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(2) Date of repair_____

(3) Initials of the Referencer_____

MADRAS RECORD OFFICE

Government of Madras

Public Works

DEPARTMENT

G.O. No.	60-61	Press	Original
B.P. No.		Mis.	
Dated	9. 1.	195	1875

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
9th January 1875.*

No. 139 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, 18th November 1874, No. 706 —

In continuation of my letters* noted in the margin, I have the honor to submit, for the information of Government, three notes† by the Deputy Consulting Engineer, describing in detail the damage sustained by the North-West Line during the floods of last month, and its present condition, also a letter‡ from the Agent

* No 660, 29th Oct 1874
 „ 684, 7th Nov. „

† Dated 4th and 9th November 1874

‡ No 1,006, 12th November 1874

of the Madras Railway, giving cover to a report from the Chief Engineer, in which Mr Anderson gives the result of his personal observation regarding the disasters at the Paupugnee and Chittravutty rivers, of which he was forced to be an eyewitness from the 24th to the 28th ultimo.

2 Upon the 5th instant, I accompanied the Agent and the Chief Engineer upon an inspection of the North-West Line, with a view to ascertain the exact extent of the injury inflicted by the floods, and to decide, as far as possible, upon the measures to be immediately adopted. I have delayed submitting the accompanying papers in the hope that the full report promised by Mr Anderson would by this time have been available, but it has not yet reached me, and on its receipt I shall again address Government.

3. The portion of the North-West Line which suffered most severely during the late floods is between the Rajampett and Royelcherroo stations, a distance of 113 miles, the intermediate distances being as follow —

Distance from Madras	Name of Station or Bridge
Miles	
129½	Rajampett station
135½	Cheyaur bridge
136½	Nundalore station
147	Wontimettah station
161½	Cuddapah station
175	Paupugnee bridge
176	Camalapoore station
185½	Yerragoontla station
195½	Moodanoor station
210½	Kondipooram station
211½	Chittravutty bridge
227½	Tadputry station
233½	Pennair bridge
242½	Royalcherroo station

4 The condition in which this portion of the railway was left by the floods during the last week of October may be summed up as follows. The bridges over the Cheyaur, Paupugnee, Chittravutty, and Pennair rivers were all seriously injured and rendered impassable for trains. The section between Rajampett and the Cheyaur river was entirely destroyed in many places by the bursting of two tanks and by the overflow from the Cheyaur. The south approach to the Paupug

*Proceedings of the Madras Government, Public Works Department,
9th January 1875*

nee bridge was also breached in several places by the overflow from that river. The line northward from Moodanoor station was almost completely destroyed for a distance of nearly four miles by the bursting of the Chintagoonta tank

5 In letter No 684 the Government were informed that a day service of trains had been resumed from the 30th October between the north bank of the Cheyaur and Cuddapah, passengers making their own arrangements for transit between Rajampett and the Cheyaur. Early in this month the south approach to the Paupugnee bridge was restored, so that trains were enabled to run without a break between the Cheyaur and the Paupugnee rivers, and, as two trains had fortunately been cut off on the night of the 24th October between the Paupugnee and Chittravutty rivers, a day service of trains, in connection with that from Cuddapah and the south, was also resumed between the north bank of the Paupugnee and Moodanoor, passengers making their own arrangements for crossing the Paupugnee. The section between the Chittravutty and Pennair rivers was unfortunately left without locomotive or rolling stock, so that from Moodanoor to the north bank of the Pennair there was a long break of 38 miles without any train service. From the Pennair northwards to Ghooty, Ruchore, and Bellary, the ordinary day service of trains has been maintained without interruption.

6 Upon the 12th instant, communication was restored between Rajampett and the south bank of the Cheyaur river, and upon the 17th instant the damaged section northward from Moodanoor was also made passable for trains. Upon the same date, the 17th, the bridge over the Pennair river was repaired in a rough and temporary manner, sufficiently to admit of an engine and train passing over it, which will work for the present between the Pennair and Chittravutty rivers.

7. The state of the train service on the North-West Line is, therefore, at present as follows —

Trains run without interruption from Madras to the Cheyaur river, a distance of about 135 miles, between the Cheyaur and Paupugnee rivers, a distance of about 40 miles, between the Paupugnee and Chittravutty rivers, a distance of about 36 miles; between the Chittravutty and Pennair rivers, a distance of about 23 miles, and north of the Pennair river trains run without interruption. Passengers have to make their own arrangements for crossing the breaks at the four rivers.

8 It is improbable that these arrangements can be materially improved for several weeks. By the month of January I trust that the repairs to the Pennair bridge, where the injuries have been comparatively slight, will be sufficiently advanced to admit of the regular passage of trains, and that temporary roads will be laid across the beds of the Cheyaur, Paupugnee, and Chittravutty rivers, so as to allow the train service to be maintained without a break. And I also trust that, during the approaching dry season, the repairs to the bridges over the three last-named rivers will be so far advanced as to oppose no obstacle to the maintenance of the service during the monsoon.

Note on the Injuries sustained by the North-West Line of the Madras Railway, between Tirupetty and Moodanoor, from floods on the 24th and 25th of October 1874

I HAVE the honor to report that the Cheyaur and Paupugnee Bridges on the North-West Line of the Madras Railway were partially destroyed and rendered wholly impassable by unusually heavy floods on Saturday the 24th, and Sunday the 25th, of October 1874.

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9th January 1874.*

2 The line between Tirupetty and Nundallore also suffered very severely in places from the bursting of tanks to the west of the railway.

