



<a href="#">Construction Package No.: 07</a>	<u>MPR NO.: 30</u>		
			

## Environmental Monitoring Plan for MSRDC



DPR Package No.: 02  
CP No. 07: Sept. 2022

**“Samruddhi Mahamarg”**  
From 296 + 000 Km to 347 + 190 Km  
Village Banda to Village Sawargaon Mal  
District(s): Buldhana


M/s. Reliance Infrastructure Limited / Roadway Solutions India Infra Limited.

Appointed Date : 13. 04. 2019  
Scheduled Completion Date : 09. 10. 2021



**Submitted to MSRDC & CSIR – NEERI**

Prepared By	Reviewed By	Approved By
Safety Officer	Project Head	Authority’s Engineer
(Signature) <u>Wasim Akram</u>	(Signature) <u>Venkata Rama Rao Kaza</u>	(Signature) <u>Dilip Salunke</u>

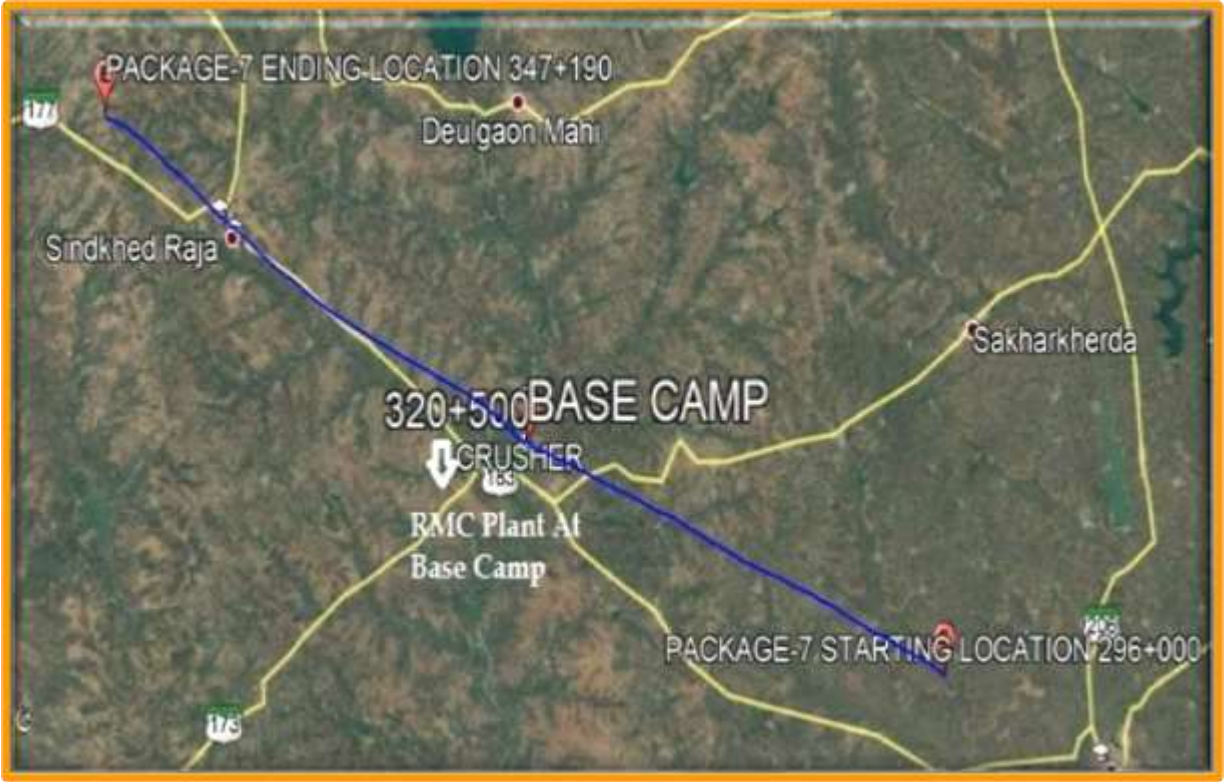
<a href="#">Construction Package No.: 07</a>	<u>MPR NO.: 30</u>		<b>RELIANCE</b>
			

# Environmental Monitoring Plan for MSRDC

DPR Package No.: 02  
 CP No.: 07 Sept – 2022



## “Samruddhi Mahamarg”

From **296 + 000** Km to **347 + 190** Km  
 Village **Banda** to Village **Golegaon**  
 District (s): **Buldhana**





EPC CONTRACTOR NAME: **Roadway Solutions India Infra LTD.**

**Submitted to MSRDC & CSIR – NEERI**

<b>Construction Package No.: 07</b>	<b>MPR NO.: 30</b>		
			

## Environmental Monitoring Plan Summary

Sr. No.	Parameters	Frequency	Remarks (if any)
1.	Ambient Air Quality Monitoring	<i>Once in Three Months</i>	-----
2.	Surface Water Quality Monitoring	<i>Once in Three Months</i>	-----
3.	Ground Water Quality Monitoring	<i>Once in Six Months</i>	If any sites change then the EPC has to carry out on monthly or quarterly basis, depending on site or location specification.
4.	Batching Plant Effluent Treatment Plant (BPETP) Monitoring	<i>Once in Three Months</i>	-----
5.	Sewage Treatment Plant (STP) Monitoring	<i>Once in Three Months</i>	-----
6.	Soil Quality Monitoring	<i>Once in Six Months</i>	If any sites change then the EPC has to carry out on monthly or quarterly basis, depending on site or location specification.
7.	Ambient Noise Monitoring	<i>Once in Three Months</i>	-----
8.	Solid & Construction and Demolition Waste	<i>Once in Three Months</i>	-----
9.	Trees and Plantations Amenities for Highways Road Construction Network	<i>Throughout of the Year Till Project Ending on Contractual Basis</i>	If any sites change then the EPC has to carry out on monthly or quarterly basis, depending on site or location specification.

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## Ambient Air Quality Monitoring (Once in Three Months)

The air monitoring locations should be identified on the following basis:

- **Source:** The exposure to the construction activity emissions are severe and would be the impact in terms of RSPM, HC, SO<sub>x</sub> and NO<sub>x</sub>.
- **Path:** The meteorology and the wind flow affect the impact on the receiver. The impact is higher during night time and low in daytime (for the same intensity of pollution produced by source). Likewise, the impact is high during inversion conditions or on locations lying at the downwind of the alignment.
- **Receiver:** The impact is higher if the receiver is considered to be sensitive w.r.t. the “National Ambient Air Quality Standards” (NAAQM). Such sensitive receptors. The villages in vicinity to the alignment.

**Frequency of Monitoring: Once in Three Months till End of Construction, Continuous 24 Hours for 2 Days (48 Hours).**

Sr. No.	@ Location	Location ID	Geographical Location	Longitude	Latitude	AAQMS Standards					
						Analysis Protocol	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>	NO <sub>x</sub>	CO
						Parameters					
1.	Ready Mix Concrete Plant/ Batching Plant/ Asphalt Mix Plant	320 + 000 (Base Camp)	Tadhegaon	76°17'7.14 E	20°0'47.538 N	90 – 100 µg/m <sup>3</sup>	78.8	39.5	8.8	28.2	0.172
2.	Stone Crusher	320 + 000 (Base Camp)	Tadhegaon	N/A	N/A	90 – 100 µg/m <sup>3</sup>	-----	-----	-----	-----	-----
3.	Wet Mix Macadam	N/A	N/A	N/A	N/A	-----	-----	-----	-----	-----	-----
4.	Near Office/ DG Stack	320 + 000 (Base Camp)	Tadhegaon	76°16'55.674 E	20°0'47.388 N	90 – 100 µg/m <sup>3</sup>	70.6	35.2	5.5	18.7	0.110
5.	Quarry Details @ Site	328 + 000	Shelgaon Raut	N/A	N/A	-----	-----	-----	-----	-----	-----
6.	Camp/ Labour Site	320 + 000 (Base Camp)	Tadhegaon	76°16'55.674 E	20°0'47.388 N	90 – 100 µg/m <sup>3</sup>	70.6	35.2	5.5	18.7	0.110
7.	Stretch of the Road Where Construction is in Progress @ Minimum 4: Locations – (4: Locations as per EIA):										
	7 (a): Location – 1	316 + 300	Dusarbid	76°18'45.33 E	20°1'56.082 N	90 – 100 µg/m <sup>3</sup>	71.3	35.8	5.3	19.4	0.112
	7 (b): Location – 2	321 + 400	Tadhegaon	76°16'47.88 E	20°1'6.438 N	90 – 100 µg/m <sup>3</sup>	74.8	37.1	5.8	19.5	0.113
	7 (c): Location – 3	330 + 100	Dusarbid	76°11'30.444 E	20°0'13.578 N	90 – 100 µg/m <sup>3</sup>	75.2	37.3	6.1	18.3	0.117
	7 (d): Location – 4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----


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<b>8.</b>	<b>Baseline Monitoring Locations as per the EIA, If Applicable:</b>										
	<b>8 (a): Location – 1</b>	<i>340 + 000</i>	<b>Sindkhed Raja</b>	<i>76° 6'12.252 E</i>	<b>19°58'27.63 N</b>	<i>90 – 100 µg/m<sup>3</sup></i>	<b>70.1</b>	<i>34.8</i>	<b>5.2</b>	<i>17.6</i>	<b>0.115</b>
	<b>8 (b): Location – 2</b>	<i>321 + 400</i>	-----	<i>76°16'47.88 E</i>	<b>20°1'6.438 N</b>	<i>90 – 100 µg/m<sup>3</sup></i>	<b>74.8</b>	<i>37.1</i>	<b>5.8</b>	<i>19.5</i>	<b>0.113</b>

**NOTE:**

**Minimum 4 – Locations should be selected for monitoring of Ambient Air Quality:**

- *If locations Sr. No.: 1 to 6 are in the vicinity of 50 – 100 m from each other, only 1 monitoring location can be considered.*
- *If any baseline monitoring locations are present in the package then it is to be considered as one of the selected locations.*
- *Photographs while monitoring and analysis should be attached wherever possible.*

<b><u>Construction Package No.: 07</u></b>	<b><u>MPR NO.: 30</u></b>		<b>RELIANCE</b>
			 <b>ROADWAY SOLUTIONS INDIA INFRA LTD.</b>



GPS Map  
Camera Lite

Shop No 1 Main Road, Tadhegaon, near  
Bus Stop, Maharashtra 443308, India

Latitude	Longitude
20° 0' 47.538" N	76° 17' 7.14" E
Local 04:23:38 PM	Altitude 13.91 meters
GMT 10:53:38 AM	Thursday, 22.09.2022

Note : Pkg 7

**Ambient Air Monitoring @ Km: 320 + 000**





GPS Map  
Camera Lite

MH SH 183, Borakhedi Bawara,  
Maharashtra 443204, India

Latitude	Longitude
19° 58' 27.63" N	76° 6' 12.252" E
Local 05:41:11 PM	Altitude 13.75 meters
GMT 12:11:11 PM	Thursday, 22.09.2022

Note : Pkg 7

**Ambient Air Monitoring @ Km: 340 + 000**



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**Ambient Air Monitoring @ Km: 321+ 400**



**Ambient Air Monitoring @ Km: 330 + 100**

<b>Construction Package No.: 07</b>	<b>MPR NO.: 30</b>		
			



## Surface Water Quality Monitoring (Once in Three Months)

- Monitoring is to be carried out Once in Three Months.
- At least 4 – Locations in the area adjacent to the alignment on both the side should be selected as monitoring location (200 m from either side).
- To identify potential effects of road construction and operation activities on groundwater and any potential effects of groundwater quality on road construction and integrity.
- To identify residual effects of road construction and operation activities on groundwater in the project area.

