

Public Works (1892) Department.

RAILWAY BRANCH.

G.O., No. 378. R

DATED 20 February

[Despatch Abstract.]

Inspection - Report on the — of the
Bezrada-Godavari section of the East
Coast Railway prior to opening, recorded.

BACK PAPERS.

[illegible]

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

NOTE ON THE INSPECTION OF THE BEZVADA-GODAVARI SECTION
OF THE EAST COAST RAILWAY BY THE GOVERNMENT
INSPECTOR PRIOR TO OPENING.

This inspection was made on the 8th February 1893 in company with the Engineer-in-Chief of the East Coast Railway, his Traffic Superintendent and Engineers in charge of divisions, and the Agent and Manager of His Highness the Nizam's State Railway, and his heads of departments.

2. **Description.**—The section to be opened is 90½ miles in length and extends from the Bezvāda Railway station on the left bank of the Kistna river, to the Godāvāri ferry on the right bank of the Godāvāri river, the mileage counting from the centre of the existing Bezvāda Railway station. The country is flat, rich and highly cultivated, very little above sea level, and is intersected by canals. The line was severely tried by abnormal floods in October and November 1892.

3. **Banks and cuttings**—Are of standard width, 20 feet and 18 feet respectively, and most of them have had one or two monsoons over them. The banks are full in section and fairly consolidated, but as they are chiefly composed of black soil, they will give trouble for some time to come. Practically there are no cuttings.

4 **Gradient and curves.**—The ruling gradient is 1 in 200 or .5 per cent.; approximately 47½ per cent. of the whole length of the line is level.

The sharpest curve is 4° (radius 1,432) and about 87 per cent. of the line is straight. No compensation for curves or gradients has been found necessary.

5. **Permanent-way.**—The permanent-way consists of the ordinary State Railway type of 75 lb flat-footed steel rails, 30 feet long, with shallow fish plates laid for 53 miles on transverse wooden sleepers 10' $\times$ 10' $\times$ 5", 1,944 to the mile, the balance being on steel sleepers; the fish plates are held by five fish bolts and the rails are fastened to the wooden sleepers by two spikes. On the wooden joint sleepers there are bearing plates, the rails being held by four spikes.

For the first 60 miles the road having a sufficient bed of ballast is in very good order and fit for a speed of 25 miles an hour. Beyond this, where in many places there is little, if any, ballast and the banks are nearly all black soil, the road is in good order, but in the absence of ballast a limiting speed of 20 miles an hour should be adhered to.

6. **Ballast.**—The final section of ballast which is to consist of broken stone is to be 11 feet wide at top, 14 feet at bottom with side slopes 1 to 1. The depth below bearing surface of sleepers between rails and outside rails respectively will be 8", 1' 3" and 1' 6" and will amount to (without deducting the cubic contents of sleepers) 93,250 cubic feet per mile, being equal to 17.66 cubic feet per lineal foot of road. Up to mile 60, about 70 per cent. has been collected; beyond this scarcely any. At present the ballast in the road consists of gravel, moorum sand or stone, but only sufficient has been put on to make a good bed for sleepers.

Up to mile 60 the line is fairly ballasted with this temporary bed of ballast, most of which will eventually sink into the black soil banks; from mile 60 to 80 very little has been put in, but the sand ballast north of this is being rapidly extended southwards to fill up this gap.

7. **Level crossings and fencing, mile and gradient posts.**—No fencing has been provided at present either along the line, or round stations, or at the back of platforms. The only exception is the Ellore yard which is being temporarily fenced with jungle posts.

The level crossings have not yet been provided with outer guard rails, but this is in hand. As a rule the approaches are unmetalled and no gates or chains have yet been provided. In a few instances jungle post fencing has been put alongside the approach roads. All the above omissions are being taken in hand.

Efficient but temporary mile and gradient posts have been erected or are being erected everywhere, and south of Ellore the telegraph posts have already been numbered.

