M.R.O. 1—77,000—8-6-37.

(1) Number of pages _____

(2) Date of repair 5-8-40

(3) Initials of the Referencer _____

CT

MADRAS RECORD OFFICE.

Government of Madras.

PUBLIC DEPARTMENT.

G.O. No. 1418 Press Mis. 154-158

Dated 26-8-80 — 1874.

15/16

Not to be folded or roughly handled

CTF

Read the following papers :—

No. 154. From Colonel C. V. WILKIESON, R.E., Superintending Engineer, Coimbatore, to Colonel G. W. WALKER, R.E., Secretary to Government, Public Works Department, Fort St. George, dated Coimbatore, 24th July 1874, No. 55.

I have the honor to forward, for the sanction of Government, a revised estimate, amounting to Rupees 30,000, with plan, for building the bridge over the Oopaur River on the road from Dharapooram to Tirpoor Railway Station and to Konghiem.

1 Plan per Banghy.
1 Estimate.
1 Comparative Statement.

2. The original estimate was sanctioned by Government in G.O., No. 127, of 29th July 1870, being Rupees 21,140 for the bridge and Rupees 36,090 for the alteration of the two roads, so that traffic may pass the river by the same bridge to and from the Tirpoor Railway Station and Konghiem to Dharapooram.

3. The causes of the excess now shown are as follows :—

I.—More concrete was required under one abutment, Nos. 1 and 3 piers, and wing-walls, also over the arches, owing to the change of shape, amounting to Rupees 419-10-8.

II.—The foundations were obliged to be made nearly double the depth allowed for, making an extra cost of Rupees 700.

III.—The retaining walls have been made deeper at an extra cost of Rupees 1,264.

IV.—In place of making the eight piers all of the same size, two abutment piers have been made for safety in building the bridge, this entails an extra cost of Rupees 3,047. This alteration was made by the order of Colonel Farewell.

V.—The segmental arches are proposed to be converted into semi-elliptic arches which thus raises the roadway and gives more waterway. This alteration was ordered by Colonel Bean because he did not consider the waterway sufficient. This is the cause of an increase of Rupees 561.

VI.—The costs of the centrings is estimated at Rupees 1,800 instead of Rupees 837, caused chiefly by my order to make three instead of two centrings.

VII.—Rupees 220 for filling approaches which were not allowed for in the original estimate. There is also extra cost for blasting rock, Rupees 300, and baling, Rupees 450, neither of which items appears in the original estimate.

4. The remainder of the extra cost consists in the rates in several items being rather higher than in the original estimate, which is fully shown in the comparative statement, caused chiefly by the difficulty in getting skilled work-people, and the stone proving much harder than was expected.

5. It will be observed that great delay has taken place in carrying out the work owing chiefly to having no officer in special charge of such an important work, as the Supervisor in charge of the range had to carry on the works of his important charge at the same time, and there was no Overseer to place in special charge. There was another reason, the difficulty during the last two years to get artisans, as all the best bricklayers and stone-cutters were employed on the Great Southern of India Railway to Madura and Tuticorin.

6. I would now propose that a subordinate be given to me for special charge of this work, and if the revised estimate is sanctioned by Government, I have no doubt that I can open the bridge by May next for traffic. It appears that first expenditure was made in September 1870, and it has been going on gradually ever since, the expenditure being—

	Rs.	A.	P.
1870-71	3,836	8	0
1871-72	6,889	0	0
1872-73	3,757	0	0
1873-74	4,780	0	0
1874-75 [up to June]...	594	15	0
	19,858	0	0

7. I do not propose to ask for a further sanction on the whole estimate as the sum now asked can be taken from the savings on the original estimate for road work on which we can make savings owing to the work being in progress so many years, and a mileage allowance on the whole line being given during this time.

No. 155. From Colonel C. V. WILKIESON, R.E., Superintending Engineer, Coimbatore, to Colonel G. W. WALKER, R.E., Chief Engineer and Secretary to Government, Public Works Department, Fort St. George, dated Coimbatore, 31st July 1874, No. 61.

In continuation of my yesterday's letter,* forwarding the sanctioned plan of the Oopaur Bridge, I have the honor to forward the copy of a memorandum of instructions sent by Colonel Bean to Mr. Nicholson on the subject of giving more waterway.

* No. 60 of 30th July 1874.

Copy of Memorandum, No. 172, 28th January 1874.

No. 172.

MEMORANDUM.