**Frequency of Monitoring: Once in Three Months during Construction Phase to Grab Sample:**

Monitoring Location/ Area/ Place/ Region's Specification					
Sr. No.	Location	Name of the Geographical Location	Location ID (LID)	Longitude	Latitude
1.	Nala Up Stream	<i>Location of Malkapur</i>	@ Ch.= 299 + 090	76°28'4.092" E	20°5'32.532" N
2.	Nala Down Stream	<i>Location of Malkapur</i>	@ Ch.= 299 + 090	76°28'5.232" E	20°5'30.084" N
3.	Nala Up Stream	<i>Location of Malkapur</i>	@ Ch. = 312 + 195	76°21'11.886" E	20°2'46.698" N
4.	Nala Down Stream	<i>Location of Malkapur</i>	@ Ch. = 312 + 195	76°21'11.376" E	20°2'46.278" N
5.	River Purna Up Stream	<i>Location of Malkapur</i>	@ Ch. = 321 + 400	76°16'25.572" E	20°1'0.498" N
6.	River Purna Down Stream	<i>Location of Malkapur</i>	@ Ch. = 321 + 400	76°16'25.548" E	20°1'0.03" N
7.	Nala Up Stream	<i>Location of Malkapur</i>	@ Ch. = 340 + 095	76°5'51.3" E	19°58'13.698" N
8.	Nala Down Stream	<i>Location of Malkapur</i>	@ Ch. = 340 + 095	76°5'51.828" E	19°58'14.022" N





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Sr. No.	Parameters	Analysis Protocol	Standards (IS: 2296)	Nala Up Stream Ch.= 299 + 090	Nala Down Stream Ch.= 299 + 090	Nala Up Stream Ch.= 312 + 195	Nala Down Stream Ch.= 312 + 195
1.	pH Value	IS: 2296	6.5 – 8.5	7.5	7.5	7.6	7.65
2.	Temperature	IS: 2296	-----	28	28	28	28
3.	Total Dissolved Solids (TDS)	IS: 2296	1,500	214	220	226	228
4.	Total Suspended Solid (TSS)	IS: 2296	-----	18	18	16	18
5.	Total Hardness	IS: 2296	-----	86	88	92	92
6.	Chloride	IS: 2296	600	11.4	11.8	11.0	11.3
7.	Nitrate	IS: 2296	50	2.25	2.20	2.10	2.14
8.	Iron (as Fe)	IS: 2296	50	0.073	0.074	0.095	0.10
9.	Sulphate (as SO <sub>4</sub> )	IS: 2296	400	9.4	9.5	9.7	9.9
10.	Turbidity Level	IS: 2296	-----	5.5	5.5	7	7
11.	DO Level	IS: 2296	4.0	6.6	6.6	6.4	6.3
12.	BOD (3 Days) Level	IS: 2296	3.0	4.6	4.7	4.3	4.5
13.	COD Level	IS: 2296	-----	16.8	17.1	17.2	17.8
14.	Lead (as Pb)	IS: 2296	0.1	<0.001	<0.001	<0.001	<0.001
15.	Oil and Grease	IS: 2296	0.1	<0.1	<0.1	<0.1	<0.1
16.	Total Coliform	IS: 2296	5,000	142	144	132	133

\*IS: 2296 – BIS – Indian Standards Specification (Second Revision);

Sr. No.	Parameters	Analysis Protocol	Standards (IS: 2296)	Purna River Up Stream Ch. = 321 + 400	River (Purna) Down Stream Ch. = 321 + 400	Nala Up Stream Ch.= 340 + 095	Nala Down Stream Ch.= 340 + 095
1.	pH Value	IS: 2296	6.5 – 8.5	7.4	7.4	7.65	7.65
2.	Temperature	IS: 2296	-----	28	28	28	28
3.	Total Dissolved Solids (TDS)	IS: 2296	1,500	196	208	212	217

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4.	Total Suspended Solid (TSS)	IS: 2296	-----	10	12	18	16
5.	Total Hardness	IS: 2296	-----	82	84	94	95.2
6.	Chloride	IS: 2296	600	10.2	10.7	11.2	11.7
7.	Nitrate	IS: 2296	50	2.10	2.10	2.30	2.30
8.	Iron (as Fe)	IS: 2296	50	0.095	0.10	0.071	0.072
9.	Sulphate (as SO <sub>4</sub> )	IS: 2296	400	9.2	9.2	10.8	10.9
10.	Turbidity Level	IS: 2296	-----	3.5	3.6	14	15
11.	DO Level	IS: 2296	4.0	6.7	6.7	6.2	6.3
12.	BOD (3 Days) Level	IS: 2296	3.0	3.8	4.1	4.3	4.1
13.	COD Level	IS: 2296	-----	12.7	13.0	15.5	15.2
14.	Lead (as Pb)	IS: 2296	0.1	<0.001	<0.001	<0.001	<0.001
15.	Oil and Grease	IS: 2296	0.1	<0.1	<0.1	<0.1	<0.1
16.	Total Coliform	IS: 2296	5,000	112	116	150	154

2296 – BIS – Indian Standards Specification (Second Revision);

**NOTE:**

- *If any baseline monitoring locations are present in the package then it is to be considered as one of the selected locations.*
- *Photographs while monitoring and analysis should be attached wherever possible.*

**Brief interpretation and justification of the above monitoring report with all monitoring location details and site conditions.**


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**Surface Water Nala Upstream @ Km: 299 + 090**



**Surface Water Nala Downstream @ Km: 299 + 090**

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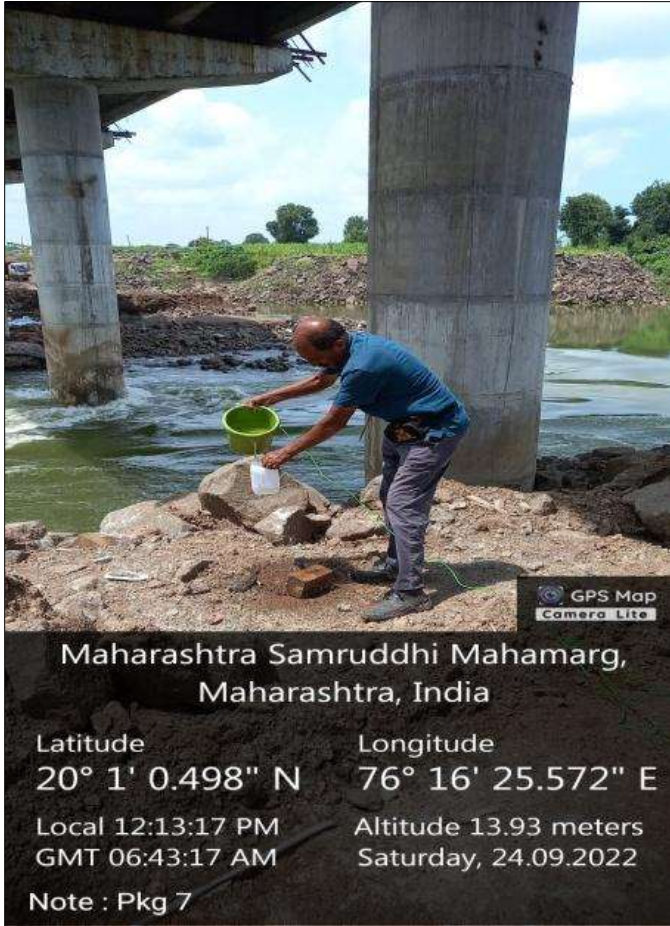


**Surface Water Nala Upstream @ Km: 312 + 195**




**Surface Water Nala Downstream @ Km: 312 + 195**

<b><u>Construction Package No.: 07</u></b>	<b><u>MPR NO.: 30</u></b>		<b>RELIANCE</b>
			ROADWAY SOLUTIONS INDIA INFRA LTD.



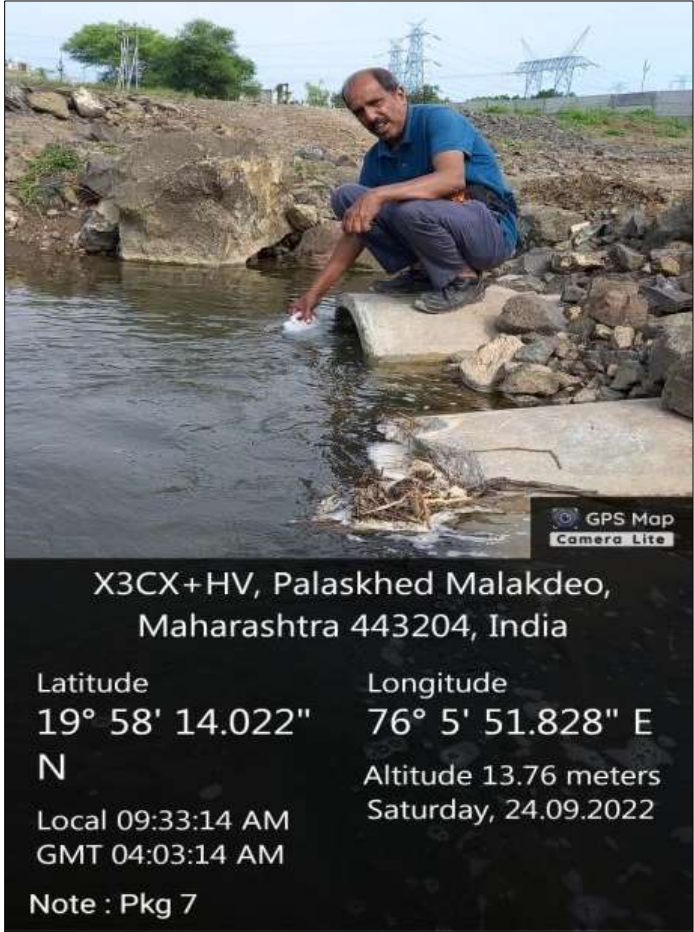
**Surface Water Purna River Upstream @ Km: 321 + 400**

**Surface Water Purna River Downstream @ Km: 321 + 400**


<b><u>Construction Package No.: 07</u></b>	<b><u>MPR NO.: 30</u></b>		<b>RELIANCE</b>
			



**Surface Water Nala Upstream @ Km: 340 + 095**





**Surface Water Nala Downstream @ Km: 340 + 095**

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**Ground Water (Open Well) at Base Camp @ Km: 320 + 000**



**Ground Water (Open Well) Batching Plant @ Km: 340 + 000**

<p><b><u>Construction</u></b> <b><u>Package No.: 07</u></b></p>	<p><b><u>MPR NO.: 30</u></b></p>		
			



**Ground Water (Open Well) Batching Plant @ Km: 297 + 409**





<b>Construction Package No.: 07</b>	<b>MPR NO.: 30</b>		
			

## Ground Water Quality Monitoring (Once in Six Months)

- **# - Monitoring is to be carried out once in every six months, if any sites change then the EPC has to carry out on monthly or quarterly basis, depending on site specification.**
- **@ - If groundwater extraction system is near any Septic Tank/ Soak Pit/ Material Storage Area then the monitoring is to be carried out on every mentioned site, on quarterly basis.**
- **At least 4 – Location in the area adjacent to the alignment on both the side should be selected as monitoring location (200 m from either side).**
- To identify potential effects of road construction and operation activities on groundwater and any potential effects of groundwater quality on road construction and integrity.
- To identify residual effects of road construction and operation activities on groundwater in the project area.