8. Bridges.—The bridges and culverts are built of stone and are of good quality. All of them are not 20 feet wide from face to face of abutment, but in cases where a width of 16 feet had been adopted, the wing walls have been built level at the coping at formation level to a width of 20 feet.

The first bridges built had wing walls of 45° , but the latter ones have a splay of $27\frac{1}{2}^\circ$ from line at right angles to centre line of railway. All the girders are of Government type.

9. Diversions.—There is an easy one at mile 75 where the two 60 feet and one 100 feet girders are being erected. It is about 2,000 feet in length; its sharpest curve has a radius of 1,000 feet and its ruling gradient is 1 in 50; at the bottom there is a strong rail and sleeper crib temporary bridge.

The other diversion is at mile $84\frac{1}{2}$ and is also very easy where four 60 feet girders are under erection. It is about 1,500 feet long; its sharpest curve has a radius of 2,400 feet and its ruling gradient is 1 in 50. It has a similar temporary bridge at the bottom.

10. Stations and station-yards.—*Mustabad at mile 8.*—This is to be a trial station consisting of a dead end siding only. Home and distant signals are under erection and a temporary station building will be put up. An unmetalled platform, 250 feet long and 1 foot above rail level, has been thrown up and a platform wall will be built as well as a latrine.

Gannavaram at mile 12.—Has an unmetalled platform, 1 foot above rail level 600 feet long. The platform wall now at rail level will be raised. A Horbury iron waiting-shed. There is a temporary tiled station building inclusive of permanent quarters for the station staff exist and the signals are in working order. There is a through siding and a dead end; the latter is opposite the station building and will, as at other stations, be converted into a short loop, an improvement on existing practice, I think.

Viravalli at mile 20.—Is a temporary watering and flag station, and is to have a through siding and a dead end. Signals are in working order. Platform is 250 feet long, 1 foot above rail level, and unmetalled at present. A platform wall will be added, and a Horbury latrine is under erection. A temporary station building including a waiting-shed is built and temporary staff quarters are to be run up at once.

Núzvid at mile 26.—Possesses a 600 feet platform, 1 foot high and unmetalled at present. It has a permanent station building including waiting-shed, all completed except the verandah. Permanent staff quarters are finished, and the signals are in working order. A Horbury latrine is under erection. There is a through siding and a dead end.

Kalaparru at mile 29.—Is a trial and flag station, without points, and possesses an unmetalled platform 250 feet long and 1 foot high, to which will be added a platform wall. A temporary station building including waiting-shed is being run up, and temporary staff quarters, and a latrine, will be provided in a few days. There is a home signal, but no distant signal, the latter being considered unnecessary.

Tumileru river dead end sidings at mile 35.—One runs into the main line to the north, and another to the south, the points being 2,600 feet apart. There are semaphores at the points, and a telegraph hut between these from which the signals are worked. Distant signals will be provided and worked from the points, and a home signal will be erected at the telegraph hut. No traffic will be booked from this place, but otherwise it will be treated as a station.

Ellore Station at mile 37.—Has a 3 feet high unmetalled platform, with a good permanent station building, including waiting-shed, and a refreshment room. All the staff quarters as well as the two ashpits are completed, and the permanent tank

house and hydrants are practically completed. The signals are in working order, and a Horbury latrine is being erected. There is also a goods-platform and wall, but the shed has not yet been provided. There is a through-siding and a goods siding is to be added, and as many more sidings as may be found necessary.

The station yard is being fenced in a temporary manner.

Bhimadól at mile 49.—Possesses a 1 foot high, 600 feet long, metalled platform with a temporary station-building including waiting-shed, and a Horbury latrine is being erected. The staff quarters are also completed and the signals are in working order. There is a through siding, but no dead end yet.

Chébról at mile 58.—Possesses a metalled platform, 1 foot high and 600 feet long, with a temporary station building including waiting-shed, also temporary quarters for the staff, and a Horbury latrine. The signals are in working order, whilst a through siding is half in.

