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MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No.	3463	Press
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Dated	9-12	6874
		195

Not to be folded or roughly handled

No. 184. 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, 4th November 1874, No. 678:—

In continuation of letters Nos. 553 and 582, dated respectively the 18th and 30th September 1874, I have the honor to submit, for the information of Government, the papers noted in the margin, upon the subject of the break near the Cadgoody station on the Bangalore branch of the Madras Railway on the 17th September 1874.

From Agent, Madras Railway, No. 916, 13th October 1874.
From Deputy Consulting Engineer, 20th September 1874.
Do. do. do., 30th September 1874.

2. The submission of these papers has been delayed in the hope that I should by this time have been able to lay before His Excellency in Council the opinions of the Railway Authorities regarding the sufficiency or otherwise of the waterway provided by the existing bridge, consisting of five 30 feet arches; but the information necessary to arrive at a conclusion upon this point is still incomplete, and the extensive damage which other parts of the Madras Railway system have lately sustained will probably cause still further delay in the submission of the additional reports promised.

3. With reference to paragraphs 4 and 5 of the Deputy Consulting Engineer's report, dated the 30th September, it may be mentioned that the temporary bridge was inspected by me upon the 2nd October, and that during the three days which had elapsed since Captain Thompson's visit, the structure had been greatly improved and strengthened, so much that I considered it unnecessary to limit the speed below five miles per hour, or to insist upon the trains being brought to a stand-still before passing over the bridge.

From R. B. ELWIN, Esq., Agent and Manager of the Madras Railway Company, to Lieutenant-Colonel J. H. M. SHAW-STEWART, R.E., Consulting Engineer for Railways, dated Madras, 13th October 1874, No. 916.

With reference to paragraph 2 of your letter, No. 944, dated the 5th instant, I have the honor to enclose you a copy of the Acting Chief Engineer's letter of this date, No. 687, in which he affords particulars of the break on the Bangalore Branch near the Cadgoody station, which occurred on the 17th ultimo.

2. You will observe that Mr. Going is unable to estimate the area of the catchment basin of the drainage afforded at the part of the railway in question, and requests that this information may be obtained from the Mysore Authorities. I shall feel obliged by your obtaining the required information, and on receipt thereof a further report upon the subject will be submitted.

From T. H. GOING, Esq., Acting Chief Engineer, to R. B. ELWIN, Esq., Agent and Manager of the Madras Railway Company, dated Madras, 13th October 1874, No. 687.

In continuation of my letter No. 631, of 17th ultimo, reporting the breach of embankment at 203-16, Bangalore Branch, by an overflow of the Penankeney river on that date, I beg to give the following particulars: so far as the Resident Engineer can ascertain the following three tanks, Penankeney series, breached on the occasion in question, viz:—

2. Gullabillay kote, Boodigerry and Ooscottah. In addition to the water which escaped from the breach in Ooscottah tank band, there was a flow of 5 or 6 feet in depth over the waste weirs.

*Proceedings of the Madras Government, Public Works Department,
9th December 1874.*

3. The bridge of five 30 feet arches at 203-12 was constructed to carry all the discharge from the drainage basin of the Penankeny north of the railway. It was however insufficient, and the water backed up to an irrigation channel which was passed under the embankment by a 6 feet arched culvert at 203-16, carrying it away and forming an opening through the embankment of about 100 feet wide.
4. The bridge over the Penankeny was not damaged, although the water rose to within about a foot of the crown of the arches and rushed through with great velocity. The only effect appears to have been a scour of about 5 feet deep at the east abutment.
5. This bridge has no proper floor, but several train loads of large rubble stone were thrown into the channel beneath the arches some 18 months ago, and these have apparently resisted all scour except at the place noted above and have remained unmoved.
6. The sectional area of waterway of the bridge is 1,745 feet.
7. I have not ascertained at what velocity the water flowed when the flood was at its height, but am trying to arrive at this. I have also some difficulty in estimating the area of the catchment basin of this drainage, as the Ordnance sheet does not show clearly how much of the country to the east of the river and north of railway should be included. I should be obliged if you would kindly request the Consulting Engineer to ascertain this from the Mysore Authorities.
8. The question of amount of waterway required for the discharge of the Penankeny drainage must lie over till these two particulars are known with greater certainty, viz., velocity and catchment basin.
9. In the meantime, I shall only observe that whether or not the existing bridge be sufficient to carry off the ordinary discharge of the river, it is certain that it is not sufficient to meet the emergency which may at any time arise if one or more chains of tanks in this great series should again become breached.
10. The further consideration of the question of increased waterway will be discussed in a future letter.

Note on the "Break" of the 17th of September 1874 in the Bangalore Branch of the Madras Railway.

I HAVE the honor to report that a masonry culvert of 6 feet span, near Cadgoody Station, on the Bangalore branch of the Madras Railway, was carried away by an unusually high flood on the 17th instant at about 2-15 P.M.

2. The culvert was situated at the 203rd mile, 16th telegraph post, from Madras, or about three-quarters of a mile from Cadgoody, on the east side of the Railway Station. The number of the culvert was XXII.

3. At a distance of four telegraph posts further to the east is a masonry bridge* of five 30 feet arches, and at three telegraph posts, still further towards the east, is a 6 feet skew Culvert No. XXIV.

* No. XXIII.