The District Engineer informs Mr. Nicholson, Supervisor in charge of Caroor Range, that the piers of the Oopaur Bridge are not to be raised above the present height. He will, therefore, use every endeavor to complete the three remaining piers to be built, as soon as possible, so as to be ready with the turning of the arches next official year, with which object bricks should be prepared at once and in excess of the original estimate.

2. On an examination of the sections, the District Engineer observes that the area given in the specification of the flood-water at the site of bridge amounts to 3,200 square feet, corresponding with the section; but the area of water taken above this site, and obtained by adding together the section of the Big and Little Oopaur, amounts to as much as 4,164 square feet, whilst a section taken half a mile below the bridge and above the influence of the Ambravatty flood-water gives 4,447 square feet, corresponding very nearly with the section worked out by the Supervisor.

3. As the area of the bridge as designed and now building only amounts to 3,260 square feet, it is clear that more waterway must be allowed, and the District Engineer directs that it be obtained in the following manner, giving an extra or increased waterway of 654 square feet, the extra cost of the work being reported by Mr. Nicholson, accompanied by plan and supplemental estimate with comparative statement in due course.

Proceedings of the Madras Government, Financial Department,
25th August 1874.

4. The Supervisor will raise the versed sine or rise of the arches to seven and a half feet in place of five feet, and turn three centre or elliptical arches in the mode proposed by him, and according to the design submitted for Colonel Bean's inspection, only that the haunches of the arches or skew backings are not to be built in the first instance of brick or stone, an objectionable arrangement; but to be turned with the arch and form part of the arch itself, and be made of brick.

5. There will be no necessity for an arch of thirty feet span to have the thickness at crown, proposed in the revised sketch, one and-a-half feet would be ample, with the two thicknesses of four and-a-half inches proposed from crown to the springings; but Mr. Nicholson is at liberty, for the sake of solidity, and considering the violence of the flood waters, to add four and-a-half inches at the crown only, if the bricks will suit for the extrados of arch.

PERINDORAY,
28th January 1873.

(Signed) J. BEAN, Colonel, R.E.,
District Engineer, Coimbatore.

No. 156. From Colonel C. V. WILKIESON, R.E., Superintending Engineer, Coimbatore, to Colonel G. W. WALKER, R.E., Chief Engineer, Public Works Department, Fort St. George, dated Poogalore Anicut, 8th August 1874, No. 63.

With reference to your Memorandum No. 580, dated 3rd August 1874, I have the honor to report that the statement made in No. 4 of paragraph 3* should be altered; that the excess of Rupees 3,047 was owing to increased rates of stone-work as well as the extra work for the two abutment piers.

* Of letter, No. 55, of 24th July 1874.

2. I now send a comparative statement showing how the excess was arrived at.

3. I also forward a statement showing the difference of cost of two common piers and two abutments, amounting to Rupees 753-13-4.

P.S.—I did not mention that one reason of the delay in carrying out this work was that in the Caroor Range all the works are done by departmental agency, as no contractors can be got except for petty contracts.

No. 627.

No. 157. *Chief Engineer's Memorandum.*

The excess on this work is attributed partly to increase of rates, partly to additional work.

Concrete was used under some foundations, and will be used over the arches. An undoubted improvement.

Excavation of foundations to double the estimated depth is stated to have cost eight times as much as was anticipated. Presumedly a lump sum only was allowed in the estimate; and rock near the surface anticipated throughout. Such increased depth of excavation entailed extra work in *Retaining* and other *Walls*.

The introduction of two *abutment piers* at an extra cost of Rupees 750 was a necessity, if all the arches could not be turned in the same season. Their existence might save two-thirds of the bridge, if by future floods one-third were destroyed.

Elliptical arches will give more waterway than, and be an improvement on, the segmental arches of the original design.

A *3rd Centring* was a necessity before the abutment piers were introduced. It is now only a convenience—great, no doubt, when the object is to hasten the completion of the archwork in a single season, which must have been the Superintending Engineer's object in ordering it. Three, however, must have been originally estimated for, but an insufficient rate allowed for their timber and carpentry. Some recovery on this item should be practicable on completion of the work.

Blasting and *Baling* are unforeseen contingencies.

Approaches must have been allowed for in the Road Estimate.

The *increased rates* appear to have been found necessary in carrying out the work. They are not too high for the best work; and there were not sufficient data for work of the kind when the estimate was originally made. Want of special supervision, and the spread of work over so many seasons, have no doubt greatly conduced to increase of rates. There is an extra officer allowed for the Coimbatore District; but shortly after his first appointment he had to take a range vacated by an officer who went on furlough and subsequently resigned the service. It may be possible to post a young Assistant to the District in October, when the Cooper's Hill men are expected to arrive.

