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MADRAS RECORD OFFICE

Government of Madras

Public Works. DEPARTMENT

G.O. No.	1879	Press
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238-239		
Dated	13. 7-1874	135.

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
13th July 1874.*

No. 238. Read the following letter from Lieutenant-Colonel J. H. M. SHAW-STEWART, R.E., Consulting Engineer for Railways, to Colonel G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Madras, 23rd June 1874, No. 364:—

In continuation of my letter No. 358, dated the 18th instant, I have the honour to forward, for the information of Government, a further communication* from the Agent of the Madras Railway Company, enclosing a report from the Chief Engineer upon the recent accident at the Paupugnee river.

* No. 537, 19th June 1874.

2. Upon the 19th and 20th instant, I was present at an inquiry instituted by the Magistrate of the Cuddapah District into the circumstances of the accident. The evidence taken by Mr. Horsley was voluminous, and will, I presume, be shortly laid before Government. The facts are simple, and I understand that Mr. Horsley arrived at the conclusion expressed in my previous letter, viz., that the accident was altogether due to the excessive speed at which the train was driven.

3. The bridge where the accident occurred consists of twenty girder openings of 70 feet each. The girders are constructed in continuous lengths of 140 feet, each girder spanning two openings. The abutments are built of stone, and the piers are constructed of screw piles, the piles being arranged so as to form trestles, each trestle consisting of five piles, and two trestles forming the pier. As stated by Mr. Going, the bridge has been carefully erected in accordance with Sir John Hawkshaw's design; but it does not possess the degree of rigidity and strength to be found in most of the large girder bridges upon the Madras Railway. With few exceptions, the large bridges on the Madras Railway are formed of 140 feet continuous girders (spanning two openings) resting upon masonry piers. The substitution of screw piles for masonry in the piers tends to reduce in two directions the strength and rigidity of the structure. In the first place the pier, from its nature, is necessarily less rigid, and more liable to receive and to communicate vibration and oscillation; and, in the second place, the unsupported length of the girder is increased from 64 feet to 66 feet. For these reasons bridges of the special class to which the Paupugnee bridge belongs have always been held to be unsuited for the running of trains at high speed. In the case of the bridge over the Chittravatty river, the speed of trains has been limited to eight miles per hour; and it has always been understood that a somewhat similar limit would have been fixed in the case of the Paupugnee bridge had it not been that the Camlapoor station, at which every train is timed to stop, is only about half a mile distant.

4. Another reason, if it were required, for running over the Paupugnee river at moderate speed is to be found in the construction of the girders, which are in several respects inferior in strength to those that have of late years been sent from England for spanning similar openings.

5. There is considerable difference of opinion as to the speed at which the inspection train was driven over the bridge upon the morning of the 16th instant. From the evidence adduced at the magisterial inquiry, His Excellency the

*Proceedings of the Madras Government, Public Works Department,
13th July 1874.*

Governor in Council will be able to form an opinion upon this point. Those who were in the train are of opinion that, at the moment of the accident, they were travelling at the rate of about 35 miles an hour. After carefully studying the local circumstances, and weighing the evidence, I am forced to the conclusion that the speed could not have been less than 45 miles an hour.

For the assistance of the Government in considering the subject, I enclose a rough sketch showing a portion of the line upon each side of the Paupugnee river.

6. It is with great satisfaction I am able to report that the four persons injured by the accident are all making favourable progress.

7. During last week I was able to inspect almost daily the construction of the temporary bridge across the gap. The Deputy Consulting Engineer is now upon the spot, and I hope to hear that communication has been restored to-night or to-morrow morning. Great credit is due to Mr. Stoney for his successful exertions.

P.S.—Since writing the above, I have received a telegram to the effect that the temporary bridge has been completed, and was tested and passed by the Deputy Consulting Engineer this afternoon. Trains passing over it are limited to a speed of 5 miles an hour.

