

(1) Number of pages

32

(2) Date of repair

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(3) Initials of the Referencer

MADRAS RECORD OFFICE.

Government of Madras.

Public works DEPARTMENT.

G.O. No. 2850

Press
Misr

48182

Dated 25-11

1870.

Not to be folded or roughly handled

5-7

*Proceedings of the Madras Government, Public Works Department,
25th November 1870.*

No. 481. Read the following letter from the Acting Superintending Engineer, 5th Division, to the Secretary to Government, Public Works Department, dated Cuddalore, 5th November 1870, No. 163 :—

I HAVE the honour to submit, for the sanction of Government, a revised estimate of Rupees 53,930, accompanied by a comparative statement, for the bridge that is being constructed across the

One Revised Estimate of Rupees 53,930.
„ Comparative Statement.

Vellaur, on the coast road from Pondicherry to Negapatam, or on the first branch of the Great Southern road from Madras to the Travancore frontier.

2. In G. O., No. 2,427, of the 9th August 1867, an estimate of Rupees 44,800 was sanctioned for this bridge, and the work was commenced during the last official year on an allotment of Rupees 20,000. When the revised rates provided in this estimate were fixed, the Range Officer, Mr. R. E. Norfor, considered them sufficient; as he did not anticipate the many difficulties which he had afterwards to contend with when the work was commenced; and it is therefore apprehended that, notwithstanding the great attention and time devoted by that officer to this work, and his earnest endeavours to economize in every possible way, the sanctioned estimate is likely to be exceeded by Rupees 9,130.

3. The causes which have led to this excess are detailed below :—

1st.—The first item of excess over the revised estimate occurs in the brick-in-chunam work. The rate allowed in the estimate is 2 Annas and 3 Pice per cubic foot, while the actual cost of the work, done up to date, is at the rate of 2 Annas and 6 Pice per cubic foot. The cause of this excess is chiefly attributable to the difficulty of obtaining fuel for burning bricks and chunam. It was expected that the ryots in the vicinity of the work would dispose of their Carivalen topes for a reasonable offer, but it is now found that they refuse to do so at any price; and there has been no alternative, therefore, but to cut down old avenue trees on abandoned lines of roads at great distances from the work, and to cart the same departmentally. And the pay for the pit-sawyers and for the cartage thus entailed has greatly enhanced the price of the wood. Again, the laying of the solid foundation above the wells was a matter of great difficulty, and it was in consequence impossible to obtain the full profitable value of the men's wages, as the springs were very great and impeded the progress of the work.

2nd.—The next item of excess is in the wells. Those sunk up to the present time on the work have cost about Rupees 21 each, while the price entered for them in the estimate is only Rupees 16 each. When the estimate was prepared it was not intended that the wells should be filled with *hydraulic* concrete. The specification distinctly states that they are “to be filled with cubes, with concrete in the interstices, or to be filled entirely with concrete.” But Colonel Foord, R. E., subsequently directed the Executive Engineer to use hydraulic concrete, similar to that employed by the French Engineers in the foundations of the Ariancoopam bridge, which is also built across a tidal river, between Cuddalore and Pondicherry. Moreover, the well-sinkers, who had to be obtained from Pondicherry and Cuddalore, taking advantage of the scarcity of this class of people near the work, and knowing that we were entirely at their mercy, commanded their own price, and it

*Proceedings of the Madras Government, Public Works Department,
25th November 1870.*

was only after infinite trouble and worry that they agreed to take 5 Rupees per well for sinking alone.

3rd.—The next and the largest item of excess is in the temporary dam and baling. The sum allowed for these services is Rupees 3,000, whereas Rupees 5,099-9-5 have been already laid out, and Rupees 3,800 in addition are still required for these purposes. It is thus clearly shown that the provision made in the original estimate for these services was altogether inadequate. In fact, the peculiar situation of the work makes it nearly impossible to estimate accurately the cost of the items in question. The temporary dam constructed last year was completely washed away by the unusually heavy flood in the river in November 1869, as reported in paragraph 4 of the Executive Engineer's letter, recorded in G. O., No. 214, of the 19th January 1870. This was replaced this year, but it has been again entirely carried away by another heavy flood on the 7th September 1870. It is, however, to be observed that on both these occasions the dam would have had to be breached, had not the freshes done so, in order to prevent the erosion and destruction of the opposite bank that would have been caused by the groyne-like effect of the bund.

