

Details of Forest Land for Diversion of 24.585 ha of Revenue forest land from Km 0+000 to Km 53+300 for Rehabilitation and up gradation to 4-lane with paved Shoulders configuration of Bilaaspur -Katghora section of NH-111 (new NH-130), from Pendridih to Pathapali in District Bilaspur of State Chattisgarh.

Area Calculation for Proposed Revenue Forest land for Diversion												
Patch S. no.	Chainage		Forest Patch Details Falling Left Side of Proposed Centreline or on PROW				Forest Patch Details Falling Right Side of Proposed Centreline			Total Area (In sq. m)	Total Area (In Ha.) As per Revenue Record	
	From	To	Length (In m)	Width (in m)	Area (In sq. m)	Length (In m)	Width (in m)	Area (In sq. m)				
1	0	0.4	363	60	21780	-	-	-	21780	2.178		
2	1.1	1.7	495	60	29700	-	-	-	29700	2.9779		
3	3.8	4	80	30	2400	-	-	-	2400	0.2489		
4	4.7	4.8	5	60	300	-	-	-	300	0.0288		
5	5.3	5.4	28	20	560	-	-	-	560	0.0561		
6	5.5	5.8	220	60	13200	-	-	-	13200	1.3354		
7	11.7	12.1	250	20	5000	140	10	1400	6400	0.6304		
8	13.7	14.1	275	60	16500	-	-	-	16500	1.6395		
9	14.7	14.9	-	-	-	140	20	2800	2800	0.2792		
10	16.1	16.2	15	60	900	-	-	-	900	0.0931		
11 & 12	18.5	18.7	-	-	-	33	30	990	990	0.0983		
13	34.8	34.9	25	15	375	-	-	-	375	0.037		
14	35.3	35.5	100	20	2000	-	-	-	2000	0.202		
15	35.6	35.2	750	20	15000	-	-	-	15000	1.523		
16	36.3	36.5	105	50	5250	-	-	-	5250	0.511		
17	36.5	37.3	250	45	11250	-	-	-	11250	1.133		
18	37.4	38.3	700	20	14000	-	-	-	14000	1.3931		
19 & 20	39.3	39.7	165	60	9900	-	-	-	9900	0.9818		


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21	41.7	42	185	60	11100	-	-	-	11100	1.1164
22	42	42.1	75	50	3750	-	-	-	3750	0.3788
23	42.5	42.6	20	10	200	-	-	-	200	0.0176
24 & 25	42.8	44.5	1300	30	39000	800	10	8000	47000	4.7039
26	44.6	44.8	50	10	500	-	-	-	500	0.0474
27	45.8	46	165	60	9900	-	-	-	9900	0.9975
28	46.1	46.2	40	10	400	-	-	-	400	0.0365
29	49.7	50.1	100	10	1000	-	-	-	1000	0.0931
30	50.2	50.3	100	30	3000	-	-	-	3000	0.3074
31 & 32	52.9	53.3	250	60	15000	40	10	400	15400	1.54
Total Area Proposed For Diversion									245855	24.5851



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4- Lane with Pave Shoulder Configuration of Bilaspur- Pathrapali of NH-111 (New NH -130)) from Km 0+000 (Pendridih, Bilaspur) to Km 53+300 (Pathrapali) of the road Stretch Section of Bilaspur -Katghora Section in the State of Chhattisgarh under BharatMala on Hybrid Annuity Mode.

Sr. No.	Design Chainage (Km)		Length	TCS Type	TCS Description
					Slip road
11	15.220	15.480	260	IV	Approaches to Grade Separator (Bypass) with Slip road
12	16.200	16.260	60	IV	Approaches to Grade Separator (Bypass) with Slip road
13	16.260	17.200	940	IV	Approaches to Grade Separator with Slip Road
14	17.540	18.075	535	IV	Approaches to Grade Separator with Slip Road
15	18.075	19.190	1115	IV	Approaches to Grade Separator (Bypass) with Slip road
16	20.170	21.310	1140	IV	Approaches to Grade Separator (Bypass) with Slip road
17	23.600	24.490	890	IV	Approaches to Grade Separator with Slip Road
18	26.025	27.000	975	IV	Approaches to Grade Separator with Slip Road
19	27.000	27.200	200	IV	Approaches to Grade Separator (Bypass) with Slip road
20	28.190	28.300	110	IV	Approaches to Grade Separator (Bypass) with Slip road
21	28.300	29.160	860	IV	Approaches to Grade Separator with Slip Road
22	30.140	31.240	1100	IV	Approaches to Grade Separator with Slip Road
23	39.020	39.055	35	IV	Approaches to Grade Separator (Bypass) with Slip road
24	39.055	39.855	800	IV	Approaches to Grade Separator with Slip Road
25	39.855	39.940	85	IV	Approaches to Grade Separator (Bypass) with Slip road
26	43.320	44.410	1090	IV	Approaches to Grade Separator with Slip Road
27	45.540	46.765	1225	IV	Approaches to Grade Separator with Slip Road
28	46.765	46.950	185	IV	Approaches to Grade Separator (Bypass) with Slip road

