

Environment and Social Due Diligence Report

September 2014

IND: Accelerating Infrastructure Investment Facility in India –Chetak Tollways Ltd.

Prepared by

India Infrastructure Finance Company Limited for the Asian Development Bank

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INDIA INFRASTRUCTURE FINANCE COMPANY LIMITED

ENVIRONMENT AND SOCIAL SAFEGUARDS DUE DILIGENCE REPORT

OF Chetak Tollways Ltd



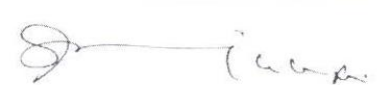


Sub Project: Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

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ENVIRONMENT AND SOCIAL SAFEGUARDS DUE DILIGENCE REPORT

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CONTENTS

ENVIRONMENT AND SOCIAL SAFEGUARDS DUE DILIGENCE REPORT.....	2
PROJECT BACKGROUND:	8
1. PURPOSE OF THE REPORT:	9
2. SUB-PROJECT TITLE:	9
3. SUBPROJECT SCOPE	9
4. SUBPROJECT DESCRIPTION:	9
5. ALTERNATIVE ANALYSIS	12
6. PROJECT ADMINISTRATIVE DETAILS:.....	14
7. DEBT COMPONENT OF THE PROJECT:	15
8. CONCESSIONAIRE:	15
9. EPC CONTRACTORS:.....	15
10. INDEPENDENT ENGINEER:.....	15
11. LENDER’S ENGINEER:.....	15
ENVIRONMENTAL SAFEGUARDS.....	16
12. AVAILABILITY OF EIA/EMP REPORTS:.....	17
13. ENVIRONMENTAL SENSITIVITY AND DUE DILIGENCE:.....	17
14. CATEGORIZATION OF SUB-PROJECT:.....	18
15. STATUS OF REGULATORY CLEARANCES:	18
16. PUBLIC CONSULTATIONS AND PUBLIC HEARINGS:	19
17. ENVIRONMENT AND SAFETY CLAUSES IN CONCESSION AGREEMENT.....	20
18. ENVIRONMENT AND SAFETY CLAUSES IN EPC CONTRACT	20
19. EMP IMPLEMENTATION BUDGET:	21
20. ENVIRONMENT MANAGEMENT PLAN (EMP) IMPLEMENTATION:	21
21. CONCESSIONAIRE AND EPC CONTRACTOR’S HSE PLAN.....	21
22. ENVIRONMENTAL MONITORING:.....	22
23. INSTITUTIONAL FRAMEWORK FOR EMP IMPLEMENTATION:.....	22
24. SITE VISIT:.....	22
25. CONCLUSIONS AND RECOMMENDATION:	23
SOCIAL SAFEGUARDS	25
26. METHODOLOGY FOLLOWED DURING SSDDR:.....	26
27. SOCIAL SAFEGUARDS COMPLIANCE REVIEW:.....	26
27.1. Minimization of social impacts:	26
27.2. Bypass:	26
27.3. Realignment:.....	26
28. PUBLIC CONSULTATION:	27
29. LAND ACQUISITION IN THE SUB-PROJECT:.....	29
30. RESETTLEMENT IMPACT IN THE SUB-PROJECT:	29
30.1. Impact on Project Affected People.....	30
30.2. impacts on TRIBAL population.....	30
30.3. Impact on structure:	30
30.4. Impact on Common property Resources (CPR):	32
30.5. Village level public Interaction.....	32
31. COMPENSATION AND ENTITLEMENT:	32
32. MONITORING AND EVALUATION:.....	32
33. LABOUR HEALTH, SAFETY, HYGIENE OF CONSTRUCTION WORKERS:	32
34. EMPLOYMENT GENERATION AND INCOME RESTORATION:	33
35. CSR ACTIVITIES UNDERTAKEN:	33

36.	DISCLOSURE:	33
37.	SITE VISIT OBSERVATIONS:.....	33
38.	CONCLUSION AND RECOMMENDATIONS:	34

LIST OF TABLES

Table-1: Project Length of NH-79 and NH-113	9
Table-2: Bypasses Detail of the project	10
Table-3: Project Salient Features	10
Table-4: “With” and “Without” Project Scenarios	13
Table-5: Administrative details of the project:	14
Table-6: Status of Regulatory Clearances Obtained.....	18
Table-7: Discussions and suggestions rose during the design stage of the project	27
Table-8: Summery of Land acquisitions	29
Table-9: Number of PAPs along the Project Road (NH-79).....	30
Table-10: Number of PAPs along the Project Road (NH-113).....	30
Table-11: Ownership of the Properties affected (NH-79).....	30
Table-12: Ownership of the Properties affected (NH-113).....	31
Table-13: Employment generated during construction stage of the project	33

LIST OF FIGURES

Figure-1: Project Location Chetak Tollways Ltd	12
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APPENDICES:

Appendix-I-EIA-EMP Report	Appendix-II-Environmental Clearance
Appendix-III-Forest Clearance	Appendix-IV-Water drawing permissions
Appendix-V-Consents and Approvals	Appendix-VI-Concession Agreement
Appendix-VII-CTL- EPC Agreement	Appendix-VIII-Pollution Control Measures
Appendix-IX-Traffic Management Plan	Appendix-X- Organization Chart
Appendix-XI- Public Hearing Details	Appendix-XII-RoW Handover Letter
Appendix-XIII- CSR activity done by the foundation	

ABBREVIATIONS

ADB	:	Asian Development Bank
CA	:	Concession Agreement
CTL	:	Chetak Tollways Ltd
CoI	:	Corridor of Impact
CSR	:	Corporate Social Responsibility
DBFOT	:	Design, Built, Finance Operate and Transfer
DG	:	Diesel Generator
EIA	:	Environmental Impact Assessment
EMP	:	Environmental Management Plan
EPC	:	Engineering Procurement and Construction
EPFO	:	Employees' Provident Fund Organization
ESDDR	:	Environmental and Social Due Diligence Report
IIFCL	:	India Infrastructure Finance Company Limited
GoI	:	Government of India
LHS	:	Left Hand Sight
LIE	:	Lenders Independent Engineers'
MoEF	:	Ministry of Environment and Forestry
MP	:	Madhya Pradesh

NH	:	National Highway
NHDP	:	National Highway Development Plan
NOC	:	No Objection Certificate
PAPs		Project Affected Persons
PPP	:	Public Private Partnership
RHS	:	Right Hand Sight
RAP	:	Resettlement Action Plan
RoW	:	Right of Way
SDDR	:	Social Due Diligence Report
TDP	:	Tribal Development Plan

PROJECT BACKGROUND:

1. PURPOSE OF THE REPORT:

1. This Environmental and Social Due Diligence Report (ESDDR) has been carried out by India Infrastructure Finance Company Limited (IIFCL) in consultation with the Concessionaire, Chetak Tollways Ltd (CTL) to assess the adequacy of the project with the applicable national safeguard compliance status. The report has been prepared as per the documents/information received from the concessionaire, the site visit observations and discussions with the concessionaire. In order to be eligible for funding from the ADB, IIFCL has prepared the Environmental and Social Due Diligence Report (ESDDR) for the sub-project on behalf of the concessionaire CTL. All the information given in the ESDDR is agreed and confirmed by the Concessionaires.

2. SUB-PROJECT TITLE:

2. Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB.

3. SUBPROJECT SCOPE

3. Public Works Department (PWD), Rajasthan, has awarded the Concession to Chetak Tollways Pvt. Ltd. for 4- laning of NH-79 from Chittorgarh to Neemuch (MP Border), starts from km 183+000 and ends at km 221+400 by Four Laning and 2- laning of NH-113 from Nimbahera to Pratapgarh Section starts from km 0+000 and ends at km 80+000 in the State of Rajasthan. construction and /or rehabilitation of major bridges, minor bridges, culverts, pedestrian under pass, vehicular under pass, foot over bridge, box culverts, pipe culverts, truck/bus lay bay, road intersections, interchanges, drains, etc. and operation and maintenance thereof by the concessionaire. The project has been allotted to the concessionaire for the concession period for duration of 19 years (including the construction period of 730 days) from the date of appointment.

4. SUBPROJECT DESCRIPTION:

4. NH-79 Chittorgarh to Nimbahera, proposed to widen the alignment to 4-lane carriageway with granular shoulder, configuration with each carriageway 7.25m width with 4.50m median, shoulders at the outer edge 2.5 m width i.e. 1.50m paved shoulder and 1.0m granular shoulder. NH-113 Nimbahera to Pratapgarh, proposed to widen the alignment to 2-lane carriageway with Granular shoulder, configuration with carriageway 7.00m width, shoulders at the outer edge 2.5 m width. The total length of the main carriageway of the project road as involves in NH-79 and NH-113 as provided in **Table-1**:

Table-1: Project Length of NH-79 and NH-113

Stretch	NH	Existing	Proposed	Total Km.
Chittorgarh-Neemuch, Rajasthan	79	Two-lane	Four-lane	44.082 Km
Nimbahera-Pratapgarh, Rajasthan	113	Single lane	Two lane	72.915 Km

			Total	116.997 Km
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5. Considering the safety of local people and to facilitate the movement of the local traffic at urban and semi urban locations, underpasses, total length of 19.434 Km of services road with 7.0 m width of carriageway on NH-79 and 2.400 Km on NH-113, bus bays and truck lays have also been proposed on the project road. Total 6 Nos. of village underpasses, 2 Nos. of truck lay bays at NH-79 and NH-113 each and 46 Nos. bus bays and bus shelters on NH-113 have been proposed in the project road.

6. In urban areas, as Shamabhupura, Bari and Chotti Sadari the existing RoW is very less and having congested area, therefore three bypasses have been proposed, one bypass at NH-79 and two bypasses at NH-113. The detail of proposed bypasses have given in **Table:-2**

Table-2: Bypasses Detail of the project

Section	Bypasses	Existing Chainage (Km)		Existing Length (Km)	Design Chainage (Km)		Proposed Length (Km)
		Start	End		Start	End	
Section-I (NH-79)	Shambhupura	194.450	197.000	2.550	194.450	198.000	3.550
Section II (NH-113)	Bari	13.000	15.600	2.600	13.300	15.575	2.275
Section II (NH-113)	Choti Sadri	24.550	31.500	6.950	24.475	30.000	5.525
Total				12.100			11.350

7. The proposed widening and strengthening works would mainly involve: Toll Plazas, roadside furniture, pedestrian facilities, landscaping and tree plantation, truck lay bays, bus-bays and passenger shelters, cattle crossing / underpasses (vehicular) /flyovers, highway lighting, administrative, operation and maintenance of base camp, vehicle rescue posts, telecom system and highway traffic management systems. The project salient features and the project location are given in below **Table-3 & Figure-1** respectively.

Table-3: Project Salient Features

Particulars	Project Road
Concessionaire	Chetak Tollways Ltd.
Project Road	Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis
Length	116.997 Km. (44.082 Km. of NH-79 and 72.915 Km. of NH-113)

Terrain	Entire Project Highway NH – 79 passes through plain terrain & NH – 113 passes through Plain & Rolling terrain
Service Road	Total length of 19.434 Km of services road with 7.0 m width of carriageway on NH-79 and 2.400 Km on NH-113
Bypass	Two bypass at NH-79 (one existing) and two Nos. of bypasses at NH-113 total Km. of 11.350 Kms.
Major Bridges	6 Nos. at NH-79 (1No. for repairing,3Nos for reconstruction and 2Nos for widening and rehabilitation) and 1 No at NH-113 For repairing and strengthening.
Minor Bridges	5 Nos.at NH-113 for new construction and 15 Nos. for widening and rehabilitation
Railway Over Bridge	2 Nos. at NH-79
Intersections and Junctions	There are 34 nos. exist on NH-79 and 62 nos. on NH-113.
Box/Slab Culverts	36Nos on NH-79 and 89 culverts on NH-113.
Truck lay-byes	4Nos. at NH-79
Bus bays & Bus shelters	46 Nos. at NH-113.
Toll Plaza	Four Nos. (Two Toll plazas on NH-79 and Two on NH-113)

Source: EIA Report

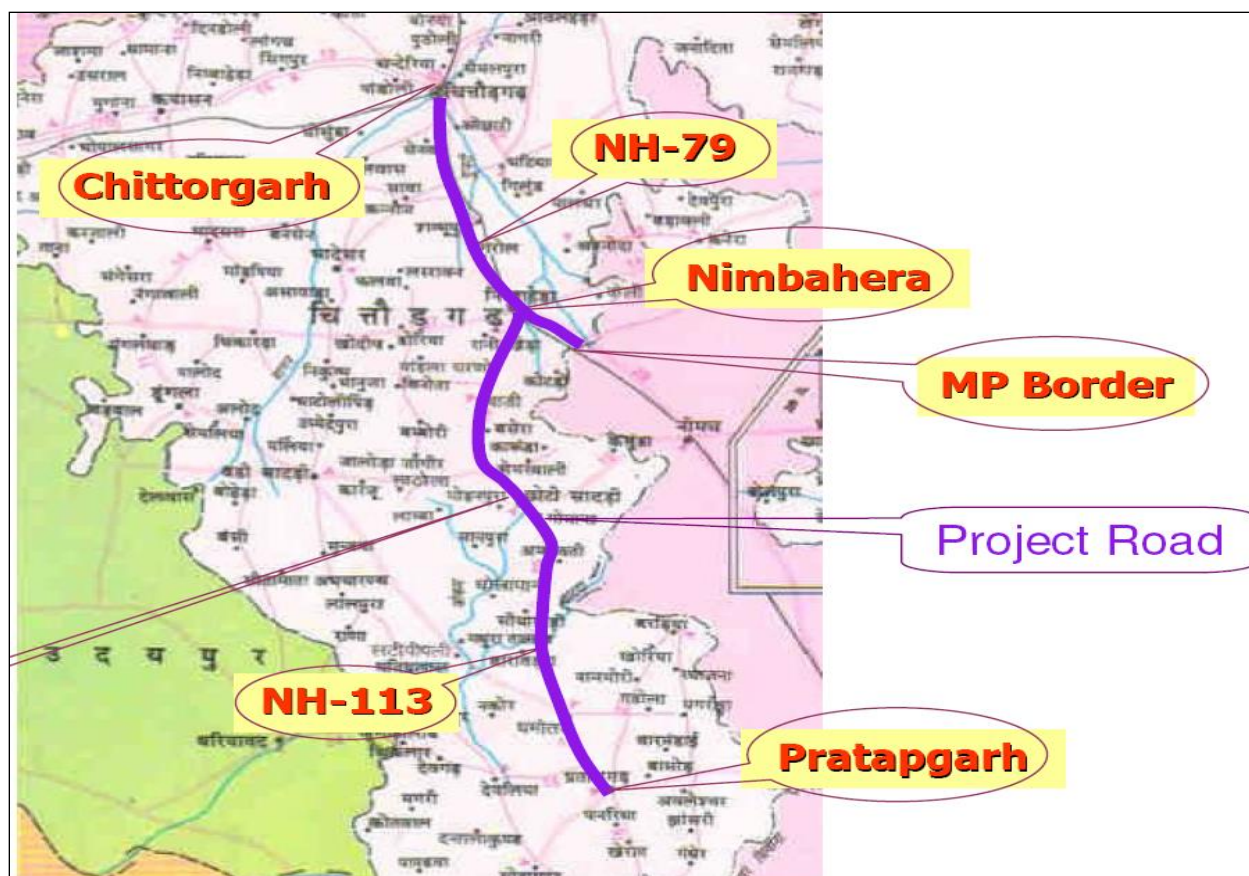


Figure-1: Project Location Chetak Tollways Ltd

5. ALTERNATIVE ANALYSIS

8. The analysis of alternatives is carried out to find the least cost option with regards to socio-economic and environmental consequences to each alternative and the cost attributed to it. On the basis of analysis that “without” project scenario will do more harm than the benefits in terms of the biological and socio-economic environment of the project region as compared to “with” project scenario. Hence the “with” project scenario with minor reversible impacts is an acceptable option for the project section. A comparative assessment of the ‘With and Without’ project scenarios are presented in **Table:-4**.

Table-4: “With” and “Without” Project Scenarios

Scenario type	Long-term scenario “with” project	Long-term scenario “without” project
Flora	About 7521 numbers of trees within ROW need to be felled, however, through compensatory afforestation @ 1:3 will again improve the greenery of the area.	No change in vegetation and number of trees.
Social and Cultural Environment	100 community properties will be partially affected due to proposed widening. Total land acquisition will be 575.906 ha. Major land use affected will be agricultural. Use of open / barren land has reduced acquisition in other areas.	Along the road side many community properties are present. No change in land acquisition and cultural properties.
Topography and Soils	No major change in topography and soils, however, better road will reduce soil erosion and dust	Further deterioration in present conditions
Highway Geometrics	Divided four lane carriageway with geometric improvements	Two-lane highway with poor geometrics.
Speed	80 kmph in urban sections 100 kmph in rural sections	20-30 kmph in urban sections 50-60 kmph in rural sections
Safety	Along the settlement stretches with significant pedestrian traffic, sidewalks have been provided. Improved road safety since all inadequacies of road will get corrected and overall safety of corridor will be significantly increased.	On the present road accidents are common and in future they will be gradually increased.
Drainage /Water logging	Will be improved due to reconstruction of culverts/bridges with adequate hydraulics.	No changes in present problems associated with inadequate drainage. Possible weakening and damage to existing drainage structures causing further damage to the road.
Environmental Quality	Provision of bypasses around the major settlements improves environmental quality within the urban areas due to lowered pollution levels and relieving of congestion	Present environmental quality is poor due to congestion and high emission levels because of slow movement of traffic. A further deterioration is expected due to increase in traffic volumes and further congestion.
Road side Amenities	Appropriate road side amenities to be provided at various locations along the corridor.	Not adequate

Scenario type	Long-term scenario “with” project	Long-term scenario “without” project
Wayside Facilities	Wayside facilities proposed at several locations, where necessary – like rest areas, with appropriate facilities for recreation, highway public telephones etc.	Not of adequate standards, quality and number
Financial Implications	Total project cost is 511.29 Cr.	No capital costs. However, increasing road maintenance and vehicle operating costs as road deteriorates and as travel times increase.

Source: EIA Report

6. PROJECT ADMINISTRATIVE DETAILS:

9. The administrative and financial details of the project as follows in the below **Table-5**:

Table-5: Administrative details of the project:

Sl. No.	Description	Project Data
1	Client	Public Works Department, Rajasthan,
2	Total Project Cost	Rs. 577.08 Cr
3	EPC Contractor	M/s Chetak Enterprises Ltd.
4	EPC Cost	INR 514.10 Cr.
5	Independent Engineer	M/s Consulting Engineer Group Pvt. Ltd.
6	Date of Concession Agreement	5th September 2012
7	Financial Closure	28th February 2013
8	Appointed Date	1st October 2014
9	Concession Period	19Years from the Appointed date including construction period of 730 days.
10	Lenders Independent Engineer	M/s SA Infrastructure Consultants Pvt. Ltd.
11	Ecologically Sensitive Area	The project road does not pass through National park/sanctuary/wildlife corridor/eco sensitive Zone.

Source: LIE Report: June 2014 and other relevant Documents.

7. DEBT COMPONENT OF THE PROJECT:

10. The debt¹ allocation to various banks and IIFCL for the proposed project is being financed by a syndication of loan with lead Bank State Bank of Bikaner and Jaipur (SBBJ). Chetak Tollway Ltd. has signed a common rupee loan agreement with consortium of five other lenders. The consortium of Lenders comprises State Bank of Bikaner and Jaipur (Lead Bank), India Infrastructure Finance Company Limited (IIFCL), State Bank of Patiala (SBOP), Dena Bank and Industrial Development Bank of India (IDBI). The total cost of the project is 577.08 Cr. The equity and debt component of the project is 153.08 Cr. and 424.00 Cr respectively.

8. CONCESSIONAIRE:

11. Public Works Department (PWD), Rajasthan, has awarded the Concession to Chetak Tollways Pvt. Ltd. for 4- laning of NH-79 from Chittorgarh to Neemuch (MP Border) and 2- laning of NH-113 from Nimbahera to Pratapgarh in the State of Rajasthan. The Concession Agreement was signed on 05th day of September 2012 between Public Works Department, Rajasthan and M/s. Chetak Tollways Pvt. Ltd. The financial close has been achieved on 28th February 2031.

9. EPC CONTRACTORS:

12. M/s. Chetak Tollways Ltd has signed the EPC contract agreement with M/s Chetak Enterprises Limited on 13th September 2013 and the EPC cost is Rs.514.10 Cr.

10. INDEPENDENT ENGINEER:

13. M/s Consulting Engineer Group Pvt. Ltd. has been appointed as the independent Engineer for the project.

11. LENDER'S ENGINEER:

14. M/s SA Infrastructure Consultants Pvt. Ltd. has been appointed as Lender's Engineer for the project M/s. Chetak Tollways Ltd. As per the Lender's Engineer report up to the month of May 2014 the physical progress achieved in NH-79 is 41.12%.

¹ The debt components of the lenders include SBBJ: Rs.100.00 Cr., IIFCL: Rs. 60.00 Cr., SBOP: Rs. 75.00 Cr., Dena Bank Rs. 95.00 Cr. and IDBI Bank: 94.00 Cr.

ENVIRONMENTAL SAFEGUARDS

ENVIRONMENTAL SAFEGUARD DUE DILIGENCE

12. AVAILABILITY OF EIA/EMP REPORTS:

15. The environmental impact assessment (EIA) study was carried out in accordance with requirements of Ministry of Environment and Forests (MOEF), GOI, guidelines for highway projects. As per stipulations of EIA notifications, 2006 of MoEF, and its subsequent amended the proposed Highway project was considered as Category A project. The Expert Appraisal Committee of MOEF held on 17-18 October, 2011 finalised ToR including conduct of Public Hearing. Draft EIA/EMP reports were prepared as per ToR. Public hearings were conducted as per MOEF's requirement on 08.11.2012 at Chittorgarh and 22.11.2012 at Pratapgarh. In general public welcomed the project and the major issue as discussed was compensation. Final EIA was prepared incorporating the proceedings of public hearings and submitted to MoEF for environmental clearance. On the basis of Expert Appraisal Committee recommendation environmental clearance was accorded by MoEF to the proposed project. Copies of the EIA/EMP reports are attached as **Appendix-1**.

13. ENVIRONMENTAL SENSITIVITY AND DUE DILIGENCE:

16. The project site was visited by the Environmental Safeguard Specialist of IIFCL along with the concessionaire's officials during 17-18 July, 2014 for field verification of environmental safeguards.

- Project Highway NH-79 (four laning) starts at Chittorgarh and end at Nimbahhera. The total length of the road under consideration is 44.082 km and it traverses through 21 villages of Chittorgarh district;
- Project Highway NH-113 (two laning) starts at Nimbahhera and end at Pratapgarh. The total length of the existing road under consideration is 80/000 km which starts at km 000/000 and ends at km 80/000 of NH-113. Total length of the project road is 72.915 km and it traverses through 36 villages two districts Chittorgarh and Pratapgarh;
- The area along project area represent mostly rural environment. Entire Project Highway NH – 79 passes through plain terrain & NH – 113 passes through plain & rolling terrain;
- To avoid dense habitation and ensure smooth, safe & uninterrupted traffic flow three By Passes have been proposed in Sambhupura, Bari & Chhoti Sadri;
- The project road does not pass through any protected area like Wildlife Sanctuary, National Park, Bio Reserve, etc.;
- Alternative analysis, with and without project scenario, have been provided in EIA report (Appendix-I);
- There are no known rare, threatened or endangered flora and fauna species reported in the area close to the corridor of impact (CoI) of the project road;
- 11.99 ha forest land is involved. The project road passes through forest area from km 45/280 to 48/950 in Barol block (length 3.670 km) and from 49/080 to 49/900 (length 0.82 km) in Kala Khat

block. Stage I clearance for forest land has been obtained under Section-2 of the forest (Conservation) Act, 1980 from regional office (Lucknow) of MOEF, GOI and Stage II clearance is expected shortly.

- About 7521 numbers of trees are likely to be felled. The tree cutting permission is already taken from the concerned authority. As compensatory plantations about 22570 saplings will be planted.
- There are no archaeological monuments and cultural sites of national importance within corridor of impact for the project;
- The project management team is in constant interaction with the affected community and conducting environmental awareness programmes regularly;
- Elaborate environmental management and monitoring activities are being conducted;
- Lined and earthen drains are being provided on either side of the carriageway at settlement areas rural areas, respectively. Additional culverts are also being built up. Hence, the drainage along the road will considerably improve.
- The concessionaire has undertaken implementation of environment management measures as per agreed EMP during the construction stage of the project.
- As part of EMP implementation, a provision of INR 2.3 Cr. (approx.) has been proposed.

14. CATEGORIZATION OF SUB-PROJECT:

17. The sub-project may be classified as Category B based upon the Asian Development Bank's policies on environment. This classification is based on the review of EIA/EMP and other available documents provided by the Concessionaire with respect to the environmental sensitivity due to project activities.

15. STATUS OF REGULATORY CLEARANCES:

18. It is required that the sub-project meets the requirements of appropriate State and National legislations by considering appropriate obligations and guidelines of Regulatory Authorities. The sub project needs to have necessary national and local environmental clearances as well as permits and approvals for project implementation and suitable environmental management. The statutory clearances required as part of the proposed strengthening of the sub-project has been assessed and current status of such clearances are given in **Table-6**.

Table-6: Status of Regulatory Clearances Obtained

Sl. No.	Clearances Required	Statutory Authority	Current Status of Clearance
1.	Environmental Clearance	Ministry of Environment and Forests, GoI, New Delhi	Environmental clearance has been accorded by MOEF vide F.No. 10 – 81/2011- IA – III dated 23.04.2013(Appendix-II).

2.	Forest Clearance	Ministry of Environment and Forests, Government of India	Stage I clearance for forest land has been obtained(Appendix-III) under Section-2 of the forest (Conservation) Act, 1980 from regional office (Lucknow) of MOEF, GOI vide letter No. 8B/Raj./06/05/F.C./1166, dated 04.10.2013 and Stage II clearance is expected shortly.
4.	Water Drawing Permission	Water Resource Department, Rajasthan	Permission has been obtained (Appendix-IV).
5.	Permission to Install & Operate	Rajasthan State Pollution Control Board	NoCs have been obtained for the installation and operation of Stone Crusher, Hot Mix Plant, DG sets, etc. (Appendix-V).
6.	Tree Cutting Permission	State Government	Permissions have been obtained (Appendix-V).
7.	Storage of Petroleum Product	Petroleum & Explosives Safety Organization, Ministry of Commerce & Explosives	Permissions have been obtained (Appendix-V).
8.	Borrow Area Permission	State Government	NoCs have been obtained (Appendix-V).

Source: Concessionaire and Field Observation

19. Copies of all relevant clearance, approvals and permits inkling permission from the Panchayat are attached as **Appendix-II to V**.

16. PUBLIC CONSULTATIONS AND PUBLIC HEARINGS:

20. The public consultations in the project area were held at various levels; Local level, and Block level, District level. The consultation program during project preparation was designed with the view to disseminate project information and to incorporate local peoples and PAPs opinion in mitigating negative impact on the population. The main objectives of the consultation program were to:

- educate the general public, specially potentially impacted communities/ individuals and stakeholders about the proposed project activities;
- familiarize the people with technical, environmental, social and economic issues of the project for better understanding;
- solicit the opinion of the affected communities/ individuals on environmental issues and assess the significance of impacts due to the proposed development;
- Identify the environmental issues relating to widening and strengthening of the road.
- secure people's inputs in respect of project design, selection of mitigation measures and

monitoring strategies;

21. The Rajasthan State Pollution Control Board has coordinated and arranged public hearings at Chittorgarh (Nimbhera) and Pratapgarh on 08.11.2012 and 22.11.2012, respectively. The meetings were attended by representatives from public, local bodies, farmers, etc. whose lives are likely to be impacted by the project. A team from the Consultant made presentation on salient features of the existing road and the new proposals of project to the participants at both locations. The meetings were well attended and held in congenial atmosphere. The participants appreciated the features of the widening proposals. Main issues raised from during public hearing meetings were compensation and safety. Details of Public Consultations and Public Hearings are provided in the EIA report (**Appendix-I**).

17. ENVIRONMENT AND SAFETY CLAUSES IN CONCESSION AGREEMENT

22. The Government of Rajasthan, Public Works Department (PWD) on behalf of Ministry of Road Transport & Highways, Government of India has signed concession agreements with M/s Chetak Tollways Limited. Copy of the Concession Agreement (CA) is attached as **Appendix-VI**.

23. Safety requirements are given under Article 18 in which it is specified that the Concessionaire shall comply with the provisions of agreement, applicable laws and applicable permits and conform to good industry practices for securing the safety of the users. In particular, the Concessionaire shall develop, implement and administer a surveillance and safety programme for providing a safe environment on or about the project roads and shall comply with the safety requirements set forth in Schedule L.

24. The Authority shall appoint an experienced and qualified firm or organization for carrying out safety audit of the Project Highway in accordance with the safety requirements and shall take all other actions necessary for securing compliance with the Safety Requirements.

25. As per Concessionaire Agreement all costs and expenses arising out of or relating to safety requirements shall be borne by the Concessionaire to the extent such costs and expenses form part of the works and services included in the scope of the project, and works and services, if any, not forming part of the Scope of the Project shall be undertaken in accordance with the provisions of Article 16.

18. ENVIRONMENT AND SAFETY CLAUSES IN EPC CONTRACT

26. The Chetak Tollways Limited has awarded the EPC works for this project to Chetak Enterprises Limited. Copy of the EPC Contract for this project has been attached as **Appendix-VII**. As per EPC Contract the Contractor shall take all times during implementation period be solely responsible adequacy, stability and safety of its operations of Project Road. The contractor will comply with and shall ensure that all of its employees agents and sub-contractors of any tier engaged in work at the site comply with the provisions of such safety regulations.

27. The Contractor shall at its own cost take all due precaution to ensure the health and safety of its staff and labours.

28. The contractor shall initiate, maintain and supervise all safety measures in connection with the works necessary to properly protect all persons in the proximity of the project facilities from injury and danger to the health and all property from damage or loss.

29. The Contractor shall never permit a hazardous, unsafe, unhealthy or unsound condition or activity

to be conducted at site.

30. The Contractor shall in discharging its responsibilities under the agreement comply with applicable environmental laws and requirements and shall also be responsible for adopting measures required to ensure compliance under environmental laws.

31. The Contractor shall take all reasonable precautions to avoid pollution or contamination of air, land or river and ground water arising out of the performance of the works.

19. EMP IMPLEMENTATION BUDGET:

32. As part of the project, detailed EMP measures have been undertaken including a budget of INR 2.3 Cr. (Approx.) for implementing the same. The EMP budget exclusively includes the following measures:

- Maintenance of air, noise and water quality;
- Monitoring of environmental parameters and preparation of compliance report;
- Sprinkling of water during construction;
- Tree-cutting and plantation of new trees;
- Health & safety;
- Training and awareness on health, safety and environment.

20. ENVIRONMENT MANAGEMENT PLAN (EMP) IMPLEMENTATION:

33. The environmental management plan(EMP) as appeared in the EIA is provided at Appendix-I. The EMP consists of a set of mitigation, monitoring and institutional measures to be taken during the design, construction and operational phases of the project to eliminate adverse environmental impacts, to offset them, or to reduce them to acceptable levels. The main aim of the EMP is to ensure that the various adverse impacts are mitigated and the positive impacts are enhanced. The EMP has proposed mitigation measures which are being adopted during the pre-construction and construction phases of the project. The EMP also elaborates on environmental monitoring program. The specific project pollution control measures also been prosed (**Appendix-VIII**). The mitigation measures adopted during construction and operations shall include the ambient air quality management; control of water pollution including treatment and water conservation; spill prevention and control; noise quality management from plant, machineries and vehicles and solid waste management, etc.

21. CONCESSIONAIRE AND EPC CONTRACTOR'S HSE PLAN

34. To ensure smooth, safe and uninterrupted traffic flow during construction in rural as well as in urban areas traffic management plan has been prepared (**Appendix-IX**). Safety management plan has been provided in the EIA (Appendix I) which addresses good industry practices with regard to worker safety and accident/hazard prevention at work site. Major objectives of developing such a plan is to specifically assess the risk associated with worker's safety and to suggest precautionary measures to avoid accidents; integrate safety with work practices; create safety awareness amongst every individual

associated with the project.

22. ENVIRONMENTAL MONITORING:

35. Monitoring of environmental quality during construction and operation reflects the success of implementation of the mitigation measures and it also provides a chance to review the suggested measure and improve upon the measures. The environmental monitoring is primarily the responsibility of the EPC contractor. Provision has been made to engage the service of a MoEF/NABL approved monitoring agency to oversee monitoring of air, noise, and water and soil quality. Presently, Nakshatra Enviro Services, Jaipur, a NABL accredited laboratory, is carrying out the monitoring work. Environmental quality monitoring should be carried out as described in the EIA/EMP report (sampling locations, parameters and frequency of monitoring).

23. INSTITUTIONAL FRAMEWORK FOR EMP IMPLEMENTATION:

36. The project institutional framework as given in the project EMP (Appendix- I) indicates that the overall implementation responsibility of the EMP lies with EPC contractor; Head (Project Manager) at site office assisted by two safety-in-charge and safety assistant/supervisor. The arrangement made for implementation of project including quality assurance, health, safety and environmental aspects is provided as **Appendix-X** (Organization Chart).