From T. H. GOING, Esq., Acting Chief Engineer, to R. B. ELWIN, Esq., Agent and Manager of the Madras Railway Company, dated Madras, 18th June 1874, No. 401.

I beg to give the following particulars of the accident which befel the inspection train on the 16th instant.

2. This train, composed of a small engine, the Engineer's Inspection carriage, and a goods brake-van, had left Madras on the morning of 15th instant under the orders of the Acting Deputy Chief Engineer (Mr. Robinson), who was proceeding on his quarterly inspection of the North-West Line. It reached Cuddapah on that day, and on the morning of 16th started at 6 o'clock A.M. for the purpose of running over the 2nd Division and Bellary Branch. When crossing the Paupugnee bridge, however, the engine mounted the west rail between the centre and north end of bridge and got off the road, crashing through the sleepers and the bracings of the bridge and over-setting the north half of the western girder, of which the bottom web became fractured at its point of continuity, over the intermediate pier.

3. The bed of the river is at this part dry and about 17 feet below rail level. The engine was pitched on its side and all the heating and driving portions of it were smashed to pieces; one of its wheels was broken off short from the end of the axle. The inspection carriage was completely demolished, and the brake-van having fallen bottom forward with its axles athwart the west trestle of the pile pier which supported the north ends of the girders, was suspended a little above the river bed. The concussion bent the five piles of the trestle at various considerable angles. The timber work of the van escaped almost undamaged as the shock was received by its heavy axles.

4. You are already in possession of full particulars as to the extent of injury sustained to life and limb by the persons who travelled with the train. This would have been greater had the brake-van not been arrested in its descent as I have described.

5. As you are aware I gauged the line of rails over the bridge in presence of yourself and Colonel Shaw-Stewart on the morning after the accident and found it correct and in corres-

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13th July 1874.*

pondence with the gauge over the rest of the section, viz., tight 5 feet 6 inches, the cotters being outside and gibs inside according to the drawing furnished by Sir John Hawkshaw.

6. I also closely examined the road over the bridge on the evening of the same day (17th June) and found it in good condition, and as there is no evidence of any obstruction having been placed on the road, or that the engine was in a defective state, I conclude that the cause of its mounting the rail was vibration of the bridge due to the motion of the train. What the speed was over the bridge has not yet been satisfactorily ascertained, but will probably be elicited in the course of the investigation by the Magistrate.

7. The Paupugnee Bridge is composed of ten sets of wrought iron boiler plate girders, each continuous over two openings and supported on nineteen piers each composed of two trestles of Mitchel's screw piles, and a masonry abutment at each end. It was designed by Sir John Hawkshaw, was carefully erected, and is in every respect a sufficient bridge.

No. 537.

The Consulting Engineer for Railways for information in continuation of my letter of yesterday, No. 536.

MADRAS,
19th June 1874.

(Signed) J. W. MELLIS,
for Agent and Manager.

No. 239.

ORDER THEREON, 13th July 1874, No. 1,879.

RAILWAY, No. 34.

RECORDED pending receipt of report
of the magisterial inquiry.

(True Extract.)

Colonel, R.E.,

Secretary to Government.

To the Consulting Engineer for Railways.
Judicial Department.

Exd. S. T. Austin.

Spare Copies

No. 407.

Madras Railway Company
Chief Engineer's Office
Madras 10th June 1874.

The Agent and Manager,
Dear Sir,

I beg to give the following particulars of the accident which befell the Inspection Train on the 16th instant.

2. This Train, composed of a small Engine, the Engineer's Inspection Carriage and a Goods Brake Van, had left Madras on the morning of 15th instant under the orders of the Acting Deputy Chief Engineer (Mr Robinson) who was proceeding on his quarterly inspection of the North West Line. It reached Cuddalore on that day and on the morning of 16th started at 6 o'clock AM for the purpose of running over the 2^d Division, and Bellary Branch. When crossing the Panpuzer bridge however the Engine mounted the West Rail between the centre and south end of bridge and got off the Road, crashing through the sleepers and the Bearings of the Bridge and over setting the south half of the Western girder, of which the bottom web became fractured at its point of continuity, over the intermediate Pier.