As regards baling. This river, as the Government are well aware, is dissimilar to most of those in the district, in its being tidal for many miles inland. At the bridge site the water is never less than 4 and 5 feet deep, and as much as 12 and 14 feet during floods. In fact, the "more than ordinary difficulty in laying the foundation," anticipated by Colonel Foord (*vide* paragraph 6 of his letter, recorded in the Government Order above quoted), has proved to be short of what has really had to be contended against from the constant floods, and the springs arising from the ebb and flow of the tide. Even with three picottahs working close together it was at times not possible to keep the foundations sufficiently dry for laying bricks in mortar, and hence the very heavy cost for baling water.

4th.—No provision is made in the estimate for filling in with concrete the interstices between the wells under the abutments and wing-walls, but, as Colonel Foord afterwards considered this system necessary in order to form one solid mass to build upon, it has accordingly been carried out at a cost of Rupees 773-7-0.

5th.—The sum allowed under the head of Sundries, namely, Rupees 1,400, which is only about 3½ per cent. on the amount of the estimate, is too small to meet the charges for minor supervision, sheds, petty stores, etc., required for a work of this magnitude, and an addition of Rupees 271 is found absolutely necessary.

4. So much for the excess. *Per contra*, there are a few items upon which a saving can be expected, namely:—

1st.—Approaches.—When the estimate was prepared it was intended to build the bridge at the present ford, but my predecessor afterwards fixed the site a little to the west of this crossing, where the river is narrower, so that it is expected that Rupees 1,574, instead of Rupees 2,000, will be sufficient for the approaches. On the other hand, this alteration of the site will necessitate an outlay of about Rupees 4,000 in connecting the bridge with the road on either bank, including a tunnel and calingulah; for this a separate estimate will be submitted shortly.

*Proceedings of the Madras Government, Public Works Department,
25th November 1870.*

2nd.—Gravel.—As this is not procurable nearer than Cuddalore, and could not, therefore, be laid down for the sum allotted, it is proposed to use for the surface of the road-way brick-jelly, or refuse of over-burnt bricks, by which a saving of Rupees 850 is anticipated.

3rd.—Out of the sum of Rupees 1,000 allowed for scaffolding, it is considered that 500 Rupees will be sufficient with the materials now on hand.

5. The work was commenced in April 1869 on a grant of Rupees 20,000, and stopped in September 1869 after an outlay of Rupees 19,930-13-0 had been incurred thereon, and the grant thus exhausted. It was re-commenced in April 1870 on a further allotment of Rupees 20,800, of which Rupees 8,482-7-2 have been spent up to the end of October 1870, making the total expenditure Rupees 28,413-4-2.

6. The sum still required for completing the bridge is Rupees 13,199, that is, the balance of the revised estimate now submitted; and of this balance Rupees 10,000 has been applied for in my Budget Estimate for the ensuing year. As for the remainder, Rupees 3,199, I am unable to point out any source to which it may be charged, and should there be no likelihood of its being granted later in the year, I can only suggest that this sum be also included in the next year's Budget.

7. As it is of great importance that the work should be completed, if possible, before the next year's freshes come down, which may be expected about July next, and as, under the circumstances stated above, it would appear that the excess over the sanctioned estimate is unavoidable, I have the honour to request that the Government will be pleased to accord their sanction to the revised estimate herewith submitted, and to allot the funds required for the completion of the bridge.

8. I think it proper to state, in conclusion, that I have recently visited the site of the bridge, and examined the work as carefully as the state of the river would permit. I find the bricks of excellent quality, and the work, as far as I could judge, neatly and conscientiously carried out. And I am of opinion that the Government may rely upon the works being executed successfully under the Superintendence of Mr. R. E. Norfor, who, I am satisfied, uses his best endeavours to economize in every way consistent with the satisfactory completion of the work.

