

(1) Number of pages _____

(2) Date of repair _____

(3) Initials of the Referencer _____

MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No. <i>651</i>	Press ~~Mis.~~
<i>320-321</i>	
Dated <i>20-4-</i>	<i>1865.</i>

Not to be folded or roughly handled*88/1/102*

No. 320. Read the following letter from Lieutenant-Colonel T. GREENAWAY, Superintending Engineer, 6th Division, to Colonel C. A. ORR, R. E., Secretary to Government, Public Works Department, dated Tanjore, 1st April 1865, No. 2,855:—

SIR,

1. I have the honor to bring to your notice that the under-tunnels recently constructed beneath the bed of the Vedar-niam canal, at the crossing of the Tritra-poondi road, to admit of the passage of

3 Plans.
3 Estimates.

two irrigation channels and of the surplus water of the Chundranuddy, were reported by the Officer of the Range as being in his opinion unsafe, as owing to the great head of water they are liable to be exposed to they might very probably blow up.

2. Having had accurate data determined as to height of water in river and canal, &c., I now do myself the honor to forward a cross section of the existing work (under-tunnel for Chundranuddy) and a section showing water levels. You will observe that the crown of the arch is liable, in high freshes, to a pressure of 750 lbs. to the square foot, due to a head of 12 feet, to counterpoise which there is only the weight of brick masonry 1' 10" thick = about 200, and about 4 feet of water in the canal (it could not be counted on as more at low-tide,) which for sea water, would be 256, total 456 lbs., leaving an excess of pressure of 294 lbs. to be resisted by cohesion only. To lower the arch one foot (it could not afford more) and load the crown with granite slabs would give $P = 812\frac{1}{2}$ ($h = 13'$) $R = 624$: an excess of $188\frac{1}{2}$ lbs, still to be met by cohesion only, quite unsafe to trust to in masonry of the sort and dimensions.

3. I have great diffidence in proposing a plan for protecting the work which occurred to me, as I believe nothing of the sort has been attempted hitherto, but as it looks plausible on paper, it may be worth suggesting.

4. It is to cover the whole extrados of the arch, as shown in the second plan attached, with sheet iron,* the plates

* One-eighth inch thick.

revetted together at their ends, the sheet carried over the skew backs and turned up at its outer extremities. The entire back of the arch to be loaded with granite rubble masonry up to the level of the canal bed, except over the crown, which being so thin should be of cut granite.

5. The hydrostatic pressure on one entire arc of the intrados one foot in width would be with the water 16' above the floor 14,780 lbs, to counterpoise which there would be:—

Weight of one foot wide of brick arch	...	...	...	...	lbs.	3,795
Rubble and stone work about	...	...	...	...	"	8,150
Water in canal 24 × 1 × 4	...	...	...	...	"	6,144
					lbs.	18,089

making $R > P$ by 3,309 sufficient to prevent any risk of the whole thing blowing up bodily.

6. The cohesive strength of the iron would be amply sufficient to prevent blowing out of the crown.

*Proceedings of the Madras Government, Public Works Department,
20th April 1865.*

7. I suppose that during low tide when R would be at its least value P also would be somewhat reduced owing to increased fall, but I have no data for estimating to what extent.

8. The two smaller tunnels were fortunately only just commenced when the danger was brought to my notice, they are exposed to a head never exceeding 10', and I propose merely to lower their vents one foot and load their crowns with granite, which will be rather cheaper than applying the sheet iron remedy also to them; I have however forwarded both, and request that orders may be passed upon the subject as early as possible, as time draws rapidly towards the season when work will be impracticable in those parts.

No. 321. ORDER THEREON, 20th April 1865, No. 1,051.

CIVIL WORKS, No. 58.

1. With reference to the above letter the Government are of opinion, in the case of the Chundranuddy under-tunnel, that the brick-work of the arch, if of ordinary good quality, ought to have tenacity far more than sufficient to counteract the maximum excess of pressure, represented by Colonel Greenaway, as liable to occur on the occasion of a high fresh in the river, and they are not therefore disposed to sanction the large additional expenditure* recommended by that Officer.

* Rupees 3,500.

2. In the case of the two small tunnels alluded to in the last paragraph of the foregoing letter, the information supplied by the Superintending Engineer is far from full, but as these works have just been commenced, the Government will not object to the alterations recommended, and they accordingly sanction the estimate of the additional expenditure, amounting to Rupees 1,600.

