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*Proceedings of the Madras Government, Public Works Department,
14th December 1864.*

No. 277. Read the following letter from Lieutenant-Colonel J. C. ANDERSON, R. E., Superintending Engineer, 2nd Division, to Colonel C. A. ORR, R. E., Secretary to Government, Department Public Works, dated Masulipatam, 23th October 1864, No. 99:—

SIR,

- 3 Comparative Statements.
3 Reports from Lieutenant Smith (to be returned.)
1 Delta Plan.
1 Diagram.

Plans in a separate cover.

1. Referring to G. O. Nos. 2,295 and 2,576, dated 14th August and 7th September 1863, respectively, I have the honor to forward Comparative Statements shewing the probable expenditure on the Kistnapatam Canal, and on

the Idur Codur, and Labor branches of the Jaffer Sahib's Channel, together with reports on each, and a general plan of the Pennair Delta, prepared by Lieutenant C. J. Smith, R. E.

2. A Comparative Statement for the Survapully new cut was submitted on 16th September 1862, by Major Greenaway, and the revised estimate amounting to Rupees 92,630 was sanctioned in G. O. No. 2,943, dated 8th December 1862.

3. The above works comprise four separate projects, viz.:—
Jaffer Sahib's Channel.

	RS.	RS.
1. Labor branch, sanctioned G. O. No. 943, dated 15th May 1861	...	30,000
2. Idur Codur branch, sanctioned in G. O. No. 943, dated 15th May 1861... ..	...	27,100
3. Kistnapatam Canal, sanctioned in G. O. No. 1,621, dated 28th August 1861	...	59,600
4. Enlarging Survapully cut, G. O. No. 360, dated 17th February 1860.	61,300	
Do. No. 1,071, dated 29th June 1860	3,147	
Do. No. 2,943, dated 8th December 1862	25,183	
	92,630	
Aqueduct across Survapully Channel Nos. 2,431 and 895, dated 26th August 1863, and 1st April 1864...	4,230	
		96,860
Total... ..		2,13,560

4. An estimate for Rupees 13,450 for improving the Pennair embankment east of Nellore, and on the south of the river, and another for the embankment west of Nellore were sanctioned* in G. O. Nos. 2,005 and 1,835, dated 5th October 1861, and 12th July 1864, respectively; but as these works are for the protection of the Delta without special reference to the channels connected with the Anicut, it would seem unnecessary to enter upon a consideration of them at present.

* G. O. No. 2,295, dated 14th August 1863.

5. As I reported† on a former occasion numerous deviations from the original design for the Delta works were found necessary. The masonry works allowed in the original estimates were one and all of too slight a character to stand the considerable velocity to which they were to be exposed. I also reported that there would probably be a saving on earth works sufficient to cover the enhanced cost of masonry; and the Comparative Statements now submitted bear out my assertion,

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6. The following is an abstract of the probable cost of each description of work, and the increase or decrease on the original estimates for the projects Nos. 1, 2 and 3 above enumerated :—

Names of Channels.	Items.	Original Estimate.	Revised Estimate.	Increase.	Decrease.
		RS.	RS.	RS.	RS.
LABOUR BRANCH.	Earth work	23,165	19,571	.....	3,594
	Masonry works	4,530	12,249	7,719	.....
	Compensation . . . . .	.....	894	894	.....
	Planting trees. . . . .	.....	100	100	.....
	Superintendence	1,112	800	.....	312
	Sundries	1,193	1,447	254	.....
	Total... ..	30,000	35,061	5,061	.....
IDUR COUDRE BRANCH.	Earth work.	20,971	8,720	.....	12,251
	Masonry works	4,620	10,479	5,859	.....
	Planting trees. . . . .	.....	200	200	.....
	Superintendence	810	810	.....	.....
	Sundries	699	1,600	901	.....
	Total... ..	27,100	21,809	.....	5,291
	Grand total of two branches...	57,100	56,870	.....	230
KISTNAPATAM CANAL.	Earth work	29,052	25,871	.....	3,181
	Masonry works	15,208	16,640	1,432	.....
	Planting trees . . . . .	.....	200	200	.....
	Compensation	6,500	5,000	.....	1,500
	Superintendence	1,351	1,200	.....	151
	Sundry works	820	2,500	1,680	.....
	Improving Rameredde Channel...	.....	5,400	5,400	.....
	Total revised estimate...	52,931	.....	.....	.....
	Add the difference between the original and revised estimate	6,669	.....	.....	6,669
		59,600	56,811	.....	2,789

7. I think it unnecessary to submit the amended plans and estimates to Government. The works are very numerous and none of them of any considerable size, and the accompanying reports and statements, will, I imagine, furnish all the information required by Government.

8. I have no irregularities to report. Shortly after taking charge of the Division, I arranged with Lieutenant Smith on the ground all the additions or improvements that were necessary ; and plans and estimates were regularly submitted and examined preparatory to the works being carried out. In some cases the amended estimates have been exceeded and an explanation of the cause in each case has been inserted in the Column of remarks in the Comparative Statements. As a general rule the cost of baling has been heavier than was anticipated, owing to the extraordinary force of springs, and owing to the great distance to which fuel had to be carted to burn bricks for some of the works, the cost of this material has risen to an unusually high rate.

