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MADRAS RECORD OFFICE.

Government of Madras.

*Public Works***DEPARTMENT.**

G.O. No. 2992	Press
311-312	~~Mis~~
Dated 18 - 10 - 18 64.	

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
13th October 1864.*

No. 311. Read again letter from the Superintending Engineer, 6th Division, No. 1,403, dated 16th September and recorded in Proceedings No. 2,778, dated 23rd idem:—

Read also the following letter from Captain J. BEAN, R. E., Officiating Superintending Engineer, 6th Division, to Major J. H. M. SHAW STEWART, R. E., Deputy Secretary to Government, Public Works Department, dated Combaconum, 23rd September 1864, No. 1,456.

SIR,

1. In continuation of my letter as per margin, I have the honor to report that I inspected
1 Sketch. the Lower Coleroon Anicut south branch on
No. 1,403, dated 16th September 1864. the 21st instant, and I beg to state the result
of my inspection of the work and enquiry into
the causes of the fall of six out of the seven arches which were built in June and July last.

2. I would, in the first instance, state that the estimate of Rupees 24,000, lately sanctioned
G. O. No. 1,030, dated 12th April 1864. for restoring a portion of the work, allowed for
the re-construction of the body and apron of the
anicut commencing from a distance of 80 feet from the north abutment, this part having been
uninjured, up to the first sluice pier, which has been considered the most dangerous portion of
the anicut, a distance of 145 feet. Seven arches were re-built including the one over the first set
of sluices which had not fallen but was shattered. The adjoining southern arch was also injured,
but I reported* that we had hopes of saving it
and it was not re-built subsequently.

* G. O. No. 1,030, dated 12th April 1864.

3. On examining the work on the 21st instant, I found that only 33 feet of the 80 feet
remaining of the old Anicut on the northern side had stood firm, and I am therefore led to
suppose, judging also from the reports of the anicut servants, that the old work first gave way,
and then caused the destruction of the adjoining new work and fall of the arches. From the
northern sluice, 96 feet in length of the new work from the lower step of the body remains firm,
then northwards there is a deep breach of 96 feet, and the remainder consists of the 33 feet
referred to above. The breach first caused the fall of three arches and shortly afterwards of three
more, leaving the sluice arch (which had been built) standing alone of the seven. The adjoining
arch has again suffered and sunk so that it must now be re-constructed.

4. The old work had twice breached before, and we have every reason to suppose
breached again, from the leakage through the wells, because our new work was carefully
executed to the full depth of 10 feet, and care had been taken in the selection of material
which was of the average quality used for such works. The foundations body and arches had
Vide report, dated 18th June 1864, No. 416.

G. O. 24th idem.

† Since contradicted by the Sub-Engineer's late inspection.

G. O. No. 2,390, dated 20th August 1864.

Vide G. O. No. 2,735, dated 20th September 1864.

been completed by the middle of June, and if of
bad material would not have stood, in the late
high freshes, till 12th of September. It is true
that the coping stones and upper portions† of the
body suffered from the floods as mentioned in my
letter No. 1,057, dated 12th August 1864, but
this was owing to the Coleroon river having
commenced to flow over from 15th of July before
the masonry was dry. During the erection of the
work I was present, and saw that the old wells were being removed to the full depth of 10 feet,
and I subsequently examined the arches carefully to test their quality. The debris of the work
now exposed since the accident is of the usual quality of brick masonry, and much of it has
fallen in masses.

5. On my supposition as to the cause of the accident, it is clear that the southern branch
of the anicut is not safe for one day, for a leakage may take place through any portion of it,
causing the destruction of the whole from defective and, I believe, insufficient depth of founda-
tions. Already has the centre portion of three arches been carried away and re-built in 1862, and

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18th October 1864.*

the northern portion has twice been similarly damaged. The only partial preventive or, I trust, remedy for this state of things, is one which we carried out this year to the extent of our available means but very imperfectly, and it is expensive, as it consists of throwing in a mass of rubble stone in front of the work, throughout its extent, so as to form a front apron and protection from scour and leakage through the wells. There is already a retaining wall between the piers supported on a row of wells, at least, for the extended portion of the work designed by Colonel Lawford, but this protection has proved insufficient for its security. Such an apron composed of laterite closed packed to a breadth and depth of 6 and 1½ yards, would not cost less for the whole length of 410 yards of anicut than 22,000 Rupees.