(True Extract.)

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

To the Superintending Engineer, G.h Division.
" Accountant General.
" Controller of Public Works Accounts.
" Revenue Department.

Ed. S. T. Augustin.

Newcastle

Supplemental Estimate of 1864/65

District Tanjore

Talug Nagapattinam

Limits Karainagumy

*Work Flooring with cutstone over the arches of the 2
undertunnels for the irrigating channels now building
across the junction Canal*

Measurement				Description of Work	Price Rate		Amount
L	B	H	cut				
53	18	1	954	cutstone flooring, including the workmanship & convergence from Tanjore & (Complete)	1	8	431
				Cost of removing the brick work (that was built 1 foot from the ground at the time the order was given by the Superintending Engineer) & relaying 8 inches lower than the original plan including excavation &c			42
				Sundries			127 128
Total amount of Estimate Rs.							1,600

R. Appanthy
Assessee

*Karainagumy
12th March 1865
84224*

H. H. Minter
Sub Engineer D.P.W.

*Sup^r Engr's Office 6th Div.
Tanjore 1st April 1865*
H. H. Minter
Sup^r Engineer G.h Division

Estimate of work to be done
 with cut stone over
 the arches of the
 2 water wheels for
 the irrigating channel
 near junction of canal
 and river to be done
 by the 4th Coy. of
 the 1st Bn. of the
 1st Regt. of the
 1st Div. of the
 1st Army Corps.

Communication - Supplemental Estimate No 9/64/55.
 Tanjore District.
 Repayment Fund.

Work. Covering the two Siphon Pipes on South of
 Canal Bridge with sheet-iron and weighting with rubble stone

Measurements			Contents	Description of work.	Price Rate		Amount
L	B	H					
			1339	Sq. ft. of sheet-iron at 5 lbs. per sq. ft. @ 13 ³ / ₁₀₀ Candies	45	Candies	602 8 5
				Iron rivets Labor & Carriage			50
				Laying Iron on both sides			5
			1320	Cu. ft. of Rubble masonry	12	Cu. ft.	990
				Contingencies and Sundries			152 7 3
				Total of Estimate Rupees.			1800 0 0

4th Coy. Office.
 Formulary Repayment
 29th March 1865.
 2 x 2 H

J. H. Minter
 Sub. Engr. D. M. M.

Sup. Engr. Office 6th Div.
 Tanjore 1st April 1865.

J. H. Minter
 Sup. Engr. 6th Division

Communication

Supplemental Estimate

Tanjore District

Nagapattinam Taluk

Work — Covering the Chundra nady Siphon Sluice
with sheet iron & weighting with rubble stone.

Quantity	Description of Work	Rate	Amount	Amount of Each part
1551	Agre part of Sheet Iron @ 5 lbs. per sq ft = 15 ⁵ / ₁₀₀ Candies	45 "	697 15 2	
	Iron bolts Sakh & Carriage	" "	60 " "	
	Tarring Iron on both sides	" "	6 " "	
3001	Cft of Remaning Machinery over Arch.	" " 4	62 8 4	
917	Cft of Brick in Chunnam — rebuilding on Crown of Arch	" 2 3	128 15 3	
2687	Cft of Granite rubble	" 12 "	205 4 "	
197	do Cut Granite.	1 8 "	295 8 "	
	sundries & contingencies.	" "	233 13 3	

Total Estimate Rupees 3500

Sup^d Engr Office 6th Dec^r
Tanjore 1st April 1865

Edw. M. J.

Quercus J. Colonel
Sup^d Engineer 6th Dec^r

Estimate for covering
the 2 Siphon Sluices
on Chundra nady Sluice
with sheet iron and
weighting with rubble
stone.

1865

No 2855.

Supt: Engrs Office 6th Divⁿ
Tanjore 1st April 1865

From,
Lieut Col. T. Greenaway
Supt: Engineer 6th Division

To,
Colonel C. A. Orr R.E.
Secretary to Government
P. W. Department

Sir,

I have the honor to bring to your notice that the under tunnels recently constructed beneath the bed of the Udumiam Canal at the crossing of the Tritapomudi road to admit of the passage of two irrigation channels and of the surplus water of the Chandranuddy were reported by the Officer of the Range as being in his opinion unsafe, as owing to the great head of water they are liable to be exposed to they might very probably blow up.

