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MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

G.O. No. <u>554</u>	Press <u>Original</u> Mis.
Dated <u>19 2</u>	18 <u>77</u>

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
19th February 1877. No. 551.*

Read the following papers:—

No. 454. Endorsement of the Chief Secretary to Government, Financial Department, dated Ootacamund, 27th April 1876, No. 693.

Read the following Proceedings of the Board of Revenue, dated 12th April 1876, No. 1,010.

Read the following letter from J. H. GARSTIN, Esq., President of the Local Fund Boards, South Arcot District, to H. E. STOKES, Esq., Acting Secretary to the Board of Revenue, dated Cuddalore, 11th December 1875, No. 110.

In forwarding herewith two letters from the District Engineer as per margin, I have the honor to request the Board will move Government to place at the disposal of the Department of Public Works the sums of Rupees 16,350 and 5,000, or Rupees 21,350 in all.

2. The first sum is asked for to meet the expenses in connection with the temporary repairs to the Pooniar Bridge. In connection with these repairs, nearly 4,500 Rupees' worth of bricks and chunam seem to be in hand.

3. It is needless for me to comment on the work done. The present District Engineer, who differs from Major Smith and Mr. Sage as to what ought to have been done to the bridge, is of opinion that the work has been mismanaged. It is hardly any consolation to the Local Fund Board to know that this has been the case, and that the bill to be paid for such a result is 16,350 Rupees with the prospect of a very large additional outlay to be met in order to carry out the protective works which are required to save the bridge from being swept away.

4. The Chief Engineer in a letter to Captain Ross Thompson, quoted by the District Engineer in his letter of 9th April 1875, No. 11, threw on the Local Fund Board the burden of all the cost of repairing the bridge, and if this position is approved by Government then, unless some assistance is afforded to the Board by Government from Provincial Funds, the whole of the Road Fund balance at present available will not suffice to pay the present bill. I therefore trust the Revenue Board will support my application for assistance from Government. As pointed out

by the Local Fund Board in the resolution,* of which a copy is enclosed, the bridge was handed over to them with foundations of three feet resting on five feet wells, and it is hard that the Local Funds of the district should be held responsible for the errors of construction, if such they are, of an Engineer not in any way responsible to the Local Fund Board. If Government allow half the amount, viz., 8,175 Rupees from Provincial Funds, the relief will be considerable.

5. The second application made by Major Mead is for a transfer of Rupees 5,000 from the allotments for certain works, which, acting on his advice, the Local Fund Board have cancelled;† Rupees 3,000 of the amount to a new road in course of construction from Brahma-desam to Parangani, and Rupees 2,000 to the Pondicherry-Merkanum Road, in addition to the 11,520 Rupees, which sum only, acting on Mr. Norfor's assurance

Approaches to Thondiar Bridge	Rs. 1,200
Road to Railway station at Vilangambadi	1,600
Additional arch to Giddangal Surplus	2,470
Odai Bridge	4,020
Pooniar Causeway at Trikalore	
Total	9,290

*Proceedings of the Madras Government, Public Works Department,
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that more could not be spent during the year, the Local Fund Board allotted for that road. The estimate for the Brahmadesam Road is Rupees 9,050, but the Board were only able to allot 1,000 Rupees for it. The District Engineer is able to push on with it apparently and wants Rupees 3,000 more. To save time, I apply to the Board without waiting to lay the matter before the Local Fund Board, and request sanction for the transfers.

6. The existing balances on the 1st November of the Road and General Fund after taking credit for the four lapses above quoted were—

	RS.	A.	P.	RS.	A.	P.
Road Fund Balance	4,020	0	0			
Do. Reserve	7,756	0	0			
				11,776	0	0
General Fund Balance	10,327	5	6			
Do. Reserve	4,929	14	0			
				15,257	3	6
Total ...	27,033	3	6			

If Rupees 9,574 be transferred from General to Road Fund, the allotments asked for can be made and there will be a General Fund Balance of Rupees 5,683. If, however, the Government advance 8,175 Rupees from Provincial funds, the transfer from General Funds which will be necessary will *pro tanto* be diminished.

7. As to the future expenditure on the bridge, the Local Fund Board must bear it all if it is so ordered by Government; but in that case, on the estimate being submitted to the Local Fund Board, it will, of course, be a matter for them to consider whether the bridge may not be rendered stable at too great a price for Local Funds to pay, and whether the old causeway should not be restored and the bridge left to take its chance. A great deal has been recently done to the causeway, and probably 10,000 Rupees more would put it into first rate order throughout.

ENCLOSURES Nos. 1 and 2.—Copies of letters from District Engineer.

ENCLOSURE No. 3.—Statement.

ENCLOSURE No. 4.—Extract from Proceedings of the Local Fund Board.

In the foregoing letter the President requests that Government may be moved to place at the disposal of the Public Works Department the sums of Rupees 16,350, 5,000, or Rupees 21,350 in all, for the undermentioned works:—

	RS.
1. Repairing the Pooniar Bridge	16,350
2. Constructing a road from Brahmadesam to Parangani. In addition to the allotment of Rupees 1,000, Item No. 5 in the Supplemental Budget of 1875-76, sanctioned in G.O., Financial Department, dated 4th August 1875, No. 1,590	3,000
3. Constructing a road from Merkanum to Pondicherry. In addition to the allotment of Rupees 11,520, Item No. 6 in the Supplemental Budget of 1875-76, sanctioned in G.O., Financial Department, dated 4th August 1875, No. 1,590	2,000
Total ...	21,350

*Proceedings of the Madras Government, Public Works Department,
19th February 1877. No. 554.*

2. As regards the first work, the Local Fund Board, looking to its original faulty construction, the opinion of the present District Engineer that the repair work already executed has been mismanaged, and the paucity of funds under the Road Fund, desire that half the cost thereof may be allowed from Provincial Funds, the remaining half being met from Local Funds. This work appeared in the list of incomplete works of 1874-75, but the Board disallowed it, pending the result of inquiries ordered in G.O., Public Works Department, dated 13th March 1875, No. 719-A, and the submission of an estimate. It appears from the District Engineer's letter* to the President that the Government in their Order, dated 14th July 1875, No. 2,198 (not communicated to the Board), authorized some temporary protective works to be executed so as to ensure the safety of the bridge and to allow of the traffic passing over it. Nothing appears to have as yet been finally settled either as to the future treatment of the bridge or as to the source from which the cost of the work hitherto done and to be executed hereafter is to be met. Pending final orders of Government on this subject, the Board think it premature to make any allotment from Local Funds. The Circle Board's proposition to pay half the expenditure which has already been incurred, and to bear half the cost of the protective works to be constructed hereafter, appears fair.

3. As regards funds required for the second and third works, the Board sanction them from the savings in the allotments for the works mentioned in paragraph 5 of the President's letter. It is presumed that the concurrence of the Local Fund Board as regards the proposed transfers has been obtained.

(A true Copy and Extract.)

(Signed) C. A. GALTON,
Acting Secretary.

REFERRED to the Department of Public Works.

(Signed) W. HUDLESTON,
Chief Secretary.

154-A. Memorandum by the Chief Engineer Public Works Department, dated 6th May 1876, No. 773.

154-B. Memorandum by the Chief Engineer, Public Works Department, dated 24th June 1876, No. 973.

154-C. Memorandum from the Financial Dept., dated 7th July 1876, No. 1,056.

154-D. Chief Engineer's Memorandum, 7th " " " 1,046.

154-E. From Major H. R. MEAD, R.E., District Engineer of South Arcot, to Major-General G. W. WALKER, R.E., Chief Engineer, Public Works Department, dated Camp Cuddalore, 7th August 1876, No. 81.

WITH reference to your memorandum, No. 1,046, dated 7th July 1876, I have the honor to inform you that I much regret that I have been unable as yet to do anything towards the borings ordered to be made opposite to each pier of

the Pooniar bridge near Cuddalore, as I have been unable to procure any boring apparatus.

2. As there was no boring apparatus in this district, on receipt of the memorandum I wrote to the Superintendent of Stores and requested that apparatus and tubing might be at once sent down; he replied that he had none in store, but that he believed there was a set in Tanjore District. I applied to that district, but as yet have had no reply.

3. I much fear that should I obtain a set of boring apparatus from Tanjore there may be further delay, as unless it is accompanied with tubing it will be useless as the bed of the Pooniar is sand, full of springs; without tubing, therefore, it will be impossible by boring to find out the nature of the sub-soil and therefore unless I procure this tubing from Tanjore I shall have to send to Madras for tubing. I cannot do so now as I do not know the size of it.

No. 454-F. From the same Officer, dated Camp, Punrootti, 18th September 1876, No. 116.

I HAVE the honor to report, with reference to your memorandums, No. 1,046, dated 7th July, and No. 1,226, dated 14th August 1876, that I was unable to borrow

One list of borings taken.

a boring apparatus from the Railway Company; they had only one in the district, and that was in use, also that they had no tubing; that used some few years ago for the borings taken in the rivers could not be found, and no one knew where it had gone to.

2. I received from Tanjore, on the 13th August, a set of boring apparatus; but, as I had to go into the district and had no one to use it, I was unable to commence boring until the 29th August; the only tubing I could get was a piece 8' 4" long lent to me by the Railway.

3. With this I commenced boring; the shell auger of the boring apparatus, however, broke after three holes had been made. I managed to get it repaired, but it has again gone, and this time it is too short and thin to allow it repair. I therefore am unable to make any more borings at present. Owing to the bed of the river being almost entirely sand and my having a pipe only 8½ feet long, I regret that I was unable to bore to any great depth as the hole could not be kept clear.

4. I enclose a list of the depths and the results, and trust, although so meagre, it will be considered sufficient.

5. From the information obtained from the Railway Engineers, who are sinking wells in the Guddelum and Pooniar rivers, I do not think there is any chance of our finding any foundation except thin layers of clay, and these very irregular, at any reasonable depth. I have requested them to let me have sections of the soil passed through by their wells, and on its receipt I will forward it.

6. I will, as soon as I can, get a new shell auger made, but as the Government Workshops are closed I fear there will be great delay.

No. 454-G. From the same Officer, dated Camp, Shatiatope, 7th October 1876, No. 134.

I HAVE the honor, as promised in my letter No. 116, dated 18th September 1876, to forward tracings of sections showing the nature of the soil through which the

Two Tracings.

wells have been sunk by the Railway Engineers for the bridges across the Pooniar (Panar) and Guddelum rivers; the former is situated about 18 miles above the Pooniar road bridge near Cuddalore, the latter across the Guddelum river and about 3 miles south-west of the same bridge.

On the Pooniar section it will be seen that there is an irregular stratum of red clay and lime-stone and red clay and sand; this is from 6 to 12 feet below the present bed of the river; but as this is 18 miles inland I do not think we can hope for anything like it to be found at the site of the Cuddalore-Pooniar bridge that is close to the coast. The bed of the Guddelum at the railway crossing, about 3 miles from the sea coast, is very different; blue clay has been met with at the bottom of five of the wells at a depth of about 17 feet below deep bed in three wells and 24 feet in two others, but above these depths nothing but sand and sand mixed with clay has been found.

