उप मुख्य अभियंता का कार्यालय (निर्माण) OFFICE OF THE DEPUTY CHIEF ENGINEER (CONSTRUCTION) SWRLY MYSORE

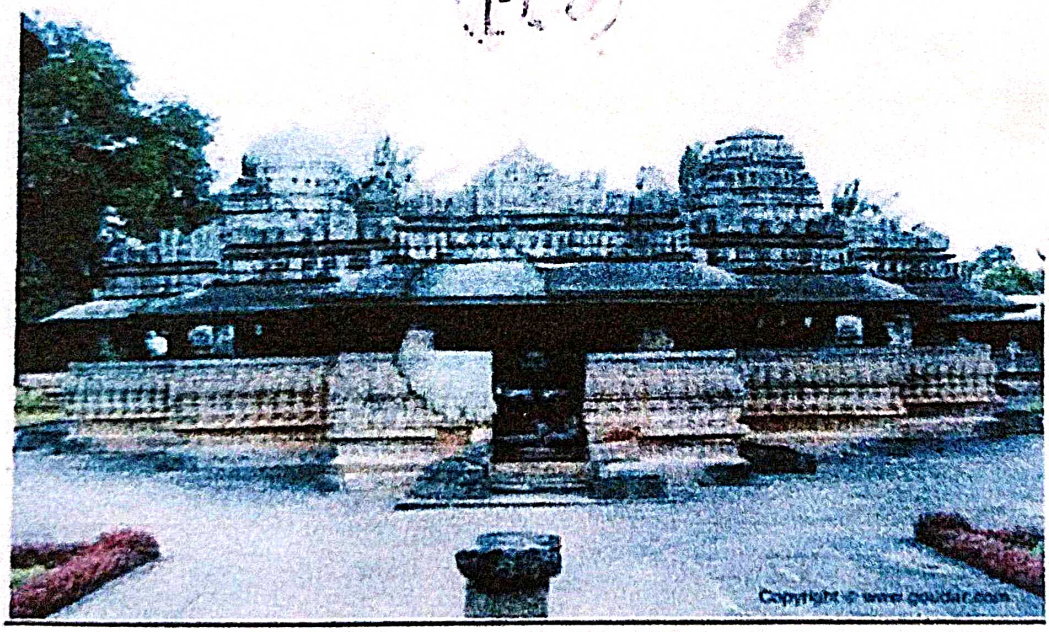
SOUTH WESTERN RAILWAY

PROPOSED NEW BG LINE FROM SHIMOGA (KONAGVALLI) to RANEBENNUR VIA SHIKKARIPURA

(103.175 Km)

DETAILED PROJECT REPORT

(JAN -2019)



CHIEF ADMINISTRATIVE OFFICER / CONSTRUCTION
BANGALORE CANTONMENT.

