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MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No.	416	Press	<i>Original</i>
B.P. No.		Mis.	
Dated	20 - 2	6874	
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Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
20th February 1874.*

Read the following papers:—

No. 379. From Captain H. BAILEY, Acting District Engineer, Malabar, to Colonel G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Calicut, 15th July 1873, No. 71.

I REGRET to have to report the fall on the 18th of May of a bridge of 15 feet span, 3 feet rise, which was in course of construction between Pudupaddy and the foot of the Tambracherry Ghaut, amount of estimate Rupees 550, of which Rupees 549-13-6 had been expended.

2. The bridge was originally designed for a wooden platform, but was altered to an arched one by Captain Wood's orders.

3. The arch was completed in March last; but the bridge had not been opened for traffic, as only the earthwork of the roadway had been completed, the metalling not having been put on.

4. To save crossing the stream three bandymen who were passing along the road pulled down the fence put to prevent bandies crossing the bridge, and it fell when the third bandy was passing.

5. The Range Maistry reports that the bandymen have been fined, one of them 100 Rupees and two others 25 Rupees each, and that the Contractors who built the arch saw them pulling down the fence before crossing.

6. Were that the case one would suppose the Contractors would have kept the bandies from going over, unless they felt that their work was so bad that they wanted such a chance to give them an excuse for the failure of the bridge.

7. Seeing the very inferior quality of the arch stones, I am of opinion that the bandies crossing when they did merely hastened its downfall, as I believe it was certain to have come down whenever opened for traffic.

8. The Range Officer informs me that, when he inspected the bridge on the 7th of May, he noticed the inferior quality of the stone, but that the Range Maistry who had charge of the work told him that he had showed the stone to Captain Wood, and that he had ordered it to be used.

9. This I can hardly believe, as the stone is very soft and could hardly be expected to stand in a flat segmental arch.

10. I have delayed reporting the matter till I had inspected the bridge.

REFERRED to the Inspecting Engineer for Communications for report.

2. The arch and earthwork of the roadway having been completed in March, it would appear to be gross neglect that prevented the bridge being opened to traffic before the monsoon simply for want of metalling to the roadway. Had any doubts as to the stability of the arch been entertained, it should have been tested by the imposition of weights.

(Signed) G. W. WALKER, Colonel, R.E.,
Secretary to Government, P.W.D.

21st July 1873.

No. 380. From Captain H. BAILEY, Acting District Engineer, Malabar, to Colonel G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Calicut, 21st July 1873, No. 77.

IN continuation of my letter, No. 71, dated 15th instant, I have the honour to report that not feeling satisfied about Captain Wood having inspected the stones

of which the bridge referred to was constructed, I called for further information from the Range Maistry, and his report is that that officer inspected the stones both at the bridge and quarry, and, as he did not object to them, the Maistry did not bring to his notice that they were very soft, as he was afraid he might be thought impertinent if he had done so.

2. From merely looking at the stones it would be very difficult for any person not very well acquainted with the appearance of laterite to detect that it is of such an inferior quality as it really is, as it looks quite good enough for the work it was intended for; the Maistry, however, knew that this was not the case, and it was his duty to have pointed this out to Captain Wood, as his showing the stone to that officer without any remark as to its quality must have led him to believe that it was better than the Range Maistry knew it to be.

3. I have warned the Maistry that such another occurrence will lead to his being recommended for reduction.

FORWARDED to Inspecting Engineer for Ports and Communications in continuation of docket, dated 21st July 1873. It is questionable whether laterite of the best quality should be used in arches with so small a rise compared to their span as that of the bridge under review.

(Signed) G. W. WALKER, Colonel, R.E.,
Secretary to Government, P.W.D.

No. 381. From Lieutenant-Colonel W. T. F. FAREWELL, Inspecting Engineer for Ports and Communications, to Colonel G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Chempak, 20th December 1873, No. 441-36:—

With reference to your endorsements on letters, Nos. 71 and 77, dated 15th and 21st July 1873, from the Acting District Engineer of Malabar to your address, and herewith returned, I have the honour to report that I have examined the ruined Pudukudy bridge situated at the foot of the Tambracherry Ghaut. In 1870, a bridge said to be of 12 feet span crossing this nullah was reported to have been washed away on the first burst of the monsoon, the reason given by the Range Officer was insufficiency of water-way; an estimate framed by Mr. Overseer Arbuthnot for re-constructing this bridge with a timber superstructure and a span of 17 feet was sanctioned by the Revenue Board in their Proceedings, dated 6th June 1872. In September 1872, Captain Wood, R.E., reported that the water-way allowed appeared to him excessive, and subsequently Captain Bailey expressed the same opinion.

