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MADRAS RECORD OFFICE.

Government of Madras.

Public works DEPARTMENT.

G.O. No. 882	Press Mis.
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Dated 31 - 3 -	1864.

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*Proceedings of the Madras Government, Public Works Department,
31st March 1864.*

No. 554. Read the following letter from Major General S. O. E. LUDLOW, Consulting Engineer for Irrigation and Canal Company, to Colonel C. A. ORR, R. E., Secretary to Government, Department Public Works, dated Kurnool, 27th February 1864, No. 156:—

SIR,

1. I have the honor to submit for the sanction of Government a supplemental Estimate received from the Chief Engineer, through the Agent, for the completion of the Aqueduct which is to carry the Canal across the Hindri river at Kurnool.

2. The abstract or comparative Statement which accompanies it will show the different items on which excesses have occurred.

3. In the item of rubble stone in chunam there is an excess in quantity of 3,721 cubic yards, which is accounted for in paragraph 2 of Colonel Cotton's No. 28* by the rock surface in the bed of the Hindri over half its breadth having been found to be considerably lower than appeared by the sections. This of course fully accounts for the additional expense, but more careful soundings of the river should have been taken before the first Plan and Estimate were prepared for so important a work.

4. For excavation, baling, &c., only Rupees 1,700 were allowed on the supposition that the rock was near the surface throughout, but, as appears above, this proved not to be the case, and the actual cost of this item will be Rupees 9,539 in excess of that original Estimate.

5. On the item of arch work there is some excess (573 yards) in quantity and a considerable one (Rupees 24,795) in cost. The first is probably due to the average thickness of the arches being somewhat in excess, the latter is owing to the heavy expenses which were incurred in attempts to manufacture brick, and by the final substitution of stone for brick in the arch work. Why these experiments to manufacture bricks were so long continued at a heavy expense, when a really better material was ready at hand, has never been satisfactorily accounted for.

6. The centrings which were estimated at Rupees 13,020 will have cost when the work is completed Rupees 36,094. There are fourteen 40 feet arches and the full breadth of the work from face to face is 102 feet. Each arch is turned in three separate sections, so that the whole work is equivalent to a bridge of forty-two 40 feet arches of 34 feet breadth. Three centrings only have been used, the original cost and repairs of which ought not, in my opinion, including the rubble walls to have amounted to so large a sum as 36,094 Rupees.

7. In the item of cut-stone there is an excess in quantity of about 100 cubic yards accounted for by additional work and saving in the item of cornice, and the rate has been nearly doubled, which is attributed, *vide* Colonel Cotton's No. 28,† to increased cost of labor and difficulty in fitting the stones.

8. The road-way under the arch and rubble stone revetment have exceeded the Estimate by Rupees 2,607, but this part of the work has been made more extensive and complete than was originally intended, and I do not consider the cost as at all excessive.

9. Superintendence and sundries estimated at Rupees 13,001 will exceed that amount by Rupees 9,997, for which excess no cause is assigned. One cause is doubtless the much greater time which the work has occupied in construction than was originally contemplated.

10. The total of the supplemental Estimate is stated at Rupees 70,000, but it really is more than this, for, in the supplemental Estimate, the cost of iron railings has been altogether omitted, but as no reason has been given why they are dispensed with and as I still consider them to be indispensably necessary an item of Rupees 3,752-8-0 must be added on this account. Moreover, the cost of completing the approaches for which Rupees 8,553 were allowed in the original Estimate and of which Rupees 831 only have been spent has been altogether excluded from the supplemental Estimate and transferred to mile 18th of the Canal. A sum of Rupees 7,722 should therefore properly speaking be added to the supplemental Estimate on this account and that without allowing for any excess on the item, when as really there will be a very large excess upon it. But excluding altogether this item, on the understanding that it will be provided for in the Canal Estimate, the additional sum still requiring sanction is Rupees 73,752-8-0, and as the original Estimate less the cost of approaches was Rs. 36,447 Rupees, (*viz.*, 1,45,003—8,553-13-6) and the cost of the work when completed will be, exclusive of the approaches, 2,18,752 Rupees. There will be excess on the original Estimate of 60 per cent.