No. 482. ORDER THEREON, 25th November 1870, No. 2,850.

CIVIL WORKS, No. 34.

In their Proceedings of the 9th August 1867, No. 2,427, the Government sanctioned an estimate of Rupees 44,800 for the construction of a bridge across the Vellaur on the coast road from Pondicherry to Negapatam in the South Arcot District, for which a revised estimate of Rupees 53,930 is now submitted, exhibiting a probable excess of Rupees 9,130. This increase is distributed under the following items:—

1. Brickwork.
2. Wells.
3. Baling and temporary dam, and
4. Sundries.

*Proceedings of the Madras Government, Public Works Department,
25th November 1870.*

2. The excess* on brickwork is stated to be due to the difficulty of procuring fuel for burning bricks and clammam and of laying the solid foundation above the wells on account of the quantity of water flowing into the excavations from land springs.
- * Rupees 1,797.
3. The substitution, by the order of the Superintending Engineer, of hydraulic concrete for "cubes, with concrete in the interstices, or concrete only" in filling the wells, and the enhanced rates required to be paid to well-sinkers, have, it seems, led to the increase† under the item of wells; while the utter inadequacy of the provision made for baling in a tidal river like the Vellur, which is moreover liable to constant floods, accounts for the very large excess‡ under item No. 3.
- † Rupees 2,205.
- ‡ Rupees 5,900.
4. The amount entered under the head of Sandries which is about 3½ per cent. on the sanctioned estimate, is represented to have proved too small to cover the various charges under that head.
5. In addition to these causes of excess the Acting Superintending Engineer states that extra work to the extent of Rupees 773, not provided for in the original estimate, was carried out, also under the direction of Colonel Foord, in filling in with concrete the interstices between the wells under the abutments and wing-walls with a view to form one solid mass to build upon.
6. Under these explanations, and seeing that the Acting Superintending Engineer, after personal examination, certifies to the excellent quality of the materials used and the neat and economic manner in which the work is progressing under the superintendence of the Range Officer, Mr. Norfor, the Government sanction the revised estimate of Rupees 53,930.
7. The expenditure on the work up to the end of 1869-70 was Rupees 19,931, and a sum of Rupees 20,800 is provided for it in the current year's Budget, leaving a balance of Rupees 13,199 yet to be assigned. This amount His Excellency the Governor in Council will endeavour to allot in the outgoing Budget.
- (True Extract.)

Colonel R.E,
Secretary to Government.

To the Acting Superintending Engineer, 5th Division.
 .. Controller of Public Works Accounts.

Exd. S. T. Augustin.

5th Division D.P.W.

New York.

Communications.
For the Free District.

N^o 4 Range.

Chedumbrum Talook.

Abstract of Revised Estimate of 1870-71.

Work.—Constructing a Bridge of 11 Arches of 45 feet span across the Vellour River at Nudloor on the Road from Pondicherry to Negapatam.

Quantity	Description of Work	Rate Per	Amount	Total
1150 11 1/4	Cubic feet of Brick in chunam work	2 6 cts	17970 7 5	
323 18 3/4	— of Archwork	3 . D ₂	5684 12 3	
562 3/4	Squares of Plastering	3 . . Sq ₂	1687 3 2	
309	Wells of 3 feet diameter and 5 feet deep	21 2 3/4 Each	6528 14 7	
155	— D ₂ — D ₂ — D ₂	20 . . D ₂	3100 . .	
8200	Cubic feet of Brick jelly and cement chunam work for filling the spaces between the wells under the abutments.	1 69 cts	773 7 .	
	Excavating foundation &c	. . .	1460 9 11	
	Raising approaches and Roadway	. . .	1573 10 5	
400	Cubic yards of Gravel	6 . byd	150 . .	
	Temporary dam and barling water	. . .	8899 9 5	
	Centings and removing	500 . . Each	2000 . .	
4	— D ₂ — of the above materials	200 . . D ₂	1800 . .	
9	Guard Stones	10 . . D ₂	40 . .	
4	Scaffolding	. . .	500 . .	
			52168 10 2	
	Sundries		1761 5 10	

Deduct the amount of Estimate sanctioned in G. O. N^o 2427 of the
9th August 1867. 44,800..