**Frequency of Monitoring: Once in Six Months during construction phase, Grab Sample<sup>#@</sup>:**

Monitoring Location Specification					
Sr. No.	Location	Name of Geographical Location	Location ID (LID_____)	Longitude	Latitude
1.	Open Well	Open Well @ Chainage (320 + 000) Km	@ Camp Site	76°17'1.422" E	20°0'45.27" N
2.	Open Well	Open Well @ Chainage (340 + 000) Km	@ Camp Site	76°6'8.244" E	19°58'27.972" N
3.	Open Well	Open Well @ Chainage (297 + 409) Km	Along the ROW	76°28'51.462" E	20°6'4.806" N
4.	Septic Tank	-----	-----	-----	-----
5.	Material Storage Area	-----	-----	-----	-----

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Sr. No.	Parameters	Analysis Protocol	Standards (IS: 10500: 2012)	Open Well @ Chainage (320 + 000) Km	Open Well @ Chainage (340 + 000) Km	Open Well @ Chainage (297 + 409) Km	Septic Tank (LID)	Soak Pit (LID)	Material Storage Area (LID)
1.	pH Value	6.5 – 8.5	IS: 10500	7.85	7.7	7.8	-----	-----	-----
2.	Temperature	Instrumental	Not Specified	-----	-----	-----	-----	-----	-----
3.	Total Dissolved Solids (TDS)	500 mg/l	IS: 10500	382	31	336	-----	-----	-----
4.	Total Suspended Solid (TSS)	mg/l	IS: 3025	-----	-----	-----	-----	-----	-----
5.	Total Hardness	200 mg/l	IS: 10500	164	128	144	-----	-----	-----
6.	Chloride Level	250 mg/l	IS: 10500	13.4	10.7	12.4	-----	-----	-----
7.	Nitrate Level	45 mg/l	IS: 10500	2.15	2.10	2.32	-----	-----	-----
8.	Iron (as Fe)	0.3 mg/l	IS: 10500	0.095	0.087	0.082	-----	-----	-----
9.	Sulphate (as SO <sub>4</sub> )	200 (400) mg/l	IS: 10500	11.2	9.3	10.1	-----	-----	-----
10.	Turbidity Level	1 (5) NTU	IS: 10500	0.2	0.3	0.2	-----	-----	-----
11.	DO Level	mg/l	IS: 3025	-----	-----	-----	-----	-----	-----
12.	BOD (3 Days) Level	mg/l	IS: 3025	-----	-----	-----	-----	-----	-----
13.	COD Level	mg/l	IS: 2488	-----	-----	-----	-----	-----	-----
14.	Lead (as Pb)	0.01 mg/l	IS: 10500	< 0.001	< 0.001	< 0.001	-----	-----	-----
15.	Oil and Grease	mg/l	USEPA: 1664	-----	-----	-----	-----	-----	-----
16.	Total Coliform	CFU 100 ml	IS: 10500	12	10	15	-----	-----	-----

\*IS: 10500: 2012 – BIS – Indian Standards Specification (Second Revision);

**NOTE:**

- *If any baseline monitoring locations are present in the package then it is to be considered as one of the selected locations.*
- *Photographs while monitoring and analysis should be attached wherever possible.*

**Brief interpretation and justification of the above monitoring report with all monitoring location details and site conditions.**

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**Batching Plant Effluent Treatment Plant (BPETP)**  
**Monitoring**  
**(Once in Three Month)**

- Quantity of Water Treated in the Month : 07.5 Lakh Litre;
- Location of BPETP (Longitude/ Latitude) : 76.25°56.00” E and 20.00°84.00” N;
- Treatment Facility/ Process used at BPETP : N/A;
- Number of BPETP Operational in Package : 02;
- Capacity of BPETPs : 120 and 90;

Frequency of Monitoring: **Once in Three Months**, Inlet and Outlet Grab Sample:


Sr. No.	Parameters	Analysis Protocol	MPCB Standard for Treated Effluent Quality*	BPETP 1 (LID _____)		BPETP 2 (LID _____)	
				Inlet	Outlet	Inlet	Outlet
1.	pH Value	IS: 3025	Between 5.5 – 9.0	8.10	7.95	-----	-----
2.	Total Dissolved Solids (TDS)	IS: 3025	Not to Exceed 2,100 mg/l	1,278	1,310	-----	-----
3.	Total Suspended Solid (TSS)	IS: 3025	Not to Exceed 100 mg/l	186	82	-----	-----
4.	BOD (3 Days) Level	IS: 3025	Not to Exceed 30 mg/l	15.2	12.4	-----	-----
5.	COD Level	IS: 2488	Not to Exceed 150 mg/l	161.7	70.7	-----	-----
6.	Oil and Grease	USEPA:1664	Not to Exceed 10 mg/l	8.0	5.7	-----	-----

\*Draft Guidelines for Ready Mix Concrete (RMC) Plants;

**NOTE:**

- *If any baseline monitoring locations are present in the package then it is to be considered as one of the selected locations.*
- *Photographs while monitoring and analysis should be attached wherever possible.*



**Brief interpretation and justification of the above monitoring report with treatment plant conditions.**

<b><u>Construction Package No.: 07</u></b>	<b><u>MPR NO.: 30</u></b>		<b>RELIANCE</b>
			 <b>ROADWAY SOLUTIONS INDIA INFRA LTD.</b>



**Batching Plant Monitoring Testing (Inlet) @ Km: 320 + 000**

**Batching Plant Monitoring Testing (Outlet) @ Km: 320 + 000**

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## Sewage Treatment Plant (STP) Monitoring (Once in Three Months)

- Quantity of Water Treated in the Month : 03 Lakh Litre;
- Location of STP (Longitude/Latitude) : Base Camp 76.28'19.05" N/ 20.01'29.06" E;
- Treatment Facility/ Process used at BPETP : N/A;
- Number of STP operational in Package : 01 No.;
- Capacity of STPs : 05 Lakh Litre;

Frequency of Monitoring: Once in Three Months, Inlet & Outlet Grab Sample:


Sr. No.	Parameters	Analysis Protocol	CPCB Standard*	STP 1 (LID _____)		STP 2 (LID _____)	
				Inlet	Outlet	Inlet	Outlet
1.	Colour and Odour	IS: 3025	-----	112 and Objectionable	78 and Unobjectionable	-----	-----
2.	pH Value	IS: 3025	5.5 – 9.0 mg/l	7.85	8.10	-----	-----
3.	Electrical Conductivity	IS: 3025	-----	974	1020	-----	-----
4.	Total Dissolved Solids (TDS)	IS: 3025	2,100 mg/l	602	632	-----	-----
5.	Total Suspended Solid (TSS)	IS: 3025	100 mg/l	118	52	-----	-----
6.	BOD (3 Days) Level	IS: 3025	100 mg/l	47	26.2	-----	-----
7.	COD Level	IS: 3025	250 mg/l	178	110	-----	-----
8.	Oil and Grease	IS: 3025	10 – 20 mg/l	22	7.5	-----	-----
9.	Phosphate Content	IS: 3025	-----	1.80	1.17	-----	-----
10.	Ammonia Nitrogen	IS: 3025	120 mg/l	0.78	0.58	-----	-----

*\*CPCB Effluents Standards for Public Sewer/ Inland Surface Water as Applicable – GENERAL STANDARDS FOR DISCHARGE OF ENVIRONMENTAL POLLUTANTS  
PART – A: EFFLUENTS [SCHEDULE – VI];*

**NOTE:**



- If any baseline monitoring locations are present in the package then it is to be considered as one of the selected locations.
- Photographs while monitoring and analysis should be attached wherever possible.

**Brief interpretation and justification of the above monitoring report with treatment plant conditions.**

<p><b><u>Construction</u></b> <b><u>Package No.: 07</u></b></p>	<p><b><u>MPR NO.: 30</u></b></p>		
			





**Soil Sample at Base Camp @ Km: 320 + 400**

<b>Construction Package No.: 07</b>	<b>MPR NO.: 30</b>		
			

## Soil Quality Monitoring (Once in Six Months)#

- **# - Monitoring is to be carried out once in every six months, if any site changes then the EPC has to carry out on monthly or quarterly basis, depending on site specification.**
- Identify the different types of soil on site and their location **Frequency of Monitoring: Once in Six Months during the construction phase.**

Sr. No.	Parameters	Analysis Protocol	Standards	Near Plant Site Chainage @ (320 + 000) Km	Near Camp / Labour Site Chainage @ (320 + 000) Km	Near Construction Site Chainage @ (340 + 000) Km	Accident Spill Site Chainage @ (LID_____)
1.	pH Value	As per Agriculture Manual	Not Specified	7.7	-----	-----	-----
2.	Electrical Conductivity	As per Agriculture Manual	Not Specified	428	-----	-----	-----
3.	Calcium (as Ca)	As per Agriculture Manual	Not Specified	5978	-----	-----	-----
4.	Magnesium (as Mg)	As per Agriculture Manual	Not Specified	2994	-----	-----	-----
5.	Sodium Absorption Ratio	As per Agriculture Manual	Not Specified	0.43	-----	-----	-----
6.	Texture Content	As per Agriculture Manual	Not Specified	Coarse Sand	-----	-----	-----
7.	Lead (as Pb)	As per Agriculture Manual	Not Specified	< 0.1	-----	-----	-----
8.	Oil and Grease	USEPA 1664	Not Specified	-----	-----	-----	-----
9.	Nitrogen (as N)	As per Agriculture Manual	Not Specified	0.163	-----	-----	-----
10.	Phosphorus (as P)	As per Agriculture Manual	Not Specified	0.18	-----	-----	-----
11.	Potassium (as K)	As per Agriculture Manual	Not Specified	0.078	-----	-----	-----

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**NOTE:**

- *If any baseline monitoring locations are present in the package then it is to be considered as one of the selected locations.*
- *Photographs while monitoring and analysis should be attached wherever possible.*

**Brief interpretation and justification of the above monitoring report with treatment plant conditions.**

**Note – Soil Quality Monitoring testing had been done last in the month of June 2022; and in the month of Sept. 2022 as per contract norms.**