2. Captain Wood solicited permission to reduce the span of the bridge to 10½ feet and substitute a Portland cement concrete arch in lieu of the timber platform; he noted that the original bridge consisted of two laterite arches each of 4 feet span with a pier of 2½ feet and the total distance between the abutments 10½

feet, not 12 feet as at first reported in 1870. Captain Wood was anxious to construct a concrete arch as an experiment, and believing that under his immediate personal supervision there would be no apprehension of its failure, etc., etc., and that he would be able extensively to use this material for other small culverts, I, as Superintending Engineer of the 7th Division, on the 7th September 1872, approved of his proposal, and called for a revised plan and estimate for the work; this, however, I never received as Superintending Engineer. From the records on the subject, as District Engineer, Captain Wood appears to have changed his mind and sanctioned a laterite of 15 feet span with 3 feet rise on abutments of 3 feet in height and 4 feet in thickness; the work estimated to cost Rupees 550 was commenced in January 1873, apparently by contract, under the immediate supervision of Range Maistry Raviachen, and completed at the end of March 1873, and Captain Bailey in his letter No. 71 states it cost Rupees 549-13-6.

3. From what I learnt in Malabar, the cause of delay in opening the bridge was really due to the masonry not having dried, then heavy rain having fallen, the arch became more thoroughly saturated, and the cartmen attempting to take their carts over it while it was in this state probably caused its final collapse; the laterite stone used in the work is decidedly of very bad quality, and certainly quite unsuited for an arch with so small a versed sine as 3 feet and a span of 15 feet.

4. From Captain Bailey's report, No. 77, dated 21st July, Range Maistry Raviachen is to blame in not bringing the inferiority of the laterite stones used on the work to the notice of the District Engineer, who had very little experience of this material. Captain Bailey has submitted to me a plan and estimate for reconstructing this bridge of 2 arches of 6 feet each of laterite in chunam, giving a waterway of 64½ square feet, noting, he considers, such ample, but as I know it is difficult to get good laterite in the vicinity in question, and moreover I am very much inclined to believe from the fact of the original bridge having been washed away and on the occasion of the bridge under notice being destroyed, of the landymen having preferred to attempt crossing the bridge to taking their carts through the stream, that more waterway is required; I have therefore substituted for Captain Bailey's plan the enclosed one which while it costs but little more will give 90 square feet of extra waterway, and will, I trust, tend to popularize the use of the small iron girders included in the design of which there are many now laying in the workshops.

5. I take this opportunity of reporting that while en route to the Pudukudy bridge, I inspected a very useful and well-worked out diversion of the road from Calicut to Tambracherry at Paddavellum on the 12th mile from Calicut, where the reconstruction of a timber bridge of 30 feet span which required renewal is avoided, and in lieu thereof a substantial bridge of 12 feet span higher up the stream has been built, with safe and easy approaches instead of the very awkward and dangerous ones to the old bridge site; this work has been most satisfactorily carried out. The general condition of the road from Calicut to Tambracherry is very fair, and of the estimate of Rupees 11,650 for improving the whole line, Rupees 6,954 have been expended, and metal and gravel collected which cannot be spread for want of funds; as soon as the balance of estimate, Rupees 4,696, is granted, the work will be speedily completed to the foot of the Tambracherry Ghaut. A timber platform bridge of three bays over the Sungapah river at the

Proceedings of the Madras Government, Public Works Department.
20th February 1874.

24th mile I noted as requiring considerable repairs; the Range Officer who was with me informed me he had just received sanction for an estimate, amounting to Rupees 700, which he had submitted for the work, and that it would be taken in hand immediately. I also inspected the whole of the Tambracherry Ghaut in the Wynaad and found it in excellent order.

No. 382. ORDER THEREON, 20th February 1874, No. 416.

CIVIL WORKS, No. 33.

THE plan and estimate for a new bridge proposed by the Inspecting Engineer for Communications will be forwarded to the Calicut Local Fund Board through the Financial Department; with the remark that the failure of the bridge lately constructed is clearly due to the District Engineers having sanctioned the use of ordinary laterite in arches having a rise of only one-fifth their span. The action taken by that officer in unauthorizedly departing from a sanctioned plan and estimate and substituting another on his own responsibility, renders him personally liable to reimburse the cost of the masonry that has failed.

(True Extract.)

Colonel, R.E.,
Secretary to Government.

To the Inspecting Engineer for Communications..
.. District Engineer, Malabar.
.. Officiating Controller of Public Works Accounts.
.. Financial Department.

Exd. F. C. Shunker,

Spare Copies

No 1277

Malabar Dist. Engineer's Office
Calicut 21st July 1873

From

The Dy. District Engineer,
Malabar

To

The Secretary to Government W.P.W.
Madras

Sir,

In continuation of my letter No 1 dated 15th Instant I have the honor to report that not feeling satisfied about Captain Hood's having inspected the Stones of which the Bridge referred to was constructed, I called for further information from the Range Maistry, and his report is that that Officer inspected the Stones both at the Bridge and Quarry and as he did not object to them the Maistry did not bring to his notice that they were very soft as he was afraid he might be thought impertinent if he had done so.

2. From merely looking at the stones it would be very difficult for any person not very well acquainted with the appearance

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3. I have warned the Maistry
that such another occurrence will lead
to his being recommended for reduction.

I have the honor to be
Sir,

Your Most Obedt Servt.