2 Having had accurate data determined as to height of water in River and Canal &c. I now do myself the honor to forward a cross section of the existing work (under tunnel for Chandranuddy) and

agreed

13/4/65

and a section showing water levels. You will observe that the crown of the arch is liable in high freshes to a pressure of 750 lbs to the square foot due to a head of 12 feet, to counterpoise which there is only the weight of brick masonry 1' 10" thick = about 200 and about 4 feet of water in the Canal. (It could not be counted on as more at low tide) which for sea water, would be 256, total 456 lbs leaving an excess of pressure of 294 lbs to be resisted by cohesion only. To lower the arch one foot (it could not afford more) and load the crown with granite slabs would give $P = 812\frac{1}{2}$ / $h = 13$ / $R = 624$.

An excess of 188½ lb still to be met by cohesion only, quite unsafe to trust to in masonry of the sort and dimensions

3 I have great diffidence in proposing a plan for protecting the work which occurred to me, as I believe nothing of the sort has been attempted hitherto, but as it looks plausible on paper, it may be worth suggesting.

4 It is to cover the whole extrados of the arch as shown in the

2nd plan attached with sheet iron, the plates riveted together at their ends the sheet carried over the skewbacks and turned up at its outer extremities. The entire back of the arch to be loaded with granite rubble masonry up to the level of the Canal bed, except over the crown which being so thin should be of cast granite.

5 The Hydrostatic pressure on one entire arc of the intrados one foot in width would be with the water 16' above the floor 14780 lbs; to counterpoise which there would be

Weight of 1 foot wide of brick arch.	3795
Rubble and Stone work about	8150
Water in Canal $24 \times 1 \times 4$	6144
	18089 lbs

making $R > P$ by 3309 sufficient to prevent any risk of the whole thing blowing up bodily.

6 The Cohesive strength of the iron would be amply sufficient to prevent blowing out of the crown.

7 I suppose that during low tide when R would be at its least value P also would be somewhat

reduced during to increased fall, but
I have no data for estimating to what
extent -

8 The two smaller tunnels
were fortunately only just commenced
when the danger was brought to my
notice, they are exposed to a head
never exceeding 10' and. I propose
merely to lower their vents one foot
and load their crowns with granite,
which will be rather cheaper than
applying the sheet iron remedy also
to them, I have however forwarded
both and request that Orders may
be passed upon the subject as early
as possible as time draws rapidly
towards the season when work will be
impracticable in those parts.

I have the honor to be
Sir,

your most obedient servant

Wm. G. G. G.

Supt. Engineer 6th Div.

reduced owing to increased fall, but
I have no data for estimating to what

90/1185
of the Government
from the
The Secy: Engineer
6th Dec

The Secretary to Govt.
P. O.

Dated 1st 2 April 1865
Recd 4 2 April 1865

6th Dec
No 2855

Reporting on the average
condition of the under-
tunnels recently
constructed beneath
the bed of the Tadmira
Canal

1057-205 April 1865

No. 320

Civil Works No 1057
Proceedings of the - Madras Government
Under date the 20th April 1865
Recd the following

From the Superintending
Engineer 6th Dec

Reporting on the un-
safe condition of the Under
Tunnel recently constructed
beneath the bed of the
Tadmira Canal —

1st April 1865
No 2855

MD
W.D.
glo

With reference
to the above letter the
Government are of
opinion, in the case
of the Chundia middle
under tunnel, that
the

the brick-work of the
Arch, if of ordinary good
quality, ought to have
tenacity far more than
sufficient to counteract
the maximum excess of
pressure, represented
by Colonel Greenway
as liable to occur on
the occasion of a high
fresh in the river, and
they are not therefore
disposed to sanction
the large additional
expenditure^{*} recommended
by that Officer.

In the case of
the two small tunnels
alluded to in the last
paragraph of the fore-
going letter, the informa-
tion supplied by the
Superintending

^{*} Rupees 350

M.

Superintending Engineer
is far from full, &
as these works have
just been commenced,
the Government will
not object to the
alterations recommended,
and they accordingly
sanction the estimate
of the additional
expenditure, amounting
to Rupees 1600-

A.B.

to Supy Engineer G. D. S.
Accountant General S.
Controller P. H. Accounts S.
Revenue Dept. S.

21st April.

1771 1360 20 1/2
of Goodford

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