24. SITE VISIT:

37. A site visit was undertaken by IIFCL's Environmental and Social Safeguard Specialists along with the concessionaire's officials during 17 – 18 July, 2014. The concessionaire has appointed EPC contractor for execution of construction work. EPC contractor/subcontractor has mobilized sufficient staff for construction, survey and quality testing work together with plant, machinery and equipment. QA/QC Lab, stores, machinery, fabrication yard and work shop. During the site visit it has been observed that:

- Camp offices including toilets and mess facilities are well maintained. Base camp and labour camps construction completed. Good sanitation and proper hygiene is being maintained regularly. Monitoring is being done daily/weekly;
- First aid facilities are provided to camp offices;
- Water sprinkling facilities have been provided for suppression of dust in the premises and quarry access road;
- At construction plant sites, crushers have been provided with wind breaking walls and water sprinkler system and the Hot Mix Plants was provided with Bag House filter to control the air pollution;
- Flag men are provided at locations construction site and where tree cutting are in progress. Proper traffic diversions and appropriate signages are being provided at appropriate locations at the construction site for the convenience of road traffic;
- Workers are being provided with the required safety gears to be worn during execution of work;

- Necessary barricading and safety precautions are being ensured. Work safety signages have been provided in places where the construction work has begun;
- Retro reflective safety signs for work zone, men at work, go slow and cautionary signs are provided;
- Staff/labour accommodation facilities at camp sites have been provided with adequate drinking water, mess and sanitation facilities;
- Periodic environmental quality monitoring is being carried out by Nakshatra Enviro Services (a NABL accredited laboratory), Jaipur;
- Existing trees inside the camp area have been retained and new plantation activities inside the camp are in progress. Adequate number of saplings have already been arranged;
- Regular medium maintenance work is in progress;
- Construction works in the road section that passes through forest land have not commenced.

25. CONCLUSIONS AND RECOMMENDATION:

38. Based upon the available documents and site visit, it is concluded that the concessionaire through their EPC contractor has undertaken environmental safeguard measures. Safety-in-charge is posted at site, is responsible for the safety and environmental aspects of the project. He reports directly to the Project Manager. The sub-project has made sound progress. The conclusion for the sub-projects is given below:

- The project has been prepared by PWD, Rajasthan on behalf of Ministry of Road Transport & Highways, Government of India as per its own funding requirement and not in anticipation to Asian Development Bank's operation;
- Necessary permits/approvals, environmental clearances and forestry clearance (Stage I) for project implementation have been undertaken by the concessionaire. Stage II clearance is expected shortly. It has been confirmed by the subproject developer that the construction works in the forest area will start only after obtaining the requisite stage II (final) clearance;
- The proposed project does not affect any eco-sensitive zones as declared by MoEF. Also the project does not pass through any national park or wildlife sanctuary. No historical or archaeologically important monuments are also affected due to these sub-projects;
- Institutional arrangement is also being done for regular environmental management. EPC Contractor has engaged NABL accredited laboratory Nakshatra Enviro Services, Jaipur for carrying out the environmental parameters monitoring work;
- The proposed project may also has a positive GHG emission reduction due to less fuel consumption for the same traffic density;
- For road safety, IRC guidelines in respect of road signages, service roads bus bays, intersections, pedestrians crossing, etc. should be strictly adhered to;

- The solid waste generated should be used for rehabilitating the borrow area. Appropriate fencing all around the borrowed/excavated pit should be made to prevent mishap. Borrow pits and other scars created during the road construction should properly leveled & treated;
- Rainwater harvesting facilities including oil and grease trap should be provided as per approved plan;
- Based on the due diligence findings, it can be deduced that the sub-projects have no significant environmental safeguard issues;
- Monitoring of environmental parameters should be carried out as described in the EIA report and six monthly compliance report should be submitted to regional office of MOEF. Monitoring as well as compliance reports should also be submitted to IIFCL, New Delhi;
- Greenbelt should be developed as outlined in the EIA report;
- The Sub-projects, therefore, do not appear to involve any kind of reputational risk to IIFCL and the Asian Development Bank funding on environmental safeguards and is recommended for funding under the proposed head.

SOCIAL SAFEGUARDS

SOCIAL SAFEGUARD DUE DILIGENCE REPORT (SSDDR)

26. METHODOLOGY FOLLOWED DURING SSDDR:

39. The social safeguard due diligence study was carried out for the sub-project with the information and documents received from the concessionaire Chetak Tollways Ltd. (CTL), social due diligence for the subproject was initiated by IIFCL on behalf of the concessionaire CTL. The methodology followed during the preparation of Social Due Diligence Report (SDDR) is as follows:

- Discussion with the subproject developer regarding the implementation status and progress of the project before the site visit and during the site visit on 17th and 18th of July 2014;
- Some of the relevant documents relating to social safeguard have been reviewed, like Social Impact Assessment and Resettlement Action Plan (RAP) Social Impact Assessment and Resettlement Action Plan (RAP), Detail Project Report (DPR), Concession Agreement (CA), Engineering Procurement & Construction (EPC) Contract, Information Memorandum of the project, Lenders Independent Engineers (LIE) June 2014 and most of the applicable clearances/permits and No Objection Certificates (NoCs) applicable for the project.

27. SOCIAL SAFEGUARDS COMPLIANCE REVIEW:

27.1. MINIMIZATION OF SOCIAL IMPACTS:

40. While finalizing the road alignment efforts have been made by adopting appropriate engineering designs, to minimize resettlement impacts and additional land acquisition. To minimize displacement and to reduce disruption of livelihoods, concentric widening in village sections, bypasses to avoid settlement and raised carriageways have been proposed. Alternative analysis has also been adopted by keeping in mind the prime objective of reducing the displacement of the people and disruption of livelihoods as much as possible. To avoid the large scale acquisition of land in city areas like Chittorgarh, the widening work has been restricted to the existing RoW. Following efforts like bypass and realignments have been proposed to minimize negative social impact:

27.2. BYPASS:

41. In urban areas, at Shamabhupura, Bari and Chotti Sadari the existing ROW is very less and having congested area due to the connectivity of the other villages along the stretch, three new bypasses have been proposed, one bypass at NH-79 and two bypasses at NH-113.

27.3. REALIGNMENT:

42. Due to sharp curve on existing road and for better visibility and smooth motorable traffic in the project roads thirty seven realignment have been proposed. During the site visit it was informed that two realignments have been proposed on NH-79 and thirty five realignments have been proposed on NH-113.

28. PUBLIC CONSULTATION:

43. During the project planning and design stage public consultation in the project area was held at Local level, Block level, and District level. The consultation program during project preparation was designed with the view to disseminate project information and to incorporate the views of local people. In order to document the issues raised by the potential (Project Affected Persons) PAPs, public consultations at screening stage have been conducted at ten sensitive locations, with people of different categories and sections of society, principally with PAPs.

44. Moreover, public hearing was conducted at different locations, in respect of Environment Assessment for NH-79 and NH-113 at Panchayat Office on dated 08/11/2012 at Kumbha Nagar, Chitorgada the forwarding letter from District Collector, Chitorgarh and from state pollution control board for conducting public hearing is attached as Appendix-XI. Regarding the public hearing a notice was also been given for general people in a local Daily News Paper “The Aam Suchana”. The detail regarding Minutes of Public Hearing for both the sections, communication relating to Rajasthan Pollution Control Board, notice for conducting public hearing and public hearing related photographs is also given in **Appendix-XI**.

45. Some of the main issues as raised by the local people were related to Minimization of land acquisition, resettlement and rehabilitation options, service road provision at important junctions/intersections, wayside amenities and public services, provision of bypasses/geometric improvement of existing road wherever required, parking sites, process of shifting, religious and public services, adequate compensation of affected properties, efforts towards restoration of affected livelihood, unbiased and fair treatments with all categories of society and safety measures. Also providing employment opportunities to the local people during the construction and operation stage.

46. Few of the discussions and provision raised during the public hearing are briefed in Table-7 below.

Table-7: Discussions and suggestions rose during the design stage of the project

Sl. No.	Issue raised by	Suggestions Provided	Incorporation in design stage
NH-79 (Public Hearing was presided over by Additional District Collector, Chitorgarh held on 08/11/2012 at Panchayat Samiti, Nimbhada . The notification for conducting public hearing was published in the daily newspaper “The Dainik Vashkar” and” The Rajasthan Patrika” on dated 05/10/2012.			
1.	Sh. Pankaj Badla, Resident of Satkhanda	<ul style="list-style-type: none"> • He has given views that due to the infrastructure project the locality will develop as well as employment opportunity will generated by the project proponent. • Since he has also affected due to land acquisition, employment opportunity should be given to him or else to one of his family member 	Noted and employment opportunity is being provided by the Concessionaire.

Sl. No.	Issue raised by	Suggestions Provided	Incorporation in design stage
2.	Sh. Udit Mina, Resident of Jalia	Pedestrian under pass for the villagers	Noted and taken care by the concessionaire as per the design specification.
3.	Sh. Gopal Lal Anjana, Sarpanch, (Pradhan, Panchayat Sameet, Nimheda)	<p>The road infrastructure project will accelerate the development of the locality.</p> <p>As a representative of the locality, he support the project and the local people have no objection regarding the project.</p>	Positive response from the head of the Panchayat Sameet.
NH-113, Public Hearing was presided over by Additional District Collector, Pratapgarh on 22/11/2012 at Circuit House, Pratapgarh . The notification for conducting public hearing was published in the daily newspaper “The Dainik Vashkar” and” The Rajasthan Patrika” on dated 16/10/2012.			
1.	Sh. Mahesh Sharma, Journalist	<ul style="list-style-type: none"> • By showing his positive response towards the development activity, he has raised his concern about the ‘Dhomantar’ pond. • Provision of proper drainage facility; • Provision of emergency Health care facility to the road users. 	The authority has assured that there will be no impact on the pond.
2.	Sh. Sunder Lal, Tahasildar, Chotisadhdi	<ul style="list-style-type: none"> • He has shown his concern about the temple Ambadeep Mandir at Karunda Chouk 	Since, this temple is not coming within the RoW, so the authority has assured that there will be no impact on the temple.
3.	Sh. Rajesh Palibal, residence of Pratapgarh	<ul style="list-style-type: none"> • He has enquired about the RoW in city area; • He has also enquired about the land acquisition and compensation. 	<p>The RoW in village area will be 60 meters and in city area it will be 45 meters.</p> <p>Land acquisition and compensation will be paid by the competent authority.</p>

Source: Minutes of the public hearing

29. LAND ACQUISITION IN THE SUB-PROJECT:

47. As documented in the Gazette Notification- 3A, the total land required for the project is 575.906 Ha. Out of which 262.95 Ha. is required for NH-79 and 312.926 Ha of land is required for NH-113. The project has received Forest clearance of 11.99 Ha of land, the Forest Clearance certificate is attached in **Appendix-III**. The section wise detail summary of proposed land acquisition of the project is given in below **Table:-7**.

Table-8: Summary of Land acquisitions

Section	Activity	Land Acquisition (Ha)
NH-79	Bypasses	21.30
	Widening	241.65
	Total	262.95
NH-113	Bypasses	46.80
	Realignment	54.03
	Widening	212.126
	Total	312.926
Grand Total		575.906

Source: Detail Project Report

48. Land acquisition is being done by Public Works Department (PWD), Rajasthan, as per the applicable policy. The compensation for the loss of properties has been decided by the competent authority.

49. As per the concession agreement, the joint verification for encroach free land and Right of Way (RoW) hand over to the concessionaire the CTL by PWD, Rajasthan for the sub-project is given in **Appendix-XIII**.

30. RESETTLEMENT IMPACT IN THE SUB-PROJECT:

50. Though no separate Resettlement Action Plan (RAP) has been prepared but a short RAP including magnitude of social impact, a separate section has been prepared for this project which is a part of EIA/EMP report. The EIA/EMP report is prepared by Mantech Consultants private Limited, on behalf of Public Works Department (PWD), Rajasthan attached as **Appendix-I**. During the site visit it was informed that the rates have been taken into account from the Revenue Department on the basis of basic schedule rate prevalent in the locality which appears to be reasonable. The detail RAP including magnitude of social impact is given in Annexure 7A of the EIA/EMP report which is annexed as **Appendix -I**.

30.1. IMPACT ON PROJECT AFFECTED PEOPLE

51. There are 721 potentially affected people in NH-79 and 308 affected peoples in NH-113 along the proposed road project due to loss of structures only. The detail of number of PAPs enumerated during the project planning has been mentioned in **Table:-8&Table:-9**.

Table-9: Number of PAPs along the Project Road (NH-79)

Sl. No.	Particulars	Total
1	Male	375
2	Female	346
Total		721

Source: EIA

Table-10: Number of PAPs along the Project Road (NH-113)

Sl. No.	Particulars	Total
1	Male	163
2	Female	145
Total		308

Source: EIA

30.2. IMPACTS ON TRIBAL POPULATION

52. As information provided by the concessionaire the project does not disturb any tribal settlement and does not have any adverse impact or create any threat to the survival of any tribal community along the alignment, hence no Tribal Development Plan (TDP) is required to be prepared for this sub-project.

30.3. IMPACT ON STRUCTURE:

53. There are 114 properties likely to be affected in section-1 from Chhitorgarh to Nimbahera part of NH-79 and 47 properties likely to be affected in section-2 from Nimbahera to Pratapgarh part of NH-113 along the project route proposed for the widening. The details statuses of the properties which are likely to be affected in both the sections of NH-79 & NH-113 are given **Table:-10** and **Table:-11**. Further, for avoiding relocation of religious structures, concessionaire has saved two numbers of religious structures by slightly shifting road alignment (one on NH-79 & one on NH-113) the photo graphs of the temples are given on the cover page of the report (fourth and fifth).

Table-11: Ownership of the Properties affected (NH-79)

Sl. No.	Types Of Properties				
	Property Types	Properties	Left	Right	Total

1	Private	House	2	1	3
		Shops	4	2	6
		Building (Resi cum Commercial)	33	32	65
		Boundary/ Compound wall	13	5	18
		Water Tank	2	0	2
		Well/Tube Well	3	4	7
		Hotel/Dhaba	1	1	2
		Private Office	1	0	1
		Petrol Pump	1	1	2
	Total		60	46	106
2	Community	Hand Pump	2	3	5
	Total		2	3	5
3	Religious	Mosque	2	0	2
		Temple	1	0	1
	Total		3	0	3
Grand Total			65	49	114

Source: information received from the concessionaire

Table-12: Ownership of the Properties affected (NH-113)

Sl. No.	Types Of Properties				
	Property Types	Properties	Left	Right	Total
1	Private	House	2	1	3
		Shops	0	1	1
		Boundary wall	9	8	17
		Water Tank	2	10	12
		Well	5	3	8
	Total		18	23	41
2	Community	Hand Pump	0	3	3
	Total		0	3	3
3	Religious	Mosque	1	0	1
		Temple	-	1	1
	Total		1	1	2
4	Government	Police Station	1	0	1
	Total		1	0	1
Grand Total			20	27	47

Source: Source: information received from the concessionaire

54. The affected people are being compensated for loss of land and structures, according to the policies and procedures of Public Works Department (PWD), Rajasthan. The compensation for the loss of land has been paid by the competent authority considering the market value obtained from the Revenue Department of the state.

30.4. IMPACT ON COMMON PROPERTY RESOURCES (CPR):

55. As documented in the Table-10 and Table-11 there were five CPRs affected due to the project, which included two temples and three Mosques (two Mosques and a temple on NH-79 and a Mosque and a temple in NH-113). However, to minimize relocation of religious structures, concessionaire has saved two numbers of temple by slightly shifting road alignment (one on NH-79 & one on NH-113) the photo graphs of the temples are given on the cover page of the report (fourth and fifth).

30.5. VILLAGE LEVEL PUBLIC INTERACTION

56. As a part of goodwill gesture and to reach the affected villagers, public interaction exercises with the affected persons were carried out from time to time with the initiative of the Concessionaire. Some of these discussions were also attended by IIFCL's ESMU team during their site visits from 17th and 18th of July 2014. During this period, public discussions were held along the project road of the CTL covering villages including Narshakhedi, Basera, Karunda and Sarup Ganj the photo of the village level discussion was shown in the cover page of the report. During the meeting, it was observed that the villagers are generally in support of the project.

31. COMPENSATION AND ENTITLEMENT:

57. The land acquisition has been done by Public Works Department (PWD), Rajasthan and the compensation for the loss of properties is decided by the Competent Authority. The payment of compensation is done by PWD, Rajasthan as per the applicable policies.

58. The compensation of the land has been worked out after survey of the PAPs, verification of local market rates from local people and government rates prevalent in this area. Thus rate analysis was undertaken after verification of local market rates from local people and the government – registered prices were ascertained from the Registrar.

32. MONITORING AND EVALUATION:

59. On behalf of Public Works Department (PWD), Rajasthan the appointed Independent Consultant M/s Consultant Engineer Group Pvt. Ltd. is monitoring and submitting the quarterly compliance monitoring report to PWD, Rajasthan for the subproject which also includes the status of pending land acquisition.

60. On behalf of Lenders the Lenders Independent Engineer (LIE) M/s SA Infrastructure Consultants Pvt. Ltd is monitoring the financial as well as physical progress of the project and submitting the Monthly Report to the lenders.

33. LABOUR HEALTH, SAFETY, HYGIENE OF CONSTRUCTION WORKERS:

61. The EPC contractor Chetak Enterprises Ltd. Has obtained separate license for Employees' Provident Fund Organization (EPFO), Udaipur to cover its employ under provident fund for administrative convenience and to facilitate compliance in respect of recruited employees/ workers with effect from 14/07/2014. The detail of combined challan obtained by the company is given under **Appendix-II.**

62. The company has hired skilled and unskilled workers belonging to the project region. These workers have been provided with adequate safety measures such as safety helmets, safety boots, earplugs,

jackets and gloves. Facilities like onsite accommodation with basic amenities like water & toilets, transportation to work site and safety gears. Construction workers have also been provided with ready access to on- or off-site health care check-up facilities and provide first aid for minor injuries..

34. EMPLOYMENT GENERATION AND INCOME RESTORATION:

63. As informed by the concessionaire The Project road is expected to have a positive social impact on the surrounding village as well as the local people. The project has not only generate employment opportunity for the local unskilled labour but also provide employment to the skilled and semi-skilled labours in the area by getting jobs as supervisor, sub-contractors, driver, machine operators.

64. Further, in some cases like pan stall owners and other type of encroachers whose income source get disturbed due to the construction activity, the EPC contractor has employed such people in security, administration etc. Few Vehicles from the locality have also taken on hire basis from nearby villages. Even during operation phase, few numbers of persons will get employment opportunity in the four toll plaza. The labour employed in the project from the project affected area is given in below **Table-12**

Table-13: Employment generated during construction stage of the project.

Component	Local Labour employed	Total
Skilled	75	75
Semi-Skilled	85	160
Unskilled	80	240

Source: information provided by the Concessionaire

35. CSR ACTIVITIES UNDERTAKEN:

65. As information provided by the concessionaire, M/s Chetak Tollway Limited (the EPC Contractor) has under taken some of CSR activates during the construction and operation stage of the project. The EPC contractor celebrated its road safety week, blood donation camp, free medical check-up camp, health and hygiene awareness camps has also been under taken under CSR initiatives. The CSR initiatives have been undertaken by the foundation Harish Anjana Foundation and Harish Anjana Education Society of Chetak Enterprises Ltd. (CEL). The details of work done by the foundation were given in **Appendix-XIV**.

36. DISCLOSURE:

66. The final ESDDR report will be accepted and approved by the Concessionaire and endorsed by IIFCL. After getting the No Objection Certificate (NoC) from the ADB, the report will be uploaded for public disclosure in IIFCL's website Project developer's websites well as ADB's website.

37. SITE VISIT OBSERVATIONS:

67. A site visit was undertaken by IIFCL's Environmental and Social Safeguard specialists during

17th and 18th of July 2014 to review the implementation of the environment and social safeguards of the project. During the site visit it has been observed that:

- In the village and city area the covered drainage system is being provided;
- During the site visit it was told that there is no issues with relating to land acquisition and compensation;
- Concessionaire has saved one temple at start of Shambhupura bye pass by shifting the alignment of the main carriage, the photo of the same is given in the cover page of the report.
- To avoid disruption of livelihood in city areas like Chittorgarh, the widening work has been restricted to the existing RoW.
- The subproject developer has constructed 150 Meters of spillway wall of 'Murali Dam', which has been shifted 6 meters inwards from RoW with the help of Irrigation department;
- As informed by the concessionaire local labour has been employed for skilled, unskilled and semiskilled activities;
- As informed by the concessionaire, land acquisition has been done by the PWD, Rajasthan;
- Proper traffic diversions and appropriate signages are being provided at the site to prevent any disruption of life and the highway traffic.

38. CONCLUSION AND RECOMMENDATIONS:

68. Based upon the available documents and its review it is concluded that the concessionaire has undertaken adequate social safeguard measures for the implementation of the project. The conclusions for the sub-project is given below:

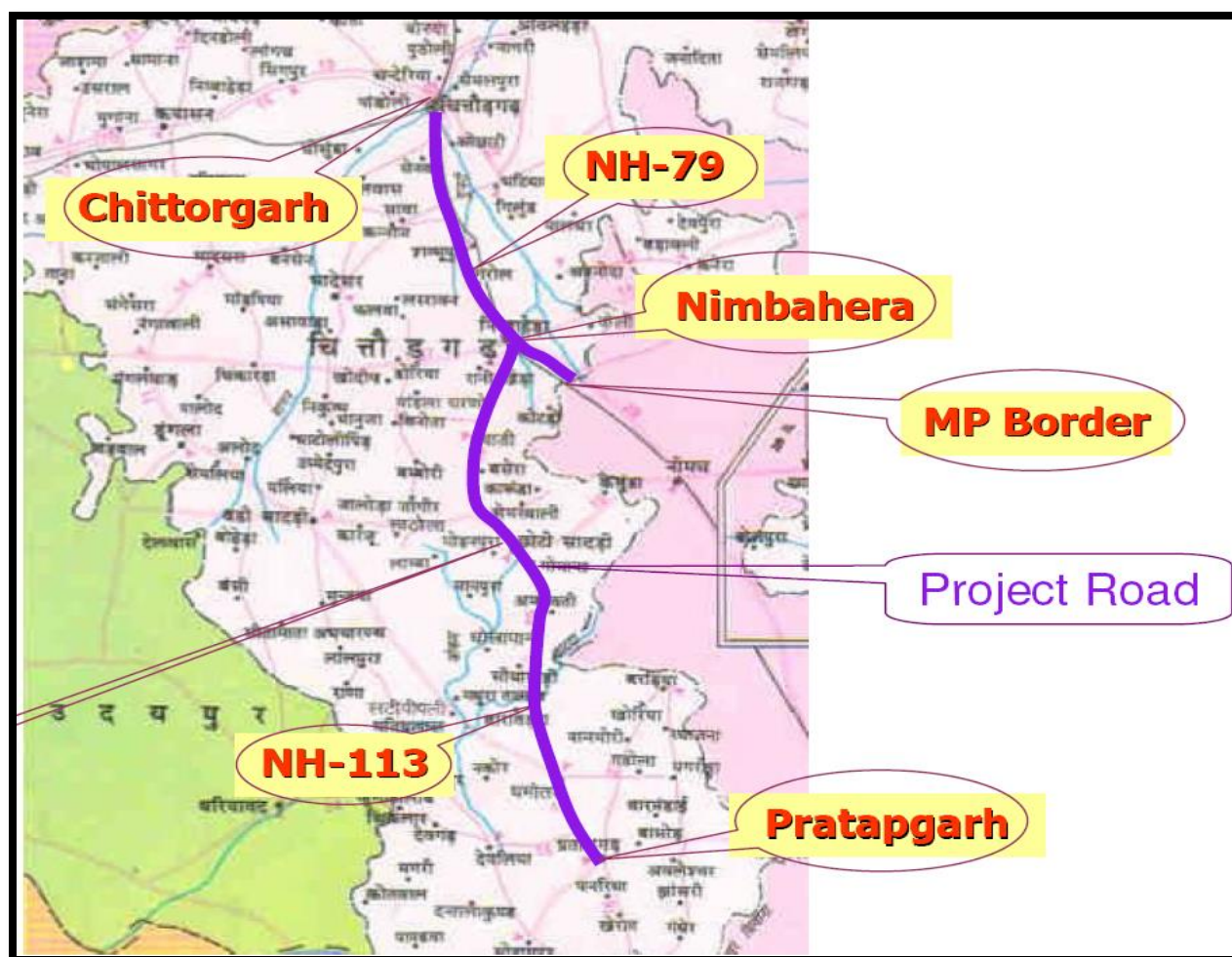
- The sub-project has been prepared by PWD as per its own funding requirement and not anticipation to ADB operation;
- Land acquisition has been done by PWD, Rajasthan and the compensation has been paid to the affected families before handing over the land to the concessionaire;
- As confirmed by the subproject developer that there are no encroachers and squatters are in both the section of the projects;
- Since, major portion of the Right of Way (RoW) was already available with the PWD, Rajasthan and the required RoW was free from encroacher and squatters. Moreover, this project is a linear project and land acquisition was carried out by PWD, Rajasthan in bits and pieces where required right of way was not sufficiently available;
- Hence, it is confirmed by the subproject developer through mail that no physical displacement was taken place in both the section of the projects.
- During the discussion, it was observed that people were generally in support of the project;

- Adequate measures have been adopted for the minimization of social impacts during the planning stage of the sub-project. The design has been finalized with due consideration so that the alignment do not pass through any congested settlement area;
 - Local people's view have been given due consideration during the project planning and designing of the project;
 - As a part of goodwill gesture and to reach the affected villagers, Public interaction exercises with the affected persons were carried out from time to time with the initiative of the Concessionaire. Some of these discussions were also attended by IIFCL's ESMU team during their site visits from 17th and 18th of July 2014.
 - With public consultation of the local people, the affected cultural properties are being relocated by the concessionaire;
 - Local labours are being engaged in the construction activities for skilled as well as unskilled activities;
 - Concessionaire has undertaken community development activities to benefit the local people;
 - Considering the socio-economic requirements of the project area it can be noted that the project would improve the quality of life for the rural population in the project area.
 - The Sub-projects therefore do not appear to involve any kind of reputational risk to IIFCL and the Asian Development Bank funding on environmental safeguards and are recommended for funding under the proposed project.
-

Public Works Department (PWD) Rajasthan

Development and Operation of NH-79 on Chittorgarh-Neemach (MP Border) Section (Km 183.000 to Km 221.400) by Four Laning and Nimbahera-Pratapgarh Section(Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis under NHDP-IVB

FINAL ENVIRONMENTAL ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN



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Table of Contents

S. No.	Chapter	Description	Page No.
1	EXECUTIVE SUMMARY		E-1 to E-12
2	CHAPTER – 1	INTRODUCTION	1-1 to 1-24
3	CHAPTER – 2	PROJECT DESCRIPTION	2-1 to 2-17
4	CHAPTER – 3	ANALYSIS OF ALTERNATIVES	3-1 to 3-7
5	CHAPTER – 4	DESCRIPTION OF THE ENVIRONMENT	4-1 to 4-31
6	CHAPTER – 5	ANALYSIS OF POTENTIAL ENVIRONMENTAL IMPACT & MITIGATION MEASURES	5-1 to 5-22
7	CHAPTER – 6	ENVIRONMENTAL MONITORING PROGRAM	6-1 to 6-22
8	CHAPTER – 7	SAFETY MANAGEMENT AND ADDITIONAL STUDIES	7-1 to 7-52
9	CHAPTER – 8	PROJECT BENEFITS	8-1 to 8-5
10	CHAPTER – 9	ENVIRONMENT MANAGEMENT PLAN	9-1 to 9-58
11	CHAPTER – 10	ENVIRONMENTAL BUDGET	10-1 to 10-7
12	CHAPTER – 11	DISCLOSURE OF CONSULTANTS ENGAGED	11-1 to 11-1

EXECUTIVE SUMMARY
IN ENGLISH

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	ES-1To ES-6
ES.1 INTRODUCTION	ES-1
ES.2 PROJECT DESCRIPTION.....	ES-1
ES.3 ANALYSIS OF ALTERNATIVES.....	ES-2
ES.4 DESCRIPTION OF EXISTING ENVIRONMENT.....	ES-3
ES.5 ANALYSIS OF POTENTIAL ENVIRONMENTAL IMPACT AND MITIGATION.....	ES-5
ES.6 ENVIRONMENTAL MONITORING	ES-5
ES.7 KEY ENVIRONMENTAL LAWS & POLICIES:.....	ES-6
ES.8 PROJECT BENEFITS	ES-6
ES.9 ENVIRONMENTAL MANAGEMENT PLAN.....	ES-6
ES.10 ENVIRONMENT BUDGET	ES-6
ES.11 DISCLOSURES OF CONSULTANT ENGAGED.....	ES-6
ES.12 CONCLUSIONS AND RECOMMENDATIONS	ES-7

LIST OF TABLE

Table ES-1: Inventory of Project Highway	ES-7
Table ES-2: Abstract of Cost Estimate	ES-7

LIST OF FIGURE

Figure ES-1: Location Map Project Road.....	ES-2
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EXECUTIVE SUMMARY

ES.1 INTRODUCTION

The Public Works Department (PWD) Rajasthan has been entrusted with the development of Chittorgarh to Nimbahera - NH-79 and Nimbahera to Pratapgarh – NH-113 sections in Rajasthan into 4 –Lane & 2 lanes.

Project Highway NH-79 starts at Chittorgarh and end at Nimbahera. The total length of the existing road under consideration is 43+028 km which starts at km 183/000 and ends at km 221/400 of NH-79. The project highway traverses through districts (namely Chittorgarh) and 21 villages.

Project Highway NH-113 starts at Nimbahera and end at Pratapgarh. The total length of the existing road under consideration is 80/000 km which starts at km 000/000 and ends at km 80/000 of NH-113. The project highway traverses through two districts (namely Chittorgarh And Pratapgarh) and 36 villages

The MoRTH and Govt. of Rajasthan, having realized the worth of development of infrastructure in the overall growth of the state has decided through Public Works Department (PWD-NH) Project for development of Road, part of NH-79 Chittorgarh to Nimbahera. Road project length is 43+028 Km. as 4 lane with paved shoulder and NH-113 Nimbahera to Pratapgarh. Road project length, is 80/000 km as 2 lane. partly rigid pavement in between project road, reconstruction of narrow and weak bridges and road user facilities.

ES.2 PROJECT DESCRIPTION

The project road (NH-79) starts at km 183+000 and ends at km 221+400. The existing carriageway is generally 2 lane with and paved shoulder road. The project road passes through plain terrain. Land use along the road is mixed type that includes agricultural, built-up area.

Existing Right of way (ROW) is 15m to 45m and proposed is 60m. The total length of the existing project road is 38+400 km and the proposed project road length is 44.05 km. 4 lane with paved shoulder (**Table ES- 1**).

In the Project Stretch 1 major bridges, 4 minor bridges, 33 Grade junction, and 78 culverts are proposed including existing structures. Location map of the project road is given in **Figure ES-1**.

The project road (NH-113) starts at km 000+000 and ends at km 80+000. The existing carriageway is generally 2 lane. The project road passes through plain terrain. Land use along the road is mixed type that includes agricultural, built-up area.

Existing Right of way (ROW) is 8m to 45m and proposed is 45m to 60m. The total length of the existing project road is 74+600 km 2 lane and the proposed project road is 80+00 km 2 lane (**Table ES- 1**).

In the Project Stretch 1 major bridges, 24 minor bridges, 64 Grade junction, and 79 culverts are proposed including existing structures. Location map of the project road is given in **Figure ES-1**.

ES.3 ANALYSIS OF ALTERNATIVES

The analysis of alternatives has been made on the basis of “Long term Scenario with projects and Long term Scenario without project” in terms of potential environmental impacts.

To assess the overall project impacts a quantitative analysis is carried out. This shows that the project has generally significant, positive impacts. The project is recommended with the adoption of mitigation measures is crucial in order to avoid adverse negative impacts. The management of traffic in Choti Sadri, Nimbahera, Bari and Sambhupura city has become very difficult creating frequent interruptions. Hence Sambhupura Bye pass having a length of 3.550km, Nimbahera Bye pass Length of 13.835km and Bari Bypass –Length 2.275km , Choti Sadri Bypass 5.995km has been included in this project.

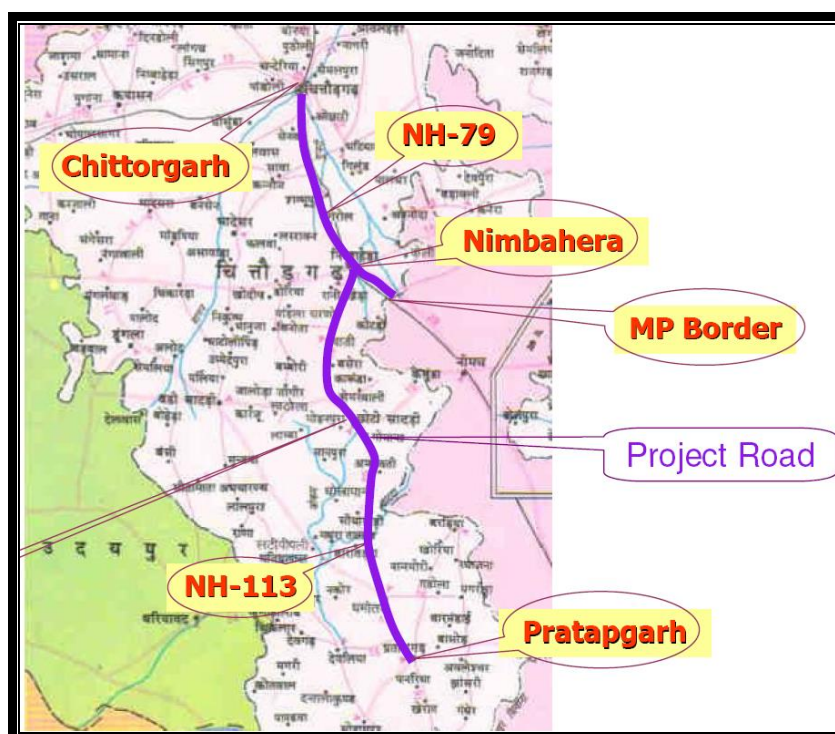


Figure ES-1: Location Map Project Road

ES.4 DESCRIPTION OF EXISTING ENVIRONMENT

The baseline environmental monitoring and discussions with the officials, NGOs and local public were conducted to establish the baseline environmental status of the study area and to assess the impacts of the proposed improvements to the project road. The baseline environmental monitoring was conducted from May 2012.