OOTACAMUND,
15th August 1874.

(Signed) G. W. WALKER, Colonel, R.E.,
Chief Engineer, P. W. D.

Transferred to the Financial Department with Chief Engineer's Memorandum.

OOTACAMUND,
15th August 1874.

(Signed) G. W. WALKER, Colonel, R.E.,
Secretary to Government, P. W. D.

No. 158. ORDER THEREON, 25th August 1874, No. 1418.

Transferred to the President of the Local Fund Board, Coimbatore Circle to whom the revised estimate should have been submitted in the first instance.

2. Colonel Wilkieson's attention will be drawn to Rule XXXIX. of the Local Fund Rules, to which he will carefully conform in future.

(True Extract.)

Acting Chief Secretary.

To the President of the Local Fund Board, Coimbatore Circle, with five enclosures.
,, Public Works Department.

Exd. W. H. French.

Govt. of Madras.

FINANCIAL.

To THE PRESIDENT OF THE LOCAL FUND BOARD, Coimbatore Circle, &c., &c., &c.

Dated August 25th.

Read.

G.O., 25th August 1874, No. 1418.

AUGUST.

Nos. 154—158.

Bridge across the Oopaur River, Coimbatore District.—Papers on the subject of the excess over the original estimate for the construction of this bridge transferred to the President of the Local Fund Board, Coimbatore Circle, and Colonel Wilkinson's attention drawn to Rule XXXIX. of the Local Fund Rules, with instructions carefully to conform to the same in future.

No. 55.

Superintending Engineer's Office
Coimbatore 24th July 1874.

From

The Superintending Engineer
Coimbatore.

To

The Secretary to Government
Public Works Department.

Sir,

I have the honor to forward, for the sanction of Government, a revised estimate, amounting to Rs 30,000, with plans, for building the bridge over the Oopaur River on the road from Pharapooram to Tirpoor Railway Station and to Kunghum.—

Enclosures 3.
1 Plan - per Bandy
1 Estimate
1 Comparative Statement.

2. The original estimate was sanctioned by Government in G.O. No 124 of 29th July 1870, being Rs 21,140 for the bridge and Rs: 36,090 for the alteration of the two roads so that traffic may pass the river by the same bridge to and from the Tirpoor Railway Station and Kunghum to Pharapooram.

Mrs: Order: not at hand: Work finished for copy 28/7

3. The causes of the excess now shown are as follows:—

None at all allowed in Original Estimate

1 More concrete was required under one abutment, No. 1 and 3 piers, and wing walls; also over the arches owing to the change of

shape, amounting to Rs: 419. 10. 8.

ii:- The foundations were obliged to be made nearly double the depth than allowed for, making an extra cost of Rs: 700;

iii:- The retaining walls have been made deeper at an extra cost of Rs: 1,264.

iv:- Instead of making the 8 piers all of the same size, two abutment piers have been made for safety in building the bridge, this entails an extra cost of Rs 3,047- This alteration was made by the order of Colonel Farwell; (Queen - Ld. Derby?)

v:- The segmental arches are proposed to be converted into semi-elliptic arches which thus raises the roadway and gives more waterway. This alteration was ordered by Colonel Bean because he did not consider the waterway sufficient. This is the cause of an increase of Rs: 561.

vi The costs of the centrings is estimated at Rs 1,000 instead of Rs: 837- caused chiefly by my order to make three instead of two centrings

vii:- Rs: 220 for filling approaches which were not allowed for in the original estimate. There is also extra cost for blasting rock Rs: 300, and baling Rs: 450, neither of which items appear in the original estimate.-

4. The remainder of the extra cost consist in the rates in several items being rather higher than in the original estimate, which is fully shown in the Comparative Statement, caused chiefly by the difficulty in getting skilled work people, and the stone proving much harder than was expected.-

5. It will be observed that great delay has taken place in carrying out the work owing chiefly to having no officer in special charge of such an important work, as the Superviser in charge of the range had to carry on the works of his important charge at the same time, and there was no overseer to place in special charge- There was another reason, the difficulty during the last two years to get artizans as all the best brickLayers and stone-cutters were employed on the Great Southern of India Railway to Madura and Tuticorin.

6. I would now propose that a subordinate be given to me for special charge of this work, and if the revised

estimate is sanctioned by Government, I have no doubt that I can open the bridge by May next for traffic. It appears that first expenditure was made in September 1870, and it has been going on gradually ever since, the expenditure being 1870-71 —— Rs 3,836. 8. "
1871-72 —— " 6,889. " . "
1872-73 —— " 3,754. " . "
1873-74 —— " 4,780. " . "
1874-75 [up to June] 594. 15. "
19,858. " . "

2nd/693/74.