In a well sunk for a bridge near Old Town Cuddalore, about three-fourths of a mile from the sea, nothing better than black mud was found.

From these sections and from the borings which I was able to take at the Pooniar bridge, I do not see any hope of there being any thing approaching a bed of clay or other fair foundation at a reasonable depth on which foundations could be founded.

On the 3rd of October there was a fresh in the river Pooniar 4 feet over flooring. I regret to have to bring to notice that there was a heavy cross current south of the 5th arch that set obliquely across the piers, and was worst at the 8th pier; this has not been protected with a new retaining wall and apron. I will endeavour to correct this, but I consider for the safety of the bridge we require that the protective works should be carried out for the whole length of the bridge, and arrangements should be made to do so. There is great difficulty next season in training this river as it is in fresh for so few days in the year.

No. 210-A.

No. 454-H.

MEMORANDUM.

THE Chief Engineer has the honor to submit the results of the further references made by him on receipt of memorandum in the Financial Department, No. 1,056 of 7th July. From the three letters from the District Engineer, South Arcot, replying to his memorandum, No. 1,046, of that date, it will be seen that but little more positive information regarding the river bed at the Pooniar bridge, Cuddalore, has been, or is likely to be, obtained. Under the circumstances reported, all he can do is to repeat his agreement with Major Mead on the grounds expressed in paragraphs 30 to 35 of his letter recorded with G.O., No. 3,423, of 2nd December 1875; and to recommend that the estimate of Rupees 44,200, which includes all outlay hitherto incurred on temporary repairs, shall be sanctioned.

(Signed) G. W. WALKER, Major-General, R.E.,
Chief Engineer, Public Works Department.

31st January 1877.

Proceedings of the Madras Government, Public Works Department,
19th February 1877. No. 554.

No. 455. ORDER THEREON, 19th February 1877, No. 554.

CIVIL WORKS, No. 36-A.

(a) *Heads of Service.*—Provincial.
Fund.—Ordinary.
Class.—Original Works.
Main-head.—(2.) Communications.
Sub-head.—i Main Roads.
Name of Work.—Repairs and protective works for the
Pooniar bridge at Cuddalore.
Amount.—Rupees 44,200.
To be carried out by the Public Works Department.

HIS GRACE the Governor in Council sanctions the estimate of Rupees 44,200 for repairs and protective works to the Pooniar bridge at Cuddalore proposed by the District Engineer and approved by the Chief Engineer.

2. It will be considered in the Financial Department what contribution

shall be made by the Local Fund Board towards carrying out the works.

3. This sanction has been registered as Provincial No. 247 W. of 1876-77.

(True Extract.)

Colonel,
Acting Joint Secretary to Government.

To the District Engineer, South Arcot.
" Examiner of Public Works Accounts.
" Financial Department.

D.P.W.
South Arcot

N: 266

District Engineer's Office
Camp, Vindavallam
Dated 11th March 1875

From.

The District Engineer,
South Arcot

To.

The Chief Engineer,
D.P.W.

Sir,

Under instructions conveyed in G.O. No 197 of 23rd January 1875 I received charge of the District on the 3rd instant, and as Mr. Lige was not able to accompany me to inspect the Pooniar Bridge at Cuddalore I had with me a Mr. Assistant Engineer Mr. Carrett who had been deputed to supervise the operations of the examination of the foundations of the works on the north bank of the River.

2. At the time of my inspection the foundations under the N. & S. shore arches were exposed to view down to about 3 ft below top of mello and the flooring under one arch (the N. shore arch) had

had been partially removed sufficient
to show the construction details of
the work below floor level and with
regard to the state of the Bridge
I think the following table notice
of every crack &c.

N^o 1 "Arch" very bad diagonal cracks
extending right across the arch,
these cracks have increased con-
siderably during removal of floor.
"Floor" one third removed, brick-
work very good indeed, very great,
difficulty experienced in breaking it
up, I have stopped any further
removal of floor for the present.

"Pier" Diagonal crack on the
face of west end does not go through
the Pier, nothing of this crack
to be seen on the south face.

N^o 2 "Arch" no cracks apparent.
"Floor" cracked and sunk at
west end of Pier is up stream side.

"Pier" cracked on north face of
west end, also on south face of
each end on down stream side.

N^o 3 "Arch" show transverse cracks, in

one very bad extending more than half
across the arch.

"Pier" sound

"Floor" Cracked right across & sunk
very much at west end of pier.
N^o 4 "Arch" four small transverse cracks
(recent)

"Pier" very bad diagonal cracks
on north face of East end also
south face of west end these
cracks have considerably increased
recently.

"Floor" Cracked from end to end
part completely separated from
main portion.

This is the present condition of
the Bridge & under the circumstances
I considered it advisable to stop all
traffic over it and as some considerable
time will lapse before the Bridge will
again be fit for use, I have issued in-
structions to clear away all sand
over the old causeway immediately
below the site of the Bridge, to repair
the damaged portions of the masonry
parapets and make the roadway

I am expecting an estimate for this
and will submit the same for sanction
when received. The work is one of
necessity & much inconvenience is felt by
detention of the mail and also by the
general public: the Caucasians will ease
matter a little so long as there are
no floods in the river, after each
flood the accumulation over the
roadway may be removed; I trust that
this step will be approved and request
to be informed from what source the
expenditure is to be met.

3. As regards the Bridge, under
Mr. Loe's instructions, Bricks Chumam,
for the materials for reconstructing the
damaged portions are under preparation.
and a Rittrop has been put up against
the 5th pier to act as a counterpoise to the
last of the arches to remain and as the
4th pier is very badly cracked & will have
to be rebuilt, the 5th arch must come
down, and I have therefore directed Mr.
Garratt, who still remains in charge of
the works, to put up a centring under this
arch with a view to its being taken down
easily

6
easily and without shaking & disturbing
the 5th pier & arch next to it.

4. In like manner also I am
of opinion the other 4 arches must all come
down, although the 2nd arch appears sound
the piers on either side are cracked at the
ends as also the flooring.

5. The cause of this failure is ap-
parently a longitudinal scour along
the upstream face of the work extending
to within the limits of the damaged portion
of the bridge. A groynes above the
bridge erected some years ago was evi-
dently overtopped and completely destroyed
in the flood. The wells under the
piers are apparently of Brick in Chumam
while those under retaining walls are
built in clay & filled with sand, an
old practice which has answered in
many large works still standing but
in this instance the wells below retaining
walls under the effect of the scour
have been regularly scooped out and
flooring above is in places standing
in suspension the ends of piers have
also in this way been damaged.

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the

Read the following:—

Pro. of the Board
of Revenue
tho' Financial Dept. } (H.C. No 1010 d/12th April 1896)

The offer of the
Local Fund Board to
share the expenses already
incurred in connection with
the Ponnar Bridge
and those of the protective
works that may be ne-
cessary is accepted.

The plans and
Estimates which the
District Engineer was
instructed in G.O. No 3423
dated 2nd December 1895,

Which we had before
have been passed
& especially the estimate
which before was with
the Local Fund—

We can then deal
with the question of
how the part of the
expenditure is to

be met.

MM

to

6. Five or six groyne are required
in the North Bank of River to turn the
set of stream off that bank.

7. I have under preparation
an estimate for rebuilding the
damaged portion of Bridge, in
the meanwhile I will arrange
to take down the 5 arches from
North bank, & continue the prepa-
ration of materials.

I have W.
(Signed) R. E. for
Executive Engineer in charge of
District Engineer's Office
(Same copy)

MM
Major, R.E.
District Engineer

to prepare, will be sub-
mitted direct to Govt.
for approval and
sanction.

G.M.W.

The Director of the Local Fund B.

No. 104
 7 13th March 1875
 Transferred to Captain
 Ross Thompson. R. E.
 who has been specially
 deputed to advise the
 Dy Dist Engr with reference
 to the work of reconstruct-
 -ing this Bridge.

P. W. 1875 Dept.
 Cr. 1703
 From
 The Dist Engr South Arc
 To The Secretary to Govt.
 P. W. D.
 No. 266
 dated 11th March
 1875
 Rd-13th - - -

Cracked state of
 the Ponnai Bridge.

Vide para 1 of letter
 printed with G. O. No.
 1504 d/31 May 75.

(a) Heads of Service—*Poonnial*

Fund. *Ordinary*

Class. *Original Works*

Main-head. (2) *Communications*

Sub-head. 1. *Main Roads*

Section—

Name of Work. *Repairs & protective works
 for the Poonai bridge at Fudalur*

Amount. *Rs 44200*

To be carried out by the *P. W.* Department.

Print in the margin of G. O. No 534 d/19/2/77

A meeting of the Local Fund Board,
Cuddalore Circle, held at Cud-
dalore, on the 30th day of April 1875.

* * * * *
28. The following allotments are
made and recommended.

Original works.

No 4. Improving the Ponnai
Bridge - Rupees 15000.

The Board are unanimously
of opinion that the Bridge should
be put into a state of thorough repair
having regard to the opinions of
Mr. Tagg and Mr. Lofan as set
forth in the letter of the former
Officer of the 12th February 1875 re-
corded in Proceedings of Govern-
ment D.P. No. of the 13th March 1875.

At the same ^{time} the Board consider
that the foundations of the Bridge
throughout its entire length should
be thoroughly examined and if
necessary, protected. Moreover
they are of opinion that the whole
cost of the repairs should not in
fairness be thrown on them. The
Bridge was built before the Local
Fund Board existed and was
transferred to them with "foundations
of 3 feet resting on 5 feet wells" as
proved by the examination of the
late District Engineer. They are

willing to allot one half of the funds
now asked for and request Govern-
ment will allot the rest from
Provincial Funds. They are also
willing to bear half the cost of the
examination and protection if
necessary of the foundation of
the rest of the bridge. The Revenue
Board will be requested to allot
7500 Rupees for this work in anti-
cipation of a regular estimate
being submitted.

The Board observe that the cost
of any additional waterway to be
provided in consequence of em-
banking the river as laid down by
the Chief Engineer, to be paid for out
of Imperial funds and included
in the Embankment Estimate.

I have
President F.B.

Sub M. A. 925

16350

the Local Board
of Cuddalore
December 1875

D.P.M.
South Arcot

No 308

12 District Engineer's
Office, Camp Cuddalore,
Tamil Nadu, Dated 26th
November 1875.

From,

The District Engineer
South Arcot.

To, The President,
Local Fund Board,
South Arcot.

Sir,

I have the honor to
forward the enclosed statement
showing the expenditure that
has been incurred on the Ponnai
Bridge at Cuddalore and request
that the Local Fund Board may be
asked to allot Rs 11100 for the repairs
already executed to the Bridge,
Rs 250 for iron work that will have
to be done and Rs 5000 for the pre-
paration of materials for next
season's work.