One portion in the 84th mile immediately north of Tirupetty was washed away.

The cutting at the top of the Ballapully Ghaut was greatly ploughed up, the ballast carried away and side drains filled in.

3 The 9-15 A M train from Arconum was detained for some hours in this cutting on Sunday, the 25th ultimo, a stream of more than 2 feet in depth rushing down it towards the south. In the 107th and 103th miles the railway embankment was washed away in places, preventing trains from running on the 25th and 26th ultimo. Up to this point the line has been repaired, and trains now run from Arconum as far as Rajampett.

4 The line was also heavily breached at the 130th mile, 7th telegraph post, and at the 131st mile, 10th to 13th telegraph posts. Also at frequent intervals between the 134th mile and the Cheyaur Bridge in the 136th mile. Mr H C West, the Resident Engineer, is rapidly restoring communication between Rajampett Station and the south bank of the Cheyaur.

5 The Cheyaur bridge has suffered very severely. The south abutment and piers Nos 1, 2, 3 and 4 next to it are still standing and apparently uninjured.

Pier No 5 leans over towards the south at an angle of about 15° from the perpendicular, and may, I think, give way entirely at any moment. It fortunately comes under the centre of the third pair of continuous girders, it does not therefore cause a break, as the ends of the girders are still supported by piers Nos 4 and 6.

6 All the other piers, both masonry and screw pile between No 5 pier and the south abutment of the "island," are apparently uninjured.

7 The abutment at the south side of the "island" has fallen over towards the south, leaving the north end of the girder which was resting on it unsupported.

An embankment of sand is being now thrown up to give this girder a bearing, and rails will be laid down for trollies to work from it over the bed of the river up to the north bank.

8 Portions of the wing walls are still standing, but cracked and tottering. Then comes a wide gap in the "island," the permanent-way being carried into the bed of the river towards the east.

9 The north abutment of the "island" has fallen towards the west or up-stream side, and there is a large gap in the wing walls. All that remains of the stone pier next to, and north of, this abutment are fragments of the girder bed stones which are left hanging by their bolts to the under flange of the girders. This girder now rests on the debris of the abutment and the second pier. Ten other piers are left apparently uninjured, then comes a gap where three piers have been completely carried away. The two pairs of girders which were over them have been carried down and buried in the sand about three-quarters of a mile below the bridge.

10 Of the north abutment (next Nundallore Station) only small portions of the wing walls remain. The watering place for locomotives at this abutment has been completely demolished, and about 140 yards of embankment next the abutment carried away.

11 The Resident Engineer tells me that the flood rose above the level of the tops of the masonry piers for the new bridge, or to a height of nearly 12 feet above the river bed. Holding in view what has just happened, it may be well to consider the propriety of increasing both the height and waterway of the new bridge before completing it.

12 The line between Nundallore and Cuddapah has suffered but little, although I am told that during the flood there was a depth of 3 feet of water in the Nundallore Station yard. Engines have been constantly running between Nundallore and Cuddapah since the flood on the 24th and 25th ultimo.

13 North of Cuddapah the line was breached near the end of the 173rd mile, but the gap has since been filled in. A little further north a 6 feet arched culvert was carried away and a considerable breach formed, sleeper abutments are being put in with 20-foot timber girders over them, and communication will shortly be restored, when there will be nothing to hinder trains from running between the north bank of the Cheyaur and the south bank of the Paupugnee.

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14 The Paupugnee (screw pile) bridge, 13½ miles north of Cuddapah, has been badly injured Its present state is as follows—South abutment, pier No 1 and girders over them, standing and apparently uninjured, piers Nos 2, 3, 4, 5 swept away, girders over piers 2 to 4 and 4 to 6 swept away No traces of them to be seen at present Piers Nos 6, 7, 8, 9, 10, 11, 12, 13, standing and apparently uninjured, the girders over these piers are also standing all right

15 Pier No 14 was carried away in the late accident, when an inspection train went down through the bridge This pier was replaced by a wooden sleeper one, which has withstood the flood, chiefly owing to its having been anchored or pinned down by the screw piles of the former pier, about which it was constructed It has now a lean over of about 1 foot towards the up-stream side

16 The sleeper piers which were constructed after the inspection train accident, between piers Nos 12 and 13 and 13 and 14, have both been carried away, nothing remains of them but a few of the sleepers, hanging to the under flanges of the girders

17 Piers Nos 15, 16, 17, 18, and 19 and north abutment are standing, and, with their girders, are apparently uninjured

18 A pair of 140 feet girders which had just been revetted up and were being braced together for the permanent repair of the breach caused by the inspection train, have been broken up and buried, a portion only of one of them being at present visible above the river bed

19 The embankment beyond the north abutment has been a good deal damaged, and a hole of 9 feet deep scoured below the surface of the ground on which the embankment stood This breach has, however, been almost filled in again Engines now run between the north bank of the Paupugnee and Moodanoor, a distance of 19½ miles

20 The Chittravutty and Pennair Bridges have also been partially destroyed, but I have not yet had an opportunity of seeing the amount of damage done

CUDDAPAH, (Signed) ROSS THOMPSON, Captain, R E,
4th November 1874 Offg Dy Consgr Engr for Railways

Note on the Injuries sustained by the North-West Line of the Madras Railway, between Moodanoor and Kondipooram, owing to the bursting of the Chintagoonta Tank, on the 30th of October 1874

