

0-7-36 III ✓

Public Works (189) Department.

✓

G.O., No. 735-*I*
DATED 25 August 1898

27/5/99

[Despatch Abstract.]

Munimijeru Project -

Sanctioning, with remarks, the revised estimates, amounting to Rs 8,240/- for certain works in connection with the —
Kistna northern D.

90
24

25

29/8

Government {1899} of Madras.
PUBLIC WORKS.

} 1899.

Spare copies

G.O., No. 735 I., 25th August 1899.

AUGUST.

Sanctioning, with remarks, the revised estimates, amounting to Rs. 8,240, for certain works in connection with the —, Kistna Northern division.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

From Captain W. M. ELLIS, R.E., Executive Engineer, Kistna Northern Division, to the Superintending Engineer, II Circle, dated 22nd February 1899, No. 581 S.E.

I regret to have to report that the last two undertunnels of the Muniyeru main channel, now under construction, will cost considerably more than the sanctioned estimates for the same owing to their being built, each two spans of 10 feet in place of single-span works provided for.

While I am of opinion that the works, as now being built, allow only the proper amount of waterway having in view the nature of the soil (black cotton), the alteration should undoubtedly have been made the subject of an application for sanction before we were committed to the design as we now are, both works being far advanced. The reason why this was not done was that it has only just come to my knowledge that the works sanctioned only provided for single span a tunnel.

2. The circumstances under which this oversight occurred were as follows :—

The estimates for both these works—viz., undertunnel at 23/2½, Rs. 2,880; undertunnel at 25/1, Rs. 3,080—made reference to a design of another work for type of design, no separate drawings being made.

This was convenient as the exact sites of the works and knowledge of soil and sub-soil were only known shortly before construction commenced.

When considering the matter of taking up the last 5 miles of channel in the latter part of 1896, I mentioned to the Sub-division officer that I thought a different type of work would be economical and serve the purpose. That officer drew up a design and submitted it for orders. The design so drawn was for a work of two spans of 10 feet.

After taking the opinion of the Chief Engineer for Irrigation when he visited Bezvada early in 1897, this type was abandoned and I drew designs for both works of the type sanctioned, adapting the designs to the circumstances of site.

These designs I drew with two vents, each 10-ft. span, being misled by the design originally submitted by the Sub-division officer, which provided for two vents.

It did not for a moment occur to me that the Sub-division officer's design provided for two 10-ft. spans where only one such span was sanctioned.

The quantities were not taken out as I knew the design followed the sanctioned type, and the calculated waterway required for the catchment area of cross drainage suited the two spans allowed; thus the alteration escaped notice altogether.

I only discovered it by noticing the expenditure on works in progress was heavy for the amount of work done and by making inquiry into the cause.

3. I now submit revised estimates for these works showing an excess over sanction of Rs. 990 and Rs. 1,290, and request that the same be sanctioned from the savings on the following cross drainage works which are completed and for which completion reports have been submitted, viz.—

	RS.	RS.
1. Constructing undertunnel at 6 mile 4 fur. 540 ft.—		
Estimate	10,270	
Actual cost	9,353	
Saving		917
2. (1) Constructing undertunnel at 2 mile 3 fur. 160 ft.—		
Estimate	9,450	
Actual cost	8,781	
Saving		669
(2) Constructing undertunnel at 7 mile 5 fur. 332 ft.—		
Estimate	11,000	
Actual cost	10,447	
Saving		553
		1,222

The rates in the revised estimates are based on the agreements entered into for the execution of the works and show a material reduction on those originally sanctioned.

4. While I must confess to oversight in the matter, I submit (a) that there was no negligence as I was most naturally misled by the circumstances explained; (b) that the works as now designed are suitable to the work they have to do and that the single-vent undertunnels originally sanctioned did not provide sufficient cross drainage area involving a dangerous velocity through and in rear of the vents. I consider that a head of 1 foot involving a velocity of about 6 feet per second is as great a velocity as these works in black cotton soil should be expected to withstand.