Balance requiring sanction Rupees. — 9130

Superintending Engineer's Office 5th Div³
Caddalore 5th November, 1870. 3

Richd. Roberts Captain, U.S.C.
 Ag. Superintending Engineer 5th Div.

1872
March 1st

Received of the
Treasury of the United States

the sum of
Four hundred and fifty dollars

for the purchase of
land in the State of California

for the purpose of
establishing a military post

at the mouth of the
Colorado River

in the Territory of Arizona

for the use of the
Army

Division of Land

San Francisco District

San Francisco

March 1st 1872

Amount of money received

for construction of bridge

across the Colorado River

between the States of

California and Arizona

Amount of Cash \$53930.

Communications.

Fifth Division D. P. W.

New Work.

South Arcot District.

No 4 Range.

Chudambarum Talook.

Comparative Statement showing the difference between the Original and Revised Estimates for constructing a Bridge of 11 Arches of 45 feet span across the Vellur River at Matloor on the Road from Pondicherry to Negapatam

Description of Work	Units	Original Estimate			Revised Estimate			Increase		Decrease		Balance	Remarks
		Quantity	Rate	Amount	Quantity	Rate	Per	Amount	Quantity	Amount	Quantity	Amount	
Brick in chunam work	Cft.	11501 1/4	23	Cft. 16173 7/8	11501 1/4	26	Cft. 17970 7/5	1797.2					
Arch work	do	30318 1/4	3	do 5684 123	30318 1/4	3	do 5684 123						
Plastering	Sqrs	562 3/4	3	Sqrs 1687 3/2	562 3/4	3	Sqrs 1687 3/2						
Wells of 3 feet diameter & 5 ft deep	No	464	16	E 7424	389	21 2 3/4	E 6528 147	2204 147					
do do do	do				155	20	do 3100						
Brick jelly and cement chunam work for filling the spaces between the wells under the abutments	Cft.				8200	16 1/2	Cft. 773 7	8200 773 7					
Excavating foundation &c				1500			1460 9 11					39 61	
Raising approaches & Roadway				2000			1573 10 5					426 57	
Gravel	Cyds	400		1000	400	6	Cyds 150					850	
Temporary dam and Baling water				3000			8899 9 5	5899 9 5					
Centrings and Removing	No	4	500	E 2000	4	500	E 2000						
do of the above materials	do	9	200	do 1800	9	200	E 1800						
Guard Stones	do	4	10	do 40	4	10	E 40						
Scaffolding				1000			500					500	
Sundries				43309 6 8			52168 10 2	10674 15 2				1815 11 8	
Total				1490 9 4			1761 5 10	270 12 6				" "	
				44800			53930	10945 11 8				1815 11 8 9130	

* Sanctioned in G. O. No. 2427 of the 9th August 1887.

Balance requiring Sanction Rs 9130

Superintending Engineer's Office
Cuddalore 5th November 1890

Pick J. Roberts Captain R.E.
Sg. Superintending Engineer & Dn.

No 168. Superintd. Engrs Office, 5th Division,
Cuddalore, 5th November 1870.

From,
The As. Superintending Engineer,
5th Division.

To,
The Secretary to Government,
P. W. Department,
Madras.

Enclosures. 2

1. Revised Estimate
of Rs 53,930.
1. Comparative
Statement.

Sir,
I have the honor to submit, for
the sanction of Government, a revised
estimate of Rupees 53,930, accompanied by
a Comparative Statement, for the bridge
that is being constructed across the
Vellam on the coast road from Pondicherry
to Nagapatam, or on the first branch of
the Great Southern road from Madras
to the Travancore frontier.

2. In G. O. No 2427 of the 9th August
1867, an estimate of Rupees 44,800 was
sanctioned for this bridge, and the work
was commenced during the last official
year on an allotment of Rupees 20,000.