Tadépulligudem at mile 66.—Possesses a 600 feet long, 1 foot high, unmetalled platform and a temporary station building including waiting-shed, as also permanent quarters for the staff. Temporary latrines will be erected. It is a watering station with two ashpits, two water columns practically completed, as is also a siding and a short loop. The signals are in working order.

Nidadavól at mile 79.—Possesses a 600 feet long, 1 foot high, unmetalled and unfenced platform. There is a temporary station building including waiting-shed, as also quarters for the staff. The signals are in working order. A temporary latrine will be run up. The station possesses a through siding and a short loop.

Godáviri Bridge at mile 88.—Is simply a junction between the Godáviri ferry station and the Godáviri bridge approach line and works, the latter being the stable for engines where the triangle is located. At the bridge points there is a temporary telegraph hut and pointsmen and signallers' quarters. A home signal exists, but as it is proposed to book passengers here, distant signals will be provided as well as a short platform, waiting-shed, and latrine.

Godáviri Ferry at mile 91.—Possesses a temporary station building including waiting-shed and guards' running room, also a permanent station-master's quarters and menials' houses. There is no platform, but the ground will be levelled to rail level between the tracks as a temporary measure. An extension to the steamer to deep water about $1\frac{1}{4}$ miles long is about to be made, and is expected to be ready in six weeks' time. But as the existing Godáviri ferry station will, it is understood, remain a booking place, it will, I think, be necessary to provide a platform and latrine. The train will remain here at night time, the engine running back tender foremost and stabling at the bridge approach lines. There is a through-siding and a loop, and the signals are in working order.

11. Signals.—At all stations where traffic will be booked, the distant signals will be worked from the home signal. Lyle's patent wire holder, in which the wire is fastened to the outside of the rail, has been adopted.

12. Turn tables and triangles.—There is a turn table at Bezvada, and a triangle at Godáviri bridge terminus where the engine will stable.

13. System of working.—Is Line Clear and Caution Message as on the Nizam's Railway. This is now in use, and all stations are provided with the necessary instruments and forms. General rules for working, similar to those now in force on the Nizam's Railway, have been forwarded for the approval of the Governor-General in Council, but have not been sanctioned or notified as prescribed in the Railway Act.

14. Rolling stock.—This is to be supplied by the Nizam's Railway and is stated to be sufficient in quantity. All engines are fitted with cow-catchers. If East Coast Railway engines are used for construction work, they will exceed the moving loads prescribed by Government to the extent shown in the appendices. The Nizam's Railway's rolling stock conforms to standard dimensions.

15. General Remarks.—The work of providing approach roads within station limits to the station buildings, constructing goods accommodation where necessary, and finishing and tidying up is going on as fast as possible.

The line though unfinished in many details which are unimportant so far as the safety of the public is concerned, is in good running order and should be opened without delay. All the minor works necessary to complete it are being pushed on. Name

boards will be sent out from the shops in a few days. Before the Nizam's Railway take over maintenance, the railway boundaries should be permanently demarcated.

16. The following plans and papers are attached to this report:—

(1) Table showing the results of tests applied to girders.

(2) The plans and tables prescribed in section 3 of enclosure to Government of India Circular No. 19 of 1883, slightly modified in some cases in accordance with the instructions contained in the Forms and Enclosures to the Rules for preparing Railway Projects.

(3) The five certificates prescribed in section 3 of the same circular.

(4) A skeleton tracing of an East Coast Railway engine in working order with which the bridges were tested. The weights are those reported to the Locomotive Superintendent of the Nizam's Railway by the Locomotive Superintendent of the East Coast Railway, but the gross weights of engine and tender are shown as 85 tons *versus* 93 tons 15 cwt. as reported by the India office. Accepting the former weight, the gross load on an axle is 16.3 tons *versus* 15 tons prescribed by standard dimensions.

