



**SOUTH EAST CENTRAL  
RAILWAY**

**OFFICE OF THE  
Executive Engineer(Construction)  
Near Gauri nagar Railway Pathak,  
South East Central Railway,  
RAJNANDGAON**

## **JUSTIFICATION FOR 3 ALTERNATIVE ROUTES**

**Name of Project: Construction of 3<sup>rd</sup> railway line in between Paniajob – Bortalao.**

Length of 3<sup>rd</sup> railway line proposed to be constructed between Paniajob – Bortalao is 8.6 km. The proposed 3<sup>rd</sup> line is expected to facilitate fast movement of passenger as well as freight traffic in this area. There is one patch of forest land between Paniajob-Bortalao. All efforts were made to find a viable route which involves minimum/least forest land. However it was found that there is no viable route that could avoid the forest land since it is linear project connecting two stations i.e. Paniajob, Bortalao which are already exist.

Presently Railway track between Paniajob-Bortalao is having maximum degree of curvature is 6 degree with maximum permissible speed is 60 KMPH and ruling gradient is 1 in 100, So for loaded goods train 1 extra locomotive is needed to haul the train in this section.

Hence for obtaining maximum permissible speed and for keeping safe ruling gradient 1 in 150, three alternative routes surveyed. The most suitable alignment is proposed route-1, as this alignment has **minimum forest area**, less linear length, no major bridges and 1 in 150 ruling gradient on which single locomotive can haul loaded goods train in between Paniajob-Bortalao, and to keep near the existing railway line as possible, make it convenient for construction and maintenance and more economical.

## Comparison of proposed routes of 3<sup>rd</sup> line in detour between Paniajob-Bortalao

S.No.	Item	Route-1	Route-2	Route-3
1	Colour code	RED	PINK	GREEN
2	Total route length between Panijob to Bortalao (excluding)	7.47 km	7.68 km	7.23 km
3	Forest linear length	1.92 km	2.45 km	2.00 km
4	Forest area	16.372 hect.	20.429 hect.	17.264 hect.
5	Revenue forest land	4.582 hect.	4.582 hect.	4.582 hect.
6	Tunnel	540 m	NIL	NIL
7	Obstructions	<p>1. Construction of tunnel required about 540 m length.</p> <p>2. This route also involves forest land of 1.92 km, because project is linear.</p>	<p>1. This route crosses through one water body, a major district road-twice and service road connecting paniajob dam.</p> <p>2. It also crosses residential area of paniajob village which will require dismantling of residential buildings, etc.</p> <p>3. This route is about 1316 m away from existing Down main line. So, maintenance of this route will be quiet difficult and additional resources will be required.</p> <p>4. This route also involves forest land of 2.45 km, because project is linear.</p>	<p>1. This route crosses through a major district road-twice and service road connecting paniajob dam.</p> <p>2. It also crosses residential area of paniajob village which will require dismantling of residential buildings, etc.</p> <p>3. This route is about 929 m away from existing Down main line. So, maintenance of this route will be quiet difficult and additional resources will be required.</p> <p>4. This route also involves forest land of 2.00 km, because project is linear.</p> <p>5. Since the overall length is less, required gradient i.e. 1 in 150 cannot be provided.</p>

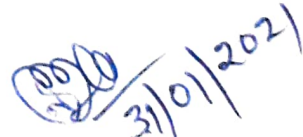
8	Forest length involving tree cutting	1.42 km approx. (as tree cutting may be avoided in major portion of the tunnel location)	2.45 km	2.00 km
9	Max distance from existing Down Line	295 m approx	1316 m approx	929 m approx

**Note-** Proposed route-1 is having minimum total forest area 20.954 hect (forest area 16.372 hect. and Revenue forest area 4.582 hect). This proposed alignment is also having tunnel of length 540 m, so in tunnel portion, neither any topography of existing forest area will be changed nor cutting of trees will be done in about 500 m length of proposed forest land. Hence, affected area of forest will be further reduced. So, this proposed route-1 will require minimum forest area.

