M.R.O. 1—77,000—3-6-37.

(1) Number of pages 124

(2) Date of repair 1940

(3) Initials of the Referencer

MADRAS RECORD OFFICE.

Government of Madras.

Public Work DEPARTMENT.

G.O. No. 554 Press ~~Mis.~~ Original

Dated 19 2 1877.

Not to be folded or roughly handled

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

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.

No. 308, dated 26th November 1875, with one enclosure, No. 313, dated 4th December 1875.

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.

* Dated 30th April 1875, No. 28.

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 Brahmadesam 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

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

that more could not be spent during the year, the Local Fund Board allotted fo that road. The estimate for the Brahmadesam Road is Rupees 9,050, but the Boar were only able to allot 1,000 Rupees for it. The District Engineer is able to pus on with it apparently and wants Rupees 3,000 more. To save time, I apply to th Board without waiting to lay the matter before the Local Fund Board, and reque 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 fo 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 fron General Funds which will be necessary will *pro tanto* be diminished.

7. As to the future expenditure on the bridge, the Local Fund Board mu bear it all if it is so ordered by Government; but in that case, on the estimate bein submitted to the Local Fund Board, it will, of course, be a matter for them, consider whether the bridge may not be rendered stable at too great a price for Loc Funds to pay, and whether the old causeway should not be restored and the bridg left to take its chance. A great deal has been recently done to the causeway, an 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 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

2. As regards the first work, the Local Fund Board, looking to its original ulty construction, the opinion of the present District Engineer that the repair rk already executed has been mismanaged, and the paucity of funds under the nd Fund, desire that half the cost thereof may be allowed from Provincial nds, 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 sult of inquiries ordered in G.O., Public Works Department, dated 13th March 75, 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 th July 1875, No. 2,198 (not communicated to the Board), authorized some mporary protective works to be executed so as to ensure the safety of the bridge d to allow of the traffic passing over it. Nothing appears to have as yet been ally settled either as to the future treatment of the bridge or as to the source from ich the cost of the work hitherto done and to be executed hereafter is to be met. nding final orders of Government on this subject, the Board think it premature to ke any allotment from Local Funds. The Circle Board's proposition to pay half e expenditure which has already been incurred, and to bear half the cost of the otective works to be constructed hereafter, appears fair.

ard's Procs., dated 21st June 1875, No. 1,712.

* Dated 26th November 1875, No. 308.

3. As regards funds required for the second and third works, the Board sanc- n them from the savings in the allotments for the works mentioned in paragraph 5 the President's letter. It is presumed that the concurrence of the Local Fund ard 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.

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

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

454-C. Memorandum from the Financial Dept., dated 7th July 1876, No. 1,056.
454-D. Chief Engineer's Memorandum, „ 7th „ „ „ 1,046.

454-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 e the honor to inform you that I much regret that I have been unable as yet 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.

One list of borings taken.

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 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 8⅓ 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.

Two Tracings.

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

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

No. 266

4

District Engineer's Office
Camp Virdachallum
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 February 1875 I received charge of the District on the 3rd Instant, and as Mr Sage was not able to accompany me to inspect the Pooniar Bridge at Cuddalore I had with me Mr Assistant Engineer Garrett who had been deputed to supervise the opperations of the Examination of the foundations of the work on the north bank of the River.

2. At the time of my inspection the foundations under the 4 Northern Arches were exposed to view down to about 3 ft below top of walls and the flooring under one arch (the Northern shore Arch)

had

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

No 1 "Arch" very bad diagonal cracks extending right across the arch these cracks have increased considerably 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.

No 2. "Arch" No cracks apparent.

"Floor" cracked and sunk at West end of Piers i.e. up Stream side.

"Pier" Cracked on North face of West end, also on South face of East end on down Stream side.

No 3. "Arch" Three transverse cracks, one very bad extending, more than half across the arch.

"Pier" Sound

"Floor" Cracked right across & sunk very much at West ends of piers.

No 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 these 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 instructions 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 metal the road way

I

I am expecting an estimate for this and will submit the same for sanction when received. the work is one of necessity as much inconvenience is felt by detention of the Mail and also by the general public: the Causeway 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. Sage's instructions, Bricks Chunam & other materials for reconstructing damaged portions are under preparation. and a Buttress 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, I have therefore directed Mr. Garrett, 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

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 apparently a longitudinal scour along the upstream face of the work extending to within the limits of the damaged portion of the Bridge. A groyne above the Bridge erected some years ago was evidently overtopped and completely destroyed in the flood. The wells under the Piers are apparently of Brick in Chunam 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.