Topography and Geomorphology & Drainage

The Project Highway NH - 79 traverses through district Chhitorgarh and NH - 113 traverses through two districts viz. Chhitorgarh and Pratapgarh.

Major Physiographic Units	Pediment, Buried Pediment, Intermontane Valley
Major Drainage	Banas, Gambhiri, Berach, Jakham, Wagon

The district is characterized by undulating topography. The western, southern and northern parts are generally plain area. Hills are scattered in Chhoti Sadri, Bari Sadri and Pratapgarh tehsils. Hill ranges towards east of Chittaurgarh town runs north-south with intervening valleys parallel to each other. Chittaurgarh and Pratapgarh tehsils are partly hilly and partly plain. The district has the regional slope from south to north. The height varies from 317m to 617m, amsl. Pal khera hill is the highest, having height of 617m. Geomorphologically the district is divided into following units:

Origin	Land Forms	Occurrence in the District
Fluvial	Alluvial Plains	Along west of Banas river and Berach river
Valley Fills	North of Jhakham dam	
Ravines	East of Begun and Motipura village	
Denudation	Pediment	Scattered in entire district
Burried pediment	Entire district	
Intermountain Valley	Scattered in eastern and northern part of Chittaurgarh	
Structural	Plateau	East, North & south –east part of the district
Dissected Plateau	South –west part around Pratapgarh	
Hill	Structural hill	North of Gangrar town

Drainage: Chittaurgarh district falls in parts of Chambal (27%), Mahi (21%) and Banas(52%) basins. Tehsil wise distribution of basin area is given below

Sl No	Name of Tehsil	Area in Sq. Km.		
		Chambal	Mahi	Banas
1	Choti sadri		374.4	117
2	Chittaurgarh	146.7		732.7
3	Nimbahera		0.1	453.9

Topography

Entire Project Highway NH – 79 passes through plain terrain & NH – 113 passes through Plain & Rolling terrain.

Soil Characteristics:

MAJOR SOIL TYPE

Yellow brown soil, Black, soil, Red Loam

Black soil found predominantly in the district mostly in eastern, southern, central and eastern part. Red soil mostly found in western portion of district from north to south.

The project area is characterized by undulating topography. The eastern part is the extension of Malwa plateau & is comprising of high hills with intervening long and narrow valleys. In central part of the district undulating to rolling topography prevails. While in western part plain and rolling topography prevails. The general slop of the area is from east to west.:

Temperature

The mean maximum temperature in the region reaches 43.7 °C in the warmer months from March to June. During the winter season, in December-January, the minimum temperature dips to 7.4 °C and the maximum temperature remains around 31.9°C. The lowest average monthly minimum temperature is around 21.6 °C.

Humidity

The average maximum humidity is observed to vary between 75.00-90.00 percent, with the highest humidity observed in the month of August. The average minimum humidity varies between 17.00-35.00 percent, the lowest observed in the months of March- April. The variation between maximum and minimum humidity is relatively larger in the months of June and July.

Rainfall

The average rainfall is 760 mm. 95 percent of the annual rains are experienced during June to September. The maximum rainfall was experienced in 1122mm & 1295mm was observed during the year 2006. The rainfall over Chittorgarh is scanty and is concentrated over four month i.e. from June to September. The rains are erratic and so is the distribution of the rainfall. However agriculture and the animal wealth are dependent on rains to large extent

The average annual rainfall data during year 2004 to 2011 are given in given Table

Annual Rainfall (in mm)

District	2004	2005	2006	2007	2008	2009	2010	2011
Chhitorgarh	959.8	638.9	1121.8	610.3	813.8	677.0	981.0	817.0
Pratapgarh	989	828	1295	735	832	718.0	1005.0	1381.0

(Source: Indian Meteorological Department)

Water Quality:

For the water quality motoring, five water samples were collected from different locations along the project road. These samples have been analysed for physico-chemical parameters as per established standard methods and procedures. The ground water analysis results reveal that the water quality was slightly alkaline (pH 7.16-8.11); and total hardness varies 112 to 524 mg/l as CaCO₃; Calcium at all location was found in between 86 to 444 mg/l. Test analysis results indicate that the ground water quality was all most good.

Ambient Air Quality:

To establish the baseline air quality scenario four representative ambient air quality monitoring stations were selected within the study corridor covering all land use categories as per the CPCB / BIS guidelines. Continuous 24 hours monitoring was done at a frequency of twice a week at more vales less uniform intervals during April to May 2012. The observed values of PM₁₀, PM_{2.5}, SO₂, NO₂ and CO were good and within the prescribed limits of National Ambient Air Quality Standards for the Industrial and Commercial areas published by Ministry of Environment & Forest Notification 2009. There is no major air polluting sources in the project area.

Ambient Noise level:

Five representative locations as indicated mostly close to the project road covering industrial, commercial, and residential areas were selected for measuring the present status of ambient noise level. A sound level meter was used for monitoring of background noise level.

The ambient noise level monitoring results that daytime equivalent sound level at both locations was varied from 53.7 to 62.7dB and night time from 46.7 to 54.2dB.

Biological Environment:

Along the project stretch no national park and wildlife sanctuaries within 15 km radius from road centerline. Along the project road many plant species are observed viz Khejri, Babul, Aam (*Mangifera indica*), Shisham (*Dalbergia sissoo*), Jamun (*Syzygium cumini*), Pipal (*Ficus religiosa*), Neem (*Azadirachta indica*), Dak, Kachnar, Ashok. In this road project about 7521 trees shall be affected.

ES.5 ANALYSIS OF POTENTIAL ENVIRONMENTAL IMPACT AND MITIGATIONS

Although this widening project will have many benefits but some negative impacts will be also created specially during construction. The paved shoulder shall be constructed within the existing ROW and tree cutting shall be minimized. The project negative impacts like cutting of about 7521 trees (mainly Khejri, Babool, Shisham, and Neem, Dak, Kachnar, Ber trees), losses of government as well as private structures and land, loss of productive agricultural lands and change the quality of air, water, and soil environment.

Overall, it is found that the proposed project road will result in some adverse impacts to the biophysical and socioeconomic environment of the project. It needs to be mitigated by adopting appropriate mitigation measures in the design, construction and operation phase. Net environmental impacts to the physical, biological and socioeconomic environment, will be insignificant and of short term in nature by observing proposed mitigation measures.

Environment Management stating the various impacts and their mitigation measures, has been formulated to avoid/ minimise the anticipated impacts. The responsibility of implementing of suggested mitigation measures lies mainly with Contractor / concessionaire, Construction Supervision Consultant / Independent Consultant and PIU. During the construction and operation phases existing environment is change through many ways viz. soil erosion, loss of soil productivity, compaction of top soil, contamination of air, water & soil and destruction of biodiversity etc.

ES.6 ENVIRONMENTAL MONITORING

An Environmental Monitoring Plan is proposed as part of the EMP to evaluate the efficiency of implementation of mitigation measures recommended in the EMP and facilitate management decisions for the project. During the construction and the operation stages various water, air and soil parameters will be measured according

prescribed method of CPCB/BIS. Air quality monitoring will be conducted one time in every season, three seasons (except monsoon) per year, and continuous 24 hours / or for 1 full working day. Water quality will be analysed two times in a year (pre monsoon and post monsoon seasons) during the entire construction period. Noise levels using an integrated noise level meter kept at a distance of 15 m from edge of the pavement will be taken ones every season for each construction.

ES.7 KEY ENVIRONMENTAL LAWS & POLICIES:

The Constitutional Provisions like Article 48 and 51-A (g) and 74th Amendment to the Constitution serve as principle guidelines of environmental protection. Further Regulations, Acts, Policies applicable to sustainability and environmental protection are as follows.

- EIA Notification, September 2006 & February 2009
- The Environment (Protection) Act, 1986
- The Water (Prevention and Control) Act, 1974
- The Air (Prevention and Control) Act, 1981
- The Indian Forest Act, 1927
- The Forest (Conservation) Act, 1980 (as amended in 1988)
- The Forest Conservation Rules, 1981
- The Wildlife Protection Act, 1972
- The Hazardous Waste (Management and Handling) Rules, 1989
- National Environment Tribunal Act, 1995
- National Environment Appellate Authority Act, 1997
- The Ancient Monuments and Archaeological Sites and Remains Act 1958
- Town and Country Planning Act, 1976
- The Motor Vehicles Act 1988
- Public Liability Insurance Act, 1991
- Coastal Regulation Zones Act 1991 & 2011
- The Factories Act 1956

The other guidelines and norms related to road construction by Indian Road Congress that help for environmental protection include, IRC: 104-1988, IRC: 36-1974, IRC: 10-1961, IRC: 36-1970, IRC: 43-1972, IRC: 72-1978, IRC: 33-1982, etc.

ES.8 PROJECT BENEFITS

This highways project has been under taken to access markets, materials and opportunities by facilitating movement of persons and goods. The ultimate aim of the developmental activities, such as National Highway 113 (NH 113) is a National Highway in western India. NH-113 connects Nimbahera in Rajasthan with Dahod, in Gujarat. It runs for a distance of 240 km (150 mi), of which 200 km (120 mi) is in Rajasthan and 40 km (25 mi) is in Gujarat.

National Highway 79 (NH 79) is a National Highway that links Ajmer in Rajasthan and Dhar in Madhya Pradesh. The highway is 500 km (310 mi) long, of which 220 km (140 mi) is in Rajasthan and 280 km (170 mi) is in Madhya Pradesh.

is to promote societal welfare of the Madhya Pradesh, Partapgarh chittorgarh and other nearest districts in Rajasthan state. The developments of above widening project will play a significant role in changing the socio-economic condition of the living of people of a region through dynamic externalities that such development often generates. This route provide safety and speed to the traffic.

ES.9 ENVIRONMENTAL MANAGEMENT PLAN

Provide Cost effective environmental management plan to eliminate / offset the identified environmental impact, so that development will become environmentally sound.

The Environmental Management Plan (EMP) consists of a set of mitigation, monitoring and institutional measures to be taken during the design, construction and operational phases of the project to eliminate adverse environmental impacts, to offset them, or to reduce them to acceptable levels. The main aim of the Environmental Management Plan is to ensure that the various adverse impacts are mitigated and the positive impacts are enhanced.

No.	Subject	Authority Granting Clearance	When required	Remarks
1	Environmental Clearance	Ministry of Environment and Forest Environmental, New Delhi	Before Construction	State PWD or MoRTH
2	Tree cutting and forest land diversion.	Department of Forest, GoR and MoEF	Before Construction	State PWD or MoRTH
3	Consents under Water (P&CP) Act, 1974 & Air (P&CP) Act,	Rajasthan State Pollution Control Board (RPCB)	Before Construction	Contractor responsibility.

4	Permit for installation of crusher	Rajasthan State Pollution Control Board (RPCB)	Before Construction	Contractor responsibility.
5	No Objection (NOC) for batching plant	RPCB, Inspectors of Factories	Before Construction	Contractor responsibility.
6	Clearance for establishing Asphalt Plant	RPCB	Before Construction	Contractor responsibility.
7	Crossing railway lines	Indian Railways	Before Construction	State PWD or MoRTH
8	Installation of Generators	Rajasthan Electricity Board of respective regions	Before Installation	Contractor's responsibility
9	Clearance for excavation & transporting soil	Department of Mines & Geology/ Local Bodies	Before Quarrying	Contractor's responsibility
10	Permission for extraction of boulder	Department of Mines & Geology. Government of Rajasthan	Before Quarrying	If the extraction of boulder is being procured from the existing quarry/supplier, it shall be ensured that, requisite license/ lease has been obtained from the concerned Authority.
11	Permission for extraction of sand	Department of Mines & Geology. Government of Rajasthan	Before Quarrying	If the extraction of boulder is being procured from the existing quarry/supplier, it shall be ensured that, requisite license/ lease has been obtained from the concerned Authority.
12	License for storing diesel	Commissioner of Explosives & RPCB	During Construction	Contractor's responsibility
13	Labour camps	District Health Officer .	During Construction	Contractor's responsibility
14	Clearance for crossing other waterways	Irrigation Department, Government of Rajasthan	During Construction at the specific site	Contractor's responsibility
15	If water has to be taken from river / Reservoir	Concerned Water Authority	During Construction at the specific site	Contractor's responsibility

ES.10 ENVIRONMENT BUDGET

The total environmental cost is 2.3 Crore. Mitigation cost around 1.9 Crore, and environmental monitoring cost approx (9.3 lakh) ,Training & Mobilization cost 10 laks.

ES.11 DISCLOSURES OF CONSULTANT ENGAGED

Description of the name & brief resume of the consultant engaged in the preparation of EIA report.

ES.12 CONCLUSIONS AND RECOMMENDATIONS

Benefits of the project will be the reduction in cost of travelling & transportation, reduction in travelling time, reduction in accidents due to better service levels of the road and better connectivity from Chittorgarh-Nimbahera-Pratapgarh etc. The proposed widening of the road requires land Total 342.42 ha of land required for proposed project (135.50 ha land on NH 79 and 206.92 ha land on NH 113). The project involves improvement of curves for a design speed of 100km/hr. On account of frequent traffic jams and railway crossing gate closure. The management of traffic in Choti Sadri, Nimbahera, Bari and Sambhupura city has become very difficult creating frequent interruptions. Hence Sambhupura Bye pass having a length of 3.550km, Nimbahera Bye pass Length of 13.835km and Bari Bypass –Length 2.275km, Choti Sadri Bypass 5.995km has been included in this project. The project also envisages for compensatory afforestation and avenue plantation throughout the stretch with indigenous species which are suitable to the environment. The project requires cutting of about 7521 trees. Temporary impacts on air quality, water quality and noise levels are anticipated during the construction phase and an increase in the ambient noise level is anticipated during the operation phase of the project.

Proper mitigation measures are proposed in the EMP for mitigating the negative impacts. The environmental monitoring plan and reporting mechanism proposed as part of the EMP will ensure the proper implementation of the EMP. Thus the overall benefits of project outweigh the negative impacts of the project.

Table ES-1: Inventory of Project Highway

Sr. No.	Particulars	Existing	Proposed	
			Existing Alignment	Bypasses/Realignment
1.	Road Length	1. 43.028 km of NH-79 (Chittorgarh-Neemach Section) 2. 74.600 km of NH-113 (Nimbahera-Pratapgarh Section)	1. 25.679 km on NH-79 2. 51.945 km on NH-113	1. 18.385 km on NH-79 2. 20.970 km on NH-113
2.	Carriageway	1. NH-79 carriageway wide in 7.00 m	1. NH-79 is Four lane with paved shoulder (8.75 m both	1. NH-79 is Four lane with paved shoulder (8.75 m both side with

Sr. No.	Particulars	Existing	Proposed	
			Existing Alignment	Bypasses/Realignment
		2. NH-113 carriageway varies from 5.5 m -7.0 m	side with 4.50 central median) 2. NH-113 is Two lane with hard shoulder (7.0 m wide)	4.50 central median) 2. NH-113 is Two lane with hard shoulder (7.0 m wide)
3.	ROW (m)	1. Varies from 15-45 m in NH 79 2. Varies from 08-45 m in NH 113	1. 60 m for NH-79 2. 45-60 for NH-113	60 m
4.	Realignment	Nil	1. 1.00 km on NH-79 2. 12.750 on NH-113	Nil
6.	Junctions	1. 33 Grade junctions in NH-79 2. 64 Grade Junction in NH-113	1. 19 on NH-79 2. 45 on NH-113	1. 14 on NH-79 2. 9 on NH-113
7.	Railway Over Bridge	1. NH-79 = 01 2. NH-113 = Nil	1. 01 on NH-79 2. Nil on NH-113	1. 02 on NH-79 2. Nil on NH-113
8.	Vehicular Underpass with Footpath	Nil	1. 04 on NH-79 2. Nil on NH-113	1. 02 on NH-79 2. Nil on NH-113
9.	Pedestrian	Nil	1. 01 on NH-79 2. Nil on NH-113	Nil
10.	Cattle Underpass	Nil	1. 01 on NH-79 2. Nil on NH-113	Nil
11.	Service Road on both Sides	Nil	1. 11.704 km in NH-79 2. 0.00 km in NH-113	1. 7.73 km in NH-79 2. 2.040 km in NH-113
12.	Bus bays	Nil	1. 05 Nos. on NH-79 2. 14 nos. on NH-113.	1. 02 on NH-79 2. 02 on NH-113
13.	Truck Lay bay	Nil	➤ 1 Nos. on NH-79 ➤ 00 Nos. on NH-113.	➤ 1 Nos. on NH-79 ➤ 00 Nos. on NH-113.
14.	Rest Area	Nil	1. 01 on NH-79 2. Nil on NH-113	1. 01 on NH-79 2. Nil on NH-113
15.	TOLL PLAZA	Nil	1. 01 on Nh-79 2. 02 on NH-113	1. 01 on Nh-79 2. Nil on NH-113

Sr. No.	Particulars	Existing	Proposed	
			Existing Alignment	Bypasses/Realignment
16.	Major Bridges	NH-79 = 01 NH-113 = 01	1. Nil on Nh-79 2. 01 on Nh-113	1. 01 on NH-79 2. Nil on NH-113
17.	Minor Bridges	NH-79 = 04 NH-113 =22	1. 03 on NH-79 2. 22 on NH-113	1. 02 on NH-79 2. 02 on NH-113
18.	Fly Over	Nil	1. 01 on NH-79 2. Nil on NH-113	1. 01 on NH-79 2. 01 on NH-113
19.	Culverts	NH-79 = 83 NH-113 =64	1. 27 on NH-79 2. 75 on NH-113	1. 51 on NH-79 2. 04 on NH-113

Table ES-2: Abstract of Cost Estimate

Sr. No	Items	Cost (Rs.) in Crore
1	Total Civil Costs	408.97
2	Environmental Cost	2.3
3	R&R Cost including land cost	36.77
4	Utility Shifting	8.5
TOTAL PROJECT COST		456.54

Chapter – 1

INTRODUCTION

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

The State of Rajasthan, in which the project highway NH-79 & NH-113 passes through, is situated in the northern part of Indian peninsula. It is located between 24° 52' and 24° 01' North latitude to 74° 37' and 74° 46' East longitude. The tropic of cancer passes through Chittorgarh and Pratapgarh districts. Rajasthan is one of the border states of India, sharing India's frontier with Pakistan on the west and northwest. Punjab bounds it on the north, Haryana and Uttar Pradesh on the northeast and east, Madhya Pradesh on the south to southeast and Gujarat on the southwest. Administratively, Rajasthan is divided into 32 districts and 211 tehsils.

It is a largest state with an area of 3, 42,239 sq. kms. Formerly different areas of the state were known as Marwar (Western part comprising of Jodhpur, Jaisalmer etc.), Mewar (Udaipur, Chittor etc.), Hadoti (Kota, Jhalawar etc.), Matsya (Alwar etc.), Shekhawati (Sikar, Jhunjhunu & Churu), Bagad (Banswara etc.), Dhundhar (Jaipur etc.). It is bounded by five states Punjab, Haryana, Uttar Pradesh, Madhya Pradesh & Gujarat and has 1168 kms of long international border with Pakistan.



Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

1.2 IDENTIFICATION OF PROJECT PROPONENT & PROJECT ROAD

Ministry of Road Transport and highway (MoRTH) is an apex organisation under the Central Government, is entrusted with the task of formulating and administering, in consultation with other Central Ministries/Departments, State Governments/UT Administrations, organisations and individuals, policies for Road Transport, National Highways and Transport Research with a view to increasing the mobility and efficiency of the road transport system in the country. e Ministry has two wings: Roads wing and Transport wing.

ROADS WING

Deals with development and maintenance of National Highway in the country

Main Responsibilities:

- ❖ Planning, development and maintenance of National Highways in the country.
- ❖ Extends technical and financial support to State Governments for the development of state roads and the roads of inter-state connectivity and economic importance
- ❖ Evolves standard specifications for roads and bridges in the country.
- ❖ Serves as a repository of technical knowledge on roads and bridges.

TRANSPORT WING

Deals with matter relating to Road Transport

Main Responsibilities:

- Motor Vehicle legislation.
- Administration of the Motor Vehicles Act, 1988.
- Taxation of motor vehicles.
- Compulsory insurance of motor vehicles.
- Administration of the Road Transport Corporations Act, 1950.
- And promotion of Transport co-operatives in the field of motor transport.
- Evolves road safety standards in the form of a National Policy on Road Safety and by preparing and implementing the Annual Road Safety Plan.

- Collects, compiles and analyses road accident statistics and takes steps for developing a Road Safety Culture in the country by involving the members of public and organising various awareness campaigns.
- Provides grants-in-aid to Non-Governmental Organisations in accordance with the laid down guidelines.

National Highway 79 (NH 79) is a National Highway that links Ajmer in Rajasthan and Dhar in Madhya Pradesh. The highway is 500 km long, out of which 220 km is in Rajasthan and 280 km is in Madhya Pradesh.

National Highway 113 (NH 113) is a National Highway in western India. NH-113 connects Nimbahera in Rajasthan with Dahod, in Gujarat. It runs for a distance of 265 km, of which 225 km is in Rajasthan and 40 in Gujarat.

The present project NH-79 starts from km 183+000 and ends at km 221+400, whereas NH-113 starts from km 0+000 and ends at km 80+000.. Index map of the Project Road is presented in **Figure 1-1**.

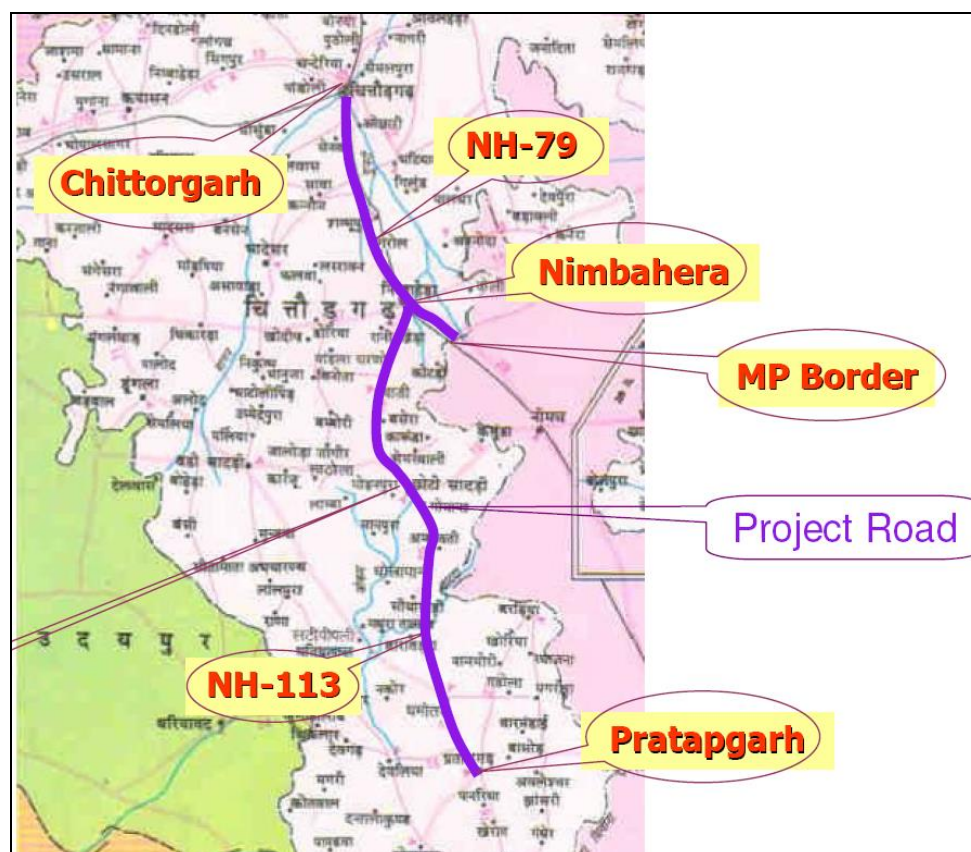


Figure 1-1: Index map of the Project Road

Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

1.3 SIGNIFICANCE OF THE PROJECT ROAD

National Highway 113 (NH 113) is a National Highway in western India. NH-113 connects Nimbahera in Rajasthan with Dahod, in Gujarat. It runs for a distance of 240 km (150 mi), of which 200 km (120 mi) is in Rajasthan and 40 km (25 mi) is in Gujarat.

Chittorgarh is an important district of the State having historical importance & flow of tourist traffic is quite substantial. It is situated on the broad gauge railway line of Ajmer – Ratlam section. It is also connected by broad gauge to Udaipur & Kota also. Chittorgarh is also connected on Golden Quadrilateral of NHAI that is Delhi to Bombay. It is also connected on Silcher – Porbandar East – West corridor of National Highway Development Programme. Chittorgarh is also rich in mineral wealth. The abundance of lime stone deposits have generated cement factories at Chittorgarh – Nimbahera – Shambhupura on NH -79. The lime stone deposits in adjoining state Madhya Pradesh have also established the cement factories at Naya Gaon in Neemach District.



Figure: Project Road NH-113

National Highway 79 (NH 79) is a National Highway that links Ajmer in Rajasthan and Dhar in Madhya Pradesh. The highway is 500 km (310 mi) long, of which 220 km (140 mi) is in Rajasthan and 280 km (170 mi) is in Madhya Pradesh.

It is very important route of Western Madhya Pradesh & life line of Western M.P. Ajmer is the one end of this national highway and other end is Ghatabillo Dist Dhar(M.P.) which is a small town 40 km (25 mi) away from Indore and approx. 10 km (6.2 mi) from Mhow. It covers many important industrial, commercial & tourist places i.e. Ajmer(religious place), Nasirabad (Army cantt.), Bhilwara (known for industries), Chittorgarh (Famous tourist place & cement Industries), Nimahera (cement industries & stone), Nimach (Cement Industries, Agriculture Business, Major Opium crop center & Govt. Opium Factory, Major CRPF Center), Mandsour(known for Pashupatinath temple), Ratlam (Division & Important center of Western Railway), Indore (Commercial Capital of M.P.) and Mhow (A major Army Head Quarter). Now Four Lane road construction is in full swing.



Figure: Project Road NH-79

The section of NH-79 from Chittorgarh to Nimbahera & upto Madhya Pradesh border is only 2 lane. The road portion from Chittorgarh to Ajmer has already been developed as 4 lane under GQ. The road portion in Madhya Pradesh from Naya Gaon to Indore has also been developed as 4 lane by Madhya Pradesh State Road Development Corporation. The East & West side of Chittorgarh has been developed as 4 lane road as East West corridor. The Traffic on Chittorgarh – Madhya Pradesh border is very high & the present road is not capable of sustain the present traffic resulting in the road blockages & traffic jams quite frequently.

On Chittorgarh Madhya Pradesh stretch of NH – 79 which is presently proposed to be developed as 4 lane project, this assignment takes into account the project preparation considering the present traffic & future projections.

At Shambhupura Aditya Birla Cement Factory is existing on the western side of NH -79 & a level crossing is existing at design chainage Km 193+912 on NH – 79 for which it has been proposed to provide ROB. At design chainage Km 209+665 approach road to J K Cement unit is existing.

Mangrol is an important villages & approach road of Gambhiri Dam – An Irrigation Project takes off at design chainage Km 204+695. further Mangrol Railway Station on broad gauge is also situated on this approach road. On the Eastern side of NH-79 at the start of Mangrol approach road, Govt. High School is existing & On the Western Side temple is existing where the villager from from Mangrol & near by villagers come daily for prayers.

1.4 OBJECTIVES OF THE EIA STUDY

Although this highway project has significant positive impact but it may be negative impacts on nearby communities and natural environment if proper precautions will not be taken during the design and implementation stage of the project. People and properties may be direct/indirect affected in major way such as disruption of livelihood, loss of accustomed travel paths and community linkages, increases in noise levels, soil erosion, detrimental changes to streams / rivers and ground water, and interference with plant and animal life. Roads are agents of

change, which can bring both benefits and damage to the existing balance between the people and their environment. So this EIA study has been under taken to:-

- Facilitate the incorporation of the environment as a factor in project decision making, along with engineering and economic factors;
- To arrive at actions those are environmentally more compatible;
- To enable environmental issues to be presented before the public and ensure public participation in decision making and
- To help in identifying management and mitigation measures.

1.5 SCOPE OF THE STUDY

The main aim of the Environmental Impact Assessment (EIA) is to ensure that this project proposal may be environmentally sound and sustainable on a long-term basis. The adverse impacts of the proposal need to be identified in advance and duly considered in preparation of project's engineering designs.

The scope of work for preparing the environmental impact assessment (EIA) is comprised of the following terms of references:

1. The generic structure and contents of the environmental impact assessment document as provided in appendix III of the EIA notification dated 14th September 2006 and its amendment on dated 01-12-2009 is followed;
2. The baseline environmental information in the study area viz., climate, physiographic features, drainage, geology, flora, fauna, ambient air, water, noise and socio-economic conditions;
3. Assessment of the potential significant impacts and identification of the mitigative measures to address impacts adequately;
4. The study of analysis of alternatives incorporating environmental concerns including 'with' and 'without' project scenario and modification in the proposed project due to environmental considerations;
5. Preparation of environmental management plan (EMP) and its integration into project cycle for mitigating and reducing environmental issues which

may arise during construction and operation phases viz., compensatory afforestation, soil disposal, utility restoration, noise and vibration control, campsite management and disaster management;

6. The special attention to the environmental enhancement measures in the project for the following :
 - Cultural property enhancement along the highways;
 - Bus bays and bus shelters including a review of their location;
 - Highway side landscape and enhancement of the road junctions;
 - Enhancement of highway side water bodies and
 - Redevelopment of the borrow areas located on public land;
7. The monitoring network with regard to air, water and noise pollution including the inputs in the areas of performance indicators and monitoring mechanisms for environmental components during construction and operational phase of the project and
8. Suggestion of mitigation measures along with implementation cost and proposal for staffing, training and institutional requirements for environmental management unit.

The scope of environmental assessment as described in the Terms of Reference (TOR) provided by NHAI and in accordance with the MoEF, Government of India legal and procedural requirements. The emphasis during environmental analysis, design and management action plan is to facilitate decision-making and to ensure that the corridor improvement options are environmentally sound, and contribute to the development of the environmental assets.

**Table 1-1: Scope of Environmental Analysis, Design and
Environmental Management Plan**

Environmental Analysis	<ul style="list-style-type: none"> ▪ To carry out a preliminary environmental screening of the highway alignment to determine the magnitude of actual and potential impacts and ensure that environmental considerations are given adequate weightage in the selection and design of the proposed highway improvement; ▪ To collect information on existing environmental baseline conditions and undertake a preliminary evaluation of the highway alignment selected for improvement in order to define the focus of the environmental assessment, design and management studies; ▪ To identify positive and negative impacts of upgrading the highway and to propose cost-effective measures to enhance positive impacts and to avoid and / or mitigate negative impacts;
Environmental Design	<ul style="list-style-type: none"> ▪ From environment assessment, to identify adverse impacts such as soil erosion, loss of flora and fauna, physical resources etc. and prevent them through judicious design changes by adopting appropriate mitigation measures such as plantation of trees, installation of proper drainage system, provision of suitable mitigation measures etc. ▪ Prepare cost – effective proposals to implement appropriate mitigation and remedial measures to upgrade and enhance the environmental quality along the highway in a sustainable manner; and ▪ Selecting stretches along the highways, which provide opportunity for environmental enhancement and the development of cost-effective sustainable environmental assets.
Environmental Management Plan	<ul style="list-style-type: none"> ▪ To prepare an implementation schedule and supervision program with associated costs and contracting procedures for the execution of environmental mitigation and design works; ▪ To develop a program for monitoring environmental impacts during construction and operational phases; ▪ To spell out specific requirements for institutional strengthening and training; and ▪ To recommend further studies on environmental aspects, which are required to be undertaken during project implementation, if

1.6 PRESENT STATUS OF THE PROJECT

Present Status of the Project

MoRTH / PWD Rajasthan has submitted application to the MoEF for obtaining Environmental clearance. (**Annexure 1B**).

