



EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

1 GENERAL

The Public Works Department (MPPWD-NH) has been entrusted with the assignment of Consultancy Services for preparation of Detailed Project Report of National Highways/ State Roads (approved as National Highways) in the State of Madhya Pradesh for up gradation to Two/Four lane with paved shoulder configuration.

MPRDC now invites proposal from Technical consultants for carrying out detailed project report for proper structuring and implementation of projects on EPC/PPP mode on **Jabalpur-Kundam-Shahpura-Dindori Road** which is a part of Newly Declared NH-45 Ext. in the State of Madhya Pradesh.

In order to fulfill the traffic needs and road safety requirement, MPPWD (NH), has appointed the [L. N. Malviya Infra Projects Pvt. Ltd, Bhopal \(MP\)](#) as consultants to Providing Consultancy



Services for Preparation of Detailed Project Report of **Jabalpur-Kundam-Shahpura-Dindori Road** in the State of Madhya Pradesh for up-gradation to Two Lanes with paved shoulder /Four lane configurations., the assignment for **Package No. - IV**.

2 OBJECTIVES

- The main objective of the consultancy service is to establish the technical, economical, and financial viability of the project and prepare detailed project reports for rehabilitation and upgrading of the existing road to 2/4 lane configuration.
- The viability of the project shall be established taking into account the requirements with regard to rehabilitation, upgrading and improvement based on highway design, pavement design, provision of service roads wherever necessary, type of intersections, rehabilitation and widening of existing and/or construction of new bridges and structures, road safety features, quantities of various items of works and cost estimates and economic analysis.
- The Detailed Project Report would inter-alia include detailed highway design, design of pavement and overlay with options for flexible or rigid pavements, design of bridges and cross drainage structures and grade separated structures, design of service roads, quantities of various items, detailed working drawings, detailed cost estimates, economic and financial viability analyses, environmental and social feasibility, social and environmental action plans as appropriate and documents required for tendering the project on commercial basis for international / local competitive bidding.
- The DPR consultant should ensure detailed project preparation incorporating aspects of value engineering, quality audit and safety audit requirement in design and implementation.

3 SCOPE OF SERVICES

The scope of consultancy services includes:

- Engineering Surveys and Investigations.
- Highway Design.
- Environmental Impact Assessment.
- Estimation of Project Cost.
- Economic Analysis.
- Preparation of Feasibility Study Report and Detailed Project Report.
- Submission of Deliverables.



4 APPROACH AND METHODOLOGY

The consultant's approach towards the approach is in accordance to the TOR in lines with the project objectives. The prescribed engineering surveys and investigations have been carried out on the Project Road conforming to MORTH/IRC/BIS Specifications/Codes as per TOR to generate adequate database for preparing the most proposal for the rehabilitation and upgrading of the existing National Highway.

5 TERRAIN

Most of the project road passes through plain terrain.

6 START AND END OF PROJECT HIGHWAY

The Project Corridor **Jabalpur-Kundam-Shahpura-Dindori Road** is Declared as NH-45 Ext. which is in the Madhya Pradesh State. The project road starts from Ranjhi in Jabalpur at SH-22, Existing km 0+000 and ends at km 35+400 of existing road at Kundam Town in the state of Madhya Pradesh. The project road is a connecting/crossing link to SH-22 & SH-11. The existing length of project road is 35.400 km and design length of project is **26.195 km**.

7 REFERENCING SYSTEM

Along the existing road, Kilometer stones are existing in entire length of the project highway. It is called the "Existing Chainage". During topography survey with Lidar, observations made are referred to "Design Chainage". The relationship between the "Existing Chainage" and the "Design Chainage" as per field surveys of the location of existing km stones using the Lidar for the "Project Highway", Design Chainage corresponding to existing kilometer stone. (The existing length of project road is 35.400 km and design length of project is 26.195 km.)

DESIGN CHAINAGE CORRESPONDING TO EXISTING CHAINAGE

Existing Chainage	Design Chainage	Remarks
-	0+000	Jabalpur Bypass
8+780	38+025	
9+035	38+280	Amakhoh
9+685	38+930	Amakhoh
10+860	39+900	Realignment
11+360	40+400	Amjhar
15+785	44+800	
16+385	45+400	Padariya
16+785	45+800	

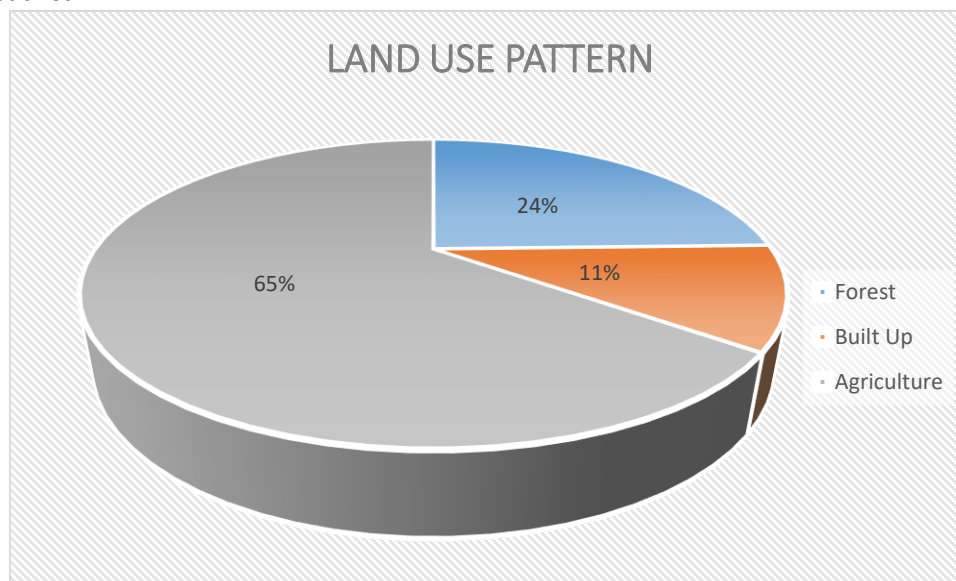


Existing Chainage	Design Chainage	Remarks
17+315	46+300	Realignment
19+220	48+200	
21+160	50+025	Realignment
23+500	52+365	
23+960	52+825	Badraji
24+680	53+525	Realignment
25+520	54+365	
25+925	54+755	Realignment
26+470	55+300	
26+715	55+545	Negai
27+300	56+125	
31+270	60+100	
31+630	60+460	Bairagi
35+400	64+220	

8 ABUTTING LAND USE PATTERN

The roadside environment is variable from urbanized town developments to rural agricultural areas, with intermediate semi-urban settlements and semi-rural open area with occasional roadside dwellings and small businesses scattered throughout the route. The existing alignment is a link between Jabalpur, Amakhoh, Amjhar, Padariya, Badraji, Negai and Bairagi.

