



EXECUTIVE SUMMARY

1.0 Introduction

Maharashtra State Road Development Corporation Limited (MSRDC) - Project Proponent has been entrusted with the development of Access Controlled Super Communication Expressways which connect the shaktipeeth in Vidharbha, Marathwada and Konkan region in Maharashtra. MSRDC has proposed Expressway into four different Packages falling in Vidharbha, Marathwada, Pune and Konkan Revenue Divisions as under,

Package I: Package-I start at Wardha (Ch. 0+000) and ends at Yavatmal district border (Ch.171+690). The alignment passes through Wardha and Yavatmal districts. Total length of the Package I is approx. 171.690 km

Package II: Package II starts at Nanded district border (Ch. 171+690) and ends at Osmanabad district border (Ch. 439+170). The alignment passes through Nanded, Hingoli, Beed, Latur, Parbhani and Osmanabad districts. Total length of the Package II is approx. 267.48 km

Package III: Package III starts at Ch. Solapur district border (Ch. 439+170) and ends at Kolhapur district border (Ch. 764.080). The alignment passes through Osmanabad, Solapur, Sangali and Kolhapur districts. Total length of the Package III is approx. 324.910 km

Package IV: Package IV starts at Sindhudurg district border (Ch. 764.080) and ends at at Patradevi in Sindhudurg district (Ch. 802+869). The alignment passes through Kolhapur and Sindhudurg districts. The overall length of Package IV is 38.789 km

The proposed project is for Package I: Starting from Digraj village in Wardha district Amala village in Yavatmal district. As per Environment Impact Assessment (EIA) Notification dated 14th September 2006, and its amendments until date, the proposed project falls under 'Category B1' with activity number 7(f).

Accordingly, the application was submitted for obtaining Terms of References (ToR) for Prior Environmental Clearance for Package I. The project was recommended in the 292nd State Expert Appraisal Committee-1 (SEAC-1) held on 11th to 15th March 2025 and by SEIAA in its 290th meeting held on 23rd April, 2025. The project was accorded ToR vide TOR Identification No. TO25B3602MH5942744N dated 29th April 2025 (copy of original TOR is enclosed as **Annexure 1**).

2.0 Project Location

The proposed project alignment passes through 20 villages in Wardha and Deoli talukas of Wardha district, and 71 villages in Kalamb, Yavatmal, Ghantanji, Arni, Mahagaon, and Umarched talukas of Yavatmal district in the state of Maharashtra. The key map of the project is

as shown in **Figure 1** and Toposheet Map of the project site & study area is as shown in **Figure 2**.

The details of the area and length in each of the village are as provided in **Table 1**.

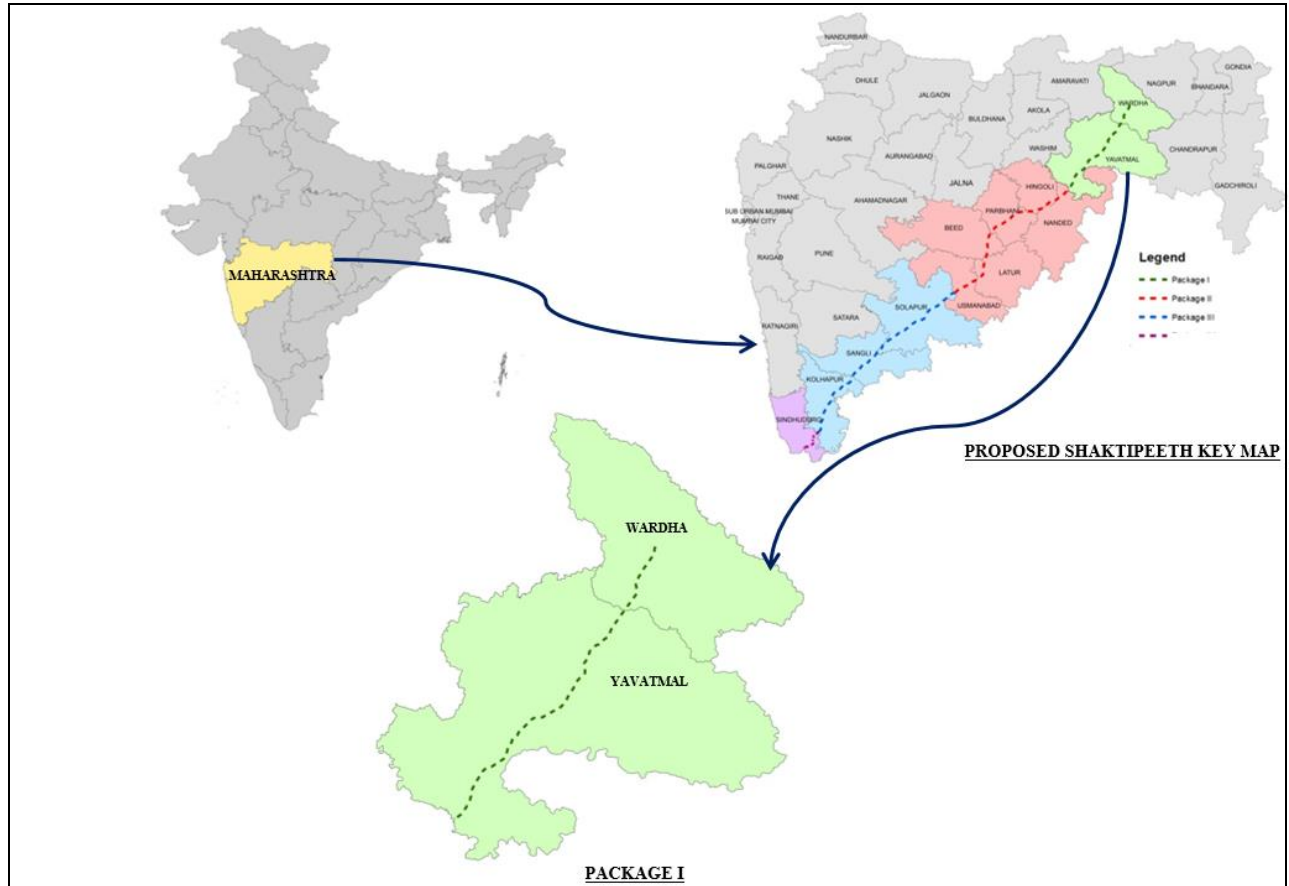


Figure 1: Location Map of the Project Site



M/s. Enviro Resources

ExecutiveSummary for Construction of Pavnar (District Wardha) to Patradevi (District Sindhudurg) at Maharashtra Goa Border Super Communication Expressway (Maharashtra Shaktipeeth Expressway) in the state of Maharashtra, Package – I (Wardha to Yavatmal)