AXEN/CN/MYS

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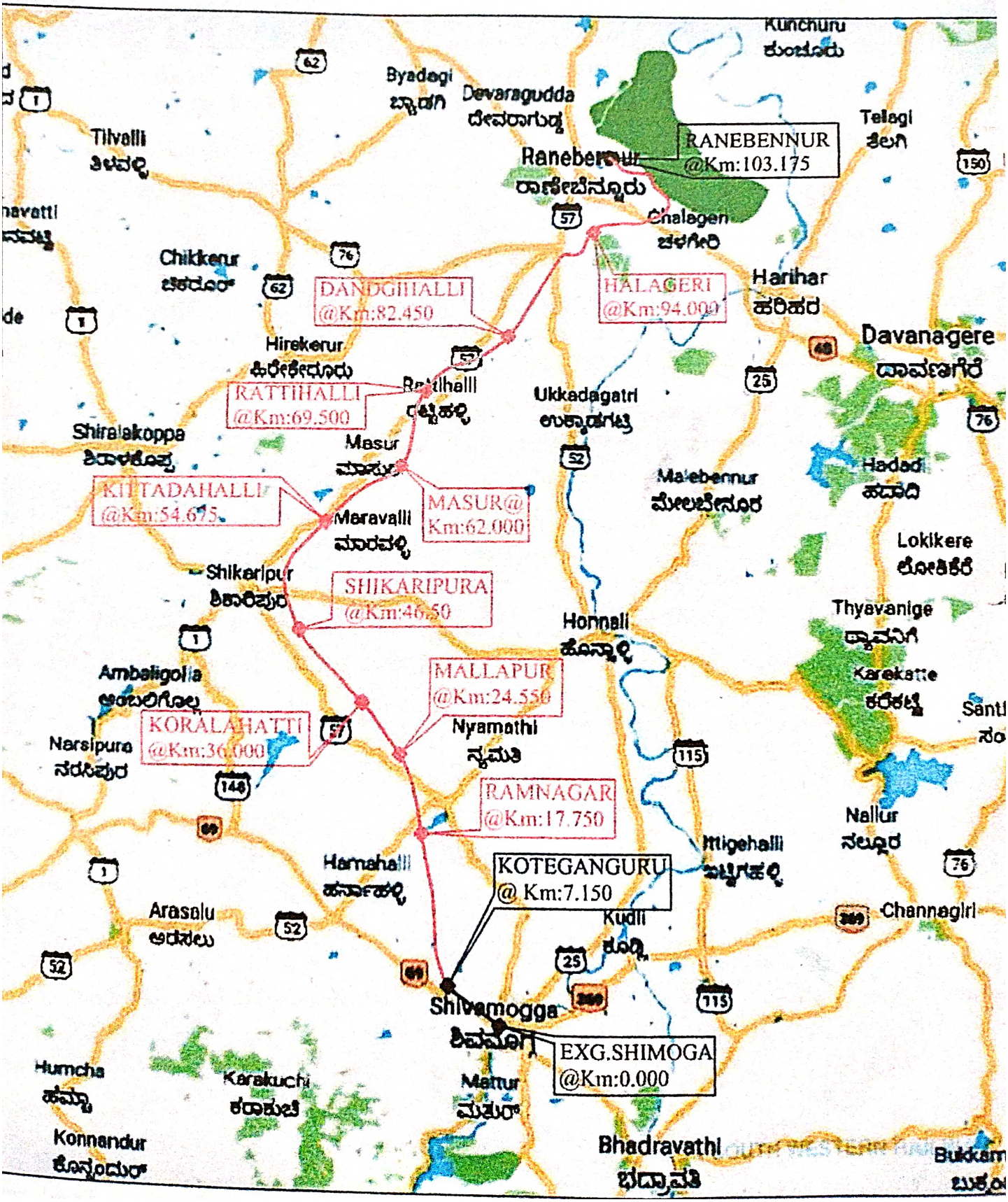
South Western Railway, Mysore

SOUTH WESTERN RAILWAY

PROJECT : NEW RAILWAY LINE BETWEEN SHIMOGA (KOTEGANGURU) -RANEBENNUR VIA SHIKKARIPURA (103.175 KM)

KEY PLAN



PROPOSED NEW BG LINE SHIMOGA (KONAGVALLI) TO RANEBENNUR (103.175 KM)