ABOUT 3½ miles of the North-West Line of the Madras Railway have been breached in places and rendered impassable immediately to the north of the Moodanoor Station, in consequence of the Chintagoonta Tank, situated to the west of the railway, having breached on Friday, the 30th of October last

2 The tank had, I understand, a waterspread of about two square miles It had been in a dangerous state for some days previously, and the bund was cut to save it by order of the District Engineer The bund however appears to have given way suddenly immediately afterwards, and the whole of the water to have rushed out at once

3 All the ballast has been swept off the line in the Moodanoor Station yard, and the formation is much cut up

4 From the 195th mile, 14th telegraph post, to the 196th mile, 1st telegraph post, the permanent-way has been washed off the line to the eastward and the embankment almost completely carried away

5 About 100 yards of line have been swept away south of a girder bridge of three 30-foot spans This work was saved by the embankment having been cut previously behind each abutment The bridge has not been injured, although flood drift is hanging over the hand rails, showing that the water must have been 2 or 3 feet above the rail level.

6 From the 196th mile, 6th telegraph post, to a skew girder opening of 20 feet at the 196th mile, 8th telegraph post, the line is gone, but the bridge has stood all right.

7 From the 197th mile, 4th telegraph post, to the 197th mile, 9th telegraph post, line nearly all carried away.

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8 From the 198th mile, 4th telegraph post, to the 198th mile, 9th telegraph post, line carried away, and deposited at 30 to 40 feet east of the embankment

9 From 199th mile to the 199th mile, 6th telegraph post, all ballast and a good deal of embankment gone. The permanent-way washed to the eastward

10 From 199th mile, 3rd telegraph post, to 199th mile, 5th telegraph post, line all gone to a depth of 14 feet, and permanent-way carried to eastward

11. Mr Haworth, the Resident Engineer, has about 3,000 coolies now at work on this portion of line, and will shortly have communication restored between Moodanoor and Kondipooram

CUDDAPAH, (Signed) ROSS THOMPSON, Captain, R E,
4th November 1874 Offg Depy Consgr Engineer for Railways

Note on the Girder Bridges over the Chittravutty and Pennair Rivers, North West Line, Madras Railway, which were partially carried away in the floods of the 24th and 25th October 1874

I HAVE the honor to report that I inspected the Chittravutty and Pennair Bridges on the North-West Line of the Madras Railway on the 5th instant

2 I noted, en route from Cuddapah to the Chittravutty and Pennair, that the gap in the 173rd mile where a 6-foot culvert had been carried away had been filled in again, and a temporary bridge of wooden beams laid on sleeper

Abutments completed in lieu of the culvert

3 This temporary bridge has been substantially constructed. Passenger trains are therefore permitted to pass over it at a speed of four miles an hour

4 I also noted at the Paupugnee bridge that the northern two pair of 35 feet girders, which were displaced and hanging by the permanent-way, had been raised again, and were resting at proper level on a sleeper pier which has been constructed to bear them

5. The southern two pairs of 35 feet girders were in process of being raised, and supported on a sleeper pier in the same way as the northern pair

I understand that this work has since been completed

6 It will be remembered that the four pairs of 35 feet girders above alluded to are those which were put up between piers Nos 12 and 13 and 13 and 14 to repair the break caused in the late inspection train accident.

Chittravutty Bridge

7 This bridge consists of twenty masonry piers, ten next the north and ten next the south abutment, with nineteen screw pile piers between in the middle of the river.

8 The state of the bridge on the 5th instant was as follows —

South abutment standing and apparently uninjured

Pier No 1 do do

No I pair of girders resting on the south abutment and pier No 1

Pier No 2 carried away, portions of it still to be seen above water

Piers Nos 3, 4, 5, 6, 8 and 10 completely carried away

Nos II and III. pairs of girders carried away and buried in the river bed on the down stream side at distances of about 200 and 130 yards respectively.

Piers Nos 7 and 9 are still standing, but have apparently been washed off their proper foundation beds, they are both canted down stream

No IV pair of girders still rest on pier No 7, and No V. pair of girders on pier No 9

The girders in each case having the same cant toward the down stream side as the piers on which they rest

Their girder bed plates have been cracked and torn away by the girders slipping along the tops of the piers, when the piers tilted over towards down stream.

9 The remainder of the bridge, although strained in places, is still standing, and has not sustained any injury of a very serious nature

Pennair Bridge

10 This bridge has sustained less injury than the Cheyaur, Chittravutty, or Paupugnee bridges

Its state on the 5th instant was as follows —

North abutment standing and apparently uninjured

Pier No 1 do do

Pier No 2 completely gone

Pier No 3 leaning towards the north and with a cant up stream, also very badly cracked

Pier No 4 badly cracked, but still standing

No I pair of girders 140 feet, resting on the north abutment and pier No 1

No II. pair of girders, 140 feet, resting on pier No 4 and the remains of pier No 3

The north end of this pair of girders droops a good deal over the position which pier No 2 occupied

The south abutment and the remainder of the bridge appear uninjured

11 As soon as Nos I and II pairs of girders have been supported and brought to proper level on screw pile piers, which are to be put down for them, trains will be enabled to run between the Chittravutty and Pennair rivers. At present there are no engines on this portion of line, viz, a length of 22½ miles

BELLARY, (Signed) ROSS THOMPSON, Captain, R E,
9th November 1874 Offg Dy Consgr Engineer for Railways

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, 12th November 1874, No 1,006

In compliance with the request contained in your docket, No 1,072, of the 10th instant, I have the honor to enclose you, herewith, a copy of the Chief Engineer's letter to me, No 729, of the 3rd November, 1874

From B ANDERSON, Esq., Chief Engineer, to R B ELWIN, Esq., Agent and Manager of the Madras Railway Company, dated Madras, 3rd November 1874, No 729.

