

Govt. of Madras.

PUBLIC WORKS.

To

The Engineer-in-Chief.

Dated

Issued

Recd.

Encl.

G. O. 11/12 1875, No. 2250

Nos. 58-59

(Accident to the Inspection
train at the Paupugnee
Bridge upon the 16th June 1874)
Informing that Sir John
Hawshaw states that
no reason is given for the
conclusion of the Viceroy that
in their order of the 17th Aug
1874, No 2270 on the subject

Proceedings of the Madras Government, Public Works Department,
4th August 1875.

No. 58. Read the following letter from Lieutenant-Colonel J. H. M. SHAW-
STEWART, R.E., Consulting Engineer for Railways, to Lieutenant-Colonel
J. MULLINS, R.E., Officiating Secretary to Government, Public Works
Department, dated Madras, 19th July 1875, No. 404:—

ADVERTING to the Proceedings of Government noted in the margin, I have the

13th July 1874, No. 1,878.
Do. " " 1,879.
17th Aug. 1874, " 2,270.
2nd Dec. " " 3,378.

* No. 402, 16th April 1875.
" 420, 21st " "
" 753, 16th July " "

honor to enclose three letters* from the
Agent of the Madras Railway forwarding
further correspondence upon the subject
of the accident to the inspection train at
the Paupugnee bridge upon the 16th
June 1874. With the first of these letters
is forwarded an extract of a letter from

the Board of Directors, giving cover to a report by their Consulting Engineer. With
the second is forwarded a letter addressed to the Acting Deputy Chief Engineer by
Mr. Stoney, the Engineer employed in repairing the bridge, to which letter allusion
is made by the Board and their Consulting Engineer. With the third letter is
forwarded a report by the Company's Chief Engineer, in reply to the observations
contained in the letter from the Directors.

2. Sir John Hawkshaw states his opinion that the speed of the train when
approaching the Paupugnee bridge would have been reduced from 45 miles to between
34 and 35 miles an hour, by shutting off steam at a distance of three quarters of a
mile from the bridge. He assumes the correctness of Driver Lem's statement, that the
speed of the train had previously been reduced to 45 miles an hour; but my experience
shows that there is a decided tendency on the part of the drivers on the Madras Rail-
way to under-estimate the speed of their trains, and in this particular case I think the
evidence taken before the Magistrate of Cuddapah is conclusive with regard to the
speed of the train having been greater than Driver Lem's estimate.

Sir John Hawkshaw alludes to some faults in the design and construction of the
bridge, and he attributes the accident partly to this cause, and partly to the unsound
condition of the bridge at the time. That the bridge was in an unsound condition he
concludes, both from Mr. Stoney's letter and from an expression in the Magistrate's
report. Mr. Stoney states that numbers of the dog-bolts were turned the wrong way,
and that they had not been screwed up for long. I cannot but agree with Mr. Anderson
that the description given in this letter is greatly exaggerated. Mr. Anderson shows
how entirely that description is contradicted by the evidence.

From an expression in Mr. Horsley's report, Sir John Hawkshaw draws the
conclusion that the rails were out of gauge at the point where the engine mounted the
rail. In drawing this conclusion I can state positively that he is mistaken. Part
of the thorough inspection of the bridge made by Mr. Going and myself on
the morning after the accident consisted in personally gauging the rails along the
whole roadway over the bridge; and the gauge was found by us to be correct every-
where. This is alluded to by Mr. Going

Vide Proceedings of Government, 13th July
1874, No. 1,879. in his letter, dated the 18th June,
No. 401.

3. The Board of Directors, in their letter to the Agent, allude to Driver Lem's
evidence and Mr. Stoney's letter, also to the opinion recorded by their Consulting
Engineer, and state that they have arrived at the conclusion that, "even supposing

the accident was not occasioned by the line being out of gauge, yet as nothing was previously known inconsistent with the perfect soundness and stability of the bridge, and in the absence of any regulation to the contrary, Mr. Robinson cannot be blamed for allowing so light a train to cross it at a speed of from 30 to 40 miles an hour." On this point Sir John Hawkshaw writes also. He says, "before it can be asserted that Mr. Robinson was sanctioning a speed inconsistent with safety, it must be proved that he was acquainted with the circumstance that the bridge was in such a state as to render it unsafe to travel at the speed at which the inspection train was going." Now, in all that has been written on the subject, I cannot see that it has anywhere been suggested that the train was driven over the bridge at a speed which Mr. Robinson knew to be dangerous; but the structural defects of the bridge were well known, and I am certainly of opinion that an officer in the position of Deputy Chief Engineer should have been thoroughly acquainted with them, and with the fact that a high rate of speed over the bridge was unsafe.