6.

6. Five or Six Groynes 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 preparation of materials.

I have &c.

(Signed) R. E. Norfor
Executive Engineer in charge of
Distt Engr's Office

(True Copy)

[signature] Major, R.E.
District Engineer

Public Works Department.

PROCEEDINGS of the MADRAS GOVERNMENT.

UNDER date the

READ the following:—

Pro: of the Board of Revenue thro' Financial Dept. } (H.E. No. 1010 d/ 12th April 1876)

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

The plans and Estimates which the District Engineer was instructed, in G.O. No. 3423 dated 2nd December 1875, to

Which we had better have these plans & especially the estimate settled before comm. with the Local Fund — We can then deal with the question of how the past & future expenditure is to be met. [initials]

to prepare, will be submitted direct to Govt. for approval and sanction.

G.M.W.

At a Meeting 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
Ag Dist Engr with reference
to the work of reconstruct-
-ing this Bridge.

P W 1875 Dept

C No. 1703

From
The Dist Engr South Arcot
To
The Secretary to Govt
PWD

No. 266

dated 11th March
Rec-13th " } 1875

Cracked state of
the Poonair Bridge.

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

10

(a) Heads of Service— Provincial

Fund. Ordinary

Class. Original Works

Main-head. (2) Communications

Sub-head. 1 Main Roads

~~Section.~~

Name of Work. Repairs & protective works
for the Poonair bridge at Cuddalore

Amount. Rs 44200

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

Print in the margin of G. O. No 554 d/19/2/77

At a meeting of the Local Fund Board, Cuddalore Circle, held at Cuddalore, on the 30th day of April 1875.

* * *

28. The following allotments are made and recommended -

Original works.

* * * * *

No 4 - Improving the Pounian Bridge - Rupees 15,000 -

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 Sage and Mr Lofan as set forth in the letter of the former Officer of the 12th February 1875 recorded in Proceedings of Government D.P.W. of the 18th 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 improved by the examination of the late District Engineer - They are

willing to allot one half of the funds now asked for and request Government 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 foundations of the rest of the bridge. The Revenue Board will be requested to allot 7500 Rupees for this work in anticipation of a regular estimate being submitted.

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

* * * *

J. H. Gant
President L. F. B.

Sent letter from the President of the Local Fund Board of South Arcot, Dated 11th December 1875, No. 110.

Engd. 11th 9 1875

L. F. B. 975/76

D.P.W.
South Arcot

No. 308.

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

From,
The District Engineer
South Arcot.

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

Sir,

I have the honor to forward the enclosed Statement showing the expenditure that has been incurred on the Pounia 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 preparation 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 Estimate to the Chief Engineer for Rs. 33000 which allowed for two new retaining walls and other protective works; this the Chief Engineer did not recommend to Government as more information was considered

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.

2. Major Smith considered that the 5 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 much 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 5 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. I regret much that I am unable to give any other opinion than that this work has been badly managed and I attribute it not a fit 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 ~~we~~ should be done and be=fore making out plans and esti=mates 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 northern arches for the present. My own belief is that if they are protected by a new retaining wall and floor=ing that most probably they will last for years. Should at some future time it be necessary to re=move 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 necess=ary say 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 pro=posed it to be 11 feet deep but pro=tected 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 water=way of the Bridge being increased which certainly will be necessary should as has been proposed the Pounian be embanked it is not likely that this question will be de=cided for some little time and when settled arrangements for in=creasing the waterway of the Bridge can be made (this I should think would be an Imperial charge) in the mean=time it is necessary to secure the present Bridge and arrange for the work being commenced in pro=per 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 mea=sures they consider best to be adopted towards the Bridge, and now 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 Pro=ceedings 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 deferred the question of whether Government 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 Para 2 of the Bd's Pro: of 21st June/75 No 1712.

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

True Copy.

J. H. Garth
President L.F.B.

Sua letter from the President of the Local Fund Board of South Arcot dated 11th December 1875, No 110.

Sub Mtg 9 Oct 75

L. F. Mtg 9/75

D.P.W.
South Arcot.

District Engineer's office
Camp Cuddalore
Dated 4th December 1875.

No 313.

From
The District Engineer
South Arcot.

To,
The President
Local Fund Boards
South Arcot.