4. The Pennair river, which has its source in the Nundydroog range, after feeding the Ooscottah and other tanks, flows under the railway through Bridge No. XXIII. During floods Culverts Nos. XXII. and XXIV. also carry off some of the water flowing down the valley of the Pennair, or as it is locally called the "Ooscottah nullah."

5. On the morning of the 17th instant, as the Permanent-way Inspector (Mr. Mersh) of the Bangalore branch was proceeding towards Malloor, he found the valley of the Pennair unusually full of water. The river having risen to within an inch or two of the crowns of the arches in Bridge No. XXIII.

Culverts XXII. and XXIV. were also discharging furiously.

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9th December 1874.*

6. The flood being so high and the current so violent, Mr. Mersh considered the bridge to be in imminent danger of being carried away, and accordingly turned back to telegraph warning from the Cadgoody Station.

7. He had examined Culvert No. XXII, a few minutes previously, and considered it to be perfectly sound and in no danger. He had however only proceeded about 20 or 30 paces in the direction of the station, after recrossing it, when he heard a crash behind him, and on turning back found that the eastern abutment of the culvert had been carried away. The breach thus formed rapidly increased in width through the washing away and falling in of the earthwork at each side of the culvert. It is now 90 feet wide.

8. The western abutment was left standing, but was broken up into several large blocks.

9. Mr. Mersh states that the culvert was carried away at or about 2-15 P.M. on the 17th instant.

10. The 11-15 A.M. train, consisting of 3rd class, cooly, and goods vehicles from Bangalore, passed over this culvert in safety at about 12-30 P.M. on the same day.

11. Over the breach thus formed, the rails, with their tie-bars and pot sleepers, were left suspended; the fish plates, and bolts having fortunately not given way.

12. The Resident Engineer of the Bangalore Branch (Mr. Scott) proceeded immediately to the break, and ropes, chains, sleepers, etc., materials of every kind which could be of any use, were sent down from Bangalore and Cadgoody. Nothing however could be done beyond placing some sleepers in line, end to end over the tie-bars connecting the suspended rails, to enable people to walk over singly. It was not deemed prudent to make a broader footway, as the extra weight of material would have tested too severely the endurance of the already over-strained fish plates and bolts; one person only at a time was allowed to walk over.

13. The 2-10 P.M. train of the 17th instant from Jollarpett (viz., the 7 A.M. from Madras) left Jollarpett with English Mails about 45 minutes late. It was again delayed about an hour at the Colar Road Station, whilst wooden sleepers, girders, etc., were being placed on wagons for conveyance to the break. It was therefore quite dark for some time before the train reached the break, and it had become a by no means safe or pleasant task to get the mails and passengers with their luggage across the breach, a furious current still rushing through. The Resident Engineer however contrived to get the lady passengers across in safety by walking backwards along the footway of sleepers holding the passengers by both hands, and thus giving them confidence to follow him. The children were carried across by him in his arms.

14. A special train was ready at the western, or Bangalore side of the break, so that passengers, luggage, and mails arrived at Bangalore about 10-30 P.M.

15. The mails and most of the passengers by the mail train of the evening of the 17th instant from Madras, reached Bangalore at 7 A.M. on the 18th instant. The Resident Engineer again undertaking the task of getting the lady passengers and children across. It was of course distinctly understood that passengers were to cross *at their own risk*, but when once they had made up their minds to do so every possible assistance appears to have been given them by the Railway officials.

16. I was not aware until the forenoon of the 18th instant that the line had been breached at Cadgoody, but I went down to the break as soon as possible by a special engine after hearing of the occurrence. Mr. Scott (the Resident Engineer), Mr. Johnson (the Bangalore Station Master), Mr. Mersh (the Permanent-way Inspector), and Mr. Patten (the Sub-Inspector of Permanent-way), were at Cadgoody and the break, making arrangements for restoring through communication as soon as possible, but as there was still a tremendous rush of water through the breach very little could be done.

17. A stout chain was passed under the tie-bars, connecting the suspended rails, and firmly anchored at each side of the breach, to ease the strain on the fish plates as much as possible. This chain has since done good service.

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9th December 1874.*

18. A pier of wooden sleepers was constructed between the then still standing western abutment of the culvert and the railway embankment on the Bangalore side of the breach, to give the suspended rails a bearing, and thus reduce the span, and consequently the strain on the fish plates and bolts.

19. At 5-5 P.M. on the 18th instant, whilst this sleeper pier was being constructed, the western abutment of the culvert fell over towards the eastward, into the main body of the current. Fortunately no one was hurt, the workmen being all employed to the eastward of the falling abutment.

20. A large boat belonging to the Sappers and Miners, and capable of holding about 35 people with safety, has been lent by Major H. L. Prendergast, R.E., Commanding. It was conveyed from Bangalore to the breach on a couple of carriage trucks, and was launched successfully on the evening of the 18th. It has since done good service in carrying passengers and luggage across the stream. A party of six Sappers and a Naigue work it, and regulate the number of passengers each trip.

21. The boat is firmly secured by ropes. No oars or poles are used in crossing, so there is no danger of its breaking away and being carried down stream.

22. A stout rope of about 40 yards in length is attached to the boat midships, the other end being fastened to a tree immediately opposite to the breach. The boat is thus free to swing like a pendulum; ropes are attached to her stem and stern by means of which she is hauled from one side of the breach to the other. Twenty-five passengers are allowed to cross at one time.