1.4.4 Cross-Drainage Structures:

As per Recommended alignment option following CD structures are proposed.

Major Bridges: The Project Alignment is crossing two major rivers i.e. the Arpa River & Ahiran River. 4 lane bridge is proposed at this location. Details of major bridge are given below:

Table 1.4 Details of Major Bridges



4- Lane with Pav Shoulder Configuration of Bilaspur- Pathrapali of NH-111 (New NH -130)) from Km 0+000 (Pendridih, Bilaspur) to Km 53+300 (Pathrapali) of the road Stretch Section of Bilaspur -Katghora Section in the State of Chhattisgarh under BharatMala on Hybrid Annuity Mode.

S. N.	Existing Chainage (Km)	Design Chainage (Km)	Proposed Span Arrangement (m)	Total Width (m)	Remark
1	Bilaspur Bypass	22+815	10 x 40 = 400	16.0 + 16.0	Arpa River
2	Ratanpur Bypass	41+620	1x21+2x24+1x21 = 90	16.0 + 16.0	River

Minor Bridges: The Project Alignment crosses canals and nalas, 4 lane bridges is proposed at this location. Details of minor bridges are given below:

Table 1.5 Details of Minor Bridges

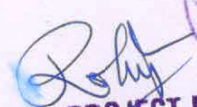
S. No.	Existing Chainage (Km)	Design Chainage (Km)	Ex. Span Arrangement (m)	Proposed Span Arrangement (m)	Total Width (m)	Remark
1	1+350	1+350	14.16	1x12 = 12	16.0 + 16.0	Nala
2	4+100	4+090	2x0.7	1x18 = 18	16.0 + 16.0	Nala
3		7+000		1x16 = 16	16.0 + 16.0	Canal
4		12+050		1x16 = 16	16.0 + 16.0	Canal
5	17+155	16+600	24.5	1x16 = 16	16.0 + 16.0	Nala
6	-	37+340	2x8+4x10	3x20 = 60	16.0 + 16.0	Nala
7	-	39+370	-	1x12 = 12	16.0 + 16.0	Canal
8	Realign/Ratanpur Bypass	42+360	4x4.8	2x24 = 48	16.0 + 16.0	Canal

Culverts: Most of the culverts on the project highway are pipe culverts and slab/ stone arch culverts. Some Hume pipe culverts existing are less than 0.6 m. Most of these culverts are proposed to be replaced. The details of existing and proposed culverts are given in table below:

Table 1.6 Summary of Type of Culvert

S. No.	Type of Culvert	No. of Culvert (Nos.)	Improvement Proposal
1	Box Culvert	30	Reconstruction
		10	New Construction
2	HP Culvert	38	Reconstruction
		32	New Construction

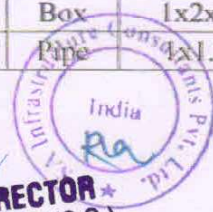
Table 1.7 Details of Culvert


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4- Lane with Pave Shoulder Configuration of Bilaspur- Pathrapali of NH-111 (New NH -130)) from Km 0+000 (Pendridih, Bilaspur) to Km 53+300 (Pathrapali) of the road Stretch Section of Bilaspur –Katghora Section in the State of Chhattisgarh under BharatMala on Hybrid Annuity Mode.

