

Public Works (1895) Department.

RAILWAY BRANCH.

G.O., No. 89 R

DATED 23rd September

[Despatch Abstract.]

Madras, Canner Section of the Bezwada-Madras Railway

The Govt Inspector's inspection report of the — for the half-year ending 30th June 1895, Comd^d to the agent & manager Madras Railway, for attention & to the Local & Municipal Dept with reference to the remarks by the senior Govt Inspector.

Forwarding Prov: on the Government Inspector's inspection report of the — for the half-year ending 30th June 1895.



Indexed.

REPORT.

Preliminary.—(a) The survey of the Arsikeri-Mangalore Railway was undertaken under the orders of the Government of India conveyed in notification, Public Works Department, No. 416, dated 27th October 1894.

The object is to establish railway connection with Mangalore, a sea-port on the Western Coast, from Arsikeri, a station on the Southern Mahratta Railway (Mysore section), about 160 miles north of Bangalore. The length of the line has been estimated at 137 miles, but this has been obtained from the length of the road and in the final result it is expected to be about 143 miles, the extra length being due to the gradients necessary for an adhesion-line. The origin of the survey is, an application from Messrs. Kirby and Lonsdale for a concession for the construction of a line from

G.O., No. 619 R., 23rd March 1893.

" " 818 R., 6th May 1893.

" " 819 R., 6th "

" " 152 R., 10th March 1894.

Arsikeri through Hassan to Mangalore with branches from Hassan to Mysore and Chickmagalur and an extension from Nunjengod in Mysore territory through Satya-Mangalur to Erode on the Madras

Railway, where it would effect a junction with the narrow gauge system of the South Indian Railway. As a result of these negotiations the survey now under submission was taken up as it really forms the main feature in the schemes proposed.

The primary object is to obtain an outlet for the Mysore State to a port and Mangalore has been for ages the port which has served Mysore. From its situation on the West Coast it is liable for three months every year to the full force of the monsoon and the only routes by which either merchandise or travellers can leave involve a long land journey over roads much cut up during the heavy rain. Mangalore contains a large mercantile population and is a wealthy town and is about the northern limit of the Moplah population who are known to be subject to periodical turbulent out-breaks, and were this to occur at Mangalore from where the garrison has been now removed, it would take at least a week before troops could be brought upon the scene.

Further, the province of South Canara is rich in crops irrigated by the Nitravati and other large rivers which never fail owing to the south-west monsoon, and had transport been available much of the distress in Mysore during the disastrous famine of 1876-77 would have been prevented.

(b) The previous reports will be found in the Government Orders quoted above and with regard to them it is only necessary to point out that a very serious clerical error has crept into the report by Mr. McFarlane at page 8 which has led to the hope

G.O., No. 2043 R., 20th August 1892.

that a gradient of 1 in 84 would be possible. This results from the level of the road at the Frontier being given as 1,733

feet above sea-level instead of 733 feet, and this error has been carried through much of the subsequent notes.

(c) From Arsikeri to Hassan the country is much the same as Mysore generally, open rolling plains with deep depressions and high ridges between the valleys. For these 30 miles the line proposed has been located as far as Hassan by the Mysore Government and the attention of the party was chiefly directed to the portion to be done between Hassan and Mangalore. After leaving Hassan the country falls for some 4.9 miles to the Yagatchi river and after crossing another smaller river rises to Palya on the main road. Beyond Palya the rise continues to a place called Barlo at which coffee land is first met. From Barlo to Saklasapur the fall is 360 feet, the whole of which occurs on the road in the first 4 miles from Barlo and the railway has therefore to take a route to the eastward along the ridges dividing the watershed between the

Yagatchi river and the Hemavati which entails increased length to the extent of $3\frac{1}{4}$ miles. At Saklaspur the Hemavati is crossed by the road on an iron bridge of 4 spans of 120 feet supported on screw piles and immediately to the west of the river lies the town of Saklaspur, head-quarters of the Manjarabad taluk. Saklaspur is situated on the end of a ridge branching out from the actual watershed of the Western Ghâts and along this ridge the road runs too close to the Manjarabad hill on which is an old Fort evidently built to command the pass in former days. The actual ridge of the ghâts between the east and west watersheds runs north at about one mile north of Manjarabad and along this watershed the Mudugherri road has been laid out. Mr. Groves' trace crosses this Mudugherri road at a saddle about 3 miles north-east of Manjarabad and measured directly about $1\frac{1}{2}$ miles from Saklaspur. There is, therefore, a very peculiar physical feature at this point in the fact of a river of considerable volume, requiring to span it 4 spans of 120 feet, running parallel to the actual watershed of India only $1\frac{1}{2}$ miles distant and only 83 feet below the saddle, which has been selected for the proposed railway to pass through for the descent to the western plains.

The reduced level of Saklaspur is 2,960
The reduced level of saddle is 3,043 } Difference 83.

The river on the western face is the Yettenhalle and the road circles under the Manjarabad hill until it reaches a point in the valley 6 miles from Saklaspur where it crosses the Yettenhalle at reduced level 2,628. The reason for this is that the road abandons the Yettenhalle valley and rises in 2 miles 300 feet to cross into the Maran-halli valley and so work through easier country. The actual descent of the road begins only at 11 miles from Saklaspur up to which point the total fall has been only 525 feet. The railway trace sticks to the Yettenhalle valley and falls only 533 feet in a distance of $7\frac{3}{4}$ miles from the ridge, or $10\frac{1}{4}$ miles from Saklaspur, and at this point enters a gorge down which the river rushes in a series of falls. The reduced level at the head of the gorge is 2,480. From this point the 1 in 40 carried out by Mr. Groves for some seven miles began and at first sight it appeared hopeless to get a 1 in 40 line down a valley in which the road falls 1 in 20. Before debouching on the plain the fall of the road becomes very gradual and, in the result to be explained more fully hereafter by economising every foot and utilizing every favourable spur, a line has been obtained which will meet the line in the plains without any loss of direction or deviation to the north. The road ghât ends at a place called Kemphole 18 miles from Saklaspur and has on it only one zigzag of about $\frac{1}{4}$ mile in length, its mean gradient being 1 in 27 throughout, but about 1 in 20 on the steepest part of the descent $6\frac{1}{2}$ miles in length. The frontier is at Marbid 21 miles from Saklaspur and Seradi; the first village in South Canara is eight miles beyond.