3. The bed of the River is at this point dry and about 17 feet below Rail level. The Engine was pitched on its side and all the heating and driving portions of it were smashed to pieces. One of its wheels was broken off short, from the end of the

44
wheels. The Inspection Carriage was completely demolished and the Brake Van having fallen bottom forward with its wheels without the west trestle of the Pile pier which supported the north end of the girder, was suspended a little above the River bed. The concussion bent the 5 Piles of the trestle at various considerable angles. The timber work of the Van escaped almost undamaged as the shock was received by its heavy wheels.

4. You are already in possession of full particulars as to the extent of injury sustained to life and limb by the persons who travelled with the train. This would have been greater had the Brake Van not been arrested in its descent as I have described.

5. As you are aware I gauged the line of Rails over the Bridge in presence of yourself and Colonel John Stewart, on the morning after the accident and found it correct and in correspondence with the gauge over the rest of the Section, viz. eight feet six inches, the rollers being outside and gibs inside according to the drawing furnished by Sir John Hawkshaw.

6. I also closely examined the Road over the Bridge on the evening of the same day (17 June) and found it in good condition, and as there is no evidence of any obstruction having been placed on the Road or that the Engine was in a defective state, I conclude that the cause of its mounting the Rail

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was vibration of the Bridge due to the motion
of the Train. What the speed was over the
Bridge has not yet been satisfactorily as-
certained but will probably be elicited in
the course of the investigation by the magistrate.

7. The Paupunee Bridge is composed
of ten sets of wrought Iron Boiler Plate
Girders, each continuous over two openings
and supported on 19 Piers, each composed
of two trestles of elliptical Locomotive Poles, and a
masonry abutment at each end. It was
designed by Mr. John. Hawkshaw, and
carefully erected and is in every respect a
sufficient Bridge.

Yours faithfully
J. H. Fairg.
Sg. Chief Engineer.

// True Copy //

J. H. Nellis.
per the Agent & Manager.

Op. 537.

The Consulting Engineer for Railways
for information in continuation of
my letter of yesterday Op. 536.

Madras
19th June 1874.

E. J. P.

Railway Department.

CONSULTING ENGINEER'S OFFICE.

No. 364.

From

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

Consulting Engineer for Railways,

To

COLONEL G. W. WALKER, R.E.,

Secretary to Government,

Public Works Department.

~~Public Works Department.~~

SIR,

Cotacaimund.

In continuation of
my letter No 358 dated the 18th
instant, I have the honor to for-
ward, for the information of
Government, a further communica-
tion from the Agent of the Madras
Railway Company, enclosing a
report from the Chief Engineer
upon the recent accident at the
Pauspuznee river.

Yours

No 534

19 June 74.

O. W. 3720 04/14

126. 2/13 July 1874
for 1874 No 238
20 June 1874

2. Upon the 19th and 20th instant I was present at an inquiry instituted by the Magistrate of the Buddapah district into the circumstances of the accident. The evidence taken by Mr. Howley was voluminous, and will I presume be shortly laid before Government. The facts are simple; and I understand that Mr. Howley arrived at the conclusion expressed in my previous letter, namely, that the accident was altogether due to the excessive speed at which the train was driven.

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3. The bridge where the accident occurred consists of twenty girder openings of 70 feet each. The girders are constructed in continuous lengths of 140 feet, each girder spanning two openings. The abutments are built of stone, and the piers are constructed of screw piles, the piles being arranged so as to form trestles, each trestle consisting of five piles, and two trestles forming the pier. As stated by Mr. Young, the bridge has been carefully erected in accordance with Sir John Hawkshaw's design; but it does not

not possess the degree of rigidity and strength to be found in most of the large girder bridges upon the Madras Railway. With few exceptions, the large bridges on the Madras Railway are formed of 140 feet continuous girders, spanning two openings, resting upon masonry piers.