4. Mr. Anderson explains that the original design for the Paupugnee bridge provided for the piers, as well as the abutments, being constructed of masonry; and that the substitution of screw piles for masonry in the piers was suggested in 1865 by Mr. Smart, the Chief Engineer. Mr. Anderson further states that the modified design was again deviated from in the construction of the bridge; and he illustrates

* No. 167, return requested. by a* drawing the position which Mr. Smart intended the piles to occupy, and the position in which they were actually screwed. A similar error was committed in the construction of the Chittravutty bridge, as explained in my letter, dated the 23rd March 1868, No. 97; but in that case the error was detected and corrected before the bridge was opened for traffic. In the case of the Paupugnee bridge there can be no doubt, as stated by Mr. Anderson, that the error in question tended to render the structure insecure.

Mr. Anderson states that, in his opinion, "the cause of the accident is to be found in the faulty design and construction of the bridge, which rendered it an unsuitable structure to be run over at so high a rate of speed as was attained by the inspection train."

5. After carefully considering all that has been written on the subject of this accident, my opinion remains unchanged, that it is to be attributed to the high rate of speed at which the inspection train was driven over the bridge, a speed to which the bridge, from structural defects, was altogether unsuited. In support of my opinion that the bridge, setting aside its well-known structural defects, was sound and in good condition at the time of the accident, I would point, not only to the evidence adduced at the magisterial inquiry, but to the fact that three trains, each much heavier than the inspection train, passed safely over the bridge within a few hours of the accident; the down mail having gone over it at about 10-30 P.M. on the 15th June; the up mail at about 2-45 A.M. on the 16th, and a goods special train at about 4 A.M. the same day. From the evidence on record, I am unable to accept Driver Lems' estimate that "by the time he came to the bridge the speed was reduced to about 30 or 35 miles an hour;" although even that rate of speed over the Paupugnee bridge I should, without hesitation, have pronounced to be unsafe.

No. 59.

ORDER THEREON, 4th August 1875, No. 2,250.

RAILWAY, No. 10.

AFTER full consideration of the papers above recorded, the Government see no reason to doubt the correctness of the views stated in their Order of the 17th August 1874, No. 2,270.

(True Extract.)

Major-General, R.E.,
Secretary to Government.

To the Consulting Engineer for Railways.

Exd. S. T. Austin.

Spare Copies

Railway Department.

CONSULTING ENGINEER'S OFFICE.

No. 464 Madras 19 July 1875.

From

LIEUT. COLONEL J. H. M. SHAW STEWART, R.E.,

Consulting Engineer for Railways,

To Lt. Col. J. Mullins R.E.

Colonel C. W. WALKER, R.E.,

Offg. Secretary to Government,

Public Works Department,

Fort Saint George.

SIR,

Adverting to the Proceedings of Government noted in the margin, I have the honor to enclose three letters from the Agent of the Madras Railway forwarding further correspondence upon the subject of the accident to the Inspection train at the Paupugnee bridge upon the 16 June 1874. With the first of these letters is forwarded an extract of a letter from the Board of Directors, giving cover to a report by their Consulting Engineer. With the second

13 July 74. No 1878

do - " 1879

14 Aug - " 2270

2 Dec - " 3378

No 402. 16 April 75

" 420 - 21 - " -

" 753 - 16 July 75

second is forwarded a letter addressed to the Acting Deputy Chief Engineer by Mr. Shree, the Engineer ^{employed} in repairing the bridge, to which letter allusion is made by the Board and their Consulting Engineer. With the third letter is forwarded a report by the Company's Chief Engineer ^{in reply} to the observations contained in the letter from the Directors.