11100
5000
250
16350

2. As you are aware this Bridge
was seriously cracked in the heavy
floods of October 1874 so much so,
that the late Mr Sage considered
it necessary to close the Bridge;
he forwarded in December an esti-
mate to the Chief Engineer for Rs
33000 which allowed for two new
retaining walls and other protec-
tive works, this the Chief Engineer
did not recommend to Government
as more information was considered

16350

necessary. In February 1875 after examination of the Bridge Mr Sage requested that a Superintending Engineer might be sent down to report on the Bridge. Government were unable to do this and directed in March, Captain Ross Thomson to examine and report on it; he was unable to do so and in May Major Smith was ordered to go to Cuddalore and this he did in July. Major Smith considered that the 5th northern arches might be opened for traffic but that it was necessary at once to adopt temporary measures to protect them from any scour and proposed that this should be done by means of piles and rough stone. Government in G.O. No 2198 dated 28th July 1875 ordered this to be carried out at once.

4. The work has been most costly, it having cost exclusive of stone work more than 10 Rupees per foot run.

5. The cost of the bunds, baling &c has been very heavy; this is owing to the length of time and the number of times that the Bridge was under examination. In February by Mr Sage, in March for Captain Thomson's expected arrival and again in July for Major Smith. The cost has been about Rupees 2700.

6. Mr Sage considered that it was necessary to rebuild the 5th northern arches and to do this built a buttress against the 5th pier and put up a centring under the 5th Arch, the parapet walls were also removed (since been rebuilt temporarily) the cost of this has been Rupees 911-7.

7. I regret much that I am unable to give any other opinion than that this work has been mismanaged and I attribute its cost to the late Mr Sage having to leave the district sick and Government being unable to send as they intended an Officer to examine and report on the Bridge so that measures for either rebuilding or protecting might have been undertaken in proper time. As it was Major Smith did not come until July and then it was absolutely necessary to protect the Bridge at once, to do this expensive measures had to be adopted. Had however Major Smith estimated the cost of his proposal or had he known how expensive it would have proved to be, I am sure he would have altered his proposition.

8. With regard to the future of this Bridge, I have reported to Government regarding

regarding it and made a proposal of what ~~it~~ should be done and before making out plans and estimates for the work think it best to wait for Government orders regarding it.

9. My opinion differs from both Mr. Sage and Major Smith and I consider there is no necessity for the rebuilding of the 5 or 6 arches for the present. My own belief is that if they are protected by a new retaining wall and flooring that most probably they will last for years. Should at some future time it be necessary to remove them the retaining wall now proposed to be put down will not interfere with the new work; in fact the cost of rebuilding them if necessary say 10 years hence will hardly be greater than doing so now.

10. With regard to the retaining walls Major Smith proposed it to be founded on wells 20 feet deep. Mr. Sage proposed the bottom of foundation 14 feet. I have proposed it to be 11 feet deep but protected by an apron of laterite rough stone 4 yards in width.

11. I have not thought it necessary now to discuss the question of the waterway of the Bridge being increased

which certainly will be necessary. Should as has been proposed the Ponnar be embanked it is not likely that this question will be decided for some little time and when settled arrangements for increasing the waterway of the Bridge can be made (which I should think would be an Imperial charge) in the meantime it is necessary to secure the present Bridge and arrange for the work being commenced in proper time next season.

12. As soon as I receive the orders of Government on the letter I have addressed to them I will inform the Local Fund Board what measures they consider best to be adopted towards the Bridge, and how I have to ask for the allotment of the money that has been spent. I regret much that I have been unable to do so before the reason is that I have had considerable difficulty in closing some of the accounts and even now some of them are not finally closed.

13. In the Local Fund Board Proceedings dated 30th April 1875 they proposed to allot Rs 7500 for this work on the supposition that Government would give a grant of the same amount on account

of the Bridge - This was forwarded
to the Board of Revenue who in the
absence of an estimate declined
to sanction it and this has defer-
red the question of whether Govern-
ment will assist in this work or
not - I think it would be as well
that they should be again asked
through the Board of Revenue
and this point decided as soon
as possible.

Vide Memo
of the B. & P.
of 21st June/75
No 1712.

I have &c
Signed H. R. Mead, Major R.E.
District Engineer,

True Copy.

W. Hart
President of B.R.

12th 975

12th 975

Letter from
the Board of
Revenue
dated 11th
December 1875
No 110.

S.P. W.
South Arcot.

District Engineer's Office
Camp Cuddalore
Dated 14th December 1875.

No 313.

Dear Sir,
The District Engineer
South Arcot.

To,
The President
Local Fund Board
South Arcot.

In their Proceedings
of the 30th August and 29th Octo-
ber 1875 the Local Fund Board,
Cuddalore Circle cancelled
the estimates and allotments
of Rupees 1200, 1600 and 2470,
made respectively for 2 tunnels
in the approaches to the Thondiar
Bridge for the road to the Rail-
way station at Vellampai -
pandy and for an addi-
tional vent to the Bridge over
the Giddungal surplus channel.
2. Again in the current year's
Budget a sum of Rupees 4020
has been allotted for a Cause-
way across the Ponnai at
Enkalore but the Local Board
in their Proceedings of the
30th September 1875 decided to
defer the execution of this work
till the action of Government in

in respect of the river embank-
-ments is known.

3. It would thus appear
that a sum of Rupees 9290 from
the grants already sanctioned
is available for expenditure
on other works.

4. I have therefore the honor
to request that sanction be
obtained at an early date
to the transfers from the said
amount of Rupees 3000 to the
new road from Brahmades
-sami to Parangani via Samir
and Rupees 2000 to the com-
-pletion of the road from Ner-
-karam to Pondicherry to
supplement the grants of
Rs 1000 and 11520 already made
for these works in the Supple-
-mental Budget.

5. In addition to this a sum
of Rupees 16350 is required for
the Ponnias Bridge work as
reported in my letter No 308
dated 26th November 1875. There
was I believe Rs 13488 balance
when the Supplemental Budget
was sent up and to this may
be added the Rupees 9290 now
cancelled making a total of
Rupees 27778 from which however

has to be deducted a few
minor sanctions by the Local
Fund Board.

I have &c
/Signed/ H. R. Head Major
District Engineer. R.E.

True copy/

I H, and
President J.B.

Statement showing the work done in Temporary Repairs to Pouian Bridge and Cost of the Same.

Description.	Quantity.	Cost.		Rate.	
		Rs.	as p.	Rs.	as p.
Temporary Bunds —		832	46		
Baling water —		1126	56		
Buttress wall —	128 yards	431	109 7/8	3	6 1
Centring and removing —		338	3 3		
Leveling and removing sand —		310	4 1		
Rough Stone —	778 yds	943	13 10		
Eroques —	3 of 13 yds each	676	7 10	225	7 11
Piles —	540 feet	5524	3 9 8 1/2	10	3 8
Parapet wall —	7 1/2 yds	141	59 9/10	1	14
Lundries —		408	7 10		
Superintendence —		323	13 3		
Total Work —		11057	4		
Materials					
Chunam —		602	15 9		
Bricks —		3845	14 5		
		4448	14 2		
Grand Total —		15505	14 6		

District Engr's Office,
South Arcot.
Cuddalore 26th Novr/75.

Signed H. R. Mead, Major R.E.
District Engineer
J. G. Austin
President L.F.B.

*Proceedings of the Madras Government, Public Works Department,
13th March 1875.*

Read the following letters:—

No. 356A. From G. S. SAGE, Esq., District Engineer, South Arcot, to Colonel G. W. WALKER, R.E., Chief Engineer, Public Works Department, dated Camp at Cuddalore, 16th December 1874, No. 197.

I HAVE the honor to lay before you an estimate for protecting the foundations of the bridge across the Poniar, near Manjacoopum, and to explain as follows.

1 Plan.
1 Abstract Estimate.

2. From all I can learn up to this year water never rose above springings; this year we had three heavy freshes, the smallest rose to 4.34 above springing, and the largest to 5.45.

3. Whilst on circuit I received a report that the bridge had received damage, and on my return I tried to examine it, but up to present time there is too much water to permit of proper examination.

4. From what can be seen, the third pier from north has had a scour in front of it and has been undermined and fallen slightly up stream, the arches on either side being cracked and settled down five inches on up stream and three inches on down stream side.

5. From enclosed section, which I am not sure is correct, but which is made from the original plan in my office, signed by Lieutenant O'Connel, the then District Engineer, shows only three feet foundation on five feet wells, and as there are no aprons it is no wonder the pressure of water against these wells, as well as the scour caused by a set in the river, has at last caused damage to the bridge.

6. There appears to have been an earthen groyne to counteract this set, but this year's high floods have topped it and carried it away. I am having a survey of river made with a view to putting in two or three stone groynes, and will include the cost in the estimate for repairing the arches, as soon as it is possible to find out what is required.

7. The estimate now submitted is for putting two floors, each fourteen feet over all, measuring from edge of cut waters; the floor to be one foot thick of brick on edge on one and a half feet of concrete with five feet retaining walls below the brick on edge carried on nine feet wells.

8. It may be thought the work should be done by Local Funds, but I have left that point to be settled, and request early sanction to the estimate to enable me to push on with it. I have directed brickmaking for the purpose to be put in hand as such a large number are required; also the preparation of well rings.

No. 356B. From the same Officer, dated Cuddalore, 12th February 1875, No. 237.

In continuation of my No. 197, dated 16th December 1874, forwarding plan and estimate for protective works to Poniar bridge, I have at last been able to get the water down sufficiently to enable me to inspect the work, and am sorry to say that the actual work is even worse than shown in the section sent you with my letter abovementioned; the foundations are only three feet instead of five feet on

*Received from
the District Engineer
of the Local Funds
at Cuddalore
11th December 1875
No. 110.*

L. Walker 900/95

L. Walker 925/76

*Proceedings of the Madras Government, Public Works Department,
13th March 1875.*

wells of five feet; the wells have sunk away from the foundations, and water passes freely under the bridge.

2. As to what should be done to this bridge, I am of opinion that when the river is embanked its waterway will be utterly insufficient, and in its present state, I mean without expensive protective works, it will not stand. I may mention that Mr. Logan, Chief Engineer of the South Indian Railway, is here and has been looking at the bridge, &c., with reference to the waterway of the railway bridge across this river, and agrees with what I have stated above.

3. I wrote you demi-officially asking for the Circle Superintending Engineer to come and inspect the bridge, and I now do so officially, as I consider it absolutely necessary the matter should be thoroughly gone into and at as early a date as possible.

No. 356-C. ORDER THEREON, 13th March 1875, No. 719-A.

ESTABLISHMENT, No. 22-A.

THE services of Captain Ross Thompson, R.E., having been made available by the return to duty of Major

C. J. Smith, R.E., and that officer having lately devoted much attention to the subject of the waterway necessary for the railway bridge over the Poniar, he will be deputed to advise the District Engineer as to the action to be taken with reference to the road bridge near Cuddalore.

2. The effect of the river embankments on the waterway to be allowed, with reference both to the railway and road bridges, is a subject which should be previously discussed with the Chief Engineer for Irrigation.

(True Extract.)

C. J. Smith Colonel, R.E.,
Secretary to Government.

To Captain Ross Thompson, R.E.
To the Chief Engineer for Irrigation.
„ Consulting Engineer for Railways.
„ District Engineer, South Arcot.
„ Controller of Public Works Account.
„ Financial Department.

Exd. S. T. Austin.

Spare Copies

25th March

Financial Department

Govt. of 1875 Madras.

PUBLIC WORKS.

To

CAPTAIN ROSS THOMPSON, R.E.

&c. &c. &c.