17. I am of opinion that the section of railway between Bezvada and Godavari ferry may be opened for the public carriage of passengers without danger to the public using it at a speed of 25 miles per hour, by day only, between Bezvada and Chébról, and at 20 miles an hour between Chébról and the Godavari ferry, subject to the condition that the Engineer-in-Chief provides all the signals considered necessary in this report, and puts them in working order. This he has promised to carry out by the 15th instant.

GODAVARI,
9th February 1893.

(Signed) W. V. CONSTABLE, Major, R.E.,
Government Inspector.

STATEMENT showing result of tests of bridges on the Bezvada-Godavari section of the East Coast Railway inspected on the 8th February 1893.

Name or Number of bridge.	PARTICULARS OF WATER-WAY.			Description of girder.	PARTICULARS SHOWING POSITION IN WHICH TEST WAS APPLIED.				FIRST TEST.		SECOND TEST.		THIRD TEST.		Remarks.			
	Mileage.	Number of spans.	Length of span in feet.		Number of spans counting from Bezvada.	Right or left girder.	Top or bottom boom.	Point at which deflection and oscillation were taken.	In inches.	In terms of span.	In inches.	In terms of span.	In inches.	In terms of span.				
																Deflection.	Deflection.	Deflection.
..	41-6	1	6	1	Left.	Centre of web.	..	.07	1/1,030	.05	1/1,440	.05	1/1,440	Tests made with an East Coast Railway tender and engine said to weigh 85 tons.				
36½	..	1	12	1	Right.	Do.	..	.16	1/ 900	.16	1/ 900	.18	1/ 800	Weight on centre coupled wheels of engine 16.3 tons.				
38½	..	7	20	4	Do.	Do.	..	.24	1/1,000	.22	1/1,090	.24	1/1,000	Weight on two pairs of front coupled wheels of engine 82 tons.				
37½	..	4	40	4	Do.	Do.	..	.34	1/1,411	.32	1/1,500	.34	1/1,411	Weight on three pairs coupled wheels of engine 17 cwt.				
..	..	..	..	..	..	..	..	..	..	..	..	..	..	Weight on all wheels of engine and tender including Bissel truck 80 tons 9 cwt.				
														The speed in all third tests was about 20 miles an hour.				
														No oscillation was recorded as the test cards were not arranged to show this.				
														No permanent set was recorded as the girders had been run over before.				

GODAVARI,
9th February 1893.

(Signed) W. V. CONSTABLE, Major, R.E.,
Government Inspector.

20TH FEBRUARY 1893, No. 378 R., PUBLIC WORKS.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Railway.

Read the following paper :—

Report on the inspection on the 9th February 1893 of the Bezvada-Godavari section of the East Coast Railway by the Government Inspector prior to opening.

No. 91.

Endorsement by the Consulting Engineer for Railways, dated Madras, 18th Feb. 1893.

Submitted for the information of Government.

2. The sanction of the Government of India to the opening of the line on the 20th instant has been asked for.

ORDER—dated 20th February 1893, No. 378 R., Public Works.

Recorded.

(True Extract.)

Major, R.E.,
Offg. Under-Secy. to Govt., P.W.D.,
Railway Branch.

To the Consulting Engineer for Railways.

Exd. C. A. Munisawmy.
Spare Copies

RAILWAY.

Govt. of {1893} Madras.

PUBLIC WORKS.

Dated February, 20th.

Recd.

Encl.

G.O., 20th Feb. 1893, No. 378 R.

FEBRUARY.

Inspection

Report on the — of the Bezvada-Godavari section of the East Coast Railway prior to opening, recorded.

NOTE ON THE INSPECTION OF THE BEZVADA-GODAVARI SECTION OF THE EAST COAST RAILWAY BY THE GOVERNMENT INSPECTOR PRIOR TO OPENING.