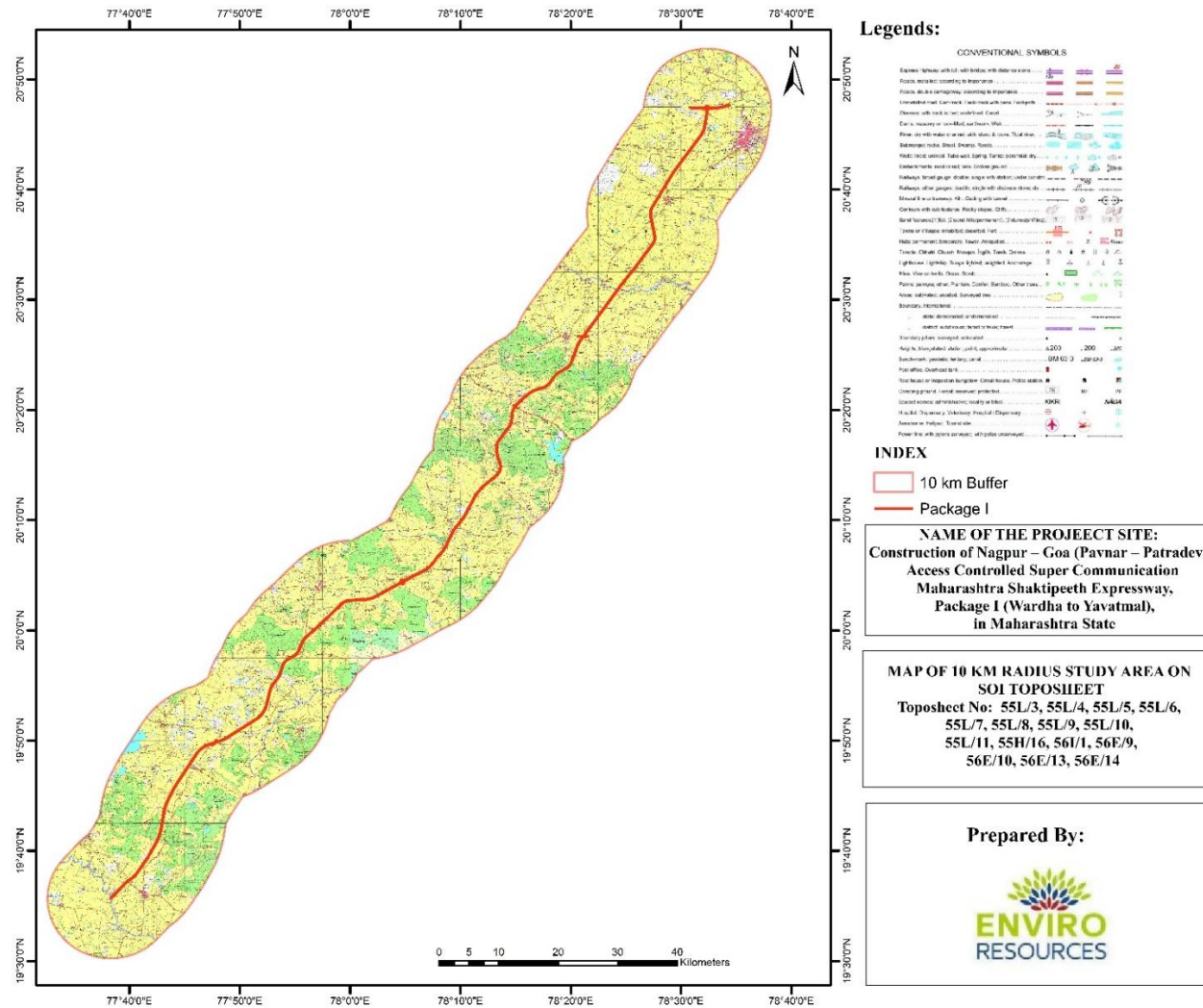


Figure 2: Toposheet Map of the Project Site & Study Area



Table 1: Details of Project Alignment Village-wise

SR NO	DISTRICT	TALUKA	VILLAGE NAME	STSRT CH	END CH
1	WARDHA	WARDHA	DIGRAJ	0+000	1+050
2	WARDHA	WARDHA	PANDHARKAVADA	Interchange	
3	WARDHA	WARDHA	GANESHPUR		
4	WARDHA	WARDHA	ZADGAON		
5	WARDHA	WARDHA	TIGAON	1+050	4+080
6	WARDHA	WARDHA	ROTHA	4+080	5+440
7	WARDHA	WARDHA	DHOTRA_RE	5+440	9+610
8	WARDHA	WARDHA	NIMGAON	9+640	9+660
9	WARDHA	WARDHA	PADHEGAON	9+610	12+495
10	WARDHA	WARDHA	CHIKANI	12+495	14+430
11	WARDHA	DEOLI	DEOLI	14+430	19+510
12	WARDHA	DEOLI	ISAPUR	19+510	22+730
13	WARDHA	DEOLI	KAJALSARA	22+730	26+630
14	WARDHA	DEOLI	WAKHEDA	24+200	24+850
15	WARDHA	DEOLI	BABHULGAON	26+630	28+610
16	WARDHA	DEOLI	SAIDAPUR	28+610	28+910
17	WARDHA	DEOLI	KARMALPUR	28+910	29+240
18	WARDHA	DEOLI	VABGAON	29+240	30+595
19	WARDHA	DEOLI	VABGAON	31+780	32+530
20	WARDHA	DEOLI	KASIMPUR	30+595	31+780
21	WARDHA	DEOLI	KHARDA	32+530	34+940
22	YAVATMAL	KALAMB	WANDALI	34+940	35+210
23	YAVATMAL	KALAMB	MAHITAPURI	35+210	36+720
24	YAVATMAL	KALAMB	GHAMANGAON	36+800	36+820
25	YAVATMAL	KALAMB	SONEGAON	36+720	38+400
26	YAVATMAL	KALAMB	SONKHAS	38+400	38+490
27	YAVATMAL	KALAMB	MALWANI	38+490	40+950
28	YAVATMAL	KALAMB	SHINGNAPUR	40+950	43+060
29	YAVATMAL	KALAMB	MALKAPUR	43+060	43+830
30	YAVATMAL	KALAMB	KALAMB	43+830	46+920
31	YAVATMAL	KALAMB	RASA	46+920	47+830
32	YAVATMAL	KALAMB	JONDHALNI	47+830	48+700
33	YAVATMAL	KALAMB	DATTAPUR	48+700	53+170
34	YAVATMAL	KALAMB	HIRDI	53+170	55+060
35	YAVATMAL	KALAMB	GANDHA	55+060	56+310
36	YAVATMAL	KALAMB	WADHONA KH	56+310	56+450
37	YAVATMAL	KALAMB	POPHALNI	56+450	57+620
38	YAVATMAL	KALAMB	SHERAD	57+620	59+645
39	YAVATMAL	YAVATMAL	YERAD	59+645	61+860
40	YAVATMAL	YAVATMAL	GHODAR	61+860	62+710
41	YAVATMAL	YAVATMAL	CHINCHGHAT	62+710	67+920
42	YAVATMAL	YAVATMAL	CHAPDOHA	67+300	68+260



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SR NO	DISTRICT	TALUKA	VILLAGE NAME	STSRT CH	END CH
43	YAVATMAL	YAVATMAL	YAVALI	67+920	73+205
44	YAVATMAL	YAVATMAL	WADGAON	73+205	73+470
45	YAVATMAL	YAVATMAL	RAMNAGAR TARF YAULI	73+470	74+880
46	YAVATMAL	YAVATMAL	KAREGAON	74+880	77+020
47	YAVATMAL	YAVATMAL	VARUD	77+020	78+770
48	YAVATMAL	YAVATMAL	YEWATI	78+770	81+250
49	YAVATMAL	YAVATMAL	WARZADI	81+250	81+340