**Enclosed:** - 1. Topo sheet drawing showing **forest area** of 03 alternate routes (Route-1 – Red, Route-2 – Pink, Route-3 – Green) with details.

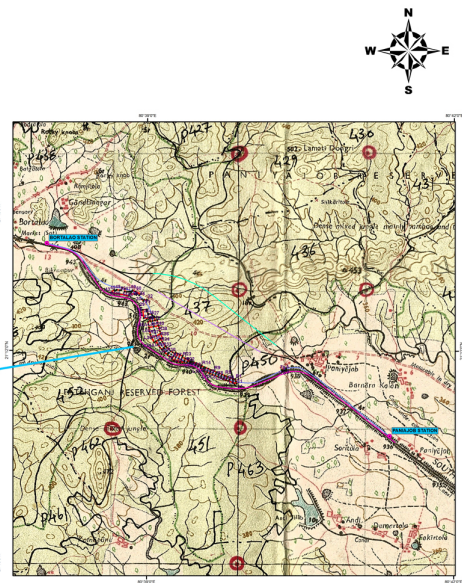
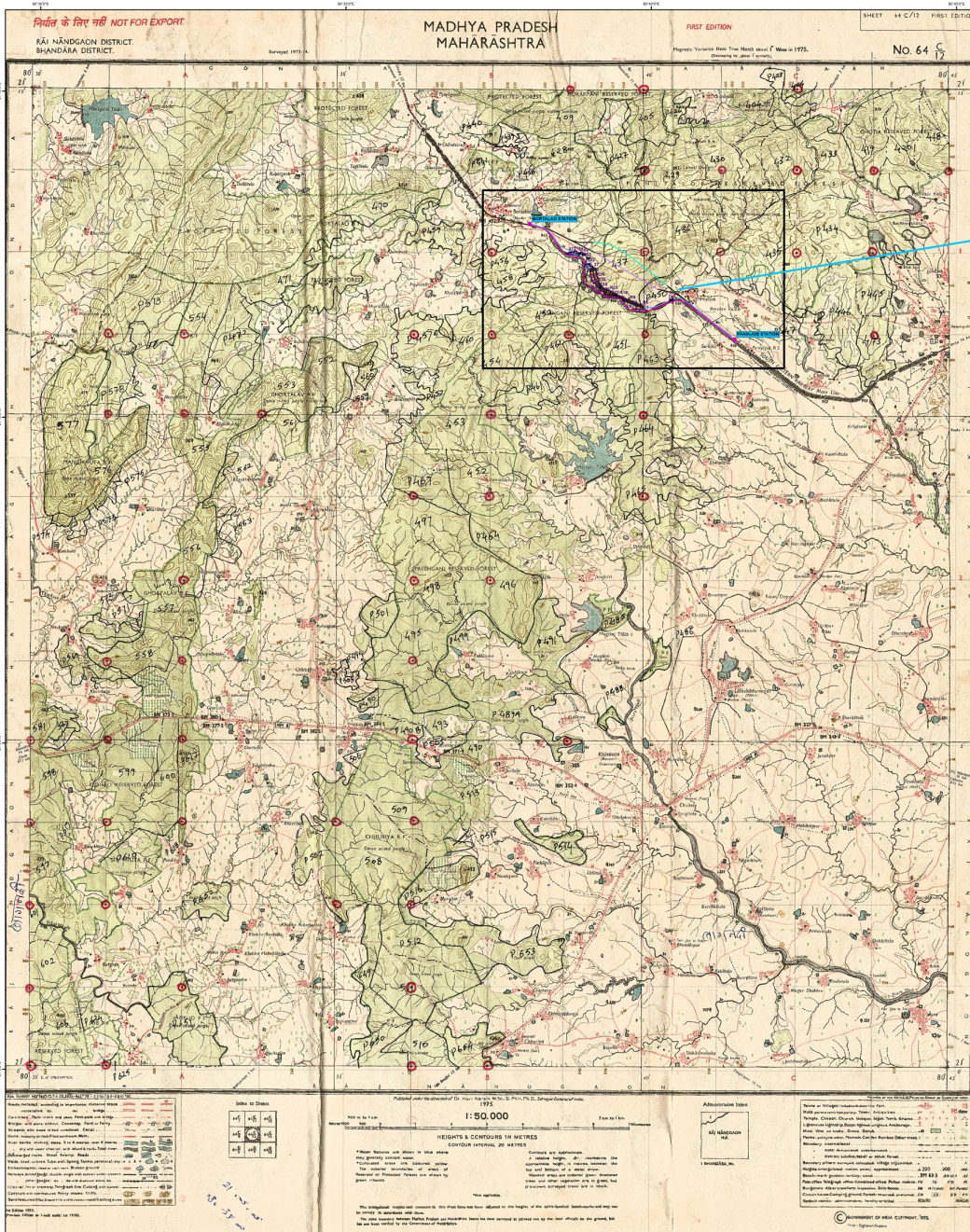
Place: Rajnandgaon

