PROJECT DESCRIPTION

1. INTRODUCTION

National Highways Authority of India (NHAI) is engaged in the development of National Highways. As a part of this endeavor, NHAI has decided to upgrade and strengthen the existing two lane State Highway MSH-3 between sections Ausa – Waranga Phata and Wardha – Butibori into 4 – lane configuration. In this regard, NHAI retained the services of M/s. Aarvee Associates Architects Engineers & Consultants Pvt. Ltd. for preparation of the Detailed Project Report for upgradation and strengthening of the existing two lane State Highway MSH-3 between sections Ausa – Waranga Phata and Wardha – Butibori into 4 – lane configuration. The different stretches of the project road that are proposed for the above said development are:

PROJECT STRETCH

S. No	Section	Chainage	NH No	State
1	Ausa – Waranga Phata	Km.470.000 to Km.611.200	361	**Maharashtra**
2	Wardha – Butibori	Km 80.000 to 28.800		

2. LOCATION OF THE PROJECT AREA

MSH-3 originates from Ratnagiri and passes through several districts of Maharashtra like Kolhapur, Sangli, Solapur, Tuljapur, Ausa, Nanded, Hingoli, Yeotmal, Wardha and terminates at Nagpur, having overlaps with several NH and other State Highways.The National Highway No. 361 startes at Tuljapur and passes important towns Ausa, Latur, Chakur, Sirur Tajband, Ahmedpur, Loha, Nanded, Hadgaon, Umerkhaed, Mahagaon, Arni, Yavatmal, Kalamb, Deoli, Wardha and ends at Butibori on NH-44. The section-I of the the project highway starts at Ausa (Km 470.000 on MSH3) run across the districts of Latur, Nanded and Hingoli and ends at Waranga Phata (Km 611.200 on MSH3). The Section – II Starts at Butibori (Km 28.800 on MSH3) in Nagpur district and ends at Wardha (Km 80.000) in Wardha District. The entire project stretch passes through 5 districts

S. No	Section	Chainage	Length	Geo Co.ordinates	
				From	To
1	Ausa – Waranga	Km.470.000 to Km.611.200	194.7	657890.3496 E, 2016206.4939 N	752968.7121 E 2150335.5067 N

AUSA – WARANGA

The Section starts at Km 470.00 at Ausa and traverses through Latur, Latur Road, Chakur, Shirur Tajbund, Ahmedpur, Malegoan, Loha, Nanded and ends at Km 611.200 at Waranga Phata. The project stretch constitute of 6 lane, 4 lane and 2 lane flexible pavement with paved & earthen shoulders, where the stretch is to be widened into four lane with 5.0m median width. The general terrain along the road is plain with intermittent stretches falling under rolling terrain. Most of the land use pattern falls under agricultural, built-up, and barren land. The pavement is entirely of flexible type with varying width from 6.7m to 7.1m in 2 lane, 15m to 22m in 4 lane and 30m to 33m in case of 6 lane and earthen shoulder width varies from 1.5m to 2.5m. The project crossing the Asna, Goadavari, Limoti and Majra and also it crosses many streams, and canals. The section passes through Latur, Nanded and Hingoli district. This section is having Latur bypass, Malegoan, Nanded and Ardhapur. it is observed that MSH-3 is overlapping with MSH-2 from Loha junction to Degloor Naka for a length of about 30km. Further, MSH3 is also overlapping with NH-222 (i.e. Nanded Bypass) for a length of about 15km and finally the overlapping with MSH-6 for a length of about 2 km is observed. The project stretch consists of one RUB, one ROB and five major bridges. The height of the embankment varies between 0.5m to 3m. There are 12 major junctions along the project stretch. The Index map of project stretch is shown in **Fig – 2.**