SALIENT FEATURES

1	States served	:	Karnataka
2	District Served	:	Shimoga & Haveri
3	Important Places	:	Shikaripura, Rattihalli & Halageri.
4	Length	:	Total Length = 103.175 km
			Existing Length = 13.800 km
			Proposed Length = 89.375 km
5	Ruling Gradient	:	1 in 150 Compensated & 1 in 125 has been provided for a length of 5975m to Avoid Heavy Bank/Cutting and to minimize the extent of Forest Area
6	Gradient in yards	:	1 in 1200 for 1500m length in Yards for new lines and 1 in 400 grade for existing stations.
7	Degree of Curvature	:	1) 3 degree at Konagvalli takeoff & 3.5 degree at Ranebennur Joining & 2 nos. 1.75°, 1 no. 1.50° & 1 no 1.25° 2) All others are upto 0.8 degree (22 nos)
8	Number of Bridges	:	129 No's
	i)Important Bridges		Nil
	ii) Major Bridges		26 No's
	iii) Minor Bridges	:	24 No's
	iv) ROB	:	16 No's. (16 nos)
	v) RUB	:	6 No's
	vi) Tunnel		1 No's
9	Max height of Banking, track length in Formation	:	23.249 m/ 70.750 Km
10	Max depth of Cutting, track length in Cutting	:	49.567 m/ 18.625 Km
11	Permanent Way	:	60 kg 90 UTS rails with 60kg PSC sleeper per km 1660 sleeper density and 350 mm Ballast cushion main line. 52 Kg 90 UTS Class II rails with 60kg PSC sleeper 1540 sleeper density, 250 mm ballast cushion loop lines.
12	Level Crossing	:	Nil
13	Standard of Signaling	:	MACL Signalling with standard III Interlocking.
11	No. of Stations	:	12 No (2 Existing stations) Shimoga(Exg) , Kotegangur, Konagavalli, Mallapur, Koralahatti, Shikaripura, Kittadahalli, Masur, Ratihalli, Dandgihalli, Halgeri & Ranebennur(Exg.)
15	Cost of Construction	:	Civil Engineering Rs. 816.98 Crores. S&T+RE Survey Estimate Rs. 36.33 Crores. Electrical(G) Estimate Rs. 67.23 Crores. Electrical(RE) Estimate Rs. 73.92 Crores. Total Estimate Rs. 994.47 Crores.
16	ROR	:	At full cost = (-) 13.43% At 50:50 = (-) 5.10%

SOUTH WESTERN RAILWAY

DETAILED PROJECT REPORT
SHIMOGA (KONAGAVALLI) – RANEBENNUR NEW BG LINE (103.175 KM)

I. Executive Summary :

1. The surface transport facilities are vital for development of any country. The rail transport is one of the best and economic among the surface transport systems. The South Western Railway is one of the new zones of Indian Railways created by Ministry of Railways, Government of India, and has been vested with the responsibility of conceptualization, implementation, operation, efficiently running and managing the rail network under its jurisdiction. The South Western Railway has conceived plan to carry out extensive studies to re-orient and link the existing rail networks as their massive expansion plan.

2. The existing railheads at Shimoga, Ranebennur have been selected to be linked via Shikaripura, which is located in Karnataka State. Shimoga - Ranebennur stations of South Western Railway are not directly inter-connected with existing Broad gauge lines. The existing BG line connecting Shimoga with Ranebennur takes a roundabout route via Birur, covering a distance of 214kms. The proposed railway line between Shimoga and Ranebennur via Shikaripura will cover a distance of 102.90 kms thus saving a distance of around 110.27kms between Ranebennur and Shimoga. The proposed new BG line will serve extensively for Haveri & Shimoga Districts in Karnataka. The latitude and longitude of Shimoga is $13^0 54'57"$ and $75^0 33'57"$. Ranebennur is $14^0 36'57"$ and$75^0 36'57"$ respectively. The entire project area is confined between $13^0 54'57"$ and $14^0 36'57"$ latitude and $75^0 33'57"$ and$75^0 36'57"$ longitude.

3. The Railway Board has sanctioned the Detailed survey for this route vide Blue Book item No. 24 of 2017-18. The detailed project report covers the work between Shimoga(Konagavalli) and Ranebennur via Shikaripura Town, a distance-of 103.175Kms. C/L of Shimoga station of Birur - Talguppa main line is reckoned as km 0.000 and C/L of Ranebennur is 103.175. The estimated cost was Rs. 938.32 Cr for this project in preliminary engineering survey report of year 2011-12.

