EXECUTIVE SUMMARY

Proposed Expressway Connector to Hindu Hrudaysamarat Balasaheb Thackeray Maharashtra Samruddhi Mahamarg from Jalna to Nanded - 179.772 km,

Districts - Jalna, Nanded and Parbhani, Maharashtra

Project Proponent:

MSRDC

Maharashtra State Road Development Corporation Limited.

Report Prepared by:

DPR Consultant:

MONARCH

M/s. Monarch Surveyors and Engineering Consultant Pvt. Ltd. Pune.
Reg. Add. 3/67 Rujeta Apartment, Shivprasad Society, Sinhgad Road, Panmala Pune-411030,
Email: monarchsurveyors@gmail.com, Tel: 91-020-24327228/21, Fax : 91-020-24330246

Environmental Consultant:

ENVIRO RESOURCES

M/s. ENVIRO RESOURCES
(NABET Certificate No: NABET/EIA/1821/IA0038)
Reg. Add. 1904 Roopnagar CHS, S V Road, Kandivali West, Mumbai 400067
E-mail: info@enviroresources.in, Telephone: +91 9867898844.

Environmental Laboratory:

NOIDA TESTING LABORATORIES
Reg. Add. GT-20, Sector-117,
Noida Gautam Budh Nagar, Uttar Pradesh, India 201 301

Baseline Period: December, 2021 to February, 2022

EXECUTIVE SUMMARY

1.0 Introduction

Maharashtra State Road Development Corporation Limited (MSRDC) - Project Proponent has been entrusted with the assignment of development of Expressway connector to Hindu Hrudaysamarat Balasaheb Thackeray Maharashtra Samruddhi Mahamarg from Jalna to Nanded through the successful implementation of Hindu Hrudaysamarat Balasaheb Thackeray Maharashtra Samruddhi Mahamarg for East-west connectivity with fast track becomes possible for Maharashtra state. Jalna - Nanded link is most important economic corridor link, which intersects Samruddhi corridor at almost broad mid-point of Hindu Hrudaysamarat Balasaheb Thackeray Maharashtra Samruddhi Mahamarg at jalna.

The project corridor is part of Economic Corridor (EC-23) connecting Hyderabad in the State of Telangana and Jalna in the state of Maharashtra. The project road starts on Samrudhi Mahamarge near Jalna at CH 352+500 of Hindu Hrudaysamarat Balasaheb Thackeray Maharashtra Samruddhi Mahamarg @ Ch. 0+000 to Nanded on Nanded Degloor NH-161 @ Ch. 179+772.
Nanded situated on the bank of the Godavari River, holds religious significance for Sikhs and is like Dakshin (South) Kashi.Nanded is the second most important city in Marathwada after Aurangabad as it connects to nearby states of Telangana and Karntaka and vehicles travel from there in large numbers.
As per Environment Impact Assessment (EIA) Notification dated 14th September, 2006, and its amendments till date, the proposed project falls under 'Category B1' with activity number 7(f).

Accordingly, the application for obtaining Terms of References (ToR) for carrying out EIA studies for Proposed Expressway connector to Hindu Hrudaysamarat Balasaheb Thackeray Maharashtra Samruddhi Mahamarg was submitted on PARIVESH (MoEF&CC) portal. The project was recommended in the 214th meeting of State Expert Appraisal Committee - 1 (SEAC-1) held on 11th January 2022 and then by SEIAA during its 238th meeting dated 21st February 2022. As per the recommendation, PP was accorded ToR to the project vide File No. SIA/MH/IND/70426/2021 (copy of TOR enclosed as ***Annexure 1***). As per Govt of Maharashtra, Environmental Department, GR dated 14/5/2018. As estimated project cost is Rs.17,565.40/- cr. , the project proponent is required to pay project scrutiny charges of Rs. 20 lakhs for investment cost more than Rs. 1000 Crores, Accordingly, MSRDC has made online payment in the Bank Account of SEIAA/SEAC SECRETARIAT vide MSRDC Ltd letter no. . MSRDC/JNE/Env/2022 dated 20.04.2022.

2.0 Project Location

The alignment of the proposed Samruddhi Connector – "Greenfield Expressway" from Jalna to Nanded starts at Jalna on Hindu Hrudaysamarat Balasaheb Thackeray Maharashtra Samruddhi Mahamarg at CH 352+500, traverses Southwest through Jalna District, Parbhani District and Nanded District and end on Nanded – Degloor- Telangana National Highway No 161 at CH 32+000. The overall length of the project corridor is 179.772 Km. The Google Earth Imagery 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.**

Table 1: Details of Length and Area in Each Village

SN	District	Taluka	Village	Land Area (Ha.)	Design Chainage		Length (km)
					From	To	
1	Jalna	Jalna	Panshendra	24.82	0.000	2.500	2.500
2			Devmurti	35.64	2.500	6.150	3.650
3			Gavli Pokhri	3.92	6.150	6.550	0.400
4			Ramamurti	26.43	6.550	9.220	2.670
5			Sindhi Kalegaon	39.1	9.220	13.220	4.000
6			Savargaon Hadap	15.77	13.220	14.800	1.580
7			Ramnagar	32.88	14.800	18.100	3.300
8			Maujpuri	25.83	18.300	20.900	2.600
			Dhandegaon	26.69	20.900	23.580	2.680
9			Khondepuri	17.62	23.580	25.310	1.730
10			Nasadgaon	23.56	25.310	27.680	2.370
11			Hivardi	19.65	27.680	29.750	2.070
12			Ghodegaon	1.07	27.910	28.020	0.110
13			Haste Pimpalgaon	23.2	29.750	32.100	2.350
14			Shevga	25.82	32.100	34.700	2.600
15			Sarwadi (Ner)	13.27	34.700	36.000	1.300
16		Partur	Waghadi	8.86	38.880	40.010	1.130
17			Edlapur	32.13	40.010	43.250	3.240
18			Watur	26.59	43.250	45.930	2.680
19			Pimparkhed Tarf Garad	22.08	45.930	48.200	2.270
20		Mantha	Wai	28.67	36.000	38.880	2.880
21			Kendhali	52.16	48.200	53.400	5.200
22			Aawalgaon	14.2	53.400	54.800	1.400
23			Devthan	11.29	54.800	55.940	1.140
24			Gevrai	24.64	55.940	58.380	2.440
25			Arda Khari	17.46	58.380	60.180	1.800
26			Helaswadi	21.77	60.180	62.450	2.270
27			Limbewadgaon	12.98	62.450	62.580	0.130

SN	District	Taluka	Village	Land Area (Ha.)	Design Chainage		Length (km)
					From	To	
28			Patoda Kh.	25.93	62.580	63.050	0.470
29	Parbhani	Selu	Jawala Jivaji	25.52	66.380	69.380	3.000
30			Chikalthana Bk.	30.86	69.380	71.650	2.270
31			Chikalthana Kh.	18.55	71.650	73.510	1.860
32			Raipur	36.18	73.510	77.100	3.590
33			Hatnoor	5.3	77.100	77.620	0.520
34			Walur	72.19	77.620	84.850	7.230
35			Gulkhand	28.59	84.850	87.710	2.860
36			Tandulwadi	21.18	87.710	89.900	2.190
37			Hatta	20.85	89.900	91.980	2.080
38		Jintur	Marwadi	29.47	91.980	94.930	2.950
39			Kausadi	5.44	94.930	95.650	0.720
40			Pimpalgaon Gaykyache	7.08	95.650	96.200	0.550
41			Kumbhari	26.92	96.200	98.900	2.700
42		Parbhani	Kumbhari	13.6	98.900	100.270	98.900
43			Digras	16	100.270	101.900	100.270
44			Aarvi	12.58	101.900	103.150	101.900
45			Takli Kumbhkarna	63.13	103.150	109.490	103.150
46			Sanpuri	16.27	109.490	111.150	109.490
47			Kardgaon	23.99	111.150	113.500	111.150
48			Dharangaon	4.15	113.500	113.950	113.500
49			Satla	14.06	113.950	115.350	113.950
50			Samsapur	13.99	115.350	116.750	115.350
51			Dhar	12.98	116.750	118.050	116.750
52			Durdi	3.75	118.050	118.420	118.050
53			Muramba	17.21	118.420	120.150	118.420
54			Saba	18.72	120.150	122.010	120.150
55			Nandgaon Bk	16.24	122.010	123.650	122.010
56			Pandhari Alapur	8.83	123.650	124.520	123.650
57			Rahati	17.37	124.520	126.640	124.520
58			Nandgaon Kh	11.31	126.640	127.750	126.640
59		Purna	Katneshwar	30.23	127.750	130.800	3.050
60			Sadlapur	3.62	130.800	131.150	0.350
61			Pimpalgaon Balapur	23.85	131.150	133.550	2.400
62			Laxmannagar	17.12	133.550	135.250	1.700
63			Kaudgaon	13.55	135.250	136.550	1.300
64			Mategaon	22.23	136.550	138.850	2.300
65			Purna	32.68	138.850	142.100	3.250
66			Aadgaon (Lasina)	25.37	142.100	144.650	2.550
67			Gaur	47.25	144.650	149.420	4.770