9. The projects abovementioned comprise all the new works and improvements that are required in the Pennair Delta in connection with the Anicut at Nellore, with one exception, viz., the widening and extension of the old Survapully or Rameredde Channel, from the point where the Kistnapatam Channel is opened out. The estimates for this work were partly drawn up by Lieutenant Smith prior to his departure to Tanjore, and I now await their receipt from Major Richerdon, to submit them for the sanction of Government, and for entry in the Budget of 1865-66.

*Proceedings of the Madras Government, Public Works Department,
14th December 1864.*

No. 278.

ORDER THEREON, 14th December 1864, No. 3,571.

Ordered to be recorded.

(True Extract.)

(Signed) CHARLES A. ORR, Colonel, R. E.,
Secretary to Government.

Exd. T. O'Connor.

To The Supt Engineer
2nd Division

Sir, I have the honor to forward
a comparative statement of the
work executed on the Ristnaipattan
canal up to the end of July 1863;

1. The original sanction for this
work was Repees 59,600 - - - - . The amount
of the Estimate framed by Captain

* After deducting Mullins amounted to Repees 52,931
Rs 8,669 for new
cut from Jafersaib and may be subdivided into the
to the old
Sarnapally ch^l following heads, under which it

will be better to consider the
expenditure, than in the whole sum,
the heads are these.

- 1 compensation for land occupied.
- 2 construction of masonry works
- 3 channel
- 4 Sundry works.

5. Allowance for the Sumbati Poree
drainage.

6. Minor distributing channels.

7. Contingencies

8. Superintendence

2. Under head one, it will be seen

there is considerable saving; and the
probable requirements are but small,

under head two, as was reported

Masonry works

by Major Greenaway to be probable,

there is a heavy excess, in individual
works, though taking the whole, seem

allowed for masonry of every
description, it is not so great;

an explanation of the excess on each
work I have attached separately to the Bill

the general causes may be taken
as follows;

The increase in rate of daily hire
from 1.6 per mile per load, to 2.0

per mile per load; The cost of firewood
for brick burning viz 1.0 ^{1.5} ^{2.0} ^{2.5} ^{3.0} ^{3.5} ^{4.0} ^{4.5} ^{5.0} ^{5.5} ^{6.0} ^{6.5} ^{7.0} ^{7.5} ^{8.0} ^{8.5} ^{9.0} ^{9.5} ^{10.0} ^{10.5} ^{11.0} ^{11.5} ^{12.0} ^{12.5} ^{13.0} ^{13.5} ^{14.0} ^{14.5} ^{15.0} ^{15.5} ^{16.0} ^{16.5} ^{17.0} ^{17.5} ^{18.0} ^{18.5} ^{19.0} ^{19.5} ^{20.0} ^{20.5} ^{21.0} ^{21.5} ^{22.0} ^{22.5} ^{23.0} ^{23.5} ^{24.0} ^{24.5} ^{25.0} ^{25.5} ^{26.0} ^{26.5} ^{27.0} ^{27.5} ^{28.0} ^{28.5} ^{29.0} ^{29.5} ^{30.0} ^{30.5} ^{31.0} ^{31.5} ^{32.0} ^{32.5} ^{33.0} ^{33.5} ^{34.0} ^{34.5} ^{35.0} ^{35.5} ^{36.0} ^{36.5} ^{37.0} ^{37.5} ^{38.0} ^{38.5} ^{39.0} ^{39.5} ^{40.0} ^{40.5} ^{41.0} ^{41.5} ^{42.0} ^{42.5} ^{43.0} ^{43.5} ^{44.0} ^{44.5} ^{45.0} ^{45.5} ^{46.0} ^{46.5} ^{47.0} ^{47.5} ^{48.0} ^{48.5} ^{49.0} ^{49.5} ^{50.0} ^{50.5} ^{51.0} ^{51.5} ^{52.0} ^{52.5} ^{53.0} ^{53.5} ^{54.0} ^{54.5} ^{55.0} ^{55.5} ^{56.0} ^{56.5} ^{57.0} ^{57.5} ^{58.0} ^{58.5} ^{59.0} ^{59.5} ^{60.0} ^{60.5} ^{61.0} ^{61.5} ^{62.0} ^{62.5} ^{63.0} 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of masonry works except in the case of some of the Sundry works have all been reported from time to time and the necessity has been clearly demonstrated by this and last years working of the channel.

3. Under head three, the sections prepared by Captain Mullins, the discharging capacities of reaches and positions of falls have been strictly adhered to except in the last reach, which Major Greenaway sees no necessity for carrying on beyond the Mutterbura Village in the 12th mile there being no tanks to supply below that and he judging that the river Pannair ^{except} ~~same~~ in the most exceptional years would yield a supply inadequate for direct irrigation, while the Calingulaks previously sanctioned for the two tanks into which the last reach discharges itself, would, he thought, obviate the necessity for the last fall;

under

4 Under head four the statement will
show what works have been constructed
and the expenditure incurred, the designs
now submitted, and for the delay in
submission of which I am alone re-
sponsible, will show their nature, and
while the attached explanation will
show ^{cause} of excess.

Under head 5: nothing much need be written the best method of attaining the end in view within the amount allowed in the Estimate was sanctioned by yourself and has been carried out.