4. **Description of project area:** The entire new BG Line from Shimoga to Ranebennur is coming under Karnataka state only and passes through 2 districts i.e. Shimoga & Haveri . The section falls about 46.00Km in Shimoga District and 57.175Km in Haveri District. Shimoga & Ranebennur are important junction. The proposed New BG line would pass through important developed towns like; Shikaripura in Shimoga District.

Shimoga is a District head quarter in the State of Karnataka. In 2011, Shimoga had population of 3,22,428 of which male and female were 1, 61,978 and 1,60,450 respectively. The district occupies an area of 50 km². It lies on the banks of the Tunga River and is the administrative headquarters of the district. The climate is tropical wet and dry summer average temperature 20–35 °C (68–95 °F). This means that the winter and the early part of summer are typically dry periods. The majority of the rainfall occurs between June and early October. Shimoga is a part of a region known as Malnad (land of hills) in Karnataka. Most/all these hills are part of the Western Ghats, a region known for plentiful rainfall and lush greenery and declared during 2012 as a World Heritage site. Tunga River flows through Shivamogga and Bhadraa river flows through Bhadravathi.

Shimoga is a true picture of nature's bounty-landscapes dotted with waterfalls, swaying palms and lush paddy fields make for picturesque locales. Shimoga, almost central on the Karnataka map is the rice bowl of the State. The river Tungabhadra, Sharavathi, Varada and Kumudavathi inundate the luxuriant greens of the region. Shimoga was ruled by the great Indian dynasties of the Kadambas, Gangas, Chalukyas, Rastrakutas, Keladi and Vijaynagar Kings. Shimoga (Face of Shiva) was established by the Keladi rulers. It reached its pinnacle during the rule of Shivappa Nayaka around1600A.D. The Sahyadri ranges, part of the Western Ghats, feed the rivers round the year, and inundate the fertile alluvial soil; this nature's blessing makes it the bread basket of Karnataka. Today, Shimoga is more than just a tourist destination. Its rich tradition in education, fine arts and culture remain deeply etched in its people and place. The enchanting natural scenery of hills, hillocks and green dales, rivers and streams; dense forests, flora & fauna, forts, temples and historical places, sandalwood and spices, add to this mouth-watering cuisine and touching hospitality and you know you've got - HEAVEN ON EARTH.

SHIKARIPURA:

Shikaripura is a town in Shimoga district in the Indian state of Karnataka. It is the headquarters of Shikaripura taluk. It is located at 14.27°N 75.35°E. It has an average elevation of 603 metres (1978 feet). It lies between plain land of Bayaluseeme and tropical forests of Malenadu.

4. M/s Shanthala Sphero Cast Pvt. Ltd.,NO.368, Machenahalli Indl.Area,Shimoga
5. M/s Perfect Alloy Component Pvt. Ltd., Sawalanga Road, Shimoga
6. M/s Ambuthirtha Power Pvt. Ltd. Bus stand Road, Jogfalls,Sagar Tq. Shimoga
7. M/s Shimoga Milk Union Ltd., Machenahalli, Shimoga Tq.
8. M/s M.S.P.L. Gases Ltd., Steel Authority of India, VISL, Bhadravathi
9. M/s Bharath Starch Industries, Machenahalli Indl.Area, Shimoga Tq.
10. M/s Shahi Exports ltd., Machenahalli Indl.Area, Shimoga Tq.
11. M/s Exchanging Technologies, IT Park, Machenahalli Indl.Area, Shimoga Tq

III. STANDARDS OF CONSTRUCTIONS:

1. GAUGE:

It would be a Broad Gauge Line with 1676 mm. Gauge. The alignment connects between existing Shimoga Station on Bangalore – Hubli section & Ranebennur station of Bangalore-Hubli section. Total length of proposed line from Shimoga to Ranebennur is 102.900 km. It passes through important places like Shikaripura, Massur & Rattihalli.