Sir,

In their Proceedings of the 30th August and 29th October 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 Railway Station at Vellanganipandy and for an additional vent to the Bridge over the Giddangal Surplus channel.

2. Again in the current year's Budget a sum of Rupees 4020 has been allotted for a Causeway across the Pounnar at Irkalore 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 Brahmade=Sam to Parangani via Vanur and Rupees 2000 to the com=pletion of the road from Mer=kanam 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 Pounnar Bridge work as reported in my letter No. 308 dated 26th November 1875: there was I believe Rs. 13,488 balance when the Supplemental Budget was sent up and to this may be added the Rupees 9290 now cancelled making a total of Rupees 24,1778 from which however has to be deducted a few minor sanctions by the Local Fund Board.

I have &c.

(Signed) H. R. Mead, Major R.E.
District Engineer.

(True copy)

J. H. Gante
President F.B.

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

Description.	Quantity.	Cost. Rs.	as.	p.	Rate. Per	Rs.	as.	p.	
Temporary Bunds		832	4	6					
Baling water		1126	5	6					
Buttress wall	128 yards	431	10	9	yds	3	6	1	
Centring and removing		338	3	3					
Levelling and removing sand		310	4	1					
Rough Stone	778 yds	943	13	10					Note about 600 yds collected in hand
Groynes	3 of 13 yds each	676	7	10	each	225	7	11	
Piles	540 feet	5524	3	9	ft.	10	3	8	504 ft. of 10 ft. piling 36 do. 5 do.
Parapet wall	74¼ yds	141	5	9	Cyd	1	14	-	
Sundries		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 Engrs. Office,
South Arcot.
Cuddalore 26th Nov/75.

Signed/ H. R. Mead, Major R.E.
District Engineer

True Copy/

J H Gaustin
President L.F.B.

In a letter from the President of the Local Fund Boards of South Arcot, dated 11th December 1875, No. 10 -

Inv. 9/1875 9065/75

[illegible]

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.

1 Plan.
1 Abstract Estimate.

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.

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

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.)

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.

25th Mch 1875 No. 654

Communicated through the Bd of Revenue with the Madras Cuddalore Road Board

To the Board of Revenue

dated 25/3

To

CAPTAIN ROSS THOMPSON, R.E.

&c., &c., &c.

Dated March 13th.

Recd. No. 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 Poniar, near Cuddalore, South Arcot District.

Ar 17.2.77

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 :—

1 Statement of Expenditure.
1 Section.

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.

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 (mangoe-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

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.

18th Decr. 2444

Financial Department

Govt. of {1875} Madras.

PUBLIC WORKS.

To

THE DISTRICT ENGINEER,
SOUTH ARCOT.

Dated December 2nd.

Issued

Recd. [illegible] Encl.

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

DECEMBER.

Nos. 20 21

No 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.

Order 18 Dec 75 No 2444
Committed to the Colr. of S. Arcot [illegible]
To the Colr. of S. Arcot Desp. 18/1

Cer 17.2.77

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

Present

J. H. Garstin Esquire President
M. R. R. C. Sri Baliah Avergal
Deputy Collector on General Duties.
P. Venkatramier Avergal, Deputy Inspector of Schools
Potti Naik Avergal

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 No 41 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

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.

	Rupees
Probable cost of the work to 6 northern arches	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 upto the end of 1875-76 and to finish the work upto the 6 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 allot 10796 Rs. If Government however decline to assist the Local Fund Board this allotment must be increased to Rs 10796 + 13946 = 24742 Rupees.

× × ×

Signed) J. H. Garstin
President L.F.B.

(True Extract)

No. 41 District Engineer's office
Cuddalore 9th May 1876.

From

The District Engineer
South Arcot

To

The President L.F.B.
South Arcot

Sir

Enc. 1
1 Statement

With reference to your endorse=ment No. 232 of 24th April 1876 on the Pro=ceedings of the Cuddalore Circle of the 12th idem regarding the protective works proposed to the Pomnar Bridge I have the honor to forward as requested therein a statement shewing the allotment actually required this year for com=pleting the protective works to the 6 Northern Arches.

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

the

Statement shewing the outlay incurred up to last year on the Protective works to the Ponmar Bridge and the actual allotment required in 1876-77 to finish the same (the protective works) to the 6 northern arches of the Bridge

Probable cost of the work to 6 northern Arches	9871
Add amount spent last year in temporary protective works &c &c	13100
	22971
Deduct Expenditure up to last year	18021
Balance required for 1876-77	4950
Deduct amount provided for in Budget of 1876-77	3150
Supplemental amount required for 1876-77	1800

District Engineer's office S. Arch
Cuddalore 9th May 1876

(Signed) H. R. Meade Major R.E.
District Engineer

(True copy)
[illegible]
President L.F.B.