No. 117 I.

Copy forwarded to the Chief Engineer for Irrigation for favour of sanction of Government being obtained to the revised estimates for constructing undertunnels at 23/2½ mile and 25/1 mile of Muniyeru main channel.

2. The excesses over the original estimates may be met from the savings on other works of the project for which completion reports have already been forwarded to the Examiner, Public Works Accounts.

(Signed) J. HANNAN,
Suptg. Engineer, II Circle.

12th April 1899.

To the Examiner of Public Works Accounts, dated 18th April 1899, No. 137.
From the " " " " 28th " " " 1323 B./A.
To the Superintending Engineer, II Circle, " 6th May " " 75 K.S.
From the " " " " 29th June " " 222 I.
To the Examiner of Public Works Accounts, " 6th July " " 224.
From the " " " " 22nd " " " 2450 B./A.

ENCLOSURE.

STATEMENT showing the excesses or savings on the following works up to 19th July 1899 on Muniyeru project for which completion reports have been received.

Item No.	Authority.	Description of work.	Amount of estimate.	Expenditure.	Excess or savings.
G.O., No. 518 I., dated 8th July 1898.					
1	60-8/1898-99.	Muniyeru project.—Repairing rest-house, stables and cook-house at Polempally ..	212	274	• 62
2	60-9/1898-99.	Do. —Repairing lascars' shed at Polempally ..	70	88	• 18
3	60-3/1898-99.	Do. —Rest-house at Polempally ..	2,550	2,505	— 45
4	60-4/1898-99.	Do. —Store-shed at do. ..	35	34	— 1
5	60-5/1898-99.	Do. —Lascars' shed at do. ..	1,360	1,462	102
6	61-6/1898-99.	Do. —Constructing undertunnel at 2 mile 3½ fur. ..	9,450	8,781	— 669
7	61-7/1898-99.	Do. —Constructing undertunnel at 2 mile 7 fur. ..	2,330	2,205	— 125
8	61-8/1898-99.	Do. —Constructing undertunnel at 3 mile 2 fur. 120 ft. ..	4,500	4,245	— 255
9	61-18/1898-99.	Do. —Constructing undertunnel at 18 mile 6 fur. 635 ft. ..	3,890	3,828	— 62
10	61-21/1898-99.	Do. —Constructing undertunnel at 21 mile ..	4,190	3,778	— 412
11	61-16/1898-99.	Do. —Do. do. at 15 mile ..	2,610	2,423	— 187
12	61-9/1898-99.	Do. —Constructing undertunnel at 4 mile 4 fur. 330 ft. ..	3,150	3,023	— 127
13	61-10/1898-99.	Do. —Constructing undertunnel at 6 mile 4 fur. 540 ft. ..	10,270	9,353	— 917
14	61-11/1898-99.	Do. —Constructing undertunnel at 7 mile 5 fur. 332 ft. ..	11,000	10,447	— 553
15	61-12/1898-99.	Do. —Constructing undertunnel at 8 mile 7 fur. 500 ft. ..	3,410	3,039	— 371
16	61-19/1898-99.	Do. —Constructing undertunnel at 19 mile 2 fur. 556 ft. ..	2,250	2,147	— 103
17	61-3/1898-99.	Do. —Outlet at 10th mile ..	2,020	1,475	— 545
18	61-47/1898-99.	Do. —Repairs to Machintala rest-house ..	80	77	— 3
19	61-38/1898-99.	Do. —Rest and tools shed at Vemavaram ..	200	200	..
20	61-39/1898-99.	Do. —Rest-shed at Machintala ..	1,650	1,721	71
21	61-40/1898-99.	Do. —" at Gummadidurru ..	200	200	..
22	61-4/1898-99.	Do. —Constructing undertunnel or weir at 14 mile 4 fur. ..	850	649	— 201
23	61-48/1898-99.	Do. —Repairs to rest-shed at Vemavaram ..	60	30	— 30
Total ..			66,337	61,984	— 4,353
			Net savings ..		4,353

* Excesses of Rs. 62 and 18 against items 1 and 2 sanctioned by Superintending Engineer in his No. 117 Exr., dated 21st April 1899.