Nearly 65% of the project corridor has purely agricultural land, 11% has built up area and 24% has Forest area.





9 ROAD INVENTORY

The project corridor traverses mostly through plain/hilly terrain. The land use is predominantly agricultural with intermittent built up areas. The carriageway is having a width of 5.5-7.0m. The earthen shoulder width generally varies from 1.50-2.00 m on either side. The type of shoulder is earthen or hard excluding the urban areas. The details of existing carriageway width are given in Table E-1.

Table E-1: Details of Existing Carriageway Width

Existing Chainage		Length (m)	Carriageway		Shoulders
Km	Km		Width(m)	Type	Width(m)
0+000	4+200	4200	12	BT	2
4+200	4+820	620	12	BT	2
4+820	5+800	980	10	BT	2
5+800	6+435	635	5.5	BT	1.5
6+435	7+135	700	5.5	BT	1.5
7+135	7+835	700	7.0	BT	1.5
7+835	8+535	700	5.5	BT	1.5
8+535	9+655	1120	5.5	BT	1.5
9+655	10+060	405	5.5	BT	1.5-2
10+060	10+930	870	5.5	BT	1.5
10+930	11+600	670	5.5	BT	1.5
11+600	12+000	400	5.5	BT	1.5
12+000	12+730	730	5.5	BT	1.5
12+730	14+135	1405	5.5	BT	1.5
14+135	15+240	1105	5.5	BT	1.5
15+240	15+945	705	5.5	BT	1.5-2
15+945	16+200	255	5.5	BT	1.5
16+200	16+945	745	5.5	BT	1.5
16+945	17+000	55	5.5	BT	1.5
17+000	19+440	2440	5.5	BT	1.5
19+440	20+660	1220	5.5	BT	1.5
20+660	21+160	500	5.5	BT	1.5
21+160	21+400	240	5.5	BT	1.5
21+400	21+600	200	5.5	BT	1.5
21+600	21+720	120	5.5	BT	1.5
21+720	22+435	715	7.0	CC	1.5-2
22+435	22+780	345	7.0	CC	1.5-2
22+780	23+200	420	5.5	BT	1.5
23+200	24+265	1065	5.5	BT	1.5
24+265	24+415	150	5.5	BT	1.5



Consultancy Services for preparation of Detailed Project
Report of Newly Declared National Highways to Two / Four
lane with paved shoulder.
Package – IV

Chapter 00- Executive Summary
Jabalpur to Dindori Road
(NH No.-45 Ext.)

Existing Chainage		Length (m)	Carriageway		Shoulders
Km	Km		Width(m)	Type	Width(m)
0+000	4+200	4200	12	BT	2
24+415	26+125	1710	5.5	BT	1.5
26+125	27+200	1075	5.5	BT	1-1.5
27+200	28+070	870	5.5	BT	1.5
28+070	28+430	360	5.5	BT	1.5
28+430	28+625	195	5.5	BT	1.5
28+625	28+845	220	5.5	BT	1.5
28+845	29+225	380	5.5	BT	1.5
29+225	31+525	2300	5.5	BT	1.5
31+525	33+945	2420	5.5	BT	1-1.5
33+945	34+360	415	5.5	BT	1.5
34+360	34+760	400	5.5	BT	1.5
34+760	35+285	525	5.5	BT	1.5
35+285	35+985	700	5.5	BT	1.5
35+985	38+150	2165	5.5	BT	1.5
38+150	38+525	375	5.5	BT	1.5
38+525	39+530	1005	5.5	BT	1.5
39+530	42+800	3270	5.5	BT	1.5
42+800	43+545	745	5.5	BT	1.5
43+545	44+560	1015	5.5	BT	1.5
44+560	45+660	1100	5.5	BT	1.5
45+660	47+580	1920	5.5	BT	1.5
47+580	49+680	2100	5.5	BT	1.5
49+680	49+980	300	5.5	BT	1.5
49+980	50+300	320	5.5	BT	1.5
50+300	50+700	400	5.5	BT	1.5
50+700	54+415	3715	7.0	CC	1.5-2
54+415	57+170	2755	5.5	BT	1.5
57+170	57+690	520	5.5	BT	1.5
57+690	60+900	3210	5.5	BT	1.5
60+900	61+700	800	5.5	BT	1.5
61+700	64+500	2800	5.5	BT	1.5-2
64+500	64+900	400	7.0	CC	1.5-2
64+900	65+400	500	5.5	BT	1.5
65+400	66+000	600	5.5	BT	1.5
66+000	67+100	1100	5.5	BT	1.5
67+100	67+450	350	5.5	BT	1.5
67+450	67+640	190	5.5	BT	1.5



Consultancy Services for preparation of Detailed Project
Report of Newly Declared National Highways to Two / Four
lane with paved shoulder.
Package – IV

Chapter 00- Executive Summary
Jabalpur to Dindori Road
(NH No.-45 Ext.)