2. CATEGORY OF LINE:

The section from Shimoga (Konagavalli) to Ranebennur is classified as Group-'D' route. Formation and bridges shall be constructed to cater for 25T Axle loading standards.

3. GRADIENT:

The ruling gradient has been kept as 1 in 150 (compensated) throughout the alignment. Gradient has been compensated for curvature .List of gradients is furnished in a separate statement in the standard format.

4. ALIGNMENT AND CURVES:

Efforts have been made to restrict the curves within 1 degree all along the alignment. There are 28 curves along the proposed alignment out of which 21 curves are up to 0.85 degree, 1 curves are of 1.0 degree, 1 curves are of 1.16 degree, 1 curves are of 1.5 degree, 2 curves are of 1.75 degree and 3 curves of 3.5 degree are provided at takeoff and joining location i.e. at Konagavalli and Ranebennur of existing yard approaches. The list of curves is furnished in a separate statement in the standard format.

As of 2001 India census, Shikaripura had a population of 31,508. Males constitute 51% of the population and females 49%. Shikaripura has an average literacy rate of 71%, higher than the national average of 59.5%: male literacy is 75%, and female literacy is 67%. In Shikarpur, 12% of the population is under 6 years of age.

The former Chief Minister of Karnataka B. S. Yeddyurappa has been a legislator of this town from many years.

5. Geographical features: The general terrain is plain and plateau to entire section. Major part of the alignment passes through the cultivated lands. The climate in the area is generally pleasant and moderate in nature and average rainfall in the area is 1400mm per year.

H. INDUSTRIES:

Shimoga district has as on 31-3-2000, 9779 no. of units with an investment of Rs.11715.90 lakhs, employing 41000 persons. Agro based industries and Automobile based industries and the Engineering based industries are the prominent ones in the district. The average investment per unit is about Rs.1.30 lakhs and the employment per unit on an average is 4 persons. So far, the investment made is maximum under the food and beverages sector followed by the general Engineering/mechanical products. Likewise, the employment provided is also maximum from Food & Beverages sector followed by General Engineering/mechanical sector. The foundry units in the district have been very successful in producing quality products. They have been manufacturing components for automobile sector, electric motors etc. Some of them have been exporting their products that have obtained ISO certification.

Under the rural artisan's category, there are units like traditional carpentry, blacksmithy, leather crafts, pottery, beekeeping, stone cutting, handlooms, agarabathi and sandal carving etc. There are about 13126 artisans spread over the entire district under various crafts. Among these, sandalwood articles have brought number of awards to the district. These products have been displayed in various trade fairs and exhibitions. Some articles are being exported through KSHDC.

Some of the major industries are:

1. M/s Vishveshwaraiah Iron & Steel Plant, Bhadravathi
2. M/s Mysore Paper Mill Pvt. Ltd., Bhadravathi
3. M/s Paper Packaging Pvt. Ltd., Mandli Kallur Indl.Area, Shimoga

5. PERMANENT WAY:

The track structure is proposed as 60 Kg 90 UTS Class I rail with 1660 PSC sleepers per Km and 350 mm hard granite machine crushed stone ballast cushion for mail line. Sleeper density has been kept as 1660 per km as increasing of sleeper density within a short span of even 8 to 10 years after the traffic grows is difficult and very costly affair. Hence, it is suggested to keep 1660 sleeper density right from the beginning so that the requirement of heavier track structure arising out of traffic growth on this route can be fulfilled. It is proposed that the complete track would be LWR. The bridges will be designed for 25T-2008 axle load. This is adopted as per Railway Board's letter No.2005/CE-II/TS/5 dated 12.06.06. Provision has also been made for glued joints for track circuits and converting rails into LWR. 1 in 12 PSC fan shaped turnouts are proposed on all running lines and turnout on goods lines and lines leading to snag dead ends or Buffer stops. For loop lines it is proposed to provide 52Kg Class-II rails with 1540 sleepers per km (60Kg Class-II).