2. Sir John Hawkshaw states his opinion that the speed of the train when approaching the Rungwa bridge would have been reduced from 45 miles to between 34 and 35 miles an hour, by shutting off steam at a distance of three quarters of a mile from the bridge. He assumes the correctness of driver Lewis' statement that

that the speed of the train had ⁷⁹ previously been reduced to 45 miles an hour; but my experience shows that there is a decided tendency on the part of the drivers on the Madras Railway to underestimate the speed of their trains, and in this particular case, I think the evidence taken before the Magistrate of Cuddalore is conclusive with regard to the speed of the train having been greater than driver Lewis' estimate.

Sir John Hawkshaw alludes to some faults in the design and construction of the bridge, and he attributes the accident partly to this cause, and partly to the unsound condition of the bridge at the time. That the bridge was in an unsound condition he concludes, both from Mr. Shree's letter, and

and from an expression in the Magistrate's report. Mr. Stoney states that numbers of the dog bolts were turned the wrong way, and that they had not been screwed up for long. I cannot but agree with Mr. Anderson that the description given in this letter is greatly exaggerated. Mr. Anderson shows how entirely that description is contradicted by the evidence.

From an expression in Mr. Horsley's report, Sir John Hawkshaw draws the conclusion that the rails were out of gauge at the point where the engine mounted the rail. In drawing this conclusion I can state positively that he is mistaken. Part of the thorough inspection of the bridge made by Mr. Going and myself on the

Vide Pro. of G.
13 July 74
No 1879.

the morning after the accident consisted in personally gauging the rails along the whole roadway over the bridge; and the gauge was found by us to be correct everywhere. This is alluded to by Mr. Going in his letter dated the 18 June, No 401.

3. The Board of Directors, in their letter to the Agent, allude to driver Lewis' evidence and Mr. Stoney's letter, also to the opinion recorded by their Consulting Engineer, and state that they have arrived at the conclusion that, "even supposing the accident was not occasioned by the line being out of gauge, yet as nothing was previously known inconsistent with the perfect soundness and stability of the bridge, and in the absence of any regulation to

to the contrary, Mr. Robinson cannot
be blamed for allowing so light a
train to cross it at a speed of from
30 to 40 miles an hour. On this
point Sir John Hawkshaw writes
also. He says, "before it can be
asserted that Mr. Robinson was
sanctioning a speed inconsistent
with safety, it must be proved that
he was acquainted with the circum-
stances that the bridge was in such
a state as to render it unsafe to
travel at the speed at which the
inspection train was going." Now in
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ject, I cannot see that it has any-
where been suggested that the train
was driven over the bridge at a
speed which Mr. Robinson knew to
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be dangerous; but the structural defects
of the bridge were well-known, and
I am certainly of opinion that an officer
in the position of Deputy Chief Engineer
should have been thoroughly acquainted
with them, and with the fact that
a high rate of speed over the bridge
was unsafe.

4. Mr. Anderson explains
that the original design for the Paupye-
nee bridge provided for the piers, as
well as the abutments, being constructed
of masonry; and that the substitution
of screw piles for masonry in the piers
was suggested in 1865 by Mr. Smart,
the Chief Engineer. Mr. Anderson
further states that the modified de-
sign was again deviated from in the
construction of the bridge; and he —
illustrates

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to which Mr. Smart intended the piles
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traffic. In the case of the Paupug
bridge there can be no doubt, as
stated by Mr. Anderson, that the error
in question tended to render the struc-
ture insecure.

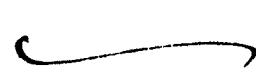
Mr. Anderson states
that in his opinion, "the cause of
the accident is to be found in the
faulty design and construction of the
bridge

* No 16,
Return.

No. 577
16th 61
No 1139

bridge, which rendered it an inevitable
structure to be run over at so high a
rate of speed as was attained by the
Inspection train.