Existing Chainage		Length (m)	Carriageway		Shoulders
Km	Km		Width(m)	Type	Width(m)
0+000	4+200	4200	12	BT	2
67+640	67+900	260	5.5	BT	1.5
67+900	69+900	2000	5.5	BT	1.5
69+900	70+100	200	5.5	BT	1.5
70+100	70+250	150	5.5	BT	1.5
70+250	70+450	200	5.5	BT	1.5
70+450	70+700	250	5.5	BT	1.5
70+700	71+100	400	5.5	BT	1.5
71+100	71+600	500	5.5	BT	1.5
71+600	72+100	500	5.5	BT	1.5
72+100	72+450	350	5.5	BT	1.5
72+450	73+400	950	5.5	BT	1.5
73+400	74+470	1070	5.5	BT	1.5
74+470	76+470	2000	5.5	BT	1.5
76+470	76+915	445	5.5	BT	1.5
76+915	77+285	370	5.5	BT	1.5
77+285	77+870	585	5.5	BT	1.5
77+870	78+120	250	5.5	BT	1.5
78+120	78+765	645	5.5	BT	1.5
78+765	79+250	485	5.5	BT	1.5
79+250	79+650	400	5.5	BT	1.5
79+650	80+350	700	5.5	BT	1.5
80+350	80+550	200	5.5	BT	1.5
80+550	81+200	650	5.5	BT	1.5
81+200	81+630	430	7.0	CC	1.5
81+630	82+080	450	5.5	BT	1.5
82+080	82+480	400	5.5	BT	1.5
82+480	84+250	1770	5.5	BT	1.5
84+250	84+650	400	5.5	BT	1.5
84+650	85+900	1250	5.5	BT	1.5
85+900	86+800	900	5.5	BT	1.5
86+800	87+800	1000	5.5	BT	1.5
87+800	88+670	870	5.5	BT	1.5
88+670	92+340	3670	5.5	BT	1.5
92+340	93+440	1100	5.5	BT	1.5
93+440	94+140	700	5.5	BT	1.5
94+140	94+535	395	5.5	BT	1.5
94+535	95+550	1015	5.5	BT	1.5



Existing Chainage		Length (m)	Carriageway		Shoulders
Km	Km		Width(m)	Type	Width(m)
0+000	4+200	4200	12	BT	2
95+550	96+470	920	5.5	BT	1.5

10 ROAD CROSSINGS / JUNCTIONS

There are 3 numbers of major junctions along the project section of the project road and 47 minor junctions. The approach roads are basically feeder roads connecting to villages, agricultural fields and factories along the project road. Mostly these are WBM roads. Rest of the intersections is of lower significance with local roads in urban settlements, village roads and earthen roads. The lists of junctions are presented in Table E-5 below.

Table E-5: (a) List of Existing Major Junctions

Sr. No.	Design Chainage	Type	Side	Destination	Remarks
1.	0+000	X	LHS/RHS	LHS-To Jabalpur City, RHS- To Dindori	MAJOR(SH-22)
2.	17+800	X	LHS/RHS	LHS-To Jabalpur, RHS- To Katni	MAJOR(NH 7)
3.	38+000	X	LHS/RHS	LHS-To Mandla, RHS- To Jabalpur	MAJOR (NH 12A)

Table E-5: (b)List of Minor Junctions

Sr. No.	Design Chainage	Type	Side	Destination	Remarks
1.	1+860	X	LHS/RHS	LHS-To Birner , RHS- To Saraswahi Village	Minor
2.	2+940	X	LHS/RHS	LHS-To Sonpur , RHS- To Sunderpur	Minor
3.	6+180	X	LHS/RHS	LHS-To Rithori , RHS- To Ganjar	Minor
4.	6+250	X	LHS/RHS	LHS-To Rithori , RHS- To Bandhi	Minor
5.	11+390	X	LHS/RHS	LHS-To Chhatarpur , RHS- To Charkhi	Minor
6.	13+640	X	LHS/RHS	LHS-To Imlai , RHS- To Nargawan	Minor
7.	15+700	X	LHS/RHS	LHS-To Khusner , RHS- To Umariya	Minor



Consultancy Services for preparation of Detailed Project
Report of Newly Declared National Highways to Two / Four
lane with paved shoulder.
Package – IV

Chapter 00- Executive Summary
Jabalpur to Dindori Road
(NH No.-45 Ext.)

8.	18+260	X	LHS/RHS	LHS-To Luhkari RHS- To Luhkari	Minor
9.	20+520	X	LHS/RHS	LHS-To Luhkari RHS- To Amjhar	Minor
10.	23+570	X	LHS/RHS	LHS-To Indra RHS- To Likhari	Minor
11.	25+800	Y	RHS	RHS- To Pipariya	Minor
12.	26+900	Y	LHS	LHS-To Padwar	Minor
13.	28+250	X	LHS/RHS	LHS-To Sihora RHS- To Partala	Minor
14.	28+500	Y	LHS	LHS-To Padwar	Minor
15.	30+400	T	LHS	To Mahgawan	Minor
16.	33+200	Y	RHS	RHS- To Kaashi	Minor
17.	34+800	Y	RHS	RHS- To Hinotiya	Minor
18.	35+700	X	LHS/RHS	LHS-To Junwani RHS- To Jamuniya	Minor
19.	36+800	X	LHS/RHS	LHS-To Junwani RHS- To Barela	Minor
20.	38+300	T	LHS	To Amakhoh	Minor
21.	39+700	Y	RHS	To Amjhar	Minor
22.	40+520	Y	LHS	To Village	Minor
23.	41+120	X	LHS/RHS	LHS-To Village Road , RHS- To Village Road	Minor
24.	41+400	T	LHS	To Village	Minor
25.	41+600	T	LHS	To Village	Minor
26.	42+400	X	LHS/RHS	LHS-To Village Road , RHS- To Village Road	Minor
27.	43+560	Y	RHS	To Padariya Village	Minor
28.	43+870	Y	LHS	To Bijapuri	Minor
29.	44+550	Y	RHS	To Padariya	Minor
30.	44+700	Y	RHS	To Padariya	Minor
31.	46+500	T	RHS	To Kolmuhi	Minor
32.	47+690	T	LHS	To Dehari Kalan	Minor
33.	50+530	T	LHS	To Village	Minor
34.	52+050	Y	RHS	To Tilsani	Minor
35.	52+200	Y	LHS	To Phiphari	Minor
36.	55+110	Y	RHS	To Imalai	Minor
37.	56+120	Y	LHS	To Bhajiya Village	Minor



Consultancy Services for preparation of Detailed Project
Report of Newly Declared National Highways to Two / Four
lane with paved shoulder.
Package – IV

Chapter 00- Executive Summary
Jabalpur to Dindori Road
(NH No.-45 Ext.)