(Signed) H. RAINIER,
Offg. Exr., P.W. Accounts, Madras and Coorg.

No. 162 I.

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, II Circle, submits revised estimates, amounting to Rs. 3,870 and Rs. 4,370, for the last two undertunnels of the Muniyeru main channel, involving excesses of Rs. 990 and Rs. 1,290, respectively, over the sanction accorded in G.O., No. 518 I., dated 8th July 1898. The revised estimates may be sanctioned as the original estimates did not provide for tunnels of sufficient waterway for the cross drainage.

12th August 1899.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

ORDER—No. 735 I., dated 25th August 1899.

The following revised estimates are sanctioned in lieu of the provision of Rs. 2,880 and Rs. 3,080 made for the works in the revised estimate for the Muniyeru project sanctioned in G.O., No. 518 I., dated 8th July 1898, the total excess of Rs. 2,280 on both the works being met from the saving of Rs. 4,353 shown in the

statement submitted by the Examiner of Public Works Accounts to have been realized on completed works of the project. The balance of the saving will be added to the sum * available for unforeseen works which will then be increased to Rs. 4,291 :—

* Rs. 2,218.

Irrigation.
43. Minor Works and Navigation.
Minor Works for which Capital and Revenue Accounts are kept.
Capital Account.
Muniyeru Project.
I. Works.
(2) Main Canals and Branches.
Muniyeru Main Channel.
6. Other Cross Drainage Works.

RS.

1. Constructing undertunnel at 23/2½ mile 3,870
2. " " at 25/1 " 4,370

2. This sanction is registered as No. 55 I. of 1899-1900.

(True Extract.)

Under Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle, with eight enclosures.
" Examiner of Public Works Accounts.

Exd. T. K. Narayana Aiyangar.

Public Works (1899) Department.

CURRENT No. 6883

Order

From

The Chief Engineer for Irrigation

No. 162 J

Dated 12 - 8 - 99

Received

Registered

Enclosures

Spare copies.

SUBJECT.

Muniyow Main Channel
— Revised estimates amounting
to \$ 3870 and 4370 for the
last two under tunnels of the
— Note recommending that
the — maybe sanctioned.

IRRIGATION BRANCH.

Revised estimates for cost of
under tunnels at $\frac{23}{2}$ in and $\frac{25}{2}$ in of
the Munjore main channel.

UNDER date the

Read the following

From the Supg: Engineer 2nd Circle - No 117. I. d. 12th April 1899.
To the Examiner of P.W. Accounts No 137 d. 18th - do -
From the _____ do _____ No 1323 B/A d. 28th - do -
To the Supg: Engineer, 2nd Circle, No 75 K.S. d. 6th May 1899.
From the _____ do _____ No 222. I. d. 29th June 1899.
To the Examiner of P.W. Accounts No 224 d. 6th July 1899.
From the _____ do _____ No 2450 B/A d. 22nd - do -
Statement of Savings realised on completed works of the Munjore
project
Note by the Chief Engineer for
Irrigation

The Supg: Engineer, 2nd Circle,
submits revised estimates
amounting to Rs 3870 and
Rs 4370 for the last two under-
-tunnels of the Munjore
main channel involving
excesses of Rs 990 and Rs 1290,
respectively, over the sanction
accorded in G.O. No 518. I.
dated 8th July 1898. The
revised estimates may
~~excesses are due to the~~
be sanctioned as the
~~under-tunnels being built~~
original estimates
with two vents of 10 feet

Issue
15.8.99 NH
I

7.2.9.

did not provide for
~~span each instead of the~~
~~tunnels of~~
~~single span works originally~~
~~sanctioned, which did not~~
~~provide sufficient water-~~

- way for the cross drainage.