This inspection was made on the 8th February 1893 in company with the Engineer-in-Chief of the East Coast Railway, his Traffic Superintendent and Engineers in charge of divisions, and the Agent and Manager of His Highness the Nizam's State Railway, and his heads of departments.

2. **Description.**—The section to be opened is 90½ miles in length and extends from the Bezvada Railway station on the left bank of the Kistna river, to the Godavari ferry on the right bank of the Godavari river, the mileage counting from the centre of the existing Bezvada Railway station. The country is flat, rich and highly cultivated, very little above sea level, and is intersected by canals. The line was severely tried by abnormal floods in October and November 1892.

3. **Banks and cuttings.**—Are of standard width, 20 feet and 18 feet respectively, and most of them have had one or two monsoons over them. The banks are full in section and fairly consolidated, but as they are chiefly composed of black soil, they will give trouble for some time to come. Practically there are no cuttings.

4. **Gradient and curves.**—The ruling gradient is 1 in 200 or .5 per cent.; approximately 47½ per cent. of the whole length of the line is level.

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9. **Diversions.**—There is an easy one at mile 75 where the two 60 feet and one 100 feet girders are being erected. It is about 2,000 feet in length; its sharpest curve has a radius of 1,000 feet and its ruling gradient is 1 in 50; at the bottom there is a strong rail and sleeper crib temporary bridge.

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Ganhdavaram at mile 12.—Has an unmetalled platform, 1 foot above rail level 600 feet long. The platform wall now at rail level will be raised. A Horbury iron latrine is being erected. There is a temporary tiled station building inclusive of waiting-shed. Permanent quarters for the station staff exist and the signals are in working order. There is a through siding and a dead end; the latter is opposite the station building and will, as at other stations, be converted into a short loop, an improvement on existing practice, I think.

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The station yard is being fenced in a temporary manner.

Bhímadól at mile 49.—Possesses a 1 foot high, 600 feet long, metalled platform with a temporary station-building including waiting-shed, and a Horbury latrine is being erected. The staff quarters are also completed and the signals are in working order. There is a through siding, but no dead end yet.

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Nidudavól at mile 79.—Possesses a 600 feet long, 1 foot high, unmetalled and unfenced platform. There is a temporary station building including waiting-shed, as also quarters for the staff. The signals are in working order. A temporary latrine will be run up. The station possesses a through siding and a short loop.

Godávári Bridge at mile 88.—Is simply a junction between the Godávári ferry station and the Godávári bridge approach line and works, the latter being the stable for engines where the triangle is located. At the bridge points there is a temporary telegraph hut and pointsmen and signallers' quarters. A home signal exists, but as it is proposed to book passengers here, distant signals will be provided as well as a short platform, waiting-shed, and latrine.

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11. **Signals.**—At all stations where traffic will be booked, the distant signals will be worked from the home signal. Lyle's patent wire holder, in which the wire is fastened to the outside of the rail, has been adopted.

12. **Turn tables and triangles.**—There is a turn table at Bezváda, and a triangle at Godávári bridge terminus where the engine will stable.

13. **System of working.**—Is Line Clear and Caution Message as on the Nizam's Railway. This is now in use, and all stations are provided with the necessary instruments and forms. General rules for working, similar to those now in force on the Nizam's Railway, have been forwarded for the approval of the Governor-General in Council, but have not been sanctioned or notified as prescribed in the Railway Act.

14. **Rolling stock.**—This is to be supplied by the Nizam's Railway and is stated to be sufficient in quantity. All engines are fitted with cow-catchers. If East Coast

Railway engines are used for construction work, they will exceed the moving loads prescribed by Government to the extent shown in the appendices. The Nizam's Railway's rolling stock conforms to ~~the~~ standard dimensions.

15. **General Remarks.**—The work of providing approach roads within station limits to the station buildings, constructing goods accommodation where necessary, and finishing and tidying up is going on as fast as possible.