Dated March 13th.

Recd. 23?

Encl.

G. O., 13th March 1875, No. 719A.

MARCH

Nos. 356A-356C

No 716

Captain Ross Thompson, R.E.—The services of — made available for the special duty in connection with the road bridge over the Pooniar, near Cuddalore, South Arcot District.

Proceedings of the Madras Government, Public Works Department,
2nd December 1875.

No. 20. Read the following letter from Major H. R. MEAD, R.E., District Engineer, South Arcot, to Major-General G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Camp at Cuddalore, 25th November 1875, No. 168 :—

I REGRET that I have not before this reported regarding the Pooniar bridge near Cuddalore, but I have not been able to do so because of the difficulty I have had in making up the accounts of the work, and

even now I am unable to clear them up entirely, as it is impossible to tell at present how the materials prepared will turn out, and some accounts still remain unsettled.

2. I have the honor to point out, that chiefly owing to the late Mr. Sage's having to leave the district sick that this bridge has not had the attention it should have had, and that many circumstances have happened which have caused a much heavier expenditure than would have been incurred had there been an officer in charge in whom Government had confidence. The following brief history of the work will, I think, show this.

3. In 1874 there were heavy floods in the Pooniar, the highest in October rose to 5 feet 5 inches above the springing level of the bridge, and there were serious cracks in the northern arches. Mr. Sage, on the 16th December 1874, forwarded an estimate amounting to Rupees 33,000, this allowed for putting down two floors or aprons (one on each side of the bridge) 14 feet in breadth, with retaining walls of 5 feet solid masonry on 9 feet wells.

4. On the 13th January 1875, the Chief Engineer, in Memorandum No. 52, declined to recommend the adoption of this estimate, because he considered there was not sufficient information to justify so great an expenditure.

5. On the 12th of February, Mr. Sage reported again on the bridge, he having examined it; he found the old work was 3 feet solid masonry on 5 feet wells; he considered also that if the River Pooniar was embanked, as it was proposed should be the case, that the waterway of the bridge would be insufficient. He further requested that the Circle Superintending Engineer should be sent down to examine the bridge, and urged that the matter should be decided as soon as possible.

6. Government in their Order No. 719-A, dated 13th March 1875, directed that Captain Ross Thompson should be sent to advise the District Engineer regarding the bridge.

7. I would remark that Mr. Sage left the district very sick on the 3rd March, and Mr. R. E. Norfor took charge of the district. Captain Ross Thompson was unable to carry out the duty assigned to him, and Government in G.O., No. 1,415-A, dated 21st May 1875, directed Major C. J. Smith to take up the duty; he did not, however, visit Cuddalore until July, and his report is printed in G.O., No. 2,198, dated 28th July. Government directed that the protective measures proposed by Major Smith should be carried out.

8. The protective measures were as follow :—

At a distance of 18 feet above and below the bridge two rows of sheet piling to be driven and a rough stone apron 2 feet thick of laterite to be put down, the sheet piling to be 15 feet deep.

25th March p. no 654

Communicated through
the B^d of Revenue & the
Works of the Cuddalore
Local Board.

23/3

To the Board of Revenue
desp 25/3

Ar 17.2.77

W. K. W. W.

9. It was found that piling 15 feet could not be put down, and 10 feet piling was substituted for it.

10. This work was carried out; it has proved most costly, much more so than Major Smith could have had any idea of when he proposed it. The cost has been over Rupees 10 per foot run; of course next year the piles may be removed, but I fear the value of the wood (mango-wood) will be found to be but small, and that of the iron shoes and straps little or nothing. I therefore think we must not calculate on reducing the expenditure materially in this way.

11. I enclose a statement showing the expenditure on the different items, and I must say that the work in consequence of having been so long in hand has not, I consider, been done as cheaply as it might have been.

12. For the expenditure incurred had sanction been given in February for the retaining wall as proposed by Mr. Sage, the bridge could have had this permanent protection for a longer length than it has the temporary protection; or, in other words, the money expended in a temporary protection of piles and rough stone for 270 feet run of the bridge would have been sufficient to have put down a permanent retaining wall in front and rear with flooring for the same distance.

13. As Mr. Wiffen, the Range Officer, was fully occupied in the works of his range, which had the heavy work of the Pooniar Anicut in progress, he was not put in charge of this work, but it was put in charge of Mr. Garrett, a young officer who only landed in the country in November 1874, and I think, as might have been expected, the management and arrangement of the work was not carried on as judiciously as might have been, and there is no doubt the check on the work was not what it should have been.

14. With regard to the expenditure on bunds, baling, sundries, and superintendence, I would remark that work had been in progress from January to September; that the bridge foundations were laid open in February for Mr. Sage's examination; again in March and April for Captain Thompson's expected arrival, and lastly in July for Major Smith's arrival, the cost of these items has been nearly Rupees 2,700.

15. By Mr. Sage's order a centring was put up under the 5th arch from north, this was done so that this arch might be removed by hand and the four northern arches blown up by gunpowder; it was removed in July after Major Smith's inspection; the cost of this was Rupees 338.

16. A buttress wall was built against the fifth arch south pier at a cost of Rupees 431-10-9. The parapet walls were removed in March and temporary ones rebuilt after Major Smith's inspection; this cost Rupees 141.

17. The cost of levelling and removing sand from floors, apron, &c., has been heavy, viz., Rupees 310, this is in consequence of the floods in the river in August and September constantly filling in the work that had been done.

18. With regard to the piles, considerable difficulty was experienced in procuring them and also in putting them down. Mr. Norfor, then in charge of the district, finally gave the work to Narrainsawmy Naidu, an Overseer in the district, who had sent his papers in for pension, and was and is now waiting orders regarding them.

19. The rates for the work were, I must remark, very high indeed, no less than Rupees 12½ for a 15 feet pile, and Rupees 10 for a 10 feet one completed with shoes

and straps, the charges for driving was Rupees 1-12-0; the Contractor has, I have no doubt, made considerably by the work; he of course declares that he only undertook the work at the request of Mr. Norfor and has lost by it.

20. I must, however, bring to notice that it was not until July that Mr. Norfor received orders to do this work; that he considered rightly so that it was necessary that it should be carried out at once; that there was a great deal of cholera about, and great difficulties in getting coolies. Mr. Garrett and the Local Fund Overseer under him were unable to get on with the work, and Mr. Norfor I believe had a very high opinion of Narrainsawmy Naidu, and considered him almost the only man in the district capable of carrying out the work quickly and satisfactorily at the time.

21. A sum of Rupees 676-7-10 has been expended on three groynes which were put up at Major Smith's suggestion, they have acted well and have already improved the river bed.

22. Rupees 4,448-14-2 has been spent on the preparation of bricks and chunam. I regret to say that the cost of the bricks prepared departmentally has been very great; they are not first-class and have cost more than Rupees 8 a thousand. With regard to the chunam, I much fear there will, when it is measured out, prove not the full quantity paid for.

23. It is necessary that it should be decided soon what is to be done with regard to this bridge, which in November last was considered so unsafe that it was closed for traffic; it was re-opened in July on Major Smith's recommendation, but in September I found it again closed. I had it re-opened and it has been so ever since.

24. Both Mr. Sage and Major Smith considered that it is necessary to rebuild the five northern arches; I differ with them both and see no reason to do so at present; it may be necessary to do so eventually, but I think probably they will last for years. I know other arches with worse cracks that have stood for years.

25. These arches have gone through the last eight months great trials, and I am much surprised to find that the cracks (as far as I can ascertain) have not in any way increased and no new signs of weakness have appeared. Mr. Sage, to examine the foundations, lowered the water 5 feet and exposed 2 feet of the top of the wells. In April, and again in July, the water was again lowered to expose the foundations.

26. In August and September two rows of piles were driven at a distance of 18 feet from cutwaters 10 feet deep; this was sufficient to shake the bridge seriously and increase the cracks had it been in a really dangerous state.

27. I consider therefore that if the foundations are protected by retaining walls in front and rear with aprons that it will not be necessary to remove these arches.

28. I would point out I think it possible that hereafter we may have to rebuild these arches, but I consider it most probable that we shall not have to do so.

29. Should, however, the work some years hence have to be done it can be done then as cheaply as now, as the retaining walls proposed to be built will not in any way interfere with work; all that would have to be done being to remove a portion of the aprons and the floorings.

30. With regard to the retaining walls Mr. Sage, in December 1874, proposed them to be 5 feet solid on 9 feet wells. Major Smith, in July, proposed the retaining

*Proceedings of the Madras Government, Public Works Department,
2nd December 1875.*

walls should be 6 feet cylinders 20 feet deep. I suppose he intended the upper 5 feet (a depth at which water can be kept down at for a moderate cost) to be solid masonry.

31. I must remark that I am not aware of a single anicut, bridge, or other river work in Southern India (except exceptional rail-road bridges), which have retaining walls 20 feet deep, and I cannot consider it necessary to go to this expense or advisable to do so.

32. Many of our old works in Southern India have foundations that are now considered of less depth than advisable, most of them were designed to be 3 feet solid on 6 feet wells, and although it is notorious that the foundations in many cases (I may say in most of the old works) are less than this, yet the works when properly looked after have stood successfully, and this in many places where rough stone is not procurable.

33. I would propose that the retaining walls should be 5 feet solid resting on square wells 6 feet deep, that they should have a protection of a rough stone apron (laterite of a fair description is procurable at a cost of Rupees 1-2-0 per cubic yard) 4 yards in width and 2 feet thick.

34. We have now, 18 feet beyond the present flooring, two rows of piles 10 feet deep, the new retaining wall must be placed beyond, and I would propose it should be 8 feet distant from them.

35. I enclose a section of what I propose, and if this is carried out I myself have no fear of the safety of bridge provided the apron is kept in fair order and the river kept from forming lateral currents; and this it is necessary should be done in any case no matter what depth the retaining walls are taken to.

36. In the above I have not entered on the question as regards what is to be done should the Pooniar river be embanked, and for this it is necessary to increase the waterway of the bridge. I think that this question may be left for the present, as it will probably be some time before it is settled, and it does not for the present affect the necessity of securing the safety of the present bridge which must be done in any case.

37. Should more waterway be required hereafter, the present bridge must be lengthened.

38. I request early orders as regards this bridge, in order that the plans and estimates may be prepared and sanction obtained for the work, so that it may be commenced in January should the river permit it.

39. With regard to the work done there has been no formal sanction, but I intend laying it before the Local Fund Board for sanction, and it will then go through the ordinary course.

No. 21. ORDER THEREON, 2nd December 1875, No. 3,423.

CIVIL WORKS, No. 4.

His Excellency the Governor in Council is glad to accept the opinion expressed by Major Mead that the reconstruction of the five northern arches of the Pooniar bridge at Cuddalore need not, for the present

*Proceedings of the Madras Government, Public Works Department,
2nd December 1875.*

at least, be undertaken, and he requests that officer to submit his detailed plans and estimates of the protective works which he proposes, for sanction in the usual course; acting on his proposals emergently meanwhile, if necessary. The question of eventual increase of waterway will be left for after-consideration.

(True Extract.)

(Signed) G. W. WALKER, Major-General, R.E.,
Secretary to Government.