Finalization for ToR for 4- laning of NH-79 from Chittorgarh to Neemuch (MP Border) and 2- laning of NH-113 from Nimbahera to Pratapgarh in the State of Rajasthan by M/s Public Works Department, NH Circle, Kota, Rajasthan [F.No.10-81/2011-IA-III]

The point wise compliance of the TOR is given below:

S. No.	Issues/ Concerns raised by EAC	Measures Proposed
(i)	Any litigation(s) pending against the proposed project and/or any directions or orders passed by any court of law/any statutory authority against the project is to be detailed out.	No litigation(s) pending against the proposed project
(ii)	The project road passes through Reserved Forest area from km 45/280 to 48/950 in Barol block (length 3.670 km) and km 49/080 to 49/900 (length 0.82 km) in Kala Khat block. Necessary stage ?I forestry clearance shall be obtained as per OM dated 31.03.2011 and submitted along with final EIA report.	Forest Applications has been submitted in PCCF jaipur for onward submission to Divisional Forest Officer (DFO) Pratapgarh
(iii)	Submit Land use map of the study area to a scale of 1: 25,000 based on recent satellite imagery delineating the crop lands (both single and double crop), agricultural plantations, fallow lands, waste lands, water bodies, built-up areas, forest area and other surface features such as railway tracks, ports, airports, roads, and major industries etc. and submit a detailed ground surveyed map on 1:2000 scale showing the existing features falling within the right of way namely trees, structures including archeological & religious, monuments etc. if any.	Land use map of the study area on Google satellite imagery and GT Sheet is given in Annexure 2A .

S. No.	Issues/ Concerns raised by EAC	Measures Proposed
(iv)	Study regarding the Animal bypasses / underpasses etc. across the habitation areas shall be carried out. Adequate cattle passes for the movement of agriculture material shall be provided at the stretches passing through habitation areas.	Study carried out and the provisions are given in Ch.2.
(v)	It is indicated that 7521 trees are proposed to be cut, the information should be provided about their species and whether it also involved any protected or endangered species. Necessary green belt shall be provided on both side of the highway with proper central verge and cost provision should be made for regular maintenance.	<ol style="list-style-type: none"> 1. Detail of affected trees species is provided in Ch-4 (Details are given in para 4.5). 2. There is no protected or endangered species exist on project road. 3. Green belt will be developed along the project road on available land.
(vi)	The proposed route is passing through a city or town, with houses and human habitation on the either side of the road, the necessity for provision of bypasses/diversions/under passes shall be examined and submitted. The proposal should also indicate the location of wayside amenities, which should include petrol station/service centre, rest areas including public conveyance, etc.	<ol style="list-style-type: none"> 1. To avoid dense habitation in Sambhupura, Bari and Choti Sadri Bypass have been purposed. Details are provided in the Ch-3 of EIA/EMP report. 2. Details of wayside amenities are provided in Ch-2 of EIA/EMP report. (Please refer to 2.2.9 User Facilities)
(vii)	Submit details about measures taken for the pedestrian safety and construction of underpasses and foot-over bridges along with flyovers and interchanges.	<ol style="list-style-type: none"> 1. For the pedestrian safety, many measures will be taken viz. FoBs, walkways, sidewalks, paved shoulders, jaywalking and various types of instruction signs along the project road. 2. The flyovers with slip roads have been proposed at urban locations and main junctions for free flow of through traffic by elevating the main carriageway.

S. No.	Issues/ Concerns raised by EAC	Measures Proposed
(viii)	Assess whether there is a possibility that the proposed project will adversely affect road traffic in the surrounding areas (e.g. by causing increases in traffic congestion and traffic accidents).	During the construction period traffic conjunction and traffic accident may be created in surrounding areas. Proper measures such as traffic diversion; traffic filtration etc. shall be used
(ix)	Clearly indicate/provide details regarding the location, date (along with site photographs with the background of monitoring equipments and/or sample collection in process) and protocol adopted for sampling and analysis of various environmental parameters as a part of the baseline data collection.	Details about Monitoring location and time are provided in Ch-4.
(x)	Examine and submit the details of sand quarry, borrow area and rehabilitation.	Sand quarry and borrow area rehabilitation plan given in EMP in Ch. 9
(xi)	Climate and meteorology (max and min temperature, relative humidity, rainfall, frequency of tropical cyclone and snow fall); the nearest IMD meteorological station from which climatological data have been obtained to be indicated.	<ol style="list-style-type: none"> 1. Climate and meteorology data are given in Ch-4 (4.5) of EIA/EMP report. 2. There are no any cyclone hit areas. Snowfall has been not observed in recent years
(xii)	The air quality monitoring should be carried out as per the new notification issued on 16th November, 2009.	<p>The baseline ambient air quality monitoring was done as per EIA new notification issued on 16th November, 2009 and air quality monitoring in construction and operation phase shall be done as per EIA notification 2006 and CPCB guidelines.</p> <p>Air monitoring result are summarized in Ch-4.</p>

S. No.	Issues/ Concerns raised by EAC	Measures Proposed
(xiii)	Identify project activities during construction and operation phases, which will affect the noise levels and the potential for increased noise resulting from this project. Discuss the effect of noise levels on near by habitation during the construction and operational phases of the proposed highway. Identify noise reduction measures and traffic management strategies to be deployed for reducing the negative impact if any. Prediction of noise levels should be done by using mathematical modelling at different representative locations.	<ol style="list-style-type: none"> 1. Detail of project activities during construction and operation phases, which will affect noise level are given in Ch-5 and Ch-9 (EMP) 2. Noise generating construction activities will be held 500m far from the near by habitation. So there will be no major problems of noise pollution. 3. Provision of bypasses protects to near by habitation from loudly noise during operation phases. 4. Noise mitigation measures are provided in Ch-5.
(xiv)	Examine the impact during construction activities due to generation of fugitive dust from crusher units, air emissions from hot mix plants and vehicles used for transportation of materials and prediction of impact on ambient air quality using appropriate mathematical model, description of model, input requirement and reference of derivation, distribution of major pollutants and presentation in tabular form for easy interpretation shall be carried out.	Various impacts during construction activities and their mitigation measures are described in Ch-5 and Ch-9 of EIA/EMP report.
(xv)	Also examine and submit the details about the protection to existing habitations from dust, noise, odour etc. during construction stage.	Protection measures are described in Ch-5 and Ch-9 of EIA/EMP report.
(xvi)	If the proposed route involves cutting of earth, the details of area to be cut, depth of cut, locations, soil type, volume and quantity of earth and other materials to be removed with location of disposal/ dump site along with necessary permission.	Terrain is almost plain so there is no need to cut the earth surface.

S. No.	Issues/ Concerns raised by EAC	Measures Proposed
(xvii)	Examine and submit the water bodies including the seasonal ones within the corridor of impacts along with their status, volumetric capacity and quality likely impacts on them due to the project.	Appropriate measures like construction of Bypasses, major bridge, minor bridge and culverts shall be taken to avoid adverse impacts on water bodies.
(xviii)	Examine and submit details of water quantity required and source of water including water requirement during the construction stage with supporting data and also classification of ground water based on the CGWA classification.	<ol style="list-style-type: none"> 1. The water requirement for this project road is approx 960 (KLD) kilo liters/day. 2. Ground water will be used for domestic purpose.
(xix)	Examine and submit the details of measures taken during constructions of bridges across river/canal/major or minor drains keeping in view the flooding of the rivers and the life span of the existing bridges. Provision of speed breakers, safety signals, service lanes and foot paths should be examined at appropriate locations through out the proposed road to avoid the accidents.	<p>Last 50 years HFL and 50 years 24-hours rainfall for the zone has been considered to design vertical profile of the bridges. Adequate vertical clearance provided for all the major and minor bridges. Lined drains are provided on either side of the carriageway at settlement areas and earthen drain is provided at rural areas. Non monsoon season shall be preferred for such work so that disturbance to the flow of the water can be avoided.</p> <p>Ch.7 described the Provision of safety signals etc.</p>
(xx)	If there will be any change in the drainage pattern after the proposed activity, details of changes shall be examined and submitted.	It is ensured that there is no change in the drainage pattern after the proposed activity and provision of Major and Minor bridges and appropriate culverts.
(xxi)	Rain water harvesting pit should be at least 3 - 5 m. above the highest ground water table. Provision shall be made for oil and grease removal from surface runoff.	Oil interceptors will be provided for vehicle parking, wash down and refueling areas as per the standard design of the interceptor. Collected oily waste will be disposed of at the pre identified disposal sites.
(xxii)	If there is a possibility that the construction/widening of road will cause impact such as destruction of forest, poaching, reductions in wetland areas, if so, examine the impact and	<ol style="list-style-type: none"> 1. Along the project road Reserved / protected forest is present so there will be diversion of this land for road widening.

S. No.	Issues/ Concerns raised by EAC	Measures Proposed
	submit details.	2. Applications for trees cutting and diversion of forest land have been filed in concern district forest departments. 4. Detail of affected trees species is provided in Ch-4 (Details are given in para 4.5).
(xxiii)	Submit the details of road safety, signage, service roads, vehicular under passes, accident prone zone and the mitigation measures.	1. M.S Crash barrier, Traffic safety, device, Traffic blinking signals will be provided to control the road accidents (Ch-7).
(xxiv)	IRC guidelines shall be followed for widening & up-gradation of road.	<u>IRC guidelines have been enclosed in Annexure 1-A.</u>
(xxv)	Submit details of social impact assessment due to the proposed construction of road.	Social impact assessment is provided in Annexure 7A .
(xxvi)	Examine road design standards, safety equipment specifications and Management System training to ensure that design details take account of safety concerns and submit the traffic management plan.	1. Project road has been design according IRC guidelines and standards. Structures like that cure improvement, realignments, safety barriers, crash barrier and guard stones have been proposed for road safety. 2. The detailed study of the traffic management plan is given in Ch-7 of EIA/EMP report.
(xxvii)	Accident data and geographic distribution should be reviewed and analyzed to predict and identify trends ? incase of expansion of the existing highway and provide Post accident emergency assistance and medical care to accident victims.	Accident spots and their geographic distribution have been reviewed to predict and prevention of future accidents.
(xxviii)	If the proposed project involves any land reclamation, details to be provided for which activity land to reclaim and the area of land to be reclaimed.	Not required

S. No.	Issues/ Concerns raised by EAC	Measures Proposed
(xxix)	Details of the properties, houses, businesses etc. activities likely to be effected by land acquisition and their financial losses annually.	Details of Project affected properties, houses, businesses are provided in the Table of 7.2 (Annexure7A) of R&R plan of Social Study.
(xxx)	Detailed R&R plan with data on the existing socio-economic status of the population in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternative livelihood concerns/ employment and rehabilitation of the displaced people, civil and housing amenities being offered, etc and the schedule of the implementation of the project specific.	R&R plan is provided in Annexure7A
(xxxi)	Submit details of Corporate Social Responsibility. Necessary provisions should be made in the budget.	Separate budget of Rs 10.00 lacs will be provided for Awareness and Training Programmes to locality and road users.
(xxxii)	Estimated cost of the project including environmental monitoring cost and funding agencies, whether governmental or on the basis of BOT etc and provide details of budget provisions (capital & recurring) for the project specific R&R Plan.	1. The total project cost is approx 456.54 Crore, Environmental monitoring cost is 9.30 lac. and R&R cost is approx 36.77 Crore. 2. The funding agency is MoRTH.
(xxxiii)	Submit environmental management and monitoring plan for all phases of the project viz. construction and operation.	1. Environmental management Plan for this project is provided in Ch-9 of EIA/EMP report. 2. Environmental monitoring plan for all phases in given in Ch-6 of EIA/EMP report.

The EIA report has been updated in compliance with the final ToR issued by the MoEF.

1.7 STRUCTURE OF THE EIA REPORT

This EIA report is organized in accordance with the stipulations of the Environmental Impact Assessment Notification of September 2006 and its amendment dated 1st December 2009, Form-I, GOI's Handbook of Environmental Procedures and Guidelines and Environmental Guidelines for Highway Projects. Accordingly the EIA report has been structured into the following chapters:

Executive Summary: briefly discusses key environmental issues and recommended actions.

Chapter 1: Introduction Provide the significance of the project, Objectives and Scope of the EIA study and Structure of the EIA Report.

Chapter 2: Project Description Provide the description of the project activities which includes location, design and structure, need and purpose of the project.

Chapter 3: Analysis of Alternatives discusses the criteria for identification and analysis of alternatives, description of various alternatives including "No Change" alternative.

Chapter 4: Description of the Existing Environment describes the environmental setting of the project area baseline conditions relating to meteorology, physical environment, water resources, noise, air as well as flora and fauna.

Chapter 5: Analysis of Potential Environmental Impact and Mitigation Measures identification and quantification of the potential impacts based on analysis of secondary and primary data and gives brief description of the mitigation and enhancement measures adopted for the project.

Chapter 6: Environmental Monitoring Programme discuss the objective and methodology for the monitoring of air quality, water quality and noise parameters.

Chapter 7: Safety Measure and Additional Studies describes the policy, legal and administrative framework reviews, the existing institutional and legislative setup relevant to the project at the national and state levels, risk assessment and disaster management plan, summaries of public

consultants at different levels (e.g. villagers, project affected persons, and other stakeholders such as govt. officials) and R&R plan.

Chapter 8: Project Benefits turn lead to changes in the level of well-being and human development, through their benefit on consumption level, educational attainment, health status etc.

Chapter 9: Environmental Management Plan Provide cost effective environmental management plan to eliminate/ offset the identified environmental impact, so that development will become environmentally sound.

Chapter 10: Environmental Budget- Environmental budget for the various environmental management measures proposed in the EMP at construction and operation stages are summarized in this chapter.

Chapter 11: Disclosures of Consultant Engaged - Describes the name and brief resume of the consultant engaged in the preparation of EIA report.

Annexure – 1A**IRC GUIDELINES AND STANDARDS**

Indian Road Congress Code of Practices for Highway Projects

S.No	Subject matter related to recommended code of practices	IRC Code
1.	Hill Road Manual	IRC: SP-48-1998
2.	Recommendations for Road Construction in Waterlogged Areas	IRC: 34-1970
3.	Guidelines for use of Fly Ash in Road Embankments	IRC: SP: 58-2001
4.	Ribbon development along Highways and its prevention	IRC: SP: 15-1996
5.	Guidelines for Environmental Impact Assessment of Highway Projects	IRC: 104-1988
6.	Guidelines on Road Drainage	IRC: SP: 42-1994
7.	Report containing recommendations of the IRC regional workshops on Highway Safety	IRC: SP: 27-1984
8.	Recommended practice for Borrow pits for Road Embankments constructed by Manual operation	IRC: 10-1961
9.	Road accident Forms	IRC: 53-1982
10.	Proceedings of International Seminar on sustainable development in Road Transport	8.10.2001
11.	Highway Safety Code	IRC: SP: 44-1996
12.	Guidelines for Pedestrian Facilities	IRC: 103-1988
13.	Guidelines on Safety in Road Construction Zones	IRC: SP: 55:2001
14.	Recommended practice for treatment of embankment slopes for erosion control	IRC: 36 – 1974
15.	Guidelines on bulk bitumen transportation and storage equipment	IRC: SP: 39
16.	Manual on landscaping of roads	IRC: SP: 21 – 1979
17.	Road safety for children	IRC: SP: 32 – 1988

Annexure 1B: Addition TOR

4.31 Finalization for ToR for 4- laning of NH-79 from Chittorgarh to Neemuch (MP Border) and 2- laning of NH-113 from Nimbahera to Pratapgarh in the State of Rajasthan by M/s Public Works Department, NH Circle, Kota, Rajasthan [F.No.10-81/2011-IA-III]

As presented by the project proponent, the proposal involves development and operation of NH-79 from Chittorgarh - Neemuch (MP Border) Section (Km 183.000 to Km 221.400) by 4-laning and 2- laning of NH-113 from Nimbahera - Pratapgarh section (Km 5.4000 to Km 80.000) in the State of Rajasthan. The existing length of the road is 43.100 km (NH-79) and 74.600 km (NH-113). The proposed designed length is 44.082 km (NH-79) and 72.915 km (NH-113). Existing carriage way 5.5 to 5.7 mtr. The road traverse through two district viz. Chittorgarh and Pratapgarh. The present project NH-79 starts from km 183+000 in Chittorgarh and ends at km 221+400 in Nimbahera, whereas NH-113 starts from Nimbahera km 5+400 and ends at km 80+000 in Pratapgarh. In urban areas, as Shamabhupura, Bari and Chotti Sadari the existing ROW is very less and having congested area, therefore bypasses have been proposed.

The project road passes through Reserved Forest area from km 45/280 to 48/950 in Barol block (length 3.670 km) and km 49/080 to 49/900 (length 0.82 km) in Kala Khat block. Total 342.42 ha of land required for proposed project (135.50 ha land on NH-79 and 206.92 ha land on NH-113). Existing ROW width varies from 15m to 45m. Proposed ROW width is 45-60m. There are 1648 trees likely to be cut for the project road. 4 truck lay-by (2 on NH-79 and 2 on NH-113), 7 Nos. Bus bays have been proposed in the section of NH-79 and 16 nos. have been proposed in the section of NH-113 and 4 toll plazas (2 on NH-79 and 2 on NH-113) etc are proposed. The total land required for the project is 616.42 ha. and total available land is 274 .0 ha and land to be acquired 342.42 ha. The tentative environmental budget is approximately Rs. 41,55, 900.

During the discussions, the Committee finalized the following additional TOR for further study:

- (i) Any litigation(s) pending against the proposed project and/or any directions or orders passed by any court of law/any statutory authority against the project is to be detailed out.
- (ii) The project road passes through Reserved Forest area from km 45/280 to 48/950 in Barol block (length 3.670 km) and km 49/080 to 49/900 (length 0.82 km) in Kala Khat block. Necessary stage ?I forestry clearance shall be obtained as per OM dated 31.03.2011 and submitted along with final EIA report.
- (iii) Submit Land use map of the study area to a scale of 1: 25,000 based on recent satellite imagery delineating the crop lands (both single and double crop), agricultural plantations, fallow lands, waste lands, water bodies, built-up areas, forest area and other surface features such as railway tracks, ports, airports, roads, and major industries etc. and submit a detailed ground surveyed map on 1:2000 scale showing the existing features falling within the right of way namely trees, structures including archeological & religious, monuments etc. if any.

- (iv) Study regarding the Animal bypasses / underpasses etc. across the habitation areas shall be carried out. Adequate cattle passes for the movement of agriculture material shall be provided at the stretches passing through habitation areas.
- (v) It is indicated that 7521 trees are proposed to be cut, the information should be provided about their species and whether it also involved any protected or endangered species. Necessary green belt shall be provided on both side of the highway with proper central verge and cost provision should be made for regular maintenance.
- (vi) The proposed route is passing through a city or town, with houses and human habitation on the either side of the road, the necessity for provision of bypasses/diversions/under passes shall be examined and submitted. The proposal should also indicate the location of wayside amenities, which should include petrol station/service centre, rest areas including public conveyance, etc.
- (vii) Submit details about measures taken for the pedestrian safety and construction of underpasses and foot-over bridges along with flyovers and interchanges.
- (viii) Assess whether there is a possibility that the proposed project will adversely affect road traffic in the surrounding areas (e.g. by causing increases in traffic congestion and traffic accidents).
- (ix) Clearly indicate/provide details regarding the location, date (along with site photographs with the background of monitoring equipments and/or sample collection in process) and protocol adopted for sampling and analysis of various environmental parameters as a part of the baseline data collection.
- (x) Examine and submit the details of sand quarry, borrow area and rehabilitation.
- (xi) Climate and meteorology (max and min temperature, relative humidity, rainfall, frequency of tropical cyclone and snow fall); the nearest IMD meteorological station from which climatological data have been obtained to be indicated.
- (xii) The air quality monitoring should be carried out as per the new notification issued on 16th November, 2009.
- (xiii) Identify project activities during construction and operation phases, which will affect the noise levels and the potential for increased noise resulting from this project. Discuss the effect of noise levels on near by habitation during the construction and operational phases of the proposed highway. Identify noise reduction measures and traffic management strategies to be deployed for reducing the negative impact if any. Prediction of noise levels should be done by using mathematical modelling at different representative locations.

(xiv) Examine the impact during construction activities due to generation of fugitive dust from crusher units, air emissions from hot mix plants and vehicles used for transportation of materials and prediction of impact on ambient air quality using appropriate mathematical model, description of model, input requirement and reference of derivation, distribution of major pollutants and presentation in tabular form for easy interpretation shall be carried out.

(xv) Also examine and submit the details about the protection to existing habitations from dust, noise, odour etc. during construction stage.

(xvi) If the proposed route involves cutting of earth, the details of area to be cut, depth of cut, locations, soil type, volume and quantity of earth and other materials to be removed with location of disposal/ dump site along with necessary permission.

(xvii) If the proposed route is passing through low lying areas, details of fill materials and initial and final levels after filling above MSL, should be examined and submit.

(xviii) Examine and submit the water bodies including the seasonal ones within the corridor of impacts along with their status, volumetric capacity and quality likely impacts on them due to the project.

(xix) Examine and submit details of water quantity required and source of water including water requirement during the construction stage with supporting data and also classification of ground water based on the CGWA classification.

(xx) Examine and submit the details of measures taken during constructions of bridges across river/canal/major or minor drains keeping in view the flooding of the rivers and the life span of the existing bridges. Provision of speed breakers, safety signals, service lanes and foot paths should be examined at appropriate locations through out the proposed road to avoid the accidents.

(xxi) If there will be any change in the drainage pattern after the proposed activity, details of changes shall be examined and submitted.

(xxii) Rain water harvesting pit should be at least 3 - 5 m. above the highest ground water table. Provision shall be made for oil and grease removal from surface runoff.

(xxiii) If there is a possibility that the construction/widening of road will cause impact such as destruction of forest, poaching, reductions in wetland areas, if so, examine the impact and submit details.

(xxiv) Submit the details of road safety, signage, service roads, vehicular under passes, accident prone zone and the mitigation measures.

(xxv) IRC guidelines shall be followed for widening & up-gradation of road.

Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

(xxvi) Submit details of social impact assessment due to the proposed construction of road.

(xxvii) Examine road design standards, safety equipment specifications and Management System training to ensure that design details take account of safety concerns and submit the traffic management plan.

(xxviii) Accident data and geographic distribution should be reviewed and analyzed to predict and identify trends ? incase of expansion of the existing highway and provide Post accident emergency assistance and medical care to accident victims.

(xxix) If the proposed project involves any land reclamation, details to be provided for which activity land to reclaim and the area of land to be reclaimed.

(xxx) Details of the properties, houses, businesses etc. activities likely to be effected by land acquisition and their financial loses annually.

(xxxi) Detailed R&R plan with data on the existing socio-economic status of the population in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternative livelihood concerns/ employment and rehabilitation of the displaced people, civil and housing amenities being offered, etc and the schedule of the implementation of the project specific.

(xxxii) Submit details of Corporate Social Responsibility. Necessary provisions should be made in the budget.

(xxxiii) Estimated cost of the project including environmental monitoring cost and funding agencies, whether governmental or on the basis of BOT etc and provide details of budget provisions (capital & recurring) for the project specific R&R Plan.

(xxxiv) Submit environmental management and monitoring plan for all phases of the project viz. construction and operation.

General Guidelines:

(i) The EIA document shall be printed on both sides, as for as possible.

(ii) The status of accreditation of the EIA consultant with NABET/QCI shall be specifically mentioned. The consultant shall certify that his accreditation is for the sector for which this EIA is prepared.

(iii) On the front page of EIA/EMP reports, the name of the consultant/consultancy firm along with their complete details including their accreditation, if any shall be indicated. The consultant while submitting the EIA/EMP report shall give an undertaking to the effect that the prescribed TORs (TOR proposed by the project proponent and additional TOR given by the

Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

MoEF) have been complied with and the data submitted is factually correct (Refer MoEF office memorandum dated 4th August, 2009).

(iv) While submitting the EIA/EMP reports, the name of the experts associated with/involved in the preparation of these reports and the laboratories through which the samples have been got analysed should be stated in the report. It shall clearly be indicated whether these laboratories are approved under the Environment (Protection) Act, 1986 and the rules made there under (Please refer MoEF office memorandum dated 4th August, 2009). The project leader of the EIA study shall also be mentioned.

(v) All the TOR points as presented before the Expert Appraisal Committee (EAC) shall be covered.

Public hearing to be conducted for the project as per provisions of Environmental Impact Assessment Notification, 2006 and the issues raised by the public should be addresses in the Environmental Management Plan. A detailed draft EIA/EMP report should be prepared as per the above additional TOR and should be submitted to the Ministry as per the Notification.

Any further clarification on carrying out the above studies including anticipated impacts due to the project and mitigative measure, project proponent can refer to the model ToR available on Ministry website ?<http://moef.nic.in/Manual/highways?>

Chapter – 2

PROJECT DESCRIPTION

CHAPTER 2

PROJECT DESCRIPTION

2.1. GENERAL

National Highway 79 (NH 79) is a National Highway that links Ajmer in Rajasthan and Dhar in Madhya Pradesh. The highway is 500 km long, out of which 220 km is in Rajasthan and 280 km is in Madhya Pradesh. Project NH-79 Chittorgarh to Nimbahera including nimbahera bypass, starts from km 183/0 and ends Nimbahera, MP border.

National Highway 113 (NH 113) is a National Highway in western India. NH-113 connects Nimbahera in Rajasthan with Dahod, in Gujarat. It runs for a distance of 240 km, of which 200 km is in Rajasthan and 40 in Gujarat. Project NH-113 Nimbahera to Pratapgarh starts from Km 0/0 at Nimbahera and ends at km 80/0 at pratapgarh town.

The broad objective of the project is rehabilitation of existing road network involving rising of formation levels, strengthening of pavements and where necessary widening and realignment of roads.

However, the specific objectives of the project are;

- Provide scope for more efficient transportation of passengers and goods.
- Reduce transport operating costs by improving the quality of the road.
- Reduce journey time by minimizing congestion in especially urban centers.
- Minimize road accidents by increasing road widths, improving intersections and road geometry.
- Provide better accessibility and reduce traffic distress on the arterial highways passing through the state.
- Improve accessibility to existing and proposed industrial estates, and mega-industrial complexes for efficient transport of goods.
- Upgrade road to function in all weather by improving drainage and raising road levels.
- Provide structurally sound roads capable of achieving their design life.

2.2. BROADER DETAILS OF THE PROJECT AND LOCATION

The State of Rajasthan, in which the project highway NH-79 & NH-113 passes through, is situated in the northern part of Indian peninsula. It is located between 24° 52' and 24°

01' North latitude to 74° 37' and 74° 46' East longitude. The location of the project road on GT sheet and satellite imagery is provided in **Annexure 2A and 2B**.

The present project NH-79 starts from km 183+000 and ends at km 221+400, whereas NH-113 starts from km 0+000 and ends at km 80+000. The location of the project road is given in Fig. 2.1.

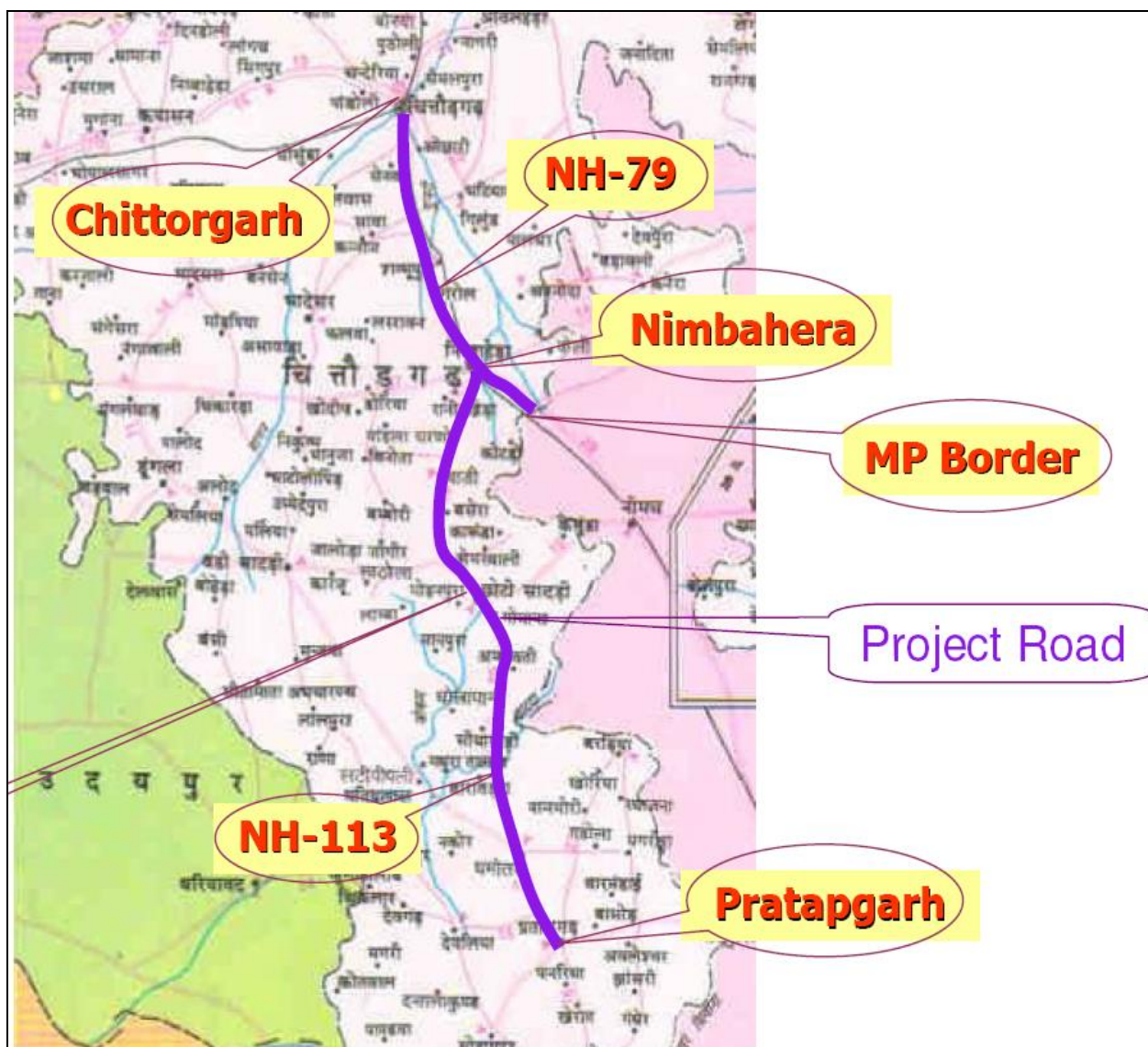


Figure 2-1: Location Map of Project Road

Details of the project road are given below:-

2.2.1 Right of Way (ROW) and Carriageway

As per the details obtained from the State PWD Rajasthan. The details of ROW chainage wise are given in Table below .

Table 2.1: Right of Way (NH-79)

Km		Length (Km)	ROW	Remarks
From	To			
183000	184000	1000	20	
184000	190000	6000	30	
190000	191000	1000	40	
191000	192000	1000	28	
192000	193000	1000	26	
193000	194000	1000	28	
194000	195000	1000	30	
195000	195500	500	20	
195500	196000	500	30	
196000	198000	2000	20	
198000	206000	8000	30	
206000	208000	2000	25	
208000	209150	1150	40	
209150	218000	14000	45	Nimbahera bypass
218000	218500	500	15	
218500	219000	500	20	
219000	221400	2400	15	

Table 2.2: Right of Way (NH-113)

S.NO.	Name of road /Revenue Village	Km. From	Km. To	Length	Avaible Row (M)
				(m)	
Tehsil Nimbahera					
1		0	300	300	24
2	Nimbahera	300	5000	4700	30
3	Maddo	5000	5625	625	8
4		5625	5825	200	8
5		5825	7225	1400	8
6	Sanpaliya	7225	7625	400	30
7		7625	7825	200	-
8		7825	8025	200	8
9	Aminpura	8025	8625	600	24
10		8625	9025	400	8
11	Sagwadia	9025	9825	800	8
12	Narsingh	9825	11625	1800	8
13		11625	11925	300	8
14	Bari	11925	13525	1600	20
15		13525	13925	400	20
16		13925	14325	400	8
17		14325	15050	725	20
18		15050	16450	1400	20
19	Narsa Khedi	16450	17450	1000	8

Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

S.NO.	Name of road	Km. From	Km. To	Length	Availble Row
20		17450	18350	900	20
Tehsil Chhoti Sadri					
21	Baseda	18350	19150	800	30
22		19150	19400	250	25
23		19400	19500	100	-
24		19500	19800	300	20
25		19800	20100	300	24
26		20100	20525	425	28
27	Semarthali	20525	21025	500	16
28		21025	21175	150	15
29		21175	22075	900	16
30		22075	23025	950	16
31	Karunda	-	-		-
32	Semarada			125	30
33				300	20
34				125	30
35				175	20
36				200	10
37				200	15
38	Semarda			150	24
39				1180	30
40	Choti Sadri			100	20
41				175	15
42				350	22
43				475	16
44				600	25
45				325	20
46	Gomana			250	15
47				425	24
48				350	15
49				1150	25
50	Dhamniya			-	-
51	Jakhmiya			-	-
52	Barkheda			-	-
53	Ambawali			1480	30
54				340	20
55				380	15
56	Kit Kheda			830	15
57	Barol			1050	28
58				1200	25
59				550	30
60				950	25
61	Siya Khedi			625	32
62				1350	32
63				1300	30
Tehsil Pratapgarh					
64	Sewara	51600	52350	750	30
65		52350	52425	75	20
66		52425	52560	135	8
67		52560	52725	165	8
68	Talayan	52725	53005	280	8

S.NO.	Name of road	Km. From	Km. To	Length	Availble Row
69		53005	53285	280	8
70		53285	53665	380	12
71		53665	53885	220	12
72		53885	54085	200	11
73		54085	54285	200	12
74		54285	54785	500	8
75	Kheda Narsingh Mata	54785	55335	550	18
76	Hanuman Choraya(Baeavarda)	55335	56055	720	21
77		56055	56335	280	26
78		56335	57495	1160	28
79		57495	57655	160	20
80		57655	58175	520	30
81		58175	58535	360	22
82		58535	59415	880	30
83		59415	59595	180	9
84		59595	59975	380	10
85	Bawadi Kheda	59975	60125	150	18
86		60125	60455	330	24
87		60455	61615	1160	22
88		61615	62415	800	27
89		62415	62535	120	30
90	Bhagwanpura	62535	62915	380	22
91	Mahudikheda	62915	63795	880	23
92	Dhamotar	63795	64035	240	16
93		64035	65205	1170	24
94		65205	65305	100	18
95		65305	65565	260	24
96		65565	65725	160	20
97		65725	66765	1040	24
98	Kulmipura	-	-		-
99	Tanda	-	-		-
100	Ambamata	-	-		-
101	Sidhpura	69190	69510	320	23
102		69510	70270	760	28
103		70270	70470	200	20
104		70470	70890	420	24
105	Gopalpura	70890	71300	410	24
106	Bamotar	71300	71820	520	24
107		71820	72060	240	20
108		72060	72430	370	22
109		72430	73190	760	24
110	Bagwas	73190	73270	80	45
111		73270	73350	80	22
112		73350	73810	460	16
113		73810	74170	360	20
114		74170	74350	180	28
115		74350	74520	170	30
116		74520	74680	160	45
117		74680	75280	600	45
118	Pratapgarh	75280	75800	520	25
119		75800	76020	220	20
120		76020	76400	380	24

Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

S.NO.	Name of road	Km. From	Km. To	Length	Availble Row
121	Raghunathpura	76400	77000	600	20
122		77000	77220	220	36
123	Pratapgarh	77220	77660	440	15
124		77660	77920	260	18
125		77920	78600	680	25
126		78600	79060	460	21
127		79060	80000	940	35

The carriageway width of the Project Highway is Two-Lane (7.0 m). Details are given in Table below

Table 2.3: Existing Road Details

S.No.	Section	Length (km)	Existing Carriageway
1	NH-79	43.100 (Including Nimbahera Bypass)	7.00
2	NH-113	80.000	2.50 o 7.00

2.2.2 Structures

Existing and proposed structures are given in Table 2.4 to 2.6.