50	YAVATMAL	YAVATMAL	KHAIRGAON EJARA	81+340	84+230
51	YAVATMAL	YAVATMAL	MANJARDA	84+230	86+800
52	YAVATMAL	GHANTANJI	DONGARGAON	86+800	87+340
53	YAVATMAL	ARNI	BORGAON	87+340	89+660
54	YAVATMAL	ARNI	TALNI	89+660	90+140
55	YAVATMAL	ARNI	KURHA TARF TALNI	90+140	94+825
56	YAVATMAL	ARNI	ANJI	94+825	97+360
57	YAVATMAL	ARNI	KAREGAON_PRAMANE_SINDHKHED	97+360	98+320
58	YAVATMAL	ARNI	BOREGAON_EJARA	98+320	98+940
59	YAVATMAL	ARNI	PIMPRI	98+940	100+870
60	YAVATMAL	ARNI	VITHOLI	100+870	101+760
61	YAVATMAL	ARNI	YERMALA	101+760	103+590
62	YAVATMAL	ARNI	KELZARA	103+590	105+750
63	YAVATMAL	ARNI	Antargaon	105+750	108+890
64	YAVATMAL	ARNI	KURHAPRAMANE_EJARA	108+890	112+580
65	YAVATMAL	ARNI	SUKALI	112+580	116+540
66	YAVATMAL	ARNI	LONBEHAL	116+540	119+440
67	YAVATMAL	ARNI	GHONSARA	119+440	120+650
68	YAVATMAL	ARNI	GHONSARA	121+660	122+130
69	YAVATMAL	ARNI	HIWALESRAWAR	120+650	121+660
70	YAVATMAL	MAHAGAON	PIMPALDARI	122+130	123+430
71	YAVATMAL	MAHAGAON	TIWARANG	123+430	124+960
72	YAVATMAL	MAHAGAON	TIWARANG	125+810	127+370
73	YAVATMAL	MAHAGAON	MALKAPUR	124+960	125+810
74	YAVATMAL	MAHAGAON	POUNDUL	127+370	129+980
75	YAVATMAL	MAHAGAON	IJANI	129+980	132+110
76	YAVATMAL	MAHAGAON	HIWARA	132+110	135+270
77	YAVATMAL	MAHAGAON	GAUL_IJARA	135+270	135+770
78	YAVATMAL	MAHAGAON	KURWADI	135+770	136+690
79	YAVATMAL	MAHAGAON	KHADAKE	136+690	137+555
80	YAVATMAL	MAHAGAON	WAGHNATH	137+555	139+505
81	YAVATMAL	MAHAGAON	AMBODE_BK	139+505	143+605
82	YAVATMAL	MAHAGAON	KALGAON	143+605	145+860
83	YAVATMAL	MAHAGAON	UTI	145+860	149+370
84	YAVATMAL	MAHAGAON	NEHERUNAGAR	149+370	152+970
85	YAVATMAL	MAHAGAON	MUDANA	149+800	149+880



SR NO	DISTRICT	TALUKA	VILLAGE NAME	STSRT CH	END CH
86	YAVATMAL	MAHAGAON	KOTHARI	152+970	153+380
87	YAVATMAL	MAHAGAON	RAJURI	153+380	156+140
88	YAVATMAL	MAHAGAON	NANDGAVHAN	156+140	159+060
89	YAVATMAL	UMARKHED	CHILLI	159+060	162+430
90	YAVATMAL	UMARKHED	SUKALI	162+430	164+960
91	YAVATMAL	UMARKHED	NAGESHWADI	164+960	166+300
92	YAVATMAL	UMARKHED	DAHGAON	166+300	167+990
93	YAVATMAL	UMARKHED	BELKHED_JAHAGIR	167+990	170+360
94	YAVATMAL	UMARKHED	AMALA	170+360	171+690

Source: Land records by Monarch

****Note:** Forest land to be diverted may be changed during Forest Clearance process

3.0 Project Description

The salient features of the proposed project are as tabulated below in **Table 2**.