(True Copy)

G. W. Walker Major General. R.E.
Secretary to Government P. W. Dep.

To the District Engineer, South Arcot.
Financial Department.

2

18th Dec

24th Dec

Financial Department
 Govt. of 1875 Madras.
 PUBLIC WORKS.

To

THE DISTRICT ENGINEER,
 SOUTH ARCOT.

Dated December 2nd.

Issued

Recd. *[Signature]* Encl.

G. O., 2nd December 1875, No. 3,423.

DECEMBER.

Nos. 20 21

N^o 2892

Protective works to the Pooniar bridge at
 Munjacoopum, South Arcot District.—The
 District Engineer to submit for sanction the
 detailed plans and estimates for the — which
 he proposes.

Memo 18 Dec 75 - 2466
Commit to the Govt. of

S. B. [Signature]
To the Com. of S. Arcot 24th Dec 75

Car 17.2.77

*At a meeting of the Local Fund Board
 Cuddalore Circle held at Trichalore on
 the 15th May 1876.*

Present

J. H. Gaustin Esquire President
M. R. R. C. Sri Baliah Avargal
Deputy Collector on General Duties.
P. Venketrameswar Avargal, Deputy
Inspector of Schools
Potti Naik Avargal

*Read letter No 28 dated 24th April 1876
 from the District Engineer forwarding
 a list of works that remained incomplete
 at the end of the official year 1875/76
 and for which allotments have to
 be made during the current year.*

*With regard to the Pooniar Bridge
 the District Engineer has submitted
 with his letter of the 9th May 1876 hold
 the statement called for by the Local
 Fund Board in their Resolution
 No 6 of the 12th April last which shows
 the sum actually required this year
 to complete the work upto the 6th Arch*

of the Bridge from the northern bank of the river. This sum the District Engineer makes out to be 4950 Rupees and deducting from it the allotment in the current year's Budget (Rs 3150) he only asks for a sum of Rs. 1800 as a supplemental allotment. His figures are given below.

Probable cost of the work to 6 northern arches —	Rupees 9871
Add amount spent last year in temporary protective work —	13100
	22971
Deduct expenditure upto last year —	18021
Balance required for 1876/77 —	4950
Deduct amount entered in the Budget of 1876-77 —	3150
Supplemental amount required for 1876-77 —	1800

The Board however observe that although they have made one or more allotments for this work from time to time none of them have ever been sanctioned by the Revenue Board or Government and that

Consequently those allotments have become null and void and the total amount necessary to be now allotted by them to adjust all the past expenditure up to the end of 1875-76 and to finish the work up to the 6th arch is Rs 18021 + 9871 or 27892 in all; from which deducting 3150 Rs. allotted in the current year's Budget, a sum of Rs 24742 is required to be supplementally allotted by them. If Government however pay half the cost of the work then $\frac{27892}{2} = 13946$ Rs is all the Local Fund Board need think about and deducting from this sum the above allotment of Rs 3150 entered in this year's Budget there remains 10796 Rs to be allotted now. At their last meeting they resolved to allot Rs 8100. This allotment was made from General Funds and has therefore been disallowed by the Revenue Board. The Local

fund Board therefore now allots
10796 Rs. If Government however
decline to assist the Local
Fund Board this allotment must
be increased to Rs 10796 + 13946
= 24742 Rupees.

(Signed) L. N. G. S. S.
President of the
(True & Exact)

No 41 District Engineer's office
Cuttack 7th May 1876

From
The District Engineer
South Arc

To
The President L. N. G. S. S.
South Arc

Sir

Enc: 1
Statement

With reference to your order
No 232 of 24th April 1876 on the
proceedings of the Cuddalore Board of the
12th idem regarding the protective work
proposed to the Pannar Bridge I have
the honor to forward as requested therein
a statement showing the allotment
actually required this year for com-
pleting the protective works to the
6th Northern Arches.

2. I take also the opportunity
of bringing to your notice with reference
to your letter No 267 of 4th Instant that

Statement showing the outlay incurred up to last year on the Protective Works to the Pennine Bridge and the actual alterations required in 1876-77 to finish the viaduct (the protective works) to the 6 northern arches of the Bridge

Probable cost of the work to 6 northern arches ———	9871
As amount spent last year in finishing protective works &c &c	13160
	22971
Required Repairs &c up to last year ———	18021
Balance required for 1876-77 ———	4950
Amount provided for in Budget of 1876-77 ———	3150
Supplemental amount required for 1876-77 ———	1800

Westhick Engineer of the S. & B. Ry.
 London 9th May 1876 —

I enclose
 (true copy) Westhick Engineer

W. H. Allen

President of the S. & B. Ry.

558/7777

the outlay incurred on the bridge work during the past year has been passed only conditionally by the Engineer of P. & W. Accounts in the absence of appropriation of funds; it is necessary that this expenditure should be finally adjusted without delay. It is however hoped that this matter will be settled by Government when they pass orders on the estimate for the work.

I have &c
 (Signed) H. R. Meade Esq. R.E.
 Chief Engineer

(True copy)
 H. R. Meade
 President of S. & B.

W. H. Allen

R

PROCEEDINGS OF THE BOARD OF REVENUE.

Dated 17 June 1876.

Read the following

From

J. H. Garton Esquire.
President S. H. South Arcot District

To

C. A. Garton Esquire.
Secretary to the Board of Revenue
Madras.

With reference to the Proceedings
of the Board of Revenue, dated 1st
ultimo, submitting to Government,
with remarks, the estimates of
the Protective Works to the Ponnar
Bridge at Minjankuppam, I
have the honor to enclose copies
of the District Engineer's letter
No. 41, dated 9 ultimo and of its
enclosures along with an extract
from Resolutions No. 1 of the Pro.
Cmty.

...ceedings of the Cuddalore Local
Fund Board dated 15th Idem
showing the actual amount re-
quired to be allotted this year
for the above work...

2. It will be seen from the
Resolution that a total sum
of 27892 Rs is required to be
allotted to adjust all expenditure
upto date and to provide for the cost
of completing the repairs to the
northern arches of the Bridge. If
Government however agree to pay
half the cost then the Local Fund
Board will only need to allot 13946 of
which 3150 Rs is already provided
in the Budget leaving a further
sum of 10796 Rs to be allotted now.

3. The actual Road Fund Balance

on the 1st of April 1876 according to
the monthly return for March last
was ^{ruined} 17,744-2-0 Rs.

Local Fund Office
Cuddalore
6 June 1876

I have
J. J. Harston
President L.F.B.

* Referred
to Chgo.
1020 705
6-5-76

Submitted for the orders of
Government in continuation of the B^{rs}
Proceedings dated 12th April & 1st May 1876
1010 and 1143.

2 It is observed that the
Road Fund of the Cuddalore Circle
closed with a deficit of Rs 17744- on
the 1st April 1876.

True copy & extract

Acting Secretary
The Chief Secretary to Government
Financial Department
with 3 enclosures
to be returned

Adm. Locker
C.F.

No. 52.

Memorandum

Letter from the District Engineer,
South Coast No. 19 of 16th Dec. 1874.

This letter has only just
reached the Chief Engineer Public
Works Department from the Office
of the Chief Engineer for Irrigation,
to which it appears to have been
forwarded by mistake.

2. Colonel Walker is quite
unable to recommend for a deep-
-draw so large an estimate as
No 33000 avowedly prepared after
a very imperfect examination of
the Bridge to which it refers, and
of which the only information given
is a section of the various supports
which the District Engineer is
not sure. The protective measures
recommended would no doubt
be useful, but are they the best
to be adopted with reference to the
real necessities of the work,
and would not something much
less costly answer the purpose?
On what grounds are the depths
of the retaining walls and breadth
of aprons fixed? What is the
nature

1874
Minister of Defense
(General D. H. H. H.)
PROCEEDINGS OF THE BOARD OF
REVENUE.

Dec 1 1874

Dated
Dec 17 1874
SUBJECT
No. 19 of 16th Dec. 1874

Mr. Chief Engineer
Public Works
South Coast
No. 19 of 16th Dec. 1874
A. L. L.

Letter from the District Engineer,
South Coast No. 19 of 16th Dec. 1874
to which it appears to have been
forwarded by mistake.

On what grounds are the depths
of the retaining walls and breadth
of aprons fixed? What is the
nature

nature of the River bed: and
is it not possible to take an accu-
rate section of it, showing at
what depths the good foundations
may be found.

3. The responsibility for devising
the best remedy for the present
state of the bridge, must rest
with the District Engineer on the
spot; and he must be prepared
to act immediately if necessary.
But the Chief Engineer, at a distance
from the work, and having no
personal knowledge of it, must
decline sharing that responsibil-
ity, by giving an opinion with-
out the full information being
laid before him, as to the state
of each arch, Pier foundation
and floor between Piers.

4. So far as he can judge it seems
to Colonel Walker that the arches
on each side of the 3rd Pier from
the north must come down;
if so, the first thing to be done is
to support the arches in centres
before taking down the dangerous
ones. Then to rebuild them as
soon as possible, with a new
pier

20
pier, laid to such a depth, and
with such flooring and aprons,
as may be found advisable. The
weak points of the structure
having thus been first attended
to precautions against future possi-
ble damage may be planned
and carried out more at leisure.

5. So many of the old Indian
Bridges with comparatively
shallow foundations laid in
sand, have stood for so many
years, that the Chief Engineer can-
not but think their sudden ul-
timate failure to be possible, attri-
butable to want of attention to the
River beds. Such for instance as
that which has to be raised on
the bed of the Godavary above and
below the Anicut at Dow Cacheram,
owing to a slight failure in
which, that work was badly
nearly being seriously
damaged. Lots of current
allowed to continue through
particular arches unwatched,
are not at all unlikely to
cause accidents like that
under

under note. - Prevention is
such case is more rational
to try than cure.

Signed G. W. Walker Col. Reg.
Chief Surg. to 1st W.

Fort St George.
15th Jan'y 1875

To the Dist. Surg.
South Africa.

In File 1417
76.

Ar 17.2.77

in my case No 8 of 26th November
1875

Financial (1876) DEPARTMENT.
(Local Funds. Roads)

From

The Chief Engineer
Pur: Works Dept

No. 773

Dated

Received

6th 8th May/76.
6 ends

No. 1068

Remarks on
the estimate &
plan for the pro-
tective works to
the Ponnian Bridge
at Manjacooppam.

226.5

Ar 17.2.77

N. 314.

District Engineer's office
Cuddalore
3rd March 1876.

From The District Engineer
South Arcot

To The President of the Local
Fund Board, Cuddalore Circle.

Sir,

I have the honor to forward
a plan, estimate &c for the pro-
-tective works to the Ponnian bridge
work amounting to Rs. 44,200;
this includes the expenditure in-
-curred last year on the temporary
protective works - Rs. 11057-4-4, and
also Rs. 2042-15-8 being the esti-
-mated loss in the Brick field
and in Chinnam.

2. With reference to the 1st
item I have reported fully on
it in my letter No 188 dated 25th
November 1875 published in G.O.
No 3423 dated 2nd December 1875,
a copy of which has been sent to
the Local Fund Board, and also
in my letter No 308 of 26th November
1875.