Date :

  
 (Narayan Singh Bundela)  
**Executive Engineer (Construction)**  
**S.E.C. Railway, Rajnandgaon**



SURVEY SITE ON SOI TOPOSHEET No. : 64C12  
3rd LINE IN BETWEEN PANIAJOB-BORTALAO IN LIEU OF  
3rd LINE PROJECT BETWEEN RAJNANDGAON-NAGPUR (KALUMNA)  
FOREST DIVISION KHAIRAGARH  
DISTRICT RAJNANDGAON  
CHHATTISGARH



**Legend**

- BURNED GROUND CONTROL POINTS
- SURVEY SITE AREA: 20.954 (in Hectares)
- REVENUE FOREST TOTAL AREA: 4.882 (in Hectares)
- ALTERNATIVE WAY LENGTH (in Meters)
- ALTERNATIVE WAY FOREST AREA (in Hectares)
- REVENUE FOREST TOTAL AREA: 4.882 (in Hectares)
- ALTERNATIVE WAY FOREST AREA: 20.954 (in Hectares)
- SOI TOPOSHEET No. 64C12
- Red, Band-1
- Blue, Band-2

**Scale**  
1:32,000  
1 centimeter = 320 meters

**Geographic Coordinate Systems**  
WGS 1984  
Projected Coordinate Systems  
WGS 1984 UTM Zone 44N

SURVEYED GROUND CONTROL POINTS								
S.No.	LONGITUDE	LATITUDE	S.No.	LONGITUDE	LATITUDE	S.No.	LONGITUDE	LATITUDE
L1	80° 39' 52.737" E	21° 11' 41.955" N	C23	80° 39' 20.060" E	21° 11' 55.125" N	L41	80° 39' 19.584" E	21° 12' 18.028" N
C1	80° 39' 52.222" E	21° 11' 41.137" N	L23	80° 39' 19.466" E	21° 11' 53.774" N	C41	80° 39' 19.248" E	21° 12' 17.828" N
L1	80° 39' 52.737" E	21° 11' 41.955" N	C24	80° 39' 20.060" E	21° 11' 55.125" N	R41A	80° 39' 19.475" E	21° 12' 18.157" N
C2	80° 39' 50.388" E	21° 11' 43.600" N	R23	80° 39' 19.863" E	21° 11' 57.111" N	C42	80° 39' 18.931" E	21° 12' 18.340" N
L2	80° 39' 50.150" E	21° 11' 43.613" N	C24	80° 39' 19.466" E	21° 11' 53.774" N	R42	80° 39' 18.795" E	21° 12' 18.407" N
R2	80° 39' 50.522" E	21° 11' 44.612" N	L24	80° 39' 17.635" E	21° 11' 54.019" N	C43	80° 39' 18.492" E	21° 12' 18.505" N
C3	80° 39' 48.398" E	21° 11' 44.232" N	R24	80° 39' 19.397" E	21° 11' 57.720" N	R43	80° 39' 18.292" E	21° 12' 18.405" N
L3	80° 39' 48.387" E	21° 11' 43.455" N	C25	80° 39' 16.844" E	21° 11' 56.402" N	L43	80° 39' 17.901" E	21° 12' 18.405" N
R3	80° 39' 49.251" E	21° 11' 45.010" N	L25	80° 39' 15.917" E	21° 11' 54.614" N	C44	80° 39' 17.635" E	21° 12' 18.405" N
C4	80° 39' 46.781" E	21° 11' 44.820" N	R25	80° 39' 17.916" E	21° 11' 58.373" N	L44	80° 39' 17.635" E	21° 12' 18.405" N