Sl. No.	Existing Chainage (Km)	Type of Culvert	No. of Spans with Span Length x Vertical Clearance (m)	Recommendation	Design Chainage (Km)	Type of Culvert	No. of Spans with Span Length (m)
1	0+025	Hume Pipe	1x1.0	Reconstruction	0+025	Pipe	1x1.2
2				New	1+050	Box	1x2x2
3	1+955	Hume Pipe	1x0.5	Reconstruction	1+950	Box	1x2x2
4	2+010	Hume Pipe	1x0.5	Reconstruction	1+990	Pipe	1x1.2
5	2+055	Hume Pipe	1x0.3	Reconstruction	2+040	Pipe	1x1.2
6				New	2+300	Box	1x2x2
7	2+600	Hume Pipe	1x0.750	Reconstruction	2+590	Pipe	1x1.2
8	2+790	Hume Pipe	1x0.9	Reconstruction	2+775	Pipe	1x1.2
9	3+140	Hume Pipe	1x0.9	Reconstruction	3+125	Pipe	1x1.2
10	3+270	Hume Pipe	1x0.2	Reconstruction	3+250	Pipe	1x1.2
11	3+340	Hume Pipe	1x0.350	Reconstruction	3+320	Pipe	1x1.2
12	3+790	Hume Pipe	1x0.6	Reconstruction	3+770	Pipe	1x1.2
13	3+810	Hume Pipe	1x0.750	Reconstruction	3+790	Pipe	1x1.2
14	4+040	Hume Pipe	2x1.0	Reconstruction	4+010	Pipe	2x1.2
15	4+060	Hume Pipe	2x1.0	Reconstruction	4+035	Pipe	2x1.2
16	4+150	Hume Pipe	2x1.0	Reconstruction	4+125	Pipe	2x1.2
17	4+675	Hume Pipe	1x1.0	Reconstruction	4+610	Box	1x2x2
18	4+990	Hume Pipe	2x0.5	Reconstruction	4+925	Pipe	2x1.2
19	5+350	Hume Pipe	1x0.5	Reconstruction	5+285	Pipe	1x1.2
20	5+790	Hume Pipe	1x0.6	New	5+735	Pipe	1x1.2
21	6+825			New	6+705	Box	1x2x2
22	7+000	Hume	1x1.0	Reconstruction	6+860	Pipe	1x1.2





4- Lane with Pave Shoulder Configuration of Bilaspur- Pathrapali of NH-111 (New NH -130)) from Km 0+000 (Pendridih, Bilaspur) to Km 53+300 (Pathrapali) of the road Stretch Section of Bilaspur -Katghora Section in the State of Chhattisgarh under BharatMala on Hybrid Annuity Mode.

Sl. No.	Existing Chainage (Km)	Type of Culvert	No. of Spans with Span Length x Vertical Clearance (m)	Recommendation	Design Chainage (Km)	Type of Culvert	No. of Spans with Span Length (m)
		Pipe					
23	7+385	Hume Pipe	2x1.0	Reconstruction	7+245	Box	1x2x2
24	7+645	Hume Pipe	1x0.9	Reconstruction	7+510	Pipe	1x1.2
25	8+700	Box	3x1.0	Reconstruction	8+560	Box	1x3x3
26				New	8+750	Box	1x2x2
27	9+470	Hume Pipe	1x0.9	Reconstruction	9+330	Pipe	1x1.2
28	9+950	Hume Pipe	2x0.6	Reconstruction	9+810	Pipe	2x1.2
29				New	10+025	Pipe	1x1.2
30				New	11+100	Box	1x3x3
31				New	11+550	Pipe	1x1.2
32				New	13+075	Box	1x2x2
33				New	13+400	Pipe	1x1.2
34				New	13+560	Pipe	1x1.2
35	14+400	Hume Pipe	3x1.0	Reconstruction	13+850	Box	1x3x3
36	15+180	Hume Pipe	1x0.6	Reconstruction	14+620	Pipe	1x1.2
37	15+260	Hume Pipe	1x0.9	Reconstruction	14+640	Pipe	1x1.2
38	15+500	Hume Pipe	2x1.0	Reconstruction	14+950	Box	1x2x2
39	15+950	Hume Pipe	2x1.0	Reconstruction	15+390	Box	1x3x2
40	16+230	Hume Pipe	2x0.5	Reconstruction	15+667	Box	1x2x2
41				New	16+780	Box	1x2x2
42	17+805	Hume Pipe	2x0.6	Reconstruction	17+246	Pipe	2x1.2
43	18+480	Hume Pipe	2x0.6	Reconstruction	17+917	Pipe	2x1.2
44	20+080	Hume Pipe	1x1.2	Reconstruction	18+950		1x2x2