Table 2.4: Existing structure

Features	NH-79	NH-113
Road Length (in Km)	43.100	80
Major Bridge	1	1
Minor Bridge	04	22
HP/RCC Culvert	83	64
ROB	1	0
Total	89	87

Table 2.5: Proposed structure on NH-79 (For 4-lane)

Features	New Construction	Repairing	Reconstruction	Widening and Rehabilitation
ROB	2 (at km193+912 and km204+4550)	-	-	-
Major Bridge	-	1	3	2
Culverts	-	-	34	2
Fly over	2 (at km 210+100 and km 217+9250)	-	-	-

VUPs	6	-	-	-
Non VUP	1	-	-	-
Service Road	Total length=19.434 km Locations=19	-	-	-

Table 2.6: Proposed structure on NH-113 (For 2-lane)

Features	New Construction	Repairing and strengthening	Reconstruction	Widening and Rehabilitation
Major bridge	-	one (Existing major bridge at km 73+010)	-	-
Minor Bridge	5		-	15
Culverts	22	-	44	23
Fly over	One at km 24+440	-	-	
Service Road	Total length=1.20x2 km Locations=One (from km 23+970 to km 24+990)	-	-	

2.2.3 Junctions & Intersections

There are 34 nos. exist on NH-79 and 62 nos. on NH-113.

2.2.4 Terrain

Entire Project Highway NH – 79 passes through plain terrain & NH – 113 passes through Plain & Rolling terrain.

2.2.5 Geography of the Project Stretch

The Project Highway NH - 79 traverses through district Chhitorgarh and NH - 113 traverses through two districts viz. Chhitorgarh and Pratapgarh.

2.2.6 Land Use Pattern

In the project districts predominant land use pattern is agricultural. However, a significant amount of industrial development is also observed. Details about land use pattern are given in **Annexure 2A (on Topo sheet) and Annexure 2B (on satellite imagery)**.

The soils of the project influence area falls under the following broad categories.

- Black Soils
- Yellowish brown soils

- Grayish brown alluvial soils
- Hilly soils

2.2.7 Traffic

Present Traffic

Three homogenous sections identified in the road project and manual traffic counts at 6 locations were conducted accordingly. Table 2.7 and 2.8 provides a summary of the Average Daily Traffic (ADT) relevant to this package.

Table 2.7: 7-Day Traffic Volume Count Summary (NH-79)

Description	Km 189		Km 221.400	
	ADT	PCU	ADT	PCU
Two Wheeler	1961	981	1656	829
Three Wheeler/Auto Rickshaw	177	177	67	67
Car/Jeep/Taxi	2093	2093	1919	1919
Mini Bus	71	107	85	128
Full Bus	405	1215	378	1134
LCV	326	490	408	613
2- Axle Truck	2100	6300	1507	4521
Multi Truck	1988	8946	1910	8596
Agri. Tractor With Trailer	235	1058	332	1495
Agri. Tractor With out Trailer	53	80	120	181
Cycle	114	57	115	58
Cycle Rickshaw	0	0	2	4
Bullock Cart	14	84	15	90
Other(Pl. Specify Drawn)	109	109	112	112
Total Motorised Vehicle	9409	21447	8382	19483
Total Commercial Vehicle	4890	17058	4288	14992
Total Non Motorised Vehicle	237	250	244	261
Total Vehicle	9646	21697	8626	19744

Table 2.8: 7-Day Traffic Volume Count Summary (NH-113)

Description	Km 6		Km 25		Km 32		Km 76	
	ADT	PCU	ADT	PCU	ADT	PCU	ADT	PCU
Two Wheeler	1405	703	1620	811	3231	1616	3372	1687
Three Wheeler/Auto Rickshaw	55	55	30	30	204	204	174	174
Car/Jeep/Taxi	954	954	773	773	1053	1053	689	689
Mini Bus	3	5	2	4	67	101	72	109
Full Bus	56	168	121	363	322	966	64	192
LCV	99	149	81	122	334	502	102	153
2- Axle Truck	221	663	210	630	1028	3084	198	594
Multi Truck	59	266	217	977	891	4010	164	739

Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

Agri. Tractor With Trailer	65	293	113	509	413	1859	321	1445
Agri. Tractor With out Trailer	29	44	20	31	198	298	83	125
Cycle	201	101	131	66	1331	666	1070	535
Cycle Rickshaw	0	0	15	30	2	4	6	12
Bullock Cart	3	18	2	12	43	258	11	66
Other(Pl. Specify Drawn)	2	8	4	16	0	0	28	112
Total Motorised Vehicle	2946	3300	3187	4250	7741	13693	5239	5907
Total Commercial Vehicle	438	1251	631	2096	2642	8663	745	2222
Total Non Motorised Vehicle	206	127	152	124	1376	928	1115	725
Total Vehicle	3152	3427	3339	4374	9117	14621	6354	6632

2.2.8 Realignments

Due to sharp curve on existing road will be realignment at two locations on NH-79 and at 35 locations on NH-113 described in Tables (2.9) below.

Table 2.9: Realignment on NH-113

S.N.	Design Chainage		Length (m)
	From	To	
1	198+200	198+600	400
2	202+500	203+100	600

Table 2.10 : Realignment on NH-79

S.N.	Design Chainage		Length (m)
	From	To	
1	4+940	5+540	600
2	6+040	6+140	100
3	11+440	11+790	350
4	18+315	18+615	300
5	24+515	24+715	200
6	26+015	26+240	225
7	27+865	28+015	150
8	29+290	29+890	600
9	29+890	30+165	275
10	31+490	31+615	125
11	31+965	32+165	200

S.N.	Design Chainage		Length (m)
12	32+990	33+640	650
13	33+990	34+290	300
14	34+690	35+540	850
15	36+140	36+940	800
16	37+515	37+815	300
17	38+265	38+490	225
18	39+665	39+790	125
19	40+040	40+540	500
20	40+915	41+190	275
21	41+540	42+240	700
22	44+490	44+640	150
23	46+190	46+990	800
24	47+165	47+490	325
25	47+765	48+040	275
26	48+390	48+740	350
27	48+915	49+490	575
28	51+690	52+040	350
29	52+940	53+140	200
30	54+440	54+640	200
31	59+290	59+840	550
32	59+990	60+440	450
33	60+590	60+840	250
34	64+865	65+165	300
35	68+765	68+890	125

2.2.9 User Facilities

Tuck Lay bays

Four Truck lay bays have been proposed along project highway to provide safe and comfortable journey, given in **Table 2.11 and 2.12**.

Table 2.11: Truck Lay bays on 4-lane

S. No	Existing Chainage	Design Chainage	Side
1	188+900	188+900	Left
2	On Nimbahera Bypass (218+660)	219+500	Right

Table 2.12: Truck Lay bays on 2-lane

S. No	Existing Chainage	Design Chainage	Side
1	9+325	4+040	Left
2	72+150	64+990	Right

Bus Bays:

For the regular movement of buses through operating under government and private sectors 46 Nos bus bays and bus shelters have been proposed, given in **Table 2.13 and Table 2.14).**

Table 2.13: Bus bays and shelter on 4-lane

S.No.	Location (km) Existing Chainage	Location (km) Design Chainage	Side (Left / Right)
1	183+700	183+700	Left and Right
2	193+250	193+250	Left and Right
3	197+125	198+100	Left and Right
4	203+425	204+600	Left and Right
5	209+028	209+900	Left and Right
6	On Nimbahera Bypass (214+040)	214+900	Left and Right
7	On Nimbahera Bypass (218+400)	223+900	Left and Right

Table 2.14: Bus bays and shelter on 2-lane

S.No.	Location (km) Existing Chainage	Location (km) Design Chainage	Side (Left / Right)
1	5+450	0+140	Left and Right
2	6+360	1+040	Left and Right
3	11+010	5+740	Left and Right
4	Bari Bypass	9+040	Left and Right
5	17+685	12+090	Left and Right

S.No.	Location (km) Existing Chainage	Location (km) Design Chainage	Side (Left / Right)
6	24+475	18+800	Left and Right
7	Chhoti Sadri Bypass	22+275	Left and Right
8	35+750	26+690	Left and Right
9	35+935	28+975	Left and Right
10	37+690	30+630	Left and Right
11	40+350	33+940	Left and Right
12	43+200	36+140	Left and Right
13	50+925	43+990	Left and Right
14	66+450	59+440	Left and Right
15	72+960	65+860	Left and Right
16	76+350	69+260	Left and Right

Toll Plaza:

Two Toll plazas on NH-79 and Two on NH-113 are proposed. Location and other details are provided in **Table 2.15** and **2.16**.

Table 2.15: Detail of Toll Plaza on NH-79

Sl.No.	Location of Toll Plaza (Existing Chainage)	Location of Toll Plaza (Design Chainage)
1	189+000	189+000
2	On Nimbahera Bypass (221+510)	222+350

Table 2.16: Detail of Toll Plaza on NH-113

Sl.No.	Location of Toll Plaza (Existing Chainage)	Location of Toll Plaza (Design Chainage)
1	10+000	4+726
2	70+000	63+115

2.2.10 Material Requirement:- The materials and resource requirements for the project are as follows:- Moorum (tonn) : 3983651 ,Aggregate (cum) : 1148366 ,Bitumin (Tonn) : 23907 ,Water (KLD) : 600 ,Diesel (KL) : 6250 ,Sand (cum) : 29825, Cement (Tonn) : 17176 ,Steel (Tonn) : 4201 .The details of borrow area are presented in Table 2.17

Table 2.17: Detail of Borrow Area

Borrow area detail NH-79 & NH-113			
Sr. No.	Location of Village	Khasara No.	Area (Ha)
1	Patniya	49	6.21 Hectare
		50	6.59 Hectare
		68	3.71 Hectare
2	Laxmipura	156	5.03 Hectare
3	Lasravan	781/703	.875 Hectare
4	Akya (Ranikhera)	170	23.5Hectare
5	Ahirpura (Fatcher Ahiran)	156	5.03 Hectare
		781/703	1.5 Hectare
6	Bahadurpura	2	35.35 Hectare
7	Narsakheri (Badi)	459/323	2.5Hectare
8	NarsaKheri	460/328	2.5 Hectare
9	Gudakhera	154	.53 Hectare
10	Makanpura	20	1.28 Hectare
		18	5.16 Hectare
11	Ranikhera	492	5.28 Hectare
		494	7.03 Hectare
12	Chandkhera	359/166	2.5 Hectare
13	Ranikhera	522/424	23.75 Hectare
14	Jaliya	35	7.52 Hectare
		38	6.54 Hectare
15	Siyakheri	1280,1309,688,689,690,691,927	20 Hectare
16	Sajanpura	209,212,12,31,220/376,191,263	24 Hectare
17	Rambawali	5,13,514	10.72,0.58 Hectare
18	Gomana	1998,1959	3.66,3.39 Hectare
19	Semarthaly	1030	3.03 Hectare
20	Jalminda(Barekhan)	310,215,216,676,677-----,690,738	20.41 Hectare
21	Gothada(Barekhan)	215,216,636,677-----690,738	55.14 Hectare
22	Baseda(Karunda)	1063,1064,1066,1067,1068,1069,1073,	40 Hectare
23	Semarda(Karunda)	10,103,1063,1064,-----1069,1073	42 Hectare
24	Devdarh	1,30,71,31,41,336	5 Hectare
25	Hanuman Chouraya (Barabarda)	1,33,61,314	1.57& ,0.81,Hectare

26	Bagwas	198	2.60 Hectare
27	Kulmipura	641,642,643,644,645,646,647,	0.27,0.18,2,0.47,0.72,0.86,0.20,Hectare
28	Dhamotar	580,78	0.6,1.03 Hectare
29	Sidhupura	1493,1494	3.05,5.90 Hectare
30	Tanda(Kulmipura)	48,21,47,149	1.23,3.31,2.23 Hectare
31	Arniya Panth	1080	0.4 Hectare
32	Borakheri (Badoli Madhosingh)	35,43,85,515	43 Hectare
33	Sakariya (Ranikhera)	522/424	23.78 Hectare

2.2.11 Safety Measures

Delineators and Guard Posts

- Delineators and Guard Posts will be provided at all horizontal curves on either side of the carriageway as per specifications and as per the design standards.
- Guard post will be provided on either side of the carriageways, at locations where the embankment height varies between 2 to 3m, as per the design standards.

Traffic Aid Posts

Traffic Aid Posts shall be provided at the Toll Plazas in accordance with Clause 12.8 of Manual of specifications and standards of Four Lane.

Medical Aid Posts

Medical aid posts shall be provided at the Toll Plazas in accordance with clause Clause 12.9 of Manual of specifications and standards of Four Lane.

Vehicle rescue posts

Vehicle rescue posts shall be provided at the Toll Plazas in accordance with clause 12.10 of Manual of specifications and standards of Four Lane.

Telecom system

Telecom posts shall be provided at the Toll Plazas in accordance with clause 12.11 of Manual of specifications and standards of Four Lane for convenience of the users of the Project Highway with necessary equipments.

Note: In case of any discrepancy in numbers or location of any of the project facilities mentioned in this Annex-I, the Independent Engineer shall finalize the number/location of these facilities as per site requirement.

Road side Furniture

Road side furniture shall be provided in accordance with section-9 of Manual of Specifications and Standards for 4 lane section.

Street Lighting

Street lighting and lighting system shall be provided in accordance with clause 12.3 of section-12 of Manual of Specifications and Standards for 4 Lane section.

Pedestrian Facilities

Pedestrian crossing Facilities shall be provided in accordance with 12.2 of section-12 of the Manual of Specifications and Standards for 4 Lane section.

Landscaping and Tree Plantation

Highway landscaping and tree plantation shall be provided in accordance with Section-11 of the Manual of specifications and Standards for 4 Lane section.

Typical conditions of the exiting Project Highway are shown in **Photos**.



Photo 2.1: Bridge at Km 216.800 (2x7.50x3.80)



Photo 2.2: Bridge at Km214.310 (2x5.10x2.60)



Photo 2.3: Bridge at Km41.100 (7x4.40x3.60)



Photo 2.4: Causeway at Km 75+990 (5x4.10x2.80)



Photo 2.7: Nimbahera at Km 0.0



Photo 2.8: Bari at Km 14.0



Photo 2.9: Semarda at Km 25.0



Photo 2.10: Choti Sadri at Km 30.0



**Photo 2.11: Pt, Deen Dayal Upadaya Circle
Km 76/0**



Photo 2.12: To Neemach Km 31.0



Photo 2.13: To Pratapgarh at Km 209



Photo 2.14: Marjivi Crossing Km 219.0



Photo 2.13: Congested Area at Chittorgarh from km 183/0 to km 184/0



Chapter – 3

ANALYSIS OF ALTERNATIVES

CHAPTER 3

ANALYSIS OF ALTERNATIVES

3.1. ANALYSIS OF ALTERNATIVES

The analysis of alternatives is carried out to find the least cost option with regards to socio-economic and environmental consequences to each alternative and the cost attributed to it. The option study will also enable the consultants to approach people for various aspirations of the local stakeholders.

Environmental alternatives and design considerations

The project offers some environmental alternatives in order to facilitate the decision making process. As usual the analysis of alternative should start with the customary 'with' and 'without' the project scenario. This is to justify the proposal of a widening alternative to no widening alternative. The "*with*" project scenarios will, however, only occur only if the recommendations provided for the construction stage are followed and all construction activities are carried out according to principles of Environment Friendly Road Construction

3.2. WITH AND WITHOUT PROJECT SCENARIO

3.2.1. Without Project Scenario

The existing project road NH-79 and NH-113 are two lane highway, in this stretch existing ROW is approx 20-45 and 8-24m. The carriageway of the existing road is 7.0m with 1.5m Paved shoulders on either side in most of the section . The volume of the project highway carrying high traffic volumes is upto 20390 PCU's, the capacity of the present highway is insufficient for handling such volume of traffic so that NH-113 and NH-79 calls in for immediate conversion of 2 lane of NH-113 and 4 lane of NH-79.

The present highways are continuously dotted with settlements and the traffic flow is seriously affected by severe conflicts between the local traffic and the through traffic. This is further compounded by the various landuse conflicts, in terms of uncontrolled development along the highway and the encroachments onto the designated highway land (ROW).

The population growth, increase in traffic volumes and the economic development along the corridor would continue to occur and will further add to the already critical situation. The existing unsafe conditions and the adverse environmental consequences, in terms of

environmental quality along the highway, would continue to worsen in the absence of proposed improvements. Therefore, no action alternative is neither a reasonable nor a prudent course of action for the proposed project, as it would amount to failure to initiate any further improvements and impede economic development.

3.2.2. With Project Scenario

This scenario includes the widening to 2-lane and 4-lane of the existing two lane of NH-113 and NH-79, as envisaged in the project objectives. The “with project scenario”, has been assessed to be economically viable and will alleviate the existing conditions. It would therefore, contribute to the development goals envisaged by the Government of India, and enhance the growth potential of the area.

To avoid the large scale acquisition of land and properties, the project envisages the two and four laning of the highway within the existing ROW, but for the critical locations, where bypasses and realignments have been proposed.

In spite of the various development benefits likely to accrue due to the project, as is the case of every development project, this project would be accompanied by certain impacts on the natural and social environmental components. The potential impacts on the various environmental components can be avoided through good engineering practices. Wherever warranted and avoidance has not been possible, appropriate mitigation and enhancement actions will be worked out to effectively offset the environmental damages inflicted due to the project. A comparative assessment of the ‘With and Without’ project scenarios are presented in **Table 3.1**.

Table 3.1: “With” and “Without” Project Scenarios

SCENARIO TYPE	LONG-TERM SCENARIO “WITH” PROJECT	LONG-TERM SCENARIO “WITHOUT” PROJECT
Flora	About 1648 numbers of trees exists within ROW and need to be felled, however, through compensatory afforestation @ 1:3 will again improve the greenery of the area.	No change in vegetation and number of trees.

SCENARIO TYPE	LONG-TERM SCENARIO “WITH” PROJECT	LONG-TERM SCENARIO “WITHOUT” PROJECT
Social and Cultural Environment	100 community properties will be partially affected due to proposed widening. Total land acquisition will be 616.42 ha. Major land use affected will be agricultural.. Use of open / barren land has reduced acquisition in other areas.	Along the road side many community properties are present. No change in land acquisition and cultural properties.
Topography and Soils	No major change in topography and soils, however, better road will reduce soil erosion and dust	Further deterioration in present conditions
Highway Geometrics	Divided four lane carriageway with geometric improvements	Two-lane highway with poor geometrics.
Speed	80 kmph in urban sections 100 kmph in rural sections	20-30 kmph in urban sections 50-60 kmph in rural sections
Safety	Along the settlement stretches with significant pedestrian traffic, sidewalks have been provided. Improved road safety since all inadequacies of road will get corrected and overall safety of corridor will be significantly increased.	On the present road accidents are common and in future they will be gradually increased.
Drainage /Water logging	Will be improved due to reconstruction of culverts/bridges with adequate hydraulics.	No changes in present problems associated with inadequate drainage. Possible weakening and damage to existing drainage structures causing further damage to the road.
Environmental	Provision of bypasses around the	Present environmental

SCENARIO TYPE	LONG-TERM SCENARIO “WITH” PROJECT	LONG-TERM SCENARIO “WITHOUT” PROJECT
Quality	major settlements improves environmental quality within the urban areas due to lowered pollution levels and relieving of congestion	quality is poor due to congestion and high emission levels because of slow movement of traffic. A further deterioration is expected due to increase in traffic volumes and further congestion.
Road side Amenities	Appropriate road side amenities to be provided at various locations along the corridor.	Not adequate
Wayside Facilities	Wayside facilities proposed at several locations, where necessary – like rest areas, with appropriate facilities for recreation, highway public telephones etc.	Not of adequate standards, quality and number.
Financial Implications	Total project cost is 511.29 crores.	No capital costs. However, increasing road maintenance and vehicle operating costs as road deteriorates and as travel times increase.

It is found on the basis of analysis that “without” project scenario will do more harm than the benefits in terms of the biological and socio-economic environment of the project region as compared to “with” project scenario. Hence the “with” project scenario with minor reversible impacts is an acceptable option for the project section.

3.3. ALIGNMENT IMPROVEMENT ALTERNATIVES

Improvement of existing alignment has been done in following ways which will have significant beneficial impact in terms of

- Minimizing displacement
- Reducing resistance to the project
- Minimize the impact on the existing trees/local environment;

- Maximum benefit in terms of road geometry, pavements, shoulders, embankments etc
- Uninterrupted flow of through traffic along the project stretch
- Avoid future possibility of installation of speed breakers by the local administration/public
- Avoid adverse impacts of the crowded areas along the project stretch
- Provide scope for wayside amenities

3.4. BYPASS ALTERNATIVE

Choti Sadri, Nimbahera, Bari and Sambhupura are presented along the road side. The available land width at most of places is 20m to 28m. The through traffic on the both National Highways has only a two lane carriage way is at present passing through these towns resulting in congestion, traffic hold ups and cause accidents. Keeping in view of above, bypasses are essential to decongest the roads and to improve air and noise quality. In order to assess the feasibility, potential alternatives were studied for the bypasses of above mentioned towns. The issues considered were:

- Length of bypass;
- Geometrics;
- Land acquisition;
- Environmental constraints;

The options considered were analyzed to develop information on each, relative to its performance against the factors designed. Constraints with respect to environmental, engineering and social factors, for different option of bypasses are presented in the options study given below for all bypasses. The options considered and finally selected option is marked.

There are different reasons for considering the bypasses. There is congestion all along the highway in urban areas, widening will lead to dislocation of structures and create resettlement problems, loss to residential and commercial properties, rise in vehicular and pedestrian accidents. The loss of establishment will affect on livelihood. In addition there is possibility of service roads in urban areas. Increase in air, noise and water pollution problems will take place. All these force to think and plan alternative bypasses. The bypasses planned as alternatives are discussed below.

Bypasses

4 number of bypasses have been proposed out of 2 are 4-lane configuration and other 2 are 2-lane. On NH-79 one 2-lane bypass is already present that will be changed into 4-lane. Detail of bypasses is given in **Table 3-2 and 3-3**.

Table 3-2: Proposed 4.lane Bypasses

S.N.	Name of Township	Existing Chainage (km)		Design Chainage (km)		Length (km)
		From	To	From	To	
1	Sambhupura Bye pass	194+450	197+000	194+450	198+000	3.550
2	Nimbahera Bye pass (Existing two lane shall be strengthened and new two lane shall be constructed)	209+128	218+000	209+665	223+500	13.835

Table 3.33: Proposed 2.lane Bypasses

S.N.	Name of Township	Existing Chainage (km)		Design Chainage (km)		Length (km)
		From	To	From	To	
1	Bari Bypass	13+000	15+600	7+740	10+015	2.275
2	Choti Sadri Bypass	24+550	31+900	18+915	24+860	5.945

3.5. ALTERNATIVE METHODS OF CONSTRUCTION

All methods except those involving heating with firewood are acceptable. However the quality of work should be good. Seepage of water through the pavement and causing damage to the underlying base courses needs to be prevented. Such will cause a rapid deterioration in structural strength and riding quality, resulting in higher vehicle operating costs, longer travel time and more emissions. Bitumen emulsion should be used wherever possible.

The key recommendations for each type of engineering or construction parameter are:

Pavement

- Options of providing flexible and rigid pavements were evaluated by comparing the life cycle cost over the design life period. Flexible pavement was found to be more cost effective and is being proposed.

- All methods of paving, except those involving heating with firewood, are acceptable. However the quality of work should be good. Seepage of water through the pavement and causing damage to the underlying base courses needs to be prevented. Such will cause a rapid deterioration in structural strength and riding quality, resulting in higher vehicle operating costs, longer travel times and more emissions. Bitumen emulsion should be used wherever possible and.
- Detailed design engineers, supervisory engineers and contractors should be aware of, or made aware of, the suitability of each method of pavement construction and the behaviour of different types of bitumen under varying climatic, traffic and other road conditions.

Drainage

- Drains lined with cement mortar should be used. This will minimise damage to the road from leakages and should minimise total costs;
- Cross drainage structures should be designed to accommodate and support the expected water flows.

Chapter – 4

DESCRIPTION OF THE ENVIRONMENT

CHAPTER-4

DESCRIPTION OF THE ENVIRONMENT

4.0 General

The baseline environmental status is discussed with reference to physical, chemical, ecological and social aspects of the project road. It is based on environmental monitoring, field observation, public consultation and secondary data review. The study corridor includes 15 km aerial distance on either side of the project road. Primary data was collected for the Right of Way and for 500 m on either side of the NH-113 and NH-79. The study was conducted as per the EIA Guidance manual for Highways by Ministry of Environmental & forest and EIA Notification 14th September 2006 and its amendments.

Study Area

The areas of direct influence will be confined in a linear fashion along the corridor, where the construction activities take place. The existing RoW is varying from 10-45m (NH-79) and 8-45m (NH-113) as per PWD record. Project stretch has 2-lane, 7 m wide bituminous carriageway with 1 m to 2 m wide unpaved shoulders on both sides. Embankment height varies from 0 m to 1.5 m for most of the stretch. The area of direct influence of 500 m on either side of RoW has been considered. Secondary data have been collected within 15 km aerial distances specifically mentioned at Para 9(iii) of Form I of EIA Notification 2006.

Project District

Chittorgarh District: Chittorgarh is a city and a municipality in Rajasthan state of western India. It lies on the Berach River, a tributary of the Banas, and is the administrative headquarters of Chittorgarh District and a former capital of the Sisodia clans of Rajputs of Mewar. The city of Chittorgarh is located on the banks of river Gambhiri and Berach. The district was bifurcated and a new district namely Pratap Garh was created with certain portion taken from Udaipur district in the newly created district of Pratap Garh.

Fiercely independent, the fort of Chittor was under siege thrice and each time they fought bravely and thrice Jauhar was committed by the ladies and children, first led by Rani Padmini, and later by Rani Karnavati. The famous warriors Gora and Badal, in the war against Allaudin Khalji (1303 AD), have become legendary. The sacrifice of Jaimal and Phata in the war against the Mughals (1568 AD) was so great that the Mughal Emperor Akbar installed their statues in the fort of Agra. It has also been land of worship for Meera.^[1] Chittorgarh is home to the Chittorgarh Fort, the largest fort in Asia.

Geography

Chittorgarh is located at 24.88°N 74.63°E. It has an average elevation of 394 metres (1292 ft).

Demographics

As of 2011 India census, Chittaurgarh city had a population of 1,16,524. Males constitute 50.9% of the population and females 49.1%. According to census 2001 ^[3] Religion wise Hindu are 92% of the total population. Scheduled caste and scheduled tribes constitute 13.9% and 21.53% which is major portion of both total population and Hindu population. chittaurgarh district has literacy rate of 54%.

Transport

The completed Golden Quadrilateral highway system will pass through Chittorgarh, connecting it to much of the rest of India. Also crossing the East West Corridor (Express Highway). The Chittorgarh is situated at National Highway No. 76 & 79, both the Highways are crossing at Chittorgarh. National Highway 76 connects to Kota within 2 hours. It is well connected by rail with Jaipur via Bhilwara and Ajmer, Kota via Bundi, Jodhpur via Ajmer, Indore Junction BG, Bhopal, Indore Mhow, Ujjain, Ratlam, Nagda Junction, Ajmer and Fatehabad by many Broad gauge trains. The city is also connected to Udaipur City via Mavli Jn. It is also connected to Kota via Bundi. Thus, Chittaur Garh is a major rail junction of south Rajasthan. Some weekly trains to Hyderabad and Kolakata are passing through this station. The town still lacks connectivity to Bikaner,

Ahmedabad, Jabalpur and Nagpur, so in order to catch trains for further cities one has to reach either Kota, Nagda or Ratlam.



Pratapgarh district: Pratapgarh district is the 33rd district of Rajasthan, created on 26 January 2008. comprising five Tehsils/ sub-divisions, Pratapgarh, Chhotee Sadri, Dhariyawad, Arnod and Peepalkhoont. It is a part of Udaipur Division and has been carved out from the erstwhile tehsils of Chittorgarh, Udaipur and Banswara districts. Pratapgarh town is the administrative headquarters of the district. As of 2011 it is the second least populous district of Rajasthan (out of 33), after Jaisalmer.

Well known for pure gold and glass-inlay handmade unique jewelry called "Thewa", Pratapgarh,

The district is dotted with good number of ancient and historical sites, but in want of a detailed study either by the Archaeological Survey of India or by the Department of Archaeology and Museums, Government of Rajasthan, there are no 'protected monuments' as such. A few important still unexplored archaeological and historical sites include Avleshwara, Ghotaavarshika (Ghotarsi), Sidheriya, Gandharvpur (Gandher) Jaanagarh, Veerpur and many others. Sita Mata sanctuary houses pre-historic rock engravings.

Geography

Pratapgarh is located at 24.03° N 74.78° E with an average elevation of 580 meters (1610 feet above mean sea level). It is said to be the second highest place (?) in Rajasthan after Mount Abu. Situated on the junction of the Aravali mountain ranges and the Malwa Plateau its unique location prominently carries the geological characteristics of these both.

Area

The geographical area of Pratapgarh is 4,11,736 hectares, out of which forest area is 1,20,976 hectares (2009-'10).

Climate, Soil, Topography and Minrels

The average annual rainfall is 856 mm. The soil is mainly highly fertile Black Cotton Soil made of magma of volcanos. The major rivers of the district are Jakham, Mahi, and Siwana or shiv. Other seasonal rivers are Som, Era, and Karmoi. Out of five, four sub divisions except Chhoti Sadri, are notified forest blocks, where no major industry or mining activity is allowed under law. However, in non-forest regions of Chhoti Sadri (and part of Pratapgarh and Dhariyawad), small scale mining activities are in operation extracting mainly red ochre, calcite, dolomite, quartz, feldspar and soapstone. Marble, Building-stone and Limestone are also available in small quantities.

Rich in natural beauty and an ideal blend of Malwa, Mewar and Vagad cultures, Pratapgarh known in earlier times as 'Kanthal', is surrounded by Udaipur, Banswada, Chittaurgarh districts of Rajasthan and Neemach and, Mandasaur districts of Madhya

Pradesh (MP). The people of this region are more linked with MP for social obligations than other parts of Rajasthan, because Neemuch, Mandsaur and Ratlam districts of MP surround Pratapgarh boundaries in about 60% length.

The district includes **habitants of all sects**, religions and castes including Bhil, Balai, Bhanti, Dholi, Patidar, Rajput, Brahmin, Mahajan, Sunar, Darzi, Chamar, Luhar, Suthar, Nai, Dhobi, Koli, and above all Mina; major occupants are traditional Meena tribals, exclusively dependent on agriculture, animal husbandry and forestry, who have their own culture, attire, dialect, rituals, fairs and festivals. A good number of native Bohra Muslim families are engaged in overseas trading and business in Middle East countries.