L4	80° 39' 46.380" E	21° 11' 43.884" N	C26	80° 39' 15.607" E	21° 11' 57.079" N	C45	80° 39' 17.635" E	21° 12' 18.405" N
R4	80° 39' 47.180" E	21° 11' 45.757" N	L26	80° 39' 14.940" E	21° 11' 55.889" N	C46	80° 39' 17.635" E	21° 12' 18.405" N
C5	80° 39' 45.176" E	21° 11' 45.436" N	R26	80° 39' 16.400" E	21° 11' 58.254" N	C47	80° 39' 17.635" E	21° 12' 18.405" N
L5	80° 39' 45.251" E	21° 11' 45.566" N	L27	80° 39' 13.446" E	21° 11' 55.354" N	C48	80° 39' 17.635" E	21° 12' 18.405" N
R5	80° 39' 45.572" E	21° 11' 46.055" N	C27	80° 39' 14.200" E	21° 11' 57.939" N	C49	80° 39' 17.635" E	21° 12' 18.405" N
L6	80° 39' 43.203" E	21° 11' 45.722" N	L28	80° 39' 11.913" E	21° 11' 57.817" N	C50	80° 39' 17.635" E	21° 12' 18.405" N
R6	80° 39' 43.973" E	21° 11' 46.990" N	R27	80° 39' 15.030" E	21° 11' 59.062" N	C51	80° 39' 17.635" E	21° 12' 18.405" N
C7	80° 39' 43.968" E	21° 11' 46.673" N	C28	80° 39' 12.800" E	21° 11' 58.899" N	C52	80° 39' 17.635" E	21° 12' 18.405" N
L7	80° 39' 43.608" E	21° 11' 45.722" N	L29	80° 39' 11.913" E	21° 11' 57.817" N	C53	80° 39' 17.635" E	21° 12' 18.405" N
R7	80° 39' 42.363" E	21° 11' 47.612" N	R28	80° 39' 13.734" E	21° 11' 59.951" N	C54	80° 39' 17.635" E	21° 12' 18.405" N
C8	80° 39' 40.365" E	21° 11' 47.292" N	C29	80° 39' 11.479" E	21° 11' 59.951" N	C55	80° 39' 17.635" E	21° 12' 18.405" N
L8	80° 39' 39.961" E	21° 11' 46.358" N	L29	80° 39' 10.337" E	21° 11' 59.061" N	C56	80° 39' 17.635" E	21° 12' 18.405" N
R8	80° 39' 40.800" E	21° 11' 48.212" N	R29	80° 39' 12.472" E	21° 12' 0.951" N	C57	80° 39' 17.635" E	21° 12' 18.405" N
C9	80° 39' 38.761" E	21° 11' 47.911" N	C30	80° 39' 10.237" E	21° 12' 1.088" N	C58	80° 39' 17.635" E	21° 12' 18.405" N
L9	80° 39' 38.181" E	21° 11' 46.960" N	L30	80° 39' 9.072" E	21° 12' 2.367" N	C59	80° 39' 17.635" E	21° 12' 18.405" N
R9	80° 39' 38.181" E	21° 11' 48.838" N	R30	80° 39' 11.327" E	21° 12' 1.997" N	C60	80° 39' 17.635" E	21° 12' 18.405" N
C10	80° 39' 37.157" E	21° 11' 48.530" N	C31	80° 39' 9.767" E	21° 12' 1.566" N	C61	80° 39' 17.635" E	21° 12' 18.405" N
L10	80° 39' 36.820" E	21° 11' 47.566" N	L31	80° 39' 8.667" E	21° 12' 3.760" N	C62	80° 39' 17.635" E	21° 12' 18.405" N