23. Loading and unloading the boat and time of passage occupy about 2½ minutes. As 25 people can be safely passed over in this space of time the stoppage to passenger traffic is not so great as before, when only two persons per minute could cross by the footway on the suspended rails, and no heavy baggage could be carried over.

24. Long wooden sleepers are being brought up from Colar, Jollarepett, and Tripatore, and as soon as the water has subsided sufficiently, two sleeper piers will be constructed, over which a couple of 20 feet girders will be placed to carry the rails and sleepers. It is hoped that by this means through communication may be restored, and the culvert reconstructed, without making a "diversion" of the line. It is however impossible to speak with any certainty on this point, as a deep hole has been scoured where the culvert was, and until the water subsides it cannot be known whether sleeper piers can be safely constructed or not.

25. The flood has now subsided to below the cut-water caps on the piers of bridge No. XXIII. Although there has been a great scour at the upstream side of each abutment, the bridge seems sound enough. Trains are therefore allowed to run over it and come close up to the break. This bridge has not been floored, but about eighteen months ago between forty and fifty trucks of stone were thrown in to form a rough floor. It is believed that this, and the 90 feet breach at culvert No. XXII, have been the means of preserving it. There is a report that the flood was caused by the bund of the large Ooscottah tank having been cut by villagers, but I am unable at the present moment to say whether the report is true or not.

26. I regret very much to add that one of the men employed at the break, an old railway servant, though a young man (S. Reddy Maistry), was unfortunately drowned yesterday morning. He had waded into the water some 50 or 60 yards above the breach to ascertain the depth of the water, when he appears to have gone too far and to have got beyond his own depth. He was then carried off by the current through the breach and drowned; I have not yet heard of the body having been recovered. The occurrence was immediately reported to the Police, and in the afternoon an official inquest or investigation was held.

27. The unfortunate man did not call out, or make any signs of requiring assistance. He was known to be an excellent swimmer, so there are many theories started as to the cause of his sinking so suddenly. Such as cramps, fits, being sucked under by under-currents, etc.

28. It is impossible to say exactly by what date through communication will be restored, but all is being done which can be done by the Resident Engineer, who, with the Inspector and

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Sub-Inspector of Permanent way, and the Bangalore Station Master, has been constantly on the spot since the afternoon of the 17th instant.

BANGALORE,
20th September 1874.

(Signed) ROSS THOMPSON, Captain, R.E.,
Offg. Dy. Consulting Engr. for Railways.

*Note on the break in the Bangalore Branch line, Madras Railway, near Cadgoody of
September 17th, 1874.*

I HAVE the honor to report having seen the temporary bridge over the break at Cadgoody satisfactorily tested on the evening of the 28th, and again on the morning of the 29th instant. The temporary bridge consists of two openings, the abutments and pier are built of squared sleepers, and 30 feet girders are laid over them.

2. It was first tested with a single engine and afterwards with two, coupled funnel to funnel. The engines weighed together about 75 tons.

3. Levels were taken over the abutments and pier before and after testing, and a barely perceptible subsidence was observed. As the girders were taken from "Accident stock," were in good order, and had been used on several occasions previously, they were not tested for deflection. The amount of lateral movement observed was very small.

4. A telegram as follows was despatched by me to the Consulting Engineer for Railways on the evening of the 28th instant:—

"Temporary bridge, Cadgoody break, satisfactorily tested; through traffic may be resumed. Speed limited to three miles per hour."

5. The Resident Engineer is of opinion that trains should first be brought to a stand still on each side of the temporary bridge, at a distance of 100 yards from it, and then run across at a speed not exceeding three miles per hour. I quite agree with him as to the advisability of these precautions, as there is a long steep gradient on each side of the bridge, and consequently an inducement to engine drivers to allow their trains to acquire momentum in running down one gradient to enable them to surmount the opposite one.

The speed at which the bridge would be crossed under such circumstances would be much greater than is at present advisable.

6. The pier of the temporary bridge rests on a bed of rough stone thrown in until raised slightly above the level of ordinary floods. One hundred and thirty truck loads were thrown in before this level was attained. Earth was then thrown in on each side of the stone, and rough stone again on each side to prevent the earth from washing away.

7. The foundation thus secured for the pier is strong enough so long as water does not flow over it, but should a slightly higher flood than usual come down, and a stream flow through the bridge openings, the pier would be seriously endangered, and it would be again necessary to stop through traffic. There is no doubt that the temporary bridge, by affording two openings of 30 feet each, would greatly relieve the bridge of five 30 feet spans over the "Ooscottah nullah" in the event of another high flood, but if it were not for the possibility of such a flood I would strongly recommend that the breach over which the temporary bridge has been constructed should be at once closed by making up the embankment.

8. The culvert which was carried away was constructed over an irrigation channel, and for this channel an opening must be left in the line. The amount of land to be irrigated is, I understand, about 300 acres, and for this a supply of 10 cubic feet of water per second would, I believe, be sufficient.

9. It would, I think, be better and safer to lay down an iron pipe or group of pipes of sufficient capacity to pass this amount of water than to reconstruct the masonry culvert.