SN	District	Taluka	Village	Land Area (Ha.)	Design Chainage		Length (km)
					From	To	
68			Narhapur	9.27	149.420	150.350	0.930
69			Pimpalgaon Likha	17.83	150.350	152.080	1.730
70			Sonna (Trfe Kavalgaon)	0.57	152.080	152.150	0.070
71			Changephal	28.33	152.150	155.050	2.900
72			Aalegaon	7.08	155.050	155.700	0.650
73			Kaulgaon	2.74	155.700	156.010	0.310
74			Aalegaon	11.61	156.010	157.200	1.190
75			Pimparan	27.01	157.200	159.900	2.700
76	Nanded	Nanded	Jaitapur	2.89	159.900	160.210	0.310
77			Rahti Bk	8.32	160.210	160.800	0.590
78			Naleshwar	20.92	160.800	163.100	2.300
79			Pimplagaon Koraka	27.76	163.100	165.990	2.890
80			Borgaon Telang	5.74	165.990	166.550	0.560
81			Kalhal	3.75	166.550	167.350	0.800
82			Vishnupuri	33.63	167.350	170.650	3.300
83			Pangari	26.66	170.650	173.410	2.760
84			Gundegaon	9.19	173.410	174.480	1.070
85			Babhulgaon	27.62	174.480	177.300	2.820
86			Tuppa	15.25	177.300	178.810	1.510
87			Kakandi Trfe Tuppa	8.99	178.810	179.722	0.912
			Total :	**1777.4183**			**179.772**