---

the outlay incurred on the bridge work during the past year has been passed only conditionally by the Examiner 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 Major R.E.
Dist. Engineer

(True copy)
[illegible]
President L.F.B.

Cuddalore 28th July 76

R

MISCELLANEOUS No. 5079 REVENUE DEPARTMENT.

PROCEEDINGS OF THE BOARD OF REVENUE.

Dated 17 June 1876.

Read the following

From J. H. Garstin Esquire
President L.F.B.d South Arcot District

To C. A. Gatton Esquire
Ag Secretary to the Board of Revenue
Madras.

Sir,

With reference to the Proceedings of the Board of Revenue dated 1st ultimo, submitting to Government, with remarks, the estimates &c for the Protective Works to the Poinnar Bridge at Mungakuppum, 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 Resolution No 1 of the Pro-

ceedings

ceedings of the Cuddalore Local Fund Board dated 15th Idem showing the actual amount required 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 6 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

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

Local Fund office
Cuddalore
6 June 1876

I have &c
(Sd) J H Garstin
President L F Bd.

Submitted for the orders of Government in continuation of the Bds Proceedings dated 12th April & 1st May 1876 Nos 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)

C C Cutler
Acting Secretary

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

* Referred to Chf Engr 1020 705 6-5-76

Nd Gw Locker
C.P.

No. 52.

Permanent Road

Letter from the Rt. Hon'ble Secretary of State dated 19th Feb. 1876

Minute of the Chief Engineer & Secretary to the Chief Commissioner, Public Works Department, Chief Commissioner, Chief Engineer, Secretary to the Chief Commissioner, Secretary to the Board of Revenue

1. Calcutta to Malda in extension of the Trunk Road

2. Calcutta to Pooranee and Kurdumnee Road

= Alone the Large and Kurdumnee Road

Mr. Bayard

A letter in reply to the Chief Commissioner, the Board of Revenue, the Chief Engineer, the Secretary to the Chief Commissioner, the Secretary to the Board of Revenue

Mr. Bayard

Mr. Bayard

Mr. Bayard

nature of the River bed: and is it not possible to take an accurate section of it, showing at what depths 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 emergently if necessary. But the Chief Engineer, at a distance from the work, and having no personal knowledge of it, must decline sharing that responsibility by giving an opinion without the fullest 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 on centres before taking down the dangerous ones - Then to rebuild these as soon as possible, with a new pier

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 possible 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 cannot but think their sudden ultimate failure to be possibly attributable to want of attention to the River beds - Such for instance as that which has to be bestowed on the bed of the Godavery above and below the Anicut at Dow Cashweram, owing to a slight failure in which, that work was lately nearly being seriously damaged - Sets of current allowed to continue through particular Arches unwatched, are not at all unlikely to cause accidents like that under

under note. Prevention in such cases is more satisfactory than cure.

(Signed) G. W. Walker Col. R.E.
Chief Engr to V.W.

Fort St George
15th Jany 75

To The Dist Engr.
South Arcot

Ar 17.2.77

[illegible] 1417
76

[illegible] 338 of 26th November 1875

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

From
The Chief Engineer
Pub: Works Dep

No. 773

Dated 6
Received 8 } May/76.

6 endt

No. 1068

Remarks on the estimate & plan for the Protective works to the Pounian Bridge at Manjacooppam.

c26.5

Ar 17.2.77

No. 314.

District Engineer's office
Cuddalore
3d 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 &ca for the protective works to the Pounian bridge work amounting to Rs. 44,200; this includes the expenditure incurred last year on the temporary protective works - Rs. 11057-0-4, and also Rs. 2042-15-8 being the estimated 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. 168 dated 25th November 1875 published in G.O. No. 3423 dated 2d 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

1876, to you; it is therefore unnecessary for me here to remark on it.