I do not propose to ask for a further sanction on the whole estimate as the sum now asked can be taken from the savings on the original estimate for road work on which we can make savings owing to the work being in progress so many years and a mileage allowance on the whole line being given during this time.—

I have the honor to be,
Sir,
Your most obed Servt.

A. Wilkinson Colonel R.E.
Superintending Engineer
Coimbatore.

From Fwd 1874 Depe
from 25th Augt 74
The Supg Engineer
Coimbatore

To
The Secretary to Govt
P.W. Department
Octacamund

Memo: 561-29th July/74.
No. 55

Dated 21st July 1874.
Rec'd
Memo & Do
Enclosures 31/8/74

Forwards for sanction a revised Estimate, with Comparative Statt and Plan, amounting to Rs 30,000 for constructing a bridge across the Odpaur River.

No 154

No 61

Superintending Engineer's Office
Coimbatore 31st July 1874

From
The Superintending Engineer
Coimbatore.

155

To
The Chief Engineer P.W.D.
Octacamund.

Sir,

In continuation of my yesterday's letter, forwarding the sanctioned plan of the Odpaur bridge, I have the honor to forward the copy of a memo: of instructions, sent by Colonel Beam to Mr Nicholson, on the subject of giving more water way.

Enclosure.
Copy of memo:
No 172 - 28th Jany/74

× No 60 of 30th July 1874.

I have the honor to be,
Sir.
Your most obed. Servt.

Nicholson Colonel R.E.
Superintending Engineer
Coimbatore

Encl. to 1874 Diary
Letter
Asst. Engr. Salem
Coonoor Cavery
To Supt. Engineer
Chief Engineer
Dist. Engineer
Nilgiris
Dated 31st July 1874
Received 1st August 1874
Enclosure 1.
Forwards copy of Colonel Beans Minute of instructions to Mr Nicholson Supervisor in charge of Cavery Range, with reference to the subject of raising the Bridges.

No 172. Memo:

The District Engineer informs Mr Nicholson, Supervisor in charge of Cavery Range, that the piers of the Bopaur bridge are not to be raised above the present height. He will, therefore, use every endeavour to complete the three remaining piers to be built, as soon as possible, so as to be ready with the turning of the arches next official year, with which object bricks should be prepared at once and in excess of the original estimate.

2 On an examination of the sections, the District Engineer observes that the area given in the specification of the floodwater at the site of bridge amounts to 3,200 square feet, corresponding with the section; but the area of water taken above this site and obtained by adding together the section of the Big and Little Bopaur, amounts to as much as 4,164 square feet, whilst a section, taken ½ mile below the bridge and above the influence of the Ambravatty flood water, gives 4,447 square feet, corresponding very nearly with the section worked out by the Supervisor.

fall at Site very rapid

These various sections are useless, unless the fall of the rivers at each place is given for comparison

3. As the area of the bridge as designed and now building only amounts to 3,200 square feet, it is clear that more waterway must be allowed, and the District Engineer directs that it be obtained in the following manner, giving an extra or increased waterway of 654 square feet, the extra cost of the work being reported by Mr Nicholson accompanied by plan and supplemental estimate, with comparative Statement in due course.

4. The Superviser will raise the versed sine or rise of the arches to 7½ feet in place of 5 feet, and turn three centre or elliptical arches in the mode proposed by him, and according to the design submitted for Colonel Beaumont's inspection, only that the haunches of the arches or skew backings are not to be built in the first instance of brick or stone, an objectionable arrangement; but to be turned with the arch and form part of the arch itself and be made of brick.

5 There will be no necessity for an arch of 30 feet span to have the thickness at crown, proposed in the revised sketch. 1½ feet would be ample, with the two thicknesses of 4½ inches proposed from crown to the springings; but Mr Nicholson is at liberty for the sake of solidity, and considering the violence of the flood waters, to add 4½ inches at the crown only, if the bricks will suit for the extrados of arch.

Camp Permidoray
28th January 1873

I Sd J. Bram. Colel R.E.
District Engineer Combatore

/True Copy/

William Colonel R.E.
Superintending Engineer
Combatore

N:63. Supg Engrs Office 19 8
Camp Poogalore Anicut
8th August 1874.

From

Colonel C. Wilkieson RE.
Superintending Engineer
Coimbatore.

156

To

Colonel G. W. Walker RE.
Chief Engineer D. P. W.
Cotacamund.