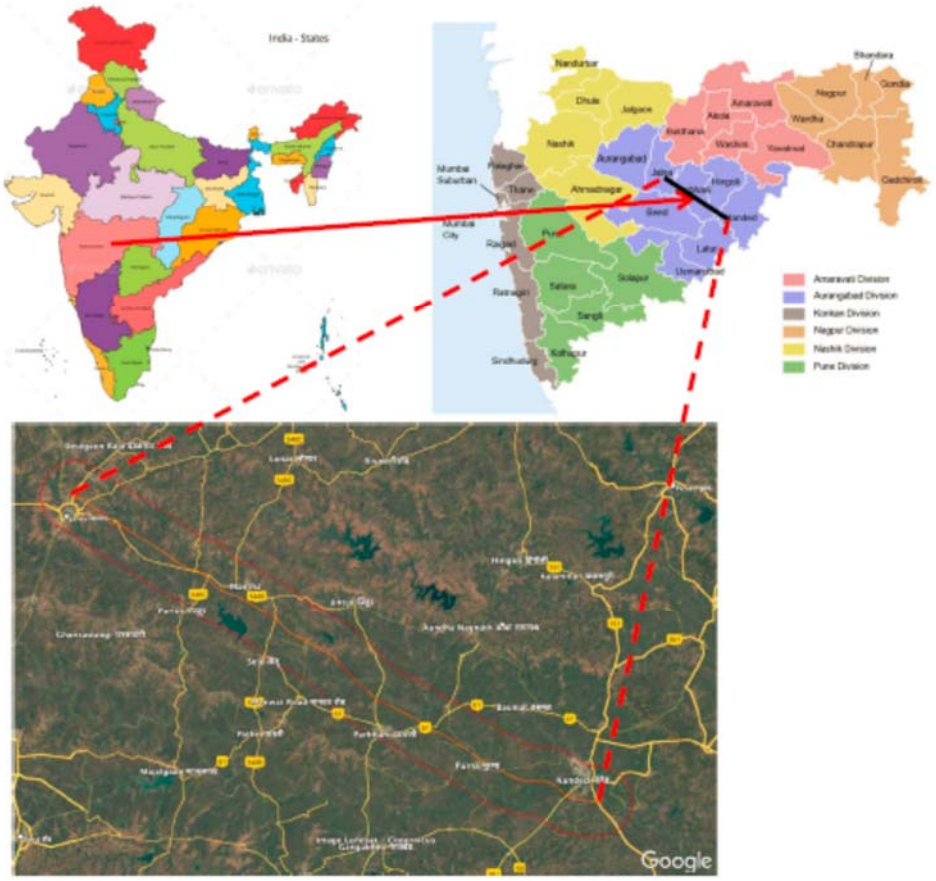


Figure 1: Location Map of the Project Site

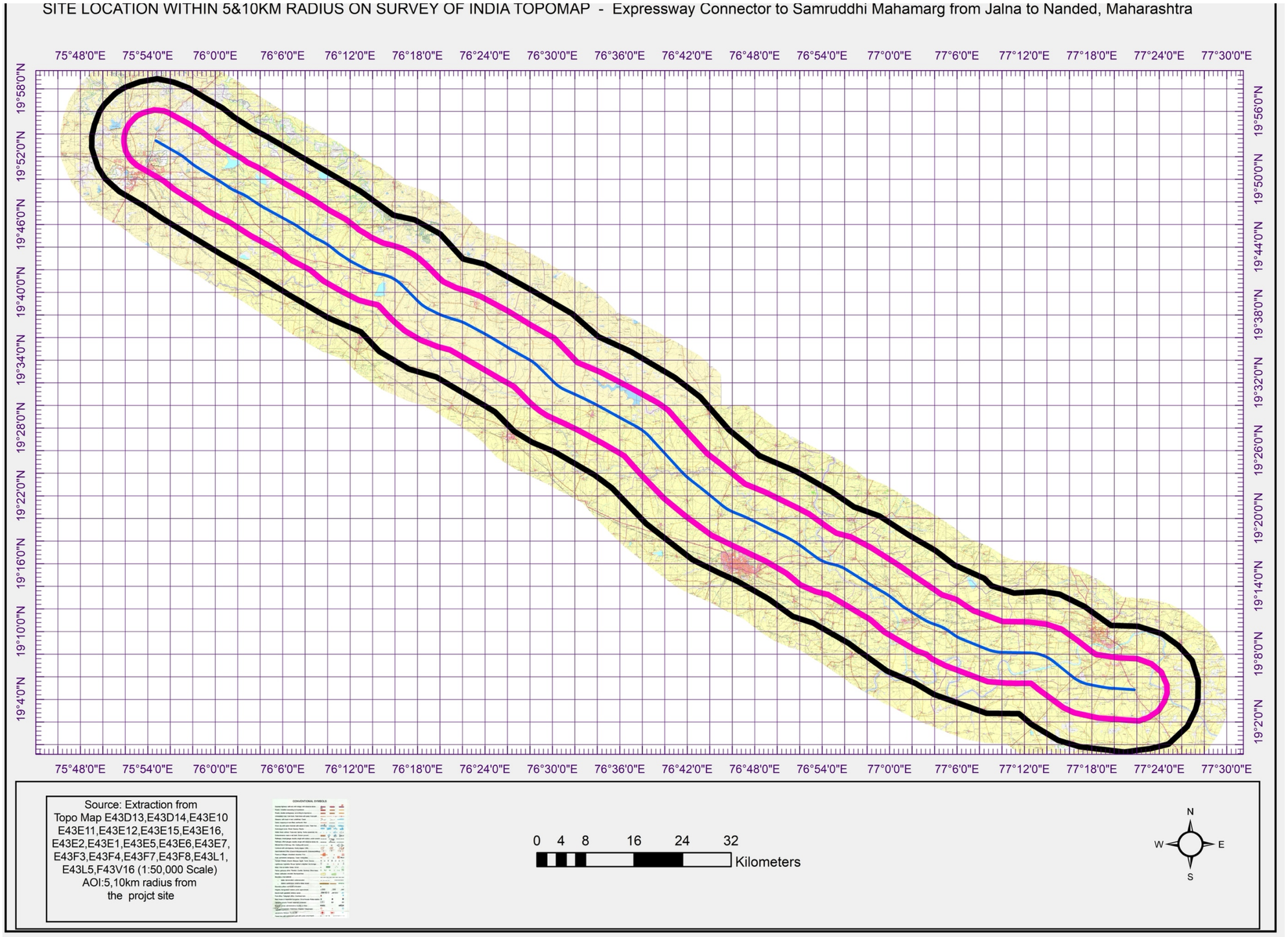


Figure 2: Toposheet Map of the Project Site & Study Area

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 proposed	179.772 km
2	State	Maharashtra
3	District	Jalna, Nanded and Parbhani
4	Village	The proposed alignment will pass through 87 number of villages
5	Terrain	Mostly plain and rolling at some places
6	Seismic Zone	III 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 land use.
8	RoW	100 m except at interchanges and Way side Aminities
9	Total Area of Land Acquisition	Total Land Acquisition: 1777.4 ha Government Land: 60.1 ha Private Land: 1717.3 ha
10	Main Carriageway (Proposed)	3+3 Lane Divided Carriageway
11	Interchange	8 locations
12	Major Bridge	22 Nos.
13	Minor Bridge	38 Nos.
14	Flyover	34 Nos.
15	Underpass Box/VUP/SVUP/VOP	VUP - 35 Nos. LVUPs -136 Nos. VOPs - 14 Nos.
16	Road Over Bridges (ROB's)	2 Nos.
17	Tunnel	Not any
18	Culvert	35 Nos.of balancing culvert and 78 Nos. of box culvert
19	Rainwater Harvesting System	Rain water 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.
20	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 on the basis of Travel Distance. at the Entry point 2 lanes of 3.50m and 2 lanes of 4.50m for OSV are proposed at the Exit point 2 lanes of 3.50m and 2 lanes of 4.50m for OSV are proposed
21	Construction Period	36 months
22	Employment	Approx. 1800 nos during construction and approx. 80 nos during operation phase (for Toll Plazas).
23	Total Civil Cost	Rs. 13,456.46 Cr
24	Total Capital Cost	Rs. 17,565.40 Cr

	(including LA and Utility Shifting, etc.)	
25	R&R Plan	Refer SIA-RAP Report of Annexure 8

Project Schedule & Cost : The proposed project is scheduled to be completed within 24 months after Environment Clearance (EC) and other statutory approvals are granted. The estimated cost of the project is Rs. 17,565.40 Crores. The budget for Environment Protection in the proposed project is ~ INR 10.6 Crores.

Resource Requirements

Land : The proposed project will be executed on total land area of ~1777.4 Ha and is being acquired by MSRDC, Government of Maharashtra.

Water : The domestic water requirement will be approximately 81 m^3/day (i.e. 45 lpd for 1800 labours). Additional water of ~1200 m^3/day will be required for dust suppression & construction activities. The water will be sourced from nearby surface water sources 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 1800 for the proposed project.

