

RAILWAY BRANCH.

G.O., No. 25-26R

DATED 18th January,

[Despatch Abstract.]

Bezwada-Madras Railway Surveys — Plans and estimate and a report on the —, ordered to be forwarded for the consideration and orders of the Govt of India.

Forwarding for consideration & orders plans & estimates & a report on the —.

His view was that it should be at Bezwada, so that the Southern Mahratta Railway should have access to the head of the Góddávari delta.

The present line was therefore run into Tadapilli and connects the towns of Chinna Gánjam, Vetapalem, Chirila, Bápata, Nidubrol, Tenali and Tadapilli, and a branch line was run from Tsundur, mile 241, to Guntúr in view of future possibilities, and the much discussed question of the gauge of the Bezwada-Masulipatam line may be decided hereafter also as between the claims of the Southern Mahratta and the East Coast line to enter the delta of the Góddávari and Kistna rivers. By this location also a fertile tract of 23 miles of country is traversed by the main line and the town of Tenali, of 5,000 people with a large import and export trade carried on by twelve merchants, is connected with the railway.

The junction station of Tadapilli is not however well chosen and the branch line into Guntúr enters that town the wrong way.

Construction and Engineering—Earthwork.—The general level of the line is 3½ feet above high flood level which is sufficient.

The bank between miles 40 and 44 should be lowered 3 feet to save earthwork. There is an error of 10 feet in ground level at chain 231.

There being some danger of the Kalinga river breaching the line mile 49-50 the bank should be pitched.

Mile 67-69 bank should be raised one foot.

Mile 73-74 bank should be lowered and cutting at mile 74 increased to save earthwork.

Mile 116, head way over canal should be increased to 10 feet and 1 × 40' span substituted for 2 × 20', if there is any navigation herein.

Mile 127, side pitching across tank required.

Bank at mile 150-151 should be lowered.

Bridges—Pulicat Lake.—As remarked before on the Ennore creek bridge the design of piles is not good. They should be screwed in clusters of five under each girder seat with a batter and connected at heads with cast-iron table as is done on the Madras Railway.

Many bridges over ill-defined channels are designed with pier abutments protected by pitched embankments; this design contracts the water-way and is only admissible where the amount of bridging is doubtful.

Pennar Bridge.—The proposal to contract the natural channel of the river from 2,000' to 1,400' is not approved. Mr. Bell's system is applicable to rivers whose channels are liable to shift within wide limits; there is no such possibility here, moreover, the anicut is only half mile distant up-stream and the axes of the anicut and bridge are at an angle of 32° and the silting up of the bed along the training banks, which sometimes occurs, may eventually obstruct the free discharge of water below the anicut and lead to a circular scour being set up which might endanger the anicut foundations. The spans should be increased by four, and although the abstract estimate does not give the cost of the bridge separately, the omission or reduction of the training banks will probably balance the cost of the extra spans.

The four bridges No. 3, Mudigonda, Gundlakamma and No. 9 appear also to have insufficient water-way; the mean velocities are open to question, being given as 7.1, 5.9, 5.6 and 7.1 feet per second, respectively, and it is not understood how these can vary so greatly when the spills are said to come from the same river. At the Pálar with a calculated discharge of 31,800 cubic feet per second, twelve spans of 60' are allowed, while at the Gundlakamma with an observed discharge of 64,390 cub. ft. per second the same number of spans are given. I advise these bridges being given the following waterways:—

No. 3, Ongole-Kistna Section	...	...	...	...	7 × 40'
Mudigonda (as before)	...	...	...	...	12 × 40'
Gundlakamma	...	...	...	...	16 × 60'
No. 9, Ongole-Kistna Section	...	...	...	...	15 × 20'

Romperu river, even if tidal, appears to have excessive headway, the $\frac{1}{100}$ grade should be taken off from Kommanur canal.

Both the Kommanur canal bridges are designed with wing walls and abutments too thin for their height.

Pitching does not appear to have been sufficiently provided.

Stations.—A greater width should be allowed between platforms and goods sheds when placed opposite to allow of more lines being laid in. The goods sheds are located in the type opposite the station; this arrangement must depend on local requirements.

The general design of stations and sheds should be of brick or stone in mud for outer walls only; under a roof of corrugated iron on rail standards, the interior walls being sundried bricks in this way with little cost for repairs the stations, &c., will serve for many years and can be shifted if needed.