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## Ambient Noise Monitoring (Once in Three Months)



The noise monitoring locations should be identified on the following basis:

Sr. No.	Monitoring Location Specification	Latitude/ Longitude	Location ID	Analysis Protocol Standards		
				Parameters Values in dB	Leq* Day (6 AM to 10 PM) Values in dB (A)	Leq* Night (10 PM to 6 AM) Values in dB (A)
1.	Quarry Details	NA	NA	NA	NA	NA
2.	Near Plant Site Chainage = 320 + 000 Batching Plant Area	20°0'47.778 N/ 76°17'6.57 E	Ch. = 320 + 000	70 – 75	65.7	52.5
3.	Near Equipment Yard	20°01'14.02" N/ 76°27'10.89" E	Ch. = 320 + 000	70 – 75	72.7	58.8
4.	Near Camp Site	20°0'21.449N/ 76°15'53.092 E	Ch. = 320 + 000	70 – 75	51.7	43.1
5.	DG Set on Site	20°01'14.02" N/ 76°27'10.89" E	Ch. = 320 + 000	70 – 75	73.1	64.5
6.	Tunnel Location	NA	NA	NA	NA	NA
7.	Residential Area in the Vicinity of the Alignment	20°0'21.449N/ 76°15'53.092 E	Ch. = 320 + 000	70 – 75	51.7	43.1
8.	Near Viaduct	20°1'5.178N/ 76°16'47.484 E	Ch. = 321 + 400	70 – 75	54.0	43.4
9.	Near Viaduct	20°0'13.428N/ 76°11'29.52 E	Ch. = 330 + 100	70 – 75	55.2	43.9

*Leq\* Day and Leq\* Night = Leq (Equivalent Noise Level) Values are in Leq dB (A);*

- **Source:** The proximity of the villages to the alignment. The closer the villages are the severe would be the impact.
- **Path:** The meteorology and the wind flow affects the impact on the receiver. The impact is higher during night time and low in daytime (for the same intensity produced by source). Likewise the impact is high during inversion conditions or on locations lying at the downwind of the alignment.
- **Receiver:** The impact is higher if the receiver is considered to be sensitive w.r.t. the CPCB Standards for noise. Such sensitive receptors could be hospital, school, libraries etc. Also a high duration low intensity impact can be as detrimental as low duration high intensity impact.


**Frequency of Monitoring: Once in Three Months till End of Construction, Continuous 24 Hours for 2 Days (48 Hours).**

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**NOTE:**

- *If the above locations are in the vicinity of 50 – 100 m from each other, only 1 monitoring location can be considered or multiple locations at the periphery of the vicinity.*
- *Minimum 4 locations should be selected for monitoring of Ambient Noise.*
- *If any baseline monitoring locations are present in the package then it is to be considered as one of the selected locations.*
- *Photographs while monitoring and analysis should be attached wherever possible.*

**Brief interpretation and justification of the above monitoring report with all monitoring location details and site conditions.**

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Shop No 1 Main Road, Tadhegaon, near Bus Stop, Maharashtra 443308, India

Latitude	Longitude
20° 0' 47.778" N	76° 17' 6.57" E
Local 04:36:57 PM	Altitude 13.91 meters
GMT 11:06:57 AM	Thursday, 22.09.2022

Note : Pkg 7




Maharashtra Samruddhi Mahamarg, Maharashtra, India

Latitude	Longitude
20° 1' 5.178" N	76° 16' 47.484" E
Local 10:52:24 AM	Altitude 13.92 meters
GMT 05:22:24 AM	Saturday, 24.09.2022

Note : Pkg 7



**Ambient Noise Monitoring @ Km: 320 + 000 (Base Camp)**

**Ambient Noise Monitoring @ Km: 321 + 400 (Viaduct)**

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**Ambient Noise Monitoring @Km: 330+100 (Viaduct)**

<b>Construction Package No.: 07</b>	<b>MPR NO.: 30</b>		
			

**Solid and Construction and Demolition Waste Details by EPC (Once in Three Months)**

SR. NO.	SOLID WASTE		CONSTRUCTION AND DEMOLITION WASTE	
	1.	<b>Quantity of Waste Generated</b>	<i>13,100 Kg 0.17 to 5.7 Kg per Person/ Day (Approximately)</i>	<b>Quantity of Waste Generated</b>
2.	<b>Location of Disposal</b>	<i>Km 320 + 000 within Base Camp Location but at the Edge of Boundary Wall Which is Far Away from Dwelling Units</i>	<b>Location of Disposal</b>	<i>N/A</i>
3.	<b>Characteristics of Waste (% Degradable, % Non – Degradable)</b>	<i>100% Degradable Method</i>	<b>Characteristics of Waste</b>	<i>N/A</i>
4.	<b>Technology Used for Disposal</b>	<i>Composting Technology</i>	<b>Technology Used for Disposal</b>	<i>N/A</i>

<p><b>Construction Package No.: 07</b></p>	<p><b>MPR NO.: 30</b></p>		
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## **Annexure – 1:** **Systematically/ Scientifically/ Precisely Designed Air, Water and Soil Quality Monitoring Network**

### **1. Air Quality**

Ambient air quality in the state is quite pure in the state. Except for a few urban centers, the ambient air quality along the subproject roads is good. There are no major industrial activities along the projected roads. Dust arising from unpaved surfaces, forest fires, smoke charcoal production, domestic heating, and vehicular pollution are sources of pollution in the region. Firewood burning is the major contributor to the ambient pollution load. Industrial and vehicular pollution is mainly concentrated in the major commercial areas.

Vehicular pollution is a secondary source of pollution in the region as the traffic density is low. Pollution from vehicles is mainly due to the use of low – grade fuel, and poor maintenance of vehicles. The level of pollution in rural areas is much lower than that of urban areas due to the lower volume of traffic. There is a sudden increase in the number of vehicles in the town area during another cause of air pollution.

Secondary information is not available on the ambient air quality of the project road area. The major transport on the project road sections is the traffic flowing on unpaved or damaged roads. This Air Quality Monitoring Station Set up might also add to the air pollution load along the project road of the projected sections.



The base – line status of the ambient air – quality was assessed using a scientifically designed ambient air – quality monitoring network. The design of this network was based on the following:

- *Meteorological conditions, climatic conditions, and weather records/ interpretations;*
- *The assumed regional influences on background air quality data;*
- *The areas where the impact would most likely be greatest;*
- *Present land use pattern along the proposed alignment; and*
- *Traffic congestion points etc.*

To establish the baseline ambient air quality, “**Ambient Air Quality Monitoring**” (AAQM) stations were set up @ locations as indicated in **Table 1**.

At each of the 1 locations, monitoring was undertaken as per a new notification issued by “**The Ministry of Environment, Forest and Climate Change**” (MOEF & CC) on 16<sup>th</sup>, November 2021, in the second quarter of 2022; Data for the following parameters was collected.

- ❖ *Particulate Matter PM<sub>10</sub>;*
- ❖ *Particulate Matter PM<sub>2.5</sub>;*
- ❖ *Sulphur Dioxide (SO<sub>2</sub>);*
- ❖ *Oxides of Nitrogen (NO<sub>x</sub>);*
- ❖ *Carbon Monoxide (CO).*

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The sampling of PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, and NO<sub>x</sub> was undertaken on a 24 – Hourly basis while bi – hourly samples were collected for CO, PM, SO<sub>2</sub>, and NO<sub>x</sub> were monitored using **M/s. Reliance Infrastructure Limited/ Roadway Solutions India Infra Limited;** make Repairable Dust Sampler (APM – 460) along with gaseous attachment (Model APM – 415 and 411). What Man GFIA Filter Papers were used for PM, Carbon Monoxide (CO) samples were monitored by using make **Gas Detector Model Number: C – 096** and **GP – 200 P** respectively,



The methodology adopted for sampling and analysis and the instrument used for analysis in the laboratory are presented in **Table 1**.

**Table 1: Techniques Used for Ambient Air Quality Monitoring.**

<b>Techniques Used for Ambient Air Quality Monitoring</b>			
<b>Sr. No.</b>	<b>Parameter (µg/ m<sup>3</sup>)</b>	<b>Technique</b>	<b>Minimum Detectable Limit (µg/ m<sup>3</sup>)</b>
1.	<b>Particulate Matter (PM<sub>2.5</sub>)</b>	<i>Gravimetric Method</i>	<b>01</b>
2.	<b>Particulate Matter (PM<sub>10</sub>)</b>	<i>Gravimetric Method</i>	<b>01</b>
3.	<b>Sulphur Dioxide (SO<sub>2</sub>)</b>	<i>Modified West and Gaeke</i>	<b>05</b>
4.	<b>Nitrogen Oxide (NO<sub>x</sub>)</b>	<i>Modified Jacob and Hochheiser</i>	<b>05</b>
5.	<b>Carbon Monoxide (CO)</b>	<i>Non – Dispersive Infrared Spectroscopy (NDIRS)</i>	<b>01</b>

A summary of results for each location is presented in **Tables 2 (a)** and **(b)**, the existing air quality along the project roads @ monitored locations. These results are compared with the National Ambient Air Quality Standards prescribed by the “**Ministry of Environment Forests and Climate Change**” (MOEF & CC) for respective Zones.

It can be seen from **Tables 2 (a)** and **(b)** that @ all the monitored locations the ambient air quality parameters are well within the NAAQS standards prescribed by the Ministry of Environment, Forest and Climate Change for residential areas. The maximum concentration of PM<sub>10</sub> and PM<sub>2.5</sub> is 85.10 µg/ m<sup>3</sup> and 42.96 µg/ m<sup>3</sup> recorded on Road. These are well within the standards of 100 µg/ m<sup>3</sup> and 60 µg/ m<sup>3</sup> respectively for PM<sub>10</sub> and PM<sub>2.5</sub>. The “**National Ambient Air Quality Standards**” (NAAQS) prescribed by “**The Ministry of Environment, Forests and Climate Change**” (MEOF & CC).