3. With regard to the loss of Rs. 2042-15-8, the estimated loss in the Brickfield & in Chunam, 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 Kilns 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 wells 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

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. This proposed work was approved of by Government in their order No. 3423 dated 20 December 1875, 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 &c 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 18500 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 &c

(Signed) H. R. Mead Major R.E.
District Engineer

(True copy)

J. H. Garstin
President L.F.B.

[illegible] 26/7/76

[illegible] 1020/76

[illegible]

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

Present

J. H. Garstin Esquire President &
M.R.R. P. Varadachariar Avergal Deputy Collector in charge of Treasury Vice Pres
Major H. R. Mead R.E. District Engineer
C. Robertson Esqre M.D. Zillah Surgeon
The Deputy Inspector of Schools
The Tahsildar of Cuddalore.
M.R.R. C. Ramasami Pillai Al
" Lakshmana Reddiar Al
" Vencata Subba Reddiar Al

x x x

Read letter from the District Engineer dy 3d March 1876 No. 314 forwarding a plan & estimate amounting to Rs 44200 for the Protective works to the Pomiar bridge at Manjakuppam.

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 in the first instance 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 office 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

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

x x x

(Signed) J. H. Garstin
President L F B

(True copy)

J H Garstin
President L F B.

Ind Gen No 2642/78

L Fd Sec 10 20 / 31

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

1. Amount of Estimate Rs. 44200-0-0

Description 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 shewn 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" × 4½ × 2¼ 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 Oddumpalyem Kunker 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.

Soorkee 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 Soorkee well mixed and pounded.

For the upper work spandrills 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 Soorkee and 6 of broken laterite stone from Mount Capper from 1 to 1½ 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 Capper only large sized stone to be used no stone less than ¾ of a cubic ft to be used. It is to be carefully packed and the interstices carefully filled with chips and rammed in.

Wells to be built on country wood wall rings 2" in thickness at the corners halved and secured with 4 – ⅜ iron bolts. they are to be square inside 4½ × 3' or 3½ × 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 height to be built. The walls to be filled with Concrete.

Masonry retaining walls to be built as described on the wells 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 practicably 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 Bridge to be all examined those in the spandrills more than 1/8 of an inch in width to be cut out to a width of 1 ft and built cut those less than 1/8 of an inch in width to be opened out with a chisel to a depth of 2 1/2 inches and width of 1/2 inch and filled in with plaster. Cracks.

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 Parapets.

District Engineer's office
Cuddalore 3rd March 1876

[signature] Major R.E.
District Engineer

[signature]
President L.A.B.

the Arcot District | Not Range | Cuddalore Taluq

Carried over ——— 95 11 11 9 13 100

South Arcot District

In a letter No 314 of 3d March 1876. from the Distt Engineer S. Arcot to the Presdt L.F. Bds S. Arcot

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

Inv G.M. No 2642/76

Amount of Estimate Rs. 44200

Inv Fol No 1020/76.

South Arcot District — Not Range — Cuddalore Taluq

Local Fund — Communication — New works.

Abstract 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 Bunds		832 4 6	
	Baling water		1126 5 6	
128	Cubic yards Buttress wall	3 6 1 cyd	431 10 9	
	Centring and removing		338 3 3	
	Levelling and removing sand		310 4 1	
778	Cubic yards of Rough stone		943 13 10	
3	Groynes 13 yds each	225 7 11 each	676 7 10	
540.	Running feet of piles	10 3 " R.ft	5524 3 9	
74¼	Cyds of Parapet walls	1 4 " cyd	141 5 9	
	Sundries		408 7 10	
	Superintendence		323 13 3	
			11057 " 4	
	Add for loss in Brickfield Lime &ca		2042 15 8	13100
	Work now to be done.			
67639	Cubic feet of Brick in Chunam	" 23 cft	9511 11 9	
	Carried over		9511 11 9	13100

	Brought forward				9511	11	9	13100 ..
40464	Cubic foot of Concrete work	..	1	6 cft	3793	8	..	
1525	Cubic yards of Rough stone work	1	7	cyd	2192	3	..	
400	— do — of — do —	..	5	do	125	..	..	
334	Square Wells of 4½' x 3' inside built with brick in hydraulic mortar and filled with Concrete	28	4	each	9435	8	..	
2349	Cubic feet of Brick in chunam for reconstructing Parapet walls including plastering	..	3	cft	440	7	..	
	Repairing the cracks in the Bridge				250	..	..	
	Excavation				500	..	..	
	Baling water				2000	..	..	
					28248	5	9	
	Sundries & Superintendence	10	..	Cent	2851	10	3	31100 ..
	Total amount of Estimate Rupees							44200 ..