I LANDED in Bombay on the evening of the 22nd ultimo, and left by mail train at 2-30 P M. the following day. On my arrival at Raichore I found that there had been very heavy rain all along the North-West Line, and that some fears were entertained for the safety of the temporary piers of the Paupugnee Bridge. At 10 30 on the night of Saturday, the 24th, we reached Camalapur Station, and learned that the temporary wooden piers of the Paupugnee had given way, and that the bridge was impassable for trains. Mr Going and I at once went down to the river, and found that telegraphic communication with Madras was interrupted. I, however, sent you a message, via Bellary and Bangalore, announcing the interruption to traffic.

2 During the night the river rose to an unprecedented height, and at 2 A M the fourth screw pile pier was swept away. On the following night (Sunday) three more screw pile piers were destroyed, so that the bridge is now a complete wreck. Meantime, I received a report that five piers of the Chittravutty bridge had been carried away, and on going to the river found that the damage was even worse than was reported, no less than eight of the masonry piers having been destroyed. Telegraphic communication northward was now interrupted, so that I was a complete prisoner between the two rivers, and in utter ignorance of the state of things throughout the rest of the line. But even on the short section between the Paupugnee and the Chittravutty rivers our troubles were by no means at an end. At 9-30 on the night of the 26th ultimo, I received a telegram from the Station-master, Moodanoor, informing me that the bund of the

Chintagoonta tank was in a very precarious state. I at once sent a copy of the telegram to the Deputy Collector, and ran down to Moodanoor by special engine. I there learned that some villages situated below the level of the tank bund had been deserted by their inhabitants, and that the destruction of the bund was imminent. At the request of the Deputy Collector I lent a large gang of our coolies to the Overseer, Department Public Works, to assist in cutting a channel to let off the surplus water, and I also instructed our own Resident Engineer to cut the Railway embankment at the 196th mile in order to save the three 30-foot girder bridge at 196th mile, 1st telegraph post, should the bund of the tank give way. On the night of the 30th the tank breached, and, although considerable injury was done to our embankment, the precautions adopted fortunately saved the bridge.

3 It was not until the evening of Wednesday, the 28th, that I was able to cross the Paupugnee river and get into Cuddapah where I heard of the destruction of two piers of the Pennair bridge and the utter collapse of the Cheyaur bridge, the failure of five arches of the Goriatum bridge on the South-West Line, together with several breaches of minor importance.

4 I got over the Cheyaur river on the morning of Friday, the 30th, and reached Madras on Friday night. My first object, of course, was to get to my head-quarters as soon as possible in order that I might ascertain the full amount of damage sustained, find out what materials I had at my disposal, and arrange for the earliest possible restoration of through communication. I shall make a detailed inspection of the line the day after to-morrow, and on my return shall send you in the fullest particulars of the injuries sustained, and of the steps I propose to adopt to restore temporary communication. The question of the measures to be adopted in order to provide for such very exceptional floods as those of last month, must be reserved for future consideration.

5 It is, I believe, very generally understood that floods of exceptional magnitude may be expected to occur about every 20 or 25 years. In the present case, in many instances, the natural flood waters were greatly increased by the breaching of large tanks. At the Paupugnee and Cheyaur the first rush of water is reported to have come down the rivers in the form of a "bore" 5 or 6 feet in height. The rivers rose until they overflowed their banks, and completely flooded the surrounding country.

6 Mr Haworth was in the train with me on his way to Madras to relieve Mr Hanna as my Assistant, but, considering how much cut up the 2nd Division, North-West Line, has been by the destruction of the Paupugnee, Chittravutty and Pennair bridges, I felt it necessary to leave Mr Haworth at Camalapur in charge of the restoration works at the Paupugnee, and of the division from Cuddapah to the south bank of Chittravutty, leaving Mr Millett the rest of the division, with the restoration works at the Chittravutty and Pennair. Mr West will have his hands quite full at the Cheyaur, and I have therefore directed Mr French to take charge of the 1st Division, North-West Line. Under these circumstances, it will be necessary to retain Mr Hanna in Madras for the present.

No. 140

ORDER THEREON, 9th January 1875, No 60.

RAILWAY, No 15

THESE papers will be recorded and published for general information, and on receipt of the Chief Engineer's

promised full report, the Consulting Engineer will proceed without delay to compile the general narrative already called for in another order.

2. It is understood that the necessity of further increasing the waterway of the new Cheyaur Bridge is recognized; and the estimates for its reconstruction sent to Calcutta with letter No 3,063 of 27th October 1874, have accordingly been recalled for revision.

3. The attention of the Chief Engineer for Irrigation is specially called in continuation of G O, No. 3,210, of 13th November, to the state of the tanks

*Proceedings of the Madras Government, Public Works Department,
9th January 1875*

in the Cuddapah District, from the bursting of which the line between Tripetty and Nundalore and immediately north of Moodanoor Station has suffered so severely. Such action as was taken in that district with reference to the orders of 1872 appears to have been very insufficient and ineffectual, and Lieutenant-Colonel Mullins will ascertain and report who is responsible for such neglect.

(True Extract.)

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

No. 141. (DOCKET No. 61, dated 9th January 1875)
Copy of the above forwarded to the Government of India.
(True Extract)

Colonel, R.E.,
Secretary to Government.