Table 2: Salient Features

1	Total Length	171.600 km												
2	State	Maharashtra												
3	District	Wardha and Yavatmal												
4	Talukas	The proposed alignment will pass through Wardha, Deoli, Kalamb, Yavatmal, Ghantaji, Arni, Mahagaon, and Umarkhed Talukas. i.e. 8 talukas												
5	Terrain	Mostly plain and hilly at some places												
6	Seismic Zone	II as per IS 1893 (Part 1) : 2002												
7	Land Use	The alignment is passing through plain terrain. The predominant land use along the alignment is agricultural followed by residential & commercial and mix (built up) land use.												
8	RoW	100 m for Non-Forest area and 60 m for forest area with 3+3 Lanes												
9	Total Area of Land Acquisition	Total Land Acquisition: 2013.85 ha Government Land and Private Land: 1957.51 ha Forest Land: 56.34 ha (Source: Land records by Monarch; **Note: Forest land to be diverted may be changed during Forest Clearance process)												
10	Main Carriageway (Proposed)	3+3 Lane Divided Carriageway												
11	Interchange	4 locations at: <table border="1"> <tr> <td>IC-1</td><td>0+000</td><td>Samaruddhi Expressway</td></tr> <tr> <td>IC-2</td><td>60+975</td><td>Karanji - Yavatmal Major State Highway (MSH 14)</td></tr> <tr> <td>IC-3</td><td>139+770</td><td>Napur - Tuljapur National Highway (NH 361)</td></tr> <tr> <td>IC-4</td><td>167+565</td><td>Umarkhed - Pusad State Highway (NH361)</td></tr> </table>	IC-1	0+000	Samaruddhi Expressway	IC-2	60+975	Karanji - Yavatmal Major State Highway (MSH 14)	IC-3	139+770	Napur - Tuljapur National Highway (NH 361)	IC-4	167+565	Umarkhed - Pusad State Highway (NH361)
IC-1	0+000	Samaruddhi Expressway												
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M/s. Enviro Resources

12	No. of Structure	Particulars	Wardha- Yavatmal
		Major Bridges	3
		Minor Bridges	58
		Flyovers	32
		Tunnel	1
		Animal Overpass	4
		CUP/PUP	114
		Canal Crossing	63
		VUP/VOP/LVUP	63
		ROB	2
		Box Culverts	184
		Culvert (Portal Type)	8
		Utility Box	25
21	Rainwater Harvesting System	Rainwater harvesting shall be done as per IRC: SP: 50-2013 and as per Ministry Circular no. NHAI/TIC/VIP Ref/ 2012 dated 26th October 2015.	
22	Toll Plaza	Closed Loop system adopted for this corridor. Toll Tokens issued/vehicle registered at Entry Point and Toll deducted from Fast tag at Exit Point based on Travel Distance.	
23	Construction Period	30 months	
24	Employment	Approx. 1400 during construction and approx. 100 during operation phase	
25	Total Civil Cost	11411.40 Cr.	
26	Total Capital Cost (including LA and Utility Shifting, etc.)	18420.07 Cr	
27	R&R Plan	The R&R compensation activities shall be accomplished in consonance with Maharashtra Highways Act, 1955. Provisions of R&R Plan in Maharashtra Highways Act form the basis for Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. The budget is already included in the land acquisition portion for the same.	



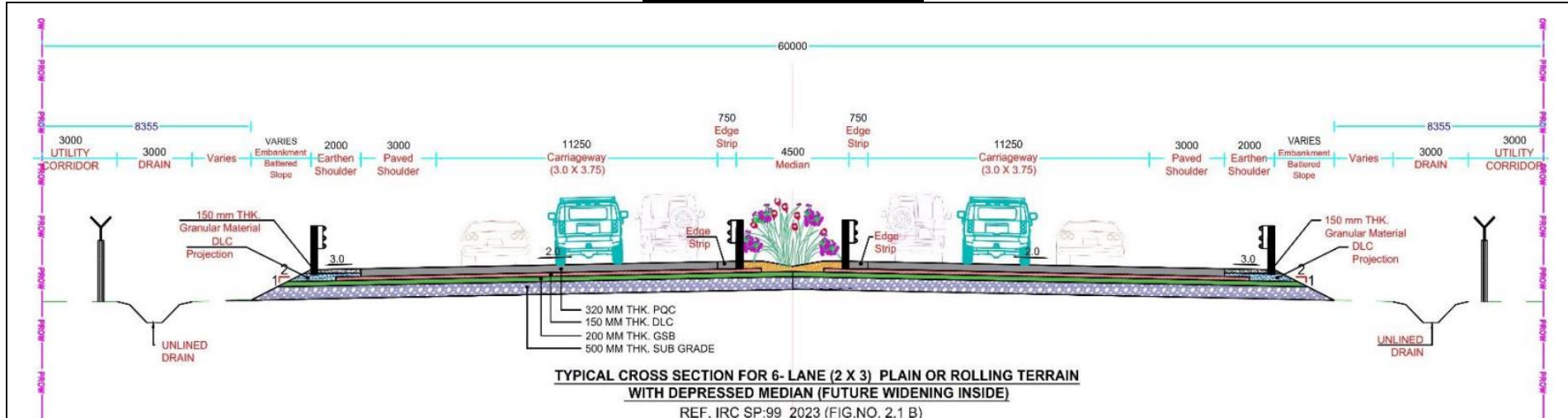
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The typical cross-section of the proposed alignment is as shown in Figure 3.