R10	80° 39' 37.572" E	21° 11' 49.460" N	R31	80° 39' 10.834" E	21° 12' 2.497" N	C63	80° 39' 17.635" E	21° 12' 18.405" N
C11	80° 39' 35.557" E	21° 11' 49.148" N	R31A	80° 39' 10.931" E	21° 12' 2.567" N	C64	80° 39' 17.635" E	21° 12' 18.405" N
L11	80° 39' 35.251" E	21° 11' 48.175" N	L32	80° 39' 8.580" E	21° 12' 6.009" N	C65	80° 39' 17.635" E	21° 12' 18.405" N
R11	80° 39' 35.933" E	21° 11' 50.092" N	C32	80° 39' 8.657" E	21° 12' 2.814" N	C66	80° 39' 17.635" E	21° 12' 18.405" N
C12	80° 39' 34.949" E	21° 11' 49.767" N	L32	80° 39' 7.507" E	21° 12' 1.819" N	C67	80° 39' 17.635" E	21° 12' 18.405" N
L12	80° 39' 34.694" E	21° 11' 49.161" N	R32	80° 39' 10.931" E	21° 12' 2.567" N	C68	80° 39' 17.635" E	21° 12' 18.405" N
R12	80° 39' 34.348" E	21° 11' 50.704" N	C33	80° 39' 7.643" E	21° 12' 4.133" N	C69	80° 39' 17.635" E	21° 12' 18.405" N
C13	80° 39' 33.107" E	21° 11' 50.094" N	L33	80° 39' 6.272" E	21° 12' 4.426" N	C70	80° 39' 17.635" E	21° 12' 18.405" N
L13	80° 39' 32.694" E	21° 11' 50.161" N	R33	80° 39' 6.979" E	21° 12' 4.899" N	C71	80° 39' 17.635" E	21° 12' 18.405" N
R13	80° 39' 33.512" E	21° 11' 51.028" N	C34	80° 39' 6.560" E	21° 12' 5.801" N	C72	80° 39' 17.635" E	21° 12' 18.405" N
C14	80° 39' 31.808" E	21° 11' 50.671" N	L34	80° 39' 5.174" E	21° 12' 5.190" N	C73	80° 39' 17.635" E	21° 12' 18.405" N
L14	80° 39' 31.520" E	21° 11' 50.485" N	R34	80° 39' 7.932" E	21° 12' 6.537" N	C74	80° 39' 17.635" E	21° 12' 18.405" N
R14	80° 39' 32.016" E	21° 11' 51.603" N	R34A	80° 39' 8.977" E	21° 12' 7.084" N	C75	80° 39' 17.635" E	21° 12' 18.405" N
C15	80° 39' 30.167" E	21° 11' 51.934" N	L34A	80° 39' 4.117" E	21° 12' 4.584" N	C76	80° 39' 17.635" E	21° 12' 18.405" N
L15	80° 39' 30.004" E	21° 11' 51.289" N	C35	80° 39' 5.367" E	21° 12' 8.147" N	C77	80° 39' 17.635" E	21° 12' 18.405" N
R15	80° 39' 30.134" E	21° 11' 51.587" N	L35	80° 39' 2.781" E	21° 12' 7.201" N	C78	80° 39' 17.635" E	21° 12' 18.405" N
C16	80° 39' 28.457" E	21° 11' 52.553" N	R35	80° 39' 7.932" E	21° 12' 6.537" N	C79	80° 39' 17.635" E	21° 12' 18.405" N
L16	80° 39' 28.424" E	21° 11' 52.460" N	L35A	80° 39' 2.653" E	21° 12' 7.159" N	C80	80° 39' 17.635" E	21° 12' 18.405" N
R16	80° 39' 28.954" E	21° 11' 53.171" N	C36	80° 39' 4.767" E	21° 12' 9.677" N	C81	80° 39' 17.635" E	21° 12' 18.405" N