When the revised rates provided in this
estimate

By the Engineer A. P. W.
South West District

Rs 44,800/30

Comparative Statement

showing the difference between

the original and Revised

Estimates for constructing a

bridge of 11 arches of 45 feet

span across the Vellam River

at Madras on the Grand Trunk

Road leading to Nagapatam.

estimate were fixed, the Range Officer, Mr R. E. Norfor, considered them sufficient, as he did not anticipate the many difficulties which he had afterwards to contend with when the work was commenced; and it is therefore apprehended that, notwithstanding the great attention and time devoted by that Officer to this work and his earnest endeavours to economize in every possible way, the sanctioned estimate is likely to be exceeded by Rupees 9,130.

3. The causes which have led to this excess are detailed below:-

1st The first item of excess over the Revised estimate occurs in the Brick & Chumam work. The rate allowed in the estimate is 2 annas and 3 Pie per Cubic foot, while the actual cost of the work, done up to date, is at the rate of 2 annas and 6 Pie per Cubic foot. The cause of this excess is chiefly attributable to the difficulty of obtaining fuel for burning bricks and chumam. It was expected that the ryots in the vicinity of the work

would dispose of their Barivaleu Sap for a reasonable offer, but it is now found that they refuse to do so at any price; and there has been no alternative therefore but to cut down old avenue trees, on abandoned lines of roads at great distances from the work, and to cart the same departmentally. And the pay for the pit-sawyers and for the cartage thus entailed has greatly enhanced the price of the wood. Again, the laying of the solid foundation above the wells was a matter of great difficulty, and it was, in consequence, impossible to obtain the full profitable value of ^{the} men's wages, as the springs were very great and impeded the progress of the work.

2^d The next item of excess is in the wells. Those sunk up to the present time on the work have cost about Rupees 21 each, while the price entered for them in the estimate is only Rupees 16 each. When the estimate was prepared, it was not intended that the wells should be filled with Hydraulic concrete. The specification distinctly states that they are to be filled with cubes with concrete in the interstices, or to be filled entirely with Concrete.

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The next and the largest item of excess is in the Temporary Dam and Baling. The sum allowed for these services is Rupees 3,000, whereas Rupees 5,099.4.5 have been already laid out and Rupees 3,800 in addition are still required for these purposes. It is thus clearly shown that the provision made in the original estimate for these services was altogether inadequate.

153
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As regards Baling. This river, as the Government are well aware, is dissimilar to most of those in the District, in its being tidal for many miles inland. At the bridge-site the water is never less than 4.5 feet deep, and as much as 12.5 feet during floods. In fact the

"more than ordinary difficulty in laying the foundation," anticipated by Col. Ford, (vide para 6 of his letter recorded in the G. O. above quoted) has proved to be short of what has really had to be contended against from the constant floods, and the springs arising from the ebb and flow of the tide. Even with 3 Pic Rottahs working close together, it was at times not possible to keep the foundations sufficiently dry for laying bricks in mortar. And hence the very heavy cost for baling water.

4th No provision is made in the estimate for filling in with concrete the interstices between the wells under the abutments and wing walls, but, as Colonel Ford afterwards considered this system necessary in order to form one solid mass to build upon, it has accordingly been carried out at a cost of Rupees 773-7-0.

5th The sum allowed under the head of Sundries, vizt Rupees 1490, which is only about 3½ per cent on the amount of the estimate, is too small to meet the charges for minor supervision, sheds, petty stores, &c.

17th
required for a work of this magnitude, and an addition of Rupees 271 is found absolutely necessary.

4. So much for the excess. Per Contra, there are a few items upon which a saving can be expected vizt:-

1st Approaches. When the estimate was prepared it was intended to build the bridge at the present ford, but my predecessor afterwards fixed the site a little to the west of this crossing, where the river is narrower, so that it is expected that Rupees 426, instead of Rupees 2000, will be sufficient for the approaches. On the other hand, this alteration of the site will necessitate an outlay of about Rupees 4000 in connecting the bridge with the road on either bank, including a tunnel and balingulak; for this a separate estimate will be submitted shortly.