*Proceedings of the Madras Government, Public Works Department,
9th December 1874.*

10. I fear the bridge of five 30 feet spans over the "Ooscottah nullah" is not sufficiently large to pass unusually high floods. It was in a very critical state on the 17th and 18th instant although relieved by the breach of 90 feet in the line. The waterway should, I think, be increased by not less than 60 feet. This might be done by having a 30 feet girder opening added to each end of the bridge.

11. In my former report on the Cadgoody break, dated 20th September 1874, paragraph 25, I mentioned a report being in circulation that the bund of the Ooscottah tank had been cut by villagers; this report however proved to be untrue.

12. The body of the unfortunate maistry, who was drowned on the 19th instant, was found the following day about 150 or 200 yards below where he disappeared; as he was sucked under water in the eddy immediately above the bridge, it is supposed that he must have been driven violently against the sunken masonry as he never rose again, and when the body was discovered the skull was found to be fractured.

MADRAS,
30th September 1874.

(Signed) ROSS THOMPSON, Captain, R.E.,
Offg. Dy. Consulting Engineer for Railways.

No. 185.

ORDER THEREON, 9th December 1874, No. 3,463.

RAILWAY, No. 30.

In his letter of 18th September, recorded with G. O., No. 2,819, of 3rd October, the Consulting Engineer communicated the fact of a 6 feet culvert having been carried away, of a considerable breach of embankment having been caused, and of a bridge of five 30 feet arches being endangered near the Cadgoody station on the Bangalore line by a flood. In a subsequent letter of the 30th September, recorded with G. O., No. 2,945, of 15th October, he reported that a temporary bridge over the break had been completed and tested, and that traffic had been resumed on the 28th September. But it is not till the 4th November that the particulars promised in his former communications have been supplied by the Consulting Engineer. His Excellency the Governor in Council trusts that similar delay will be avoided in future.

2. It appears that the entire provision made under the Ooscottah tank for passing the drainage of the valley in which it is situated was one bridge of five 30 feet vents and a 6 feet culvert on either side of it, one of which was destroyed and has been temporarily supplemented by two 30 feet girders laid on abutments and a pier of squared sleepers; and there is no doubt but that it was the existence of this large supplemental waterway which saved the bridge when again endangered by the actual bursting of the Ooscottah tank a month later, as recorded in G. O., Nos. 3,174, 3,241, and 3,291 of 9th, 16th, and 21st November. It remains to be determined whether the waterway originally allowed was sufficient for the area drained and maximum rainfall to be provided for, without reference to the contingencies of breaching tanks which are being provided against by the Irrigation branch of the Mysore Public Works Department; and pending settlement of the question and provision against breaches, it is evident that the surplus waterway now allowed must not be lessened.

3. It is noted that the Consulting Engineer has overruled, as rendered unnecessary by subsequent improvements to the temporary structure, the original

*Proceedings of the Madras Government, Public Works Department,
9th December 1874.*

restrictions under which it was to be traversed, viz., limitation of speed to three miles an hour, after previous stoppage 100 yards before reaching it. The speed of five miles an hour now permitted may be quite safe; but with the long steep gradient said to exist on either side, His Excellency the Governor in Council cannot but think that to secure its not being exceeded it may be as well to insist on previous stoppage. The late accident at the Paupugnee bridge, caused by excessive speed, regarding the exact amount of which opinions varied, points to the expediency of even excessive caution to ensure that the limit of safety shall not be passed.

(True Extract.)

(Signed) G. W. WALKER, Colonel, R.E.,

Secretary to Government.

To the Consulting Engineer for Railways.

Exd. S. T. Austin.

Spare Copies

No. 916

3
MADRAS RAILWAY.

AGENT AND MANAGER'S OFFICE.

Madras, 13 October 1874.

From

Robert B. Elwin Esqr

Agent and Manager, M. R. Company.

To

Lieut. Colonel J. H. Mc Shaw Stewart
R.E.

Consulting Engineer for Railways.

Sir,

With reference to paragraph 2 of your letter No 944 dated the 5th instant I have the honour to enclose you a copy of the Acting Chief Engineer's letter of this date No 687 in which he affords particulars of the break on the Bangalore Branch near the Badgoody station which occurred on the 17th ultimo.

You will observe that Mr. Goring is unable to estimate the area of the catchment basin of the drainage afforded at the part of the Railway in question, and requests that this information may be obtained from the Mysore authorities. I shall feel obliged by your obtaining the required information.

information and our receipt thereof a
further report upon the subject will
be submitted.

I have the honour to be,
Your most ^{dev}oted servant

Wm. G. Brown

Agent and Manager.

Pl. 79 Dec/74
In B No 184

J. W. 6989/74
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Attending further
particulars in relation
to the recent breach
on the Bangalore Branch
near the Chigary
Station -

Dated 13 October 1874
Recd. 14.10.74
No. 916.

From
MADRAS RAILWAY.
To
The Agent and Manager.
The Consulting Engineer
for Railways.

341

No 687.

Madras Railway Company
Chief Engineer's Office
Madras 13th October 1874

The Agent and Manager
Dear Sir,

In continuation of my Letter No 631 of 17th ultimo reporting the breach of embankment at 203 Bangalore Branch by an overflow of the Penna River on that date I beg to give the following particulars so far as the Resident Engineer can ascertain the following three Tanks Penna series breached on the occasion in question viz.
2. Gillabellay Kote Brodigerry and Ooscottah. In addition to the water which escaped from the breach in Ooscottah Tanks. Pond there was a flow of 5 or 6 feet in depth over the water weirs.