5. After carefully considering
all that has been written on the
subject of this accident, my opinion
remains unchanged, that it is to be
attributed to the high rate of speed
at which the Inspection train was
driven over the bridge, a speed to
which the bridge, from structural de-
fects, was altogether unsuited. In
support of my opinion that the bridge,
setting aside its well-known structural
defects, was sound and in good
condition at the time of the accident,
I would point, not only to the
evidence adduced at the Magisterial
inquiry

inquiry, but to the fact that three
trains, each much heavier than the
inspection train, passed safely over the
bridge within a few hours of the
accident: the down mail having
gone over it at about 10.30 p.m. on
the 15th June, - the up mail at about
8.45 a.m. on the 16th - and a goods
special train at about 4 a.m. the
same day. From the evidence on
record, I am unable to accept driver
Lewis' estimate that "by the time
he came to the bridge the speed was
reduced to about 30 or 35 miles an
hour"; although even that rate of
speed over the Caupugnew bridge I
should without hesitation have
pronounced to be 
unsafe.

unsafe.

159
I have the honour to be

Yours most obedt Servt.
Wm. Thomas T. Col. R.E.
Cons. Engineer for Railways.

Public Works Dept.

178

No 2250

Proceedings of the Madras Govt.

Order date 4th August/75

Read the following

From

The Comdg. Engineer
for Railways

N.E. No 404 d/19th July/75

After full consideration
of the papers above record-
ed, the Government are
no reason to doubt the cor-
-rectness of the views stated
in their ^{order} of the 17th August
1874, No 2270.

M. 4/8

7 Enclosures returned
24 A.S/75 vide letter
attached to SO No 2260/75

The Comdg. Engineer with one Drawing
for Railways.
Sc Dsp - 17-8-75

46. 2nd Dec 174 No 15-416.
" 7. 1st Aug 174 No 3338334
" 13. 1st Aug 174 No 2388239
" 13. 1st Aug 174 No 2368423
" 16. 1st Aug 174 No 2148245

P. W. 1875 Dept
RAILWAY DEPARTMENT.

From
The Consulting Engineer,
for Railways,

No: 4712

To

The Secretary to Government,

P. W. Department,

Fort Saint George.

Dated 17th July 1875

Recd. 20th July 1875

L.S. No. 4712

* Engr. Station vide Memo 9/14/75

Standard with

reference to further in-
spection of the accident
subject of the accident
to the detection of the
cause the fault
bridge upon the track

S.B. No. 2250.4-8-75.

Recd. 24. 7. 75
22. 7. 75
20. 7. 75
16. 7. 75
14. 7. 75
12. 7. 75
10. 7. 75
8. 7. 75
6. 7. 75
4. 7. 75
2. 7. 75
30. 6. 75

14

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that Mr. Robinson, the Deputy Chief Engineer, in charge of the train at the time, was not to blame, and that he should therefore be relieved from the censure implied in G. O. No 2270, dated 17th August 1874.

The grounds upon which this conclusion is based are stated in the papers submitted, as well as the arguments by which the opposite view of the case is supported.

John Astut. Major R.R.
 Offg Secy to Govt.
 W.D.
 July 75.

There are sufficient grounds for reconsidering the censure passed on Mr. Robinson.
 W.M.
 29. July 75.

The evidence appears to me to be incompatible with the assumption that the permanent way over the bridge was defective when the accident occurred as I account for it.

Some of the bolts fastening the sleepers to the girders were found loose after the accident. That part of the bridge over which the inspection train had passed. It is expressly stated in the evidence that the defect was not sufficient to have caused the accident.

Moreover the bolts had been the subject of attention on the day on which the accident occurred & 2 trains had passed safely over the bridge after they had been so examined.

I and before the accident occurred. Moreover the bolts were in the condition in which they were found after the bridge was inspected. The inspection train had not passed.

The structural conditions of the bridge were in perfect order. The girders spanned rigid openings that they had not been intended for.

The track, like most of the lines, was in a state of disrepair in the time they ought to have been occupied.

The result was that the bridge was struck by the train. It was otherwise in a state of disrepair. It can be so dark that for the purpose of ordinary speed, it was dangerous.

The structural defects were well known. It is stated by the Inspector of the G.O. that the bridge was in a state of disrepair. It was known to be in a state of disrepair. It was known to be in a state of disrepair. It was known to be in a state of disrepair.

bridge was unsafe. That the train was travelling at excessive speed is in my opinion unquestionable. The fact that the bridge was in a state of disrepair is also unquestionable. The fact that the bridge was in a state of disrepair is also unquestionable. The fact that the bridge was in a state of disrepair is also unquestionable. The fact that the bridge was in a state of disrepair is also unquestionable.