1076, to you; it is therefore unnecessary for me here to remark on it.

3. With regard to the loss of PP-2042-15-8, the estimated loss in the Brickfield & in Chumam, in para 22 of the above letter the matter was reported. I regret to say that the loss has been greater than anticipated as the outturn from the Rihua has been less than anticipated, and the loss in lime will be about 250 Rs owing chiefly to the time it has been kept; it was prepared for last year's work.

4. The works proposed for the permanent protection of the bridge are retaining walls above & below the Bridge 5 feet in depth resting on square bells sunk 6 ft; these retaining walls to be connected with the bridge's ^{existing} retaining walls by an apron of 1 ft thick resting on

a bed of concrete 1 ft in thickness. These new retaining walls to be protected by a rough stone apron 12 ft wide & 2 ft thick.

5. The estimate is I consider a liberal one, but I must warn the Board that river work is always carried on at a risk and therefore it is possible that owing to untimely floods in the river more sanction may be required.

6. The proposed work was approved of by Government in their order B-3423 dated 20 December 1975, and I trust will not only secure the uncracked arches of this Bridge but also save all necessity for the renewal of the 5 northern arches.

7. I hope that the estimate will have the approval of the Local Fund Board and I regret much that the plans & estimates have not been prepared; the Chief reason

reason of delay was the difficulty in estimating the probable loss in the old Brickfield ~~see~~ as this could not be done until the kilns were opened out.

8. I would propose that this season only the 8 northern arches should be protected the remainder to be done next season; for this an allotment of Rs 10500 will be necessary this official year 1875-76, and if possible Rs 16000 should be allotted in 1876-77, the remainder Rs 9700 in 1877-78.

I have read
(Signed) H. R. Mead, Major R.E.
District Engineer
(True copy)

H. C. Austin
President L.F.B.

Jul 2nd 1876

1000/1020

10

34
At a meeting of the Local Fund Board
Cuddalore Circle held at Cuddalore on the
12th April 1876.

Present

J. H. Gresham Esquire President
M.R. P. Varadachariar A.M. Deputy
Collector in charge of Treasury, Vuk
Majors H. R. Mead R.E. District Engineer
C. Robertson Esq. M.D. Zillah Surgeon
The Deputy Inspector of Schools
The Landholder of Cuddalore.
M.R. C. Ramasami Pillai A.L.
Lakshmana Reddiar A.L.
Veneata Subba Reddiar A.L.

Read letter from the District Engineer of 3rd March 1876 No. 314 forwarding a plan & estimate amounting to Rs. 44200 for the protective works to the Ponnai bridge at Manjakkuppam.

6. The Board resolve to adopt the District Engineer's plan & estimate for protecting the bridge throughout its entire length on both sides. At the same

same time they consider that on the grounds that the present estimated expenditure is very much in excess of what it would have been if the Local Fund Board had at their disposal an officer whose proposals would have commanded the immediate approval of Government and that the great delay caused by the appointment of several successive officers to report on the bridge has greatly increased the actual outlay which will have to be met the Government may fairly be asked to allot a sum from Provincial funds equal to half the total of the present estimate.

The Board learn from the District Engineer that the total allotment probably necessary during the current year to finish the protective works

works up to the 6" arch of the bridge, & to adjust all expenditure hitherto incurred will be about Rs. 22500. They therefore request that officers to submit to them as soon as possible a statement of the actual allotment required, & they meanwhile resolve to allot half the above amount or Rs. 11250. The Board observe that there is a sum of 3150 Rs. entered in the current year's Budget for the bridge repairs, this sum deducted from the above allotment leaves a balance of 8100 which will be the sum to be allotted from General Fund Balance (No Road Funds being available) to meet the above expenditure, if the Government as the Board anticipate, agree to pay one half the cost of the protective works. This sum is allotted accordingly subject to the approval of Government & to revision on

to the submission of the statement called for from the District Engineer.

(Signed) J. H. Garstin
President D & B

(Two copies)

Algarin
President D & B

July 11/10

July 11/10

Specification for the proposed protective works to the Poniar Bridge near Cuddalore.

- Description
1. Amount of Estimate Rs. 4200-0-0
 2. The protective works to consist of masonry retaining walls in front and rear of the Bridge, these walls to be 5 ft deep 2 ft in width at the top with an outside batter of 1 ft or 3 ft wide at the bottom resting on square wells $4\frac{1}{2} \times 3$ ft inside sunk 6 ft deep protected above and below by a Rough stone apron 12 ft wide and 2 ft thick.

These retaining walls to be connected to the old Bridge's retaining walls by an apron 2 ft thick resting on 9" of concrete.

Above and below the 5 Northern arches that had last year pile and rough stone put down above and below them the outer edge of the new retaining walls to be 28 ft from the old retaining walls for the remainder of the arches they are to be 18 ft distant as shown in the plan.

- Materials.
3. Bricks The bricks that were last year prepared for this work to be used and new Bricks to be made in the old Brickfield, to be ordinary

bricks moulded on the ground $9" \times 4\frac{1}{2}" \times 2\frac{1}{4}"$ to be of fair shape well burnt and not more than 10 per cent of half Bricks to be used.

Lime to be used from Oddempalgen Runkel lime only to be used and all of it except that prepared last year to be slaked on the work.

Sand to be taken from the river bed care to be taken that it is large grained and sharp.

Soorkree to be made of any refuse brick available but only pieces well burnt to be used, it is pounded finely.

Mortar to be composed for the walls retaining wall and apron of 1 of lime 1 of sand and 1 of Soorkree well mixed and pounded.

For the upper work spandrels and parapets it is to be made of 1 of lime and 2 of sand.

Concrete to be made of 1 lime 1 sand 1 of Soorkree and 6 of broken laterite stone from Mount Loaffer from 1 to $1\frac{1}{2}$ inches cube, to be mixed dry with only as much water as will keep the lime moist when laid under water to be carefully lowered at the bottom in a bucket or basket and rammed.

Rough stone The old stone put down last year to be taken up and made use of as far as it will go, the rest of the stone required to be brought from Mount Loaffer only large sized stone to be used no stone less than $\frac{3}{4}$ of a cubic ft to be used. It is ^{to be} carefully packed and the interstices carefully filled with chips and rammed in.

Walls to be built on country wood with rings 2" in thickness at the corners halved and secured with $4 - \frac{3}{8}$ iron bolts, they are to be square inside $4\frac{1}{2} \times 3$ or $3\frac{1}{2} \times 3$ as is found easiest to sink they are to be built 1 brick in thickness properly bonded left at least 8 days for the mortar to set being watered daily and then sunk 9 ft through the sand when being sunk the last 3 ft a temporary top of Brick in mud 3 ft high to be built. The walls to be filled with concrete.

Masonry retaining walls to be built as described on the walls water to be kept down for at least 24 hours after the latter course is completed.

Flooring to be 1 ft thick of masonry (the upper 9" being 2 rows of Brick on edge) resting on the

of concrete work. The piles put down last year
are if practically at a small expense to be taken
out but if found to cost more than the material
(mango wood planks and iron shoes) to be removed
the upper 2 ft to be cut off and removed.
Cracks in the old Bridges to be all examined
those in the span-drills more than $\frac{1}{8}$ of an inch
in width to be cut out to a width of 1 ft and
built cut those less than $\frac{1}{8}$ of an inch in width
to be opened out with a chisel to a depth of $2\frac{1}{2}$
inches and width of $\frac{1}{2}$ inch and filled in
with plaster.

The cracks in the piers and arches to be only
opened out and plastered.

The parapets that have been removed
and temporarily rebuilt to be taken down and
rebuilt similarly to the old Bridge's parapets

District Engineer's office
Cuddalore 3rd March 1876

Md. Must. Major R. C.

District Engineer

H. G. A. B.
President L.A.B.

South Arcot District

In a letter for 314
of 3rd March 1876. from
the District Engineer Arcot
to the Presd. L. F. B. S. Arcot

Specification for the
proposed protective works
to the Poniar Bridge
near Cuddalore.

July 1876

Amount of Estimate Rs. 44200

L. F. B. S. 1020
26.

South Arcot District Local Funds Local Funds Communications Revenue works

Estimate of 1875-76.

Work. — Constructing Protective Works to the
Bridge across the Poniar River near Cuddalore.

Contents. Particulars Rate per Amount Total

Work done in temporary repairs
in 1875 as reported in letter No 168 of
the 25 November 1875 recorded in
G. O. No 3423 dated 2nd December 1875.

Particulars

Temporary Quads.	...	832 46
Draining water	...	1126 56
128 cubic yards of rubble wall	361 cys	431 10 9
Levelling and removing	...	338 33
Levelling and removing sand	...	310 41
778 cubic yards of Rough stone	...	943 13 10
3 Croyne 13 yds each	225 7 11	676 7 10
540 Running feet of piles	10 3 1/2	552 4 3 9
7 1/4 1/2 yds of parapet walls	14 1/2 cys	141 5 9
Sundries	...	408 7 10
Superintendent	...	323 13 3

11057 4

Add for loss in Brickfield
Lime 1/2

242 15 8

13 10

Work now to be done.

67639 cubic feet of Brick in Chumam — 23 cfs 9511 11 9

Carried over — 9511 11 9 13 10

	Brought forward	9511	11	9	13100	
10464	Cubic foot of Concrete work	16	off	3793	8	
1525	Cubic yards of Rough Stone work	1	7	off	2192	3
2400	do of do	5	do	125		
336	Square Walls of $4\frac{1}{2}' \times 3'$ inside built with brick in hydraulic mortar and filled with Concrete	28	4	est	9435	8
2349	Cubic feet of Brick in Chumam for reconstructing. Repair walls including plastering	3	off	140	7	
	Repairing the cracks in the Bridge			250		
	Excavation			500		
	Draining water			2500		
				28248	5	9
	Surveys & Superintendence	10		est	2851	10
				3	31100	
	<u>Total amount of Estimates Rupees</u>				44200	

District Engineer's Office
 Lanthuabrah
 Subdalone
 3rd March 1876

J. M. Mun. Major, R.E.
 District Engineer

A. G. Hunter
 President D.F.B.

Revenue Department.

Proceedings of the Board of Revenue
Dated 1st May 1876.

Read the following
No 25.
From J. B. Goshin Esquire.

President. L. & Co. Boards
South West.
S. L. A. Galtton Esquire
Secretary to the
Board of Revenue.

Sir, In continuation of my letter dated 11
December last, No 110, I have the honor to forward
herewith a plan and estimate amounting to
Rs 4,200 for protecting the Ponnaiar Bridge
at Mangacooppam throughout its entire
length on both sides together with copies
of the District Engineer's letter dated 3rd
March 1876, No 314, and of the resolution
of the Cuddalore Local Board thereon,
and to request that the sanction of Govern-
ment of Government may be obtained for
the same.

Sanct. Board District

No 1000

Cuddalore & Pong.

Local Fund

Communications

San Works

Madras Cuddalore

1875-76.

In a letter No 314 of 3rd
March 1876 from the Dist.
Engineer to the P. & C.
L. & Co. Board.