District Engr's Office
South Arcot
Cuddalore
3rd March 1876

[signature] Major, R.E.
District Engineer

[signature]
President L F B

Revenue Department.

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

Read the following

No 25.

From J. H. Garstin Esquire.
President L. F. Boards
South Arcot.

To C. A. Galton Esquire
Ag Secretary to the
Board of Revenue.

Sir, In continuation of my letter dated 11th December last, No 110, I have the honor to forward herewith a plan and estimate amounting to Rs 44,200 for protecting the Pounnar Bridge at Manjacooppam 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 Fund Board thereon, and to request that the sanction of Government of Government may be obtained for the same.

Ld

South Arcot District
No 1 Range
Cuddalore Salary
Local Fund
Communication
New Work
Abstract Estimate
of
1875-76.

In a letter No 314 of 3rd March 1876 from the Distt Engr. South Arcot to the Presd. L. F. B. S. Arcot.

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

Ind. G. W. No 7047/76.

Amount of Estimate Rs 44200

L. F. B. No 1020/76

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 &c

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 Pounnar bridge at Manjacuppam 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

	Rs	A.	P.
1. Expenditure already incurred on temporary repairs	11057	0	4
2. Loss in Brickfield, Lime &c	2042	15	8
3. Work now to be done	31100	0	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, No 1010, the Board of Revenue have already expressed the opinion that the proposal is fair.

3. The Board do not approve the Circle Board's 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.

(True Copy & Extract)

[signature]
Acting Secretary

To the Chief Secretary to Government F. D. with 5 Enclosures

Public Works Dept.

Endorsement in the Financial Dept. No. 693 dated 27th April 1876, on Proceedings of the Board of Revenue No. 1010 dated 12th April 1876.

Proposed draft order in the P.W.D. on the above containing remarks by the Hon'ble R. S. Ellis C.B.

Memorandum by the Chief Engineer P.W.D. No. 973 d/24th June/76, with the papers connected therewith.

No. 188.

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

Ootacamund
24th June 1876.

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

To, The Chief Secretary to Govt.

Hing and Dept. of Govt. of Bombay
Proceedings of the
Board of Revenue

Dated 1st } May 1876
Deeps 1 } 3
Ch 5 } 4

No. 1020

Submitting for the sanction of Government letter from the President L. D. Board. S. Arcot Dist. forwarding estimate & plan for Rs. 44200 for the Bodine Works to the Poniar Bridge at Manjacooppam &c.

E. Exp. No: 7739 6th May 1876

Referred.

Ootacamund
4th May 1876

Chief Secretary

No. 705

Referred to the Chief Eng. for remarks.

W. R. Chief Engineer with 5 Enclos
4th May 1876

Financial 1876 Dept
(L. F. Roads)

From The Secretary to Govt
P W D

No 188

Dated 24th } June 1876.
Recd 24 }

Encls 19.

No 1417

Transfers all the papers connected with the protective works to the Poonies bridge at Munja-coopum —

C No 7310

P.W.D.
21 SEP 76
No. [illegible]

Enclosure in letter from the Distt. Engr. South Arcot to the Chief Engr. D.P.W. No 116 dated 18th Septr/76

List of Borings taken in the Ponniar 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:—

No. 308, dated 26th November 1875, with one enclosure, No. 313, dated 4th December 1875.

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 Ponniar 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.

* Dated 30th April 1875, No. 28.

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 Brahmadesam to Parangani, and Rupees 2,000 to the Pondicherry-Merkanum Road, in addition to the 11,520 Rupees, which

	RS.
† Approaches to Thondiar Bridge... ...	1,200
Road to Railway station at Vilangambadi	1,600
Additional arch to Giddangal Surplus Odai Bridge...	2,470
Ponniar 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 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 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 Ponniar 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, 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 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 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.

Board's Proceedings, dated 21st June 1875, No. 1,712.

* Dated 26th November 1875, No. 308.

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.

No: 1046. 7th July 1876

Memorandum

With reference to letter from the District Engineer ~~South~~ Arcot to the address of the President of the L. B. Board Cuddalore Circle, No: 314 of 3rd March, forwarding Plan & Estimate for protective works to the Pennar Bridge, the Chief Engineer has the honour to state that the Govt. have declined to accept his general concurrence in Major Mead's Proposals; inasmuch as the impression in which they concur as to a depth of 11 feet of protective walls & well foundations being sufficient for the purpose in view has no reference to any actual section of the River bed -

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

Transmitted to Chief Engineer
Secretary to Govt. Public Works Dept.
1876.
BOARD OF REVENUE,
MADRAS.