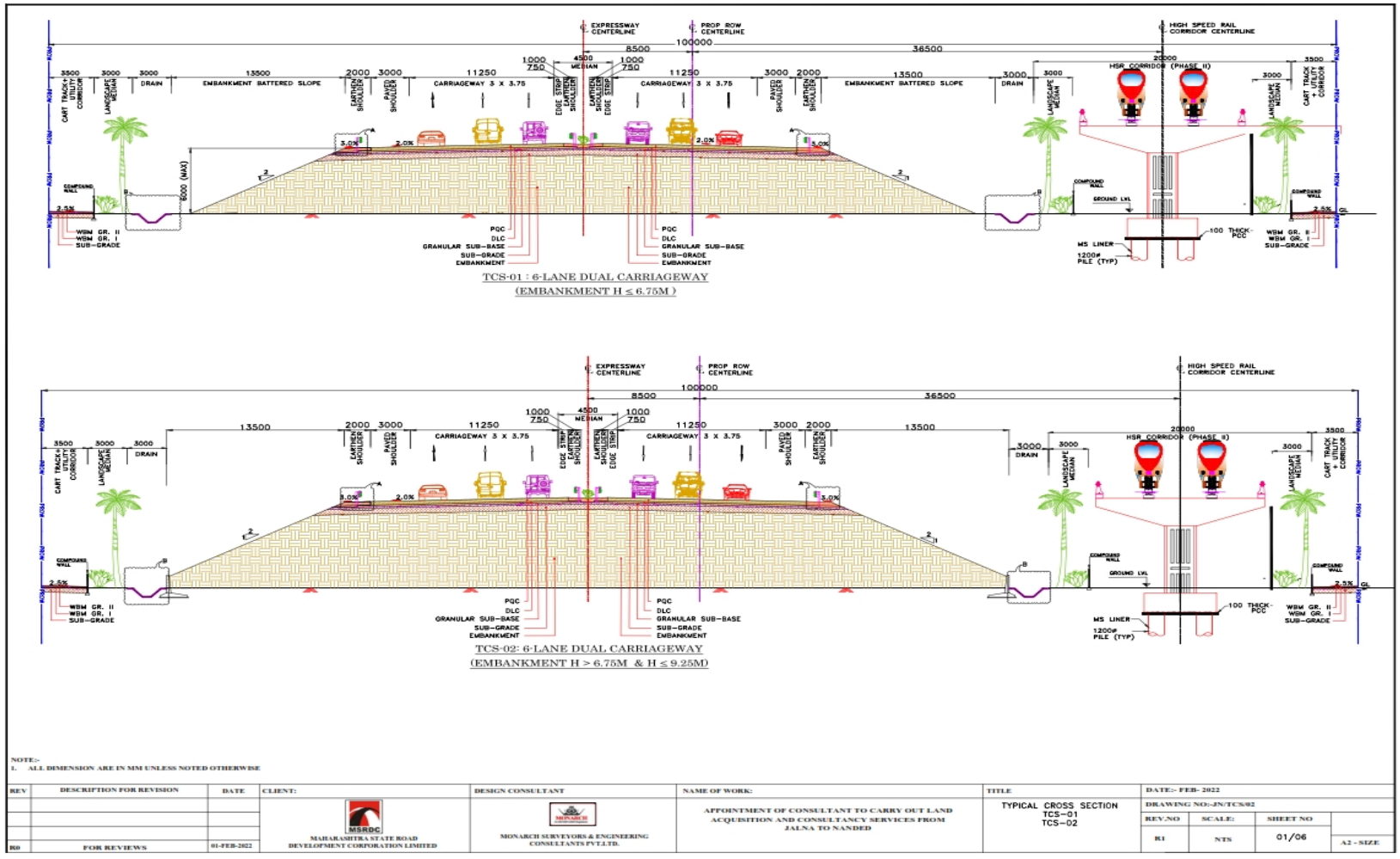


Figure 3A: (Typ.) Cross Section of Proposed Alignment

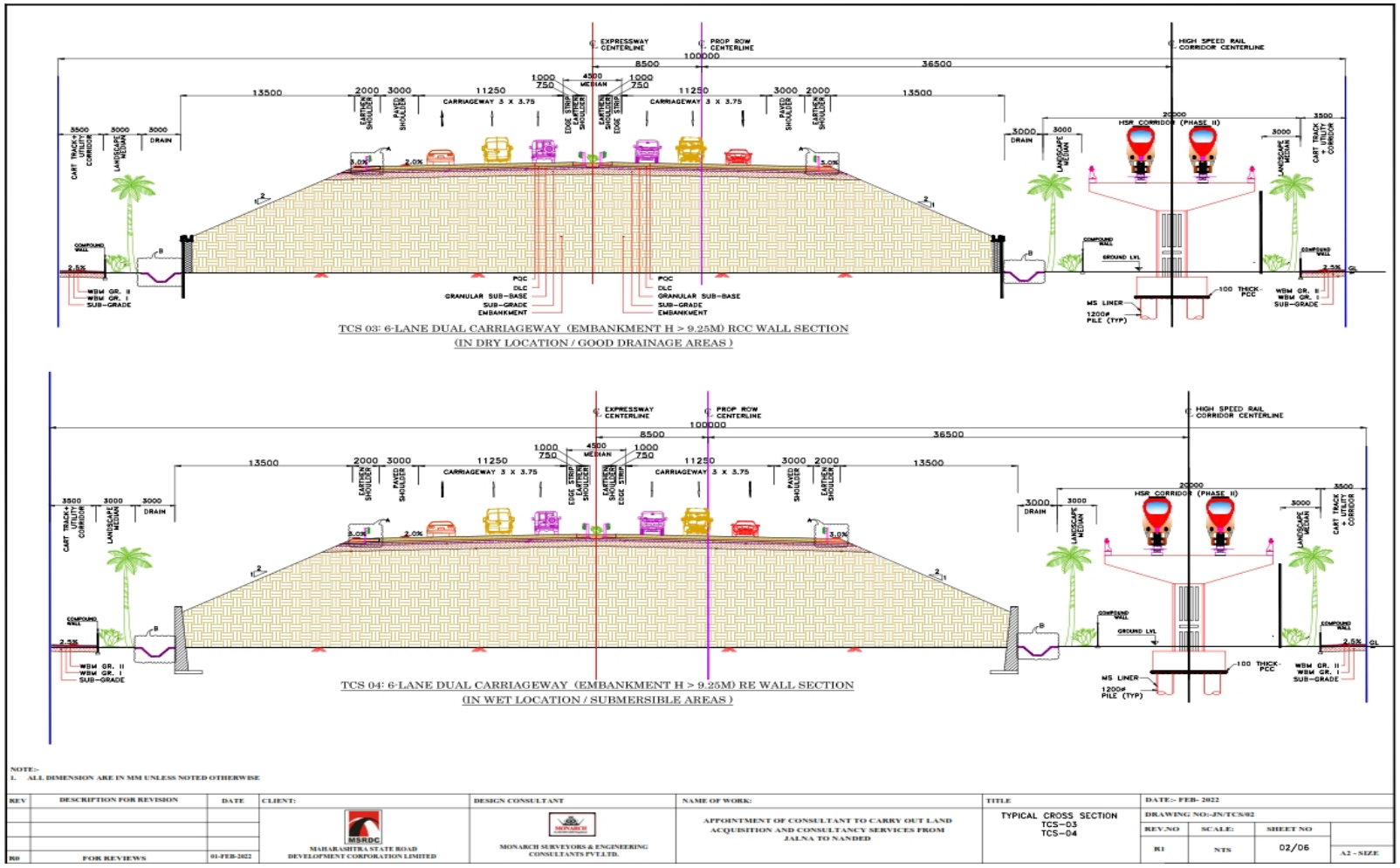


Figure 3B: (Typ.) Cross Section of Proposed Alignment

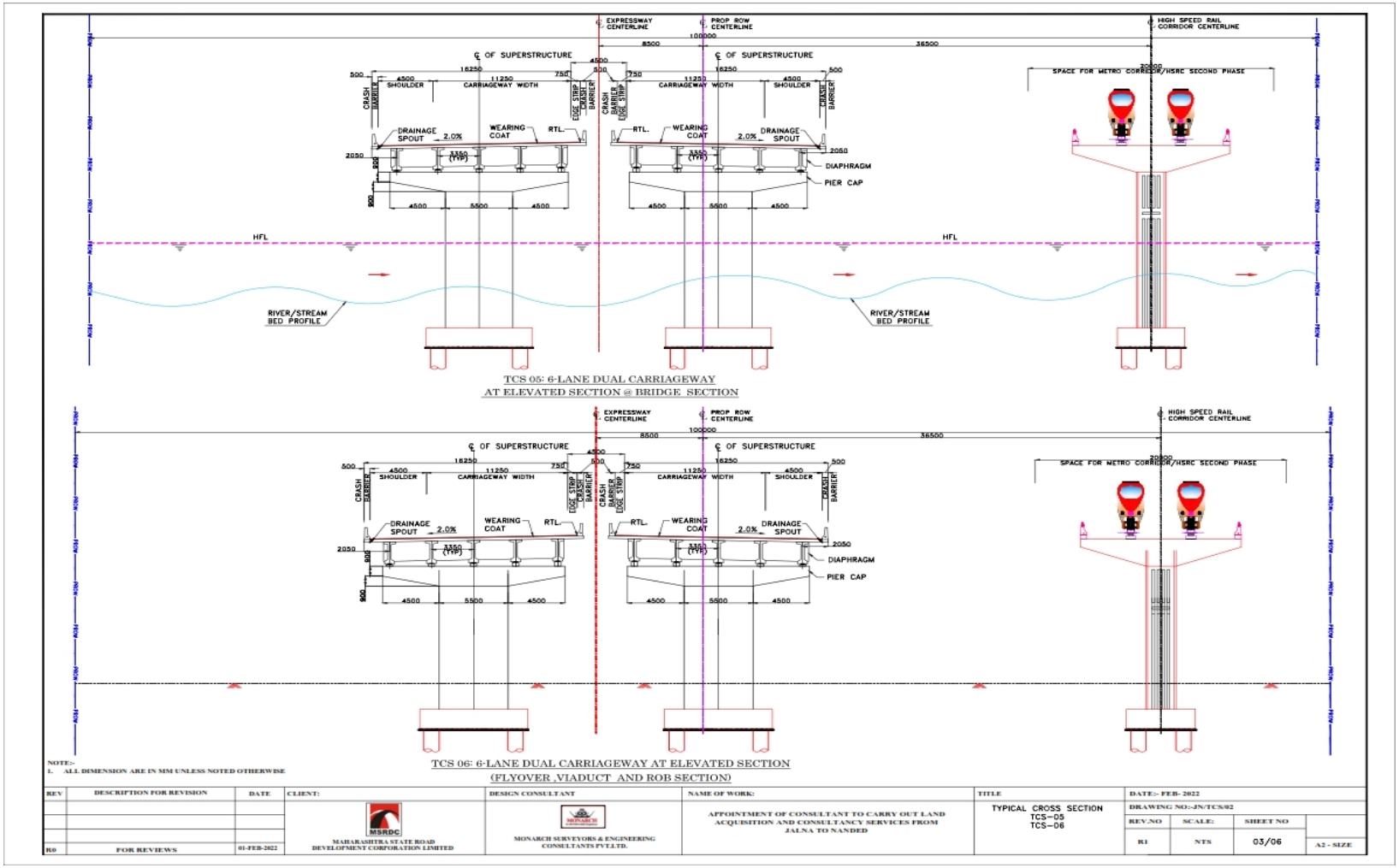