Works. Sanctioning

Protecting works to the
Bridge across the Ponnai
River near Cuddalore

J. B. Goshin Esquire

Amount of Cuddalore Rs 4,200

1. 7. 1876

2. It will be seen from the resolution that in adopting this estimate, the Local Fund Board for the reasons stated therein, consider that the Government may fairly be asked to pay from Provincial Funds half the cost of this work, and I trust that the Board of Revenue will recommend their application for the favorable consideration of Government.

I have the
Local Fund Office,
Camp-Merkanam.
24 April 1876 } Signed J. H. Garstin
President L. F. Boards

The Plan and Estimate amounting to Rs 44,200, for the Protection Works to the Ponnar bridge at Maupaeuppan throughout its entire length on both sides, are submitted for the sanction of Government after reference to the Chief Engineer.

2. The estimate is made up of the following items

items.

1. Expenditure already incurred on Rs. A. P.
temporary repairs ————— 11057-11-4
2. Loss in Brickfield, since Rs — 2042-15-8
3. Work now to be done ————— 3100-4-0
44,200-0-0

The Local Fund Board repeat their request that half the cost of the work as now estimated may be met from Provincial funds. In the concluding part of para 2 of their Proceedings dated 12 April 1876, to 1010, the Board of Revenue have already expressed the opinion that the proposal is fair.

3. The Board do not approve the Circle Boards allotment of Rs 8100 for the work from the General Fund balance. They await the receipt of the Statement of the actual allotment required for the work called for from the District Engineer, but in the meanwhile, the balance of the Road Fund on the 1st April 1876, should be ascertained and reported.
(Enc Copy & Extracts)

W. H. Allen
Acting Secretary
The Chief Secretary to Government
with 5. The Board

Public Works Dept.

Endorsement in the Financial Dept.
N^o. 693 dated 27th April 1876, in Pro-
ceedings of the Board of Revenue N^o. 1010 dated
12th April 1876.

Proposed draft order ^{in the P.W.D.} on the above containing
remarks by the Honble R. T. Ellis C.B.

Memorandum by the Chief Engineer
P.W.D. N^o. 973 d/24th June/76, with the papers
connected therewith.

N^o. 188.

Transferred to the Financial
Department with the view to the whole
subject being dealt with in that Depart-
ment. Inconvenience being likely to arise
from the matter being under disposal in
two Departments at the same time.

Noted and
24th June 1876.

Comd. Major Genl. R.E.
Secretary to Govt. P.W.D.

To the Chief Secretary to Govt.

The Secretary to Govt.
Proceedings of the
Board of Revenue

Referred to
Capt. 3. May 1876
N^o. 1020

Submitting for the sanction
of Government of the Board

The President of the Board

Sanctioned by the Board

44,000 for the Province

Works to the P.W.D. Board
at Bangalore 1876

1876 No. 7734 6th May 1876

Referring

Memorandum by the Chief Eng. P.W.D.

Noted and
24th June 1876

By the Chief Engineer with 5 sheets
4th May 1876

C No
7310

Tranquil 1876 light
(S. 7. - 1878)

From the Secretary of the
P. H. &

1878

Noted 24th 3rd from 1876.

Reas 24

1878

Therefore all
the papers connected
with the production
works to the power
works at Niagara-
columbia -

P.W.D.

21 SEP 76

*Enclosure in letter from
the Dist. Engr. South
Arcot to the Chief
Engr. S. P. No. 116
dated 18th Sept/76*

*List of Borings taken
in the Ponnai Bridge
near Cuddalore?*

No. 1,010.

PROCEEDINGS OF THE BOARD OF REVENUE, dated 12th April 1876.

Read the following letter from J. H. GARSTIN, Esq., President of the Local Fund Boards, South Arcot District, to H. E. STOKES, Esq., Acting Secretary to the Board of Revenue, dated Cuddalore, 11th December 1875, No. 110:—

In forwarding herewith two letters from the District Engineer as per margin, I have the honor to request the Board will move Government to place at the disposal of the Department of Public Works the sums of Rupees 16,350 and 5,000 or Rupees 21,350 in all.

2. The first sum is asked for to meet the expenses in connection with the temporary repairs to the Ponnai Bridge. In connection with these repairs, nearly 4,500 Rupees' worth of bricks and chunam seem to be in hand.

3. It is needless for me to comment on the work done. The present District Engineer, who differs from Major Smith and Mr. Sage as to what ought to have been done to the bridge, is of opinion that the work has been mismanaged. It is hardly any consolation to the Local Fund Board to know that this has been the case, and that the bill to be paid for such a result is 16,350 Rupees with the prospect of a very large additional outlay to be met in order to carry out the protective works which are required to save the bridge from being swept away.

4. The Chief Engineer in a letter to Captain Ross Thompson, quoted by the District Engineer in his letter of 9th April 1875, No. 11, threw on the Local Fund Board the burden of all the cost of repairing the bridge, and if this position is approved by Government then, unless some assistance is afforded to the Board by Government from Provincial Funds, the whole of the Road Fund balance at present available will not suffice to pay the present bill. I therefore trust the Revenue Board will support my application for assistance from Government. As

* Dated 30th April 1875, No. 28. pointed out by the Local Fund Board in the resolution,* of which a copy is enclosed, the bridge was handed over to them with foundations of three feet resting on five feet wells, and it is hard that the Local Funds of the district should be held responsible for the errors of construction, if such they are, of an Engineer not in any way responsible to the Local Fund Board. If Government allow half the amount, viz., 8,175 Rupees from Provincial Funds, the relief will be considerable.

5. The second application made by Major Mead is for a transfer of Rupees

† Approaches to Thondiar Bridge...	Rs. 1,200	5,000 from the allotments for certain works, which, acting on his advice, the Local Fund Board have cancelled†; Rupees 3,000 of the amount to a new road in course of construction from Brahmadesam to Parangani, and Rupees 2,000 to the Pondicherry-Merkanum Road, in addition to the 11,520 Rupees, which
Road to Railway station at Vilangambadi ...	1,600	
Additional arch to Giddangal Surplus Odai Bridge...	2,470	
Ponnai Causeway at Trikalore ...	4,020	
Total ...	9,290	

sum only, acting on Mr. Norfor's assurance that more could not be spent during the year, the Local Fund Board allotted for that road. The estimate for the Brahmesam Road is Rupees 9,050, but the Board were only able to allot 1,000 Rupees for it. The District Engineer is able to push on with it apparently and wants 3,000 more. To save time, I apply to the Board without waiting to lay the matter before the Local Fund Board, and request sanction for the transfers.

6. The existing balances on the 1st November of the Road and General Funds after taking credit for the four lapses above quoted were —

	RS.	A.	P.	RS.	A.	P.
Road Fund Balance	4,020	0	0			
Do. Reserve	7,756	0	0			
				11,776	0	0
General Fund Balance	10,327	5	6			
Do. Reserve	4,929	14	0			
				15,257	3	6
Total	27,033	3	6			

If Rupees 9,574 be transferred from General to Road Fund, the allotments asked for can be made and there will be a General Fund Balance of Rupees 5,683. If, however, the Government advance 8,175 Rupees from Provincial Funds, the transfer from General Funds which will be necessary will *pro tanto* be diminished.

7. As to the future expenditure on the bridge, the Local Fund Board must bear it all if it is so ordered by Government; but in that case, on the estimate being submitted to the Local Fund Board, it will, of course, be a matter for them to consider whether the bridge may not be rendered stable at too great a price for Local Funds to pay, and whether the old causeway should not be restored and the bridge left to take its chance. A great deal has been recently done to the causeway, and probably 10,000 Rupees more would put it into first-rate order throughout.

ENCLOSURES Nos. 1 and 2.—Copies of letters from District Engineer.

ENCLOSURE No. 3.—Statement.

ENCLOSURE No. 4.—Extract from Proceedings of the Local Fund Board

In the foregoing letter the President requests that Government may be moved to place at the disposal of the Public Works Department the sums of Rupees 16,350 and 5,000, or Rupees 21,350 in all, for the undermentioned works:—

	RS.
1. Repairing the Ponnar Bridge... ..	16,350
2. Constructing a road from Bramadesam to Parangani. In addition to the allotment of Rupees 1,000, Item No. 5 in the Supplemental Budget of 1875-76, sanctioned in G.O., Financial Department, dated 4th August 1875, No. 1,590	3,000
3. Constructing a road from Merkanum to Pondicherry. In addition to the allotment of Rupees 11,520, Item No. 6 in the Supplemental Budget of 1875-76, sanctioned in G.O., Financial Department, dated 4th August 1875, No. 1,590	2,000
Total ...	21,350

2. As regards the first work, the Local Fund Board, locking to its original faulty construction, the opinion of the present District Engineer that the repair work already executed has been mismanaged, and the paucity of funds under the Road Fund, desire that half the cost thereof may be allowed from Provincial Funds, the remaining half being met from Local Funds. This work appeared in Board's Proceedings, dated 21st June 1875, the list of incomplete works of 1874-75, No. 1,712.

but the Board disallowed it, pending the result of enquiries ordered in G.O., Public Works Department, dated 13th March 1875, No. 719-A, and the submission of an estimate. It appears from the District

Engineer's letter* to the President that the Government in their Order, dated

* Dated 26th November 1875, No. 308. 28th July 1875, No. 2,198 (not communicated to the Board), authorized some temporary protective works to be executed so as to ensure the safety of the bridge and to allow of the traffic passing over it. Nothing appears to have as yet been finally settled either as to the future treatment of the bridge or as to the source from which the cost of the work hitherto done and to be executed hereafter is to be met. Pending final orders of Government on this subject, the Board think it premature to make any allotment from Local Funds. The Circle Board's proposition to pay half the expenditure which has already been incurred, and to bear half the cost of the protective works to be constructed hereafter, appears fair.

3. As regards funds required for the second and third works, the Board sanction them from the savings in the allotments for the works mentioned in paragraph 5 of the President's letter. It is presumed that the concurrence of the Local Fund Board as regards the proposed transfers has been obtained.

(A true Copy and Extract.)

Acting Secretary.

To the Chief Secretary to Government, Financial Department,

with four enclosures, to be returned.

.. the President of the Local Fund Boards, South Arcot District.

.. the District Engineer, South Arcot.

.. the Examiner of Public Works Accounts.

Memorandum

The Chief Engineer has therefore the honour to call Major Meade's attention to the last sentence of para.

PROCEEDINGS, 12TH APRIL 1876, No. 1,010.

Encl. 4

A P R I L.

No. 1,010.

Hoas—from Brahmadesam to Parangani and from Merkanm to Pondicherry, in South Arcot District.—Sanctioning from certain savings funds required for the construction of, and submitting remarks with reference to President's application for an allotment for the repair of *Ponnair Bridge*.

N^o 454.

2 of his Memo. 8:52 of
15th January 1875; and
request that borrowings
may at once be made,
opposite French Pier,
in the proposed lines of
the retaining walls; to
show to what depth the
sandy strata, and give
some idea of the nature
of the river bed. In para.
12 of his letter recorded with
G.O. 11: 3423 of 2nd Dec 1875
Major Mead announced:
vested in the fact of some
time not having been ac-
crued to Mr. Tager's pro-
posals ~~of~~ ^{my} January 1875.
He will see now that he would
have done better had he
acted on the instructions
sent to his predecessors.
It is no use District Sur-
geon's sending in designs
based upon their general
idea of what is suitable.
The Govt. will not accept
any opinions but such
as appear to them to be
~~proper~~ ^{best}

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in careful inquiries and
accurate information.