Culture

The major attractions of the district are Sita Mata Wildlife Sanctuary and Jakham Dam, however, large number of visitors and pilgrims do visit the old temples at Ambamata Shaktipeethh, Bhanwarmata, Gautameshwara Mahadev Paapmochan Teertha, Sholi Hanuman Temple, Deepeshwar Mandir and many other temples. The magnificent Tomb (Dargah) of Saiyadi Kaka Saheb is also a popular destination, especially amongst Daudee Bohra community of Muslims, who gather here in large numbers on the occasion of Annual Urs of Saiyadi Kaka Saheb.

The major fairs of this region are- Ambamata Fair, Sita Mata Fair, Gautameshwara Fair (on 'Vaishak-Poornima') and Bhanwar Mata Fair. Fairs on stipulated dates are also held in small places like Shaulee-Hanumanjee, Gangeshwara-Parsola, Manaa-Gaon, and Gupteshwara Mahadev in and around Pratapgarh.

Although all major Hindu **festivals** like Diwali, Govardhan Puja, Holi, 'Rang-Teras', 'Raksha Bandhan', 'Mahashivratri', 'Hanuman Jayanti' and 'Vijayadashami' etc. are celebrated in Pratapgarh, yet 'Sharad Navratri' and 'Vasant Navratri' both are also celebrated in the city with fun and florid. "Doondhotsava" is celebrated on Holi. The people of city do not celebrate "Dhulendi" on the following day after Holi, as done all over India, but color holi is celebrated thirteen days after on the hindu day of "Rang Teras". 'Gair'-Dancers can be seen all over the villages during 'Dashaamaataa' festival. A

procession of folk-God Baba Ramdevji is a regular feature on 'Bhag-Dashmee Teej'. 'Sheetalaa Saptmee' is also observed in the district, when only "Makki-Dhoklas" (cooked before a day prior to the festival) are consumed. Some tribals have a tradition of 'second marriage' as an approved social-custom.

Like many other places in the region, the most **prominent custom** is "Mautana", where as a social-penalty, (mostly in accidental death-cases), heavy cash-fine is imposed on the culprit/s in favor of family of victim and his community. Before any auspicious event, people do organize Gangoj, Ratri-Jagarnaa and also obtain a Paatee (clearance) from 'Devra'- a temple of local God/s.

The prominent language of this region is Hindi, however, "Kanthhalee-Bolee" composed of words from Malwi, Mewari and Vagdee (local dialects) is commonly spoken in villages.

Amongst the local Hindi **writers** that Pratapgarh has produced, 'Pardeshi' (1923–1977) (Real Name : Mannalal Sharma) was a well known literary figure. 'Pardeshi' indeed was a prolific writer with a contribution of 15 novels, 16 poetry-collections, 8 books for children, 5 story-collections, 3 dramas, and 14 translated books in Hindi. A small public-park, in his memory has been built at Pratapgarh by the local Municipality.

Although the local tribals make different bamboo handicrafts for themselves, the most notable craft evolved by traditional goldsmiths (Raj-sonis) of Pratapgarh is **precious jewelry Thewa** which is in great demand amongst modern ladies in India and abroad.

Demographics

According to the 2011 census Pratapgarh district (Rajasthan) has a population of 868,231,^[2] roughly equal to the nation of Qatar^[5] or the US state of Delaware.^[6] This gives it a ranking of 472nd in India (out of a total of 640).^[2] The district has a population density of 211 inhabitants per square kilometre (550 /sq mi) .^[2] Its population growth rate over the decade 2001-2011 was 22.84 %.^[2] Pratapgarh has a sex ratio of 982 females for every 1000 males,^[2] and a literacy rate of 56.3 %.^[2]

The population of Pratapgarh in 1881 AD was 79,568; whereas it was 1,10,530 in 1951.

Irrigation

The major Irrigation project of the district is the Jakham Dam, located in Anooppura village of Pratapgarh Tehsil, 32 km from Dhariawad and 35 km from district headquarters. This dam was built on the Jakham river, which originates from a small village Jakhamia in chhoti sadree subdivision. The Jakham dam's foundation was laid on 14 May 1968 by chief minister Mohan Lal Sukhadia, however, the actual construction-work of the dam started in 1969-70. The dam itself was completed in 1986, but took another twelve years for the completion of this irrigation project in March 2000. Initially the catchment of the Jakham Dam was 5,015 MCft for irrigating 52,354 hectares of land. Out of its total water retention capacity of 5,015 MC ft, the usable water capacity is 4,671 MC ft. The cost of this project is 106.03 crore. The length of this Dam is 253 meters, out of which spillway is in 90 m in length. The area around the dam is hilly and rugged but interesting. 13 km away from the main dam, Nangaliya pick up ware has been constructed with Left main canal (39.90 km) and right main canal (34.12 km). Irrigation facility is being provided in 118 villages in Dhariawad sub-division.

Agriculture

Pratapgarh is one of the greenest districts of Rajasthan. Major crops, as indicated above, are wheat, Maize, Soya bean and opium. Agriculture is practised both in the valleys and on the tableland on the hilltops. Common lands account for 40% of the total geographical area, nearly 30 % of the common lands fall in the forest land category. The area is a schedule V area, predominantly inhabited by the tribal communities.

Meenas are the most numerous comprising about 55% of the entire population. Average landholdings are small and canal irrigation facilities are limited only to Dahriyawad and Peepal Khoont tehsils, therefore agriculture is mostly rain-fed. Besides farming, the tribal communities depend upon the forests for their food, fodder and fuel (wood requirements). Many of the members of tribal communities do migrate to nearby towns in Gujarat and Madhya Pradesh to find a job as farm-labourers or construction workers.

The production of wheat in 2009–10 was 1,90,585 MT in the district, of Maize it was 1,28,984 MT followed by Soya bean as 1,69,133, Mustered as 8,296 MT. Small quantity of Rice-production (989 MT) was also recorded.

Transport

Pratapgarh is well connected with major cities in Rajasthan, Gujarat & Madhya Pradesh by road . Daily Bus Services connect Pratapgarh with Chittaurgarh (110 KM), Banswara (80 KM), Udaipur (165 KM), Dungarpur (95 KM), Rajsamand (200 KM), Jodhpur (435 KM), Jaipur (421 KM) Neemach (62 km) Ratlam (85 KM), Mandsaur (32 KM) and Delhi (705 KM) and many other cities in Rajasthan. Private Bus operators are also providing regular connectivity to Pratapgarh from nearby places.

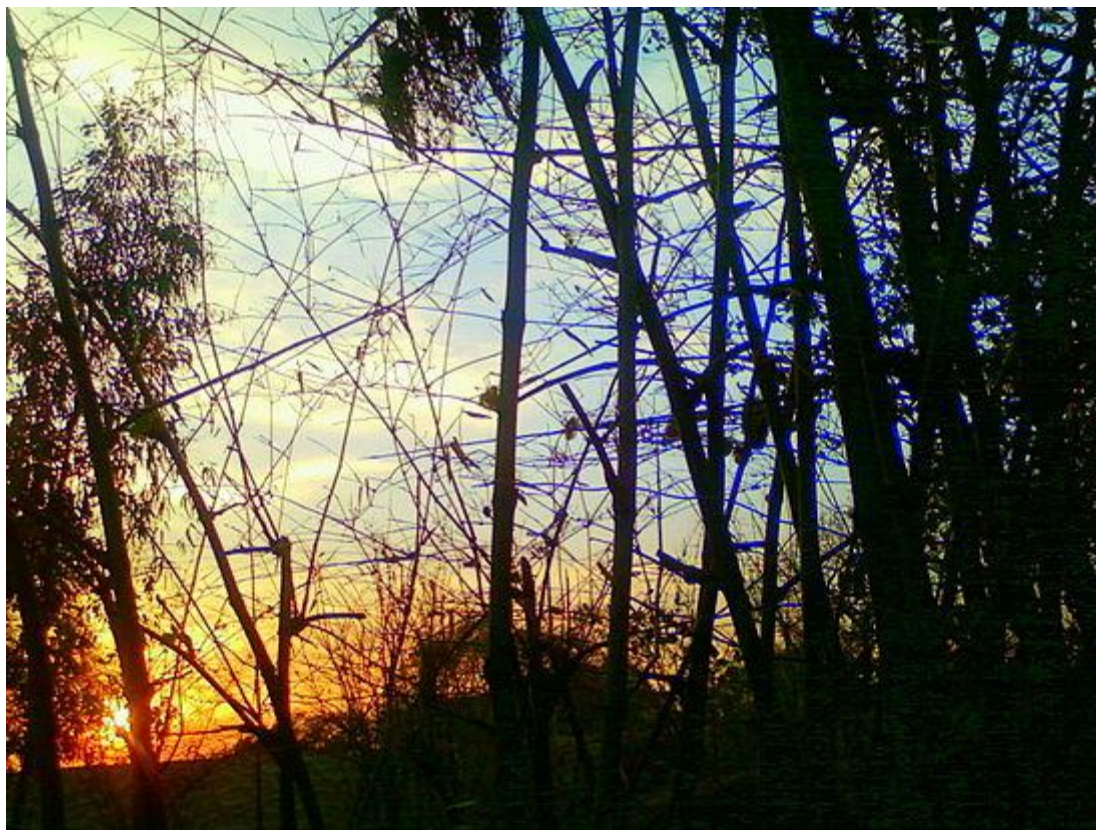
The total length of roads in the district is 1879 km, with more than 7,500 registered light and heavy vehicles.

It is the only district without rail-connectivity in Rajasthan state. However, as a result of untiring efforts by ex-district collector Hemant Shesh, the Government of Rajasthan agreed to pursue vigorously with Ministry of Railways, Government of India to connect Pratapgarh with broad-gauge from Mandsaur (32 km), for which appropriate financial contribution to GOI may also be made by the state, if required. It is therefore, presumed that a new railway track ultimately shall be laid from Mandsaur to Pratapgarh, as publicly assured and announced by Shri Ashok Gahlot, the chief minister of Rajasthan on 18 May 2011 at Pratapgarh.

Due to Pratapgarh's strategic location, the Airport Authority of India has installed a VOR station in Pratapgarh on Dariyawad Road for guiding high altitude jet aircrafts. (It is said that Pratapgarh is at the midpoint of the Delhi-Mumbai Air Route.

An airstrip has been approved by the Government of Rajasthan in April 2011 to be constructed in Varmandal village (13 km from Pratapgarh). Temporary helipads are in operation at four places in Pratapgarh, Dhariyawad, Peepalkhoont and Chhoti Sadri.

Flora and fauna



Sita Mata Wildlife Sanctuary

As indicated above, Since the early times the north-west part of this region had dense forests consisting of valuable Sagwaan, Chandan, Sheesham, Saalar, Dhaak, Dhonk, Kadamb, Mahua, Babool, Imlee and Baans trees in abundance and therefore in 1828 AD, a separate state forest department was created to manage state's exceptionally rich forest wealth.

The thickly wooded Sita Mata Wildlife Sanctuary sprawls over the Aravali ranges and the Malwa plateau, with three seasonal rivers flowing through the forest. Located about 45 km from Pratapgarh and 108 km from the divisional Hqrs. Udaipur, the sanctuary, covering 423 km². of mainly dry deciduous vegetation has exceptionally rich flora and fauna. It is the only forest region, where more than half the trees are high building value teak. Salar (*Boswellia Serrata* Rox. ex coleb) , Tendu (*Diospyros melonoxy* Roxb.), Bad (Ficus bengalensis), Peepal (*Ficus Religiosa* Linn.), Neem (*Azadiracta Indica*), Siras,

Churail, Kachnar, Gulmohar, Amaltas, Bakayan, Ashok, Mahua, Semal, Goondi, Khejadi, Amla, bamboo, Sindoor, chironjee, Rudraksha and Bel trees are also found in abundance.

Two new bird varieties for the first time in Rajasthan were noticed in Sita Mata WL sanctuary about five years ago, they are- White-thorated Ground thrush and Black-necked Monarch.

On the initiative of the earlier District Collector & District Magistrate Hemant Shesh, the Botany Department of the Mohan Lal Sukhadia University, Udaipur has agreed to undertake further various research projects to study in details its rich and varied flora and fauna. Although a tentative checklist of flora and fauna available in the sanctuary has been made by the department of forest, the place offers infinite scope of indepth research in this field.

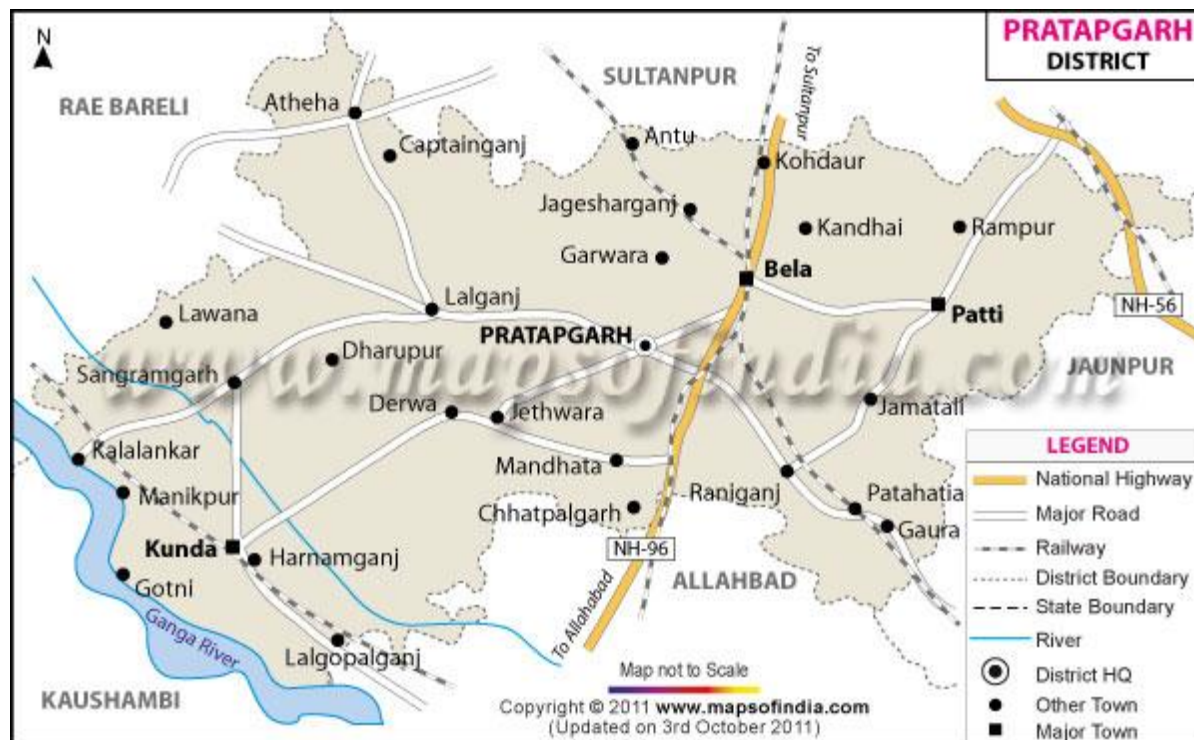
The most striking animal of Sita Mata sanctuary is the vegetarian mammal flying squirrel ('Petaurista-philippensis'), which can be seen gliding from one tree to another just around sunset.

The Sanctuary provides rich pastures for a variety of deer that includes the Chousingha (four-horned antelope). Caracal, wild boar, pangolin, leopard, hyena, jackal, fox, jungle cat, porcupine, spotted deer, wild bear, and neelgai are other animals found here. As per the wild life census conducted on 17 May 2011, the number of wild life animals in the century was 1711 (inclusive of 10 leopards, 538 Jackals, 38 hyenas, 39 foxes, 117 jungle cats etc.)

The best time to visit Sitamata Sanctuary is between October and February. It also houses ancient Valmiki Ashram- the birthplace of Luv and Kush (the twins born to Sita and Lord Rama), Hanuman and Sitamata temples and other places of historical and mythological importance.

Another significant place of interest in the Sanctuary 5 km from 'Tikhi Magri' is 'Lakhiya Bhata'- where series of prehistoric animals are engraved on rocks.

Serious efforts have been made by ex-collector Hemant Shesh to get this lovely sanctuary declared as the national park.



Seismicity

The project corridor falls in seismic zone of II as per National Informatics Centre (NIC). The required construction including structures (bridges and culverts) will be such designed to withstand the level of seismic activity for zone -V. **Figure** are showing maps of seismic zones of India and Rajasthan

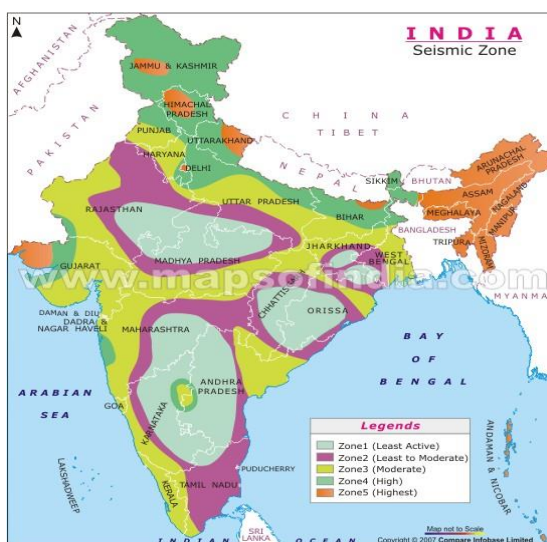


Figure 4.4(a): Various Seismic Zones in India

Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB



Figure 4.4(b): Various Seismic Zones in Rajasthan

The average annual rainfall data during year 2004 to 2011 are given in given Table

Annual Rainfall (in mm)

District	2004	2005	2006	2007	2008	2009	2010	2011
Chhitorgarh	959.8	638.9	1121.8	610.3	813.8	677.0	981.0	817.0
Pratapgarh	989	828	1295	735	832	718.0	1005.0	1381.0

(Source: Indian Meteorological Department)

4.1 Physiography of the Project Area

4.1.1 Geomorphology of the Project Road

The Project Highway NH - 79 traverses through district Chhitorgarh and NH - 113 traverses through two districts viz. Chhitorgarh and Pratapgarh.

Major Physiographic Units

Pediment, Buried Pediment,
Intermontane Valley

Major Drainage

Banas, Gambhiri, Berach, Jakham,
Wagon

The district is characterized by undulating topography. The western, southern and northern parts are generally plain area. Hills are scattered in Chhoti Sadri, Bari Sadri and Pratapgarh tehsils. Hill ranges towards east of Chittaurgarh town runs north-south with intervening valleys parallel to each other. Chittaurgarh and Pratapgarh tehsils are partly hilly and partly plain. The district has the regional slope from south to north. The height varies from 317m to 617m, amsl. Pal khera hill is the highest, having height of 617m. Geomorphologically the district is divided into following units:

Origin	Land Forms	Occurrence in the District
Fluvial	Alluvial Plains	Along west of Banas river and Berach river
Valley Fills		North of Jhakham dam
Ravines		East of Begun and Motipura village
Denudation	Pediment	Scattered in entire district
Buried pediment		Entire district
Intermountain Valley		Scattered in eastern and northern part of Chittaurgarh
Structural	Plateau	East, North & south –east part of the district
Dissected Plateau		South –west part around Pratapgarh
Hill	Structural hill	North of Gangrar town

Drainage: Chittaurgarh district falls in parts of Chambal (27%), Mahi (21%) and Banas(52%) basins. Tehsil wise distribution of basin area is given below

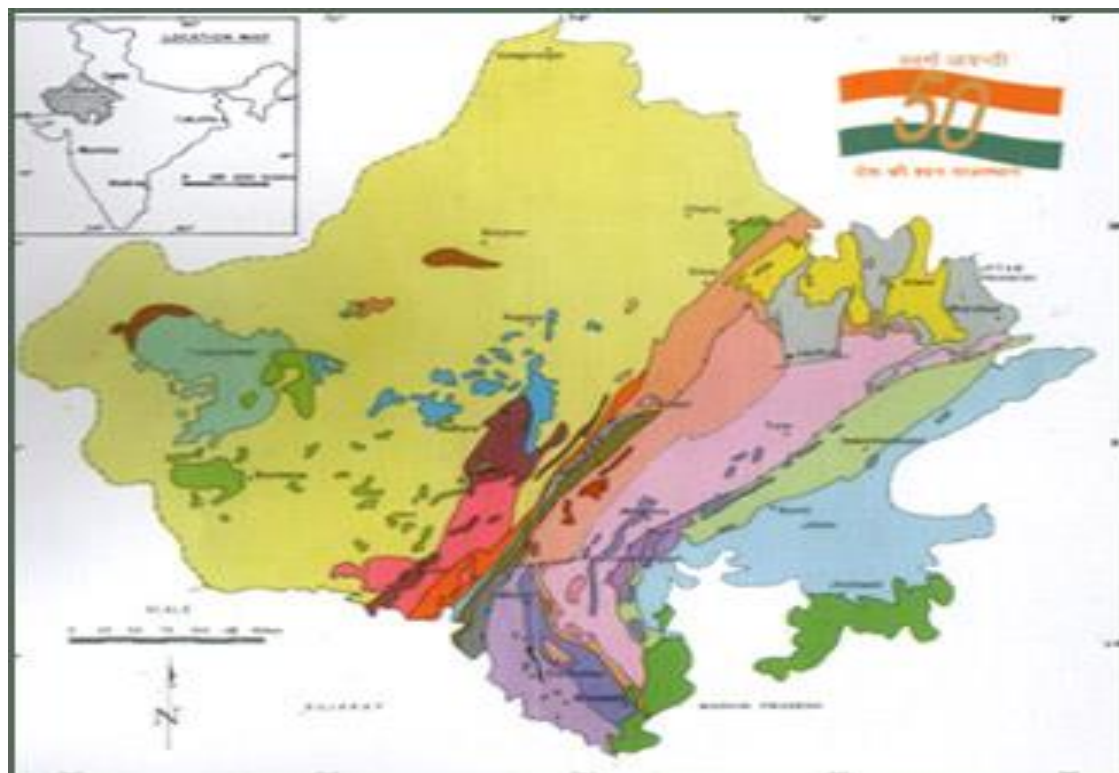
Sl No	Name of Tehsil	Area in Sq. Km.		
		Chambal	Mahi	Banas
1	Choti sadri		374.4	117
2	Chittaurgarh	146.7		732.7
3	Nimbahera		0.1	453.9

Topography

Entire Project Highway NH – 79 passes through plain terrain & NH – 113 passes through Plain & Rolling terrain.

4.1.2 Soil Type in Project Area

Geology of Rajasthan is provided in **Fig. below:**



MAJOR SOIL TYPE

Yellow brown soil, Black, soil, Red
Loam

Black soil found predominantly in the district mostly in eastern, southern, central and eastern part. Red soil mostly found in western portion of district from north to south.

The project area is characterized by undulating topography. The eastern part is the extension of Malwa plateau & is comprising of high hills with intervening long and

narrow valleys. In central part of the district undulating to rolling topography prevails. While in western part plain and rolling topography prevails. The general slop of the area is from east to west. The geomorphologic characteristics of project districts are given Table 4.1.

Table 4.1: Geomorphologic characteristics of the project districts

Origin	Land forms	Occurrence in the project districts
Fluvial	Valley Fills	Scattered in entire district mostly along drainage
Denudation	Pedimont zone	North and south part of Mahi dam
Structural	Plateau	Along eastern margin
Hill	Plateau	In south west of the project district

PREDOMINANT GEOLOGICAL FORMATIONS

Gneiss (Bhilwara Supergroup), Shale, Schist /phyllite (Aravalli Supergroup), Basalt, Limestone & Sandstone (Vindhyan Supergroup)

HYDROGEOLOGY

Major Water bearing formation

Limestone, Gneiss, Basalt, Schist/phyllite & Shale

Depth to water level (Pre-monsoon, 2006) (mbgl)

5 - 25

Depth to water level (Post-monsoon, 2006) (mbgl)

0.5 - 20

Long term decline water level trend (1997-2006) in m/yr

0.12 – 0.96

4.1.3 Land Use

Land use on project road comprise primarily of agricultural land used for cultivation of wheat and soybean. Residential and commercial land use is found only along town / village locations and major junctions. There is forest land on both sides from km 45/280 to 48/950 in Barol block (length 3.670 km) and km 49/080 to 49/900 (length 0.82 km) in Kala Khat block 109+500 to km 113+000. Details of land use along the project road are given in Table 4.2.

Table 4.2: Land use pattern of project road within 10 km radius

S. No.	Class	Area (ha)	% Area
1	Forest area	59746.68	27.83
2	Water body	1994.20	0.92
3	River	2208.96	1.02
4	Nala	438.77	0.20
5	Landing Ground	10.86	0.00
6	Unclassified	150246.25	69.99
		214645.74	100

4.1.4 Soil Sampling Locations

Three representative soil sampling locations were selected along the project road for studying soil characteristics, the locations are listed in Table 4.3.

Sampling location were spread over the study area, keeping in view the vegetative cover and different soil types, which would accord an overall idea of the soil characteristics within the study area. Soil sampling and analysis was conducted as per establish standard method and procedures prescribed in IS: 2720 and ASTM. Parameters indicative of physical, chemical and fertility characteristics were determined through the study.

4.1.3 Soil Characteristics in the Study Area

The physiochemical characteristics, as observed from the analytical test of the soil samples collected from the study area is presented in the Table 4.3.

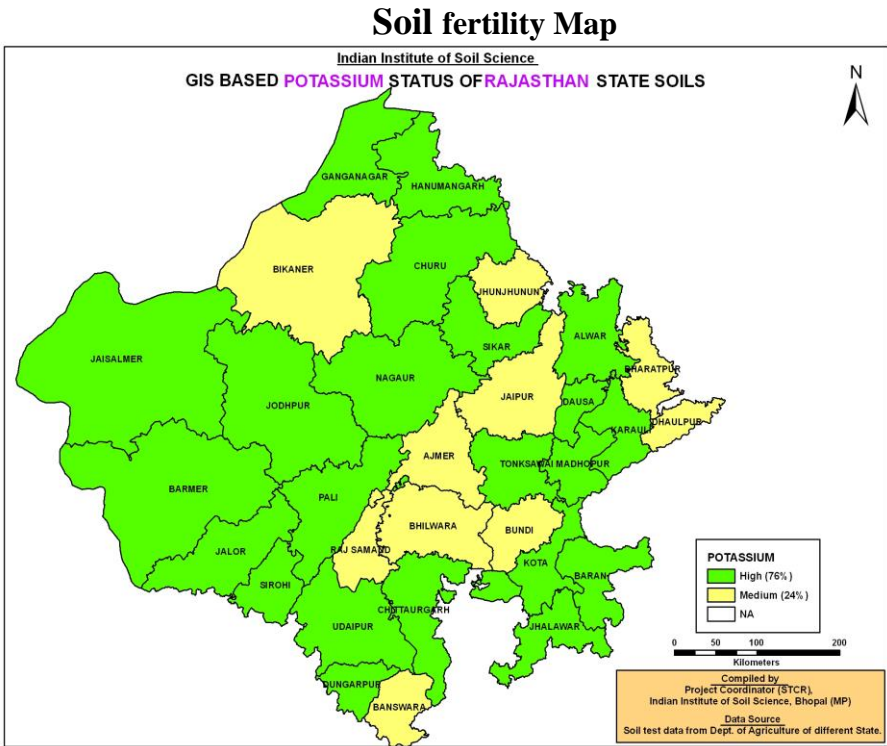
Table 4.3: Physico - Chemical properties of the soil samples

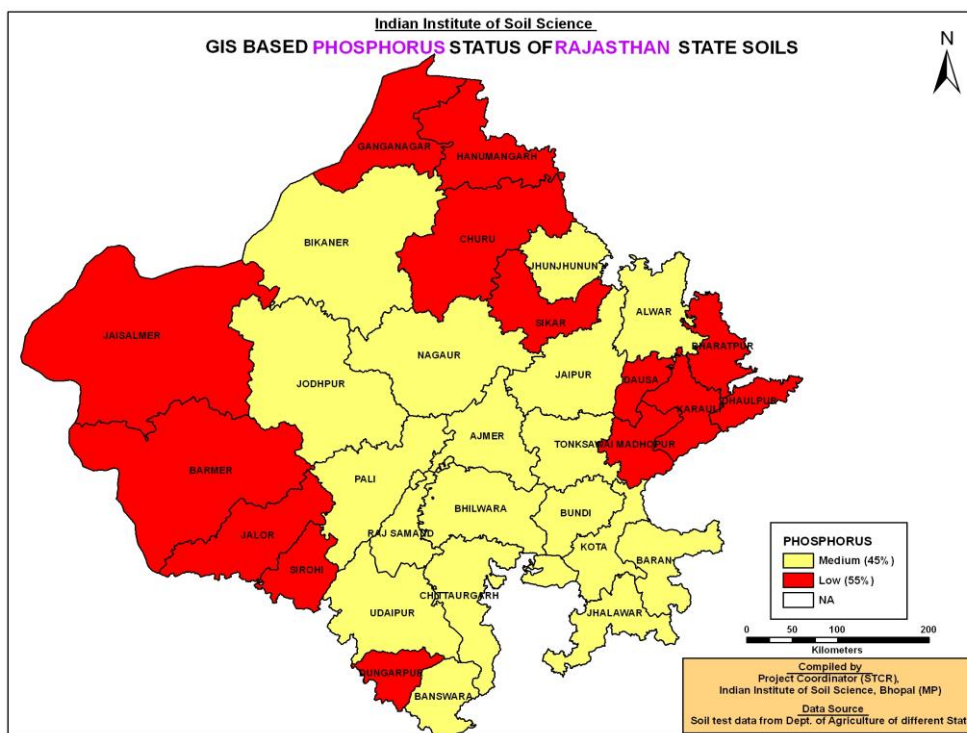
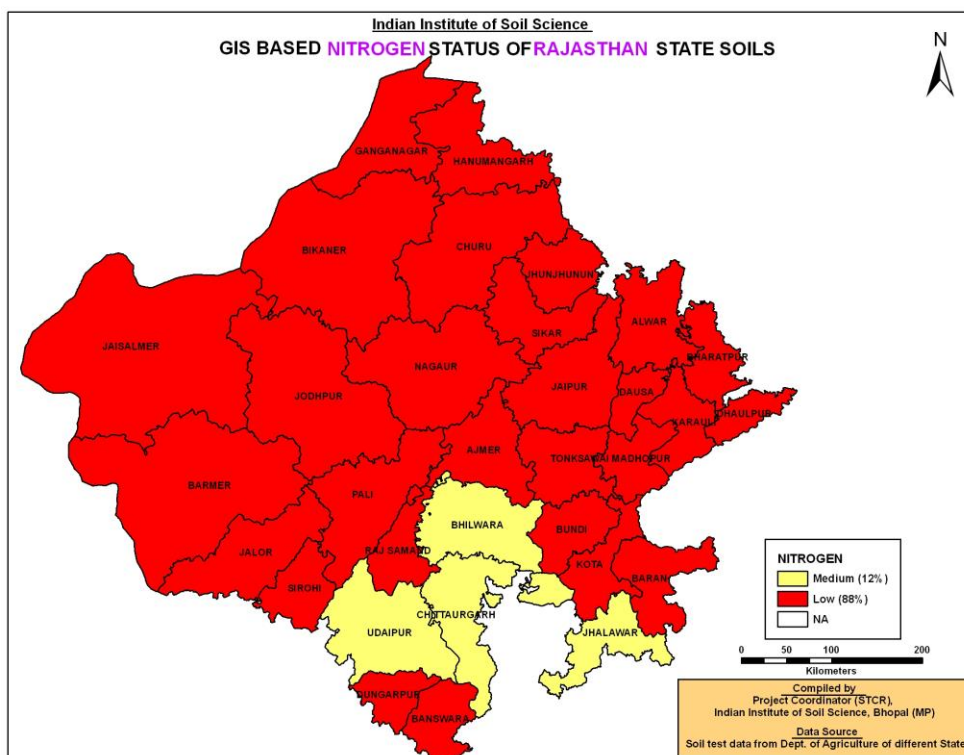
S. No.	Parameter	Unit of Measurements	Value at Chainage 5+000	Value at Chainage 31+000	Value at Chainage 67+000	Value at Chainage 72+000	Value at Chainage 121+000	Value at Chainage 186+000
1	P ^H	-	7.62	7.62	6.62	7.26	7.66	7.86
2	Bulk Density	gm/cm ³	1.60	1.59	1.59	1.62	1.56	1.55
3	Conductivity	micro mhos/cm	286	406	101	426	401	451

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4	Moisture	%	16.26	14.26	16.26	14.12	14.62	1262
5	Texture	-	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam
6	Sand	%	72	62	62	68	68	62
7	Clay	%	8	10	10	8	10	10
8	Silt	%	20	28	28	32	22	20
9	Sodium	mg/100 gm	39.2	38.2	36.2	39.2	40.1	42
10	Potassium	mg/100 gm	0.7	0.8	0.6	0.7	0.8	0.7
11	CEC	meq/100 gm	2.55	2.48	2.35	2.55	2.61	2.73
12	Nitrogen	mg/100 gm	9.2	9.8	10.2	14.6	12.7	10.2
13	Phosphorous	mg/100 gm	96.2	98.2	96.2	190.2	102.7	98.2
14	Ca	meq/100 gm	7.1	6.2	8.2	6.2	6.2	6.2
15	Mg	meq/100 gm	6.2	5.6	4.6	3.9	3.2	2.6

From the results it can be observed that the soil type varies from sandy silt, black in colour and deficient organic matter. pH value ranges between 7.62 – 7.86. From the results it can be observed that the soil in the project area is fertile with high agricultural productivity with appropriate use of fertilizer.