Proceedings of the Madras Government, Public Works Department,
31st March 1864.

11. The cost of completing the approaches being provided for elsewhere the additional sum still required for the completion of the work is Rupees 73,752-8-0, which I therefore beg may receive the sanction of Government.

12. The quantities given in the abstract or comparative Statement show the work done up to the 30th September only, but since that date all the remaining arches of the second portion have been turned, and only one-third of the arches are required to complete the work to its full breadth. It is not intended, and indeed it is quite unnecessary to do this this season. The parapet on one side will be completed to its full height, and a temporary parapet be raised on the opposite of sufficient height for the small stream which will be first carried over.

13. The work appears to have been substantially built, but notwithstanding all the care that has been taken some leakage must I think be looked for when the Canal is full, and an asphalt floor may be eventually necessary. With this exception the supplemental Estimate now submitted for sanction will I believe fully suffice for the completion of the work.

No. 555. ORDER THEREON, 31st March 1864, No. 882.

1. With this letter, the Consulting Engineer Irrigation and Canal Company submits for sanction a supplemental Estimate for the completion of the Aqueduct across the Hindri river at Kurnool, the original grant of Rupees 1,45,000 for the work having been found totally inadequate.

2. Major General Ludlow points out that the item of iron railings has been omitted in the revised Estimate, as, apparently, unnecessary, but being of opinion that railings will be indispensable, recommends that their estimated cost be added to the additional sum now applied for. The Governor in Council concurs with him in considering that iron railings must be supplied to the Aqueduct.

3. It appears, moreover, to His Excellency in Council, with reference to paragraph 10 of the foregoing letter, that the revised Estimate and abstract Statement have been prepared in an objectionable manner. The items of Rupees 3,752-8-0 for railings, and Rupees 7,721-15-6 (the unexpended balance of Rupees 8,553-13-6), for approaches in the original Estimate of Rs. 1,45,000, are entirely omitted in the revised one, but the aggregate of these sums is deducted from the total of the latter Estimate as still available, thereby making it appear that the cost of the structure will be Rupees 70,000 in excess of the original Estimate, instead of Rs. 81,474-7-6.

	Rs.	A.	P.
Amount of revised Estimate, including sundries...	2,15,000	0	0
Deduct original sanction less Rs. 3,752-8-0 for railings, and Rupees 7,721-15-6 for approaches...	1,33,525	8	6
Excess...	81,474	7	6

	Rs.	A.	P.
Revised Estimate...	2,15,000	0	0
Iron railings...	3,752	8	0
Total...	2,18,752	8	0
Deduct original sanction...	1,45,000	0	0
Additional sanction...	73,752	8	0

4. With these remarks, Government sanctions a supplemental sum of Rs. 73,752-8-0, including cost of iron railings, on account of the Hindri Aqueduct.

5. If the estimated cost of the approaches has not already been sanctioned on a separate Estimate, special application for it will now have to be submitted. Government notes the Consulting Engineer's remark that "there will be a very large excess upon" this item.

(True Extract.)

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

To the Consulting Engineer Irrigation and Canal Company,
" Agent for do. do.
" Secretary and Treasurer Bank of Madras.

Exd. S. T. Augustin

N^o 156.

Consulting Engineer's Office
Irrigation & Canal Company
Kurnool, 27 February 1864.

From
Major General B. C. Ludlow
Consulting Engineer for I & C Co.
To
Colonel C. A. Orr R. E.
Secretary to Government B. P. W.

Sir,
1. I have the honor to submit for the sanction of Government a supplemental Estimate received from the Chief Engineer through the Agent for the completion of the Aqueduct which is to carry the Canal across the Hindri River at Kurnool.
2. The abstract or comparative Statement which accompanies it will show the different items in which excesses have occurred.