The substitution of screw piles for masonry in the piers tends to reduce in two directions the strength and rigidity of the structure. In the first place the pier, from its nature, is necessarily less rigid, and more liable

liable to receive and to communicate vibration and oscillation; and, in the second place, the unsupported length of the girder is increased from 64 feet to 66 feet. For these reasons bridges of the special class to which the Paupugue bridge belongs have always been held to be unsuited for the running of trains at high speed. In the case of the bridge over the Chittavatty river the speed of trains has been limited to eight miles per hour; and it has always been understood that a somewhat similar limit would have

have been fixed in the case of the Pauquene bridge had it not been that the Comilapoor station, at which every train is fixed to stop, is only about half-a-mile distant.

4. Another reason, if it were required, for running over the Pauquene river at moderate speed is to be found in the construction of the girders, which are in several respects superior in strength to those that have of late years been sent from England for spanning similar openings.

There

5. There is considerable difference of opinion as to the speed at which the inspection train was driven over the bridge upon the morning of the 16th instant. From the evidence adduced at the Magisterial inquiry, His Excellency the Governor in Council will be able to form an opinion upon this point. Those who were in the train are of opinion that, at the moment of the accident, they were travelling at the rate of about 35 miles an hour. After carefully studying the local circumstances, and weighing the evidence

evidence, I am forced to the conclusion that the speed could not have been less than 45 miles an hour.

For the assistance of the Government in considering the subject, I enclose a rough sketch showing a portion of the line upon each side of the Paupugnee river.

With great satisfaction I am able to report that the four persons injured by the accident are all making favourable progress.

Yours

100 5
4. During last week I was able to inspect almost daily the construction of the temporary bridge across the gap. The Deputy Consulting Engineer is now upon the spot, and I hope to hear that communication has been restored tonight or tomorrow morning. Great credit is due to Mr. Storey for his successful exertions.

I have the honour to be

Sir

Your most obedt servant.

Wm. Stewart L. Holbe

Cons. Engineer for Railways

Madras. 3
23 June 1874
W. Stewart

Wheatstone
1879
Recorded pending receipt of report
to the internal inquiry.

To C. E. Dyer
June 18 Sept 18
L. Capier despatch to habe 1777/4.

with records & further
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 commenced two years
 the night Mr. B. coming
 in report found the Book
Signature upon the Book
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 Andrew had been

Dated 23rd June 1874.
Recd. 29th June 1874.
Buck: 2.
A.C. No. 1874. 23/6/4.
Fortitude Bay.

From :
The Consulting Engineer
for Railways,
To
The Secretary to Government,
P. W. Department,
Fort Saint George.

RAILWAY DEPARTMENT.

3920 a
★
Govt. of Madras.
PUBLIC WORKS.

To The Engineer
for Mys.

Date.

Place.

Encl. 2

G. O. 13 July 1874, No. 1574

Nos. 238-239

report of the ma-
= gisterial inquiry

Accident - Madras Ry

Letter from the Engineer
for Railways forwarding
with remarks a further
communication from the
Agent submitting a report
from the Chief Engineer
on the recent accident
at the Panjagenee river,
forwarded, pending receipt.

3920 a
★
Govt. of 1874 Madras.
PUBLIC WORKS.

To The Engineer
for Mys.

Date.

Place.

Encl. 2

G. O. 13 July 1874, No. 1574

Nos. 238-239

report of the ma-
= gis trial inquiry

Accident - Madras Ry

Letter from the Engineer
for Railways forwarding
with remarks a further
communication from the
Agent submitting a report
from the Chief Engineer
on the recent accident
at the Tanjore river,
forwarded, pending receipt.