The tanks should be altered by using four tanks to make one of double the height using the interior sides secured by inside stags and gussetts.

The use of rail standards for water tanks and engine sheds is recommended.

Level crossings should be outside shunting limits in large towns.

Rates are accepted as based on good authority; but those for earthwork in cuttings and for ballast appear rather high.

Traffic.—The two results for the traffic estimates approximate very closely, but the assumption that the working expenses will be 50 per cent. is sanguine as is also the probable coal traffic estimate. The cost of converting the Gudur-Nellore section from metre to standard gauge is very high compared with the Bengal-Nagpur, but no details are given of receipts from plant, permanent-way, &c.

The Madras Railway survey totals as revised by the Consulting Engineer for Madras amounted to Rs. 2,59,42,838 or Rs. 91,027 per mile as against 2,58,73,607 or Rs. 89,095 per mile in the present estimate for the entire scheme. The rate per mile of the stations and buildings is Rs. 5,734, fencing Rs. 4,396, general charges Rs. 6,365. By reducing the former to Rs. 2,000, eliminating the fencing, reducing the general charges to Rs. 5,400, and as before noted, taking a reduced rate for ballast and earthwork in cutting, and making allowance for the extra cost of bridges advised, the estimate should stand at Rs. 80,000 per mile.

MADRAS,
14th January 1895.

(Signed) F. R. UPCOTT,
Consulting Engineer for Railways.

ORDER—dated 18th January 1895, No. 25 R., Public Works.

The Consulting Engineer for Railways submits plans and estimate, and a report on the Bezwada-Madras Railway Survey sanctioned in Government of India letter No. 1150 R.C., dated 3rd November 1893.

2. In the note appended by the Consulting Engineer, it is recommended that the salt branch from Vallur to Kattur should not be constructed until certain points connected with the Salt Department are settled—

that the town of Allur should be connected by the railway;
that the main line should connect with Tadapilli on the Southern Mahratta Railway and not with Guntúr;
that the estimate should be modified to give a construction mileage of Rs. £0,000.

3. His Excellency the Governor in Council agrees generally with the recommendations of the Consulting Engineer, but considers that the proposed salt branch is unlikely to earn enough to justify its construction.

4. The map of the proposed alignment with the Consulting Engineer's note will be forwarded to the Collectors of Chingleput, Nellore and Kistna for remarks.

RAILWAY.

Govt. of {1895} Madras.
PUBLIC WORKS.

Dated January, 18th.

Recd.

Encl.

G.O., 18th Jan. 1895, No. 25 R.

JANUARY.

Pezwada-Madras Railway
Survey

Plans and estimate and a report on the
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ation and orders of the Government of
India.

18TH JANUARY 1895, No. 25 R., PUBLIC WORKS.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Railway.

Read the following paper:—

Note by the Consulting Engineer to the Government of Madras for Railways.

Location.—The general orders for the alignment and location have been correctly carried out, the accommodation of the important towns and villages having been provided for with one or two exceptions which are noted below.

The line from Madras to Ennore is now under construction, and the plans thereof are with the Government of India.

Ennore-Gudur Section.—From Ennore two routes were examined, one turning west to Ponnéri and the other running northwards to Kattur and Pulicat along the salt factories. As however it is unlikely that the railway could compete with the Buckingham Canal for the short distance of 20 miles, and because eventually the salt depôt may again be placed in Madras, and thirdly because of the projected connection of the canal with the Madras Harbour, the main line was aligned to Ponnéri and a branch of 10 miles laid out from Vallur to Kattur along the salt factories.

This branch would be laid with second-hand rails and cheaply built, and its construction deferred till the abovementioned points are settled.

The main line passes the principal towns of Vallur, Ponnéri, Sulurpet, Náyudupéta and Gudur.

The crossing of the Arani, miles 21, should be taken to the north of Ponnéri; this would bring the station nearer the town.

The line runs one mile from Elavúr, mile 32, as its position on the edge of the Pulicat lake renders it difficult to approach without adding half a mile to its length.

The station of Arambakam, mile 37, should be placed closer to the two villages at mile 37½.

The present line runs into the existing station of Gudur.

Gudur-Nellore Section.—No remark under this head.