3. In the item of Rubble stones in chunam there is an excess in quantity of 3721 cubic yards which is accounted for in para 2 of Bill of Materials N^o 28 by the Rock surface in the bed of

Dated 24 Feb/64.

of the Mundry over half its breadth
having been found to be considerably
lower than appeared by the sections.
This of course fully accounts for the
additional expense, but more careful
soundings of the river should have
been taken before the first plan and
estimate were prepared for so important
a work.

4. For excavation, Baling⁸ only was
Rupees 1700 were allowed on the suppo-
sition that the rock was near the
surface throughout, but as appears
above, this proved not to be the case
and the actual cost of this item will
be Rupees 9589 in excess of that
original estimate.

5. On the item of arch work, there
is an excess (573 yards) in quantity
and a considerable one (24795) in cost.
The first is probably due to the
average thickness of the arches being
somewhat in excess, the latter is
owing to the heavy expenses which
were incurred in attempts to manu-
facture brick and by the final
substitution of stone for brick in the
arch

54
arch work. Why these experiments
to manufacture bricks were so long
continued at a heavy expense when
a really better material was ready
at hand has never been satisfactorily
accounted for.

6. The Centings which were estima-
ted at Rupees 13,020 will have cost
when the work is completed Rs. 36,094.
There are ^{four} 40 feet arches and the
full breadth of the work from face
to face is 102 feet. Each arch is turned
in 3 separate sections, so that the
whole work is equivalent to a Bridge
of 40 feet arches of 34 feet breadth.
3 Centings only have been used in
the original cost and repairs of
which ought not in my opinion to
include the rubble walls to have
amounted to so large a sum as
36,094 Rupees.

7. In the item of cut stone there
is an excess in quantity of about
100 cubic yards accounted for by
additional work and saving in the
item of cornice and the rate had
been nearly doubled which is attributed

Vide Colonel Patton's No. 28 to increased ^{Feb. 26 1874}
cost of labor and difficulty
in fitting the stones.

8. The roadway under the arch and rubble stone revetment have exceeded the estimate by 2600^{Rs}, but this part of the work has been made more extensive and complete than was originally intended and I do not consider the cost as at all excessive.

9. Superintendent's and sundries estimated at Rupees 13,000 will exceed that amount by Rupees 9,997 for which except no cause is assigned. One cause is doubtless the much greater time which the work has occupied in construction than was originally contemplated.

10. The total of the supplemental estimate is stated at Rupees 70,000 but it really is more than this, for in the supplemental estimate the cost of iron railings has been altogether omitted; but as no reason has been given why they are dispensed with and as I still consider them to be indispensably necessary.

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an item of 3752-8- must be added on this account. Moreover the cost of completing the approaches for which 8553 were allowed in the original estimate and of which 831 only have been spent has been altogether excluded from the supplemental estimate and transferred to Mile 18 of the Canal. A sum of Rupees 7,122 should therefore properly speaking be added to the supplemental estimate on this account and that without allowing for any excess on the item whereas really there will be a very large excess upon it. But excluding altogether this item, on the understanding that it will be provided for in the Canal estimate, the additional sum still requiring sanction is Rupees 73,732-8- and as the original estimate less the cost of approaches was 1,36,447 Rupees (viz. 1,45,000 - 8553 - 13-6) and the cost of the work when completed will be exclusive of the approaches, 2,18,752 Rupees. There will be excess on the original estimate of 60 per cent.

The

11/2/74

11. The cost of completing the approaches being provided for elsewhere, the additional sum still required for the completion of the work is 73,752-8- which I therefore beg may receive the sanction of Government.

12. The quantities given in the abstract or comparative statement show in the work done up to the 30 September only but since that date all the remaining arches of the second portion have been turned and only 1/3 of the arches are required to complete the work to its full breadth. It is not intended and indeed it is quite unnecessary to do this this season. The parapet on one side will be completed to its full height and a temporary parapet be raised on the opposite of sufficient height for the small stream which will be first carried over.