No. 1006

MADRAS RAILWAY

AGENT AND MANAGER'S OFFICE

Madras, 12th November 1874

From

Robert B. Curzon Esq.
Agent and Manager of the M.R.

To

Lieut Colonel S. H. M. Shaw Stewart Esq.
Consulting Engineer for Railways

Sir,

In compliance with the request contained in your No. 1072 of the 10th instant, I have the honour to enclose you herewith a copy of the Chief Engineer's letter to me No. 7 of the 3rd November 1874.

I have the honour to be,
Sir,
Yours most obedient Servant,
R. B. Curzon
Agent and Manager.

N^o 729.

50 11/18
Madras Railway Company
Chief Engineers Office
Madras 3rd November 1874

The Agent and Manager.

Dear Sir,

I landed in Bombay on the evening of the 22nd ultimo and left by Mail train at 2.30 P.M. the following day. On my arrival at Raichore I found that there had been very heavy rain all along the North West Line, and that some fears were entertained for the safety of the temporary piers of the Paupugnee Bridge. At 10.30 P.M. on the night of Saturday the 24th we reached Camela-poor Station, and learned that the temporary wooden piers of the Paupugnee had given way, and that the bridge was impassable for trains. Mr. Goins and I at once went down to the river, and found that telegraphic communication with Madras was interrupted. I however sent you a message via Bellary and Bangalore announcing the interruption to traffic.

2 During the night the river rose to an unprecedented height, and at 2 A.M. the 4th Screw pile pier was swept away. On the following night (Sunday) three more Screw pile piers were destroyed, so that the bridge is now a complete wreck. Meantime I received a report that five piers of the Cheltravetty bridge had been carried away, and going to the river found that the damage was even.

From

The Agent and Manager

To

The Consulting Engineer

for Railways

Dated 12th Nov 1874

Recd

13th

No 1006

Forwarding as requested
a copy of the Chief
Engineers letter to
729 of the 3rd Nov 74

S. M. 7257/74

even worse than was reported. No less than eight of the masonry piers having been destroyed. Telegraphic communication northward was now interrupted so that I was a complete prisoner between the two rivers, and in utter ignorance of the state of things throughout the rest of the line. But even on the short section between the Paupugnee and the Chittavratty rivers, our troubles were by no means at an end. At 9 30 Pm. on the night of the 26th. ultimo I received a telegram from the Station Master, Moodanoor, informing me that the bund of the Chintagontah tank was in a very precarious state. I at once sent a copy of the telegram to the Deputy Collector, and ran down to Moodanoor by special Engine. I there learned that some villages situated below the level of the tank bund, had been deserted by their inhabitants, and that the destruction of the bund was imminent. At the request of the Deputy Collector I lent a large gang of our Coolies to the overseer Department Public Works to assist in cutting a channel to let off the surplus water, and I also instructed our own Resident Engineer to cut the Railway Embankment at the 196th. Mile in order to save the 30 ft. girder bridge at 196th. Mile. should the bund of the tank give way. On the night of the 30th. the tank breached and although considerable injury was done to our embankment, the precautions adopted fortunately saved

13
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Mr. Haworth was in the train with me on his way to Madras to relieve Mr. Hanna as my assistant, but considering how much cut up the 2nd Division North West Line has been by the destruction of the Paupugnee, Chittravutty and Pennair bridges, I felt it necessary to leave Mr. Haworth at Carnelapoor in charge of the restoration works at the Paupugnee, and of the Division from Buddap to the South Bank of Chittravutty, leaving Mr. Mellett the rest of the Division, with the restoration works at the Chittravutty and Pennair. Mr. West will have his hands quite full at the Cheyair and I have therefore directed Mr. French to take charge of the 1st Division North West Line. Under these circumstances it will be necessary to retain Mr. Hanna in Madras for the present.

yours faithfully

(Signed) Beresford Anderson

(True copy) Chief Engineer

W. J. L. W. M.
Agent & Manager

S. M. 7257/74

2002-2, S. P. 9/11
Note on the Injuries sustained by the North-West Line of the Madras Railway, between Moodanoor and Randipmanam, owing to the bursting of the Chitragooma Tank, on the 30th of October 1874.

1. About 3 1/2 miles of the North West Line of the Madras Railway have been breached in places and rendered impassable, immediately to the north of the Moodanoor Station, in consequence of the Chitragooma Tank, situated to the west of the Railway, having breached on Friday the 30th of October last.
2. The tank had I understand a water spread of about two square miles. It had been in a dangerous state for some days previously, and the bund was cut to save it.

by order of the District Engineer
The bund however appears to have
given way suddenly, immediately
afterwards, and the whole of the
water to have rushed out at once
All the ballast has been swept off 3.
The line in the Mordamoor Station
yard, and the formation is much
cut up.

From the 195th mile 14th Telegraph 4.
Post to the 196th mile 1st Telegraph
Post the permanent way has been
washed off the line to the Eastward
and the Embankment almost
completely carried away.

About 100 yards of line have been 5
swept away South of a girder
bridge of three 30ft spans
This work was done by the
Embankment having been cut
previously behind each Abutment
The bridge has not been injured
although flood drift is hanging
over the hand rails, showing
that the water must have been
two or three feet above the rail
level

6. From the 196th m. 6 T.P. to a
Sewer girder opening of 20ft.
At the 196 m. 8 T.P. the line
is gone, but the bridge has
stood all right.