38.	57+300	X	LHS/RHS	LHS-To Touri Road , RHS- To Tikariya Road	Minor
39.	57+780	Y	RHS	To Jujhari Village	Minor
40.	59+100	Y	RHS	To Jujhari Village	Minor
41.	59+400	Y	RHS	To Khamha	Minor
42.	60+050	T	LHS	To Bairagi	Minor
43.	60+500	T	RHS	To Village	Minor
44.	61+700	Y	RHS	To Karondi	Minor
45.	62+620	T	RHS	To Jaitpuri	Minor
46.	63+620	Y	LHS	To Sadafal	Minor
47.	63+970	Y	RHS	To Kundam	Minor



11 RAILWAY CROSSINGS

No railway line crosses the existing alignment at this Section. The detail of the structures is given below in Table E-7.

Table E-7: Details of Existing Railway Crossing

Sr. No.	Existing Chainage(Km)	Type of Track
1	1+100	BG

12 CROSS DRAINAGE STRUCTURES

There are 49 existing CD structures on the project road. There is 01 existing Major and 08 Minor Bridges, (6.0 m < Total Length < 60.0m) along existing road. The total number of structure on the site is given in Table E-8:

Table E-8: Details of Existing Cross Drainage Structures

Sr. No.	Details	Total Nos.
1	No. of Major Bridge	01
2	No. of Railway Level Crossing	01
3	No. of Railway Under Bridge	Nil
4	No. of Minor Bridge	08
5	No. of Vehicular and Non Vehicular Underpasses	Nil
6	No. of Slab / Box Culverts	23/1
7	No. of Pipe Culverts/VCW	24/1

The details of the existing Bridges are given in Table E-9. The inventory and conditional details of these minor bridges have been presented in Table E-9.

Table E-9: Details of Existing Bridges

(a) MAJOR BRIDGES: - 01 Nos.

Sr. No.	EXISTING CHAINAGE	TYPE OF STRUCTURES	SPAN ARRANGEMENT AND TOTAL VENTWAY (No. x Length) (m)	WIDTH OF CULVERT
1.	7+800	MJB (Canal)	11X10.5	12.5

(b) MINOR BRIDGES: - 08 Nos.



Sr. No.	EXISTING CHAINAGE (Km)	TYPE OF STRUCTURES	SPAN ARRANGEMENT (No. x Length) (m)	WIDTH OF CULVERT (m)
1.	0+910	MNB	1 X 8.5	6.5
2.	6+490	MNB	2X5.3	6.5
3.	7+380	MNB	2X6	6.5
4.	20+610	MNB	4X3.2	8
5.	22+800	MNB	3X3.5	8
6.	27+200	MNB	5X6.4	12
7.	29+100	MNB	5X6.4	12
8.	31+200	MNB	1X6.5	10

The details of culverts are given in Table E-10.

(a) Slab/ Box/ Arch Culverts: - 24 Nos.

Table E-10: Details of Existing Culverts

Sr. No.	EXISTING CHAINAGE (Km)	TYPE OF STRUCTURES (PIPE, SLAB, BOX, ARCH)	SPAN ARRANGEMENT AND TOTAL VENTWAY (No. x Length) (m)	WIDTH OF CULVERT (m)
1.	0+520	Arch	1X3.5	9.0
2.	0+980	Slab	1X1.5	13.5
3.	1+820	Slab	1X2.3	14.5
4.	2+310	Slab	1X2	11.5
5.	2+330	Slab	1X2	11.5
6.	2+910	Slab	1X1.5	13.0
7.	3+220	Slab	1X1.5	11.5
8.	3+600	Slab	1X2.2	11.5
9.	3+950	Slab	1X4	11.0
10.	4+140	Slab	1X4	11.0
11.	4+800	Slab	1X1.5	7.0
12.	9+460	Slab	1X1.5	10.0
13.	10+470	Slab	1X1.2	7.0
14.	11+650	Slab	1X1.5	10.5
15.	13+760	Slab	1X1.5	10.0
16.	15+490	Slab	1X2	10.0
17.	19+570	Slab	1X2.5	11.0
18.	20+040	Slab	1X2.5	12.0
19.	20+300	Slab	1X2.5	11.0
20.	27+920	Slab	1X4.5	10.0
21.	31+920	Slab	1X3.4	10.0
22.	33+210	Box	1X2X2	14.0



Consultancy Services for preparation of Detailed Project
Report of Newly Declared National Highways to Two / Four
lane with paved shoulder.
Package – IV

Chapter 00- Executive Summary
Jabalpur to Dindori Road
(NH No.-45 Ext.)

23.	34+420	Slab	1X2.5	10.0
24.	34+600	Slab	1X2.5	10.0



(b) HPC& VCW Culverts: - 25 Nos.

Sr. No.	EXISTING CHAINAGE (Km)	TYPE OF STRUCTURES (PIPE, SLAB , BOX , ARCH)	SPAN ARRANGEMRNT AND TOTAL VENTWAY (No. x Length) (m)	WIDTH OF CULVERT (m)
1.	4+600	HPC	3X1200	12.5
2.	5+010	HPC	1X1200	12.5
3.	5+380	HPC	2X900	12.0
4.	5+830	HPC	1X1200	10.0
5.	7+200	HPC	2X1200	13.0
6.	7+910	HPC	1X1200	11.0
7.	8+580	HPC	2X1500	10.5
8.	8+850	HPC	2X1500	10.0
9.	9+150	HPC	2X1200	10.0
10.	9+910	HPC	2X1200	15.0
11.	10+390	HPC	2X1500	12.5
12.	10+600	HPC	1X1000	16.0
13.	24+890	HPC	1X1500	10.0
14.	25+120	HPC	1X1500	10.0
15.	25+510	HPC	1X1500	10.0
16.	26+150	HPC	2X1200	10.0
17.	26+610	HPC	2X1500	10.0
18.	26+800	HPC	2X1500	10.0
19.	27+040	HPC	2X1500	10.0
20.	29+410	HPC	2X1200	10.0
21.	30+320	59+160	VCW	7 X 900
22.	30+590	HPC	1X1200	10.0
23.	32+890	HPC	1X1200	10.0
24.	33+640	HPC	1X1500	10.0
25.	35+280	HPC	1X1200	10.0

13 TRAFFIC ANALYSIS AND FORECAST

The traffic surveys have been carried out along the corridor to establish base year traffic as well as travel characteristics. The baseline traffic characteristics are very important for the assessment of future traffic and travel pattern.