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Sl. No.	Existing Chainage (Km)	Type of Culvert	No. of Spans with Span Length x Vertical Clearance (m)	Recommendation	Design Chainage (Km)	Type of Culvert	No. of Spans with Span Length (m)
45	20+420	Hume Pipe	1x1.2	Reconstruction	19+355	Pipe	1x1.2
46	21+110	Hume Pipe	2x0.6	Reconstruction	19+680	Pipe	1x1.2
47	21+270	Hume Pipe	1x0.750	Reconstruction	19+965	Pipe	1x1.2
48				New	20+880	Pipe	1x1.2
49				New	21+360	Pipe	1x1.2
50				New	21+880	Pipe	1x1.2
51	10+340	Slab	1x1.0	Reconstruction	23+710	Box	1x2x2
52				New	23+860	Box	1x2x2
53	10+705	Slab	1x2	Reconstruction	24+080	Box	1x2x2
54	11+200	Pipe	1x1.0	Reconstruction	24+680	Pipe	1x1.2
55				New	25+480	Pipe	1x1.2
56				New	27+780	Pipe	1x1.2
57				New	28+270	Pipe	1x1.2
58	15+010	Slab	1x2.5	Reconstruction	28+430	Box	1x3x2
59	15+410	Slab	1x2.5	Reconstruction	28+845	Box	1x3x2
60				Reconstruction	28+962	Box	1x3x2
61				Reconstruction	29+257	Box	1x2x2
62				New	29+625	Pipe	1x1.2
63				New	29+680	Pipe	1x1.2
64	16+350	Pipe	1x0.9	Reconstruction	29+745	Pipe	1x1.2
65				New	30+057	Pipe	1x1.2
66				New	30+328	Pipe	1x1.2
67	17+740	Slab	1x2.0	Reconstruction	31+207	Box	1x2x2
68	17+900			Reconstruction	31+357	Box	1x3x2
69	18+170	Slab	2x1.75	Reconstruction	31+638	Box	1x2x2
70	18+765.	Slab	1x3.5	Reconstruction	32+148	Box	1x3x2
71	19+220	Slab	1x2.5	Reconstruction	32+593	Box	1x3x3
72				New	32+758	Box	1x2x2
73	19+610	Pipe	1x1.0	Reconstruction	32+972	Pipe	1x1.2
74	19+795	Pipe	1x1.2	Reconstruction	33+205	Pipe	1x1.2
75	20+320			Reconstruction	33+670	Box	1x2x2



4- Lane with Pave Shoulder Configuration of Bilaspur- Pathrapali of NH-III (New NH -130)) from Km 0+000 (Pendridih Bilaspur) to Km 53+300 (Pathrapali) of the road Stretch Section of Bilaspur -Katghora Section in the State of Chhattisgarh under BharatMala on Hybrid Annuity Mode.

SL No.	Existing Chainage (Km)	Type of Culvert	No. of Spans with Span Length x Vertical Clearance (m)	Recommendation	Design Chainage (Km)	Type of Culvert	No. of Spans with Span Length (m)
76				New	34+510	Pipe	1x1.2
77				New	34+600	Pipe	1x1.2
78				New	35+020	Pipe	1x1.2
79				New	35+100	Pipe	1x1.2
80				New	36+100	Pipe	1x1.2
81				New	36+680	Pipe	1x1.2
82				New	37+180	Pipe	1x1.2
83				New	38+060	Pipe	1x1.2
84				New	38+240	Pipe	1x1.2
85				New	39+270	Pipe	1x1.2
86				New	39+370	Pipe	1x1.2
87				New	39+460	Pipe	1x1.2
88		Pipe	1x0.6	Reconstruction	39+572	Pipe	1x1.2
89				New	39+832	Pipe	1x1.2
90				New	40+740	Pipe	1x1.2
91				New	40+970	Pipe	1x1.2
92				New	42+050	Pipe	1x1.2
93	30+830	Pipe	1x0.9	Reconstruction	42+777	Pipe	1x1.2
94	31+325	Pipe	2x0.9	Reconstruction	43+278	Box	1x2x2
95	31+700	Pipe	2x1.0	Reconstruction	43+663	Box	1x2x2
96	32+235	Pipe	1x1.2	Reconstruction	44+210	Pipe	1x1.2
97	33+225	Pipe	3x0.9	Reconstruction	45+207	Box	1x2x2
98	33+410	Slab	1x1.5	Reconstruction	45+400	Box	1x2x2
99	33+580	Slab	1x1.5	Reconstruction	45+563	Box	1x2x2
100	34+220	Pipe	1x1.5	Reconstruction	46+215	Box	1x2x2
101	35+610	Pipe	1x0.6	Reconstruction	47+637	Pipe	1x1.2
102	35+830	Pipe	1x0.6	Reconstruction	47+852	Pipe	1x1.2
103	36+150	Pipe	1x0.6	Reconstruction	48+168	Pipe	1x1.2
104				New	48+305	Box	1x2x2
105	37+130	Pipe	4x0.9	Reconstruction	49+165	Pipe	3x1.2
106				New	49+290	Pipe	2x1.2
107	38+350	Pipe	2x0.9	Reconstruction	50+395	Pipe	2x1.2
108	38+575	Slab	1x3	Reconstruction	50+624	Box	1x3x2
109	40+110	Slab	1x4.5	Reconstruction	52+195	Box	1x5x2
110	40+395	Slab	1x3	Reconstruction	52+475	Box	1x3x2