7. From the 197 m. 4 T.P. to the 197 m.
9 T.P. line nearly all carried away

8. From the 198 m. 4 T.P. to the
198 m. 9 T.P. line carried away,
and deposited at 30 to 40
feet East of the Embankment

9. From 199 m. 0 T.P. to the 199 m.
6 T.P. all ballast and a good
deal of Embankment gone.
The permanent way washed to
the Eastward

10. From 199 m. 3 T.P. to 199 m. 5 T.P.
line all gone to a depth of
14 feet and permanent way
carried to Eastward

11. Mr Hawes, the Resident-
Engineer has about 3000
Coolies now at work on this
portion of line and will
shortly have communication
restored between Mordamoor
and Nondipooram

Post Office

Captain R.E.

Offg. Dy. Com. Secy in Pailwaf

Cuddapah 4th November 1874

7257/74

13. Nov:

W.

Handwritten note at top right of page 2.

Note on the injuries sustained by
the North-West Line of the Madras
Railway, between Tirupetty and
Muddalore, from floods on
the 24th and 25th of October 1874

1. I have the honor to report that
the Chyaur and Paupugur
Bridges on the North-West
Line of the Madras Railway
were partially destroyed
and rendered wholly in-
passable, by unusually heavy
floods on Saturday the 24th
and Sunday the 25th of
October 1874.
2. The line between Tirupetty and
Muddalore also suffered very
seriously in places from the
bursting of tanks to the west
of the Railway.
One portion in the 84th mile
immediately north of Tirupetty
was washed away.
The cutting at the top of the

Ballapully Shant- was
Greatly ploughed up, the
ballast carried away and
side drains filled up.

3.

The 9.15 am train from Arcunum
was detained for some hours
in the cutting on Sunday

The 25th ultimo, a stream of
iron ore two feet in depth
rushing down it towards the
South. In the 107th and 108th
miles the Railway Embankment
was washed away in places
preventing trains from running
on the 25th and 26th ultimo

Up to this point the line has
been repaired and trains now
run from Arcunum as far as
Pazampett.

4.

The line was also heavily bracked
at the 130th mile 7th Telegraph
Post- and at the 131st mile
10th to 13th Telegraph posts.
Also at frequent intervals
between the 134th mile and
the Cheyarr Bridge in the 136th mile

21/1
Mr. H.C. West Mr. Resident-
Engineer is rapidly restoring
Communication between
Pazampett Station and
the South bank of the Cheyarr

5. The Cheyarr bridge has
suffered very severely -
The South-Abutment and
piers Nos 1, 2, 3 and 4 left
it are still standing and
apparently uninjured.
Pier No 5 leans over towards
the South at an angle of
about 15° from the perpendicular
and may I think give way
entirely at any moment.
It fortunately comes under the
center of the third pair
of continuous girders, it does
not therefore cause a break
as the ends of the girders
are still supported by pier
Nos 4 and 6.

6. All the other piers both
masonry and screw pile
between No 5 pier and the

South Abutment of the "Island"
are apparently uninjured.

The Abutment at the South-
Side of the "Island" has fallen
over towards the South, leaving
the North end of the girder
which was resting on it
unsupported.

An Embankment of Sand is
being now thrown ~~across~~ up
to give the girder a bearing
and rails will be laid down
for trolleys to work from it
over the bed of the river up
to the North-bank.

Portions of the wing walls are 8.
still standing but cracked
and tottering. Then comes a
wide gap in the "Island"
the permanent way being
carried into the bed of the
river towards the East.

The North Abutment of the 9.
"Island" has fallen towards
the west or up stream side
and there is a large gap

gap in the wing walls 13/7
All that remains of the stone
pier. West to and North of
the abutment - are fragments
of the girder bed stones, which
are left hanging by their
bolts to the under flange
of the girders - The girder
now rests on the debris of
the abutment and the second
pier. Ten other piers are
left apparently uninjured,
then comes a gap where
three piers have been
completely carried away.
The two pairs of girders
which were over them
have been carried down
and buried in the sand
about three quarters of a
mile below the bridge.

10. Of the North Abutment (West
Inundation Station) only
small portions of the wing
walls remain. The best
place for locomotives at the

Aboutment has been completely
demolished and about 130 yards
of Embankment next the aboutment
carried away.

The Resident Engineer tells 11.
me that the flood rose above
the level of the tops of the
masonry piers for the new
bridge, or to a height of nearly
12 feet above the river bed -
holding in view what has
just happened, it may be
well to consider the propriety
of increasing both the height
and waterway of the new
bridge, before completing it.

The line between Mundalore 12.
and Cuddapah, has suffered
but little, although I am
told that during the flood
there was a depth of three feet
of water in the Mundalore
Station yard - Engines have
been constantly running between
Mundalore and Cuddapah
since the flood on the 24th & 25th ultimo

13. North of Cuddapah the line
was reached near the end of
the 143rd mile, but the gap
has since been filled in.
A little further north a 6 ft.
arched culvert was carried
away and a considerable
breach formed. Sluper
aboutments are being put in
with 20 ft. timber girders over
them, and communication will
shortly be restored, when there
will be nothing to hinder trains
from running between the
north bank of the Chygair
and the south bank of the
Pampunee.

14. The Pampunee (Serupilo)
Bridge: 13 1/2 miles north of
Cuddapah has been
badly injured. The present
state is as follows

South aboutment, Pier No 1 and
girders over them standing
and apparently uninjured
Piers Nos 2, 3, 4, 5. Swept away

Girders over Piers 2 to 4 and
4 to 6 swept away. No traces
of them to be seen at present.
Piers Nos 6, 7, 8, 9, 10, 11, 12, 13
standing and apparently uninjured.
The girders over these piers are
also standing all right.