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**Table 1 (a): Ambient Air Quality Status along the Projected Road.**



**Ambient Air Quality Status along the Projected Road**

Sr. No.	Experimental Parameter (µg/ m <sup>3</sup> )	Test Method	Units	Limits as per Environment (Protection) Act	AAQM - 1	AAQM - 2	AAQM - 3	AAQM - 4	AAQM - 5	AAQM - 6
1.	PM <sub>10</sub> Particulate Matter	IS: 5182 (P - 23): 2006	µg/ m <sup>3</sup>	100	<b>62.88</b>	70.29	<b>69.31</b>	83.02	<b>62.89</b>	65.44
2.	PM <sub>2.5</sub> Particulate Matter	As per CPCB Guidelines	µg/ m <sup>3</sup>	60	<b>29.70</b>	38.46	<b>36.16</b>	42.64	<b>32.10</b>	37.68
3.	Sulphur Dioxide (SO <sub>2</sub> )	IS: 5182 (P - 02): 2001	µg/ m <sup>3</sup>	80	<b>6.32</b>	11.03	<b>9.83</b>	10.15	<b>7.12</b>	8.12
4.	Oxides of Nitrogen (NO <sub>x</sub> )	IS: 5182 (P - 06): 2006	µg/ m <sup>3</sup>	80	<b>11.81</b>	20.87	<b>17.08</b>	21.04	<b>15.71</b>	17.10
5.	Carbon Monoxide (CO)	IS: 5182 (P - 10): 1999	µg/ m <sup>3</sup>	2.00	<b>0.290</b>	0.400	<b>0.330</b>	0.390	<b>0.380</b>	0.370

**Table 2 (b): Ambient Air Quality Status along the Projected Road.**

Sr. No.	Experimental Parameter (µg/ m <sup>3</sup> )	Test Method	Units	Limits as per Environment (Protection) Act	AAQM - 7	AAQM - 8	AAQM - 9	AAQM - 10	AAQM - 11
1.	PM <sub>10</sub> Particulate Matter	IS: 5182 (P - 23): 2006	µg/ m <sup>3</sup>	100	<b>84.20</b>	85.10	<b>78.31</b>	71.20	<b>64.22</b>
2.	PM <sub>2.5</sub> Particulate Matter	As per CPCB Guidelines	µg/ m <sup>3</sup>	60	<b>41.53</b>	42.96	<b>40.17</b>	39.64	<b>31.17</b>
3.	Sulphur Dioxide (SO <sub>2</sub> )	IS: 5182 (P - 02): 2001	µg/ m <sup>3</sup>	80	<b>11.19</b>	12.17	<b>09.86</b>	08.45	<b>06.90</b>
4.	Oxides of Nitrogen (NO <sub>x</sub> )	IS: 5182 (P - 06): 2006	µg/ m <sup>3</sup>	80	<b>23.21</b>	23.89	<b>19.75</b>	15.33	<b>11.78</b>
5.	Carbon Monoxide (CO)	IS: 5182 (P - 10): 1999	µg/ m <sup>3</sup>	2.00	<b>0.420</b>	0.430	<b>0.410</b>	0.390	<b>0.350</b>



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## 2. [Collection and Analysis of Data](#)



Data was collected on various environmental components such as soil, meteorology, geology, hydrology, water quality, flora and fauna, habitat, demography, land use, cultural properties etc., to establish the baseline environmental setup. Secondary data on environment for the subproject corridors were collected both from published and other relevant sources *e.g.*, the Departments of Forest, “**Maharashtra State Pollution Control Board**” (MSPCB), the State Statistical Department, etc. The data collection from the field was completed with the help of enumerators/ investigators. The interviewers were trained for filling up the questionnaire at the site. To ensure the accuracy of the data it was collected under the supervision of the consultant. The type and source of information compiled in this **Environmental Monitoring Plan for MSRDC Report** are shown in the **Table 3**.

**Table 3: Primary and Secondary Information Sources.**

<b>Information</b>	<b>Sources</b>
<b>Technical information on existing road features and proposed Rehabilitation Work. Investigation of road features; viz. Water bodies community structures, environmentally sensitive location areas, congested locations, etc.;</b>	<i>MSRDC Design Consultant Ground physical surveys and graphics consultants;</i>
<b>Climatic Condition;</b>	<i>Indian Meteorological Department (IMD), ENVIS Website, NIC, primary data collection;</i>
<b>Geology, Seismicity, Soil and Topography;</b>	<i>Geological Survey of India (SoI) Topo sheets, Primary data collection;</i>
<b>Land Use/ Land Cover;</b>	<i>Survey of India (SoI) Topo – Sheet, Observation during survey;</i>
<b>Drainage Pattern;</b>	<i>Survey of India Topo – Sheet and field observation;</i>
<b>Status of Forest Areas, Compensatory Afforestation Norms etc.;</b>	<i>Divisional Forest Office (DFO);</i>
<b>Status of Fishing Activity;</b>	<i>District Fisheries Offices;</i>
<b>Air Quality, Noise, Soil and Water Quality;</b>	<i>Onsite monitoring and Analysis of Field samples during field visit the monitoring report is given in <a href="#"><u>Annexure – 1</u></a>;</i>
<b>Borrow Areas, Quarries and Other Construction Material Source;</b>	<i>These sources are provided in <a href="#"><u>Annexure – 1</u></a>;</i>
<b>River Geo – Morphology, Hydrology, Drainage, and Flood Patterns;</b>	<i>Feasibility report, field observations;</i>
<b>Socio – Economic Environment;</b>	<i>Census 2021. Official websites maintained by State Govt., and Public Consultation during the Field Survey;</i>

## 3. [Environmental Monitoring and Analysis](#)

In order to assess the situation in particular sections of the subproject roads during the screening and site visit of the area, different locations were identified for monitoring and analysis the noise level, ambient air and water quality. The monitoring and analysis of water quality, air quality and noise level has been done by **M/s. Reliance Infrastructure Limited/ Roadway Solutions India Infra Limited**, NABL accredited leading environmental research laboratory. Air quality monitoring has been carried out

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as per “**Ministry of Environment, Forest and Climate Change**” (MOEF & CC) notification of November, 2009 the revised Air Quality standards and the on – site monitoring results are incorporated in the **Environmental Monitoring Report**.

- *Physical environmental components such as meteorology, geology, topography, soil characteristics, air quality, surface and sub – surface water quality;*
- *Biological environmental components such as aquatic, biotic, flora, fauna, mammals, and*
- *Land environment in terms of land use, soil composition etc.*



#### **4. Water Quality**

In order to establish baseline conditions, surface and groundwater samples were collected. The sampling locations were selected after the field reconnaissance and a review of all the water bodies/ resources in the project influence area. Samples were collected as per IS: 2488 (Part I – V).

Ground water (drinking water) samples were analysed as per IS: 10500 – 1991. Grab sample were collected from water source and were analyzed for various Physio – chemical parameters as per the procedures laid down in the MPHA and BIS. Atomic Absorption Spectrophotometer and UVNIS – Spectrophotometer were used for analysis of water samples according to the necessity. The water samples were collected from following locations along the subproject roads.

The results of the analyzed of these samples are presented in the **Table 4**. The results were compared with standards for drinking water quality.

It can be seen from table that the pH of the sampled water in the region is well within permissible limits (6.6 – 7.6). The water is also hard in nature with total hardness level ranging from 116 – 593 mg/ l against the permissible limit of 200 mg/ l. Other water quality parameters analyzed like chloride, sulphate, fluorides are “**Ground Water Sample**” (GWS) collection are found well within the permissible limits the project road for drinking waters as specified by CPCB on all sample subproject roads. Overall, the ground water quality in the projected areas is good (**Table 4**).



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**Table 4: Water Quality Characteristics along the Projected Road.**

**Part – 1**

**Ground/ Water Quality along the Project Road (Physical and Chemical Parameters)**

Sr. No.	Parameter	Test Method	Unit	Desirable Limits	Permissible Limits	SWQ 1	SWQ 2	SWQ 3	SWQ 4	SWQ 5	SWQ 6
1.	pH Value	IS: 3025 (P – 11): 1983	-----	6.5 to 8.5	N. R.	7.60	7.24	7.12	7.01	7.07	6.59
2.	Color Gratified	IS: 3025 (P – 09): 1984	°C	-----	-----	B. D. L.	B. D. L.	B. D. L.	B. D. L.	B. D. L.	B. D. L.
3.	Odour Category	IS: 3025 (P – 16): 1984	mg/l	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4.	Taste Category	IS: 3025 (P – 17): 1984	mg/l	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5.	Turbidity Type	IS: 3025 (P – 21): 2009	NTU	01	600	<01	<01	<01	<01	<01	<01
6.	Total Dissolved Solids	IS: 3025 (P – 23): 1986	mg/l	500	2000	1077.03	1055.38	1012.60	381.34	1216.82	331.90
7.	Total Hardness	IS: 3025 (P – 40): 1991	mg/l	200	600	116.72	291.80	359.89	145.90	593.33	136.17
8.	Total Alkalinity	IS: 3025 (P – 32): 1988	mg/l	200	600	567.32	268.19	195.98	113.46	371.34	113.46
9.	Calcium (as Ca)	IS: 3025 (P – 60): 2008	mg/l	75	200	27.26	50.64	62.32	35.05	124.65	35.05
10.	Chloride (as Cl)	IS: 3025 (P – 53): 2003	mg/l	250	1000	160.42	391.63	330.28	84.93	212.33	56.62
11.	Fluoride (as F)	IS: 3025 (P – 46): 1994	mg/l	1.0	1.5	0.20	0.21	0.21	0.06	0.23	0.05
12.	Iron (as Fe)	IS: 3025 (P – 53): 2003, RA: 2019	mg/l	0.3	N. R.	0.10	0.11	0.11	0.03	0.14	0.03
13.	Magnesium (as Mg)	IS: 3025 (P – 34): 1988	mg/l	30	100	12.15	41.31	51.03	14.58	70.47	12.15
14.	Nitrate (as NO <sub>3</sub> )	IS: 3025 (P – 24): 1986	mg/l	45	N. R.	41.62	24.48	18.83	10.84	31.14	10.92
15.	Sulphate (as SO <sub>4</sub> )	IS: 3025 (P – 45): 1993	mg/l	200	400	64.17	117.48	132.11	33.97	84.93	22.64
16.	Sodium (as Na)	IS: 3025 (P – 45): 1993	mg/l	-----	-----	170.14	80.40	58.50	33.90	92.47	33.90