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

Read 25th April 1876
No. 975
Encl. 4
Received 27th April 1876

Read Order 2 & 3

APRIL.
No. 1,010.

Roads — from Brahmadesam to Parangani and from Merkanum 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 Pennar Bridge.

No. 659.
Ahmed Ali Khan Bahadur, Malik Ali Khan Bahadur, Ali Khan Bahadur, Ali Khan Bahadur,

2 of his Memo. No. 52 of 15th January 1875; and to request that borings may at once be made, opposite to each Pier, in the proposed lines of the retaining walls; to shew to what depths the sand extends, and give some idea of the nature of the river bed. In para. 12 of his letter recorded with G.O. No. 3423 of 2d Decr 1875 Major Mead unmind:verted on the fact of sanc:tion not having been ac:corded to Mr. Sage's pro:posals in February 1875. He will see now that he would have done better had he acted on the instructions sent to his predecessor. It is no use District Engi:neers 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 based

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in careful inquiries and accurate information.

G.W.W.
7.7.

No. 210a.

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 24th June 1876 relating to the Poonah bridge protective works and to request that the information necessary to enable the

Chief

No. 210 a.

Chief Engineer to express a decided opinion on the plan and estimate and to recommend 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

the above preliminary question has been decided.

(By order)

E. Ardaston
Chief Secretary

Ootacamund
7th July 1876

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

G.F.

No. 210 a.

56 P 15

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List of papers transferred with
P.W. Deft No. 188 – 24th June 1876.

1 Fnl C No. 1020 – Brd No. – 1 May 76 with
5 enclosures –
1 – Chf Engr's Memo No. 773 – 6 May 76.
1 – Fnl. C No. 998 – Brd No. 1010 – 12 Apl. 76 with
4 enclosures –
1 P.W. draft order –
1 Fnl. C No. 1395 – Brd No. 5079 – 17 June 76. with
3 enclosures –
1 Chf Engr's Memo No. 973 – 24 June 76.
1 copy of Memo to D.E. South Arcit
of Chf Engr No. 52 – 15 Jany 76 –

19

Cr: 17.2.77

Of Sheet 23 ahl

No. 210 a.

Memo: No. 975 Memo: by the Chief Secy: to Govt. No. 867 dt 12th June 1876. 5
Endorsement in the Financial Dept. No. 963 dt 23d June, on Proof the Board of Revenue No. 5079 dt 17th June 1876.

No. 3

The Chief Engineer has the honour, with reference to Official Memorandum from the Chief Secretary to Govt. No. 867 of 12th June, to forward for the information of Govt. copy of his Memo to the Dist. Engr. of South Arcot No. 52 of 15th Jany 1875 — from which it will be seen that it is not from want of instructions on his part that the Plans of the Pennear Bridges have been submitted without such exact information as is necessary to enable him to decide precisely which is the proper depth to be

No. 210 a.

given to the retaining Walls
whether 5 ft of wall on
9 ft wells, as proposed
by Mr. Sage, 5 ft of wall
in 6 ft wells as proposed
by Major Mead, or 20 ft
of wall and well together
as proposed by Major C. J.
Smith. All he could do
in the matter was to in-
timate his general con-
currence with the argu-
ments in wh. Major Mead
based his proposal, as
they are set forth in
paras 30 to 35 of his let-
ter recorded with G.O. No.
3423 of 2d Dec. 1875. It
will be observed that in
the last para. of his Memo.

of January 1875, the Chief
Engineer laid great stress
in the regulation of the
River bed above bridge,
inattention to which is
apt to cause currents
and sets of flood water
which cause great dam-
ges to Bridges. Major
Mead's depth of retaining
walls is based on the pre-
sumption that care is
taken in this respect;
and the Chief Engineer
agreed to his proposals
in that understanding.—
With this explanation
the Chief Engineer trusts
he will be exculpated
from the charge of not
having done what he

No. 210 a.

could to put matters into a right train with reference to this Bridge. Mr. Sage was a good Executive Officer, but not a good District Engineer. The Supt. Engr. (Col. J. Moberly) for whose aid he called, was not an Officer in whose opinion Major Genl. Walker could place any reliance. Major Rogers Thompson had not long before spent some weeks with the Railway Engineers investigating the peculiarities of that very River, and the best advice he could give the Govt. was to send him. For the delays that occurred, the Chief Engineer is not responsible. He went to England for three months from May to August; and the subject did not come before him again till December.