4- Lane with Pave Shoulder Configuration of Bilaspur- Pathrapali of NH-111 (New NH -130)) from Km 0+000 (Pendridih, Bilaspur) to Km 53+300 (Pathrapali) of the road Stretch Section of Bilaspur -Kathora Section in the State of Chhattisgarh under BharatMala on Hybrid Annuity Mode.

1.4.5 ROB/ RUB

Railway line crosses along the alignment. Existing detail of Railway line are as below:

- 1) Existing ROW Railway = 60mtr.
- 2) LC No. = BK-6/E/SPL/2
- 3) Place = Lokhandi
- 4) Gate No. = 729/18-20m
- 5) TVU/96279 jan-15
- 6) UP- Ghutku side
- 7) DN- Uslapur side
- 8) Double Rail Line
- 9) Double overline elec. wire
- 10) Width of railway track - 1.80mtr.
- 11) Railway elec. poll no. 729/28-72/30 DN side

Table 1.8: Detail of Proposed ROB

S. No.	Design Chainage (Km)	No. of Span with Span Length (m)	Total Width (m)	Remark
1	18+290	1x18+1x36+1x18 = 72	16.0+16.0	

Table 1.8A: Detail of Proposed RUB

S. No.	Design Chainage (Km)	No. of Span with Span Length (m)	Total Width (m)	Remark
1	18+290	1x12.5x4.5m	As per requirement	

1.4.6 Underpasses

Underpasses are necessary for Cross movement of local traffic. The RCC Box of dimension 12.0m x 5.5m has been proposed for vehicular underpass and RCC Box of dimension 12.0m x 3.5m has been proposed for light vehicular underpass.

Table 1.9: List of Underpasses

Sr. No.	Location Chainage From km to km)	Span / Opening (m)	Total Width (m)	Remarks
1	1+900	1x12x5.5	16.0 + 16.0	VUP
2	4+880	2x12x5.5	16.0 + 16.0	VUP
3	7+760	1x12x4.5	16.0 + 16.0	LVUP
4	9+810	1x12x5.5	16.0 + 16.0	VUP
5	13+100	1x12x5.5	16.0 + 16.0	VUP



4- Lane with Pavement Shoulder Configuration of Bilaspur- Pathrapali of NH-111 (New NH -130) from Km 0+000 (Pendridih, Bilaspur) to Km 53+300 (Pathrapali) of the road Stretch Section of Bilaspur -Katghora Section in the State of Chhattisgarh under BharatMala on Hybrid Annuity Mode.

Sr. No.	Location Chainage From km to km)	Span / Opening (m)	Total Width (m)	Remarks
6	16+660	1x12x5.5	16.0 + 16.0	VUP
7	18+070	1x12x5.5	16.0 + 16.0	VUP
8	18+703	1x12x5.5	16.0 + 16.0	VUP
9	20+732	1x12x5.5	16.0 + 16.0	VUP
10	24+050	2x12x5.5	16.0 + 16.0	VUP
11	26+665	1x12x4.5	16.0 + 16.0	LVUP
12	28+670	1x12x4.5	16.0 + 16.0	LVUP
13	39+480	1x12x5.5	16.0 + 16.0	VUP
14	40+600	1x12x5.5	16.0 + 16.0	VUP
15	43+900	1x12x4.5	16.0 + 16.0	LVUP
16	46+440	2x12x5.5	16.0 + 16.0	VUP

1.4.6 Flyover

Table 1.10: List of Flyovers

S. No.	Design Chainage (Km)	No. of Span with Span Length (m)	Total Width (m)	Remark
1	0+000	3 Loop (400+250+750)	12m (3Lane)	Flyover
1	14+723	1x15+1x30+1x15	16.0 + 16.0	Flyover

Table 1.10: Summary of Structures in the project alignment is given below:

S. No.	Type of Structure	No.
1	Major Bridge	02
2	Minor Bridge	08
3	ROB	01
4	VUP	16
5	FLYOVER	02
6	Box Culvert	40
7	Pipe Culvert	70

1.4.7 Bus stops