6. BALLAST:

Hard granite machine crushed stone ballast of 50 mm size with ballast cushion of 350 mm for main lines and 250 mm for loop lines is proposed.

7. MAJOR BRIDGES:

There are 25 major bridges on the proposed alignment. All the major bridges are constructed with the standard multiple spans of 9.15m, 12.2m and 18.3m. Standard drawings of RDSO in respect of super structure for PSC slabs and PSC 'I' Girders are adopted for the proposed Major Bridges. The foundation of substructure shall be with MCC/RCC as per site conditions. All the Bridges are proposed to be built to 25T-2008 Loading standards. The List of Major bridges is furnished in a separate statement in the standard format.

8. MINOR BRIDGES:

There are total 30 of minor bridges on the proposed new BG line from Konagavalli to Ranebennur stations including waterways. Standards drawings of RDSO have been adopted for all the minor bridges to be constructed along the proposed New BG line. All the bridges are proposed to be built to 25T -2008 Loading standards. The List of Minor Bridges is furnished in a separate statement in the standard format.

9. ROAD CROSSING:

All roads have been provided with Grade Separators (ROBs / RUBs). There are total 80 road crossing along the alignment out of which 70 Road Under Bridges (RUB) and 10 Road over bridges have been provided. Level crossings are totally avoided by providing RUB / ROB as per profile requirement. Standards drawings of RDSO have been adopted for all the road crossing bridges to be constructed along the proposed New BG line. All the bridges are proposed to be built to 25T -2008 Loading standards. The List of road crossing is furnished in a separate statement in the standard format.

IV. STATION YARDS:

There are 12 stations from Shimoga to Ranebennur town including Shimoga,Koteganguru, and Ranebennur stations on the existing line. The station names and their inter-distance are furnished as under:

SL NO.	Name of the Stations	Class of stations	Location (Km)	Inter Distance (Km)
1	Shimoga town	EXG.Junction	0.000	
2	Koteganguru	EXG.Crossing Halt	7.100	7.10
3	Konagavalli	Pro.Junction	14.100	7.00
4	Mallapur	Pro.Crossing	23.950	9.85
5	Koralahatti	Pro.Crossing	35.900	11.95
6	Shikaripura	Pro.Crossing	46.450	10.55
7	Kittadahalli	Pro.Crossing	54.650	8.20
8	Masur	Pro.Crossing	61.975	7.325
9	Rattihalli	Pro.Crossing	69.300	7.325
10	Dandgihalli	Pro.Crossing	82.425	13.125
11	Halageri	Pro.Crossing	93.950	11.525
12	Ranebennur	Existing Crossing	103.175	9.225

1. SHIMOGA TOWN (KM.0.00)

It is an existing crossing station on Birur - Talguppa BG line. The chainage of this station is CH:62/900 Kms of Birur - Talguppa section. No new proposals have been made in this station since takeoff has been proposed from Konagavalli Station.

2. KOTEGANGURA (KM.7.10)

It is an existing crossing station on Birur - Talguppa BG line. The chainage of this station is CH:70/000 Kms of Birur - Talguppa section. No new proposals have been made in this station since takeoff has been proposed from Konagavalli Station.

3. **KONAGAVALLI (KM.14.10)**
It is existing Halt station under Shimoga-Talaguppa section.It is proposed as a crossing station with two medium level platform. This station is 14.10 kms away from Shimoga town.

4. **MALLAPUR (KM.23.95)**
It is proposed as a crossing station with two medium level platform. This station will serve nearby villages also. This station is 23.95 kms away from Shimoga town.

5. **KORALAHATTI (KM.35.90)**
It is proposed as a crossing station with two medium level platform. This station is 35.90 kms away from Shimoga town.

6. **SHIKARIPURA (KM.46.45)**
It is proposed as a crossing station with two high level platforms and one rail level goods platform. It is the head quarters of Shikaripura Taluk and one of the big station in this project. This station is 46.45 kms away from Shimoga town.