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**Part – 2**



Sr. No.	Parameter	Test Method	Unit	Requirement (Acceptable Limit)	Permissible Limit in Absence of Alternate Source	SWQ 7	SWQ 8	SWQ 9	SWQ 10	SWQ 11
1.	pH Value	IS: 3025 (P – 11): 1983	-----	6.5 to 8.5	N. R.	7.58	<b>7.13</b>	7.25	<b>6.64</b>	7.13
2.	Color Gratified	IS: 3025 (P – 09): 1984	°C	-----	-----	B. D. L.	<b>B. D. L.</b>	B. D. L.	<b>B. D. L.</b>	B. D. L.
3.	Odour Category	IS: 3025 (P – 16): 1984	mg/l	Agreeable	Agreeable	Agreeable	<b>Agreeable</b>	Agreeable	<b>Agreeable</b>	Agreeable
4.	Taste Category	IS: 3025 (P – 17): 1984	mg/l	Agreeable	Agreeable	Agreeable	<b>Agreeable</b>	Agreeable	<b>Agreeable</b>	Agreeable
5.	Turbidity Type	IS: 3025 (P – 21): 2009	mg/l	01	<b>600</b>	<01	<b>&lt;01</b>	<01	<b>&lt;01</b>	<01
6.	Total Dissolved Solids	IS: 3025 (P – 23): 1986	mg/l	500	<b>2000</b>	970.04	<b>1131.50</b>	1105.38	<b>994.29</b>	1018.02
7.	Total Hardness	IS: 3025 (P – 40): 1991	mg/l	200	<b>600</b>	437.70	<b>311.25</b>	340.43	<b>340.43</b>	330.71
8.	Total Alkalinity	IS: 3025 (P – 32): 1988	mg/l	200	<b>600</b>	330.08	<b>546.69</b>	464.17	<b>175.35</b>	587.95
9.	Calcium (as Ca)	IS: 3025 (P – 60): 2008	mg/l	75	<b>200</b>	97.38	<b>74.01</b>	81.80	<b>77.90</b>	85.69
10.	Chloride (as Cl)	IS: 3025 (P – 53): 2003	mg/l	250	<b>1000</b>	160.42	<b>212.33</b>	217.04	<b>344.44</b>	84.93
11.	Fluoride (as F)	IS: 3025 (P – 46): 1994	mg/l	1.0	<b>1.5</b>	0.20	<b>0.22</b>	0.20	<b>0.21</b>	0.20
12.	Iron (as Fe)	IS: 3025 (P – 53): 2003, RA: 2019	mg/l	0.3	N. R.	0.11	<b>0.14</b>	0.12	<b>0.11</b>	0.12
13.	Magnesium (as Mg)	IS: 3025 (P – 34): 1988	mg/l	30	<b>100</b>	48.60	<b>31.59</b>	34.02	<b>36.45</b>	18.16
14.	Nitrate (as NO <sub>3</sub> )	IS: 3025 (P – 24): 1986	mg/l	45	N. R.	31.22	<b>36.18</b>	34.11	<b>16.48</b>	45.30
15.	Sulphate (as SO <sub>4</sub> )	IS: 3025 (P – 45): 1993	mg/l	200	<b>400</b>	64.05	<b>63.68</b>	86.81	<b>137.77</b>	33.97
16.	Sodium (as Na)	IS: 3025 (P – 45): 1993	mg/l	-----	-----	95.47	102.71	118.14	<b>52.50</b>	148.52

## 5. Soil Quality

The result of the analysis of these samples is presented in the **Table 5**.

**Table 5: Soil Quality along the Projected Road.**

Sr. No.	Parameter	Test Standards	Unit	SQ1	SQ2	SQ3	SQ4	SQ5	SQ6
1.	pH Value	IS: 2720 (P – 26): 1987	-----	7.27	<b>7.20</b>	7.35	<b>6.85</b>	7.87	<b>6.57</b>
2.	Electrical Conductivity	IS: 14767: 2000	µS/ cm	210.25	<b>240.32</b>	215.89	<b>101.26</b>	522.29	<b>560.46</b>
3.	Sodium Adsorption Ration	As per USEPA Guidelines	-----	0.61	<b>0.62</b>	0.70	<b>0.69</b>	0.75	<b>0.76</b>
4.	Organic Carbon	IS: 2720 (P – 22): 1972	%age	1.04	<b>0.98</b>	1.13	<b>1.47</b>	0.39	<b>1.49</b>
5.	Organic Matter	As per USEPA Guidelines	mg/ Kg	1.56	<b>1.40</b>	1.62	<b>1.80</b>	0.81	<b>1.84</b>
6.	Nitrogen (as N)	IS: 14684: 1999	mg/ 1000 Kg	262.72	<b>252.74</b>	258.25	<b>309.66</b>	321.64	<b>190.47</b>
7.	Phosphorous (as P)	IS: 9497: 1980	mg/ Kg	25.46	<b>30.11</b>	28.41	<b>25.89</b>	55.43	<b>120.26</b>
8.	Potassium (as K)	IS: 5305: 1969	mg/ 1000 Kg	110.21	<b>112.49</b>	108.74	<b>256.19</b>	443.20	<b>351.51</b>
9.	Iron (as Fe)	As per USEPA Guidelines	mg/ 1000 Kg	5.38	<b>5.82</b>	5.67	<b>7.12</b>	7.85	<b>8.10</b>
10.	Copper (as Cu)	As per USEPA Guidelines	mg/ 1000 Kg	4.17	<b>6.30</b>	3.81	<b>1.73</b>	1.54	<b>1.19</b>
11.	Zinc (as Zn)	As per USEPA Guidelines	Kg/ Ha	1.90	<b>2.25</b>	2.10	<b>1.18</b>	1.40	<b>1.97</b>

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**a) Mitigation for Quarries and Borrow Areas:**



Quarry and borrow pits may be filled with rejected construction waste and afterward should be given a vegetative cover. If this is not possible, then the excavated slopes will be filled in such a way that they resemble an original ground surface.

- + *Aggregates will be first sourced from licensed quarry sites (which are in operation) that comply with environmental and other applicable regulations;*
- + *Occupational health safety procedures/ practices for the workforce will be adhered to in all quarries;*
- + *Quarry and crushing units will be provided with adequate dust suppression measures;*
- + *Regular monitoring of the quarries by concerned authorities to ensure compliance with environmental management and monitoring measures;*
- + *Prior approval will be obtained from concerned authorities and all local environmental regulations are complied with;*
- + *Within all identified borrow areas, the actual extent of the area to be excavated will be demarcated with signs and access to the operational area controlled;*
- + *Borrow pit plant and machinery will conform to CPCB – EHS noise emission regulations;*
- + *Protective gear will be provided to the workforce exposed to noise levels beyond threshold limits and there should be a proper rotation of such personnel; and*
- + *All operation areas will be water sprinkled to control dust levels to “National Ambient Air Quality Monitoring” (NAAQM) Standards.*



**b) Conclusions and Recommendations:**

**After Studying the Features of the Project Area and Screening Exercises the following Conclusions and Recommendations are made:**


- a)** The detailing of trees and forest areas along the project stretch will be the part of detailed “**Environmental Impact Assessment**” (EIA) study;
- b)** A further study on the project section having these feature would be required during detail “**Environmental Impact Assessment**” (EIA) study at subsequent stage;
- c)** Careful study of alternate analysis is recommended to avoid critical environmental interference/ intrusion;
- d)** One side widening options should be explored to avoid impact on large trees as well as to mitigate the impacts on forest areas/ particular land sites;
- e)** Other clearances required for the project are Forest Clearance for Diversion of Reserved/ Protected Forests, NOC from State Pollution Control Board, Permission for Tree Felling etc.

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c) **Proposed Small Sewage Treatment Plant**: Mandatory and Compulsory Requirement @ All Projected Locations/ Places/ Regions/ States including **Samruddhi Mahamarg in State of Maharashtra** as “Installation of Small Sewage Treatment Plan under Environment Mitigation Measures” Measures for Nagpur/ Amravati/ Washim/ Aurangabad/ Nashik/ Mumbai under MSRDC/ NMSCEL (Nodal) Director of “**National Highway Authority of India**” (NHAI) {**Project Implementation Unit**}/ **Nagpur – Mumbai Super Communication Expressway Limited (NMSCEL)** “Engineering, Procurement and Construction” (EPC) Model. *The Samruddhi Mahamarg or Nagpur – Mumbai Super Communication Expressway (Officially Known as Hindu Hrudaysamrat Balasaheb Thackeray Maharashtra Samruddhi Mahamarg)*. Compulsory Reference Official Order Issued on Dated: 20/ 10/ 2022 for other/ Regions/ Places/ States too Like **Urban Heat Mitigation Strategies, Technologies in Terms of Cooling Cities Strategies... to Mitigate Urban Heat** as an Example Portrayed in the **Annexure – 1**.

<a href="#">Construction Package No.: 07</a>	<b>MPR NO.: 30</b>		
			

## Annexure – 1:



### नागपुर मुंबई सुपर कम्युनिकेशन एक्सप्रेसवे लिमिटेड

(विशेष उद्देश वाहन)




मार्गसंख्या: ७७७७७७७७

**No. MSRDC/NMSCEW/2022/ २१७५**  
**Date: 20 OCT 2022**

**To,**  
**The Project Director,**  
**Nagpur/Amravati/Washim/Aurangabad/Nashik/ म.रा.र.वि.म.**  
**NMSCEL.**

**Subject:** Construction of Access Controlled Nagpur Mumbai Super Communication Expressway "Hindu Hrudaysamrat Balasaheb Thackeray Maharashtra Samruddhi Mahamarg" on EPC mode in Construction Package no. CP-01 to CP-16 in the State of Maharashtra

**Regarding:** - Installation of small sewage treatment plant under environment mitigation measures.

**Reference:-**

- Office note dated 21.09.2022

The Construction of Access Controlled Nagpur-Mumbai Super Communication Expressway (Maharashtra Samruddhi Mahamarg) is in progress through EPC contractors in packages 1 to 16.

As per clause 3.9.3 of CA, & IRC-SP-99, Clause No. 1.15 & 14.2 the Contractor is required to take necessary preventive measures to avoid environmental damage.

The toll plaza complex & all building works are the part of the development of the Samruddhi Mahamarg and the sewage of these buildings is likely to cause pollution to the ground water.

It is the obligation of the EPC contractor to carry out various parameter for mitigation of adverse environment impact. (Clause No. - 3.9.3, Vo-II of CA & IRC-SP-99, Clause 1.15& 14.2).

Accordingly, all Project Director are instructed to give directives to EPC Contractor to install small sewage treatment plant as per requirement of the toll plaza complex, police station buildings and all other building works in the Samruddhi Mahamarg as per the Contract agreement.

  
**(A.R. Galkwad)**  
**Director, (Nodal)**  
**NMSCEL.**

सीआयएन: U45309MH201750C295599  
जीएसटी: 27AAFCN6530K122



नॉडलीकृत कार्यालय: नेपियन्दी रोड,  
त्रिपादानी चार्ज वायव्य, मुंबई - ४०००३६

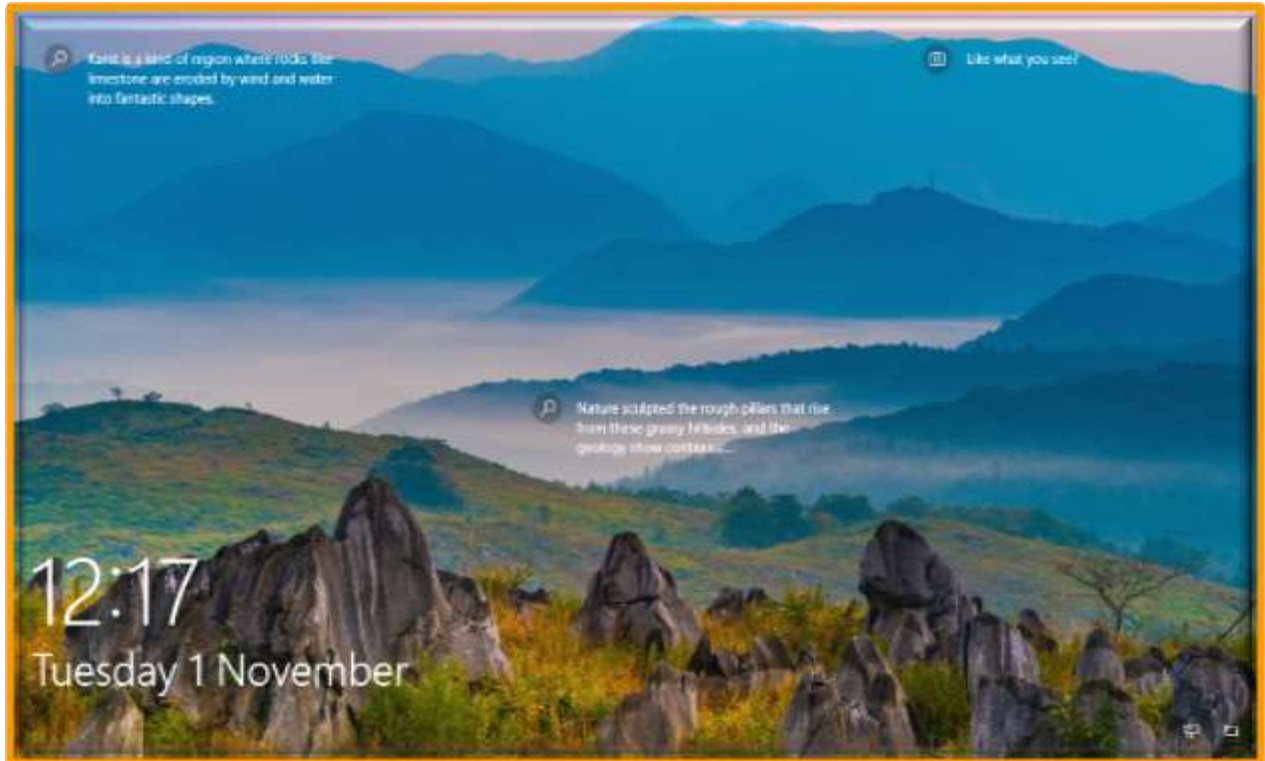
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फैक्स: (+९१) २३६८ ४९६३