T. W. Walker Major Genl.
Chief Engr. D.P.W.

24th ~~23~~ June 1876

Cr 17.2.77

In Fol No 1417
76.

No. 210a.

No 9

Memorandum.

The Chief Engineer has the honor to submit the results of the further references made by him on receipt of Memo=randum 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 Poonar 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 paras 30 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 on temporary repairs, shall be sanctioned.

C. Walker Major Genl R.E.
Chief Engineer P.W.D.

31-1-77.

Cir: 17.2.77

57

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 Poonar 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.

2. In the absence of any information 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. No. 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 could not deal with the first proposals made with letter No. 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. No. 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. No. 719 A 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.

[illegible] Major Genl. R.E.

Chief Engineer P.W.D.

Ootacamund
6th May 1876

To,
The Chief Secretary to Government
with enclosures.

Sd. Attd. Cr 17.2.77

D. P. W.
SOUTH ARCOT.

No. 116

DISTRICT ENGINEER'S OFFICE.

Camp Punroutte

Dated 18 Sept. 1876.

From

The District Engineer,
South Arcot.

To
The Chief Engineer
D. P. W.

Enclosures.

1 List of borings taken

Sir,

I have the honor to report, with reference to your Memos No. 1046 dated 7 July and No. 1226 of 14 August 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 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 Distt. and had no one to use it, I was unable

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 anger 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 8⅓ 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 Guddelum and Poonian

Poonian 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 anger made but as the Government Workshops are closed fear there will be great delay.

I have the honor to be
Sir
your most obedient servant
[signature] Major R E
District Engineer

P.W.D.
21 SEP 76
No. 5807

SOUTH ARCOT D. P. W.

From

The District Engineer

South Arcot.

To

The Chief Engineer
D. P. W.

Dated 18th
Despatched 19th } Septr/76
Received

No. 116

Enclosures 1

Reporting upon the borings ordered to be made at the Poniar Bridge near Munja-coopum, and also informing that the Apparatus was obtainable from the Railway Company.

Cen: 17.2.77
Dispatched 21-9-76

1046.

P.W.D.
10 Aug 76
No. 5728

SOUTH ARCOT D. P. W.

From
The District Engineer
South Arcot.

To
The Chief Engineer
D.P.W.

Dated 7th
Despatched 8th August 1876
Received 10

No. 81
Enclosures —

Reporting that nothing as yet been done towards the borings ordered to be made opposite to each pier of the Poonar Bridge near Cuddalore for want of boring apparatus.

Memo No 1226 dt 14-8-76

Memo: No. 1226 dt 14th Aug 1876 —

With reference to Major Meadi 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 borings ordered to be made at the Poonair Bridge

SD/G. W.W.

Ootacamund
D. Engineer S. Arcot.

Cir 17.2.77

Despd to Cir 10-8-76

62

No 554 Public Works Department.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 19th Feb 1877

Read ~~the following~~:—

~~[illegible]~~

Fin. Dept — (" " 693 ✓ 27th April 1876)
Engrs Memo — (" " 773 ✓ 6th May ")
do — (" " 973 ✓ 24th June ")
From the Fin. Dept — (" " 1056 ✓ 7th July 1876)
Engrs Memo — (" " 1046 ✓ — do —)
to Dist. Engr: South Arcot — (" " No 81 ✓ 7th Aug ✓ ")
do do — (" " 116 ✓ 18th Sept ✓ ")
do do — (" " 134 ✓ 7th Oct ✓ ")
to the Chief Engineer — (" " 210 A ✓ 31st Jan 1877)

His Grace the Governor in Council sanctions the Estimate of Rs. 44200 for Repairs and protective works to the Poonar Bridge at Cuddalore proposed by the District Engineer and approved by the Chief Engineer

2. It will be con-

-sidered in the Financial Department what Contribution shall be made by the Local Fund Board towards carrying out the works.

W.F.

This sanction has been registered as Provincial No. 2 W. of 1876-77.

Cir: 17.2.77

D.L.S. Arcot
Ex. P.W.C.
Fuel Dept.
Disp'd. 6-3-77

of {1877} Madras.

PUBLIC WORKS.

Encl.

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

Nos. 454-55

...miar Bridge at
...dalore The estimate
...to 44200 for repairs
...d protective works to
—, sanctioned with
...ments