6 - Under head 6. the largest deviation from the sanctioned Estimate will be found due like that under head two, to a difference in opinion between Major Greenaway who carried out, and Captain Mullins who projected the channel under consideration,

I may be here mistaken, but
I understand the general principle
of the latter to be, that, every tank
should have its own branch channel
and head sluice or regulator, and that
each reach should have its direct
irrigation sluice, that is, those not
leading to tanks, but direct to
the lands irrigated; that of the former
to be, that, any large amount of ~~any~~
direct irrigation could not be
looked and need not be provided,
for, and that it was preferable to
irrigate tanks of the nature, and distributed
after the manner of, those on this line,
in turn, first filling one, then the other,
to filling all simultaneously -

It falls to my duty only to report
how under Major Greenaway's direction
and guidance, I have secured the
latter method, for the defence of
either system the correspondence of

the officers concerned can be referred to. //

7. In every case the existing depressions
of the land, ridges, or existing artificial
channels, have been taken advantage of.
The first tank irrigated is the Navilati
puddu lying ^{North of the channel} on a high level, its full
tank contour 5 feet above the bed of
the first reach, its deep bed averaging
2 feet above the same; a head sluice
is built a little above the first fall
in the north bank, its sill 2 feet
above crest of fall, and the surplus
of this tank can be passed by the
coolinglah lately built, direct into
the Navigondra tank, the water spread
of which reaches to within a few hundred
yards of the head of the Navilati puddu tank.
These two tanks can be supplied by the
head sluice, and the 12th reach can by the
same outlet be relieved without
endangering the tanks below -

8. The Master Zingdura and Kallabalepu

Tanks are supplied from the 1st reach through a head sluice in the south bank immediately opposite the head sluice referred to above, its sill 1 foot above that of the fall, and from it a channel has been dug leading into an existing channel, by which till recently Mallore tank water was carried to the tanks, this channel dug from the river channel, is under one mile in length and will I believe thoroughly answer the end in view.

9. The second reach of the canal, as you are aware, runs along side the road, it is bounded on the north by the high sand ridges separating it from Varigonda and Vani Etipadu Tanks, and it was thought advisable to provide it with a relieving work of some kind, as well as with a sluice to fill a small tank lying to the south and
- so supplement

13

so supplement in good river years, the land irrigated here by Mallore Tank; This end was effected by a small work known as the Karkupalli Weir, which is a semi circular wall built with its crest flush with the serviceable level of the water in the canal, across the front wings of a road tunnel, the wings were raised to adapt them to the weir, and a Vent with shutter was left in the wall for the supply to the fields —

- 10 — The surplus, passed over this weir, falls again into the canal 3rd reach below the second fall, by the inlet in the south bank known as one of the two Karkupalli inlets or outlets, from the allowance for sundry works one in the north, one in the south bank, and for which plan and Estimate are now submitted.

11 The third reach follows

follows ~~the~~ the course of an old
drainage, across which is built
the bund of the ~~Bramadevum~~ ^{large} Tank,
the drainage was crossed by the road
over a 3-arched bridge with 15 feet
spans, it is proposed to erect a
segmental wall in front of this
work, the crest being at irriable
water level of the channel, and it to house
two 24" x 6" wide to supply the
Bramadevum Tank, the upper most
of a series of tanks lying east of it
viz Vallum Mallum, and Muttukuru
large Tank, with the Bramadevum
small Tank lying immediately
south of it, and irriable from it
by means of its sluices.

12. The water spread of the Vallum Tank
when full, reaches the Calingulak
of the Bramadevum Tank, the Mallum
water spread nearly reaches Vallum Tank,
and the surplus of Vallum or Mallum
can be made to pass direct into the

15
^{by existing tank channel}
Muttukuru Tank, where the new
Calingulak will discharge any surplus
there may be in heavy years into the
backwater, ^{13/} after crossing the drainage
(into the Bramadevum Tank) in which
the channel water will be retained
by the circular wall above referred
to, the third reach starts the Padata-
polum Tank which a head sluice
in the north bank, situated at
short distance above the third fall,
supplies, and in the bend of which
a new Calingulak with low level
vent has been built to pass water
into Varakavipadi Tank, the water
spread of which almost reaches
the Padatapolum bund -
In the Varakavipadi bund, it is
proposed to build a flash weir
with vent to supply the Nalantene
northern most Tank, which forms one
of four tanks situated like the Muttukuru

large tank, at the end of the chain
of bunds erected across the main
drainage of this ^{part of the} delta and which four
tanks it has been proposed to unite
into one

14 The fourth reach of the Kistnapatnam
channel below the third fall after
traversing the sand ridges on the
Eastern slope of which the 4th fall
is built, crosses a second time the
drainage on which lies the brahmadesam
bund, and which at the site of the
bund seems to have branched off
into two lines on one of which lies
the Walleru, Inalluru and Muttukuru
Tanks and on the other to the North
of the line chosen for ^{the} canal lies the
Pyrampuram Katuraya Tank, and below
it again the four tanks mentioned
above as irrigable from the Palatapoluru
Head sluice via the Vahakurupedi Tank.
It is proposed to construct in the North
bank of the canal a flash weir to
pass the supply to the Pyrampuram
Katuraya