4.2 Water Environment

4.2.2 Ground Water

Ground water is the major source of irrigation in the project Districts. In Pratapgarh District, water is found at shallow depth i.e. 2 to 10 m bgl during pre-monsoon season and 2 to 5 m bgl during post monsoon season. Irrigation takes place mainly by dug wells, tube wells/bore wells, tanks/ponds and canals. In Pratapgarh District, the Mahi Bajaj Sagar Dam has been constructed on the Mahi River some 16 km away from Banswara town and helps in irrigation. The water level data of sites within 10 km of the project road is given in the Table 4.5. In general ground water level in this district varies from place to place.

Table 4.5: Depth of Water level in Project Area

Blocks	Pre- monsoon		Post -monsoon	
	Mini	Max	Mini	Max
Chittaudgarh	3.30	3.73	0.93	1.99
Nimbaheda	2.34	6.05	0.01	4.92
Pratapgarh	5.76	8.80	4.06	5.47

Ground water will be used for drinking purpose. Permission will be taken from Central Ground Water Authority for withdrawal of ground water, if required.

The quantity of water required during construction 600 KLD water for a period of 36 months shall be used

4.2.3 Water Quality Monitoring Locations

Water quality monitoring was conducted to determine the water quality along the study area during May month 2012. Six representative of monitoring stations were selected. Location and analysis result of the sampling are given in Table 4.6.

Table 4.6: Location and Monitoring Results

S. No.	Parameter	Unit of Measurements	Value at Chinage 5+000	Value at Chinage 31+000	Value at Chinage 67+000	Value at Chinage 72+000	Value at Chinage 121+000	Value at Chinage 186+000
1	P ^H	-	7.18	7.16	7.18	7.16	7.21	8.11
2	Total Suspended Solids	mg/l	<4	<4	<4	<4	<4	<4
3	Conductivity	µmhos/cm	975	1030	411	1346	1498	1438
4	Alkalinity as CaCO ₃	mg/l	208	112	81	277	325	221
5	Total Dissolved Solids	mg/l	624	670	268	876	974	936
6	Total Hardness as CaCO ₃	mg/l	321	479	112	447	422	584
7	Calcium as CaCO ₃	mg/l	296	376	86	382	321	444
8	Magnesium as CaCO ₃	mg/l	25	103	26	65	100	91
9	Chloride as Cl	mg/l	134	154	34	198	273	312
10	Phosphate as PO ₄	mg/l	0.13	0.26	0.36	0.27	0.48	0.46
11	Nitrate as NO ₃	mg/l	19.1	10.19	29.22	20.25	10.26	10.12
12	Sulphate as SO ₄	mg/l	44	89	29	72	72	65
13	Sodium as Na	mg/l	68	26	27	115	160	4
14	Potassium as K	mg/l	9	5	20	4	7	4
15	Chemical Oxygen Demand	mg/l	< 4	< 4	< 4	< 4	< 4	< 4
16	Biological Oxygen Demand	mg/l	< 2	< 2	< 2	< 2	< 2	< 2
17	Total Coliform	MPN/100ml	Absent	Absent	Absent	Absent	Absent	Absent
18	Faecal Coliform	MPN/100ml	Absent	Absent	Absent	Absent	Absent	Absent

pH of water samples was observed in the range of 7.16 to 8.11 and total hardness was found from 112 to 584 mg/l and TDS varied from 268 to 974 mg/l.

4.3 Ambient Air and Meteorology

4.3.1 Meteorology

The project area has a climate which is very milder than that in the desert regions in further north and north-west with an average annual rainfall of 722 mm, the maximum being 1183 mm. The minimum temperature in the district ranges between 10°C to 20°C and maximum between 35°C to 46°C. Meteorological data has been collected from IMD Jaipur.

Temperature

The mean maximum temperature in the region reaches 43.7 °C in the warmer months from March to June. During the winter season, in December-January, the minimum temperature dips to 7.4 °C and the maximum temperature remains around 31.9°C. The lowest average monthly minimum temperature is around 21.6 °C.

Humidity

The average maximum humidity is observed to vary between 75.00-90.00 percent, with the highest humidity observed in the month of August. The average minimum humidity varies between 17.00-35.00 percent, the lowest observed in the months of March- April. The variation between maximum and minimum humidity is relatively larger in the months of June and July.

4.3.2 Ambient Air Quality Locations

A total of five monitoring locations representing Industrial, traffic and residential were selected to assess ambient air quality status within the study area. The locations of the monitoring stations were based on preliminary analysis of the meteorological conditions. Details of the AAQM locations are given in **Table 4.7**.

4.3.3 Ambient Air Quality of the Project Road

The ambient air quality monitoring was carried out between April 2011 to June 2011 for each location on a 24-hours schedule. Twice a week monitoring for the entire period was conducted at 6 locations covering weekdays. The instrument was kept in free space from vegetation and the height of sampler was kept in range of 3-6 m. monitoring was done as per the Guidelines for Ambient Air Quality Monitoring, national Ambient Air Quality Standards, 2009.

For the collection of samples for PM₁₀, PM_{2.5}, NO₂, SO₂ and CO, Respirable Dust Sampler (RDS-DX) along with gaseous sampling impingers were used. For the collection of PM_{2.5}, Fine Particulate Sampler (FPS) was used. SO₂ was collected by drawing air through absorbing solution of TCM (EPA Modified West & Geake Method) and NO₂ was collected by drawing air through the mixture of absorbing solution of Sodium Arsenite (Na-Arsenite Modified Jacob & Hochheiser Method). The measurement for both SO₂ and NO₂ was done calorimetric. All the analyses were carried out as per IS-5182. Results of ambient air quality are presented in **Table 4.7**.

Table 4.7: Description of ambient air quality monitoring locations and location

Name of the Project road	Location	Monitoring Time Sedue	Chainage	Area Category	Mean value in Microgram/meter cube				
					PM ₁₀	PM _{2.5}	SO ₂	NO ₂	CO*
					Seasonal Average Concentration				
NH-79	Chittorgarh	May 2012.	186+000	Residential	84	38	14	24	512
NH-79	Toll Booth	May 2012.	121+000	Commercial	96	50	14	25	1018
NH-113	Nimbahera	May 2012.	5+000	Commercial	89	47	10	18	605
NH-113	Choti Sadri	May 2012.	31+000	Residential	86	45	8	14	415

NH-113	Dharmottar	May 2012.	67+000	Residential	78	41	11	19	305
NH-113	Pratapgarh	May 2012.	72+000	Residential	81	48	13	21	878

4.4 Ambient Noise Level

To assess the noise level in the study corridor ambient noise monitoring was carried out. Total 6 locations within the study area were selected for measurement of present status of noise level. The locations of the noise monitoring stations and results are given in **Table 4.8**.

Table 4.8: Ambient noise level results at various locations

Name of the Project road	Location NH-113&79	Chainage (km)	Area Category	Average dB(A)	
				Day time	Night time
NH-79	Chittorgarh	186+000	Residential	58.5	48.7
NH-79	Toll Booth	121+000	Commercial	62.1	54.2
NH-113	Nimbahera	5+000	Commercial	61.1	51.7
NH-113	Choti Sadri	31+000	Residential	53.7	46.7
NH-113	Dharmottar	67+000	Residential	62.7	54.1
NH-113	Pratapgarh	72+000	Residential	58.1	47.2

Day time noise level in study area varied between 53.7 -62.7 dB(A) and night time noise level ranged between 46.7-54.2 dB(A).

The locations of monitoring sites are presented in **Figure below**.



Figure : Air and Noise Monitoring Site Photograph

It can be seen that the levels of PM_{10} , $PM_{2.5}$, and SO_2 & NO_2 are within the specified limit as prescribed by CPCB for industrial, sensitive areas, residential, rural & other areas are given in **Annexure 6C**.

4.5 Biological Environment

Ecological resources are among the most important resources impacted by the road projects. The detailed baseline study of the ecological resources is essential to estimate the magnitude of potential impacts and to avoid or mitigate any loss caused by the proposed project. In this section baseline details of the flora and fauna are presented. The project road passes through Reserved Forest area from km 45/280 to 48/950 in Barol block (length 3.670 km) and km 49/080 to 49/900 (length 0.82 km) in Kala Khat block. There are no endangered species of flora and fauna present within the project influence area.

The existing trees along the proposed project roads vary from dense to sparse. Most of the trees present within the ROW are Bamboos, Terminalia belarica (Behara), Azadirachta indica (Neem), Kikar or Babul- Acacia nilotica, Khejri- Prosopis cineraria, Lasura or Lehsua- Cordia dichotoma, Kair or Teat -Capparis deciduas, Pakori-Ficus rumphii, etc.

There are a total number of 7521 trees existing in the ROW. The majority of trees are of girth size >0.3 mm and 0.3 mm-0.6 mm. There are no vulnerable, threatened and/or endangered species of flora and fauna is available in the project corridor. Details of Forest land required are listed below:

Details of Forest land required

District	Forest Block Name	Km	Khasra No.	Total Forest Land Required (ha)	Legal Status
Chittorgarh	NA	NA	NA	Nil	R.F
Pratapgarh	Barol Jangeer		359	0.34	R.F
			364	0.21	R.F
			365	0.95	R.F
			368	0.68	R.F
			369	0.02	R.F
			371	0.09	R.F
			372	2.69	R.F
			373	0.58	R.F
			374	0.74	R.F
			375	2.34	R.F
			372/384	0.26	R.F
		Total	8.90 ha.		
	Kala khet (Village-Seya khedi)		886	0.20	R.F
			889	1.04	R.F
			890	0.05	R.F
			891	0.01	R.F
			918	0.20	R.F
			920	0.08	R.F
		Total	1.58 ha.		
Total RF area required			10.48 ha.		

Details of Protected Forest Area to be Diverted							
Pratapgarh	Jhantla- C (Village- Sewara)	Total	184		0.03		P.F
			196 Min		0.45		P.F
			203 Min		0.12		P.F
			207 Min		0.02		P.F
			246		0.01		P.F
			309		0.04		P.F
			311 Min		0.10		P.F
			367 Min		0.23		P.F
			368 Min		0.01		P.F
			379 min		0.03		P.F
			447 min		0.01		P.F
					1.05 ha.		
	Nakor (Village- Hanuman Choraya)		1646		0.02		P.F
			1647		0.01		P.F
			1649 Min/ 1		0.01		P.F
			1650 Min/ 1		0.23		P.F
			1651/1		0.02		P.F
			1652 Min/1		0.01		P.F
			1653 Min/1		0.05		P.F
			1654 Min/1		0.02		P.F
			1655 Min/1		0.09		P.F
			Total	0.46 ha.			
Total PF area required				1.51ha.			
Grand Total PF/RF area required				R.F -10.48 P.F -1.51 Total- 11.99 ha.			

Tree Counting Details:

(NH-79)			
Summary Km 183.000 - 226.400			
S.NO	Location	L.H.S	R.H.S
1	183-184	15	19
2	184-185	149	76
3	185-186	84	143
4	186-187	45	37
5	187-188	25	41
6	188-188.200	3	3
7	188.800-189.200	30	30
8	189.200-190	39	8
9	190-190.646	24	34
10	190.646-191.746	278	271
11	191.746-192	51	46
12	192-193	121	98
13	193-193.653	106	67
14	193.653-194.703	151	59
15	197-198	129	33
16	198-199	19	80
17	199-199.200	19	64
18	200-201	102	95
19	201-201.100	9	13
20	201.100-202.249	96	117
21	202.251-202.660	18	33
22	202.660-203.847	128	97
23	203.847-204	3	3
24	204-204.350	8	8
25	204.350-205.326	61	64

Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

26	205.326-206	32	32
27	206-207	46	44
28	207-207.896	125	172
29	207.900-208.786	35	40
30	209-210	6	11
31	210-211	10	18
32	211-212	2	2
33	212-213	7	7
34	213-213.675	12	16
35	213.675-214.625	44	56
36	214.625-215	18	8
37	215-216	4	9
38	216-216.525	42	39
39	216.525-217.525	83	83
40	217.575-218	3	40
41	218-219	8	22
42	219-220	7	14
43	220-221	35	70
44	221-221.200	2	14
45	221.200-221.600	48	26
46	222.110-222.900	19	30
47	222.900-223	5	2
48	223-224	27	22
49	224-225	62	42
50	225-226	44	53
51	226-226.400	28	19
	Total	2467	2430
	Total	4897	

(NH-113)			
Summary Km 5.400-80			
S.NO	Location	L.H.S	R.H.S
1	5.400-6	6	15
2	6-7	5	12
3	7-8	0	32
4	8-9	16	21
5	9-9.850	28	22
6	9.85-10.150	43	49
7	10.150-11	10	46
8	11-12	14	14
9	12-13	16	17
10	15.600-16	30	14
11	16-17	14	24
12	17-18	19	27
13	18-19	28	31
14	19-20	31	24
15	20-21	24	31
16	21-22	11	14
17	22-23	11	7
18	23-24	5	5
19	24-24.500	8	20
20	31.500-32	10	7
21	32-33	20	21
22	33-34	15	25
23	34-35	15	8
24	35-36	2	2
25	36-37	5	11
26	37-38	24	32
27	38-39	22	11

28	39-40	15	18
29	40-41	12	13
30	41-42	21	16
31	42-43	11	22
32	43-44	17	23
33	44-45	13	24
34	45-46	15	25
35	46-47	28	32
36	47-48	25	31
37	48-49	26	31
38	49-50	30	33
39	50-51	14	17
40	51-52	7	9
41	52-53	10	21
42	53-54	11	16
43	54-55	11	4
44	55-56	19	23
45	56-57	19	7
46	57-58	13	15
47	58-59	12	15
48	59-60	11	20
49	60-61	10	9
50	61-62	14	30
51	62-63	38	32
52	63-64	13	18
53	64-65	5	8
54	65-66	3	6
55	66-67	4	6
56	67-68	14	19
57	68-69	34	41
58	69-69.850	21	27

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59	69.850-70.150	24	31
60	70.150-71	22	42
61	71-72	25	16
62	72-73	12	31
63	73-74	26	32
64	74-75	31	30
65	75-76	23	10
66	76-77	19	27
67	77-78	42	27
68	78-79	14	12
69	79-80	26	21
	Total	1192	1432
	Total	2624	

Chapter – 5

**ANALYSIS OF POTENTIAL ENVIRONMENTAL
IMPACT & MITIGATION MEASURES**

CHAPTER 5

ANALYSIS OF POTENTIAL ENVIRONMENTAL IMPACT & MITIGATION MEASURES

5.1 GENERAL

This chapter describes the assessment of the nature, type and magnitude of the potential impacts of project corridor (NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning) on physical, biological and cultural environmental components along the project corridor. The basis of the assessment of impacts is the baseline information as discussed in Chapter-4, For each type of potential impact or environmental concern, the analysis should predict the nature and significance of the expected impacts (quantitative as well as qualitative).

A wide variety of direct and indirect negative impacts have been attributed to road and highway construction or improvement projects. Though sharing a common concern over most environmental attributes, depending on their past experience in various projects, different agencies tend to lay varying emphasis on different biophysical and socio-environmental components and issues.

5.2 BASIC APPROACH

Potential significant impacts that need further study were identified on the basis of analytical review of baseline data, review of environmental conditions at site, analytical review of the underlying socio-economic conditions with the project influence area. Since the project involves widening of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning , the impacts identified are mostly direct and confined to the ROW. Only at critical locations, where the engineering, environmental and social aspects have warranted a shift from the existing alignment, bypasses / realignments have been proposed. To effectively voice the potential environmental issues likely to result due to the project, an in-depth analysis of the status of the existing environment has been carried out to identify the potential impacts - both beneficial as well as adverse.

Overall, it is found that the proposed project road will result in minor adverse impacts to the physical, biological and socio-economic environment of the project. It needs to be mitigated by adopting appropriate mitigation measures in the design, construction and operation phase. Net environmental impacts will be insignificant and of short term in nature by observing proposed mitigation measures.

As further discussed below, the long-term impact is mainly beneficial. However, in the short-term, i.e. during the construction phase, there might be arise some negative environmental impacts, that can be kept under check through proper planning and adopting regulatory measures. The impacts on the various environmental components can occur at any of the following stages of the project planning and implementation.

- Planning and design stage;
- Construction stage; and
- Operation stage.

The description and magnitude of impacts for the various environmental components as visualized leads to the following observations:

5.2.1 Positive Environmental Impacts

The existing 2 lane road has to be widened and strengthened into 2 lanes with paved shoulder to accommodate the fast growing traffic, avoided traffic congestion, minimize the accident, travel time and fuel consumption & pollution load along the corridor. It will also improve the road safety, noise quality due to smooth movement of vehicle and enhanced the aesthetic values. The drainage along the road will also considerably improve because of additional culverts are being built-up and this is another positive impact.

5.2.2 Negative Environmental Impacts

Quarries, borrow pits and other sources are possible source for construction material. Though the operation of quarries is an independent and regulated activity, however the requirements of stone aggregate for the project will cause resource depletion. Similarly river sand is a scarce commodity in the entire section of project road and thus borrowing of sand from riverbed will also have resource depletion impact. Therefore as an alternative, a possibility for using stone dust has been explored. However, transportation of stone chips from its source to the construction site will have negative impact on the air quality. It is also expected that the proposed project may influence negatively but marginally on the movement of cattle. The speed and

density of the transports will be the main factor to disturb the cattle to cross the road and agricultural field after construction.

The impacts due to project location are generally irreversible and could be improved through environmental enhancement measures. The anticipated impacts have been assigned the value between 0 and 1 depending upon magnitude of impact based on its importance. Impact classification is presented in **Table 5-1**.

Table 5-1: Impact Classification

Category	Description	Impact
A	Irreversible & Unacceptable	0.8-1.0
B	Undesirable & Unacceptable	0.6-0.8
C	Undesirable & can be mitigated	0.2-0.6
D	Insignificant	<0.2

Based on the impacts a checklist of environmental parameters is also prepared in order to assess the significant / non-significant, reversible / irreversible and long term / short term impacts due to planned project activities. Checklist is the list of environmental parameters or impact indicators which the environmentalist is encouraged to consider when identifying the potential impacts. Based on proposed activity magnitude and rating is summarized in Table 5.2.

Table 5-2: Evaluation of Environmental Impacts

Proposed Activity	Potential Impacts	Nature of Potential Impact		Rating of Impact	
		Beneficial or Adverse	Direct or Indirect	Significance of Impact	Magnitude of Impact
Construction of road & Bypasses	Demand/Supply Road Infrastructure Employment	Beneficial Beneficial Beneficial	Direct Indirect Direct	Medium Medium Medium	Medium Medium Low
Raw Material Consumption	Stone	Adverse	Indirect	Medium	Low
Fuel Consumption	National Reserves	Adverse	Direct	High	Medium
Water Consumption	Natural Resources Ground Water	Adverse Adverse	Direct Direct	Medium Low	Low Low
Transportation of materials	Atmospheric Emission Ambient Noise Public Health & Safety	Adverse Adverse Adverse	Direct Direct Indirect	High Low Medium	Low Low Low
Waste water Discharge	Land/Water	Adverse	Direct	Low	Insignificant
Solid Waste	Ground Water	Adverse	Indirect	Medium	Insignificant

Disposal	Soil Quality	Adverse	Indirect	Low	Insignificant
Noise Generation	Ambient Noise	Adverse	Direct	Low	Significant
Storage & Handling of hazardous material	Public health & Safety	Adverse	Indirect	High	Low
Construction spoils disposal	Land Water	Adverse Adverse	Direct Direct	Low Medium	Low Low

Note: (Impact) High-Irreversible; Medium-Mitigated through measures; Low-mitigation required

During the environmental evaluation, those impacts, which are likely to take place due to the project and will have bearing on the environmental impacts and sensitivity, have been considered and assessed. These are discussed in following sections.

5.3 IMPACTS UPON ON ENVIRONMENT

5.3.1 Impacts on Physical and Biological Environment

5.3.2 Impacts on Cultural and Socioeconomic Environment

Project Activity	Planning and Design Phase	Pre-construction Phase		Construction Phase					Operation	Indirect effects of operation or Induced development
Env. component Affected	Land acquisition	Removal of Structures	Removal of trees and vegetation	Earth works including quarrying	Laying of pavement	Vehicle & Machine operation & maintenance	Concrete & crusher plants	Sanitation & Waste (labour campus)	Project operation	
Air		Dust generation during dismantling	Reduced buffering of air and noise pollution, Hotter, drier microclimate	Dust generation	Asphalt odour	Noise, dust, pollution	Noise, soot, odour, dust, pollution	Odour / smoke	Noise, dust, pollution	other pollution
Land	Loss of productive Land	Generation of debris	Erosion and loss of top soil	Erosion and loss of top soil		Contamination by fuel and lubricants Compaction	Contamination Compaction of Soil	Contamination from wastes	Spill from accidents Deposition of lead	Change in cropping pattern
Water	Loss of water sources	Siltation due to loose earth	Siltation due to loose earth	Alteration of drainage Break in continuity of ditches Siltation, Stagnant water pools in quarries.	Reduction of ground water recharge area	Contamination by fuel and lubricants	Contamination by leakage or fuel	Contamination from wastes Overuse	Spill Contamination by fuel, lubricants	Increased contamination of ground water
Noise		Noise Pollution	Noise Pollution due to machinery	Noise Pollution		Noise pollution	Noise Pollution		Noise Pollution	Noise pollution
Flora		Loss of Biomass		Lowered productivity Loss of ground for vegetation		Removal of vegetation	Lower productivity Use as fuel Wood	Felling trees for fuel	Impact of pollution on vegetation Lowered productivity Toxicity of vegetation.	

Fauna		Disturbance Habitat loss	Disturbance	Disturbance		Disturbance	Disturbance	Poaching	Collision with traffic	Distorted habitat
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5.3.2 Impacts on Cultural and Socioeconomic Environment

Project Activity	Planning and Design Phase	Pre-construction Phase			Construction Phase					Operation	Indirect effects of operation or Induced development
Env. Component Affected	Design decisions & Implementation policies	Land acquisition	Removal of Structures	Removal of trees & vegetation	Earth works including quarrying	Laying of pavement	Vehicle & machine operation & Maintenance	Asphalt and crusher plants	Labour Camps	Project operation	-
Agricultural land	-	Change in land prices	Loss of land economic value	Loss of standing crops	Loss of productive land	-	-	Dust on agricultural land reduce n productivity			Conversion of Agricultural Land
Buildings and built structures	-	-	Loss of structures, Debri generation, Noise and Air pollution	-	Noise, vibration may cause damage to structures		Noise, vibration may cause damage to structures	Dust accumulation on building and structure	-	Vibration and noise	Change in building use and characteristics

People and Community	Anxiety and fear among community		Displacement of people Psychological impact on people loss of livelihood	Loss of shade & community trees, Loss of fuel wood and fodder, Loss of income	Noise and Air pollution	Odour and dust	Noise and Air pollution, Collision with pedestrians livestock and vehicles	Air and noise pollution and discomfort	Community clashes with migrant labour	Noise pollution, Risk of accident	Noise pollution, Risk of accident
Cultural Assets	-	-	Displacement loss of structure from RoW	Loss of sacred trees.	Noise, vibration may cause damage to structure		Damage from vibration & air pollution	Dust accumulation	-	Damage from vibration & air pollution	-
Utilities and Amenities -	-	Interruption in supply					Damage to utility and amenities	Dust accumulation on water bodies	Pressure on existing amenities		
Labour's Health & Safety					Increase of stagnant water and disease	Asphalt odour and dust	Collisions with vehicles, pedestrians & livestock	Impact on health due to inhale of dust	Increase in communicable diseases	Collisions pedestrians & livestock	

5.4 MITIGATION AND ENHANCEMENT MEASURES

The brief description of the mitigation measures opted and designed for the project. This Chapter has been structured as per the impacts those have been identified in Assessment of Environmental Impacts.

The chapter also refers to the additional measures to be taken during the execution of the project for the benefit of the road users and the surrounding communities. This does not include several other enhancements that occur inherently because of the nature of the project such as improved drainage, pedestrian facilities, illumination in urban stretches, prevention of existing erosion, overtopping and flooding etc.

Basic Approach

To minimize the adverse impacts of the project, mitigation measures have been formulated and will be implemented during the project implementation. The mitigation measures would be directed towards the restoration of the dynamic balance of nature.

The mitigation of negative impacts involves reduction in magnitude of the adverse impacts during various stages of the project through:

- Alterations during design, site clearance, Construction and Operation phases of the road project to avoid adverse impacts, and
- Additional mitigation measures for unavoidable negative impacts on the environmental components.

The adverse impacts of the project on the surrounding environment are described in the following section.

Quarries and Borrow Areas

The quarry material will be obtained from licensed quarries, which operate with proper environmental clearances, including clearance under the Air Act. If the contractors decide to use quarries other quarries, they would be required to obtain material from licensed quarries only.

For the borrowing of earth for the project, borrow area locations will be identified and recommended. However, in case of any new borrow area being selected by the contractor, it will be ensured that no earth will be borrowed from within the ROW. If new borrow areas are selected, it will be ensured by the contractor that, there will be no loss of productive soil, and that the requisite environmental considerations are met with.

To avoid any embankment slippages, the borrow areas will not be dug continuously, and the size and shape of borrow pits will be decided by the Supervision Consultants. The borrow pits will be redeveloped, wherever required by creating ponds for fisheries, etc; or by leveling an elevated, raised earth mound. If this is not possible, then excavation slopes will be smoothed and depression will be filled in such a way that it looks more or less like the original ground surface. Re-plantation of trees in borrows areas will also to be carried out, if required.

Precautionary measures as the covering of vehicles will be taken to avoid spillage during transport of borrow materials. To ensure that the spills likely to result from the transport of borrow and quarry materials do not impact the settlements, it will be ensured that the excavation and carrying of earth will be done during day time only. The unpaved surfaces used for the haulage of borrow materials will be maintained properly.

Mitigation for Quarries

The following mitigation measures will be implemented.

- Aggregates will be sourced only from the licensed quarry sites, complying with the environmental and other applicable regulations,
- Occupational Safety procedures/practices for the work force will be adhered in all quarries as per law,
- Quarry and crushing units will have adequate dust suppression measures like sprinkler in work area and along approach road to quarry site,
- Regular monitoring of the quarries by the supervision consultant to ensure compliances of environmental management and monitoring,
- Water tankers with suitable sprinkling system will be deployed along the haulage roads. Water will be sprinkled regularly to suppress the airborne dust due to the dumper/truck movement. Required frequency will be determined by the site condition.
- Trucks deployed for the material transportation will be spillage proof.

Mitigation of Borrow Areas

Impact due to borrowing soil can be significantly mitigated by the following measures:

- Prior approval will be issued from the concerned authorities and all local environmental regulations will be complied,

- Within all identified borrow areas, the actual extent of area zones to be excavated will be demarcated with signboards and the operational area will be access controlled,
- Borrow operation plant and machineries will strictly conform to Central Pollution Control Board (CPCB) noise standards;
- Provision of protective wears like earplugs will be made available to the workforce exposed to noise level beyond the threshold limits. Rotation of personnel will be ensured.
- All operation area will be water sprinkled to control dust levels to the National Ambient Air Quality Standards.

5.5 IMPACT MITIGATION MEASURES

The best way of impact mitigation is to prevent the event occurring. All efforts should be made to locate the developmental activities in an area free of agricultural lands, cyclones earthquakes, ecologically sensitive, erosion, forests, flooding, human settlements, land slides, natural scenic beauty, water logging. In case this is not feasible the next step is to look at the raw materials/technologies/ processes alternatives which produce least impact i.e. adopting or using processes or technologies which are efficient and produce recyclable wastes/minimum waste/wastes that can be easily disposed, without affecting the environment. However if the developmental activity produce the adverse impact action has to be taken to mitigate the same. Following are some of the methods available.

Air

- Attenuation of pollution on pathway or protection of receptor through green belts.
- Particulate removal devices such as: cyclones, setting chambers, scrubbers, electrostatic precipitators, and bag houses
- Gas removal devices using absorption (liquid as a media), adsorption (molecular sieve), and catalytic converters.
- Uses of protected, controlled environment, such as oxygen masks, Houston Astrodome, etc.
- Control of stationary source emission (including evaporation, incineration, absorption, condensation, and material substitution)
- Use of masks

- Dilution of odourant (dilution can change the nature as well as strength of an odour)
- Odour counteraction or neutralise (Certain pairs of odours in appropriate concentrations may neutralise each other)
- Odour masking or blanketing (certain weaker malodours may be suppressed by a considerably stronger good odour).

Noise

- The mitigation measures may include damping, absorption, dissipation, and deflection methods. Common techniques involve constructing sound enclosures, applying mufflers, mounting noise sources on isolators, and/or using materials with damping properties.
- Performance specifications for noise represent a way to insure the procured item is controlled.
- Ear protective devices should be used. When an individual is exposed to steady noise levels above 85-dB (A), in spite of the efforts made to reduce noise level at the source, hearing conservation measures should be initiated.

Water

- Conjunctive use of ground/surface water, to prevent flooding/water logging/depletion of water resources. Included are land use pattern, land filling, lagoon/reservoir/garland canal construction, and rainwater harvesting and pumping rate.
- Minimise flow variation from the mean flow
- Segregation of different types of wastes
- Storing of oil wastes in lagoons should be minimised in order to avoid possible contamination of the ground water system.
- Surface runoff from oil handling areas should be treated for oil separation before discharge into the environment. If oil wastes are combined with sanitary sewage, oil separation will be necessary at the wastewater treatment facility.
- All effluents containing acid/alkali/organic/toxic wastes should be processed by treatment methods.
- The treatment methods may include biological or chemical processes.

- The impact due to suspended solids may be minimised by controlling discharge of wastes that contain suspended solids; this includes sanitary sewage and industrial wastes.
- Also, all activity that increases erosion or contributes nutrients to water (thus stimulating alga growth) should be minimised.
- For wastes containing high TDS treatment methods include removal of liquid and disposal of residue by controlled land filling to avoid any possible leaching of the fills.
- All surface runoffs around mines or quarries should be collected treated and disposed.
- Cooling towers can be used to convert once-through systems into closed systems. Treated wastewater (such as sewage, industrial wastes, or stored surface runoffs) can be used as cooling water makeup.
- Chromium may be recovered from cooling tower blow down before treatment and disposal of tower blow down. .
- Cooling water can be processed or stored in artificial ponds until the difference in temperature between it and the receiving water is nearly equal
- Waste-containing radioactivity should be treated separately by means of de-watering procedures, and solids or brine should be disposed of with special care.

Land

- The environmental impact of soil erosion can best be mitigated by removing vegetative cover only from the specific site on which construction is to take place and by disturbing the vegetation in adjacent areas as little as possible. Land clearing activities should be kept to the absolute minimum and use crushed stone rather than asphalt or concrete for surfacing parking areas should be attempted.
- Disturbing the existing vegetation and natural contour of the land as little as possible can mitigate increases in surface runoff. Vegetation along watercourses should not be cleared indiscriminately.. Neither should potholes or swamps be drained unless absolutely necessary for successful completion of the activity.
- Construction, land management, or mining activities that result in the soil being laid bare could be scheduled in such a way that some type of vegetative cover appropriate to the site could be established prior to the onset of intense rain or

windstorms. If grass is to be seeded, mulch of straw will help to protect the soil from less extreme erosive forces until vegetative and root development begins.

- Natural drainage patterns can often be maintained by preparing sodden waterways or installing culverts.
- Check dams built near construction sites can reduce the quantity of eroded soil particles reaching free-flowing streams or lakes.
- Use of floating foundations and height restrictions in earthquake zones and increased foundation height, wall strength, and roof support in areas periodically subject to cyclones can reduce the hazards.
- All forms of temporary structures should be avoided from the flood plain, and all permanent structures should be raised to a height above the level which flood waters can be expected to reach once every 100 years (100-year flood).
- Installation of underground drainage structures helps to reduce sediment loads
- Engineering plans can be drawn to reduce the area of earth cuts on fills below what might otherwise be acceptable, provide physical support for exposed soil or rock faces, concentrate or distribute as appropriate the weight loading of foundations to areas or state better able to support that weight,
- use small charges for mining/blasting,
- restricting the number, frequency and area of movement of heavy machinery
- Compatibility between adjacent land uses can best be assured by providing a green belt between the proposed activity and nearby properties where any significant degree of incompatibility is likely to result.

Ecology

- Intruding as little as possible on their habitat can best mitigate the impact of activities on animals. If such animals use the area where the activity will take place, the activity should be concentrated to the maximum extent possible in those parts of the area that they least often frequent.
- During the planning phase of an activity, an attempt should be made to avoid extending into the home range wild animals. If this is not feasible, the activity should be completed, as quickly as possible, and regular and sustained use of the area over time should be minimized.
- Regular or sustained intrusions of men or equipment into nesting areas of birds should be avoided to the maximum possible extent, especially while eggs are

being incubated by the adults and until the young have left the nest. The sanitation cuttings of non-commercial individual trees should destroy no known nests.

- Restricting the input of polluting substances into watercourses, estuaries, and the open sea can mitigate Impacts upon fish and shellfish populations. Additionally, when a part of the activity involves water level control, changes in such levels should be programmed to the extent it is possible to do so in a way that will minimally disturb nesting and feeding habitat.

Socio-economic Aspects

- Including, in the proposed activity funds, a welfare plan that would permit assistance for those people who would be impacted might reduce some adverse impacts. For example, when a number of jobs are to be disbanded, a service could be set up in which those people who would be without jobs could obtain assistance in locating jobs in other areas.
- In problems caused by relocation, effective rehabilitation and resettlement schemes may be drawn.