Nellore-Ongole Section.—There are two towns on this length which are unconnected with the railway, Allur of 5,000 people opposite mile 125 and Kandukur of 6,600 people; to pass through the former, the line will be lengthened by 3 miles and the ground is low, but as its chief trade is rice and indicates the presence of merchants, I advise the deviation to connect it. On the other hand, because Kandukur is chiefly a weavers' town, the advent of the railway will not materially benefit its trade, moreover, it will require five miles additional length, I advise that it be not connected by the railway.

The chief towns passed through will then be Allur, Kavali, Tangatur, Surareddipalem (Vallur) and Ongole; the latter station should be placed nearer the town and Amanabrolu station should be moved to mile 190.

Ongole-Kistna Section with Tsundur-Guntur Branch.—The main question on this section is whether the junction of the metre and standard gauges should be at Guntur or on the Kistna (either right or left bank).

The Government of India in its letter No. 252 R.C. of 13th March 1893, deferred final settlement of this question till the Consulting Engineer had discussed the matter on the spot.

His view was that it should be at Bezwada, so that the Southern Mahratta Railway should have access to the head of the Gódvári delta.

The present line was therefore run into Tadapilli and connects the towns of Chinna Gánjam, Vetapalem, Chirla, Bápatla, Nidubrol, Tenali and Tadapilli, and a branch line was run from Tsundur, mile 241, to Guntúr in view of future possibilities, and the much discussed question of the gauge of the Bezwada-Masulipatam line may be decided hereafter also as between the claims of the Southern Mahratta and the East Coast line to enter the delta of the Gódvári and Kistna rivers. By this location also a fertile tract of 23 miles of country is traversed by the main line and the town of Tenali, of 5,000 people with a large import and export trade carried on by twelve merchants, is connected with the railway.

The junction station of Tadapilli is not however well chosen and the branch line into Guntúr enters that town the wrong way.

Construction and Engineering—Earthwork.—The general level of the line is 3½ feet above high flood level which is sufficient.

The bank between miles 40 and 44 should be lowered 3 feet to save earthwork. There is an error of 10 feet in ground level at chain 231.

There being some danger of the Kalinga river breaching the line mile 49-50 the bank should be pitched.

Mile 67-69 bank should be raised one foot.

Mile 73-74 bank should be lowered and cutting at mile 74 increased to save earthwork.

Mile 116, head way over canal should be increased to 10 feet and 1 × 40' span substituted for 2 × 20', if there is any navigation herein.

Mile 127, side pitching across tank required.

Bank at mile 150-151 should be lowered.

Bridges—Pulicat Lake.—As remarked before on the Ennore creek bridge the design of piles is not good. They should be screwed in clusters of five under each girder seat with a batter and connected at heads with cast-iron table as is done on the Madras Railway.

Many bridges over ill-defined channels are designed with pier abutments protected by pitched embankments; this design contracts the water-way and is only admissible where the amount of bridging is doubtful.

Pennar Bridge.—The proposal to contract the natural channel of the river from 2,000' to 1,400' is not approved. Mr. Bell's system is applicable to rivers whose channels are liable to shift within wide limits; there is no such possibility here, more over, the anicut is only half mile distant up-stream and the axes of the anicut and bridge are at an angle of 32° and the silting up of the bed along the training banks, which sometimes occurs, may eventually obstruct the free discharge of water below the anicut and lead to a circular scour being set up which might endanger the anicut foundations. The spans should be increased by four, and although the abstract foundation does not give the cost of the bridge separately, the omission or reduction of the training banks will probably balance the cost of the extra spans.

The four bridges No. 3, Mudigonda, Gundlakamma and No. 9 appear also to have insufficient water-way; the mean velocities are open to question, being given as 7.1, 5.9, 5.6 and 7.1 feet per second, respectively, and it is not understood how these can vary so greatly when the spills are said to come from the same river. At the Pálár with a calculated discharge of 31,800 cubic feet per second, twelve spans of 60' are allowed, while at the Gundlakamma with an observed discharge of 54,300 cub. ft. per second the same number of spans are given. I advise these bridges being given the following waterways:—

No. 3, Ongole-Kistna Section ...	...	...	...	...	...
Mudigonda (as before) ...	...	...	...	...	7 × 40'
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No 9, Ongole-Kistna Section ...	...	...	...	...	18 × 60'
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Romperu river, even if tidal, appears to have excessive headway, the $\frac{1}{200}$ grade should be taken off from Kommanur canal.