The line though unfinished in many details which are unimportant so far as the safety of the public is concerned, is in good running order and should be opened without delay. All the minor works necessary to complete it are being pushed on. Name boards will be sent out from the shops in a few days. Before the Nizam's Railway take over maintenance, the railway boundaries should be permanently demarcated.

16. The following plans and papers are attached to this report :—

(1) Table showing the results of tests applied to girders.

(2) The plans and tables prescribed in section 3 of enclosure to Government of India Circular No. 19 of 1883, slightly modified in some cases in accordance with the instructions contained in the Form and Enclosures to the Rules for preparing Railway Projects.

(3) The five certificates prescribed in section 3 of the same circular.

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GODAVARI,
9th February 1893.

(Signed) W. V. CONSTABLE, Major, R.E.,
Government Inspector.

82 4.2
1554/93

STATEMENT showing result of tests of bridges on the Bezvada-Godavari section of the East Coast Railway inspected on the 8th February 1893.

Name or Number of bridge.	Mileage.	PARTICULARS OF WATER-WAY.		Description of girder.	PARTICULARS SHOWING POSITION IN WHICH TEST WAS APPLIED.				FIRST TEST.		SECOND TEST.		THIRD TEST.			Remarks.
		Number of spans.	Length of span in feet.		Number of spans counting from Bezvada.	Right or left girder.	Top or bottom boom.	Point at which deflection and oscillation were taken.	In inches.	In terms of span.	In inches.	In terms of span.	In inches.	In terms of span.	Oscillation in inches.	
41-6	1	6	Plate with cross sleepers on top.	1	Left.	Centre of web.	Do.	Do.	-07	1/1,030	-05	1/1,440	..	1/1,440	..	Tests made with an East Coast Railway tender and engine said to weigh 85 tons.
36 1/2	1	12	Do.	1	Right.	Do.	Do.	Do.	-16	1/ 900	-16	1/ 900	..	1/ 800	..	Weight on centre coupled wheels of engine 16.3 tons.
38 1/2	7	20	Do.	4	Do.	Do.	Do.	Do.	-24	1/1,000	-22	1/1,090	..	1/1,000	..	Weight on two pairs of front coupled wheels of engine 32 tons.
37 1/2	4	40	Do.	4	Do.	Do.	Do.	Do.	-34	1/1,411	-32	1/1,500	..	1/1,411	..	Weight on three pairs coupled wheels of engine 44 tons 17 cwt.
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	Weight on all wheels of engine and tender including Diesel truck 80 tons 9 cwt.
																The speed in all third tests was about 20 miles an hour.
																No oscillation was recorded as the test cards were not arranged to show this.
																No permanent set was recorded as the girders had been run over before.

GODAVARI,
9th February 1893.

(Signed) W. V. CONSTABLE, Major, R.E.,
Government Inspector.

Form No. 1.

PUBLIC WORKS DEPARTMENT.

OFFICE OF CONSULTING ENGINEER FOR RAILWAYS,
Madras, 18 February 1893.

Report on the inspection on the 9th
February 1893 of the Beavoor-Gadavari
section of the East Coast Railway by the
Government Inspectors prior to opening.

No. 91

Submitted for the information of Government.

2. The sanction of
the Government of India
to the opening of the line
on the 20th instant, has
been asked for.

McComb

Major R.E.
Offg. Cons. Eng. for Railways

Subject.

8-1
PW 1554/93

P. W. CURRENT No. 1554

Form No. 3.

From

THE CONSULTING ENGINEER

FOR RAILWAYS,

Madras,

A 378 R 20 Feb 1903.

18 Feb
Recorded.

No. 91

Dated 18th } February 1892
Received 18 }

M. S. M. S.
D. H.

No. of ENCLOSURES. 2

Subject.

Report on the inspection
of the Beypada - Godavari
Section of the East Coast Ry
prior to opening for public
traffic.

A 378 R 20 Feb 1903.

21.3
To the Consulting Engineer for Ry. 61
31
105

18 Feb 1892