For 6 Lane - Forest Area



For 6 Lane - Non Forest Area

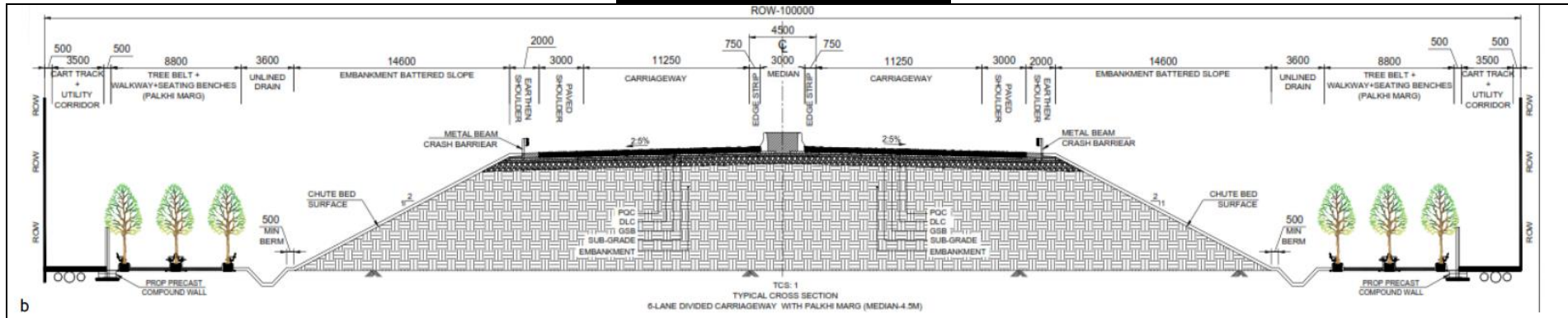


Figure 3: (Typ.) Cross Section of Proposed Alignment

Source: MSRDC (PP) and Monarch (DPR Consultant)



Project Schedule & Cost : The proposed project is scheduled to be completed within 18-30 months after Environment Clearance (EC) and other statutory approvals are granted. The estimated cost of the project is Rs. 18420.07. Crores. The budget for Environment Protection for the proposed project is ~ 322 Crores.

Resource

Requirements

- Land** : The proposed project will be executed on a total land area of ~2013.85 ha which is being acquired by MSRDC, Government of Maharashtra.
- Water** : The domestic water requirement will be approximately 0.63m³/day (i.e. 45 lpd for 1400 labours). Additional water of ~8600 m³/day will be required for dust suppression & construction activities. The water will be sourced from nearby surface water sources such as Dham River, Yashoda River, Wardha River, Adan River, Arunavati River and Penganga River with prior consent from the Authorities having Jurisdiction.
- Power** : LSD D.G sets will be used for power for onsite construction and labour camps, wherever grid supply is not available.
- Manpower** : The manpower envisaged is approximately 1400 for the proposed project.

4.0 Description of the Environment

As per the EIA Guidance Manual for Highways (MoEF&CC, February 2010), a study area of 15 km radius from the proposed alignment was considered for secondary data collection. Primary data has been collected within 500 meters on either side of the proposed alignment. Baseline environment monitoring was carried out for the period of March 2024 to May 2024.

Topography, Land use& its Classification – The topography around the project site is mostly plain and hilly at some places.

The land use and land cover of the study area was analyzed based on multispectral satellite imagery reveals that Agriculture is the highest category of Land Use accounting as much as 71.24 % (3028.90 km²) of the total area followed by Built-up 3.01 % (127.81 km²) & the least Land Use Class was represented by Water Bodies 1.23% (52.49 km²). Of the Land Cover Classes, Waste land was the major Land Cover Class which accounted to 22.09 % (939.37 km²) followed by Forest which accounted to 2.42 % (103.03 km²) and one feature viz. Water bodies which comprised of River/Stream as Land Cover & Lake/Reservoir/Tank/Canal as land use accounted to 1.23 % (52.49 km²).

Soil - The soil quality was monitored at eighteen (20) locations within the study area. Some of the important soil parameters are summarised in the below table;

Parameter	Value
pH	7.2 - 8.64
Nitrogen mg/kg	80.8 – 101.5



Parameter	Value
Phosphorus mg/kg	23.43- 52.7
Potassium mg/kg	37.07 – 56.18
Organic Carbon %	0.2 – 1.9

As per the Chemical Classification of Soil Quality by ICAR, the soils in study area come under moderate to highly productive, whereas as per Levels of Soil Fertility by Tondon H.L.S, the soils in study are can be classified under high fertile category.

Ambient Air Quality - The Ambient Air quality was monitored at eighteen (20) locations for parameters such as PM₁₀, PM_{2.5}, NO_x, SO₂, CO in the study area.