Figure 3C: (Typ.) Cross Section of Proposed Alignment

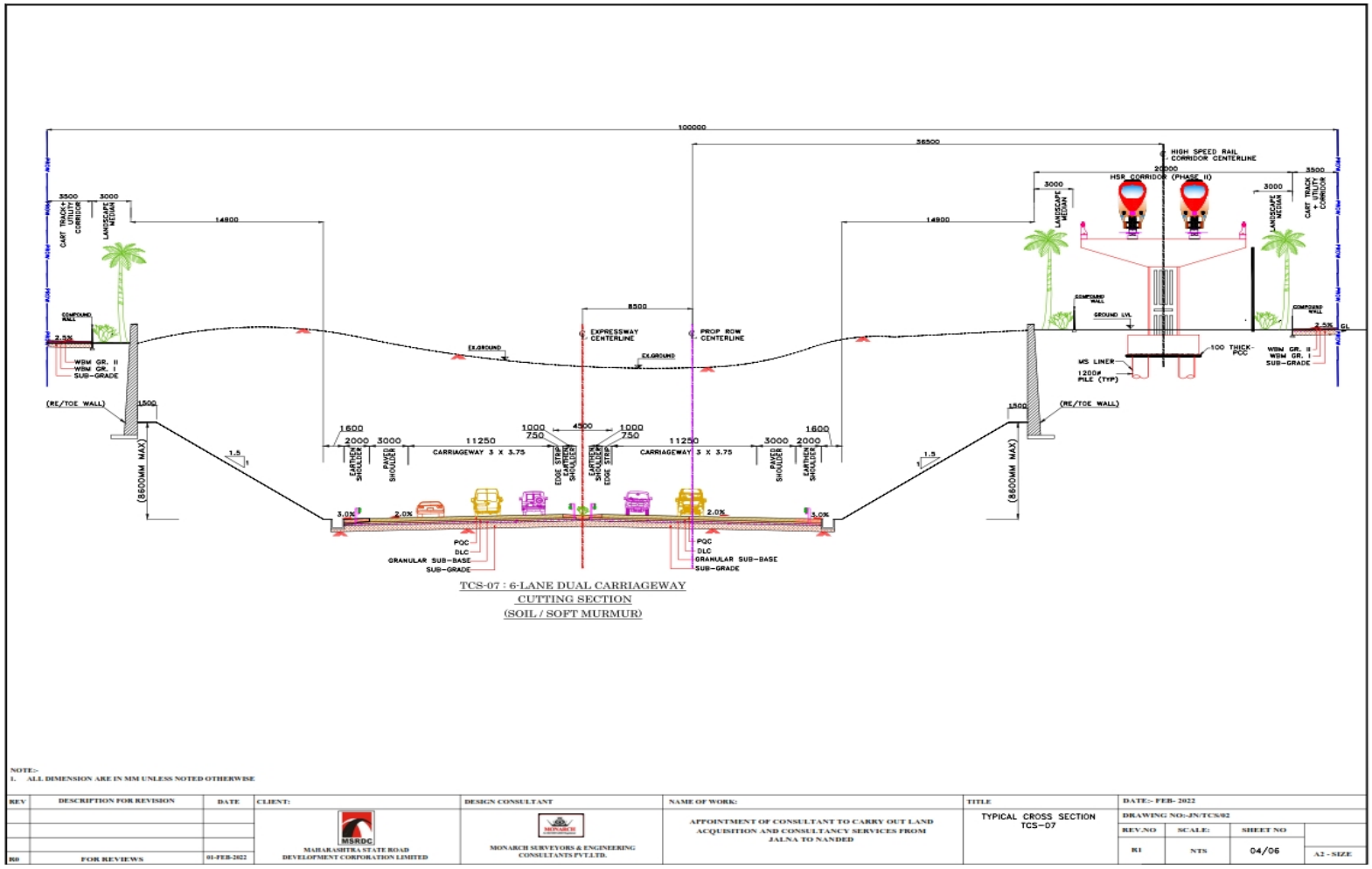
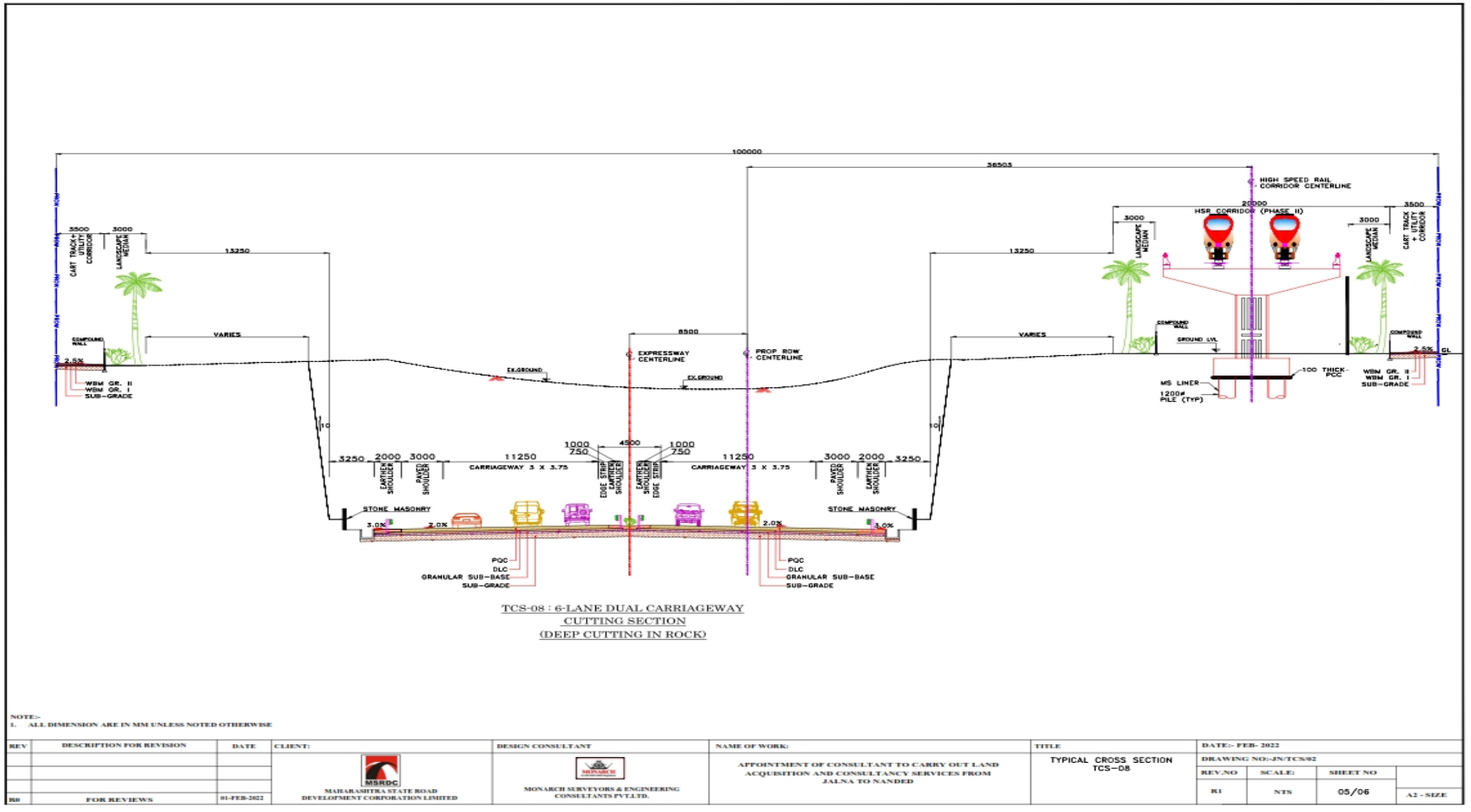


Figure 3D: (Typ.) Cross Section of Proposed Alignment



TCS-08 : 6-LANE DUAL CARRIAGEWAY
CUTTING SECTION
(DEEP CUTTING IN ROCK)