Pier No. 14 was carried away 15.
in the late accident, when
an inspection train went
down through the bridge.
The pier was replaced by
a wooden super one, which
has withstood the flood,
chiefly owing to its having
been anchored or pinned down
by the screw piles of the former
pier, about which it was constructed.
It has now a lean over of about
one foot towards the up stream
side.

The super piers which were 16.
constructed after the inspection
train accident, between piers
Nos 12 and 13, and 13 and 14,

hanging to the under flanges
of the girders.

17. Piers Nos 15, 16, 17, 18 and 19
and North Abutment are
standing, and, with their
girders, are apparently uninjured.

18. A pair of 140ft girders which
had just been melted up
and were being braced together
for the permanent repair
of the breach caused by the
inspection train, have been
broken up and buried, a
portion only of one of them
being at present visible
above the river bed.

19. The Embankment beyond the
North Abutment has been
a good deal damaged and
a hole of 9 feet deep scoured
below the surface of the ground
on which the Embankment
stood. This breach has
however been almost filled in
again. Enquiries are being

A distance of $19\frac{1}{2}$ miles

The Chittravally and Penuair
Bridges have also been partially
destroyed, but I have not yet
had an opportunity of seeing
the amount of damage done

Robt Thompson
Capt. M.E.

Offg. D. Com. Eng. for Railways

Cuddapah
November 4th 1874

W. B. B.

20

27/11-13

Note on the Girdar Bridges over
the Chittravally and Penuair
Rivers. North West-Line Madras
Railway. which were partially
carried away in the floods
of the 24th and 25th October
1874.

1. I have the honor to report
that I inspected the Chittravally
and Penuair Bridges on the
North West-Line of the Madras
Railway on the 5th Instant.
2. I noted, en route from Cuddapah
to the Chittravally and Penuair
that the gap in the 173rd mile
where a six feet Culvert
had been carried away ~~and~~
had been filled in again, and
a temporary bridge of wooden
beams laid on sleepers
abutments completed, in lieu
of the Culvert.
3. This temporary bridge has
been built with constructed

Passenger trains are therefore permitted to pass over it at a speed of four miles an hour.

I also noted at the Paupugnee 4. Bridge that the Northern two pair of 35-ft girders, which were displaced, and hanging by the permanent way, had been raised again, and were resting at proper level on a Super pier, which has been constructed to bear them.

The Southern two pair of 35-ft 5. girders were in process of being raised, and supported on a Super pier in the same way as the Northern pair.

I understand that the work has since been completed. 6

It will be remembered that the four pair of 35-ft girders above alluded to, are those which were put up between piers Nos 12 and 13 and 13 and 14

to repair the break caused in the late inspection train accident.

Chittravathy Bridge

7. This bridge consists of 20 masonry piers, ten next the North and ten next the South Abutment, with 19 screw pile piers between, in the middle of the river.

8. The State of the Bridge on the 5th Inst. was as follows.

South Abutment: Standing and apparently uninjured.

Pier No 1. Do — Do

No I Pair of girders resting on the South Abutment and pier No 1

Pier No 2. Carried away. portions of it still to be seen above water.

Piers Nos 3, 4, 5, 6, 8 and 10 completely carried away.

Nos II and III pairs of girders carried away and buried in the sand.

Stream Side, at distances of
about 200 and 130 yards
respectively.

Pier Nos 7 and 9 are still
standing, but have apparently
been washed off their proper
foundation beds, they are
both canted down stream.

No IV pair of girders still
rest on pier No 7, and No V
pair of girders on pier No 9.

The girders in each case
having the same cant-towards
the down stream side as
the piers on which they rest.
Their girder bed plates have
been cracked and torn away
by the girders slipping along
the tops of the piers, when
the piers tilted over towards
down stream.

The remainder of the bridge
although strained in places
is still standing, and has
not sustained any injury
of a very serious nature.

Pearl Bridge

10. This bridge has sustained
injury than the Cheju
Chittravally or Pearl bridge
Its state on the 5-11-1881
was as follows

North Abutment standing
and apparently uninjured

Pier No 1. Do Do.

Pier No 2. Completely gone

Pier No 3. Leaning towards
the North and with a cant
up stream. Also very badly
cracked

Pier No 4. Badly cracked
but still standing

No I. Pair of girders. 140ft.
resting on the North
Abutment and Pier No 1.

No II. Pair of girders. 140ft.
resting on Pier No 4 and
the remains of pier No 3

The North end of this pair
of girders droops a good
deal over the position which
pier No 2 occupied -

The South-Abutment and
the remainder of the bridge
appear uninjured—

As soon as Nos I and II 11.
pairs of girders have been
supported, and brought to
proper level, on screw pile
piers, which are to be put
down for them, trains will
be enabled to run between
the Chittravathy and Puar
Piers. At present there
are no engines on this
portion of line. viz a length
of 22½ miles.

R. Thompson

Captain R.E.

Off. Dy. Com. Engineer for Railways

Beltam

November 9th 1874

Railway Department.

CONSULTING ENGINEER'S OFFICE.

No. 906

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,

N^o 660-29th

October 1874.

N^o 684-7th

November 1874.

* Dated 4th

and 9th 10-

November 1874.