Start point of Ausa - Waranga

End Point of Ausa - Waranga

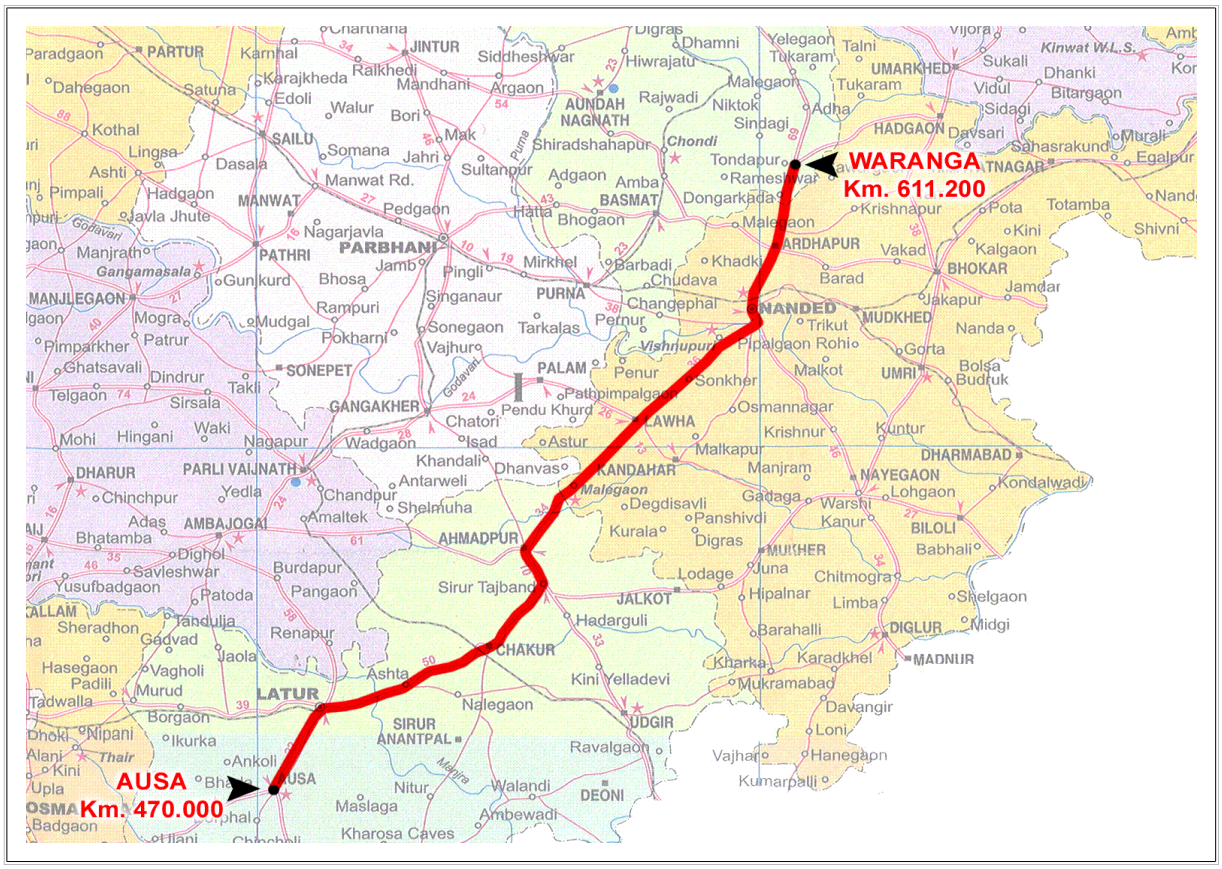

FIG – 2: Ausa – Waranga Section of Project Stretch

3. CLIMATE

The climate of the region is characterized as tropical. The climate, wind and wave pattern are governed by the annually changing monsoons and transition periods between them

dividing the year into four seasons as given below

Seasons of the region

Season	Months	Characteristics
Summer	March–May	Hottest part of the year, occurrence of dust storms
South-West monsoon	June–Sept	Characterised by predominantly SW winds. Generally strong and persistent winds prevail.
North-East monsoon	Oct-Nov	Characterised by predominantly NE winds. Fair weather with the variable winds.
Winter	Dec-Feb	Cool season of the year

Cyclonic storms/depressions do occur Maharashtra state mainly due to disturbances occurred in Bay of Bengal and partly due to disturbances occurred in Arabian Sea. However, the impact from these is minimal.

- The mean temperature of the area is 15°C minimum & 41°Cmaximum.
- The relative humidity of the area varies between 22% to 81%
- The wind speed normally ranges between 6.7Kmph to 19kmph and the wind direction is predominant in NE, W & NW directions.
- Maximum annual rainfall is received during the south-west monsoon season. July & August are being the peak rainy months. The average annual rainfall is 751.5 mm and 1087.7 mm in the south-east and north-east regions respectively.