7. **KITTADAHALLI (KM.54.65)**
It is proposed as a crossing station with two medium level platform. This station is 54.65 kms away from Shimoga town.

8. **MASUR (KM.61.975)**
It is proposed as a crossing station with two medium level platform. This station is 61.975 kms away from Shimoga town.

9. **RATTIHALLI(KM.69.30)**
It is proposed as a crossing station with two medium level platform. This station is 69.30 kms away from Shimoga town. .

10. **DANDGIHALLI (KM.82.425)**
It is proposed as a crossing station with two medium level platform. This station is 82.425 kms away from Shimoga town. Shimoga town.

11. **HALAGERI (KM.93.95)**
It is proposed as a crossing station with two medium level platform. This station is 93.95kms away from Shimoga town.

12. **RANEBENNUR (KM.103.175)**
It is an existing crossing station on Hubli - Bangalore section. This station is 103.175 kms away from Shimoga station towards Hubli end. This is a 3 line crossing station with 1 low level and 2 rail level passenger platform. As per the proposed doubling between Hubli - Chikjajur section the station is upgraded to 4 lines crossing station. As per proposed yard arrangements, Shimoga-Ranebennur line will join this station to Road -1 (Up Main line). The station is situated very close to the town.

V. **RESIDENTIAL ACCOMMODATION:**

The provision for residential quarters of Type II, Type-III, Type-IV is made in the estimate and details are furnished as Under:

Sl No	Type	Nos
1	Type-IV	3
2	Type-III	20
3	Type-II	124

The list of staff quarters is furnished in a separate statement in the standard format.

VI. **STATION MACHINARY:**

The provision for station machinery as required is made in the estimate.

VII. **SIGNALING:**

MACLS signaling with EI is proposed at all the stations. Provision has been made for S & T accommodation in the estimate.

VIII. **ELECTRICAL CROSSING:**

It is proposed to shift / eliminate all the EHT, HT & LT infringement to the proposed new BG line.

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TERMS OF REFERENCE

Sl No.	Description	Provision
I	Route	Group 'D' sutiable for 25T Axle Loading
II	Gauge	1676 mm BG
III	Track Structure	Main Line: 60Kg/90UTS Class - I LWR Track Loop Line: 52Kg Class -II Rails SWP/LWR Track
IV	Sleepers	60 Kg PSC Sleepers of existing design
V	Sleepers Density	1660 Nos of Sleepers per KM on Main line and 1540 Nos of Sleepers per KM on Loop Line.
VI	Ballast Cushion	Main line : 350 mm Loop line : 250 mm
VII	Welding of Rails	10/20 Rail Panels with in-situ welding for conversion from SWP/LWR.
VIII	Points & crossings	Turn Outs: All Turnouts are 60Kg fan shaped with 60Kg CI-I, CMS Crossing and curved switches on 350mm ballast cushion (1 in 12 Points & crossings on passanger running line and over shoot line)
IX	Formation	Width of 7.85 m for Banking and cutting excluding side drains. Blanketing layer of Adequate depth provided as per extant guidelines of RDSO.
X	Maximum Degree of curvature	3 degree except two 3/3.5 degree in the Takeoff and Joining location.
XI	Ruling Gradient	1 in 150 Compensated & 1 in 125 has been provided for a length of 5975m to Avoid Heavy Bank/Cutting and to minimize the extent of Forest Area
XII	Gradient In Yard	1 :1200 except 1:400 @ existing Konagavalli Yard and 1 : 470 & 1 : 5970 @ existing Ranebennur Yard.
XIII	Length of loop	Minimum 750m CSL proposed.
XIV	Track Centers	5.30 m
XV	Track Machine Siding	300 m length @ Shikaripura & Ratihalli
XVI	Land	As per Annexure -III of Engineering Manual
XVII	Speed	As per D-Route standards
XVIII	Type of Loading	25T -2008 Axle loading
XIX	Signaling	MACLS - Standard III inter loacking (EI) with Absolute Block system of working.