NOTE:-
1. ALL DIMENSION ARE IN MM UNLESS NOTED OTHERWISE

REV	DESCRIPTION FOR REVISION	DATE	CLIENT:	DESIGN CONSULTANT	NAME OF WORK:	TITLE	DATE:- FEB- 2022
			MSRDC MAHARASHTRA STATE ROAD DEVELOPMENT CORPORATION LIMITED	MONARCH SURVEYORS & ENGINEERING CONSULTANTS PVT.LTD.	APPOINTMENT OF CONSULTANT TO CARRY OUT LAND ACQUISITION AND CONSULTANCY SERVICES FROM JALNA TO NANDED	TYPICAL CROSS SECTION TCS-08	DRAWING NO:-JN/TCS/02
R0	FOR REVIEWS	01-FEB-2022					REV.NO: R1 / SCALE: NTS / SHEET NO: 05/06 / A2 - SIZE

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

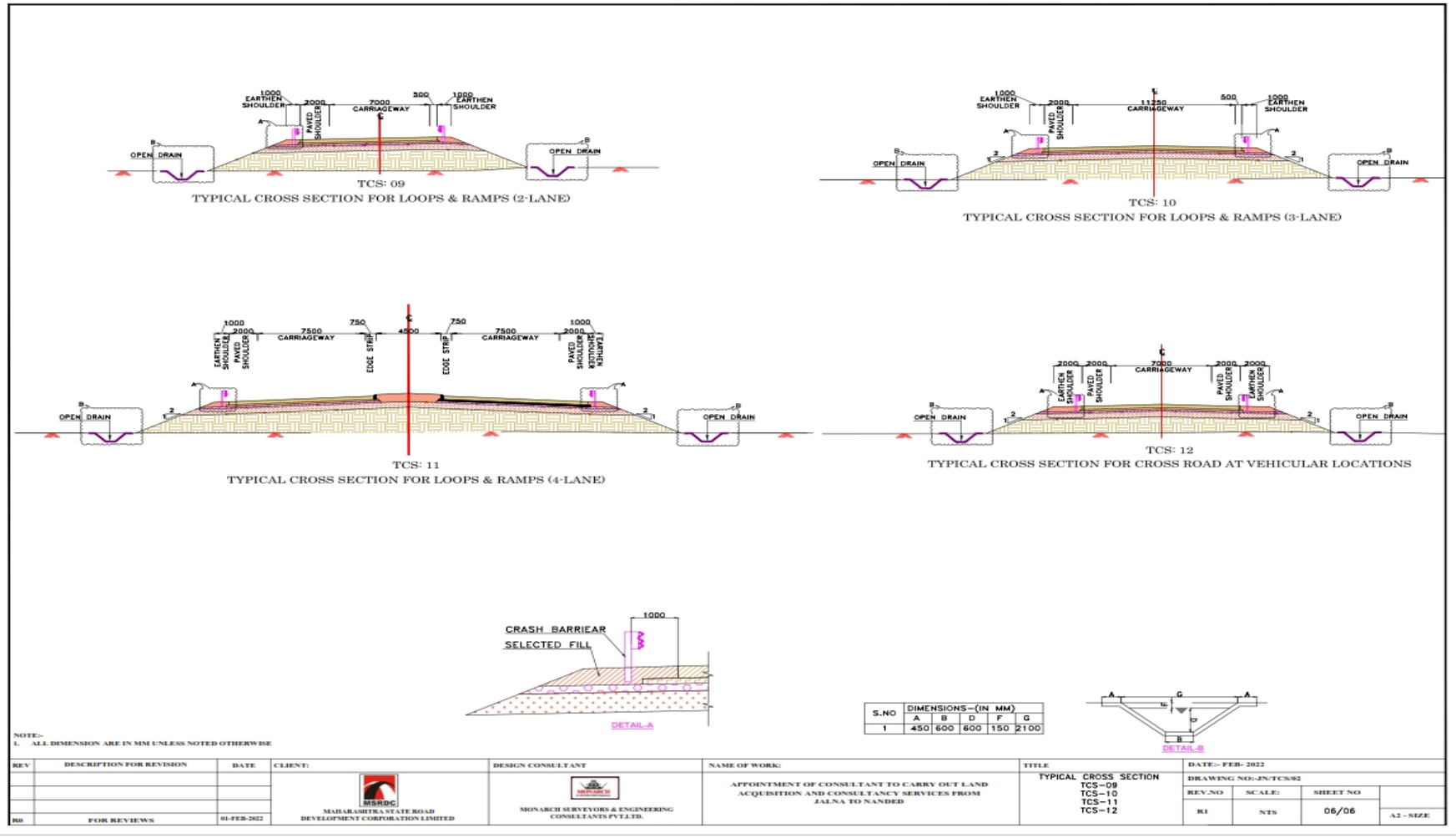


Figure 3F: (Typ.) Cross Section of Proposed Alignment

4.0 Description of the Environment

Primary baseline environmental monitoring studies in 10-km buffer study area were conducted through an NABL Accredited and MoEF&CC Recognized laboratory [Noida Testing Laboratories] during December, 2021 to February, 2022.

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

The land use and land cover of the study area analyzed based on multispectral satellite imagery reveals that Agriculture is the highest category of land use accounting as much as 91.17% of the total area followed by Built-Up 4.69 % and followed by Water Bodies of 2.96%.

Soil - The soil quality monitored at eleven locations within the study area. Some of the important soil parameters are summarised in the below table;

Parameter	Value
pH	7.22 – 8.29
Nitrogen kg/ha	487.8 – 837.3
Phosphorus kg/ha	181.5- 481.5
Potassium kg/ha	253 – 450
Organic Carbon %	1.3 – 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 monitored for PM_{10}, $PM_{2.5}$, NOx, SO_2, CO at twenty-one locations in the study area.

Parameter		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11
$PM_{2.5}$ ($\mu g/m^3$)	**Min**	24.4	28.1	29.7	27.4	25.9	30.1	25.4	26.1	31.7	26.1	26.7
	Max	34.2	39.9	41.5	38.8	36.5	42.1	35.6	36.8	44.5	36.8	38.7
	Average	27.82	32.3	33.87	31.5	29.66	34.3	29.0	30.1	36.2	30.0	30.9
	98 percentile	33.9	39.5	41.1	38.4	36.1	41.7	35.3	36.4	44.1	36.4	38.3
PM_{10} ($\mu g/m^3$)	**Min**	56.7	66.9	69.4	64.2	60.4	69.9	59	61	73.8	61	63.2
	Max	68.4	82.7	85.2	77.4	72.8	84.3	71.2	73.5	89.2	73.5	77.6
	Average	61.93	73.8	76.32	70.1	65.94	76.4	64.5	66.3	80.7	66.2	69.7
	98 percentile	68.3	81.9	84.4	77.3	72.7	84.2	71.1	73.4	89.1	73.4	77.5
SO_2 ($\mu g/m^3$)	**Min**	6.2	6.4	7.5	4.9	4.6	7.8	6.6	4.7	8.3	4.7	5.7
	Max	12.4	13.9	15	12.9	12.1	15.4	13	12.2	16.3	12.2	13.3
	Average	10.28	11.3	12.36	10.2	9.58	12.7	10.7	9.4	13.4	9.5	10.6
	98 percentile	12.4	13.9	15.0	12.8	12.0	15.4	13.0	12.1	16.2	12.1	13.3
NO_X ($\mu g/m^3$)	**Min**	18.3	20.9	22.9	20.7	19.5	22.6	19.1	19.7	23.9	19.7	19.2
	Max	24.3	28	30	27.3	25.8	29.8	25.1	26	31.5	26	26.4

Parameter		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11
	Average	20.23	23.1	25.14	22.9	21.52	24.9	21.1	21.7	26.4	21.7	21.5
	98 percentile	23.6	27.2	29.2	26.7	25.1	29.1	24.5	25.4	30.8	25.4	25.7
CO (mg/m^3)	**Min**	0.5	0.48	0.55	0.51	0.51	0.55	0.55	0.48	0.51	0.48	0.52
	Max	0.92	0.9	0.95	0.93	0.93	0.95	0.95	0.9	0.88	0.9	0.92
	Average	0.74	0.7	0.81	0.8	0.76	0.8	0.8	0.7	0.8	0.8	0.8
	98 percentile	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9