6. From the above remarks it will be seen that the damaged anicut for the length of one arch on the north side and two arches on the south side remains secure as regards foundations, whilst a space of three arches in the centre is breached, and the bed scoured out to a considerable depth by the river, all the water in the south branch now taking this course. The enclosed sketch which has been taken roughly owing to the difficulty of accurate measurements, illustrates the state of the work. The simplest method to restore the level would be to fill in with blocks of masonry, granite, or laterite, which would present a better section for the body hereafter and would probably prevent breaches, only that the piers for the arches have to be constructed on this foundation, and if stone were thrown in now, we should have insuperable difficulties in sinking wells hereafter. The Anicut is in a dangerous state, however, because the monsoon is approaching, and the scour will increase, though I have taken upon myself to open the southern sluices. I have also directed Sub-Engineer Bateman to strengthen the pier which supports the northern arch, so as to sustain the extra thrust, and to protect it at the same time from the monsoon. I have also told him to throw in stones, &c., in rear at the toe of the apron in line with the sluice elongated aprons, in order that we may raise the bed, prevent the enlargement of the breach, and avoid wastage. The number of arches could be reduced by converting three of the 34 feet spans into two of 50 feet span, allowing for the extra rise of the soffit by a corresponding diminution in the height of piers. If the above arrangement succeeds, it will be of immense advantage to turn off the water at once, and to prevent the great wastage which now occurs. Independent of the cost of the front apron, referred to in paragraph 5, the cost of restoration cannot, however, be far short of the sum lately sanctioned, if rough stone is thrown in.

7. Looking to the good character borne, and the experience heretofore gained, by those entrusted with the execution of the work, and to the measures which were, I know, taken to secure the anicut from danger by the use of every available precaution, though I deeply deplore to have to report such a disaster, I cannot attribute blame to the Department. The restoration has been a work causing much anxiety to all engaged on it, and, owing to the state of the existing anicut, future operations will require very great care and attention bestowed upon them. I would recommend that Lieutenant Smith, R. E., lately joined from Nellore, should be put in charge when work is resumed, and that Sub-Engineer Bateman be placed under his orders. I also request that Government will be pleased to sanction the measures which I propose to take to secure the work, and their cost.

No. 312.

ORDER THEREON, 18th October 1864, No. 2,992.

1. The Government have perused with much regret the above reports of the destruction of part of the southern branch of the lower Coleroon Anicut, and of the fall of six of the arches of the bridge that surmounted it. These are the same arches that fell last year, but the Superintending Engineer is nevertheless so well assured of the goodness of the materials with which they were re-built, and of their workmanship, as to be able to suggest no other reason for their downfall, than the existence of an excessive leakage through the wells under the foundations of the old part of the work which, he believes, first gave way, and forming a breach caused the destruction of the adjoining new work and, with it, of the bridge.

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18th October 1864.*

2. This leakage, owing to the insufficient depth and defectiveness of the wells under the old portion of the work, is described as so dangerous as to threaten the ruin, any day, of the whole of the southern branch of the Anicut. This ought to have been reported last year, and, had it been so, the Government would then have taken such steps as would probably have saved the new work from accident.

3. The throwing in of rough stone, as proposed by the Superintending Engineer, may check the extension of the breach, but the stone will probably cause difficulty in getting down new foundations to a proper depth, and will not prevent, but rather aggravate the evil of leakage. The manner of throwing in stone and the measures proposed to be adopted by the Superintending Engineer for repairing the damage that has been sustained are not sufficiently clear, and Captain Bean, in more fully explaining the mode in which he would carry out the re-construction of the anicut and bridge, as well as the steps he would take to defend their foundations from a recurrence of a similar disaster to that which has befallen them, will submit a detailed plan with proper cross sections.