Katuraya dammed

Katuraya Tank, a small siphon
to drain the fields under the Brahma
desam Tank lying in the upper portion
of the drainage, and a weir in the bend
of Pyrampuram Tank bend to pass
the surplus thence into the 4 Tanks
at the end of the series before described.
From this drainage the 4th reach
15 — continues its course through some heavy
sand ridges on the Eastern slopes
of which will be built the 4th fall,
discharging directly into the same 4 tanks.
By Muttukuru small, Kistnapatnam,
Nalatu North, and Pyrampuram
East Tanks, ^{the reach} supplying through a road tunnel
the Muttukuru large tank lying to the North —
I have not yet determined the position
of the final drop, and am inclined
owing to the sandy nature of soil, to
make two falls instead of one, but
these arrangements will hereafter be
investigated and reported on;

16 Under head of it will be seen a
very heavy excess has occurred the

details are all forewarded and except
that brick tables would more properly
have been debited to masonry ^{and} baskets
to earthwork, I do not consider
that exception can be taken to them
I believe the expenditure to have been
bona fide incurred, and to have been
necessary. While it will be seen that
under hisid superintendence considerable
saving has been effected -

17 It will be observed that up to the end
of July there remained for the completion
of the work nearly 16,000 Rupees of
Captain Maillins' Sanctioned Estimate
and nearly 22,000 of the sum originally
sanctioned for the Channel by government,
on the Estimate submitted by Major
Greenaway ⁱⁿ 1861 -

18 Under the head of probable amount
required for completion I have included
all earthwork and turping which at
present appears necessary, all

17
sanctioned masonry works, and those
which I am able to foresee will be
required, but for which I am unable
at present to submit designs
and estimates -

19 I have allowed altogether 2,500 Rupees
for the masonry work or works, and
completion of the arrangements at
end of 4th reach which I believe will
be fully sufficient, it is double
what was anticipated but after what
I have seen at the first fall I am
satisfied that the work must be massive,
or it will not stand in such soil as
is there met with.

20 I have allowed it will be
seen an item of Rs 1500 for iron girders
the sites for these are not determined
and as the collector is very anxious
to avoid the crossing and recrossing
of water supplied from various sources
he will I know assist me in transferring

the canal to other sources, where practicable,
so that this item may possibly be saved

21 I have allowed Rs 500 for the Arizona
channel, this is an approximation,
and in the completion of the upper
reach I have allowed for turping
the slopes throughout which is
very desirable, though not intended
I imagine in the original Estimate;

I would beg that the sum shown
as surplus may not be diverted
from the channel, I could now suggest
improvements which this years rains
may prove ^{to be} essential, and would
recommend its being held in hand
till, at least, after this monsoon.

22 I have the honor to submit herewith the
diagram of the proposed channels
showing the arrangement, the sites of
masonry works, and the levels of
the crests of the regulators reduced
to floor of head sluice as datum, which
as will be seen, is 31.49 above mean

21
tide - These levels I have had or am
having painted up on the works themselves.
I would request to be informed whether
any other information ought in your
opinion to be entered on this diagram
and as I have only one Draughtsman
(Captain Moberly's kindly lent me
for the purpose) that the original may be
returned to me for record, a copy having
been taken.

23 A large survey on a scale of 6
inches to a mile (the scale which
best agreed with the various detailed
surveys taken during the last few years)
has been copied with the ^{the} diagraph
and completed from information
— at my disposal - which will

form a correct skeleton on which
to transfer the different detailed
surveys, most of the levels hitherto
taken have been reduced to head sluice

statements (they were all taken originally with different drafts) and plans in duplicate have been prepared of the masonry works on which alterations from sanctioned designs were made when they were built or to which additions and improvements have since been carried out -

24. Comparative statements similar to those herewith submitted for the Kistna-petam canal have been prepared (in draft) for the expenditure on the Levee and Salween Branches, which will be sent in when ready.

25. I hope that a consideration of the information afforded, and of the minute examination into details connected with works extending over three years, which its submission has entailed, will be held to free me from the blame attached to me for the delay, and

I would point out that thorough statements which I prepared for²³ submission in July, and would have submitted, had I not been temporarily incapacitated for more duty than the current work required, would necessarily have contained inaccuracies and might have led to further confusion and the consequent references which I believe will be henceforth avoided, now^{that} for the first time the whole project has been grouped and committed to record.

I have &c

Believe

1st October 1863

W. M. L.

Leitch

Assistant Engineer W. M. L.

Statement of Expenditures
Toward Construction
Canal.

Enclosed 6.

No 2935
No 2935/1/2

Date 1. October 1883

The Superintendent
of Engineer 3rd Division

to 2nd Engineer

Smith

From

Received
\$10000 0/24 October 1883

Comparative Statement showing the Originals and Revised Estimates of the
Four No. 10000 Branch of Jafferlahes Channel in a Colored District
Sanctioned in G.O. No 943 dated 15. May 1881 for Rs. 27,000.