3. The Bridge of 5 thirty feet arches at 202 was constructed to carry all the discharge from the drainage basin of the Penna north of the Railway. It was however insufficient and the water backed up to an irrigation channel which was passed under the embankment by a 6 feet arched culvert at 203 carrying it away and forming an opening through the embankment of about 100 feet wide.

4. The Bridge over the Penna was not damaged although the water rose to within about a foot of the crown of the arches and rushed through with great velocity. The only effect appears to have been a scour of about 5 feet deep at the last abutment.

5. This bridge has no proper floor but several train loads of large rubble stone were thrown into the

Ph. 39 Dec 7/74 P. W. 6989/74

In B. 184

the channel beneath the arches some 18 months ago, and these have apparently resisted all scour except at the place noted above and have remained unimpaired.

6. The sectional area of waterway of the bridge is 1745 feet.

7. I have not ascertained at what velocity the water flowed when the flood was at its height but am trying to arrive at this I have also some difficulty in estimating the area of the catchment basin of this drainage as the Ordnance Sheet does not show clearly how much of the country to the east of the river and north of Railway should be included. I should be obliged if you would kindly request the Consulting Engineer to ascertain this from the Mysore authorities.

8. The question of amount of waterway required for the discharge of the Pennamony drainage must lie over till these two particulars are known with greater certainty viz velocity and catchment basin.

9. In the meantime I shall only observe that whether or not the existing bridge be sufficient to carry off the ordinary discharge of the river, it is certain that it is not sufficient to meet the emergency which may at any time arise if one or more chains of tanks in this great series should again become breached.

10. The further consideration of the question of increased waterway will be discussed in a future letter.

(True copy)

Yours faithfully

(Signed) J. H. Young

Ag. Chief Engineer

W. J. Young
Agent and Manager

Note on the Break of the 14th of September 1874, in the Bangalore Branch of the Madras Railway.

1. I have the honour to report that a masonry Culvert of six feet span, near Cadgoody Station on the Bangalore Branch of the Madras Railway, was carried away by an unusually high flood on the 14th instant at about 2.15 P.M.

2. The Culvert was situated at the 203rd mile 16th Telegraph Post from Madras, or about three quarters of a mile from Cadgoody, on the East side of the Railway Station. The number of the Culvert was XXII.

3. At a distance of four Telegraph posts further to the East, is a masonry Bridge of five

No XXIII

30 feet Arches, and at three
telegraph posts, still further
towards the East, is a six feet
skew Culvert - No XXIV.

The Penuir River, which 4.
has its source in the Mundy-
Brook Range, after feeding
the Oasottah and other Panar Rivers,
flows under the Rail-
way through Bridge No XXIII.
During floods, Culverts - Nos
XXII and XXIV also carry
off some of the water flowing
down the Valley of the Penuir,
or as it is locally called
the "Oasottah Nullah".

On the morning of the 14th - 5.
Mr. As the Permanent way
Inspector (Mr. Marsh,) of the
Bangalore Branch, was
proceeding towards Malloor,
he found the Valley of the
Penuir unusually full of
water. The river having
risen to within an inch or two

of the Crowns of the Arches
in Bridge No XXIII.
Culverts XXII and XXIV were
also discharging furiously.

6. The flood being so high and
the current so violent, Mr.
Marsh considered the bridge
to be in imminent danger
of being carried away, and
accordingly turned back
to telegraph warning from
the Cadgody Station.

7. He had examined Culvert
No XXII a few minutes
previously, and considered
it to be perfectly sound
and in no danger. He
had however only proceeded
about 20 or 30 paces in
the direction of the Station,
after recrossing it, when
he heard a crash behind
him, and on turning back,
found that the Eastern
abutment of the Culvert had

been carried away. The
breach thus formed rapidly
increased in width, through
the washing away and falling
in of the Eastwork at each
side of the Culvert. It is now
90 feet wide.

The western abutment was 8.
left standing, but was
broken up into several
large blocks.

Mr. Marsh states that the 9.
Culvert was carried away
at or about 2.15 pm on
the 17th Inst.

The 11.15 am train, consisting 10.
of 3rd Class, Cattle, and Goods
vehicles from Bangalore,
passed over this Culvert
in safety at about 12.30
pm on the same day.

Over the breach thus formed, 11.
the rails, with their tie bars
and foot sleepers, were left
suspended; the fish plates

plates, and bolts having
fortunately not given way.

12. The Resident Engineer of
the Bangalore Branch
(Mr. Scott) proceeded immediately
to the break, and ropes,
chains, sleepers &c. —
materials of every kind
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Nothing however could be
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not deemed prudent to
make a broader foot-way,
as the extra weight of material
would have tended to severely
test the endurance of the already
overstrained fish plates and
bolts — The person only at a time

was allowed to walk over
The 2.10^{pm} train of the 14th Inst - 13.
from Jollapet, (viz the 7. am
from Madras). Left Jollapet
with the English Mails, about
45 minutes late - It was
again delayed about an
hour at the Colar Road
Station, whilst wooden sleepers
girders &c. were being
placed in wagons for
conveyance to the break.
It was therefore quite dark
for some time before the
train reached the break, and
it had become a by no means
safe or pleasant task to
get the mails, and passengers
with their luggage across
the breach, a furious current
still existing through -
The Resident Engineer however
continued to get the lady
passengers across in safety