(True Extract.)

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

To the Superintending Engineer, 6th Division.

Exd. S. T. Augustin.

Circulated for the
information and orders of Gov^t

Amesbury Coll. R.R.

Secretary of Gov^t

W^t Retrospect

I do not think that the measures suggested by Captⁿ
Pean are sufficiently clear to admit of their approval
by Gov^t - I am not satisfied with the explanation given of
the cause of the accident. It is assumed by Captⁿ Pean
the Foundation of the Abicut was not deep enough but
should have been stated last year. & the Gov^t then might
have taken such steps as would have secured the new
work from disaster - a rough stone apron would
have enabled the Gov^t to secure the reach from extension &
deepening. but a detailed plan & estimate should
be submitted before the Gov^t can judge of the expense.
- Securing the plan for repairing the damage done -
the plan submitted is useless it shows nothing
at once forwarded with a proper cross section of the
work

WD

12th Sept/64. No 1030-

To Mr. J. D. Dwyer
Pro. of Gov. for Oct.
From No. 4212
The Supt. Engineer
6th Dec.

To
The Dy. Secy. Genl.
P.O.D.

Dated 23rd }
Dec 28 } Sept 1864

No. 1455-

Encls: 1

Reporting further on the
causes of the fall of 6 arches
of the Lower Coleroon Aqueduct
Ancient South Branch.

No. 311.

C. 10th Oct 1864 P. 13th

2992-18th Oct 1864

Proceedings of the *Madras* Government.
Under date the 18th Dec/64
Read again letter from the Supt. Eng. 6th
No. 1403 of 16th Dec/64
Read also the following letter
From the Supt. Eng. 6th Dec/64

Reporting further on the causes
of the fall of 6 arches of the Lower
Coleroon Aqueduct. South Branch.

14th Dec/64. No. 1456

The Government have per-
used with much regret the
report of the destruction
of part of the southern branch
of the Lower Coleroon Aqueduct,
and of the fall of one of the
arches of the bridge that con-
nects it. There are
the same arches that were
seen, but the Superintendent
Engineer is unable to
give you the names of the masonry
of the masonry with which
they were built, and of their
masonry, as to the
to suggest an other reason for
their destruction, than the
action of an excessive load
through the walls under the
foundations of the stone
of the arch which have

first gave way, and forming
a bridge across the dis-
tention of the adjoining re-
sults can, with it, of the

2. This leakage, owing to the
insufficient depth and dis-
tention of the well under
the old portion of the work
is described as is dangerous
as to the water the water
day of the shore of the water
bank of the bridge. This
work has been reported
last year, and has been
to the Government would
then have been and so
it would probably have been
the work from

3. The turning in of water
stone as proposed by the
Superintending Engineer
may cause the retention
of the water

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is probably
very cause difficult in
setting down new foundation
to a proper depth, and
the m. piers, but the
better supports the risk
of leakage - The manner
of turning in stone under
the masonry proposed to
be adopted. { The Superintending
Engineer for repairing the
damages that have been
sustained in the last
vicinity of the dam, and
Capt. Dean, in more fully ex-
plaining the mode in which
the masonry on the termination
of the American bridge, to be
as the steps in order to be
from their foundation from
a disaster because of a
similar disaster to that which
has fallen from, and which
a detailed plan with proper
of masonry.

W. S. Eng 6th Feb 1861
Capt. Dean

W. S.

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CP 4871/64

Letter from the Super-
intending Engr. G. H. D. Reporting
on the destruction of part of the
Southern branch of the Lower
Colorado Aqueduct, San Jose St,
and of the fall of six of the
arches of the bridge that
surmounted it.

No 311-312