Items

Widening Jafferlahes
Channel from 10000
to 1st Dividing Dam

Regulating width of
Jafferlahes Channel from
1st Dividing Dam to Allepore
runs Dividing Dam

Amount of
Originals
Revised
Estimates
Differences

Demanded

2858

2858

2858

2290

1199

1091

Not required

Carried forward 5748 4057 1091

Brought forward	5748	4057	"	1091
Navala Kha of phone				
Office under paper labels				
Channel for Navala Khas				
Channel				

Regulating the width of
the Channel from Allepoom
Dam to Cherry Dam

Cher Mors Diving Dam	1050	1280	230	"
Improving Channel from Cher Mors Dam to Mackinla				
Mad Dam	5384	13223		"

Macderlapad Girding.
Dams and Bridges. 670 11.37 467

Improving and Regulating
Channel from Mackinac to
Dance to Pelee Islands

	230	670	440	
Revered Diving Dams				This Dams is owing to the additions
Regulating and Improving				of things and retaining walls and
Channel from Power Dams				rough stone aprons to the original design
to Amulur Dam	976	1123	157	This Dams is owing to the slight alterations

Amulur Dam	400	1020	520	"
Improving Do	"	190	190	"
Do	"	162	162	"

Regulating and Improving
Channel from Humber
Dams to Four Dams

Exp. Dams	220	"	220
Carried forward	17254	15497	4219
			5946

A Revised Estimate submitted for Rs 1450 by the
 acting Chief Engineer, W. C. "The Income Rs 739
 dated 30th April, 1863. The excess of Rs 1970
 is owing to the increase of rates and additional
 work required in the following items —

Madam —	Rs 66	The strength of the
Mills —	" 447	Spring is now Abt =
Earth work —	" 465	Settling Extraordinary
Raising —	" 805	and Receipts of
Sum with Rs —	" 213	Net 1970

The excess of mills and the larger & purchase of
 raising —
 This excess is owing to the increase of rates

The Cause of Greece of No 230 is owing
to the Assession of Caterites, heretofore
are wrought stone Athens to the Original
Design -
God Required

This &ccs is owing to the addition
of laterites & stones retaining walls
and though some persons and alterations
to the wings, to the original design

185- both required

This Secret is owing to the Addition
of things and retaining walls and
rough stone Aprons to the original den-

This excess is owing to the slight alterations from the original estimate.

This Deed is owing to the Revision of the Plan from the Original Design. And to the Assent of the Patente Inventor and rough stone approved.

Not required

220 Not required

Brought over 17253 15297 4219 5970
 Regulating and Improving
 Channel from Green P
 Dam to Hoover Dams 906 " " 906 Not required

Hoover Dams 70 " " 70 Do

Regulating and Improving
 Channel from Cherokee
 Dams to Cherokee Dams 64 " " 64 Not required

Murkum Dams 200 540 260 " " This excess is owing to the Revision of
 the Plan from the Original Design

Regulating and Improving
 Channel from Murkum
 Dam to Cherokee Dams 539 " " 539

Cherokee Dams
 and Bridges 430 " " 430

Regulating and Improving
 Channel from Chino
 Cherokee Dams to
 Varigonda Dams 202 " " 202

Varigonda Dams 250 " " 250

Regulating and Improving
 Murkum Bank Channel
 from Murkum Dam 622 " " 606 The difference is for the Reciprocity

Regulating and Improving
 Chino Cherokee Channel 365 " " 334 Do

Regulating and Improving
 Varigonda Bank Channel
 from Varigonda 274 " " 274 Not required

Carried forward 21336 16099 4479 9710

Brought over 21336 16099 4479 9710

Regulating and Improving
Totapully Tank & Channel
from Vargoudas Dam

583 30 " 553 The difference is not found Receipts -

Regulating and Improving
Machhalapada Tank &
Channel from Machhalapada Dam

1009 19 " 1070 20 20

Totapully Quinsing
Dam

90 708 676 " The Cause of fees is owing to the Revision
of the Plan from the Original Design

Regulating and Improving
Totapully Sinner & Channel

154 " " 154 Not required

Regulating and Improving
Totapully Channel

245 " " 245 20

Regulating and Improving

Redur and South Channel
from Pover Dam

2094 24 " 2070 The difference is not found Receipts -

Superintendent

810 810 " "

Laudones

699 1600 901 "

Total Original Estimate 27100

Works Not Allowed

in the Original Estimate

Constructing 3 feet Culvert
for the Gaffer and Lake Channel
for the Drainage of Pungas
Machhalapada

215 215 "

Constructing a Quinsing Dam
at the junction of Pungas
and Gaffer and Lake Channel

384 384 "

Regulating and Improving Channel
from Machhalapada to Totapully Dam

40 40 "

Carried forward 27100 19987 6695 13808

All these works are found
Receipts & Vouchers of the Original
Project.

Bring it over 27100 19987 6695 13808

Repairing and improving
Channel and Annual Dams
to Bank

" 17 17 "

Embanking the Approaches
to Potapuly Dams

" 50 50 "

Stone to supply to Vaynabas
Dams

" 320 320 "

do do to Potapuly Dams

" 320 320 "

do do to Balagyrrow
Channel

" 170 170 "

Small sluice at 70 Pipers
Sack

" 280 280 "

Completing Approaches and

Petty Repair to Annual Dams

" 100 100 "

Clearing Channel between
Marklar to Potapuly Dams

" 200 200 "

Planting Darka grass in
rear of Existing works

" 100 100 "

Extra Rough stone

" 200 200 "

Attentions to Potapuly Dams

" 65 65 "

27100 21809 8517 13808

Despatch Expenses 8517

Net saving 5291

Superintending Engineer Office
2nd Division, Madras
26th October 1864

Despatched 16 November 1864

F. J. M. 42

C. C. Anderson Joint Colonel R.E.
Superintending Engineer 2nd Division

All these works are found to
be necessary since the sanction of
the Original Project

Comparative Statement
 Showing the Original
 and Revised Estimates of
 the Four Room Branch
 of the Jackson Channel
 in the State of Indiana
 dated 15 May 1861 per
 No. 27108

William D. Smith.

pp 1250074

Comparative statement showing the Original and Revised Estimates for
 excavating a Canal of Irrigation from the Yellow River to the Yellow
 River in the State of Indiana dated 28 August 1861. for the sum of \$59,500.