The revised estimates may
be sanctioned.

Order Hereon No: 735 Dg 25-8-99

The following revised esti-
- mates are sanctioned in
lieu of the provision of -
Rs. 2880 and Rs. 3080 ~~for~~ made
for the works in the revised
estimate for the Muniyuru
project sanctioned in G. O.

No. 518-D dated 8th July 1898,
the ^{total} net excess of Rs. 2280 on
both the works being met

from the saving of Rs. 4353
shown in the statement submitted by the Examiner of P.W.A.
on completed works of the to have been realized

project, ~~and~~ The balance of
the saving ^{will be} added to the
sum available for unforeseen
works which will then be
increased to Rs. 4291 :-

Irrigation

43 Minor works and Navigation

* Rs. 2218.

Minor works for which Capital
and Revenue Accounts are
Kept

Capital account
Muniyuru project

I. works.

(2) Main canals & branches.

(b. Other cross drainage works.

Muniyuru main channel.

1. Constructing undertunnel Rs
at $\frac{23}{2\frac{1}{2}}$ mile 3870
2. — do — do — $\frac{25}{1}$ mile 4370

2. This sanction is registered
as No. 55 D of 1899-1900.

H
11/8/99

H.H.
12.8.99

To

The Chief Engr for Mysore

a Supp: Engr II Circle with 8 enclosures.

a Examiner of P.W. accounts

R. W. G.
7.8.99.

ap $\frac{2.102}{12.77.99}$

CURRENT No. 162 KS

The Superintending Engineer
11 mile

No 224. d. 6. 7. 89

No. 2229.

Received } 3. 7. 99

Registered

Enclosures

Spare copies

SUBJECT.

Completion Reports —
stating that the — of certain
works of the Mungeru Project
which were omitted to be sent
have now been forwarded to
the Examⁿ.

FE 9

45.

DE 9

6/2/88

No. 2450 $\frac{B}{A}$ dated 22nd July 1899.

T

Herewith a list of works of the
Muniyeru Project for which completion Re-
ports have been received in this office
up

ux

1000
3/7/98

BACK PAPERS.

No.	Date.
275 K.S.	6-5-99.
R59	28-4-99
R88K	12-4-99

up to 19th: Instant showing a net --
savings of Rs: 4,353/-.

H.R.

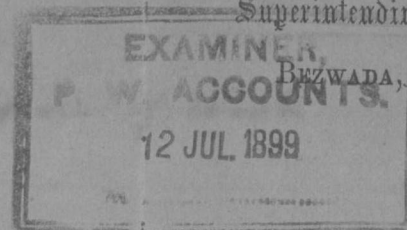
Offg: C.

22-7-99

FURTHER PAPERS.

No.	Date.
R157	22-7-99

Superintending Engineer's Office, II Circle,



29th June 1899

No. 2229

From

Captain W. M. Ellis R.E.
SUPERINTENDING ENGINEER,

II CIRCLE,

To

THE Chief Engineer,
For Irrigation

3-JUL 1899

162 K.S.

SIR,

Enclosures. —

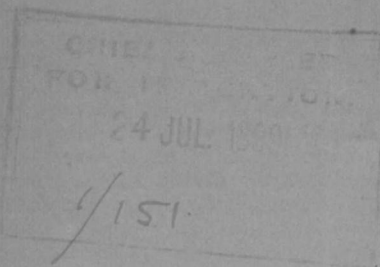
Your Endorsement No. 75 K.S. of 6-5-99
The Completion reports of the
works mentioned have now been sent
to the Examiner —

The delay was due to oversight.
The savings on the three works
amount to Rs. 2200/. or Rs. 61/-
more than originally reported.

I have the honor to be,
Sir,

Your most obedient servant,

W. M. Ellis
Captain R.E.
Superintending Engineer,
II Circle.



28/6/99

Statement showing the excesses or savings on the following works up to 31-3-99 on Mamam Project for which Completion Reports have been received.