The survey locations were finalized at 2 locations in consultation with MPRDC.

Traffic Survey Schedule

Location (Km)	Date of Traffic Survey		Duration
	From	To	
15+200	13/11/2017	19/11/2017	7 Days/24 Hours



Location (Km)	Date of Traffic Survey		Duration
	From	To	
46+000	13/11/2017	19/11/2017	7 Days/24 Hours
86+600	13/11/2017	19/11/2017	7 Days/24 Hours
Axle Load			
45+800	18/11/2017	19/11/2017	24 Hours
86+700	18/11/2017	19/11/2017	24 Hours

The following ADT and PCU were observed on project road –

Table E-11: Total ADT & PCU

Vehicle Category	AT KM 15+200		AT KM 46+000		AT KM 86+600	
	ADT	PCU	ADT	PCU	ADT	PCU
Two wheeler	3620	1810	1258	629	1620	810
Three Wheeler	174	87	25	13	77	39
Car/Jeep/Van/Taxi	1047	1047	916	916	765	765
Mini Bus	1	1	8	12	0	1
Bus	156	469	102	306	78	234
LCV	167	250	184	277	153	230
2 - Axle Truck	98	293	101	303	78	233
3 - Axle Truck	43	129	43	128	63	189
Multi Axle Truck	33	147	26	117	39	176
Tractor with Trailer	3	15	42	191	52	235
Tractor without Trailer	1	2	13	20	14	21
Total Fast Moving Vehicles (FMV)	5342	4250	2718	2910	2940	2933
Cycles	90	45	103	52	84	42
Cycle Rickshaw	0	0	1	1	0	0
Bullock Cart	0	0	0	2	0	0
Horse Drawn	0	0	0	0	0	0
Hand Cart	0	0	0	0	0	0
Total Slow Moving Vehicles	90	45	104	55	84	42
Total	5433	4295	2823	2965	3025	2976

The projected traffic growth rate is taken as 5%

Table E-12: -Projected traffic in different years



Consultancy Services for preparation of Detailed Project
Report of Newly Declared National Highways to Two / Four
lane with paved shoulder.
Package – IV

Chapter 00- Executive Summary
Jabalpur to Dindori Road
(NH No.-45 Ext.)

Location:	AT KM 15+200		AT KM 46+000		AT KM 86+000	
Year	ADT	PCU	ADT	PCU	ADT	PCU
Present Year 2018	3620	1810	1258	629	1620	810
Traffic Growth Rate = 5%						
2019	3801	1900	1321	660	1701	851
2020	3991	1995	1387	693	1786	893
Considering 20% Diverted Traffic						
Base Year 2021	4789	2394	1664	832	2143	1072
2022	5028	2514	1748	874	2251	1125
2023	5280	2640	1835	917	2363	1182
2024	5544	2772	1927	963	2481	1241
2025	5821	2910	2023	1012	2605	1303
2026	6112	3056	2124	1062	2736	1368
2027	6418	3209	2230	1115	2872	1436
2028	6738	3369	2342	1171	3016	1508
2029	7075	3538	2459	1229	3167	1583
2030	7429	3715	2582	1291	3325	1663
2031	7801	3900	2711	1356	3491	1746
2032	8191	4095	2847	1423	3666	1833
2033	8600	4300	2989	1494	3849	1925
2034	9030	4515	3138	1569	4042	2021
2035	9482	4741	3295	1648	4244	2122
2036	9956	4978	3460	1730	4456	2228
2037	10454	5227	3633	1817	4679	2339
2038	10976	5488	3815	1907	4913	2456
2039	11525	5763	4005	2003	5158	2579
2040	12101	6051	4206	2103	5416	2708
2041	12706	6353	4416	2208	5687	2844
2042	13342	6671	4637	2318	5972	2986
2043	14009	7004	4869	2434	6270	3135
2044	14709	7355	5112	2556	6584	3292
2045	15445	7722	5368	2684	6913	3456
2046	16217	8108	5636	2818	7258	3629
2047	17028	8514	5918	2959	7621	3811
2048	17879	8940	6214	3107	8002	4001
2049	18773	9387	6524	3262	8403	4201



Consultancy Services for preparation of Detailed Project
Report of Newly Declared National Highways to Two / Four
lane with paved shoulder.
Package – IV

Chapter 00- Executive Summary
Jabalpur to Dindori Road
(NH No.-45 Ext.)