[illegible]

[illegible]

GENERAL ABSTRACT

[illegible]	[illegible]	[illegible]	[illegible]	Stores	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
									[illegible]	[illegible]
1	1110	PRELIMINARY EXPENSES	17721859	0	17721859	17721859	0	0	0	0
2	1120	LAND	827486958	0	827486958	827486958	0	0	0	0
3	1130	FORMATION	3158480892	0	3158480892	3158480892	0	0	0	0
		1131 A: Earthwork	2467033861	0	2467033861	2467033861	0	0	0	0
		1131 B I : Side Drains	351698850	0	351698850	351698850	0	0	0	0
		1131 B II : Walling.	165254439	0	165254439	165254439	0	0	0	0
		1131 C : Tunnel.	174493742	0	174493742	174493742	0	0	0	0
4	1140	PERMANENT WAY	1275175677	1316730487	2591906163	2591906163	0	0	0	0
		1141: Rails & Fastenings	123786190	859140836	982927026	982927026	0	0	0	0
		1142: Sleepers & Fastenings	112300228	384136254	496436482	496436482	0	0	0	0
		1143: Points & Crossings	6934894	65578932	72513826	72513826	0	0	0	0
		1144: Ballast	312716237	0	312716237	312716237	0	0	0	0
		1145: Fencing	28871815	7874465	36746280	36746280	0	0	0	0
		1146: Road Crossings	689198231	0	689198231	689198231	0	0	0	0
		1147: Miscellaneous	1368082	0	1368082	1368082	0	0	0	0
5	1150	BRIDGES	436403177	0	436403177	436403177	0	0	0	0
		1151 / 1153 Major bridges	321449015	0	321449015	321449015	0	0	0	0
		1154 / 1156: Minor bridges	114954162	0	114954162	114954162	0	0	0	0
6	1160	STATIONS & BUILDINGS	429890787	1203070	431093857	431093857	0	0	0	0
		1161: Offices	15201041	0	15201041	15201041	0	0	0	0
		1162: Stations & Sheds	255531769	0	255531769	255531769	0	0	0	0
		1165: Residential Buildings	149875677	0	149875677	149875677	0	0	0	0
		1166: Staff welfare	4124741	0	4124741	4124741	0	0	0	0
		1167: Station Machinery	5157559	1203070	6360629	6360629	0	0	0	0
7	1170	PLANT & EQUIPMENT	17285513	0	17285513	17285513	0	0	0	0
		1174: Plant & Equipment (Civil)	17285513	0	17285513	17285513	0	0	0	0
		SUB TOTAL	6162444862	1317933557	7480378419	7480378419	0	0	0	0
8	1180	GENERAL CHARGES (Civil)	614662695	0	614662695	614662695	0	0	0	0
	1190	@ 8.217%	614662695	0	614662695	614662695	0	0	0	0
		Environmental charges 1%	61624449	13179336	74803784	74803784	0	0	0	0
		COST OF CIVIL ENGG.	6838732005	1331112892	8169844898	8169844898	0	0	0	0
		COST OF S & T ENGG.	440054000	232264000	672318000	672318000	0	0	0	0
		COST OF ELEC.(G) ENGG.	79039629	284284921	363324550	363324550	0	0	0	0
		COST OF ELEC.(RE) ENGG.	401815982	337403233	739219215	739219215	0	0	0	0
		TOTAL COST OF PROJECT.	7759641616	2185065046	9944706663	9944706663	0	0	0	0

Certified that the rates adopted in this Civil Engineering Estimate are based on USSR 2011 of SWR and Accounts vetted rates

FA & CAO/CONSTRUCTION
BANGALORE CANTT.

CHIEF ENGINEER/WEST
CONSTRUCTION, BANGALORE CANTT.

AXEN/CN/MYS

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South Western Railway, Mysore