Sir,

With reference to your Memo.
Enclosures 2. N:580 dated 3rd August 1874, I have the
honor to report that the Statement made
in N:IV of Para 3 of † should be altered,
† of Letter N:953 of 24th July 74 that the excess of Rs 3047 was owing to
increased rates of Stone work as well as
the extra work for the two abutment piers.

2. I now send a Comparative State-
ment showing how the excess was
arrived at.

3. I also forward a Statement
showing the difference of cost of two
common piers and two abutments
amounting to Rs 753.13-4.

I have the honor to be, Sir,
Your Most obedt Servant.

C. Wilkieson Colonel RE
Supg Engineer, Coimbatore PS.

Ltr a letter from the
Supg Engineer
Coimbatore to the
Chief Engineer
D.P.W. Cotacamund.
Coimbatore the 6th
31st August 1874

Copy to Colonel
Blanc Brownrigg
Inspector General of
Irrigation for
Bombay Presidency
the Assistant Engineer
in charge of
the Cauvery
Anicut
to the Captain Grid
Aug 1874

P.S. I did not mention that one reason of the delay in carrying out this work, was that in the Carroo Range all the works are done by departmental agency as no Contractors can be got except for petty Contracts

[illegible] Col R.E.
Supg Engineer Coimbatore

Rec'd 15th Aug 1874
Ans'd 18th Aug 1874
No 157

Polacamund
15th August 1874.

No. 627

Chief Engineer's Memo:

The excess on this work is attributed partly to increase of rates, partly to additional work.

Concrete was used under some foundations, and will be used over the arches. An undoubted improvement.

Excavation of foundations to double the estimated depth is stated to have cost eight times as much as was anticipated. Presumedly a lump sum only was allowed in the estimate, and rock near the surface anticipated throughout. Such increased depths of excavation entailed extra work in Retaining and other Walls.

The

Rec'd 15th Aug 1874
From Superintendent
Nilgiris Engineer
Commanding
To the Chief Engineer &
Secretary
Ootacamund.

Dated 8th August 74
Packed 10th
Rec'd
Do Do.

Submitting Estimate with report and memo from the Executive Engineer shewn in Section IV of Para 3 of Chief Engineer's letter, No 153 of 24th July 74 Also original estimate returned &c.

Rec'd 15th/74

No 157

The introduction of a abutment Piers at an extra cost of Rs 750 was a necessity, if all the Arches could not be turned in the same season. Their existence ~~would~~ might save two thirds of the Bridge, if by future floods one-third were destroyed.

Elliptical Arches will give more waterway than, and be an improvement on, the segmental arches of the original design.

A 3d Centering was a necessity before the abutment Piers were introduced. It is now only a convenience. Great, no doubt, when the object is to hasten the completion of the arch work in a single season; which must have been the Superintending Engineer's object in ordering it. These however

however, must have been originally estimated for, but an insufficient rate allowed for their timber and carpentry. Some recovery on this item should be practicable on completion of the work.

Blasting and Balings are unforeseen contingencies.

Approaches must have been allowed for in the Road Estimate.

The increased rates appear to have been found necessary in carrying out the work. They are not too high for the best work; and there were not sufficient data for work of the kind when the estimate was originally made. Want of special supervision, and

the

Public Works Dept.

Letter from Supt Engineer Coimbatore
No 555 of 24th July/74

" do do " 61 " 31st do.

" do do " 63 " 8th Augt/74.

Transferred to the Financial Department with Chief Engineer's Memo:-

Commdr RE.
Secy: to Govt.
P.W.D.

Ootacamund
15th August 1874.

spread of work over so many seasons, have no doubt greatly conduced to increase of rates. There is an extra officer allowed for the Coimbatore District; but shortly after his first appointment he had to take a Range vacated by an officer who went on Furlough and subsequently resigned the service. It may be possible to post a young assistant to the District in October, when the Poshero Hill men are expected to arrive.

Commdr RE.
Chief Engineer.
P.W.D.

1618

Financial 1874 2nd Qr.

From

The Chief Engineer

P. W. D.

Dated 15th August 1874

Recd 17th

8E 5 Enclosures
2 Estimates &
3 Letters. No 1683

Rec'd 2 Plans accompanying from 20th to Board: 2nd Bond Combatoor 19/8/74

Memo: on the Excess of £1304) on the original Estimate for the construction of a bridge across the Noyar River, Combatoor 2nd

With adv.

Rec'd 18th Combatoor Circle with 5 enclosures & 2 Plans

Rec'd 21/8 48 - 82 to 110

Rec'd 24th Do Do

157

C21/8 R24/8