Parameter		A12	A13	A14	A15	A16	A17	A18	A19	A20	A21
$PM_{2.5}$ ($\mu g/m^3$)	**Min**	27.7	23.7	21.3	23.7	28.6	31.8	30.1	33.8	32.5	30.8
	Max	39.7	34.4	32	34.4	33	36.2	33.7	37.8	37.1	34.6
	Average	31.9	27.5	25.2	27.5	30.5	33.7	31.6	35.5	35.0	33.1
	98 percentile	39.3	34.0	31.6	34.0	33.0	36.2	33.7	37.6	37.0	34.6
PM_{10} ($\mu g/m^3$)	**Min**	66.2	57.3	53.6	57.3	65.8	73.9	70.6	73.2	72.5	71.5
	Max	80.6	69.8	66.1	69.8	76.2	84.3	79.3	77	75.3	74.2
	Average	72.7	62.9	59.0	62.9	69.7	77.8	73.8	75.1	73.8	73.1
	98 percentile	80.5	69.7	66.0	69.7	75.9	84.0	79.0	77.0	75.2	74.2
SO_2 ($\mu g/m^3$)	**Min**	6.7	3.6	2.5	3.6	6.7	7.8	7.7	14.2	15.5	15.3
	Max	14.3	11.1	10	11.1	14.3	15.4	14.1	20.4	20.5	19.6
	Average	11.6	8.6	7.4	8.6	11.5	12.6	11.8	17.4	17.9	17.2
	98 percentile	14.3	11.0	9.9	11.0	14.2	15.3	14.0	20.2	20.3	19.4
NO_X ($\mu g/m^3$)	**Min**	20.2	17.3	14.9	17.3	21.5	23.7	22.2	18.3	19.3	19.4
	Max	27.4	23.6	21.2	23.6	26	28.2	26.1	24.6	23.6	23.1
	Average	22.5	19.3	16.9	19.3	23.3	25.5	23.7	21.4	21.8	21.1
	98 percentile	26.7	23.0	20.6	23.0	25.8	28.0	25.9	24.4	23.6	23.1
CO (mg/m^3)	**Min**	0.5	0.43	0.38	0.43	0.72	0.77	0.82	0.69	0.65	0.67
	Max	0.9	0.85	0.8	0.85	0.86	0.91	0.96	0.82	0.78	0.8
	Average	0.8	0.7	0.7	0.7	0.8	0.9	0.9	0.8	0.7	0.8
	98 percentile	0.9	0.8	0.8	0.8	0.9	0.9	1.0	0.8	0.8	0.8

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.

Noise Quality - The noise quality monitored at twenty-one locations in the study area during the study period.

Category	Leq daytime	Leq night time	Daytime Standard	Night time Standard
Residential	68.2	36.3	55	45

The noise quality in the study area except around N2 location was found to be satisfactory in the residential areas.

Water Quality - Surface water samples collected once during the study period at eleven locations to assess the baseline water quality in the study area. The samples 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	6.84 – 7.58
Dissolved Oxygen mg/l	4.08 – 6.46
Biochemical Oxygen Demand mg/l	5.30– 8.90
Total Coliform No./100ml	Absent
E- Coli No./100 ml	Absent

Ground water samples collected from eleven 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 (Test Characteristics for Drinking Water) and suitable for consumption. Some of the important parameters are summarized in the below table;

Parameter	Value
pH	7.22 – 8.05
Turbidity NTU	<0.1
Total Dissolved Solids mg/l	446 – 596
Total Hardness as CaCO3 mg/l	221– 390
Alkalinity	253 – 316
Fluoride as F mg/l	0.43 – 0.77
Nitrate as NO_3 mg/l	1.01 – 1.54

Biotic Environment

Study Details

Stuides conducted in slected locations within the expanse of project activity area viz. 1777.4 Ha. of the RoW & 10 km surrounding buffer area of RoW, 23 locations in & around the proposed alignment within 10 km buffer area were selected based on the reconnaissance survey for maximum terrain represententaion

Project site flora & fauna:

37 plant species belonging to 36 genera & 24 families were recorded within the RoW of proposed road, the prevailing plant species were common for the range in consideration & terrain with similar settings in Jalna, Nanded & Parbhani Districts with a very wide range of presence & abundance acoss all three districts, none species present in RoW are endemic. Except for one species viz. *Santalum album* (Chandan) the IUCN status for this species is Vulnerbale & also the project region is not a normal range of natural occurrence of this species.

No. of Species	Project Site Flora Composition & IUCN Status Summary											
	Hb	**Sh**	**Tr**		**Na**	**Nt**	**In**		**An**	**Dc**	**Ev**	**Pr**	Information could not Established
37	9	4	24		25	7	4		5	13	8	10	1
	IUCN Categories												
	NE	**DD**	**LC**	**NT**	**VU**		**EN**	**CR**		**EW**	**EX**		No IUCN Information on Species-Species Identification could not be established
	--	1	12	--	1		--	--		--	--		21-2
NE - Not Evaluated, DD - Data Deficient, LC - Least Concern, NT - Near Threatened, VU- Vulnerable, EN- Endangered, CR - Critically Endangered, EW - Extinct In the Wild, EX - Extinct													

Some of the commonest bird species & mammalian species observed in/around the proposed right of way, of which none faunal species are endemic. The observed bird species are extremely common for the range in consideration & have very large range of presence & abundance across the Jalna, Nanded & Parbhani Districts.

Fauna	**No. of Species**		**NE**	**DD**	**LC**	**NT**	**VU**	**EN**	**CR**	**EW**	**EX**	**No IUCN Information on species**		**Listed in Schedule I of WPA, 1972**
Birds	21		1	--	20	--	--	--	--	--	--	--		0
Mammals	6		--	--	5	--	1	--	--	--	--	--		0
NE - Not Evaluated, DD - Data Deficient, LC - Least Concern, NT - Near Threatened, VU- Vulnerable, EN- Endangered, CR - Critically Endangered, EW - Extinct In the Wild, EX - Extinct														

Study Area flora & fauna:

Field studies in & around selected sites/locations resulted in recording 156 plant species which comprised of native, introduced, naturalized, evergreen & deciduous type varieties trees, annual & perennial climbers, herbs and shrubs, the vegetation type & composition varied as per the terrain physiography & characteristics, described below.

Ornamental foliaceous & flowering varieties viz. *Terminalia catappa, Monoon longifolium, Peltophorum pterocarpum, Gliricidia sepium, Millingtonia hortensis, Spathodea campanulata, Delonix regia, Tecoma stans, Bougainvillea spectabilis* etc, were seen around human settlements, whereas Tectona grandis, *Morinda citrifolia, Macaranga peltata, Bombax ceiba, Butea monosperma, Erythrina suberosa, Cassia fistula, Oroxylum indicum, Heterophragma quadriloculare, Callicarpa tomentosa* etc were seen along the plains, mounds, scrub lands the vegetation type here was like that of Tropical Dry Deciduous Forests.

Tremendous growth of gregarious annual, perennial herbaceous & shrubby flora viz. *Urena lobata, Blumea oxyodonta, Lantana camara, Celosia argentea, Mimosa pudica, Ageratum conyzoides, Parthenium hysterophorus, Senna tora, Sida acuta, Dioscorea bulbifera, Ricinus communis, Malachra capitata* were prevalent in open areas & scrub lands.

Subsistence & commercial farming of various crops viz. Rice, Little Millet, Finger Millet, Luffa, Cumber, Tomato, Brinjal, Okra etc. and plantations of Mango observed.

The observed flora in within the study area though comprised of 156 species were common for the range in consideration & terrains with similar settings in Jalna, Nanded & Parbhani Districts also the observed terrestrial vegetation is extremely common & have very large range of presence across the three Districts. None endemic plant species were observed.