Both the Kommanur canal bridges are designed with wing walls and abutments too thin for their height.

Pitching does not appear to have been sufficiently provided.

Stations.—A greater width should be allowed between platforms and goods sheds when placed opposite to allow of more lines being laid in. The goods sheds are located in the type opposite the station; this arrangement must depend on local requirements.

The general design of stations and sheds should be of brick or stone in mud for outer walls only; under a roof of corrugated iron on rail standards, the interior walls being sundried bricks in this way with little cost for repairs the stations, &c., will serve for many years and can be shifted if needed.

The tanks should be altered by using four tanks to make one of double the height using the interior sides secured by inside stags and gussetts.

The use of rail standards for water tanks and engine sheds is recommended.

Level crossings should be outside shunting limits in large towns.

Rates are accepted as based on good authority; but those for earthwork in cuttings and for ballast appear rather high.

Traffic.—The two results for the traffic estimates approximate very closely, but the assumption that the working expenses will be 50 per cent. is sanguine as is also the probable coal traffic estimate. The cost of converting the Gudur-Nellore section from metre to standard gauge is very high compared with the Bengal-Nagpur, but no details are given of receipts from plant, permanent-way, &c.

The Madras Railway survey totals as revised by the Consulting Engineer for Madras amounted to Rs. 2,59,42,838 or Rs. 91,027 per mile as against 2,58,73,507 or Rs. 89,095 per mile in the present estimate for the entire scheme. The rate per mile of the stations and buildings is Rs. 5,738, fencing Rs. 4,396, general charges Rs. 6,365. By reducing the former to Rs. 2,000, eliminating the fencing, reducing the general charges to Rs. 5,400, and as before noted, taking a reduced rate for ballast and earthwork in cutting, and making allowance for the extra cost of bridges advised, the estimate should stand at Rs. 80,000 per mile.

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Forwarding, for consideration and orders,
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Print

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Construction and Engineering

Earth-work

The general ^{level} of the line is $3\frac{1}{2}$ feet above high flood - level which is sufficient.

The bank between miles 10 and 41 should be lowered about 3 feet to save earth-work. There is an error of 10 feet in ground level at chain 231.

There being some danger of the Kalinga river breaching the line mile 19-50 the bank should be pitched.

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Rs. 80,000 per mile.

J. Rupcott

Consulting Engineer for Railways.
Madras.

Madras
14th January 1895.

Print

A. N. S. Co. Secy. to Govt. of Madras, 14 Jan 95
Order to

Dated 18 January 1895
to 25. R. Public Works.

The Consulting Engineer for Railways submits plans, and estimate and a report on the Blyvada Madras Ry. Survey sanctioned in Govt. of I. letter No 1150 R.C of 3rd Novr. 1893.

2. In the note appended by the Consulting Engineer it is recommended that the salt branch from Vallur to Kattur should not be constructed until certain points connected with the salt department are settled -

- That the Tower of Allah should be connected by the railway -*
- That the main line should connect with Tadupalli on the Southern Railway and not with further -*
- That the estimate should be modified to give a construction value of 80,000.*

3. His Excellency the Governor in Council agrees finally

with
the recommendations
of the Consulting
Engineer but considers
that the proposed salt
brade is unlikely to
earn enough to justify
its construction -

1. 5. With the above remarks,
the plan, estimate &
reports will be forwarded
for the consideration and
orders of the Government
of India -

4. The ^{map of the} proposed align-
ment with the Consulting
Engineer's note will be
forwarded to the Col.
Cdr. of ^{Chingleput} Bellare and
Kistna for remarks -

Yours

Despatch No. 26, P. 4, 18th Jan 1895

Forwarded

(Sd) F. R. Upcott.
Joint Secy to Govt.
P. W. D. Ry. Dept.

To
The Commr of Chingleput
— do — Bellare
— do — Kistna
The Rev. Secy to Govt.

Despatch in
R. Office
on 19.1.95

35 Printed copies despatched to India 29/1/95

Date 18-1-95
1. To Secy to Govt.
2. To Secy to Govt.
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