In continuation of my
letter noted in the margin, I have
the honour to submit for the infor-
-mation of Government three notes
by the Deputy Consulting Engineer,
describing in detail the damage sus-
-tained by the North-West line
during the floods of last month, and
its present condition; also a letter
from the Agent of the Madras Railway,
giving cover to a report from the
Chief Engineer, in which Mr. Anderson
gives the result of his personal ob-
-servation regarding the disaster at

the Paupugnee and Chittraunty rivers, of which he was forced to be an eye-witness from the 24th to the 28th ultimo.

2. Upon the 5th instant I accompanied the Agent and the Chief Engineer upon an inspection of the North-West line, with a view to ascertain the exact extent of the injury inflicted by the floods, and to decide, as far as possible, upon the measures to be immediately adopted. I have delayed submitting the accompanying papers in the hope that the full report promised by Mr. Anderson would by this time have been available; but it has not yet reached me; and on its receipt I shall again address Government.

3. The portion of the North-West line which suffered most severely

37/1
severely during the late floods is between the Rajampett and Rayalcheruvu stations, a distance of 113 miles, the intermediate distances being as follow:

Distance from Madras Miles	Name of Station or Bridge.
129 3/4	Rajampett station
135 1/2	Cheyair bridge
136 1/2	Vundalabur station
147	Wondimittah station
161 1/2	Cuddepah station
175	Paupugnee bridge
176	Kamalapoor station
185 1/2	Yerragondla station
195 1/2	Maddur station
210 1/4	Kundipooram station
211 3/4	Chittraunty bridge
227 1/2	Sadpette station
233 1/4	Pennair bridge
242 3/4	Rayalcheruvu station

4. The condition in which this portion

portion of the railway was left by the floods during the last week of October may be summed up as follows. The bridges over the Cheyair, Paupugnee, Chittravutti, and Permain rivers, were all seriously injured and rendered impassable for trains. The section between Rajampett and the Cheyair river was entirely destroyed in many places by the bursting of two tanks and by the overflow from the Cheyair. The south approach to the Paupugnee bridge was also breached in several places by the overflow from that river. The line northward from Moodanoor station was almost completely destroyed for a distance of nearly 4 miles by the bursting of the Chintamanta tanks.

5. In letter N. 684 the Government

Government were informed that a day service of trains had been resumed from the 30th October between the north bank of the Cheyair and Buddapah, passengers making their own arrangements for transit between Rajampett and the Cheyair. Early in this month the south approach to the Paupugnee bridge was restored, so that trains were enabled to run without a break between the Cheyair and the Paupugnee rivers; and, as two trains had fortunately been cut off on the night of the 24th October between the Paupugnee and Chittravutti rivers, a day service of trains in connection with that from Buddapah and the south, was also resumed between the north bank of the Paupugnee and Moodanoor, passengers making their own arrangements for crossing the Paupugnee. The section between the Chittravutti and Permain rivers was unfortunately left without locomotive

locomotive on rolling stock, so that from Moodanoor to the north bank of the Permain there was a long break of 38 miles without any train service. From the Permain northwards to Gooty, Raichore, and Bellary, the ordinary day service of trains has been maintained without interruption.

6. Upon the 12th instant, communication was restored between Papampett and the south bank of the Chigair river; and upon the 17th instant the damaged section northward from Moodanoor was also made passable for trains.

Upon the same date, the 17th, the bridge over the Permain river was repaired, in a rough and temporary manner, sufficiently to admit of an engine and train passing over it, which will work for the present between the Permain and Chittra-
-utti rivers.

7. The

411
7. The state of the train service on the North-West line is therefore at present as follows:—

Trains run without interruption from Moodanoor to the Chigair river, a distance of about 135 miles;— between the Chigair and Pampugnee rivers, a distance of about 40 miles;— between the Pampugnee and Chittrautti rivers, a distance of about 36 miles;— between the Chittrautti and Permain rivers, a distance of about 22 miles;— and north of the Permain river, trains run without interruption. Passengers have to make their own arrangements for crossing the breaks at the four rivers.

8. It is improbable that these arrangements can be materially improved for several weeks. By the month of January I trust that the repairs to the Permain bridge, where the injuries have been comparatively slight, will be sufficiently advanced to admit of the regular passage of
Trains;

J. D. M. 1874 *Refracting*
Microscope for Grant / 75

These papers
will be recorded, and
published for general
information. and on
receipt of the Chief
Engineer's promised
full report, the lea-
ding Engineer will
proceed without delay
to

to compile the general
narrative already called
for in another order.

It is understood
that the necessity of
further increasing the
waterway of the new
Cheyenne Bridge is
recognized; and the
estimates for its recon-
struction sent to Seat-
tles with letter N^o
3063 of 27 October 1874
have accordingly been
recalled for revision.

The attention of the
Chief Engineer for Irri-
gation is specially called

N^o 3210 of 13 November
to the state of the
in the Leida River
from bursting of which
the line between
and Hundalov, and
immediately north
Hoodanov station
has suffered so
such action as was
in that District in
reference to the Oro
1872. appears to have
been very insuffi-
and ineffectual;

Lt. J. M. Mullins
will ascertain
and report
is responsible
for

7257

Govt. of Madras

PUBLIC WORKS.

The Chief Engineer
Secy. to Govt. of Madras

Per

Per

Per

G. D. S.

No. 125-141

Damages - Madras Ry.

Papers relating to the recent
damages to the North West &
South West Lines of the Madras
Railway recorded and filed
under for general information.
and the Chief Engineer promised full report
the Chief Engineer to proceed with the
consolidation of the special narrative
called for in another order, etc.
Col. Mullins to ascertain and