13. The work appears to have been substantially built but notwithstanding all the care that has been taken some leakage must I think be looked for when the canal is

is full and an asphalt floor may be eventually necessary. With this exception the supplemental Estimate now submitted for sanction will I believe fully suffice for the completion of the work.

I have the honor to be,
Sir,

Your most Obedient Servant
J. H. Watson Major Genl.
Consulting Engineer for S. B. Co.

For

shall

Proceedings of the Madras Government
Under date the 31st March 1864
Read the following

From the Consulting Engineer
for Irrigation and Canal Company.

Submits for the sanction
of Government a Supplemental Estimate amounting to Rs. 1,000
73452-8-0 for the Completion
of the Kunderi Aqueduct at
Kurnool.

With this letter, the
Consulting Engr. Irrigation and
Canal Comp^y submits for
sanction a Supplemental
Estimate for the completion
of the Aqueduct across
the Kunderi river at Kurnool. The original sum
of Rs. 1,45,000 for the work
having been found wholly
inadequate.

Major General Dunder
points out that the
stem of iron-railings has
been omitted in the
revised Estimate, as,
apparently, unnecessary
but being of opinion
that

Proc. of Govt. No. 279 B
21st Feb. 1862

MR

Rs 21 February 1864
Copy in - Attention to Eng.
of 11th May 1864

554

17th 1864
The Consulting Engineer
for Irrigation and Canal Company
Kurnool
The Secretary to Govt.
in the
Chief Clerk
Dated 27th Feb 1864
Recd 27th March 1864
2 letters in original
2 enclosed
Submitted for the
sanction of Govt.
Suppl Estimate amounting
to Rs 1,000-8-0 for
the completion of the
Kunderi Aqueduct at Kurnool
17th 1864

2-17-1864

expensable. recom-
mends that the esti-
mated cost be added
to the additional sum
now applied for. He
finds. concurs with him
in considering that ex-
penditures must be ap-
plied to the aqueduct.

It appears, moreover,
to H.B. in l. with reference
to para 10 of the foregoing
letter, that the revised
Estimate and Abstract
Statement have been
prepared in an ob-
jectionable manner. The
sums of Rs 3752-0-0 for
railings and Rs 7721-15-6
(the unexpended balance
of Rs 8553-13-6) for ap-
proaches in the original
estimate, are entirely
omitted in the revised
one, but the aggregate of these
sums, included in the
original estimate of Rs
145000 is deducted from
the

Amount of revised Estimate, in-
cluding sundries Rs 2,15,000
Deduct original sanction
less Rs 3752-0 for rail-
ings and Rs 7721-15-6
for approaches Rs 1,33,528-6
Excess Rupees 81,474-7-6

Revised Estimate - Rs 2,15,000
Iron railings " 3752-0
Total Rs 2,18,752-8.
Deduct Original sanction " 1,45,000
Additional - Rs 73,752-8.

will be Rs 70,000
in excess of the original
Estimate, instead of Rs
15,000
11474-7-6.

With these remarks, for
sanctioning the expenditure
a supplemental sum
of Rs 73,752-8 - including
cost of iron railings - on
account of the kindred
aqueduct.

If the estimated
cost of the approaches
has not already been
sanctioned on a separate
estimate, special ap-
plication for it will
now have to be sub-
mitted. Jt notes
the Consulting Engineer's
remark that "there will
be a very large excess
upon" this item.

To the Comdg. Engr. S.B. Co. With 2 letters & 2 Estimates
" Agent H.B. Co. ✓
" Secy to Engineer-in-Chief
11

Dec 1st 1891

9077 15th Dec
Price of the Good for main

7.9882

Price of the 11 Cps

2/ 81 March 1/4

March 1866/14

Supplemental
Estimate of £73,752
for the completion
of the Aqueduct across
the Manchester at
Mumool. per minute

554. 553