Parameter		A 11	A 12	A13	A 14	A 15	A 16	A 17	A 18	A19	A20
PM _{2.5} (µg/m ³)	Min.	26.35	24.66	22.87	23.12	25.96	24.58	21.18	20.36	24.65	21.45
	Max.	42.86	45.28	43.95	42.56	41.96	40.88	45.6	45.21	44.85	43.57
	Average	34.61	34.97	33.41	32.84	33.96	32.73	33.39	32.79	34.75	32.51
	98 %ile	42.00	44.37	43.07	41.71	41.12	40.06	44.69	44.31	43.95	42.70
PM ₁₀ (µg/m ³)	Min.	45.60	42.98	55.74	60.32	48.32	49.12	58.37	57.18	50.82	47.33
	Max.	73.52	75.43	72.38	73.69	71.25	72.68	73.69	70.28	72.98	75.66
	Average	59.56	59.21	64.06	67.01	59.79	60.90	66.03	63.73	61.90	61.50
	98 %ile	72.05	73.92	70.93	72.22	69.83	71.23	72.22	68.87	71.52	74.15
SO ₂ (µg/m ³)	Min.	7.60	8.69	7.45	8.32	6.32	8.74	7.98	6.25	6.32	7.48
	Max.	11.56	12.58	10.65	9.8	12.22	11.68	10.36	11.45	12.8	10.58
	Average	9.58	10.64	9.05	9.06	9.27	10.21	9.17	8.85	9.56	9.03
	98 %ile	11.33	12.33	10.44	9.60	11.98	11.45	10.15	11.22	12.54	10.37
NO _x (µg/m ³)	Min.	9.88	10.65	11.89	10.78	11.58	10.95	9.63	9.25	10.25	11.36
	Max.	14.58	15.69	13.68	14.23	13.36	14.58	15.69	12.85	15.03	14.23
	Average	12.23	13.17	12.79	12.51	12.47	12.77	12.66	11.05	12.64	12.80
	98 %ile	14.29	15.38	13.41	13.95	13.09	14.29	15.38	12.59	14.73	13.95
CO (mg/m ³)	Min.	0.31	0.27	0.32	0.38	0.42	0.28	0.34	0.4	0.33	0.29
	Max.	1.37	1.12	1.35	1.25	1.22	0.98	1.05	1.24	1.18	1.13
	Average	0.84	0.70	0.84	0.82	0.82	0.63	0.70	0.82	0.76	0.71
	98 %ile	1.34	1.10	1.32	1.23	1.20	0.96	1.03	1.22	1.16	1.11

Parameter		A 11	A 12	A13	A 14	A 15	A 16	A 17	A 18	A19	A20
PM _{2.5} (µg/m ³)	Min.	22.96	22.75	21.56	21.48	20.98	25.32	22.88	21.65	20.36	43.58
	Max.	42.64	41.98	40.83	44.73	41.89	40.23	42.36	45.18	42.39	32.62
	Average	32.80	32.37	31.20	33.11	31.44	32.78	32.62	33.42	31.38	42.71
	98 %ile	41.79	41.14	40.01	43.84	41.05	39.43	41.51	44.28	41.54	43.58
PM ₁₀ (µg/m ³)	Min.	48.96	51.77	56.95	55.87	54.26	58.69	60.52	59.83	55.25	51.68
	Max.	74.32	71.29	70.68	75.21	74.58	73.98	70.26	71.66	72.58	73.64



	Average	61.64	61.53	63.82	65.54	64.42	66.34	65.39	65.75	63.92	62.66
	98 %ile	72.83	69.86	69.27	73.71	73.09	72.50	68.85	70.23	71.13	72.17
SO ₂ (µg/m ³)	Min.	8.97	7.53	6.79	8.36	8.75	6.97	6.07	7.82	8.67	6.69
	Max.	10.74	9.86	11.99	11.83	12.47	12.03	10.89	12.65	10.69	11.65
	Average	9.86	8.70	9.39	10.10	10.61	9.50	8.48	10.24	9.68	9.17
	98 %ile	10.53	9.66	11.75	11.59	12.22	11.79	10.67	12.40	10.48	11.42
NO _x (µg/m ³)	Min.	10.89	11.02	10.56	12.64	10.83	11.66	10.87	10.61	12.4	11.36
	Max.	15.45	14.66	14.37	13.97	14.65	14.88	15.69	14.85	14.2	15.83
	Average	13.17	12.84	12.47	13.31	12.74	13.27	13.28	12.73	13.30	13.60
	98 %ile	15.14	14.37	14.08	13.69	14.36	14.58	15.38	14.55	13.92	15.51
CO (mg/m ³)	Min.	0.3	0.36	0.39	0.41	0.46	0.4	0.33	0.37	0.39	0.26
	Max.	1.29	1.21	1.19	1.13	1.15	1.3	1.11	1.2	1.17	1.06
	Average	0.80	0.79	0.79	0.77	0.81	0.85	0.72	0.79	0.78	0.66
	98 %ile	53.62	59.42	52.75	52.67	59.35	52.63	49.38	50.65	56.34	57.74

In general, the ambient air quality is satisfactory with respect to all major pollutants. The 98th percentile values of all pollutants were found to be below NAAQS, 2009 and its further amendments.

Noise Quality - The noise quality was monitored at eighteen (20) locations in the study area during the study period.

Station Coad	Name	Category	Leq daytime	Leq night time	Daytime Standard	Night time Standard
N1	Digraj	Residential	54.8	44.4	55	45
N2	Deoli	Residential	42.6	39.2	55	45
N3	Haibatpur	Residential	53.6	44.6	55	45
N4	Mawalni	Residential	51.4	42.7	55	45
N5	Kalamb	Residential	49.4	40.6	55	45
N6	Yerad	Residential	54.3	43.7	55	45
N7	Yawali	Residential	51.3	40.2	55	45
N8	Khairgaon	Residential	49.7	41.3	55	45
N9	Anji	Residential	52.1	43.8	55	45
N10	Antargaon	Residential	53.4	40.6	55	45
N11	Lonbehal	Residential	43.9	41.3	55	45
N12	Pohandul	Residential	53.1	42.6	55	45
N13	Hiwar	Residential	52.9	43.4	55	45
N14	Amboda	Residential	49.4	40.6	55	45
N15	Kalgaon	Residential	53.3	41.8	55	45
N16	Hingani	Residential	51.4	40.3	55	45
N17	Bijora	Residential	49.7	41.8	55	45
N18	Sukali	Residential	51.6	42.3	55	45
N19	Dahagaon	Residential	52.2	45.6	55	45
N20	Karodi	Residential	54.8	44.7	55	45



The noise quality in the study area except around the commercial locations was found to be satisfactory in the residential & industrial areas.