A. Bailey Captain

By District Engineer, Malabar

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bridge said to be of 12' span crossing this nullah was reported to have been washed away on the first burst of the monsoon. The reason given by the Range Officer was insufficiency of water way. An estimate framed by Mr. Overseeer Ributhnat for reconstructing this bridge with a timber superstructure and a span of 14' was sanctioned by the Revenue Board in their Proceedings dated 5th June 1872. In September 1872, Captain Wood Esq., reported that the water way allowed appeared to him excessive, and subsequently Captain Bailey expressed the same opinion.

2. Captain Wood solicited permission to reduce the span of the bridge to 10½ feet and substitute a Portland Cement concrete arch in lieu of the timber

6
timber platform; he noted that the original bridge consisted of two laterite arches each of 4 feet span with a pier of 2½ feet and the total distance between the abutments 10½ feet, not 12 feet as at first reported in 1870. Captain Wood was anxious to construct a concrete arch as an experiment, and believing that under his immediate personal supervision there would be no apprehension of its failure for years, and that he would be able extensively to use this material for other small culverts. I, as Superintending Engineer of the W. F. Division, on the 7th September 1872, approved of his proposal and called for a revised plan and estimate for the work. This, however, I never received as Superintending Engineer; from the records on the subject, as District Engineer.

Engineer, Captain Wood appears to have changed his mind and sanctioned a laterite of 15' span with 3' rise, on abutments of 3 feet in height and 4' in thickness. The work estimated to cost

Rs 550 was commenced in January 1843, apparently by contract, under the immediate supervision of Range Maistry Rairachen, and completed at the end of March 1843, and Captain Bailey in his letter No. 41 states it cost Rs 529-13-6.

3. From what I learnt in Malabar, the cause of delay in opening the bridge was really due to the masonry not having dried, then heavy rain having fallen the arch became more thoroughly saturated and the cartmen attempting to take their carts over it while it was in this state, probably caused

caused its final collapse, the laterite stone used in the work is decidedly of very bad quality, and certainly quite unsuited for an arch with so small a versed sine as 3' and a span of 15'.

4. From Captain Bailey's report No. 44, dated 21st July, Range Maistry Rairachen is to blame in not bringing the inferiority of the laterite stones used on the work to the notice of the District Engineer, who had very little experience of this material. Captain Bailey has submitted to me a plan and estimate for reconstructing this bridge of 2 arches of 6 feet each of laterite in chunam giving a waterway of $64\frac{1}{4}$ square feet, noting, he considers such ample, but as I know it is difficult to get good laterite in the vicinity

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and on the occasion of the bridge
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the Workshops.

5 I take this opportunity
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bridge, I inspected a very useful
and well-worked out diversion
of the road from Calicut to
Tambacherry at Paddavellum
on the 12th mile from Calicut,
where the reconstruction of a
timber bridge of 30 feet span
which required renewal, is
avoided, and in lieu thereof
a substantial bridge of 12
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stream has been built, with
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The general condition of the
road from Calicut to Tambacherry
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I have the honor to be

Sir,
Yours most Obedt Servt

Walter R. Lint Lieut Colonel.

Inspecting Engineer for
Ports & Harbours

Public Works, 1873 Report
From the Chief Engineer

The Inspecting Engineer
for Ports & Communications

To the Chief Engineer &
Secretary to Govt.

Public Works Dept.

Dated 20th December 1873
Page 22nd

Part 5.

Reporting on the
ruined Pudukudy
Bridge on the
Tambacherry Grant
Road in the
Malabar District

No 381

No 416 - 20 July 1874

Circular 1874

Public Works Department
No 416
Proceedings of the Madras Government

From the W. Eng. Malabar - (H.E. No 71 of 15 July 73)
No - (H.E. No 77 of 21 do -)

From the Inspecting Engineer
for Ports & Communications } H.E. No 411 of 20th Dec 73
36

The various estimates
for a new Bridge proposed
by the Inspecting Engineer
and mentioned clause of
Plan. It has no way of making
communication with
the main road. It had been
to be constructed by the
Sayer & Blum the Chief of the
underwriter 1871 M. through the Financial
Department, with the remark
that the failure of the
bridge lately constructed
is clearly due to the
Engineer having sanctioned

sanctioned the use of
ordinary Latent in
arches having a rise
of only one fifth
their span. The ac-

Comm.

tion taken by
that Officer in
unauthorizedly
departing from
a sanctioned
Plan & Estimate
& substituting
another on his
own responsibility,
renders
him personally
liable to reimburse
the cost
of the measure
by that has
failed -

Comm.

I-Eng for Comm ✓
Deputy Malabar ✓
Off Controller ✓
Finl Dep^y with plan, Est & Office
Depts Ltr S-C 24/2/24.

No 6941, 4118 & 4030

Govt. of 1874 Madras.

PUBLIC WORKS.

The Inspecting Engineer
for Ports and
Communications

Dated

Recd.

Encl 2

20th Feb'y 416.

No. 379 @ 282

Bridge. Paper order
on the subject of the
failure of the bridge
on road between
Vadavopady & the
Tambacherry Shank.