In order to analyze the past meteorological and climatological data near to the proposed project site, data from India Meteorological Department (IMD)

Comparison of Mean Monthly Meteorological Parameters for IMD, Yavatmal Station (1931– 1960)

Month	Temperature (^{o}C)		Relative Humidity (%)		Wind Speed (Km/hr)	Wind Direction (Degrees)		Rainfall (mm)
	Max	Min	Max	Min	Mean	Predominant	Calm (%)	
January	28.7	15.4	50	31	8.2	NE, E	7.5	9.2
February	32.2	17.8	39	24	9.0	NE, E	5.0	6
March	36.4	21.6	33	20	9.8	NE, SW	4..5	17.7
April	39.9	25.3	32	19	11.4	NW, SW	3.5	15.8
May	41.8	27.8	37	20	15.6	NW, SW	1.5	21.0
June	36.7	25.1	67	48	19.0	NW, SW	1.5	174.2
July	30.7	23.0	84	71	17.6	W, NW	1.0	293.5
August	29.3	22.3	85	75	16.0	NW, SW	1.5	293.8
September	30.6	21.9	81	68	11.0	NW, SW	4.5	178.2
October	31.7	20.4	63	48	6.7	NE, N	9.5	48.9
November	29.7	17.2	51	40	6.8	NE, E	11.5	18.3
December	28.0	15.0	50	37	7.1	NE, E	12.0	11.1

4. TERRAIN

Terrain is classified by the general slope of the country across the highway alignment. The general topography of the area along the project corridor is a combination of plain and rolling terrain.

Type of Terrain	Ausa – Waranga Phata	Wardha-Butibori
	Percentage	Percentage
Plain	84	89
Rolling	15	11
Hilly	1	-

5. LAND USE ALONG THE PROJECT ROAD

The project stretch passes through important settlements like Ausa, Latur, Ahmadpur, Loha, Nanded, Ardhapur, Pavnar, Seloo, Kelzar, and Seldoh. The majority of adjoining land is agricultural area and built up sections. The important crop grown along the

project stretch are mostly cotton, Sugar cane, Soya bean in the Ausa to Waranga corridor and Cotton in the Wardha to Butibori corridor. The type of land use pattern that exists along the project stretch is presented in Table

Land Use Pattern

Type of Land Use	Ausa – Waranga phata	
	Percentage of Road length	
	LHS	RHS
Agricultural	53	49
Built-Up	19	22
Barren	28	29
Forest	-	-

6. VILLAGES AND TOWNS

Ausa – Waranga phata: This Section passes through important places like Ausa, Latur, Chakur, Ahmadpur, Loha, Nanded, Ardhapur, Waranga phata

the list of villages and their locations in each section are given below

List of Villages

S.no	Name of the village
Ausa - Waranga	
1	Ausa
2	Budhada
3	Peth
4	Chandeshwar
5	Kopegav
6	Wasangav
7	Latur
8	Maharana pratap nagar
9	Kalpa
10	Bathkheda
11	Mandhapur
12	Mahalangra

S.no	Name of the village
13	Ashta mode
14	Mahodar
15	Gharani
16	Latur road
17	Chakur
18	Chopari
19	Ajaniwadi
20	Ajani
21	Sirur tajbund
22	Ahmadpur
23	Marsoni
24	Sangvi
25	Malegaon

S.no	Name of the village
26	Landgdewadi
27	Malakoli
28	Khedkarwadi
29	Policewadi
30	Loha
31	Pardhi
32	Khanegar
33	Pimpalgaon
34	Ambesangavi
35	Sonekhad
36	Panapuri
37	Kuppasarawadi
38	Wadipati
39	Vishnupuri
40	Vasarani
41	Danyagaon
42	Wajegaon
43	Bandhar
44	Kamtha
45	Asna
46	Khadkuth
47	Bhokar phata

S.no	Name of the village
48	Ardhapur
49	Pardimaktha
50	Warud thanda
51	Dungarakhada
52	Bhategaon
54	Warangaphata

7. INTERSECTIONS

The project highway crosses National Highway, State Highways, Major District roads and village roads etc. The section wise details of intersections are given below:

Sl. No	Location (Km.)	Type of Juntion	Type of Road	Leads to
Ausa – Waranga Section				
1	470.000	T	SH 165	Nilanga
2	492.500	T	SH 145	Bhabulgaon
3	509.800	+	SH 168	Renapur/Udgir
4	542.700	Y	SH 217	Udgir
5	553.100	T	SH 156	Katkarwadi
6	584.100	+	SH 222	Gangakhed/Udgir
7	536.100 on MSH 2	+	-	Nanded/Hyderabad
8	249.000 on MSH 6	T	SH 148	Bhokar
9	263.000 on MSH 6	T	MSH 6	Vasmath
10	611.200	Y	-	Hingoli

The complete analysis of the turning movement surveys with the impact of each junctions is duly presented in the traffic report. It can be inferred that the traffic pattern at most of the major junctions changes significantly, delays at these junctions are longer than usual and hence need to be improved geometrically and should be developed in a way to accommodate all types of movements in an organised manner.