Item	Original Estimate	Revised Estimate	Decrease	Remarks
Forming a Canal from Head to Tail to a depth of 10 feet	5631	6114	483	This excess is owing to the slight alteration in the original estimate.
Permitment for opening the head of the Canal	144	193	49	Do Do Do
Occupation Bridge	1439	1484	45	This excess is within 5 per cent.
Tunnel of 2 yards span Approach to Occupation Bridge	270	315	45	This excess is owing to the increase of rate.
Carried forward	7484	8106	622	

Brought over -	7484	8100	6225	"	This excess is owing to the Revision of the Plan from the Original design and to the increase of rates.
1st Drop -	1420	3420	3000	"	
Channel of distribution to Mellow Creek Channel from Stephens Creek Bridge	220	220	"	"	
Irrigation sluice	185	"	"	185	Not required
2 Spare sluices as above	370	"	"	370	Do
Forming a Channel from Vanleet's Drop to Haskins' Drop	5822	5060	"	762	The difference is not found here pay.
2d Drop	980	1444	464	"	The excess is owing to the increase of rates.
Head sluice North Side	480	560	80	"	Do Do

Irrigation sluice	260	"	"	260	Not required
Two spare sluices	370	"	"	370	
Forming Channel from Haskins' Drop to Brunswick's Drop	5548	6714	1166	"	
Sluice and surplus escapes	540	950	410	"	The excess is owing to the increase of rates for masonry work.
3rd Drop	910	1800	890	"	
Irrigation sluice North side	260	"	"	260	Not required
Do South side	260	"	"	260	
Two spare sluices	370	"	"	370	
Forming Channel from Brunswick's Drop to Mellow Creek Drop	5705	5622	"	83	
Carried forward	31184	33896	5632	2920	

4 Drop -	31184	33896	5632	2920	The saving is owing to the Revisions of the Plan from the Original Designs
Irrigation sluice North Side	1190	1000	"	190	
Irrigation sluice South side	200	"	"	260	
Two spare sluices	200	"	"	260	
Two spare sluices	370	"	"	370	
Forming Channel from Mouth of brook to terminus -	1126	500	"	626	The difference is not required
Two Irrigation sluices	370	"	"	370	
Provision for Discharging surplus waters of Vaclate pad	"	"	"	"	
Photogenic Draw	1000	830	"	170	
Curry wall -	2000	"	"	"	
Walloppully Salinjula	"	568	"	"	

Do. -	120	120	120	120	This includes certain works for which Revised Estimates and Designs have to be submitted, Para 19 of Credit Committee Reports -
Sub C in 1st mile	30	"	"	30	
Port to low tank Salinjula	310	"	"	"	
Cultivation of paddy	650	"	"	"	
Compensation for lands	5000	"	"	1500	
Extra Estate Revenue	1357	1200	"	157	
General sluices	820	2500	1080	"	
Planting Trees	"	200	200	"	
Vaclarate pad Head sluice	"	800	800	"	
Madagoo fooder Head sluice	"	800	800	"	
Carried forward	46431	58270	89725	7133	

Brought over	66131	48270	8972	7133-
Branch Channels	6500	664		
Maogoofoooon Channel		175		
Pasatapoon Channel		47		
Muthur Channel	5	3129		2359
Quelatepad Channel		255		
Vargooda Channel	121	1500		
30 Row Aqueducts with paved	200	2000		
Total	52931	1500		
As a difference between the Original and Revised Estimate	6669	"	6669	
Improving River & Channel		5400		
	59600	56811	14372	17161

* This is the amount of Revised Estimate
submitted by Mr. J. H. Mullins
to the Dept. of Engineering in his
letter No. 367 dated 8th Aug. 1882.

A separate Estimate will be submitted
for improving the River & Channel
and its distribution to the amount here
entered Rs 5400 will be recovered
and the saving on the first two items

Superintending Engineers Office	14372	14372	14372	14372
22 Division, Madras	2789			
26 th October 1884				
Despatched 16 th November 1884				

Superintending Engineers Office
22 Division, Madras
26th October 1884
Despatched 16th November 1884

E. J. M.

McDonald District
 Comparative statement
 for excavating a Canal
 of navigable form from Nelson
 to Victoria for steam navigation
 in G.O. No 1621, dated 28th
 August 1861 for Rs 59600

99787035/14

Comparative statement showing the Original and Revised Estimates of
 the latter branch of Jaffers Lake Channel in Nelson District sanctioned in
 G.O. No 943 dated 15th May 1861 for Rupees 30000

Decimals
 Rupees
 Original of
 Revised of
 Estimated
 Rupees
 Decimals

Deepening Jaffers Lake Channel from West side to 1 st Dividing Dam	5776	5777	1	3702	Robt. Macfarlane
Regulating with the Jaffers Lake Channel from 1 st Dividing Dam to Allepoorums Dividing Dam	5702	"	"	3702	Robt. Macfarlane
Constructing Allepoorums Dividing Dam	2300	3336	1036		
Carried forward	11778	9113	1037	3702	