No. of Species		**Study Area Flora Composition & IUCN Status Summary**												
	Hb	**Cl**	**Sh**	**Tr**		**Ev**	**Dc**	**An**	**Pr**	**Type Uncertain**		**Na**	**Nt**	**In**	**Origin Uncertain**
156	42	17	16	81		37	30	22	67	--		112	25	19	--
	IUCN Categories														
	NE	**DD**	**LC**	**NT**	**VU**	**EN**	**CR**	**EW**	**EX**			**No IUCN Information on species**			
	--	2	70	1	2	--	--	--	--			81			
NE - Not Evaluated, DD - Data Deficient, LC - Least Concern, NT - Near Threatened, VU- Vulnerable, EN- Endangered, CR - Critically Endangered, EW - Extinct In the Wild, EX - Extinct															

Primary field studies, secondary data viz. interactions held with locals & literature review revealed presence of 36 Bird species, 10 Reptile species and 12 Mammal species.

The status evaluation revealed presence of 1 Near Threatened bird species viz. *Threskiornis melanocephalus* (Black-headed) which is a resident species.

The two reptile species viz. *Python molurus* (Indian python) & *Varanus bengalensis* (Common Indian monitor) present in study area known from locals were assessed as Near Threatened; however both of these species were not sighted in RoW of proposed alignment & surrounding areas.

The IUCN assessment of mammal spceis viz. *Macaca radiate* (Bonnet macaque) is Vulnerable, whreas mammal spcies viz. *Canis lupus pallipes* (Indian wolf) is listed as Schedule I Spcies in WPA 1972.

Fauna	No. of Species		NE	DD	LC	NT	VU	EN	CR	EW	EX)	No IUCN Information on species		Listed in Schedule I of WPA, 1972
Birds	36		--	--	34	1	--	--	--	--	--	1		1
Reptiles	10		--	--	8	2	--	--	--	--	--	--		1
Mammals	12		--	--	10	--	1	--	--	--	--	1		1
NE - Not Evaluated, DD - Data Deficient, LC - Least Concern, NT - Near Threatened, VU- Vulnerable, EN- Endangered, CR - Critically Endangered, EW - Extinct In the Wild, EX - Extinct														

Socio-Economic Environment

The socio economics of study area 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	604
Total no. of Households	4,09,867
Total Population	21,45,908
Sex ratio	938
SC/ST population	15.80% (SC) & 1.74% (ST)
Literacy Rate	67.51

In the study area, Nanded Waghala city is likely to have high Population density. The reason for this could be equipped facilities like education, health, sanitization, banking and transportation

In the study area, Ganeshpur Village is likely to have very low population density. The reason for this could be lack of facilities like education, health, sanitization, banking and transportation.

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 36 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 avoided during nighttime. Surface runoff shall check for contaminations such as oil & grease by routing the surface runoffs in small bunds around the construction areas. All hazardous & non-hazardous material handled as per statutory requirements.

Further, except for the identified trees to be felled in 100m ROW, the proposed project activities does not alter the surrounding the surrounding biotic environment in whatsoever manner. If pilling activity to be done in riverbed 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 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 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 incorporated in the environment management plan to ensure that the environmental quality protected and enhanced. These have summarised below.

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, SO_2, NOx and CO from the operation phase has been computed by A CALINE pro. 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, SO_2, NOx and CO) have 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 emission during the operation phase is 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 modeling is been performed considering emission factors for BS-II version vehicles.
- Roads shall be maintained on timely basis 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 carried out using software tool "Custic 3.2.". The anticipated noise generation by vehicles plying on the road will be 68-86 dB(A). The ancticiapted cumulative propagating noise at various distances from respective sections viz. HS1 to HS7 for the 2024 is given in following tables.

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

Homogenous Section 1 (HS 1)		
Sr. No.	Distance in meters from alignment boundary	Noise in dB(A)
1	490	34.58
2	1029	25.93
3	1616	17.29
4	2106	8.64

Homogenous Section 2 (HS 2)		
Sr. No.	Distance in meters from alignment boundary	Noise in dB(A)
1	617	37.36
2	822	28.02
3	1542	18.68
4	2036	9.34

Homogenous Section 3 (HS 3)		
Sr. No.	Distance in meters from alignment boundary	Noise in dB(A)
1	768	22.99
2	1085	17.89
3	1211	14.01
4	1718	7.0

Homogenous Section 4 (HS 4)		
Sr. No.	Distance in meters from alignment boundary	Noise in dB(A)
1	509	33.42
2	814	25.06
3	1303	16.71
4	1839	8.96

Homogenous Section 5 (HS 5)		
Sr. No.	Distance in meters from alignment boundary	Noise in dB(A)
1	462	39.38

Homogenous Section 5 (HS 5)		
Sr. No.	Distance in meters from alignment boundary	Noise in dB(A)
2	771	29.53
3	1498	19.69
4	1851	9.84

Homogenous Section 6 (HS 6)		
Sr. No.	Distance in meters from alignment boundary	Noise in dB(A)
1	560	39.03
2	1199	29.27
3	2132	19.51
4	2665	9.78

Homogenous Section 7 (HS 7)		
Sr. No.	Distance in meters from alignment boundary	Noise in dB(A)
1	403	46.17
2	1129	34.63
3	1862	23.09
4	2587	11.54

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

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, it is more likely that water from rivers / canals will not be tapped at all for this purpose & there will not be generation of wastewater, thus no impacts are anticipated during operational phase of proposed project.

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 in place 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 constructed road, however the 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

By using Site Survey original drawings, Topo sheets and Google earth maps different types of Alternatives studied. The following Final five types of Alignments are taken into consideration.

i. The alternative-01 starts on Samrudhhi Mahamarg (T-Junction) near Jalna District & End on NH-161 in Nanded District. The alignment designed for High Speed Rail standards by considering adjacent HSR corridor.
ii. The alternative-02 starts on Samrudhhi Mahamarge (T-Junction) near Jalna District & End on NH-161 in Nanded District. The alignment designed for High Speed Rail standards by considering adjacent HSR corridor.
iii. The alternative-03 starts on Samrudhhi Mahamarg (T-Junction) near Jalna District & End on NH-161 in Nanded District. The alignment designed for High Speed Rail standards by considering adjacent HSR corridor.
iv. The alternative-04 starts on Samrudhhi Mahamarg (T-Junction) near Jalna District & End on NH-161 in Nanded District. The alignment designed for High Speed Rail standards by considering adjacent HSR corridor.
v. The alternative-05 starts on Samrudhhi Mahamarg (T-Junction) near Jalna District & End on NH-161 in Nanded District. The alignment designed for High Speed Rail standards by considering adjacent HSR corridor.

Details of alternative alignment at each of the above locations have been discussed in details within the EIA Report and the finalised alignment has been discussed.

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 estimated cost is based on the the length and existing environmental scenario of the proposed project. Estimated Environmental monitoring cost of Rs. 1,79,08,000/- per year during Construction Phase and 90,40,000/- per year 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 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 terminal 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 of Jalna, Parbhani and Nanded Districts. Smooth and fast- moving traffic will cause only lower emissions thereby reducing pollution levels. Accident rates are also expected to come down substantially. 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, service road as feasible to connect with adjoining road net work , pedestrian and cattle 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 standard 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 Corporate Environment Responsibility (CER) Action Plan

The estimated cost of proposed project is Rs 17559.80 Crores & CER activities will be implemented to address the concerns raised during the Public Consultation (Public Hearing) process as per MoEF&CC Office Memorandum vide F. No. 22-65/2017-IA.III dated 30th September, 2020. The Public Consultation is to be conducted for the proposed project; hence, CER plan will be formulated post Public Consultation process.

11.0 Project Schedule and Cost

The proposed project is scheduled to be commissioned within 36 months after Environment Clearance (EC) and other statutory approvals are granted. The estimated cost of the proposed project is Rs. 17559.80 Crores. For protection of environment, it is proposed to spend it is proposed to spend Rs. 10.6 Crores as capital cost of EMP budget.

12.0 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. Further, 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 shall be 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.