Water Quality - Surface water samples were collected once during the study period at eight (8) locations to assess the baseline water quality in the study area. The samples were compared with the CPCB's surface water classification and they conform to 'Class E' Water Quality Criteria. Some of the important parameters are summarized in the below table;

Parameter	Value
pH	7.3 – 7.8
Dissolved Oxygen mg/l	4.4 – 5.4
Biochemical Oxygen Demand mg/l	5.4– 8.6
Total Coliform No./100ml	25-67
E- Coli No./100 ml	4-9

Ground water samples were collected from eighteen (20) locations to assess the existing groundwater quality of the study area during the study period. The physico-chemical characteristics of Ground water are confirming to permissible limits of drinking water standards, prescribed in IS: 10500 (2012) (Test Characteristics for Drinking Water) and suitable for consumption. Some of the important parameters are summarized in the below table;

Parameter	Value
pH	7.32 – 8.15
Turbidity NTU	<0.1
Total Dissolved Solids mg/l	443 – 596
Total Hardness as CaCO ₃ mg/l	221– 395
Alkalinity	254 – 311
Fluoride as F mg/l	0.43 – 0.76
Nitrate as NO ₃ mg/l	1.01 – 1.48

Biotic Environment

Project Site and surrounding- Flora & Fauna

The area in and around proposed alignment prevailed varied terrain features such as hillocks, mounds, scrub lands, vegetated areas, depressions, plantations & agricultural fields. The observed in vegetation in study area was by virtue of natural vegetation & plantations in some locations.

Flora: 83 plant species were recorded, including 5 herb species, 6 grass species, 7 climber species, 14 shrub species, and 51 tree species.

Fauna: 24 bird species, 4 reptile species, 2 mammal species were recorded in and around the immediate vicinity of the proposed alignment.



Species of concern category –. None of Rare and Endangered species found in and around proposed ROW. Overall, species recorded are typical and common for the region. All the species recorded in and around the project site are very common in the Vidharbha region

Study area Flora & Fauna

Flora: 157 plant species, which comprised of 23 herb species, 18 climber species, 30 shrub species, 10 grass species & 76 tree species.

Fauna: 54 bird species, 10 mammal species, 12 reptilian species were recorded from study area.

Species of concern category – 1 Near Threatened bird species viz. (*Mycteria leucocephala*- Painted stork) which are a resident species, 1 reptilian species viz. *Varanus bengalensis* (Indian monitor lizards), 1 Vulnerable species of reptiles viz. *Python molurus* (Python), 1 Endangered species of mammals viz. *Rusa unicolor* (Sambar) were recorded in study area from primary study and from interaction with locals. However, no mammal sighted in RoW of proposed alignment & nearby surrounding areas

Socio-Economic Environment

The socio economics of study area was studied through primary and secondary survey. The socio-economic aspects of the study area is summarised in the table given below;

Parameters	Study area (10 km)
Total No. of Villages	92
Total no. of Households	29,263
Total Population	1,23,222
Sex ratio	954
SC/ST population	12.28% (SC) & 15.63% (ST)
Literacy Rate	72.28

Source: Primary Census Abstract & DCHB 2011, Wardha & Yavatmal District, State Maharashtra

In the study area, education is available from Anganwadi Centers, Preprimary School to Senior Secondary School but for further education, people have to travel about 2-15 km. highest educational level in the study area is up to 12th class. The scope for higher and technical education is existing only at the district place and only few people are able to take benefits of these educational institutions. The scope for higher and technical education is existing only at the district place and only few people are able to take benefits of these educational institutions..

5.0 Anticipated Environment Impacts and Mitigation Measures

Construction Phase: The proposed project is a green field project. The construction involves minimum ground clearing, as the profile of the proposed alignment will match the natural topography to the extent feasible. The construction phase of the proposed project will be of shorter duration for about 18- 30 months only.



The potential impacts will be localised, very limited and insignificant due to the construction activity like fugitive dust, noise during excavation, civil works, operation of construction equipment's, storage & handling of construction material, surface water runoffs, etc.

These impacts shall be minimised by providing appropriate storage for construction material, provision of acoustic barriers and enclosures for high noise generating equipment, fugitive dust control by water sprinkling on road used by vehicles, construction activities shall be avoided during night time, surface runoff shall be checked for contaminations such as oil & grease by routing the surface runoffs in small bunds around the construction areas, all hazardous & non-hazardous material shall be handled as per statutory requirements.

Further except for the identified trees to be felled in 100 m ROW, the proposed project activities does not alter the surrounding the surrounding biotic environment in whatsoever manner. If pilling activity is to be done in riverbed, this may lead to rise in suspended solids which may render the bottom waters turbid. However such effect will be temporal & original contours will be restored after cease of construction activity at river bed.

Therefore, the impacts during construction phase is to be short term, reversible, localised and are not expected to contribute significantly.

Operational Phase: The potential environmental impacts due to the proposed project have been assessed in detail. These include impact on air quality, noise, water quality, solid waste, ecology and socio economics, etc. The modelling and analysis of the data indicate that the predicted impacts are minimal and are within the prescribed norms and standards. Comprehensive mitigation measures have been incorporated in the environment management plan to ensure that the environmental quality is protected and enhanced. These have been summarised in below table.

Air Environment:

The following probable sources are identified in operation phase:

- Vehicular emissions from vehicles plying on the constructed road

The prediction of the Ground Level Concentrations (GLC's) due to emissions of pollutants such as PM, SO₂, NO_x and CO from the operation phase has been computed by A CALINEpro. CALINE3 based CO model with queuing and hot spot calculations and with a traffic model to calculate delays and queues that occur at signalized intersections.

The resultant modelled (incremental) concentrations for all the pollutants (PM, SO₂, NO_x and CO) have been found to remain within the corresponding National Ambient and Air Quality Standards (NAAQS). Mitigation measures will be in place to minimize potential adverse impacts of air emissions on health of receptors. In view of this, the atmospheric emissions during the operation phase are anticipated to be localised and the impact significance is assessed as negligible.

*Mitigation Measures*

- BS-IV or higher version accommodating engines shall be adopted in future, however modelling is been performed considering emission factors for BS-II version vehicles.
- Roads shall be maintained regularly to avoid dust emissions
- Tree plantation shall be done to avoid dispersion of particles
- Native trees with higher APTI (Air Pollution Tolerance Index) value shall be planted

Noise Environment

Noise generating sources are due to the following activities:

- During operation phase/ after completion of road construction work, the major source of noise will be due to Vehicular movement by vehicles using the road.