A Revised Estimate for Rs 2900 has been
 sanctioned by Government in G.O. No 598 dated 20th
 March 1862. The excess over the latter estimate
 Rs 436, is owing to the increase of rates
 and want of sufficient supervision

Brought over 11778 9113 1037 3702

which irregularity was noticed in
G.O. No 2576 dated 27 September 1863

Measuring and Improving
Lahur Channel from Altopor-
and Dividing Dams to
Marquarrespetta Dams

2529 3875 346 "

this excess is owing to the slight alterations
from the original estimate

Marquarrespetta
Dividing Dams

690 1294 604 "

Of this excess Profoundly is caused by the
revisions of the original design and
and the new Chapter 31, is owing to
the increase of rates

Canals Cut from Marquarrespetta
Dividing Dams to Marquarrespetta Channel

2961 5500 2539 "

351 Not required

Canals Cut from Marquarrespetta
Dividing Dams to Marquarrespetta Channel

2961 5500 2539 "

351 Not required

An Enquiry of 1000 yards of length was
made in the original estimate, which
error has been reported to the Deputy
Chief Engineer by Captain Mullins in
his letter No 997 dated 19 May 1862
The excess No 2539 is finally owing

Measuring Drop of over
4 ft in Marquarrespetta
Channel

130 } 1080 310 "

to the above Cause and 214 to the increase
the section of the Channel as proposed in
the Report of the Deputy Chief Engineer dated 24
October 1863

130 } 1080 310 "

The excess on this work is owing
to the revisions of the Plan from the
original design and to the increase
of the rates

Improving Channel from
Marquarrespetta Dividing
Dams to Lahur

562 900 338 "

Revised since the sanction of the
original estimate

Excavating a Channel from
Marquarrespetta Dividing
Dam to Old Gungapattam
Channel

170 545 375 "

Measuring and Improving
Lahur Channel from
Marquarrespetta to Patta
Dividing Dams
Excavating a Channel from
Marquarrespetta Dams to
Old Gungapattam Channel

846 257 " 589 } Not required
3060 643 " 2417 }

Carried forward 24717 23207 5349 7059

Potta poor Division Do Do Improving and Improving Indukurpetta Channel Grand Potta poor Division Dam to Mypanoor Dam	Brought over	24717	23207	5549	7059	This Estimate was sanctioned in GA No 1243 dated 16 May 1863 -
		270	680	410	"	
		"	680	680	"	
Indukurpetta Braided Channel Sluice		70	"	"	70	Not Required
Indukurpetta Dividing Dam		200	670	470	"	This excess is owing to the Revision of the Plan from the Original Design
Mypanoor Sumpanga pull Channel		888	74	"	814	Not required
Sumpanga pull Dividing Dam		230	600	370	"	The excess is owing to the Revision of the Plan from the Original Design
Superintendent		1121	800	"	3121	Not required
Inspector		1193	1447	254	"	
Works Not Allowed in the Original Estimate -						
Compensation			894	894	"	This sum was inadvertently omitted in the Original Estimate
Constructing Gungapattam Dam		"	858	858	"	
Constructing Salur Dam		"	850	850	"	
Do Direct Sluice		"	200	200	"	
Do Indukurpetta Prop.		"	410	410	"	
Improving Channel between Gungapattam and Gungapattam Prop.		"	200	200	"	
Improving Allepoor Dam		"	1210	1210	"	
Planting Durhafrass		"	100	100	"	
Carried forward		30000	34271	12526	8255	

All these works are found to
be necessary since the sanction of
the Original Project.

Brought over 3000 34271 12526 8255-

Direct migrations since
for lands lying south of
Gungahatung Drop.

20%

Constructing 2 Slaves at
Inson Purgetta, Channe-Cat
70 Refined each

210 210

Contracting & Co. to
Gungahatam Channel at
70 Pice each

210 210 "

Additional Provisions
Resolutions

0300 0300 "

30000 35061 13316 8255

Drunk because 8255

Wm. Brewster 5061

Superintending Engineers Office
22 Division Massachusetts

J. A. Andrews Vice President

Superintending Engineer
I. Parker.

26th October 1864 - J.
 dispatched 16 Souvenirs 1864.

dispatched 16 November 1864.

3417-23

11:99

53
Superintending Engineer
Office 2^d Division Massachusetts
28th October 1864

From Lieut Colonel J. L. Anderson
Superintending Engineer
2^d Division

To Colonel J. A. Cross
Secretary of Government
S. P. Works Mass

Sir,

Referring to G. O. No. 2295, and
2576, dated 14th August and 7th September
1863, respectively, I have the honor
to forward Comparative Statements
showing the probable expenditures
on the Nechuapetum Canal, and on
the Lower Coar, and other branches
of the Jaffersabels Channel, together
with reports on each, and a
General Plan of the Ounair Belles
prepared by Lieut J. F. Smith
2^d A Comparative Statement for
the Curupully River was submitted
on 16th September 1862, by Major
Greenaway, and the Revised Estimate

Placed in a
separate cover

977573376

McNamee District

Confidential Statement
showing the original and
revised estimate of the
Laborer and of the
Jaffersabels Channel
and the Curupully River
for the year 1861
for the sum of \$30,000

Amounting to Rupees 92630 was
Sanctioned in G.O. No 2943 dated
8th December 1862.