C17	80° 39' 26.796" E	21° 11' 52.527" N	L36	80° 39' 1.981" E	21° 12' 8.872" N	C82	80° 39' 17.635" E	21° 12' 18.405" N
L17	80° 39' 27.007" E	21° 11' 53.148" N	R36	80° 39' 7.531" E	21° 12' 10.540" N	C83	80° 39' 17.635" E	21° 12' 18.405" N
R17	80° 39' 27.350" E	21° 11' 53.790" N	C37	80° 39' 4.287" E	21° 12' 11.351" N	C84	80° 39' 17.635" E	21° 12' 18.405" N
C18	80° 39' 25.797" E	21° 11' 52.914" N	L37	80° 39' 1.498" E	21° 12' 10.438" N	C85	80° 39' 17.635" E	21° 12' 18.405" N
L18	80° 39' 26.071" E	21° 11' 53.546" N	R37	80° 39' 7.000" E	21° 12' 12.071" N	C86	80° 39' 17.635" E	21° 12' 18.405" N
R18	80° 39' 26.337" E	21° 11' 54.181" N	C38	80° 39' 3.849" E	21° 12' 13.141" N	C87	80° 39' 17.635" E	21° 12' 18.405" N
C19	80° 39' 25.240" E	21° 11' 53.145" N	L38	80° 39' 1.111" E	21° 12' 12.718" N	C88	80° 39' 17.635" E	21° 12' 18.405" N
L19	80° 39' 25.424" E	21° 11' 53.675" N	R38	80° 39' 6.570" E	21° 12' 13.654" N	C89	80° 39' 17.635" E	21° 12' 18.405" N
R19	80° 39' 25.740" E	21° 11' 54.409" N	R38A	80° 39' 6.707" E	21° 12' 13.679" N	C90	80° 39' 17.635" E	21° 12' 18.405" N
C20	80° 39' 24.888" E	21° 11' 53.263" N	L38A	80° 39' 0.975" E	21° 12' 12.697" N	C91	80° 39' 17.635" E	21° 12' 18.405" N
L20	80° 39' 25.093" E	21° 11' 53.741" N	C39	80° 39' 3.550" E	21° 12' 14.745" N	C92	80° 39' 17.635" E	21° 12' 18.405" N
R20	80° 39' 25.424" E	21° 11' 54.533" N	L39	80° 39' 0.797" E	21° 12' 14.449" N	C93	80° 39' 17.635" E	21° 12' 18.405" N
C21	80° 39' 23.588" E	21° 11' 53.764" N	R39	80° 39' 6.267" E	21° 12' 15.290" N	C94	80° 39' 17.635" E	21° 12' 18.405" N
L21	80° 39' 23.620" E	21° 11' 53.847" N	C40	80° 39' 3.264" E	21° 12' 16.349" N	C95	80° 39' 17.635" E	21° 12' 18.405" N
R21	80° 39' 24.147" E	21° 11' 55.038" N	L40	80° 39' 1.891" E	21° 12' 16.161" N	C96	80° 39' 17.635" E	21° 12' 18.405" N
C22	80° 39' 21.980" E	21° 11' 54.383" N	R40	80° 39' 4.621" E	21° 12' 16.611" N	C97	80° 39' 17.635" E	21° 12' 18.405" N
L22	80° 39' 21.750" E	21° 11' 53.868" N	R40A	80° 39' 5.593" E	21° 12' 16.827" N	C98	80° 39' 17.635" E	21° 12' 18.405" N
R22	80° 39' 21.539" E	21° 11' 55.646" N	L40A	80° 39' 0.520" E	21° 12' 15.969" N	C99	80° 39' 17.635" E	21° 12' 18.405" N