Sl. No.	Authority	Description of Work	Amount of Estimate	Expenditure	Excess or Savings
			Rs.	Rs.	Rs.
		<u>S.O. No. 5183 of 8-7-98</u>			
1	<u>60-5</u> <u>698-99</u>	Constructing 3 leocero huts at head Works	1360	1462	102
2	<u>61-39</u> <u>98-99</u>	- do. rest house at Machinkala	1650	1721	71
3	<u>61-47</u> <u>98-99</u>	Repairs to Machinkala rest house	80	77	-3
4	<u>60-4</u> <u>98-99</u>	Constructing Store-shed at Polempally	35	34	-1
5	<u>61-38</u> <u>98-99</u>	do. rest house and tools shed at Veema			
		- varan	200	200	-
6	<u>61-40</u> <u>98-99</u>	- do. rest shed at Gummadiidivom	200	200	-
7	<u>60-3</u> <u>98-99</u>	- do. rest house and outhouses at Po.			
		- lempally	2550	2505	-45
8	<u>60-8</u> <u>98-99</u>	Repairing rest house & cook house at			
		- Polempally	212	274	-62
9	<u>60-9</u> <u>98-99</u>	do. leocero shed at Polempally	70	88	-18
10	<u>61-18</u> <u>98-99</u>	Constructing under tunnel at $\frac{18}{6}$ m	3890	3828	-62
Total			10,247	10,389	142
Net excess					142
-x- These excesses have since been passed by the Superintending Engineer in his No. <u>117</u> of 21-4-99.					

H. R.

Offs: C.

[Signature]
26.4.99

Public Works (1899) Department.

CURRENT No. 89

From
The Examiner P.W. Accounts,
Madras Coorg

Order No 75 K.S. 6 $\frac{5}{99}$

No. 1323 B/A

Copy forwarded to the Supg:
Engineer, II Circle, with reference
to para 2 of his endorsement
No 117, I, dated 12th April 1899,
and with a request that he
will be so good as to have
the completion reports referred
to in para 3 of the Executive

Dated 28th April 1899.

Received } 1-5-99
Registered }

Enclosures 2. one file

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SUBJECT.

Engineer's letter forwarded to the
Examiner of P.W. Accounts to
admit of the sanction
of Govt being obtained
to the revised estimates
for the under tunnels at
23 m + 25 m of the
Munnigern main channel

Savings effected on Completed
Works of the Munnigern Project.
States that — cannot
be checked in the absence of
Completion Reports —

789

4/5/99
6.599
Xces
7/99

Madras + Coorg

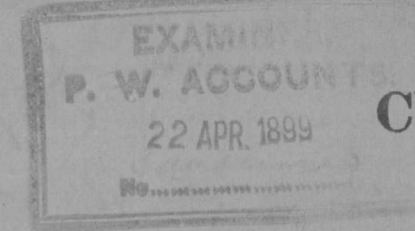
BACK PAPERS.

No.	Date.
S/137	18.4.99
R88 HS	14.4.99

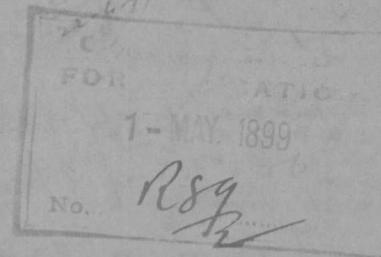
FURTHER PAPERS.

No.	Date.
275 KS	6.5.99.
R162 KS	29.6.99
R157	22.7.99

Public Works (1899) Department.



CURRENT No. 88 KS



From The Superintending Engineer
II circle

Order N^o 137 d/18.4.99
Please state the savings effected on completed works of the Munnigeru Project up to date.

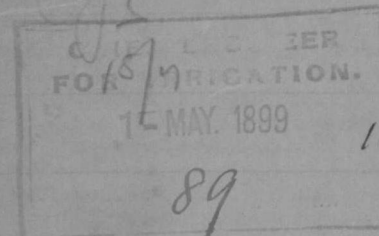
No. 117 I

Dated 12th April 1899.