3 The above works comprise four
separate projects, namely:

Jaffer Sahel Channel.

1 Lahar Branch ^{sanctioned} G.O. No 943.
dated 15th May 1861 — Rs 30000

2 Sour Mohan Branch
Sanctioned in G.O. No 943 dated
15th May 1861 — 27100

3 Mistnapatan Canal
Sanctioned in G.O. No 1621 dated
28th August 1861 — 59600

4. Enlarging Suruapully Cut
G.O. No 360 dated 17th July 1860. 64300
Do No 1071 dated 2nd June 1860. 3147
Do No 2943 dated 8th December 1862. 25183

Aqueduct Across — 92630

Suruapully Channel
No 2431, and 895 dated 26
August 1863 and 1st April
1864. — 4230 — 96860

Total — 213560

4 And Estimates for Rupees 13450
for

Rs 16400.

G.O. No 2345 dated
1st September 1863

for improving the Omniair Embankment
East of Pellores, and on the South of
the River, and another for the
Embankment West of Pellores were
sanctioned in G.O. Nos 2005 and
1835 dated 5th October 1861 and
12 July 1862 respectively; but as
these works are for the protection
of the Deltas without special
reference to the Channels connected
with the Aqueduct, it would seem
unnecessary to enter upon a Consi-
deration of them at present; -

5. As I reported on a former
occasions numerous deviations
from the Original Design for
the Delta works were found
necessary. The masonry works
allowed in the Original Estimates
were one and all of too slight
a Character to stand the Consider-
able velocity to which they were
to be exposed. I also reported
that there would probably be a
sinking.

having no earth works sufficient
to cover the enhanced cost of
masonry; and the comparative
statements now submitted bear
out my assertions -

The following is an Abstract
of the probable cost of each description
of works, and the increase or
decrease on the original estimates
for the projects No 1, 2 and 3 above
enumerated -

Name of Channels	Items	Original Estimate	Revised Estimate	Increase	Decrease
Lahur Branch	Earth work	23165	19571	"	3594
	Masonry works	4530	12249	6738	"
	Aprons	"	300	300	"
	Compensation	"	894	894	"
	Planting trees	"	100	100	"
	Superintendence	1112	800	"	312
	Provision	1193	1447	254	"
	Total	30000	35061	5061	"
Dair Doon Branch	Earth work	20971	8720	"	12251
	Masonry works	4620	10479	5859	"
	Aprons	"	100	100	"
	Planting trees	"	200	200	"
	Superintendence	810	810	"	"
	Provision	699	1600	901	"
	Total	27100	21809	"	5291
Grand total of two Branches		57100	56870	"	230

Mintuopatum Canal.

Earth work	29052	25871	11132	3181
Masonry works	14064	15617	1553	"
Aprons	144	193	49	"
Planting trees	"	200	200	"
Provision for discharging surplus water of Haveltepa & the Haveltepa Compensation	1000	830	"	170
Superintendence	6500	5000	"	1500
Land works	1357	1200	"	157
Improving Pame redd Channel Co.	820	2500	1680	"
Total Revised Estimate	"	5200	5200	"
As to the difference between the Original and Revised Estimate	52931	6669	"	6669
	59600	56811	"	2789

7- I think it unnecessary to submit
the Amended Plans and Estimates to
Government. The works are very
numerous and none of them of
any considerable size, and the accom-
panying reports and statements,
will, I imagine, furnish all

the information required by Government.

8-. I have no irregularities to report. Shortly after taking Charge of the Division, I arranged with Lieut Smith on the ground all the additions or improvements that were necessary; and Plans and Estimates were regularly submitted and examined preparatory to the works being carried out. In some cases the

Amended Estimates have been Exceeded and an Explanation of the Cause in each ^{case} has been inserted in the Column of remarks in the Comparative Statements.

As a general rule the Cost of making has been heavier than was anticipated, owing to the extraordinary force of Springs, and owing to the great distance to which fuel had to be Carted to burn bricks for some of the works, the Cost of this material has

has risen to an unusually high rate.
9-. The projects above mentioned comprises all the new works and improvements that are required in the Ponnair Delta in connection with the Aqueduct at Mellose, with one exception, viz the widening and extension of the old Turnaspeelly or Panoreddy Channel, from the point where the Krishna patams Channel is opened out. The Estimates for this work were partly drawn up by Lieut Smith prior to his departure to Bangalore, and I now await their receipt from Major Pittendown, to submit them for the sanction of Government, and for entry in the Budget of 1865/66.

I have the honour to be
Sir,
Your most Obedient Servant,
J. Anderson Lieut Colonel
Superintending Engineer 2nd Div.

Copy
JWE

14 Aug 4/43 - 22987

1864 Dec 1st
From the Commissioning by wire
to the Secretary to Govt
S. F. Nichols
Washington

ad 28th Dec 1864
12 16 15 1/2 - 1100000000
1000 20 2000

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Submitting Comrade
Attorneys, Reports and
New Rec. of the Census
with Report for the
President of Government.

Recorded

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Recorded

Delaware
11th Dec 1864

277 275

6 Aug 1864 - 1100000000

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