by walking backwards
along the foot-way of sleepers
holding the passengers by
both hands and thus
giving them confidence to
follow him. The children
were carried across by him
in his arms.
14. A special train was ready
at the western, or Bangalore
side of the break, so that
passengers, luggage, and
mails arrived at Bangalore
about 10.30 pm -
15. The mails and most of the
passengers by the mail train
of the evening of the 14th
Inst from Madras, reached
Bangalore at 7. am on
the 18th Inst. The Resident
Engineer again undertaking
the task of getting the
lady passengers and children
across - It was of course
distinctly understood that

that passengers were to cross
at their own risk, but when
once they had made up
their minds to do so, every
possible assistance
appears to have been given
them by the Railway Officials.
I was not aware until the 15th
forenoon of the 18th that
the line had been braced
at Cadgordy, but I went
down to the break as soon
as possible & a special engine
after hearing of the occurrence.
Mr Scott (the Resident Engineer),
Mr Johnson (the Bangalore
Station Master), Mr. Marsh
(the permanent-way inspector)
and Mr. Patton (the Sub-
inspector of permanent-way)
were at Cadgordy and the
break, making arrangements
for restoring through communication
as soon as possible - but
as there was still a
 tremendous rush of water

water through the breach,
very little could be done.
16. A stout chain was passed
under the tie bars, connecting
the suspended rails, and
firmly anchored at each
side of the breach - to ease
the strain on the fish plates
as much as possible - &
this chain has since done
good service.

17. A pair of wooden sleepers
was constructed between
the two still standing
western abutments of the
culvert, and the railway
embankment on the Bangalore
side of the breach, to give
the suspended rails a
bearing, and thus reduce
the span, and consequently
the strain on the fish
plates and bolts.

18. At 5.5 pm on the 18th inst.
while this sleeper pair
was being constructed

Constructed, The Western Abutment
of The Culvert - fell over towards
The Eastward, into The main
body of The Current. Fortunately
No one was hurt, - The workmen
being all employed to The
Eastward of The falling
Abutment.

19. A Cargo boat - belonging to The
Sappers and Miners, and
Capable of holding about
35 people with Safety, has
been sent - by Major H. L.
Pendergast, R.E. Commanding.
It was conveyed from
Bangalore to The beach
on a Couple of Carrier
trucks, and was launched
successfully on The morning
of The 18th. It has since
done good service in carrying
passengers and luggage
across The stream. A party
of Six Sappers and a Native
work it, and regulate The
number of passengers each trip.

20. The boat is firmly secured
by Ropes - No Bars or poles
are used in crossing, so
there is no danger of its
breaking away and being
carried down stream -

21. A stout Rope of about 40 yards
in length - is attached to
The boat - Amidships, The
other end being fastened
to a tree immediately
opposite to The beach -
The boat is thus free to
swing like a pendulum.
Ropes are attached to her
stern and stem - by means
of which she is hauled
from one side of The beach
to The other. Twenty five

passengers are allowed to
cross at one time -
Loading and unloading
The boat, and time of passage
occupy about 2 1/2 minutes.
As 25 people can be
safely passed over in this

space of time, the stoppage
to passenger traffic is not
so great as before - when
only two persons per minute
could cross the foot-way
on the suspended rails.

And no heavy baggage could
be carried over.

Long wooden sleepers are
being brought up from
Colony of the port - and
Tripalme, and as soon as
the water has subsided
sufficiently, the sleeper
piers will be constructed
over which a couple of
20 ft girders will be placed,
to carry the rails and sleepers.

23

It is hoped that by this means
through communication may
be restored, and the Culvert-
reconstructed, without making
a "diversion" of the line.
It is however impossible to
speak with any certainty

Certainty on this point, as
a deep hole has been scoured
where the Culvert was -
and until the water subsides,
it cannot be known whether
sleeper piers can be safely
constructed or not.

24

The flood has now subsided
to below the Cul-water Caps
on the piers of Bridge No

XXIII. Although there
has been a great-scan
at the up stream side of
each abutment, the bridge
seems sound enough. Trains
are therefore allowed to
run over it - and come
close up to the break -

This bridge has not been
flooded, but about eighteen
months ago, between forty
and fifty trucks of stone
were thrown in to form a
rough floor. It is believed
that this, and the 90 feet-

breach at Culvert No XXII
have been the means of
preserving it. There is
a report - that the flood
was caused by the breach
of the large Oscott tank
having been cut by villagers,
but I am unable at the
present moment to say
whether the report is true
or not.

I regret very much to add 25.
that one of the men employed
at the break, an old Railway
servant, through a young man
(S. Paddy Maistry) was
unfortunately drowned yesterday
morning. He had waded
into the water some 50 or
60 yards above the breach
to ascertain the depth of
the water, when he appears
to have gone too far and
to have got beyond his own
depth. He was then carried

carried off by the current, through
the breach and drowned.
I have not yet heard of
the body having been
recovered - The occurrence
was immediately reported
to the police, and in the
afternoon an official inquest
or investigation was held.

26. The unfortunate man did
not call out, or make
any sign of requiring
assistance, he was known
to be an excellent swimmer,
so there are many theories
started as to the cause
of his sinking so suddenly.
Such as cramps, fits,
being sucked under by
under currents &c. &c.