Location:	AT KM 15+200		AT KM 46+000		AT KM 86+000	
Year	ADT	PCU	ADT	PCU	ADT	PCU
2050	19712	9856	6851	3425	8823	4411
2051	20697	10349	7193	3597	9264	4632



14 WIDTH OF CARRIAGEWAY

The details of existing carriageway and shoulders are given below:

Existing Chainage		Length (m)	Carriageway		Shoulders
Km	Km		Width(m)	Type	Width(m)
0+000	8+780	8780	5.5	BT	1.5
8+780	9+035	255	5.5	BT	1.5
9+035	9+685	650	7.0	BT	1.5
9+685	10+860	1175	5.5	BT	1.5
10+860	11+360	500	5.5	BT	1.5
11+360	15+785	4425	5.5	BT	1.5-2
15+785	16+385	600	5.5	BT	1.5
16+385	16+785	400	5.5	BT	1.5
16+785	17+315	530	5.5	BT	1.5
17+315	19+220	1905	5.5	BT	1.5
19+220	21+160	1940	5.5	BT	1.5
21+160	23+500	2340	5.5	BT	1.5
23+500	23+960	460	5.5	BT	1.5-2
23+960	24+680	720	5.5	BT	1.5
24+680	25+520	840	5.5	BT	1.5
25+520	25+925	405	5.5	BT	1.5
25+925	26+470	545	5.5	BT	1.5
26+470	26+715	245	5.5	BT	1.5
26+715	27+300	585	5.5	BT	1.5
27+300	31+270	3970	5.5	BT	1.5
31+270	31+630	360	5.5	BT	1.5
31+630	35+400	3770	5.5	BT	1.5
35+400	36+300	900	7.0	CC	1.5-2
36+300	37+900	1600	7.0	CC	1.5-2
37+900	38+560	660	5.5	BT	1.5
38+560	39+400	840	5.5	BT	1.5



15 TYPICAL CROSS SECTION

Rigid pavement in Built-up Area

Sr. No.	Design Chainage		Length (Km)	Carriageway + P.S. (m)	Ref. Typical cross section
	From	To			
1	38+280	38+930	0+650	2.5+7.0+2.5 = 12 m	Fig 2.5 Modified
2	39+900	40+400	0+500	2.5+7.0+2.5 = 12 m	Fig 2.5 Modified
3	44+800	45+400	0+600	2.5+7.0+2.5 = 12 m	Fig 2.5 Modified
4	52+365	52+825	0+460	2.5+7.0+2.5 = 12 m	Fig 2.5 Modified
5	55+300	55+545	0+245	2.5+7.0+2.5 = 12 m	Fig 2.5 Modified
6	60+100	60+460	0+360	2.5+7.0+2.5 = 12 m	Fig 2.5 Modified
Length (A) Km			2.815		

Flexible pavement in Open Area

Sr. No.	Design Chainage (km)		Length (km)	Carriageway + P.S. (m)	Ref. Typical cross section
	From	To			
1.	38+025	38+280	0+255	1.5+7.0+1.5 = 10 m	Fig. 2.2
2.	40+400	44+800	4+400	1.5+7.0+1.5 = 10 m	Fig. 2.2
3.	45+400	45+800	0+400	1.5+7.0+1.5 = 10 m	Fig. 2.2
4.	46+300	48+200	1+900	1.5+7.0+1.5 = 10 m	Fig. 2.2
5.	50+025	52+365	2+340	1.5+7.0+1.5 = 10 m	Fig. 2.2
6.	53+525	54+365	0+840	1.5+7.0+1.5 = 10 m	Fig. 2.2
7.	54+755	55+300	0+545	1.5+7.0+1.5 = 10 m	Fig. 2.2
8.	55+545	56+125	0+580	1.5+7.0+1.5 = 10 m	Fig. 2.2
9.	56+125	60+100	3+975	1.5+7.0+1.5 = 10 m	Fig. 2.2
10.	60+460	64+220	3+760	1.5+7.0+1.5 = 10 m	Fig. 2.2
Total Length in Km (B)			18.995		

New Construction of pavement

Sr. No.	Design Chainage (Km)		Length(Km)	Carriageway Width (m)	Ref. Typical cross section	Remarks
	From	To				
1	38+930	39+900	0+970	1.5+7.0+1.5 = 10 m	Fig. 2.2 Modified	Realignment
2	45+800	46+300	0+500	1.5+7.0+1.5 = 10 m	Fig. 2.2 Modified	Realignment
3	48+200	50+025	1+825	1.5+7.0+1.5 = 10 m	Fig. 2.2 Modified	Realignment



Sr. No.	Design Chainage (Km)		Length(Km)	Carriageway Width (m)	Ref. Typical cross section	Remarks
	From	To				
4	52+825	53+525	0+700	1.5+7.0+1.5 = 10 m	Fig. 2.2 Modified	Realignment
5	54+365	54+755	0+390	1.5+7.0+1.5 = 10 m	Fig. 2.2 Modified	Realignment
Total Length in Km (C)			4.385			

Total Length = A+B+C= 26.195 Km

For One Time Improvement on existing stretch

Sr. No.	Existing PWD Chainage(km)		Length (km)	Carriageway(m)	Town/Village
1	0+000	8+780	8.780	7.0 m	Jabalpur
	Existing Length in Km		8.780		

16 PROPOSED PAVEMENT COMPOSITION

Using the design chart of IRC: 37-2012, the total pavement thickness requirements for both the homogenous sections, for the design CBR value of 8% and respective 30years 'design traffic for rigid pavement and 15 years' design traffic for flexible pavement, pavement composition for both rigid and flexible pavement is given below

➤ For Rigid Pavement (In built up section):

1. Pavement Quality Concrete (PQC) 300mm
2. Dry Lean Concrete (DLC) 150mm
3. Granular Sub base (GSB) +Drainage Layer (DL) 225mm

➤ For Flexible Pavement:

1. BC - 40mm
2. DBM - 85mm
3. WMM - 250mm
4. GSB - 200mm

- Thickness of pavement layer
- The rigid pavement and flexible pavement is designed following AASHTO Guidelines for Design of Pavement Structures, 1993 and IRC:37-2012.
- Rigid pavement is designed following IRC Guidelines for the Design of Plain Jointed Rigid Pavement for Highways IRC: 58:2015



Consultancy Services for preparation of Detailed Project
Report of Newly Declared National Highways to Two / Four
lane with paved shoulder.
Package – IV

Chapter 00- Executive Summary
Jabalpur to Dindori Road
(NH No.-45 Ext.)

-
- Comparing these two methods, the thickness of pavement and component layers is determined.