Received } 14 do
Registered }

Enclosures 8 only.

Spare copies



No: 1323 $\frac{B}{A}$ dated 28th April 1899.
To E.I.

Herewith a List of completed works to 31st: March 1899 of the Munnigeru Project for which completion Reports were submitted by the Executive - Engineer Kistna Northern Division, showing the "amount of estimate", the outlay to completion, and the difference on each work.

SUBJECT.

Revised estimates for constructing under tunnels at $\frac{23}{2\frac{1}{2}}$ m & $\frac{25}{2\frac{1}{2}}$ m of Munnigeru main channel.
Forwards for sanction the

R. S. S.

15/5/99

15/4/99

15/4/99

BACK PAPERS.

FURTHER PAPERS.

Statement showing the excesses or savings on the following works up to 19-7-99 on Manneru Project for which Completion Reports have been received.

Sl. No.	Authority	Description of Work	amount of Estimate	Ex- pendi- ture	Excess or Savings
60-518	978-7-98.				
1	60-8 98-99	Mainam Project Repairing rest house stables & cook house at Palampally	212	274	62
2	60-9 98-99	- do - Repairing lascar shed at Palampally	70	88	18
3	60-3 98-99	- do - Rest house at Palampally	2550	2505	45
4	60-4 98-99	- do - Store shed at - do -	35	34	1
5	60-5 98-99	- do - Lascar shed at - do -	1360	1462	102
6	61-6 98-99	- do - Constructing under tunnel at 2 m 3 1/2 fur	9450	8781	669
7	61-7 98-99	- do - do - do - at 2 2/7 m	2330	2205	125
8	61-8 98-99	- do - do - do - at 3/2 120'	4500	4245	255
9	61-18 98-99	- do - do - do - at 18/6 m 635'	3890	3828	62
10	61-21 98-99	- do - do - do - at 21 m	4190	3778	412
11	61-16 98-99	- do - do - do - at 15 m 4 fur	2610	2423	187
12	61-9 98-99	- do - do - do - at 4/4 330'	3150	3023	127
13	61-10 98-99	- do - do - do - at 6/4 540'	10270	9353	917
14	61-11 98-99	- do - do - do - at 7/5 332'	11000	10447	553
15	61-12 98-99	- do - do - do - at 8/7 500'	3410	3039	371
16	61-19 98-99	- do - do - do - at 19/2 m 556'	2250	2147	103
17	61-3 98-99	- do - Outlet at 10' mile	2020	1475	545
18	61-47 98-99	- do - Repairs to Machintala rest house	80	77	3
19	61-38 98-99	- do - Rest and Tools shed at Vemavararam	200	200	-
20	61-39 98-99	- do - Rest shed at Machintala	1650	1721	71
21	61-40 98-99	- do - do - at Gummadiwum	200	200	-
22	61-4 98-99	- do - Constructing under tunnel or weir at 14/4 m	850	649	201
23	61-48 98-99	- do - Repairs to rest shed at Vemavararam	60	30	30
Total			66337	61984	
			Net Savings		4353

x. Excesses of Rs 62518 against items 1 & 2 sanctioned by Superintending Engineer in his No 117 Exr of 21-4-99.

H Rainier

Offg: Examiner. P.W. Accounts
16 Madras + Co

From Captain W. M. Ellis R.E. Executive Engineer, Kistna Northern Division, the Superintending Engineer II Circle, No. 581 S.E. dated 22-2-99.

EXAMINER,
P. W. ACCOUNTS,
22 APR. 1899

I regret to have to report that the last two under tunnels of the Maniyara Main Channel now under construction will cost considerably more than the sanctioned estimates for the same owing to their being built each 2 spans of 10 ft. in place of single span works provided for.