G.M.H.
77.

Financial Department

No. 1056.

Official Memorandum

The Chief Secretary is directed by His Grace the Governor in Council to return to the Chief Engineer and Secretary Public Works Department all the papers received with his memorandum and Docket of 24 June 1876 relating to the Plover bridge protective works and to request that the information necessary to enable the

Chief

Chief Engineer to express a
decided opinion on the plan
and estimate and to re-
commend their adoption
may be obtained with as
little delay as possible
and the matter disposed
of so far in the Public
Works Department.

2. The question of the
contribution to be accepted
from the Local Fund Board
cannot be settled until
the

Sp. 210a.

the above preliminary question
has been decided.

/By order/

Ootacamund
7th July 1876

[Signature]
Chief Secretary

To
The Chief Engineer &
Secretary to Govt P.W.D.

G.A.

11/2/76

Memo: No. 975
 Memo by the Chief Secy. O. G. T. No. 867 of 12th June 1876.
 Endorsement in the Financial Dept. No. 943 of 23rd June in view of the
 Board of Revenue No. 5079 of 17th June 1876.
 The Chief Engineer has
 the honor, with reference
 to Official Memorandum
 from the Chief Secretary
 to Govt. No. 867 of 12th June
 to forward for the informa-
 tion of Govt. copy of two
 Memoirs to the Dist. Secy of
 Southern District No. 52 of 15th
 Jan'y 1875. From which
 it will be seen that it is
 not possible to want of notice
 taken in his report that
 the Plans of the Jenua
 District have been sub-
 mitted without such
 exact information as is
 necessary to enable him
 to decide precisely which
 is the proper depth to be

given to the returning Wall.
 Whether 5 ft of wall on
 9 ft walls, as proposed
 by Mr. Sage, 5 ft of wall
 on 6 ft walls as proposed
 by Major Mead, or 20 ft
 of wall and well together
 as proposed by Major J.
 Smith. After considerable
 discussion the matter was
 referred to the General Com-
 mittee with the recom-
 mendation of Mr. Major Mead
 and his proposal as
 they are set forth in
 paras 30 to 35 of the let-
 ter received with G.O.D.
 3423 of 2^d Dec 1875. It
 will be observed that in
 the last para of his Memo.

of January 1875. The Chief
 Engineer laid great stress
 on the regulation of the
 River bed above bridge,
 mentioning to which
 up to cause currents
 and sets of flood water
 which cause great dan-
 ger to bridge. Major
 Mead's depth of returning
 walls is based on the pre-
 sumption that credit
 taken in this respect;
 and the Chief Engineer
 agreed to his proposal
 as that understanding.
 With this explanation
 the Chief Engineer trusts
 he will be excused
 from the charge of not
 having done what he

could to put matters right
a right time with refer-
ence to this. The office
Sage was a good Executive
Officer, but not a good Dr.
trust. Suppose the Supp
Supt (fit & healthy) for
whose use he called, was
not an Officer, whose
opinion Major Genl Wal-
ker could place any
reliance on. Major St. John
Thompson had not long
before spent some weeks
with the Army Supt.
was investigating the
peculiarities of that very
service, and the best ad-
vice he could give the
Govt. was to send him
for the delay that causes.

Sp. 2100.

red, the Chief Engineer
is not responsible. He
went to England for three
months from May to
August; and the sub-
ject did not come be-
fore him again till
December.

Wm. Walker, Major Genl
Chief Eng. D.P. & C.

24th
29th June 1876

No. 210a.

Memorandum.

The Chief Engineer has the honor to submit the results of the further references made by him on receipt of Memorandum in the Financial Department No. 1056 of 7th July. From the three letters from the District Engineer South Arcot replying to his Memo No. 1046 of that date it will be seen that but little more positive information regarding the River Bed at the Ponnar Bridge, Cuddalore, has been, or is

Cr 17.2.77

L. F. M. 1417
76.

likely to be obtained. Under
the circumstances reported,
all he can do is to repeat his
agreement with Major Meade,
as the opinion is expressed in
Kinas 31 to 35 of his letter
recorded with G.O. No. 3423 of
2nd December 1875; and to re-
commend that the estimate
of Rs. 44,200, which includes all
outlay hitherto incurred and
temporary repairs, shall be
sanctioned.

Another Major Genl. R.C.
Chief Engineer P.W.D.

31-1-77

Dec 17.2.77

No. 773

Memorandum -

Proceedings of the Board of Revenue
No. - dated 1st May 1876, thro'
Financial Department.

The Chief Engineer observes that
the three proposals for protective works
to the Ponnar Bridge at Cuddalore
made by the late Mr. Sage, by Major
C. J. Smith R.E. and by the present
District Engineer of South Arcot, differ
in detail only, not in principle. They
consist of floors or aprons under the
arches, and above and below them
to a greater or less extent, guarded
by retaining walls on well foundations.
It is in the depths of these retaining
walls that the proposals chiefly vary,
viz from 11 to 14 and 20 feet.

3. In the absence of any infor-
mation as to the nature of the bed of the
river

river, the Chief Engineer sees no reason why Major Mead's design should not be sufficient to secure the objects in view, viz to obviate further damage to the injured portion of the Bridge, and to save the sound portion from any damage. But it would have been more satisfactory had borings been taken and sections of the River bed above and below bridge given. The cracked arches had better be rebuilt when the waterway of the Bridge is increased by additional arches; which the Chief Engineer has little doubt will have to be done eventually.

3. Major Mead remarks in para 12 of his letter recorded with G.O. N^o 3423 of 2nd December 1875 that the injured portion of the Bridge might have been permanently protected for the same money that the temporary protection has cost. But the Chief

Engineer

Engineer could not deal with the first proposals made in the letter N^o 197 of 16th December 1874 which gave no information. The only previous report was the Range Officer's, under date 6th November 1874, recorded with G.O. N^o 190 of 23rd January 1875. And still so meagre was that of 12th February 1875, that all the action Government could take was to detail an Officer to advise the District Engineer what to do. (see G.O. N^o 719 of 13th March 1875) The Local Fund Board appear to have kept aloof from the subject as long as they could, in hopes, probably, of the work being carried out with Provincial Funds, without reference to them. Clear and definite local action has manifestly been

wanting

wanting throughout.

Major Genl. R.E.
Chief Engineer P.W.D.
Ostacammund
6 May 1876

To The Chief Secretary to Government
with enclosures.

4th Oct 7.2.77

From Secy to Govt. 11/10/76

D. P. W.
SOUTH ARCOT.

11/10/76

DISTRICT ENGINEER'S OFFICE.
No. 116
Camp
Dated 18th Sept 1876
The District Engineer,
South Arcot.

To The Chief Engineer,
D.P.W.

Enclosures.

1 Set of boring
taken

Sir,
I have the honor to report
with reference to your Memo of
1046 dated 7th July and No 1226 of 11th Aug 76
that I was unable to borrow a
boring apparatus from the Railway
Company; they had only one in the
District and that was in use, also
that they had no tubing, that
used some few years ago for the boring
taken in the river could not be
found and no one knew where it
had gone to.

2 I received from Tanjore on the
13th August a set of boring apparatus,
but as I had to go into the District
and had no one to use it, I was
unable

unable to commence boring until the 29th August; the only thing I could get was a piece 8' 4" long lent to me by the Railway.

3. With this I commenced boring the shell auger of the boring apparatus however broke after 3 holes had been made; I managed to get it repaired, but it has again gone and this time it is too short and thin to allow it repair. I therefore am unable to make any more borings at present; owing to the bed of the river being almost entirely sand and my having a pipe only 8 1/2 ft long I regret that I was unable to bore any great depth as the hole could not be kept clear.

4. I enclose a list of the depths and the results and trust although so meagre it will be considered sufficient.

5. From the information obtained from the Railway Engineers, who are sinking wells in the Giddulam and Pooniar

Pooniar rivers, I do not think there is any chance of our finding any foundation except thin layers of clay and this very irregular at any reasonable depth. I have requested them to let me have sections of the soil passed through by their wells and on receipt I will forward it.

6. I will, as soon as I can, get a new shell auger made but as the Government Workshops are closed, there will be great delay.

I have the honor to be
Sir,

your most obedient servant,

M. M. M. Major R. E.

District Engineer

P.W.D.

21 SEP 76

No. 5307

SOUTH ARCOT D. P. W.

From

The District Engineer

South Arcot.

To

The

*Chief Engineer
at Pondicherry*

Dated

18.3.76

Despatched

19.3.76

Received

No. 116

Enclosure 1

*Referring to the
letter dated 18.3.76
made at the Pondicherry
Bridges near Kumbakonam,
Coimbatore, and also the
drawing that the
operation was being
done from the Pondicherry
Company.*

Ans 17.2.77

Dept. No. 21-8-76

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 19th Feb 1877.

Read the following

14 Dept
16 Dept

- 1st Dept* - (C. n. 693 27th April 1876)
- 2nd Dept* - (C. n. 773 6th May "
- 3rd Dept* - (C. n. 973 24th June "
- 4th Dept* - (C. n. 1056 7th July 1876)
- 5th Dept* - (C. n. 1046 do "
- 6th Dept* - (C. n. 1081 7th Aug "
- 7th Dept* - (C. n. 116 18th Sept "
- 8th Dept* - (C. n. 134 7th Oct "
- 9th Dept* - (C. n. 210 31st Jan 1877)

*Referring that nothing
will be done towards
the bridge ordered to be
made opposite to each
pair of the main bridge
and the details for work
of the bridge.*

Enclosure —

No. 81

From
SOUTH ARCOT D. P. W.
The District Engineer
South Arcot.
To
The Chief Engineer
at
Dated
Despatched
Received

Memo No 1226 of 14-8-76

Memo: No 1226 of 14th Aug 1876.

With reference to Major Hunt's
letter No 81 dated 7th Aug 1876 he is
requested to state whether he has
been unable to obtain assistance
from the Ry. Company in connection
with the bridge ordered to be made
at the Ponnai Bridge.

18/4.10.76.

Botlacam
S. Engineer S. Arcot.

As 17.2.77

Depd at 10-8-76

This is the
Governor in Council
sanctions the estimate
of Rs. 44200 for repairs
and protective work
to the Ponnai Bridge
at Cuddalore proposed
by the District Engineer
and approved by the
Chief Engineer
2. It will be con-

considered in the Financial
Department what con-
-tributions shall be
made by the local
Funds. Board towards
carrying out the work

W.F.

This sanction has
been registered as
Provincial No. 244 of 1876-77

Ar: 17.2.77

H. J. Great
S. P. W. L.
L. J. L.
Sept. 6-3-77

Director
Superintendent
of Public Works
of the
Government
of India
at
Bombay



of 1877 Madras.
PUBLIC WORKS.



2/27

Encl.

G. O., 19th July 1877, No. 554

Nos. 454-55

Minar Bridge at
Madurai. The estimate
to Rs 44,200 for repairs
of protective works to
— sanctioned
works.