17 PROPOSED STRUCTURES

Cross-Drainage (Bridges & Culverts)

Following guidelines shall be followed in design and construction of cross drainage structures:

- i) All the cross drainage structures for the new carriageway shall be designed in such way so that the outermost faces of the railing kerbs is equal to the roadway width of the approaches.
- ii) The existing structure, wherever possible, shall be widened i.e. extended to match the new road cross sections.
- iii) For bridges/ Grade separators covered median of the same width as of highway shall be provided except in case of T-Beam type superstructure where open median shall be provided with minimum 4.5 m gap including two parapets walls/crash barrier of the bridges.
- iv) The adequacy of the vent size for all culverts/bridges shall be ascertained through detailed hydrological surveys. The Highest Flood Level / Maximum Supply Level shall be properly assessed after collecting flood histories from local authorities / local enquiries / Irrigation authorities.
- v) Canal bridges shall be designed as per hydraulic requirements of irrigation authorities. The construction plans shall be prepared as per closure schedule of canals. Approval of GAD from irrigation department may be required. For smaller canals, it may be preferred to plan single span canal bridges with foundations not disturbing the canal bunds.
- vi) The new bridge shall be so planned to not affect the foundations of existing bridge.
- vii) The existing Pipe culverts in good conditions and adequate hydraulic capacity shall be widened to new carriageway with NP-4 HP culverts. In case where the culverts are structurally/ hydraulically inadequate shall be replaced by new culvert of adequate size. Improvement for the existing cross-drainage structures shall be made as summarized in Table E-15.

Table E-15: Recommendations on Cross Drainage Structures of the Project on the existing Road.

Type of structures	Existing No.	Retain	Widening	Reconstruction	New Construction	Total no. of Structures
Slab / Box Culvert	24	05	14	05	04	23
Hume Pipe Culvert	59	44	15	Nil	25	84
Arch	Nil	Nil	Nil	Nil	Nil	Nil
Canal	Nil	Nil	Nil	Nil	Nil	Nil
Minor Bridge	20	07	08	05	05	25



Consultancy Services for preparation of Detailed Project
Report of Newly Declared National Highways to Two / Four
lane with paved shoulder.
Package – IV

Chapter 00- Executive Summary
Jabalpur to Dindori Road
(NH No.-45 Ext.)

Type of structures	Existing No.	Retain	Widening	Reconstruction	New Construction	Total no. of Structures
Major Bridge	03	01	02	Nil	02	05



I. Culverts:

Table E-17 presents the details of Culverts proposed for the entire project.

Table E-17: Details of Culverts

A. Widening of Culvert

(a) SLAB/BOX CULVERT: 05 Nos.

Sr. No.	Existing Chainage (Km)	Design Chainage (Km)	Details of Existing Structure			Proposal
			Type of Structure	Span Arrangement (No. X Length)	Width of Structure (m)	
1.	11+650	40+690	Slab	1X1.5m	10.5	Widening
2.	13+760	42+790	Slab	1X1.5m	10.0	Widening
3.	15+490	44+490	Slab	1X2m	10.0	Widening
4.	20+040	48+970	Slab	1X2.5m	12.0	Widening
5.	27+920	56+750	Slab	1X4.5m	10.0	Widening

(b) PIPE CULVERTS: 09 Nos.

Sl. No.	Existing Chainage (Km)	Design Chainage (Km)	Details of Existing Structure			Proposal
			Type of Structure	No. x Dia. (m)	Width of Structure (m)	
1.	8+850	38+100	HPC	2X1500	10.0	Widening
2.	10+390	39+420	HPC	2X1500	12.5	Widening
3.	26+150	54+980	HPC	2X1200	10.0	Widening
4.	26+610	55+440	HPC	2X1500	10.0	Widening (One Side)
5.	26+800	55+620	HPC	2X1500	10.0	Widening
6.	27+040	56+070	HPC	2X1500	10.0	Widening
7.	29+410	58+240	HPC	2X1200	10.0	Widening
8.	30+590	59+400	HPC	1X1200	10.0	Widening
9.	35+280	64+100	HPC	1X1200	10.0	Widening

B. Reconstruction of Culvert

(a) SLAB/ARCH/BOX CULVERT: 10 Nos.

Sr. No.	Existing Chainage	Design Chainage	Type of structure	Span Arrangement (No. X Length)	Proposed Structure	Proposed Span Arrangement
---------	-------------------	-----------------	-------------------	---------------------------------	--------------------	---------------------------



						(No. X Length)
1.	9+150	38+390	HPC	2X1200	Box	1X3X3
2.	9+460	38+700	Slab	1X1.5m	Slab	1X4m
3.	10+470	39+500	Slab	1X1.2m	Slab	1X3m
4.	24+890	53+710	HPC	1X1500	Box	1X3X3
5.	25+120	53+970	HPC	1X1500	Box	1X3X3
6.	25+510	54+350	HPC	1X1500	Box	1X3X3
7.	30+320	59+160	VCW	7 X 900	Slab	2X10m
8.	31+920	60+750	Slab	1X3.4m	Slab	1X4m
9.	34+420	63+240	Slab	1X2.5m	Box	1X3X3
10.	34+600	63+420	Slab	1X2.5m	Slab	1X4m

(b) PIPE CULVERTS: 02 Nos.

Sr. No.	Existing Chainage	Design Chainage	Type of structure	Span Arrangement (No. X Length)	Proposed Structure	Proposed Span Arrangement (No. X Length)
1	32+890	61+700	HPC	1X1200	HPC	1X1200
2	33+640	62+460	HPC	1X1500	HPC	2X1200

C. Retained Culverts

(a) Slab/Arch culvert: 14 Nos. (Abandoned due to Bypass & Realignment)

S. No.	Existing Chainage (Km)	Type of Structure	No. x Dia. (m)	Proposal
1.	0+520	Arch	1X3.5	Abandoned
2.	0+980	Slab	1X1.5	Abandoned
3.	1+820	Slab	1X2.3	Abandoned
4.	2+310	Slab	1X2	Abandoned
5.	2+330	Slab	1X2	Abandoned
6.	2+910	Slab	1X1.5	Abandoned
7.	3+220	Slab	1X1.5	Abandoned
8.	3+600	Slab	1X2.2	Abandoned
9.	3+950	Slab	1X4	Abandoned
10.	4+140	Slab	1X4	Abandoned
11.	4+800	Slab	1X1.5	Abandoned
12.	19+570	Slab	1X2.5	Abandoned



Consultancy Services for preparation of Detailed Project
Report of Newly Declared National Highways to Two / Four
lane with paved shoulder.
Package – IV

Chapter 00- Executive Summary
Jabalpur to Dindori Road
(NH No.-45 Ext.)