27. It is impossible to say
exactly by what date
through communication will
be restored, but all is being
done which can be done
by the Resident Engineer

Engineer, who, with the Inspector,
and Sub-Inspector of Permanent
Way, and the Bangalore
Station Master, has been
constantly on the spot since
the afternoon of the 14th inst.

Robert Thompson

Capt. R.E.

Offg. Dy. Consulting Engineer for Railways

Bangalore
September 20th 1874

R.H. 19 Dec 1874

In B. No. 184

23. Sept. 1874

P.W. 6989/74

4

80 14
Note on the Break in the
Bangalore Branch Line
Madras Railway near
Cuddoody. 7 September 1874.

1. I have the honour to report
having seen the temporary
bridge over the break at
Cuddoody, satisfactorily
tested on the evening of
the 28th, and again on
the morning of the 29th
instant. The temporary
bridge consists of two
openings, the abutments and
pier are built of squared
sleepers, and 30ft girders
are laid over them.
2. It was first tested with a
single engine and afterwards
with two, coupled funnel
to funnel. The engines
weighed together about 75
tons.
3. Levels were taken over the
abutments and pier, before
and after testing, and a

a barely perceptible Subsidence
was observed. As the
Girders were taken from
"Accident-Stock", care in
good order, and had been
used on several occasions
previously, they were not
tested for deflection. The
amount of lateral movement
observed was very small.

A telegram as follows was 4.
dispatched by me to the
Consulting Engineer for
Railways on the evening
of the 28th instant.

"Temporary bridge, Cadzowdy."
"Break, Satisfactorily tested."
"Through traffic may be."
"Resumed. Speed limited."
"to three miles per hour."

The President-Engineer is of 5.
opinion that trains should
first be brought to a stand
still on each side of the
temporary bridge, at a
distance of 100 yards from it,

15
and then run across at
a speed not exceeding
3 miles per hour. I quite
agree with him as to the
advisability of these
precautions, as there is
a long steep gradient,
on each side of the bridge,
and consequently an in-
crease in the speed of the
trains to acquire momentum
in running down the gradient,
to enable them to surmount
the opposite one.

/// The speed at which the
bridge would be crossed
under such circumstances
would be much greater than
is at present advisable.

6. The pier of the temporary
bridge rests on a bed of
rough stone, thrown in
until raised slightly above
the level of ordinary floods.
One hundred and thirty truck
loads were thrown in before
this level was attained.

Earth was then thrown in on each side of the Stone, and rough Stone again on each side, to prevent the Earth from washing away.

The foundation thus secured for the pier is strong enough, so long as water does not flow over it; but should a slightly higher flood than usual come down, and a stream flow through the bridge openings, the pier would be seriously endangered and it would be again necessary to stop through traffic. There is no doubt that the temporary bridge by affording openings of 30 ft. each, would greatly relieve the bridge of 5-30 ft. spans over the "Oscottah Mullah", in the event of another high flood, but if it were not for the possibility of such a

flood, I would strongly recommend that the breach over which the temporary bridge has been constructed should be at once closed & making up the embankment.

8. The Culvert which was carried away was constructed over an irrigation channel, and for this channel an opening must be left in the line.

The amount of land which irrigated is I understand about 300 acres, and for this a supply of ten cubic feet of water per second would I believe be sufficient.

9. It would I think be better and safer to lay down an iron pipe or group of pipes of sufficient capacity to pass this amount of water than to reconstruct the masonry Culvert.

10. I fear the bridge of 5-30 ft. spans over the Oscottah

Mullah " is not sufficiently large to pass unusually high floods. - It was in a very critical state on the 14th and 18th ^{inst} although relieved by the breach of 90 feet in the line. The water way should I think be increased by not less than 60 feet. This might be done by having a 30 ft. ^{wide} opening added to each ^{end} side of the bridge -

P. H. Thompson
 Capt. R.E.
 Offg. B. Com. Eng. for Railway

Madras
 September 30th 1874

In my ^{former} report on the Cadgondy break. dated 20 September 1874 Para 24 I mentioned a report being in circulation

that the bund of the Pascothah tank had been cut by Villagers. This report I mean proved to be untrue -

12. The body of the unfortunate Maistr who was drowned on the 19th inst, was found the following day, about 150 or 200 yards below where he disappeared -

As he was sucked under water in the eddy immediately above the bridge, it is supposed that he must have been driven violently against the sunken masonry as he never rose again and when the body was discovered the skull was found to be fractured

F. E.
 Madras
 Sept 30th 1874

Railway Department.

CONSULTING ENGINEER'S OFFICE.

No. 678.

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.

Fort Saint George.

SIR,

In continuation of letters Nos 553 and 582, dated respectively the 18th and 30th September 1874, I have the honour to submit for the information of Government the papers noted in the margin, upon the subject of the break near the Cadgody station on the Bangalore branch of the Madras Railway on the 17th September 1874.

2.

The submission of these papers.

* From Agent Mr. A. Pro 916. 13 October. 1874.
From J. H. M. Shaw Stewart. 20 September. 1874.
do do 20 September 1874.

P. W. 6989/74

P. G. d/9 Decr 1874
In B. A. 1874

30 Sept. W.

papers has been delayed in the hope that I should by this time have been able to lay before His Excellency in Council the opinions of the Railway Authorities regarding the sufficiency or otherwise of the waterway provided by the existing bridge, consisting of five 30 feet arches; but the information necessary to arrive at a conclusion upon this point is still incomplete; and the extensive damage which other parts of the Madras Railway system have lately sustained will probably cause still further delay in the submission of the additional reports promised.