While I am of opinion that the works as now being built allow only the proper amount of water way having in view the nature of the soil (Black cotton) the alteration should undoubtedly have been made the subject of an application for sanction before we were committed to the design as we now are both works being far advanced.

The reason why this was not done was that it has only just come to my knowledge that the works sanctioned only provided for single

ENGINEER
GATION
14 APR. 1899
No. 88 K.S.

span a tunnel

2. The circumstances under which this oversight occurred were as follows.

The estimates for both these works
viz under Tunnel at $\frac{23}{2\frac{1}{2}}$ - Rs 2880

" " " $\frac{25}{1}$ - Rs 3080
made reference to a design of another
work for type of design no separate
drawings being made.

This was convenient as the exact sites
of the works and knowledge of soil
and subsoil were only known shortly
before construction commenced.

When considering the matter of taking
up the last 5 miles of channel in
the latter part of 1896 I mentioned
to the Sub Division officer that I
thought a different type of work
would be economical and serve
the purpose. That officer drew
up a design and submitted it for orders.
The design so drawn was for a work
of 2 spans of 10 feet.

After taking the opinion of the
Chief Engineer for Irrigation when
he visited Borwada early in 1897

nothing in record
in S. D. Office
M. N. 74/1899

Page 2

this type was abandoned and I drew
designs for both works of the type sanc-
tioned adapting the designs to the
circumstances of site.

These designs I drew with 2 vents
each 10 ft span being misled by the
design originally submitted by the Sub-
Division officer - which provided for 2 vents.

It did not for a moment occur to
me that the Sub Division officer's design
provided for 2 ten foot spans where
only one such span was sanctioned.

The quantities were not taken out
as I knew the design followed the
sanctioned type and the calculated
water way required for the catch-
ment area of cross drainage suited
the 2 spans allowed thus the altera-
tion escaped notice altogether.

I only discovered it by noticing the
expenditure on works in progress was
heavy for the amount of work done
and by making inquiry into the cause.

3. I now submit revised estimates
for these works showing an excess
over sanction of Rs. 990 and Rs 1140

and request that the same be sanctioned from the savings on the following cross drainage works which are completed and for which completion Reports have been submitted viz.

- 1 { Constructing under tunnel at $\frac{6 \text{ mile}}{4 \text{ f. } 54 \text{ ft}}$
 Estimate Rs 10270/- actual cost Rs. 9353/- saving Rs 917.
In program in schedule for July 98
- 2 { (1) Constructing under tunnel at $\frac{2 \text{ mile}}{3 \text{ f. } 160 \text{ ft}}$
 Estimate Rs. 9450/- actual cost 8781/- saving Rs. 669.
In program in schedule for March 1898 and Nov. 98 Rs 1222.
- (2) - 2 $\frac{1}{2}$ - do - at $\frac{7 \text{ miles}}{5 \text{ f. } 332 \text{ ft}}$
 Estimate 11900 actual cost 10447/- saving 553/-
In program in schedule for July 1898

The rates in the revised Estimates are based on the agreements entered into for the execution of the works and show a material reduction on those originally sanctioned.

4. While I must confess to oversight in the matter I submit (a) that there was no negligence as I was most naturally misled by the circumstances

explained. Page 3

(b) That the works as now designed are suitable to the work they have to do and that the single vent under tunnels originally sanctioned did not provide sufficient cross drainage area involving a dangerous velocity through and in rear of the vents. I consider that a head of 1 foot involving a velocity of about 6 ft per second is as great a velocity as these works in black cotton soil should be expected to withstand.

$$N^{\circ} \frac{117 \text{ } 9}{12.4.99}$$

Enclos: 8

Copy forwarded to the Chief Engineer for Irrigation for favor of sanction of Government being obtained to the revised estimates for constructing under tunnels at $\frac{23}{2 \frac{1}{2}}$ m and $\frac{25}{1}$ m of Munigeru Main Channel.

2. The excesses over the original estimates may be met from the savings on other works of the project for which

II Circle