S. No.	Existing Chainage (Km)	Type of Structure	No. x Dia. (m)	Proposal
13.	20+300	Slab	1X2.5	Abandoned
14.	33+210	Box	1X2X2	Retain



(b) HPC Culverts: 09 Nos.

S. No.	Existing Chainage (Km)	Type of Structure	No. x Dia. (mm)	Proposal
1.	4+600	HPC	3X1200	Abandoned
2.	5+010	HPC	1X1200	Abandoned
3.	5+380	HPC	2X900	Abandoned
4.	5+830	HPC	1X1200	Abandoned
5.	7+200	HPC	2X1200	Abandoned
6.	7+910	HPC	1X1200	Abandoned
7.	8+580	HPC	2X1500	Abandoned
8.	9+910	HPC	2X1200	Abandoned
9.	10+600	HPC	1X1000	Abandoned

D. New Culverts

a) SLAB / Box / Arch Culvert: 02 Nos.

SI. No.	Design Chainage (Km)	Structure Proposed	Proposal	Span Arrangement (No. X Length)
1.	48+590	Slab	New Construction	1X3m
2.	49+200	Slab	New Construction	1X3m

b) HPC CULVERTS: 02 Nos.

SI. No.	Design Chainage (Km)	Structure Proposed	Proposal	Span Arrangement (No. X Length)
1.	39+060	HPC	New Construction	2 X 1200
2.	39+600	HPC	New Construction	1 X 1200

II. Bridges

➤ **Existing Bridges to be Reconstructed**

(a) MAJOR BRIDGES: - Nil

(b) MINOR BRIDGES: - 01 Nos.

Sr. No.	Existing Chainage (Km)	Design Chainage (Km)	Details of Existing Structure			Details of Proposed structure		
			Type of Structure	Span Arrangement	Width of Structure (m)	Span Arrangement*	Proposed Width (m)	Type of Bridge



1	22+800	51+670	MNB	3X3.5	8.0	1 X 20	16	Minor Bridge
2	30+320	59+160	VCW	7 X 900	10.0	2 X 10	16	Minor Bridge

➤ **Existing Bridges to be Widened**

(a) MAJOR BRIDGES: - Nil

(b) MINOR BRIDGES: - 03 Nos.

Sr. No.	Existin g Chaina ge (Km)	Design Chainage (Km)	Details of Existing Structure			Details of Proposed structure			Remark
			Type of Structure	Span Arrangem ent	Width of Struct ure (m)	Span Arran gement*	Prop osed Width (m)	Type of Bridge	
1.	27+200	56+020	MNB	5X6.4	12.0	5X6.4	16	Minor Bridge	Widening
2.	29+100	57+920	MNB	5X6.4	12.0	5X6.4	16	Minor Bridge	Widening
3.	31+190	60+010	MNB	1X6.5	10.0	1X6.5	16	Minor Bridge	Widening

➤ **Additional new bridges:**

New bridges at the following locations on the Project Highway shall be constructed. GADs for the new bridges are attached in the drawings folder.

(a) MAJOR BRIDGES: - Nil.

(b) MINOR BRIDGES: - 01 Nos.

SI. No.	Design Chainage (Km)	Structure Proposed	Proposal	Span Arrangement (No. X Length in m)
1.	49+530	MNB(Slab)	New Construction	1X15

➤ **Existing Bridges to be Retained**

(c) MAJOR BRIDGES: - 01Nos



Sr. No.	Location of bridge (Existing Chainage in km)	Type of Structure	Span Arrangement (No. of Span x Length in m)	Nature and extent of repairs /strengthening to be carried out
1.	7+800	MJB	11X10.5	Retain

(d) MINOR BRIDGES: - 04 Nos.

Sr. No.	Location of bridge (Existing Chainage in km)	Type of Structure	Span Arrangement (No. of Span x Length in m)	Nature and extent of repairs /strengthening to be carried out
1	0+910	MNB	1 X 15	Abandoned
2	6+490	MNB	1 X 15	Abandoned
3	7+380	MNB	1 X 15	Abandoned
4	20+610	MNB	1 X 15	Abandoned

18. PROPOSED FACILITIES

I. **TOLL PLAZA:** One Toll Plaza is proposed in this section of project road.

Sr. No.	Design Chainage in Km.	Remark
1.	58+500	Proposed Toll Plaza of 10 Lanes

II. **BUS SHELTER & BUS-BAYS WITH SHELTER:**

Bus Bays shall be provided at following locations conforming to section 12 of manual of specifications and standards. Bus shelters are provided in the remaining villages of the section.

Sr. No.	Design Chainage	Side	Village/Town Name	Remarks, if any
Bus Lay Bye				
1	63+500	BHS	Near Kundam	Near Kundam Bypass
Bus Shelter				
1	37+900	BHS	Amakhoh	
2	40+500	BHS	Amjhar	
3	45+500	BHS	Padariya	



Consultancy Services for preparation of Detailed Project
Report of Newly Declared National Highways to Two / Four
lane with paved shoulder.
Package – IV

Chapter 00- Executive Summary
Jabalpur to Dindori Road
(NH No.-45 Ext.)

4	52+000	BHS	Badraji	
5	55+400	BHS	Negai	
6	60+500	BHS	Bairagi	

III. TRUCK LAY BYE: Truck lay-bays on either side of the road are given below;
Location of Truck lay bye

Sr. No.	Design Chainage (km)	Side	Remark
1	56+000	BHS	Near Proposed Toll Plaza

IV. SAFETY BARRIERS: Safety barriers ("W" beam type) shall be provided as per manual, relevant IRC codes and MoRT&H specifications.