With reference to paragraphs

paragraphs 4 and 5 of the Deputy Consulting Engineer's report dated the 30th September, it may be mentioned that the temporary bridge was inspected by me upon the 2nd October, and that during the three days which had elapsed since Captain Thompson's visit, the structure had been greatly improved and strengthened, so much that I considered it unnecessary to limit the speed below 5 miles per hour, or to insist upon the trains being brought to a stand-still before passing over the bridge.

I have the honour to be
Sir

Your most obedient servant
W. Maitland M. A. Esq.
Cons. Engineer for Railways

Madras
4th November
1874

[Faint, mostly illegible handwritten text, likely bleed-through from the reverse side of the page.]

[Vertical handwritten notes on the left margin:]
 1874-8-10-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100

[Handwritten notes at the bottom left:]
 Further reports upon
 the track near the
 existing station
 on the Madras line
 received by the railway
 on 17th September 1874
 No. 2463. 9-12-74.

[Printed and handwritten text at the bottom right:]
 Dated 4th Nov. 1874
 Received by
 Secy. 4. 25. 698.
 To The Secretary to Government,
 P.W. Department,
 Fort Saint George.
 From The Consulting Engineer
 for Railways,
 J. 6989.
 S. 1874. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100

[Handwritten notes at the top right:]
 1874-8-10-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100

Proceedings of the Madras Government,
 Under date the 187

Read the following:—

From
 The Consulting Engineer
 for Railways } (M. No. 678. d/4)
 November 1874

In his letter of 18th
 September recorded with
 No. 2819 of 3 Oct., the
 Consulting Engineer
 communicated the fact
 of a 6 feet Culvert having
 been carried away, of a
 considerable breach of
 embankment having
 been caused, and of a
 bridge of 5, 30 feet
 Arches

[Handwritten notes and signatures:]
 M. 27/11
 25/11

Arches being endangered
near the leadgoody station
on the Bangalore Line,
by a flood. In a
subsequent letter of the
30th September recorded
with G.O. No. 2945 of 15th
Oct, he reported that
a temporary bridge
over the break had
been completed and
tested, and that traffic
had been resumed on
the 28th September. But
it is not till the 11th
November, that the par-
ticulars promised in
his former communica-
tions have been supplied
by

All the C. & P. works
that similar day
will be avoided in
future

by the least thing.
Engineers whose reasons
for delaying the detail-
ed reports so long in
his possession are not
satisfactory. It is
desirable, that the
Government shall have
before them, the Re-
ports of their own
Officers as to the actual
state of affairs at an
early date, if only that
such Reports may be
printed for convenient
records and early refer-
ence, without having
to wait for conclusions
derivable from them;

or as in the present in-
stance, for still further
information which has
not been procurable.

2. It appears that
the entire provision
made under the Act
Collah Lark for passing
the drainage of the
valley in which it is
situated was one bridge
of 5 or 30 feet wide, and
a 6 feet Culvert on either
side of it, one of which
was destroyed and has
been temporarily sup-
plemented by 2, 30 feet
timbers laid on abut-
ments and a Pier of
squared

squared sleepers. And
there is no doubt but
that it was the existence
of this large supplemental
waterway which saved
the bridge when again
endangered by the actual
bursting of the Collah
Lark a month later,
as recorded in G.O. Nos.
3174, 3241 and 3291 of 9th,
16th and 21st November -
It remains to be deter-
mined whether the water-
way originally allowed
was sufficient for the
area drained, and
maximum rainfall to
be provided for, without
reference

reference to the contingencies of breaching tanks which are being provided against by the Irrigation Branch of the Mysore P. W. Dept; and pending settlement of the question and provision against breaches, it is evident, that the surplus water way now allowed must not be lessened.

3. It is noted that the Consulting Engineer has overruled, as rendered unnecessary by subsequent improvements to the temporary structure, the original restrictions

under

This frame is for

I think that a matter of this kind may well be left to the Party concerned as usually happens and must Pass S.

I think the new head better than the old one - The

21
under which it was taken traversed, viz limitation of speed to 3 miles an hour, after previous stoppage 100 yds before reaching it. The speed of 5 miles an hour now permitted may be quite safe; but with the the long steep gradient said to exist on either side, His Excellency the Governor in Council cannot but think, that to recur to not being exceeded, it may be as well to insist on previous stoppage. The late accident at the Parang new Bridge caused by

by excessive speed,
regarding the exact
amount of which opinions
varied, leads to the
adoption of even excessive
caution, to ensure that
the limit of safety shall
not be passed.

G.M.W.

Printed

184-185

Comd. Engrs. for Ry.
C.E. for Ry. Secpt 10/12/74.

6989 ✓
Govt. of Madras.
PUBLIC WORKS.

To
Very urgent
Mr. [unclear]
4-12-74

Dated

Encl. 4

Recd.

G. O. No. 31263
9 Dec 74

Nos. 184-185

Mackay Railway

Passing orders on
letter from the Comr.
for Railways submitting
further Reports on the
subject of the break
near the Cadgody
Station on the Bangalore
Branch of the Madras
Ry in the 17th Sept/74.