कॉर्पोरेट कार्यालय: वाई देवसेवायन  
केपीएसपी, त्रिपादानी इन्फिन्टिनायवय,  
के.सी. मार्ग, वाई (ए), मुंबई - ४०००६०



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दुरधनी: (+९१) २३६० ८९६६ / ३०९  
फैक्स: (+९१) २३६० ८९६३

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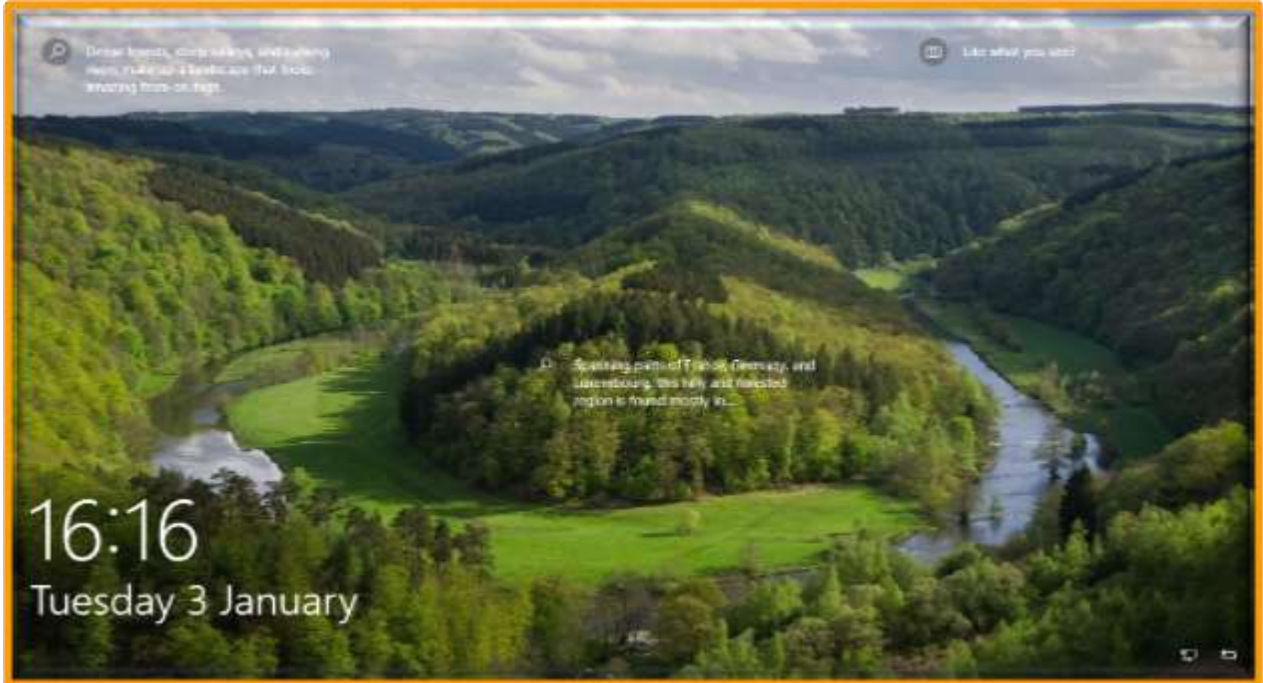
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**SAVE/ PRESERVE/ CONSERVE FANTASTIC AND ECCENTRIC SHAPES’ OF “NATURAL ECOSYSTEM AND ATMOSPHERIC ENVIRONMENT”...!!!**

<p><u>Construction Package No.: 07</u></p>	<p><u>MPR NO.: 30</u></p>		<p><b>RELIANCE</b></p> <p> <b>ROADWAY SOLUTIONS INDIA INFRA LTD.</b></p>
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<u>Construction Package No.: 07</u>	<u>MPR NO.: 30</u>		<b>RELIANCE</b>
			 ROADWAY SOLUTIONS INDIA INFRA LTD.



<u>Construction Package No.: 07</u>	<u>MPR NO.: 30</u>		
			





<p><b><u>Construction Package No.: 07</u></b></p>	<p><b><u>MPR NO.: 30</u></b></p>		<p><b>RELIANCE</b></p> <p> <b>ROADWAY SOLUTIONS INDIA INFRA LTD.</b></p>
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<p><u>Construction Package No.: 07</u></p>	<p><u>MPR NO.: 30</u></p>		<p><b>RELIANCE</b></p> <p>ROADWAY SOLUTIONS INDIA INFRA LTD.</p>
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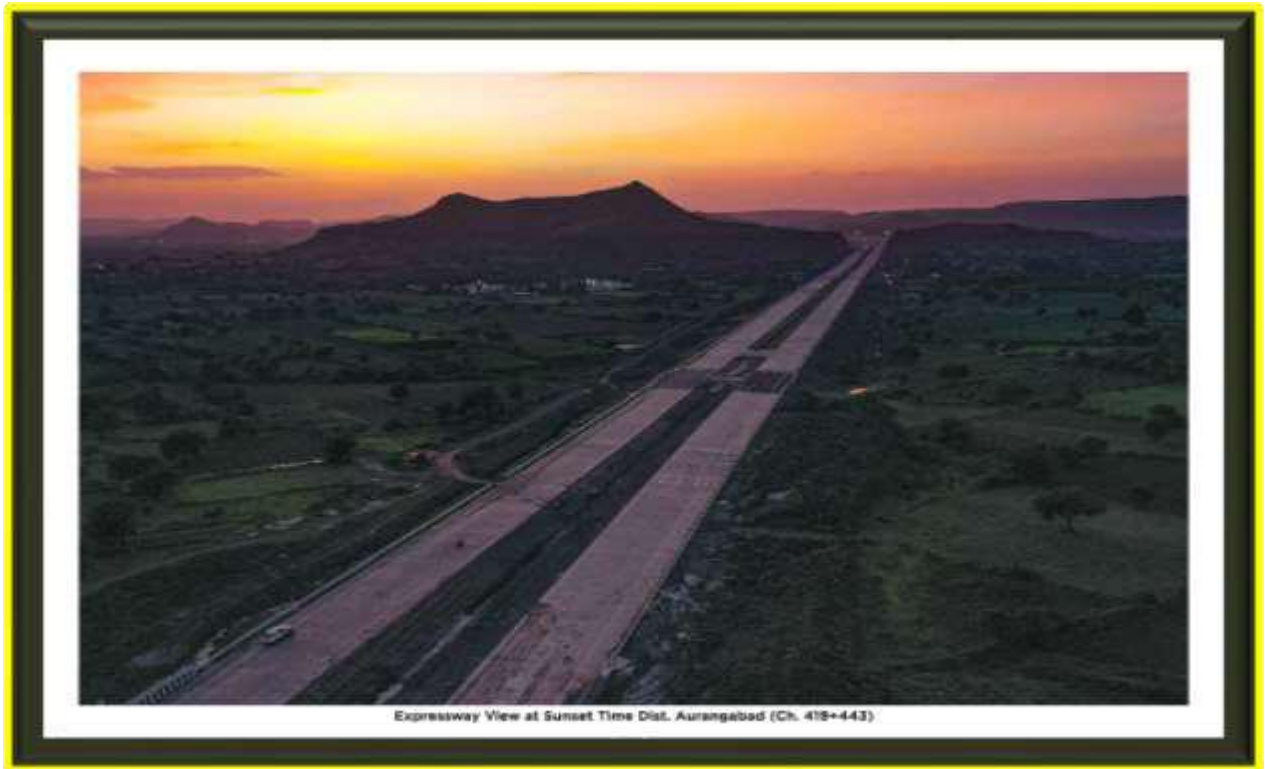
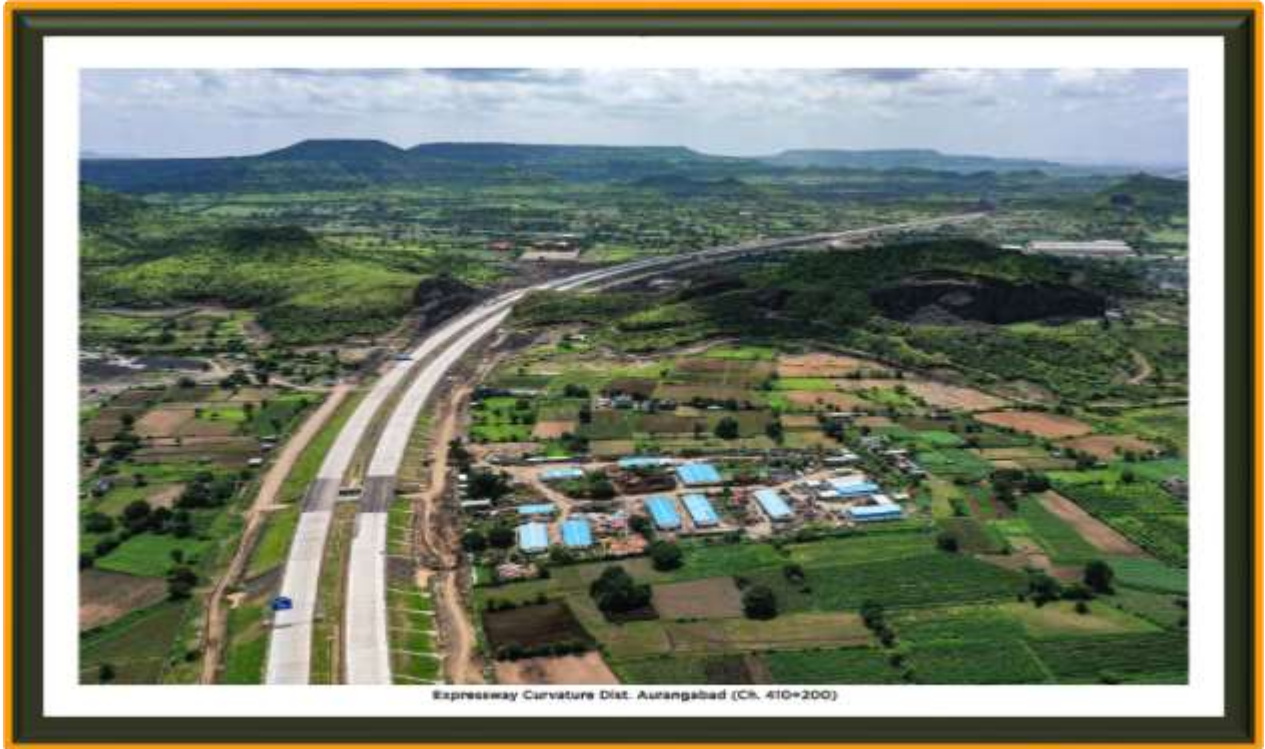
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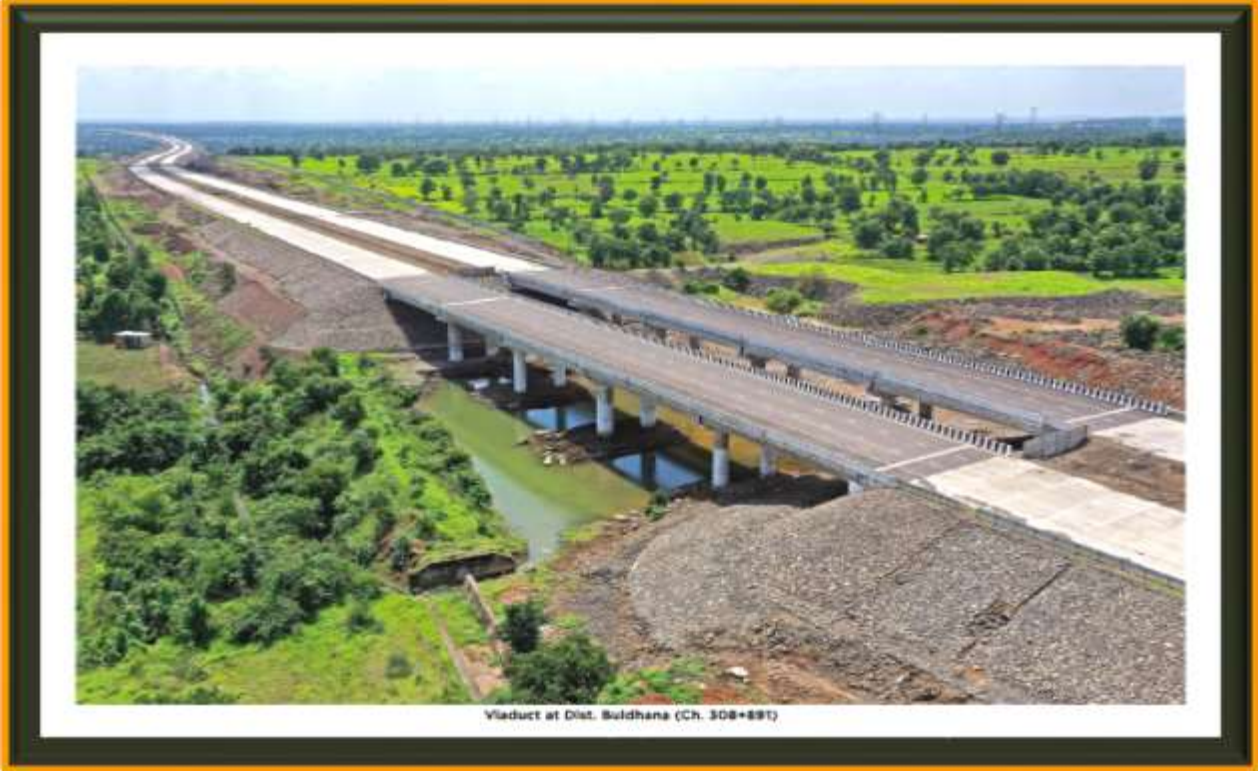