The prediction of ambient noise from the proposed project was carried out using software tool “dhwani PRO”. The anticipated noise generation by vehicles plying on the road will be 45 dB (A).

The distance wise drop down in anticipated cumulative noise from road in operational phase will be as given in following table.

Sr. No.	Distance in meters from alignment boundary	Noise in dB(A)
1	100	51.04
2	200	48.61
3	300	45.14
4	400	42.21
5	500	38.17

Thus, these noise levels will remain well within acceptable limits and will not have any impact outside the boundary from the proposed project.

Mitigation Measures

- Tree plantation is to be proposed along the alignment to minimize the intensity of dissipating noise
- Noise barrier shall be provided on bridges and links close to human habitation

Water Environment

The road operations do not require any significant water quantity, apart from time to time requirement during works such as maintenance of road. However, as needed water will be sourced from water tankers or from Dham River, Yashoda River, Wardha River, Adan River, Arunavati River and Penganga River with necessary consents from the jurisdictional authorities. Adequate precautions will be taken and proper withdrawal management plan shall be thoroughly followed.



Land Environment

Land pollution may take place during the operation phase due to accidental spillage hazardous materials in case are transported/conveyed using the proposed road.

Mitigation Measures

- Such scenarios will be tackled by District Disaster Management in place & use.
- Littering of solid wastes on proposed road shall be strictly prohibited.

Biotic Environment

Emissions & Noise – Vehicular emissions & noise generated from vehicles plying on the proposed road, however such emissions will be non-point & non continuous & the concentration of such emissions escaping the proposed road corridor will be extremely minimal and noise generation will be event specific viz. only during passing/ travel course of vehicles at any given point of time. Hence adverse/negative impacts on surrounding biotic environment during road operational phase are not envisaged.

6.0 Analysis of Alternatives

The proposed alignment was thoroughly studied based on engineering, socio-economic, environmental, cost, and safety aspects. The weightage of parameters within each aspect was tabulated, and based on the ranking, the said alignment was finalized. Details of alternative alignment locations have been discussed in details within the EIA Report and the finalised alignment has been discussed and analysed within this EIA Report.

7.0 Environmental Monitoring Programme

The Environmental Monitoring Programs are also suggested to provide information on which management decisions may be taken during construction and operational phase. The objective of this program is to evaluate the efficiency of mitigation and enhancement measures, updating the actions & impacts of baseline data and adaptation of additional mitigation measures.

The environmental monitoring cost is estimated based on the length and existing environmental scenario of the proposed project. Environmental monitoring cost of, 6,24,75,000/- during Construction Phase and 1,48,92,000 /-for 10 years during Operation Phase has been allocated.

The sampling, analysis and frequency of environmental attributes including monitoring locations will be as per the guidelines provided by MoEF&CC/CPCB/MPCB. The monitoring shall be carried out by third party laboratories that are accredited by NABL or recognized by MoEF&CC.

8.0 Environmental Management Plan

The proposed project will be certified for the internationally accepted Environmental Management System based on ISO-14001, Quality Management and Occupational Health &



Safety Management Systems. An environmental monitoring program shall be put in place, periodic review & audits shall be carried out for effective environmental management. The execution team shall have an Environmental Management Cell which shall ensure overall effective implementation of the management plan.

In general, systems shall be in place to ensure compliance with respect to environmental statutory requirements and Environment Policy are strongly adhered to all time.

9.0 Project Benefits

The proposed expressway will provide better, fast, safe and smooth connectivity for the commuters Vidharbh, Marathvada, Pune and Konkan region. Smooth and fast-moving traffic will cause only lower emissions thereby reducing pollution levels. Development of the proposed project road will improve the local agriculture and enable farmers to realize better value for their products as well as attract more investment to that region, thus boost economy of the area, state and nation as a whole. The vehicle operating and maintenance cost is expected to go down substantially. The proposed road alignment will also include general amenities like rest areas, etc. as feasible at built-up locations, pedestrian and cattle underpasses, animal underpasses, landscaping and tree plantation, traffic aid post, emergency telecom system, emergency medical aid post, street light at built ups etc. and thus overall facilities to the road users shall improve. People will have increased access to better social and health infrastructure and other services located outside the project area. This will in turn lead to overall improvement of the quality of life of the people residing in the project zone in terms of their economic, social and health status. Growth of local tourism and resultant boost to local economy is also expected due to proposed project.

10.0 Project Schedule and Cost

The proposed project is scheduled to be commissioned within 18-30 months after Environment Clearance (EC) and other statutory approvals are granted. The estimated cost of the proposed project is Rs. 18420.07 Crores. For protection of environment, it is proposed to spend 322 Crores as capital cost of EMP budget.

11.0 Conclusion

This impact assessment study indicates that the overall impact from the proposed project activities will be short term, reversible, localised and are not expected to contribute significantly to the surrounding environment. In addition, with the implementation of the pollution control and the environment management measures, these anticipated impacts due to construction and operation of the proposed project will be mitigated to reduce it further.

The project proponent will also ensure that the environmental performances of all the activities are monitored throughout execution of the project during both construction and operation phase. The project proponent will report environmental performance and monitoring reports regularly to statutory authorities.



The Project Proponent shall develop systems and procedures for effective environmental management. The effective management system coupled with monitoring of environmental components and efforts for continual improvements will result in exemplary environmental performance.

Based on the EIA study and surveys conducted for the Project, it can be safely concluded that associated potential adverse environmental impacts can be mitigated to an acceptable level by adequate implementation of the measures as stated in the EIA Report. Adequate provisions has been made in the Project to cover the environmental mitigation and monitoring requirements, and their associated costs as suggested in environmental budget. The proposed project shall improve Road efficiency and bring economic growth. In terms of air and noise quality, the project shall bring considerable improvement to possible exposure levels to population.