2nd Gravel. As this is not procurable nearer than Buddalore and could not, therefore, be laid down for the sum allotted, it is proposed to use for the surface of the roadway brick jelly, or refuse of over-burnt bricks, by which a saving of Rupees

"m. Rupees 850 is anticipated.

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a 5. The work was commenced in April
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1905
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in conclusion that I have recently
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examined the work as carefully as
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I find the bricks of excellent quality
and the work, as far as I could judge,
neatly, and conscientiously carried out.

And

And I am of opinion that the
Government may rely upon the works
being executed successfully under the
superintendence of Mr. R. E. Norfor,
who, I am satisfied, uses his best
endeavours to economize in every way
consistent with the satisfactory com-
pletion of the work.

Have the honor to be
Sir,

Your most Obedient Servant

Rich^d. Roberts Capt^y R. E.
As: Superint^y Engineer, S^t. B^y.

21st

9

1870
From, No. 4463
The Asst. Superint. Engineer,
5th Division.

The Secretary to Government,
P. W. Department,
Madras.

Dated 5th
Received 7th November 1870.

No. 168.
Enc. 2.
Bridge across the
Vellaur, in South Arcot.
Submitting for sanction,
a revised estimate for Rs.
53,930 for the bridge that is
being constructed across the
Vellaur on the coast road from
Pondicherry to Nagapattanam.
No. 2850-25/11/70.

No 481
e. 12. e. 1870. 14.

23
No. 2850, P. W. D.
Proceedings of the Madras Govt.
Read the following.

From.

The Asst. Superint. Engineer,
5th Div. } (H. E. No. 168 of 5 Nov 70)

R

In their Prog. of the
9th Aug. 1870 No. 2437 the
Govt. sanctioned an esti-
mate of Rs. 44,800 for the
construction of a bridge
across the Vellaur on the
coast road from Pondi-
cherry to Nagapattanam
in the South Arcot dis-
trict, for which a revised
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is now submitted, exhibit-

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of Rs 9,130. This increase

is distributed under

the following items:-

1 Brickwork

2 Wells

3 Baling and temporary dam
and

4 Cindries

The excess on brick-
work is stated to be
due to the difficulty of
procuring fuel for burning
bricks and chumam and
of laying the solid
foundation above the
wells on account of
the quantity of water

* Rs 1,797

* Rs 2,205

28.
flowing into the excavations
from land springs.

The substitution,
by the order of the Suptg.
Engineer of hydraulic
concrete for "cubes with
concrete in the intersti-
-ces, or concrete only,"
in filling the wells,
and the enhanced rates
required to be paid to
well-sinkers, have, it
seems, led to the increase
under the item of wells;
while the utter inade-
-quacy of the provision
made for baling in
a tidal river like

the Villam which is liable
to constant floods, accounts
for the very large excess
under item No 3.

* Rs. 5900

The amount entered
under the head of im-
-dries which is about
3 1/2 per cent on the
sanctioned estimate,
is represented to have
proved too small to
cover the various charges
under that head.

In addition to
these causes of excess
the Acting Suptg Engr
states that extra
work

270
work to the extent of
Rs. 773, not provided
for in the original
estimate, was carried
out, after under the
direction of Coll. Ford,
in filling in with con-
crete the interstices
between the wells under
the abutments and wing
walls with a view to
form one solid mass
to build upon.

Under these expla-
-nations and stating
that the Acting Suptg
Engr, after personal
examination, certifies

to the excellent quality
of the materials used
and the neat and eco-
-nomic manner in
which the work is pro-
-gressing under the super-
-intendence of the Range
Officer, Mr. Torf, the
Govt sanction the revised
estimate of Rs. 53,930.

The expenditure
on the work up to the
end of 1869/70 was
Rs. 19,931, and a sum of
Rs. 20,800 is provided
for it in the current
year's Budget, leaving

29th
18

a balance of Rs. 13,199
yet to be assigned.
This amount His Excl.
-lency the Govt in Council
will endeavour to allot
in the outgoing Budget.

W.B.

To
The Suptg Engrs of the Govt
" Cont^g of Public Works
Accts

Rs. 2 25/4/71

12. 11. 1870