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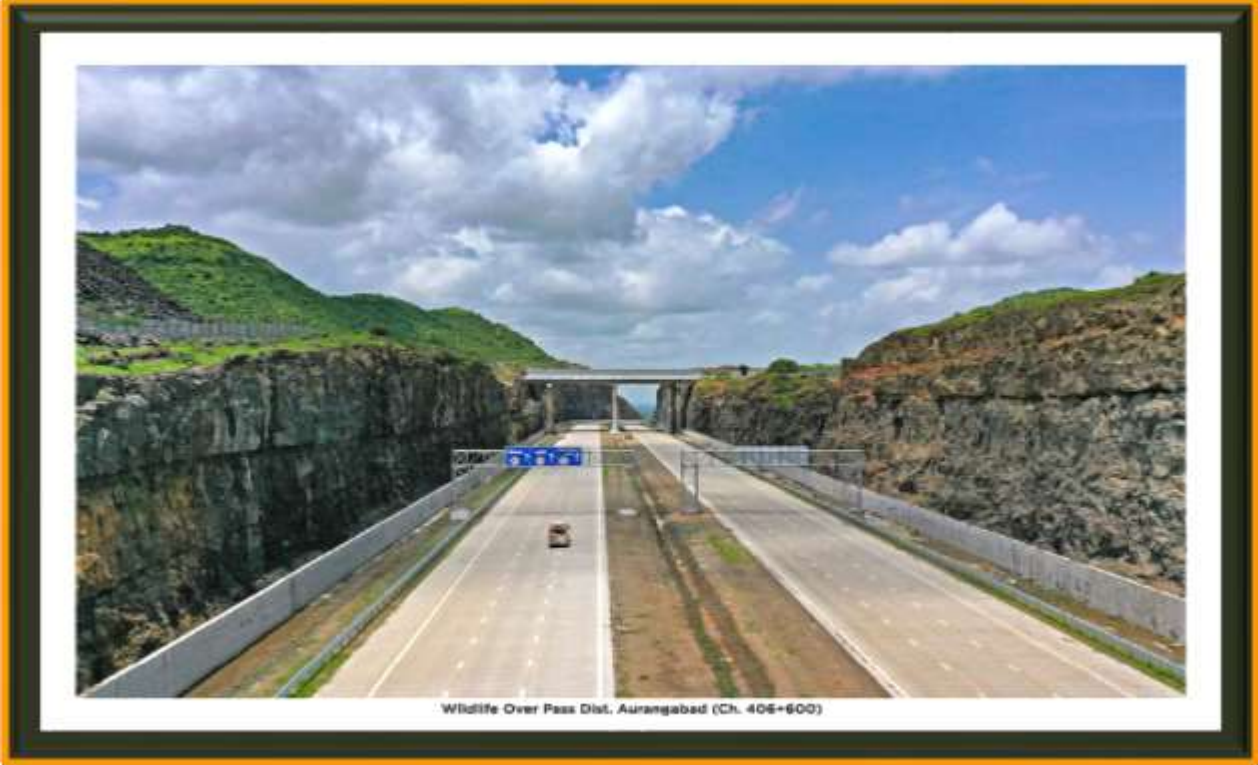
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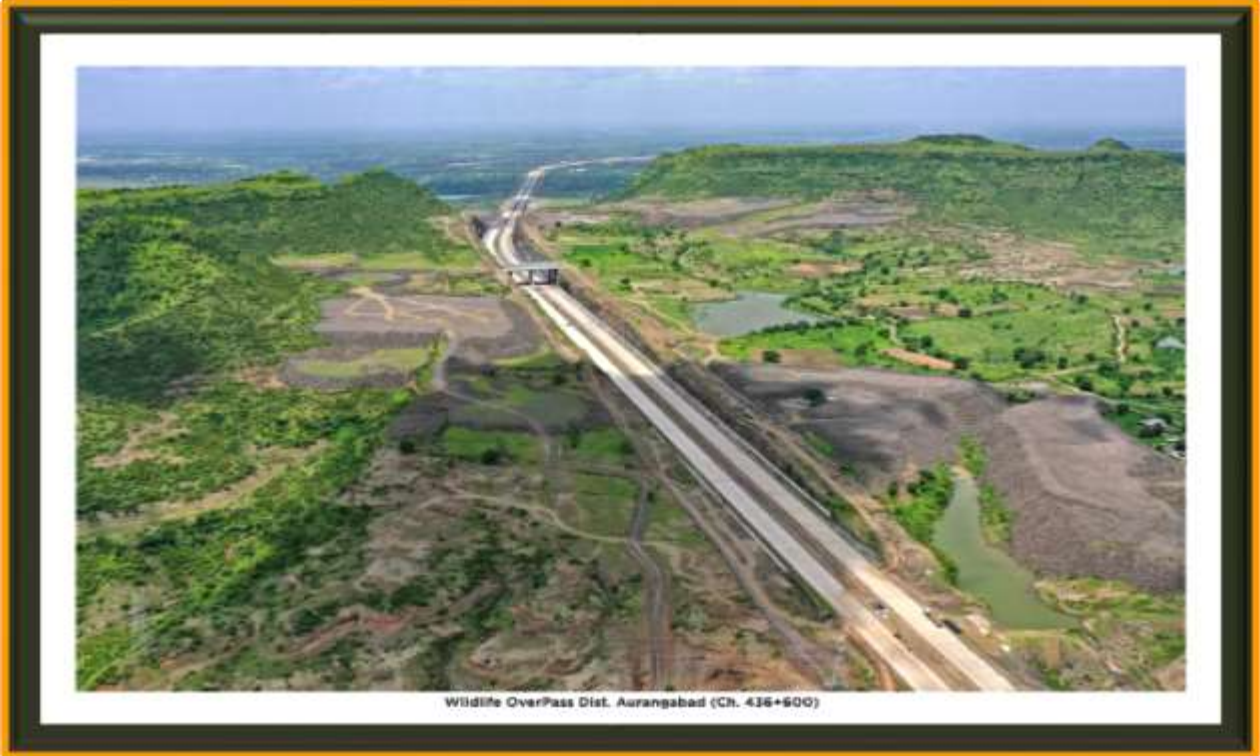
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<u>Construction Package No.: 07</u>	<u>MPR NO.: 30</u>		
			

**Recommended Suggested Exemplified/  
 Demonstrated/ Validated Role and Significance of  
 Multiple – Construction Infrastructure Development  
 Activities in Civil Engineering “(GOOD  
 ENGINEERING PRACTICES)” GEP... Including All  
 Categories of Structures, Like Buildings, Roof Top  
 Gardens, Rivers, Lakes, Ponds, Roads, and Bridges  
 with Neat, Clean, and Luxurious Green “NATURAL  
 ECOSYSTEM AND ATMOSPHERIC  
 ENVIRONMENT”...!!!**

