

Public Works (1895) Department.

RAILWAY BRANCH.

G.O., No. 97 R

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[Despatch Abstract.]

Madras, Enamur 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.

or $10\frac{3}{4}$ miles from Saklasput and at this point enters a gorge down which the river rushes in a series of falls. The Red: Level at the head of the gorge is 2480. From this point the 1 in 40 carried out by Mr. Groves for some 7 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 plains the fall of the road becomes very gradual and in the result to be explained more fully hereafter by economising every foot and utilising 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 Chat Ends at a place called Kemphole 18 miles from Saklasput 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 200 on the steepest part of the descent $6\frac{1}{2}$ miles in length. The frontier is at Marlbide 21 miles from Saklasput and Peradi the first village in South Canara is 8 miles beyond. The Red: Level at the Frontier is 7214

Red: Level at Peradi is 340.

From Peradi 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 ghats run into the plains nearly as far as Upinangady 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 put 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 Nittavati at a point near Upinangady. From Upinangady to Mangalore the North Bank of the Nittavati 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 Nittavati itself and

and the subsequent bridge over the Kittavati at Buntwal would be a very long one—

Through South Canara there are no maps of any reliability the G.I. maps not yet being published but all existing maps show the main road from Pani-Mangalore to Upinangady 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 Upinangady where the location being near the River is necessarily rough, the Banks being high and steep— From Upinangady towards Mangalore the line has been actually located up to near Pirpadi along the Banks of the Kittavati. From Pirpadi to Buntwal a ridge runs along the River which will provide a favorable location and reduce the provision for waterways. A mile from Buntwal a large stream is crossed which will probably require 3 spans of 80 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 Seringipet 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 Seringipet— From thence the whole alignment will be on Paddy land to Jeppo a suburb of Mangalore where extensive Coffee works (Morgan & Co) and Tile Works (Basil 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 Coasters the line will skirt the river some little reclamation being required until it reaches the Salt Coasters where it is proposed the Station should be situated with an extension along the Bandar to meet mercantile requirements.

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 Arsikere-Hassan Section namely the "centre of the passenger platform of the Arsikere 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 ghāt 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 ghāt 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 Saklasput and has been under Mr. H. P. Milne, Executive Engineer.

The

The work on the ghât proving too much for the limited staff Mr. McIlne 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 Bangalore 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 Dickens' Formula using coefficient 1200 require a waterway of 500 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 Paklasapur 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 deviations from the present alignment. At Paklasapur the

The Hemavati is crossed on a Bridge of 5 spans of 100 feet girders. The drainage area is 230 square miles while the road crosses on a Bridge of 4 spans 120 feet. The extra span has been put in to suit the channel and avoid a high Bank subject to flood. On the West Bank is the station of Saklaspur the head quarters of the Manjerabad Taluk and an important town as near it roads converge from the Mudugherry and Coorg directions. From Saklaspur to the actual ridge which divides the watershed of India is only 2 miles distant from the Hemavati and the rise only 53 feet.

Division II. The Second Division, Saklaspur to the Frontier has been under Mr. Lilley, Executive Engineer but the work was so far in excess of what was possible with the limited staff that Mr. Milnes' work was stopped in March and he was sent to run the upper 6 miles of the ghât from Saklaspur to the Yettenhalla crossing. The Hebsala Ridge referred to as the actual watershed carries the Mudugherry road which crosses the Railway by an overbridge and the upper descent of the ghât begins. The route down the valley is necessarily tortuous with 30 curves of 10° or 573 feet Radius and gradients 1 in 66 and 1 in 51 all fully compensated. The Yettenhalla Bridge is reached at mile $64\frac{1}{4}$ and at a Red Level of 2627. The main road here ascends and the Railway follows the course of the River as far as the $67\frac{3}{4}$ mile where it enters a gorge by a Tunnel 140 yards rendered necessary by a bend in the stream. At this point the Red Level is 2480. From this point the lower ghât begins and it has been carried out at a gradient of about 1 in 52 which fully compensates for all curves so that the gradient should be more properly described as 1 in 40 compensated. From the original trial line run by the Mysore Government it was evident that without special expedients to gain base the line would be carried North

North along the face of the ghât and that owing to the steep beds and continually narrowing valleys the crossing of them would be most difficult. It was therefore arranged to circle two spurs twice which has resulted in the necessary base being obtained about 2 miles. The lower ghât contains numerous viaducts and tunnels which the sharp spurs and narrow valleys necessitate. For the viaducts a tentative design has been taken consisting of trestles and 40 feet girders, longer spans being inadmissible on account of the curves. It is clear from this season's work that it would be impossible to cross the Hempholi River at any point further upstream than the crossing now proposed and that the adoption of a steeper grade would place the line more favorably in the valley for crossing. The min. curve has been maintained at 573 except in a few instances where sharper curves were absolutely necessary. It was considered better to get the line through and establish a good base for the next season's work than to delay trying to get in easier curves which would vastly increase work. The line is now within some 3 miles of the Frontier and it will run out close to the Kabbankhalli Bridge. The gap at this point unsurveyed is estimated at 10 miles of which 8 are on the ghât.

Division III.

The Third Division, Mysore Frontier to Mangalore has been under Mr. Farewell, Temporary Engineer who was instructed to begin at Peradi pending the completion of the ghât as it was doubtful where it would work out. This has proved a very difficult piece of country there being no maps available of any reliability. One map 4 miles to the inch dated 1827 is very inaccurate and the more recent surveys are not yet published. The line follows the Hempholi River till it bends to the South when it continues East and crosses the Perisaumty saddle which divides the watershed between

between the Kemphole and Kittavati rivers. The original trace followed the Ooperhale a tributary of the Kittavati but many trial lines proved it was best to avoid this and tending to the South reach the Kittavati near Upinangady, which gives a considerable saving in length and avoids much steep and broken country. The spurs from the hills run out as far as Upinangady and the ravines are deep and tortuous so that a line down the Ooperhale is not at all a favourable one. The whole country is densely wooded and each line has to be cleared which hampered the work. Crossing the Kittavati about 1 mile above Upinangady the line follows the North Bank to Sirpadi which is about 25 miles from Mangalore, but no map exists from which this can be ascertained. From where the work has stopped near Sirpadi the country is open and easy and the fall into Mangalore very slight.

The whole project as now submitted will on detailed revision be much reduced and where necessary steps will be taken to secure extra length for compensation of gradients on curves.

Alternative Routes.

The only alternative route which suggests itself is that from Alur to Hulsulige near Belagode about $5\frac{1}{2}$ miles from Saklasput, but the country does not appear promising as it is much broken. This will, however, be taken up at once.

The other ghats namely the Boon or Chammadi ghat on the North and the Bisley ghat on the South have been apparently condemned as unsuitable to a Railway and there is no doubt that two-thirds of the Mangalore Trade follows the Sirpadi route. Arrangements are being made to send out a party at once to see if any improvement can be effected in the alignment already selected by the Mysore Government between Arsilleri and Hassan. In some places the route runs from the section to be