8. EXISTING ALIGNMENT OF PROJECT ROAD

It is observed that the project highway has a straight and curved alignment and traverses through plain and rolling terrain throughout its length. Part of the stretch is passing along hilly region and in the forest zones. All the horizontal curves confirm to acceptable geometric standards in terms of super elevation. The vertical gradients are not so gentle and the required sight distances are not available in Ausa to Waranga phata stretch as per the design standards. The project stretch has number of horizontal and vertical curves as the existing ground profile is uneven in nature. The geometric alignment of the prevailing project stretch may have been designed as per State Highway / MDR

standards and may not meet the present NH standards. The design is deficient in terms of sight distance, curve radii and super elevation at many of the locations. Further, there are various curves near to the village limits which might require improvement

9. EXISTING ROW

The Right of Way pillars were observed at few locations along the project stretch. The Right of Way details shall be ascertained from the revenue records to clarify on the exact land availability for construction. Based on the field verification the existing ROW is 32m-45m for the entire project road except in built-up area.

10. CROSS DRAINAGE STRUCTURES

As a part of upgrading of the project, it is required to make an assessment of existing structures with regard to their adequacies to ensure that they meet the objectives of the project. The existing structures in the project corridor comprise as follows:

- Major bridges
- Minor bridges
- Slab Culverts
- Hume Pipe Culverts

Structure	Pipe Culverts	Box & Slab culverts	Minor Bridges	Major Bridges
Ausa – Waranga	128	30	45	5

11. CONDITION SURVEY OF EXISTING STRUCTURES

The aim of carrying out the condition survey is to ascertain the condition of the existing bridges and their ability to ensure the safe and smooth movement of the traffic especially on the structural portion with or without widening. As a component of the condition survey, visual observations were made keeping in view the requirements of IRC: SP-35 and IRC: SP-40. Visual observations carried out during the condition survey were mainly made to find out the shortcomings / distresses in the structures listed above. In addition to the superstructures, RCC / masonry substructures were inspected to locate cracks and loose mortar in joints, especially for piers and abutments. Condition survey of the

existing bridges has been carried out by the Consultants' senior rehabilitation expert by visual inspection of various visible parts of the structures to observe the snags and to find out whether any sign of structural distress is exhibited in any of the bridges.The most commonly observed snag in RCC bridges/ structures are as follows:

- Cracking, cracks of different types
- Scaling
- Spalling of concrete
- Leaching
- Rust stain
- Delamination

Based on the inspection it is concluded that the most of the existing bridges are in good condition. With regular maintenance these bridges will perform well for a long time to come. However, due to any eventuality because of lack of maintenance or otherwise, affected portions of the structure can be repaired, strengthened or maintained. Some of the bridges needs to widened or repaired or rehabilitated due to structural or other consideration. The detailed description of every structure with its condition and recommendation is incorporated in the Bridge Inventoty and condition survey report.

There are 2 ROB's in Ausa – Waranga Section and 1 ROB, 1 RUB and 1 VUP in Wardha-Butibori Section. Also, for each pipe culvert an inventory cum condition survey sheet has been filled up after visual observation and measurement with tapes. The locations of the cross drainage structure as noted in the inventory sheet depended on the actual existant kilometer stones.Most of the existing pipe culverts are in good to fair condition and must be widened in order to meet the the project requirement. Most of the Slab culverts are RCC slab type with RCC/ PCC abutment and wing walls. The detailed condition of Pipe and Slab culverts are described in Bridge inventory and Condition survey report.

12. EXISTING BYPASSES

There are existing bypasses in project stretch which are summarized below.

S.no	Section	Chainage		Length in Km	Name of Village	Lane Configuration
		From	To			
1	Ausa – Chakur	487.0	492.8	5.8	Latur	6 lane Carriageway
2	Loha- Waranga	530.4	542.8	12.4	Nanded	4 lane Carriageway
3		591.600	596.6	5.0	Ardhapur	4 lane Carriageway

13. BYPASSES

Project road passes through some congested locations and built-up areas for which bypasses are proposed namely, Latur Road, Chakur, Shirur Tajbund, Ahmadpur, Loha in Ausa – Warangaphata.

Name of Bypass	Existing Chainage (Km)		Design Chainage (Km)		Length (km)
	From	To	From	To	
Chakur	520.790	528.200	106.830	114.600	2.350 4.150
Sirur Tajbund	541.375	544.660	127.830	132.390	4.560
Ahmadpur	549.110	554.290	136.880	141.100	4.220
Loha	585.810*	589.200*/503.000#	171.490	176.800	5.310
	589.200*/ 503.000#	504.000#			