The reduced level at the Frontier is 724.
Reduced level at Seradi is 340.

From Seradi to Mangalore the distance by road is $53\frac{1}{2}$ miles and the average fall of the country is only about 6 feet per mile. But the spurs of the ghâts run into the plains nearly as far as Uppinangadi 32 miles from Mangalore and, though of no height, makes the country difficult to work through as it is densely wooded and each line has to be cut and cleared, only to find that some saddle obstructs the trace and a fresh start has to be made. This has been finally settled by breaking through into the valley to the south and putting the bridge over the Nitravati at a point near Uppinangadi. From Uppinangadi to Mangalore the north bank of the Nitravati is obligatory, for a larger tributary, called the Coomodari, comes in from the south, which would require a bridge as large as that of the Nitravati itself, and the subsequent bridge over the Nitravati at Buntwal would be a very long one.

Through South Canara there are no maps of any reliability, the G. T. maps not yet being published; but all existing maps show the main road from Pani-Mangalore to Uppinangadi as on the north bank, whereas it is on the south bank. The country on the north bank has been found from inspection to be well suited for a railway, except near Uppinangadi, where the location being near, the river is necessarily rough the banks being high and steep. From Uppinangadi towards Mangalore the line has been actually located up to near Sirpadi along the bank of the Nitravati. From Sirpadi to Buntwal a ridge runs along the river which will provide a favourable

location and reduce the provision for waterway. A mile from Buntwal, a large stream is crossed which will probably require three spans of 60 feet. Buntwal stands on a hill on the river bank with flat paddy land behind it, and along this the line will run to the Pani-Mangalore ferry. From this to Feringipet, 9 miles from Mangalore, the road rises and falls a good deal owing to the spurs running down to the river; so, as far as can be seen until the work reaches this place, the best alignment will probably be along the river to Feringipet. From thence the whole alignment will be on paddy land to Jeppo, a suburb of Mangalore where extensive coffee works (Morgan and Co.) and tile works (Basel Mission) are situated. It is also an important market centre and the Civil authorities attach importance to its having a station. From Jeppo into the Salt Cotaurs, the line will skirt the river, some little reclamation being required until it reaches the Salt Cotaurs where it is proposed the station should be situated with an extension along the Bunder to meet mercantile requirements.

(d) The gauge is proposed to be the metre gauge, that being the gauge of the Southern Mahratta Railway system and also of the South Indian Railway system with which the other branch lines are proposed to connect it. The group of lines thus proposed would therefore form an important link in the metre gauge system of India, while the line now under survey would give a valuable outlet for the produce of the province.

(e) The fixed point is the same as that used for the survey already sent in by the Mysore Government of the Arsikeri-Hassan section, namely, the "centre of the passenger platform of the Arsikeri station of the Mysore section of the Southern Mahratta Railway."

(f) The total length of the line is expected to be 143 miles, of which 83 miles lie in the Mysore province and 60 miles in South Canara.

Location.—The actual location of the line has been guided by the results of previous work done and has required much modification. The compensation for curvature too involves not only heavier work in the section but greater length. So far, on the line selected, all the curves have, with a few exceptions, been compensated; but without compensation a very much lighter section could be shown. It is a question whether with a ghât gradient of 1 in 40 intervening gradients of 1 in 100 with flatter curves need be compensated. The result of this season's work points very clearly that the ghât if the grade be reduced to, say, 1 in 40 nett, the curves will be easier in consequence of there being more room further down the hill side on each spur and some of the valleys, notably the Kemphole, will yield better crossings lower down the valley.

Division I.—This division extends from Hassan to Saklaspur and has been under Mr. W. P. Milne, Executive Engineer. The work on the ghât proving too much for the limited staff, Mr. Milne was deputed to survey the upper section of the ghât to ensure, as far as possible, a through section. The junction with the work completed by the Mysore Government was made at a point some 49 chains west of Hassan and the station site selected has been retained in the scheme as now submitted. From what can be seen and from what is known to be the wishes of the Durbar, the site of the station will require reconsideration and there will be no difficulty in getting a more convenient site which will interfere less with existing roads and probably afford a better gradient out of the station. The route follows somewhat the line of the main road to Mangalore and at mile $34\frac{3}{4}$ crosses the Yagatchi river about $1\frac{1}{4}$ miles north of the road. The area drained by the Yagatchi is 373 square miles, which would, according to Dicken's formula using coefficient 1,200, require a waterway of 600 feet. A bridge with 4 spans of 40 feet arches has been adopted, as the road bridge $1\frac{1}{4}$ miles lower down consists of 7 spans 25 feet arches and has stood for over 50 years. It has been necessary to deviate from the line of the road and pass through Alur, an important sub-taluk head-quarters, to which a branch road has been made as the route followed by previous survey through Palya on the main road was not feasible at 1 in 100 ruling gradients. It is proposed to investigate a more direct route from Alur to Saklaspur avoiding the Balol saddle and probably shortening the line and saving a considerable rise. The line laid out has ruling gradients of 1 in 100 which do not quite fully compensate the curves for a 12 feet wheelbase, but on revision there is no doubt this will be obtained and the work very much lightened by slight