Annexure 5.A:**a) Volume Count Station 1: Chittorgarh to Nimbahera : Km 189.000*****Summary of Average Daily Traffic at Km 189.000***

Description	Chittorgarh to Nimbahera		Nimbahera to Chittorgarh		Both Direction	
	ADT	PCU	ADT	PCU	ADT	PCU
Two Wheeler	957	479	1004	502	1961	981
Three Wheeler/Auto Rickshaw	74	74	103	103	177	177
Car/Jeep/Taxi	980	980	1113	1113	2093	2093
Mini Bus	40	60	31	47	71	107
Full Bus	179	537	226	678	405	1215
LCV	161	242	165	248	326	490
2- Axle Truck	1008	3024	1092	3276	2100	6300
Multi Truck	1006	4527	982	4419	1988	8946
Agri. Tractor With Trailer	119	536	116	522	235	1058
Agri. Tractor With out Trailer	28	42	25	38	53	80
Cycle	58	29	56	28	114	57
Cycle Rick-shaw	0	0	0	0	0	0
Bullock Cart	6	36	8	48	14	84
Other(Pl. Specify Drawn)	56	56	53	53	109	109
Total Motorised Vehicle	4552	10501	4857	10946	9409	21447
Total Commercial Vehicle	2394	8390	2496	8668	4890	17058
Total Non Motorised Vehicle	120	121	117	129	237	250
Total Vehicle	4672	10622	4974	11075	9646	21697

b) Volume Count Station 2: Chittorgarh to Nimbahera : Km 221.400**Summary of Average Daily Traffic at Km 221.400**

Descrip-tion	Chittorgarh to Nimbahera		Nimbahera to Chittorgarh		Both Direction	
	ADT	PCU	ADT	PCU	ADT	PCU
Two Wheeler	797	399	859	430	1656	829
Three Wheeler/Auto Rickshaw	22	22	45	45	67	67
Car/Jeep/Taxi	878	878	1041	1041	1919	1919
Mini Bus	35	53	50	75	85	128
Full Bus	159	477	219	657	378	1134
LCV	225	338	183	275	408	613
2- Axle Truck	727	2181	780	2340	1507	4521
Multi Truck	929	4181	981	4415	1910	8596
Agri. Tractor With Trailer	155	698	177	797	332	1495
Agri. Tractor With out Trailer	59	89	61	92	120	181
Cycle	67	34	48	24	115	58
Cycle Rick-shaw	0	0	2	4	2	4
Bullock Cart	10	60	5	30	15	90
Other(Pl. Specify Drawn)	48	48	64	64	112	112
Total Motorised Vehicle	3986	9316	4396	10167	8382	19483
Total Commercial Vehicle	2075	7230	2213	7762	4288	14992
Total Non Motorised Vehicle	125	142	116	199	241	261
Total Vehicle	4111	9458	4515	10289	8623	19744

c) Volume Count Station 3: Nimbahera to Pratapgarh: Km 6.000**Summary of Average Daily Traffic at Km 6.000**

Description	Nimbahera to Pratapgarh		Pratapgarh to Nimbahera		Both Direction	
	ADT	PCU	ADT	PCU	ADT	PCU
Two Wheeler	767	384	638	319	1405	703
Three Wheeler/Auto Rickshaw	29	29	26	26	55	55
Car/Jeep/Taxi	484	484	470	470	954	954
Mini Bus	2	3	1	2	3	5
Full Bus	32	96	24	72	56	168
LCV	44	66	55	83	99	149
2- Axle Truck	111	333	110	330	221	663
Multi Truck	33	149	26	117	59	266
Agri. Tractor With Trailer	30	135	35	158	65	293
Agri. Tractor With out Trailer	7	11	22	33	29	44
Cycle	127	64	74	37	201	101
Cycle Rick-shaw	0	0	0	0	0	0
Bullock Cart	2	12	1	6	3	18
Other(Pl. Specify Drawn)	1	4	1	4	2	8
Total Motorised Vehicle	1539	1690	1407	1610	2946	3300
Total Commercial Vehicle	222	647	216	604	438	1251
Total Non Motorised Vehicle	130	80	76	47	206	127
Total Vehicle	1669	1770	1483	1657	3152	3427

d) Volume Count Station 4: Nimbahera to Pratapgarh: Km 25.000***Summary of Average Daily Traffic at Km 25.000***

Descrip-tion	Nimbahera to Pratapgarh		Pratapgarh to Nimbahera		Both Direction	
	ADT	PCU	ADT	PCU	ADT	PCU
Two Wheeler	689	345	931	466	1620	811
Three Wheeler/Auto Rickshaw	13	13	17	17	30	30
Car/Jeep/Taxi	330	330	443	443	773	773
Mini Bus	1	2	1	2	2	4
Full Bus	55	165	66	198	121	363
LCV	40	60	41	62	81	122
2- Axle Truck	103	309	107	321	210	630
Multi Truck	118	531	99	446	217	977
Agri. Tractor With Trailer	70	315	43	194	113	509
Agri. Tractor With out Trailer	13	20	7	11	20	31
Cycle	60	30	71	36	131	66
Cycle Rick-shaw	8	16	7	14	15	30
Bullock Cart	1	6	1	6	2	12
Other(Pl. Specify Drawn)	1	4	3	12	4	16
Total Motorised Vehicle	1432	2090	1755	2160	3187	4250
Total Commercial Vehicle	317	1067	314	1029	631	2096
Total Non Motorised Vehicle	70	56	82	68	152	124
Total Vehicle	1502	2146	1837	2228	3339	4374

e) Volume Count Station 5: Nimbahera to Pratapgarh: Km 32.000***Summary of Average Daily Traffic at Km 32.000***

Descrip-tion	Nimbahera to Pratapgarh		Pratapgarh to Nimbahera		Both Direction	
	ADT	PCU	ADT	PCU	ADT	PCU
Two Wheeler	1571	786	1660	830	3231	1616
Three Wheeler/Auto Rickshaw	69	69	135	135	204	204
Car/Jeep/Taxi	566	566	487	487	1053	1053
Mini Bus	24	36	43	65	67	101
Full Bus	179	537	143	429	322	966
LCV	159	239	175	263	334	502
2- Axle Truck	497	1491	531	1593	1028	3084
Multi Truck	471	2120	420	1890	891	4010
Agri. Tractor With Trailer	212	954	201	905	413	1859
Agri. Tractor With out Trailer	81	122	117	176	198	298
Cycle	605	303	726	363	1331	666
Cycle Rick-shaw	0	0	2	4	2	4
Bullock Cart	18	108	25	150	43	258
Other(Pl. Specify Drawn)	0	0	0	0	0	0
Total Motorised Vehicle	3829	6920	3912	6773	7741	13693
Total Commercial Vehicle	1330	4423	1312	4240	2642	8663
Total Non Motorised Vehicle	623	411	753	517	1376	928
Total Vehicle	4452	7331	4665	7290	9117	14621

f) Volume Count Station 6: Nimbahera to Pratapgarh: Km 76.000**Summary of Average Daily Traffic at Km 76.000**

Descrip-tion	Nimbahera to Pratapgarh		Pratapgarh to Nimbahera		Both Direction	
	ADT	PCU	ADT	PCU	ADT	PCU
Two Wheeler	1595	798	1777	889	3372	1687
Three Wheeler/Auto Rickshaw	92	92	82	82	174	174
Car/Jeep/Taxi	312	312	377	377	689	689
Mini Bus	25	38	47	71	72	109
Full Bus	31	93	33	99	64	192
LCV	48	72	54	81	102	153
2- Axle Truck	103	309	95	285	198	594
Multi Truck	73	329	91	410	164	739
Agri. Tractor With Trailer	155	698	166	747	321	1445
Agri. Tractor With out Trailer	45	68	38	57	83	125
Cycle	520	260	550	275	1070	535
Cycle Rick-shaw	2	4	4	8	6	12
Bullock Cart	4	24	7	42	11	66
Other(Pl. Specify Drawn)	13	52	15	60	28	112
Total Motorised Vehicle	2479	2809	2760	3098	5239	5907
Total Commercial Vehicle	354	1063	391	1159	745	2222
Total Non Motorised Vehicle	539	340	576	385	1115	725
Total Vehicle	3018	3149	3336	3483	6354	6632

g) Volume Count Summary : Chittorgath to Nimbahera Section**Summary of Average Daily Traffic**

Descrip-tion	Km 189		Km 221.400	
	ADT	PCU	ADT	PCU
Two Wheeler	1961	981	1656	829
Three Wheeler/Auto Rickshaw	177	177	67	67
Car/Jeep/Taxi	2093	2093	1919	1919
Mini Bus	71	107	85	128
Full Bus	405	1215	378	1134
LCV	326	490	408	613
2- Axle Truck	2100	6300	1507	4521
Multi Truck	1988	8946	1910	8596
Agri. Tractor With Trailer	235	1058	332	1495
Agri. Tractor With out Trailer	53	80	120	181
Cycle	114	57	115	58
Cycle Rick-shaw	0	0	2	4
Bullock Cart	14	84	15	90
Other(Pl. Specify Drawn)	109	109	112	112
Total Motorised Vehicle	9409	21447	8382	19483
Total Commercial Vehicle	4890	17058	4288	14992
Total Non Motorised Vehicle	237	250	244	261
Total Vehicle	9646	21697	8626	19744

h) Volume Count Summary : Nimbahera to Pratapgarh Section**Summary of Average Daily Traffic**

	Km 6		Km 25		Km 32		Km 76	
	ADT	PCU	ADT	PCU	ADT	PCU	ADT	PCU
Two Wheeler	1405	703	1620	811	3231	1616	3372	1687
Three Wheeler/Auto Rickshaw	55	55	30	30	204	204	174	174
Car/Jeep/Taxi	954	954	773	773	1053	1053	689	689
Mini Bus	3	5	2	4	67	101	72	109
Full Bus	56	168	121	363	322	966	64	192
LCV	99	149	81	122	334	502	102	153
2- Axle Truck	221	663	210	630	1028	3084	198	594
Multi Truck	59	266	217	977	891	4010	164	739
Agri. Tractor With Trailer	65	293	113	509	413	1859	321	1445
Agri. Tractor With out Trailer	29	44	20	31	198	298	83	125
Cycle	201	101	131	66	1331	666	1070	535
Cycle Rick-shaw	0	0	15	30	2	4	6	12
Bullock Cart	3	18	2	12	43	258	11	66
Other(Pl. Specify Drawn)	2	8	4	16	0	0	28	112
Total Motorised Vehicle	2946	3300	3187	4250	7741	13693	5239	5907
Total Commercial Vehicle	438	1251	631	2096	2642	8663	745	2222
Total Non Motorised Vehicle	206	127	152	124	1376	928	1115	725
Total Vehicle	3152	3427	3339	4374	9117	14621	6354	6632

Chapter – 6
ENVIRONMENTAL
MONITORING PROGRAM

CHAPTER 6

ENVIRONMENTAL MONITORING PROGRAM

6.1. INTRODUCTION

This chapter includes study of the adverse environmental impacts during construction and operation phases for better environment management. Monitoring of environmental factors and constraints will enable agencies to identify the changes in the environmental impacts at particular locations, application of mitigative measures and utilization of standard design guidelines for finalization of alignment design. Monitoring will also ensure that actions (Widening of NH-113 and 79) taken are in accordance with the construction contract and specifications. It provides a basis for evaluating the efficiency of mitigation and enhancement measures, and suggests further actions needed to be taken to achieve the desired effect.

To ensure the effective implementation of the EMP, it is essential that an effective monitoring program be designed and carried out.

The monitoring includes:

- Visual observations;
- Selection of environmental parameters at specific locations;
- Sampling and regular monitoring of these parameters.

6.2. OBJECTIVES

The Objectives of environmental monitoring programme are:

- Evaluate of the efficiency of mitigation and enhancement measures;
- Updating of the actions and impacts of baseline data;
- Adoption of additional mitigation measures if the present measures are insufficient;
- Generating the data, which may be incorporated in environmental management plan in future projects.
- Satisfying the legal and community obligations

The environmental monitoring plan includes:

- Performance indicators
- Environmental monitoring programme
- Reporting system

- Budgetary provisions

6.3. PERFORMANCE INDICATORS

The physical, biological and social components identified to be particularly significant in affecting the environment at critical locations have been suggested as Performance Indicators (PIs). The performance indicators will be evaluated under three heads:

- a) Environmental condition indicators to determine efficiency of environmental management measures in control of air, noise, water and soil pollution.
- b) Environmental management indicators to determine compliance with the suggested environmental management measures.
- c) Operational performance indicators that have been devised to determine efficiency and utility of the proposed mitigation measures.

The Performance Indicators and monitoring plans will be prepared for the project for effective monitoring.

6.3.1 Responsibilities for Monitoring

The responsibility for monitoring of implementation of the EMP will rest with the Environmental Management Unit (EMU). Mitigation and enhancement measures adopted in final design will be explicitly identified under the Bill of Quantity (BOQ) so that performance and completion is readily documented. The PWD will visually assess the progress of Environmental Management Unit and the work of Contractors. If the level of impact is determined to be high, further monitoring will be done by a recognized 'A' category laboratory of the concerned State Pollution Control Board (SPCB) and assessed for verification of the increased or decreased emission level and pollutants along the project road, and if found more appropriate control measures would be exercised.

6.3.2 Performance Indicators

In order to evaluate the effectiveness of EMP at project level, certain physical, biological and social components identified. These component needs to be analyzed based on project specific conditions and data generated. The key quality components include Air quality, Water quality, Noise Levels around sensitive locations, Plantation / re-plantation success / survival rate, Erosion

indices, Restoration of quarries and borrow areas, Quality of human health, Accident frequency.

6.4. ROUTINE MONITORING

During the construction and post-construction phase, ambient air quality, water quality (surface and ground water), effluent (if any released from construction work site / camp) and noise level will be monitored as and when required depending upon the type, nature and duration of the project using standardized monitoring methodologies and laboratory testing facilities / techniques.

Site Selection

Monitoring stations have been identified based on observation / site conditions such as nature of construction, diversions, congestion, parking places, bus / taxi stands , number and frequency of vehicles, sources of pollutants (industrial / commercial / residential), environmental features and existence of sensitive / critical areas i.e. educational institutions, hospitals, archaeological / cultural sites. The frequency and duration of testing / sampling of air, water, noise levels and effluent quality within the ROW is to be fixed as per allotted time frame of the project and requirements of SPCB / CPCB and MoEF.

Methodology

Monitoring methodology covers the following key aspects:

- Components to be monitored;
- Parameters for monitoring of the above components;
- Monitoring frequency;
- Monitoring standards;
- Responsibilities for monitoring;
- Monitoring costs.

Environmental monitoring of the parameters involved and the threshold limits specified are discussed below:

6.4.1 Ambient Air Quality Monitoring (AAQM)

The air quality parameters viz: Sulphur Dioxide (SO₂), Oxides of Nitrogen (as NO₂), Carbon Monoxide (CO), Hydro-Carbons (HC), PM₁₀ and PM_{2.5} shall be regularly monitored at identified locations from the start of the construction activity. The air quality parameters will be monitored in accordance with the National Ambient Air Quality Standards as given in **Annexure 6C**. The

location, duration and the pollution parameters to be monitored and the responsible institutional arrangements are detailed out in the Environmental Monitoring Plan (**Annexure 6B**).

6.4.2 Water Quality Monitoring

Water quality parameters such as pH, BOD, COD, DO coliform count, total suspended solids, total dissolved solids, lead, Cadmium, and Zinc for surface water and pH, Alkalinity, Total Hardness, Sulphate, TDS, Chloride Fluoride for ground water, shall be monitored at all identified locations during construction and operation phases as per standards prescribed by Central Pollution Control Board and Indian Standard Drinking water specifications IS 10500 (1991) presented in **Annexure 6A**.

6.4.3 Noise Quality Monitoring

As with air and water quality, the noise levels will be monitored at already designated locations in accordance with the Ambient Noise Quality standards given in **Annexure 6D**. The location, duration and the noise pollution parameters to be monitored and the responsible institutional arrangements are detailed in the Environmental Monitoring Plan (**Annexure 6B**).

6.5. ENVIRONMENTAL MONITORING PLAN

Monitoring plan for both construction and operation phased is summarized in **Annexure 6B**.

6.6. REPORTING PROCEDURES

Mitigation and enhancement measures adopted in the final design have been identified in the contract documents and Bill of quantities so that performance and completion is effective. The periodic site visits of the EO of the IC and the EE of the PMT will keep a record of progress as well as the site-specific EMP implementation records. The frequent meeting of the EO of IC with the Contractors will ensure any information and communication gap with regard to the Construction phase environmental management at construction site; labour and construction camps quarry and borrow areas etc. It is necessary that the EO of IC should visit the sites for evolving a concept for the Environmental Management with regard to the silting of various construction requirements. The various reporting guidelines and arrangements are as follows.

6.7. PREPARING EMP MONTHLY PROGRESS REPORTS - NOTES

The monthly report should be prepared by the Contractor. The monthly report should contain an introductory section which gives the basic information on the contract package, a brief description of the implementation progress made till date and, particularly, the progress made during the past month.

The monthly report should contain separate sections (approx. 1-2 pages per section) for each of the following:

1. Quarries
2. Construction camps
3. Borrow areas
4. Sand mining
5. Spoils and debris disposal
6. Waste
7. Traffic management & road safety
8. Mitigation measures along the project roads
9. Enhancement measures along the project roads
10. Environmental parameter monitoring activities (air, noise and water quality)
11. Other issues along the project roads
12. The monthly report should necessarily contain a section on implementation arrangements. This section should include the environmental engineer's work and timesheet. This should be a simple table that clearly indicates the activities carried out by the environmental engineer during the month. This table should include site visits to construction camps, quarries, borrow areas, active road construction areas, disposal sites and accident prone areas. This section should also cover training / orientation activities that were carried out within the contractor's team and the environmental parameter monitoring done.
13. There should be only one monthly report per contract package.
14. Signed copies of these reports should be submitted by the Contractor to the Supervision Consultants by seventh of every calendar month.

15. Supervision Consultants should verify and countersign these reports. These should be submitted by the Supervision Consultants to the PMT by the 10th day of every month.
16. At least, three copies of these reports should be prepared. One copy should be retained by the Contractor, another with the Supervision Consultants and the third should be for the PMT

6.8. REPORTING BY IC – EMP quarterly progress reports - Notes *The quarterly report should be prepared by the Independent Consultants.

1. The quarterly report should summarize and draw the key points from the three monthly progress reports submitted by the contractor during the quarter.
2. The quarterly report should contain an introductory section which gives the basic information on the contract package, a brief description of the implementation progress made till date and, particularly, the progress made during the past month.

The quarterly report should contain separate sections (approx. 1-2 pages per section) for each of the following:

1. Construction camp
2. Quarries
3. Borrow areas
4. Sand mining
5. Spoils and debris disposal
6. Waste
7. Traffic management & road safety
8. Mitigation measures along the project roads
9. Enhancement measures along the project roads
10. Environmental parameter monitoring activities (air, noise and water quality)

The quarterly report should necessarily contain a section on implementation arrangements. This section should include a summary of the Contractor's environmental engineer's work and timesheet, and that of the IC's environmental officer. This section should also cover training / orientation activities that were carried out within the Contractor's team and the environmental parameter monitoring done during the quarter.

ANNEXURE 6A**Indian Standard Drinking Water Specifications: IS 10500: 1991**

SL. No.	Substance or Characteristics	Requirement (desirable limit)	Undesirable effect outside the desirable limit	Permissible limit in the absence of alternate source	Methods of test (ref. To IS)	Remarks
<i>Essential Characteristics</i>						
1.	Colour, Hazen Units, Max.	5	Above 5, consumer acceptance decreases	25	3025 (part4) 1983	Extended to 25 only if toxic substances, in absence of alternate sources.
2.	Odour	Unobjectionable	-	-	3025 (parts 5): 1984	a) A test cold and when heated b) Test at several dilution
3.	Taste	Agreeable	-	-	3025 (part 8): 1984	Test to be conducted only after safety has been established
4.	Turbidity NTU, Max.	5	Above 5, consumer acceptance decreases	10	3025 (part 7): 1984	
5	P ^H value	6.5 to 8.5	Beyond this range the water will not effect the mucous membrane and /or water supply system	No relaxation	3025 (part 11): 1984	

6.	Total hardness (as CaCO ₃) mg/l, Max.	300	Encrustation in water supply structures an adverse effect on domestic use	600	3025 (part 21): 1983	
7.	Iron (as Fe) mg /l Max.	0.3	Beyond this limit taste/appearance are affected has adverse effect on domestic uses and water supply structures and promotes iron bacteria	1.0	3025 (part 21): 1983	
8.	Chlorides (as Cl) mg/l Max.	250	Beyond this limit, taste corrosion and palatability are affected	1000	3025 (part 32): 1988	
9.	Residual, free chloride, mg/l Min.	0.2			3025 (part 26): 1986	To be applicable only when water is chlorinated. Tested at consumer end. When protection against viral infection is required, it should be Min. 0.5 mg/l
<i>Desirable characteristics</i>						
1.	Dissolved solids mg/l Max.	500	Beyond the palatability decreases and may cause gastro intestinal irritation	2000	3025 (part 16): 1986	
2.	Calcium (as Ca) mg/l Max.	75	Encrustation in water supply structure and adverse effects on domestic use	200	3025 (Part 16) 1986	
3.	Magnesium (as Mg) mg/l, Max.	30	Encrustation in water supply structure and adverse effects on domestic use	1.5	16,33,34 of IS 3025: 1964	

Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

4.	Copper (as Cu) mg/l Max.	0.05	Beyond taste, discoloration of pipes, fitting and utensils will be caused beyond this	0.3	35 of 3025: 1964	
5.	Manganese (as Mn) mg/l, Max.		Beyond this limit taste/appearance are affected, has adverse effect on domestic uses and water supply structures.	0.3	35 of 3025: 1964	
6.	Sulphate (as 200 So ₂), mg/l, Max.	200	Beyond this causes gastro intestinal irritation when magnesium or sodium are present	400	3025(part 24):1986	May b extended up to 400 provided (as Mg) does not exceed 30
7.	Nitrate (as No ₂) mg/l, Max.	45	Beyond this methamoglobunemia take place	100	3025 (part24): 1988	To be tested when pollution is suspected
8	Fluoride (as F) mg/l, Max.	1.0	Fluoride may be kept as low as possible. High fluoride may cause fluorosis	1.5	23of 3025:1964	To be tested when pollution is suspected
9	Phenolic compounds (as C ₆ H ₅ OH) mg/l, Max.	0.001	Beyond this it may cause objectionable taste and odour	0.002	54of 3025:1964	To be tested when pollution is suspected
10	Mercury (as Hg) mg/l, Max.	0.001	Beyond this the water becomes toxic	No relaxation	(See not mercury ion analyzes)	To be tested when pollution is suspected

Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

11	Cadmium (as cd), mg/l, Max.	0.01	Beyond this the water becomes toxic	No relaxation	(See note)	To be tested when pollution is suspected
12	Selenium, (as Se). mg/l, Max.	0.01	Beyond this the water becomes toxic	No relaxation	28 of 3025:1964	To be tested when pollution is suspected
13	Arsenic (As) mg/l, Max.	0.05	Beyond this the water becomes toxic	No relaxation	3025 (part 37); 1988	To be tested when pollution is suspected
14	Cyanide (as CN) mg/l, Max.	0.05	Beyond this the water becomes toxic	No relaxation	3025 (part 27) 1988	To be tested when pollution is suspected
15	Lead (as Pb), mg/l, Max.	0.05	Beyond this the water becomes toxic	No relaxation	(See note)	To be tested when pollution is suspected
16	Zinc (as Zn) mg/l, Max.	5	Beyond this limit it can cause astringent taste and an opalescence taste and an opalescence in water	15	39 of 3025:1964	To be tested when pollution is suspected
17	Anionic detergents (as MBAS) mg/l, Max.	0.2	Beyond this it can cause a light froth in water	1.0	Methylene-blue extraction method	To be tested when pollution is suspected
18	Chromium (as Cr ⁶⁺) mg/l, Max.	0.05	May be carcinogenic above this limit	No relaxation	38 of 3025:1964	To be tested when pollution is suspected
19	Poly nuclear aromatic hydrocarbons (as PAH) mg/l, Max.	-	May be carcinogenic above this limit	-	-	-

Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

20	Mineral oil mg/l, Max.	0.01	Beyond this limit undesirable taste and odour after chlorination take place.	0.03	Gas Chromatography method	-
21	Pesticides mg/l, Max.	Absent	Toxic	0.001	-	-
22	Radioactive material	-	-	-	58of 3025:1964	-
23	Alpha emitters bq/l, Max.	-	-	0.1	-	-
24	Beta emitters pci/l, Max.	-	-	1	-	-
25	Aluminum (as Al) mg/l, Max.	200	Beyond this limit taste becomes unpleasant	600	13of3025: 1964	-
26	Aluminum (as Al) mg/l, Max.	0.03	Cumulate effect is reported to cause dementia	0.2	31of 025: 1964	-
27	Boron mg/l, Max.	1.0	-	5	29of3029: 1964	-

Source: Indian Standard Drinking Water Specification – IS 10500, 1991

Water Quality Criteria as per CPCB Guidelines

Sl. No.	Designated Best Use	Class of Water	Criteria
1	Drinking Water source (with conventional treatment)	A	1. Total Coliforms MPN/100 ml shall be 50 or less 2. pH between 6.5 to 8.5 3. Dissolved Oxygen 6 mg / l or more 4. Biochemical Oxygen demand (BOD) 5 days 20 ⁰ C 2 mg/l or less
2	Outdoor bathing (organized)	B	1. Total Coliforms MPN/100 ml shall be 500 or less 2. pH between 6.5 to 8.5 3. Dissolved Oxygen 5 mg / l or more 4. Biochemical Oxygen demand (BOD) 5 days 20 ⁰ C 3 mg/l or less
3.	Drinking Water source (without conventional treatment)	C	1. Total Coliforms MPN/100 ml shall be 5000 or less 2. pH between 6 to 9 3. Dissolved Oxygen 4 mg / l or more 4. Biochemical Oxygen demand (BOD) 5 days 20 ⁰ C 3 mg/l or less
4.	Propagation of Wildlife	D	1. pH between 6.5 to 8.5 for fisheries 2. Dissolved Oxygen 4 mg/l or more 3. Free Ammonia (as N) 1.2 mg/l or less
5.	Irrigation, Industrial Cooling, Controlled Waste	E	1. pH between 6.0 to 8.5 2. Electrical Conductivity at 25 ⁰ C μ mhos/cm Max. 2250 3. Sodium absorption ratios Max. 26 4. Boron, Max.2 mg/l

Ref: CPCB (1999). Bio-mapping of rivers. Parivesh New Letter, 5 (iv), Central Pollution Control Board, Delhi, PP.20

ANNEXURE 6B**Environmental Monitoring Plan**

Env. Component	Project Stage	Monitoring						Institutional Responsibility	
		Parameters	Special Guidance	Standards	Location	Frequency	Duration	Implementation	Supervision
Air	Construction Stage	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , CO, and HC	High volume sampler to be located 50 m from the plant in the downwind direction. Use method specified by CPCB for analysis	Air (P&CP) Act, 1981 and its amendment	Hot mix Plant / Batching Plant	Quarterly for three years	Continuous 24 hours or for 1 full working day	Contractor through approved monitoring agency	P I U (PWD) IC
		PM ₁₀ , PM _{2.5}	Repairable Dust Sampler and FPM Sampler to be located 40 m from the earthworks site downwind direction. Use method specified by CPCB for analysis	Air (P&CP) Act, 1981 and its amendment.	Stretch of the road where construction is in progress at the site	Quarterly for three years	Continuous 24 hours or for 1 full working day	Contractor through approved monitoring agency	P I U (PWD) IC
	Operational Stage	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , CO, HC	Repairable Dust Sampler and FPM Sampler to be located 50m from the plant in the downwind direction. Use method specified by CPCB for analysis	Air(P&CP) Act, 1981 and its amendment	as specified by the Engineer PWD / IC	Three times in a year for one year	Continuous 24 hours or for 1 full working day	P I U, PWD	P I U (PWD) IC

Env. Component	Project Stage	Monitoring						Institutional Responsibility	Env. Component
		Parameters	Special Guidance	Standards	Location	Frequency	Duration	Implementation	Supervision
Water Quality	Construction Stage	pH, BOD, COD, TDS, TSS, DO, Oil & Grease and Pb	Grab sample collected from source and analyze as per Standard Methods for Examination of Water and Wastewater	Water quality standards by CPCB	other locations identified by the independent consultant	End of summer before the onset of monsoon every year for 3 years	-	Contractor through approved monitoring agency	P I U (PWD) IC

Env. Component	Project Stage	Monitoring						Institutional Responsibility	Env. Component
		Parameters	Special Guidance	Standards	Location	Frequency	Duration	Implementation	Supervision
	Operation Stage	Flooding and Cleaning of drains/water bodies	Flooding locations to be identified and choked drains, water bodies under going siltation and subject to debris disposal should be monitored under cleaning operations	Water quality standards of CPCB and cleaning shall be to the satisfaction of the engineer PWD	as specified by the Engineer PWD / IC	Thrice in monsoon and post- monsoon seasons in a year for 1 year	-	P I U (PWD)	P I U (PWD) IC
Noise Levels	Construction Stage	Noise levels on dB (A) scale	Free field at 1 m from the equipment whose noise	Noise standards by CPCB	At equipment yards	Once every month (max) for	Reading to be taken at 15 seconds interval for 15	Contractor through approved monitoring	P I U (PWD) IC

Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

Env. Component	Project Stage	Monitoring						Institutional Responsibility	Env. Component
		Parameters	Special Guidance	Standards	Location	Frequency	Duration	Implementation	Supervision
			levels are being determined			three years, as required by the engineer	minutes every hour and then averaged	agency	
	Operation Stage	Noise levels on dB (A) scale	Equivalent Noise levels using an integrated noise level meter kept at a distance of 15 m from edge of Pavement	Noise standards by CPCB	As directed by the Engineer (At maximum 4 locations)	Thrice a year for 3 years during the constructi on period	Readings to be taken at 15 seconds interval for 15 minutes every hour and then averaged.	P I U (PWD)	P I U (PWD) IC
Soil Erosion	Construction Stage	Turbidity in Storm Water Silt load in ponds, water courses	----	As specified by the engineer PWD / Water	As specified by the engineer PWD /	Pre- monsoon and post- monsoon seasons	----	Contractor	P I U (PWD) IC

Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

Env. Component	Project Stage	Monitoring						Institutional Responsibility	Env. Component
		Parameters	Special Guidance	Standards	Location	Frequency	Duration	Implementation	Supervision
				quality standards	Independent Consultant, all along the project corridor	for 3 years			
	Operational Stage	Turbidity in Storm Water Silt load in ponds, water courses	----	As specified by the engineer PWD / Water quality standards	As specified by the engineer PWD / Independent consultant, all along the project corridor	Three times a year for one year	----	P I U (PWD)	P I U (PWD) IC
Plantation of trees	Construction as well as Operational Stage		The success of tree planting. rate of survival after six	-	All along the project corridor	Maintenance for three to five years after	-	NGO, and PIU, (PWD)	P I U (PWD)

Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

Env. Component	Project Stage	Monitoring						Institutional Responsibility	Env. Component
		Parameters	Special Guidance	Standards	Location	Frequency	Duration	Implementation	Supervision
		75% Plant Survival	months, one year and 18 months in relation to total planted			plantation			
Construction Sites and Construction Camps	Construction Stage	Monitoring of: Storage Area Drainage Arrangements Sanitation in Construction Camps	The parameters as mentioned in chapter-4 but to be checked for adequacy.	To the satisfaction of the PWD and the Water quality standards given by CPCB	At storage area and construction camps	Quarterly in the constructi on stage	----	Contractor	P I U (PWD)

ANNEXURE 6C**National Ambient Air Quality Standards (NAAQS ,2009)**

Pollutant	Time Weighted Average	Concentration in Ambient Air		
		Industrial, Residential, Rural and other Area	Ecologically Sensitive Area (Notified by Central Government)	Method of Measurement
(1)	(2)	(3)	(4)	(5)
Sulphur Dioxide (SO ₂) µg/m ³	Annual Average*	50	20	Improved West and Gaske method
	24 hours**	80	80	Ultraviolet florescence
Oxides of nitrogen as NO ₂ µg/m ³	Annual Average*	40	30	Jacob & Hochheisor modified (Sodium Arsentie)
	24 hours**	80	80	Chemilumine-Scence
Particulate Matter(size less than 10µm) or PM ₁₀ µg/m ³	Annual Average*	60	60	-Gravimetric -TOEM
	24 hours**	100	100	-Beta Attenuation
Particulate Matter (size less than 2.5 µm) or PM _{2.5} µg/m ³	Annual Average*	40	40	-Gravimetric -TOEM
	24 hours**	60	60	-Beta Attenuation
Carbon Monoxide (CO)Mg/m ³	8 hours**	02	02	Non dispersive infrared (NDIR), spectroscopy.
	1hour*	04	04	

Source: National Ambient Air Quality Standards CPCB Notification 18th Nov. 2009

* Annual Arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.

** 24 hourly/8 hourly values shall be met 98% of the time in a year. 2% of the time, it may exceed but not on two consecutive days.

ANNEXURE 6D**Ambient Noise Standard (As per Noise Pollution & Control Rules 2000)**

Area Code	Category of Area	Limits in dB (A) Leq.	
		Daytime	Nighttime
A	Industrial	75	70
B	Commercial	65	55
C	Residential	55	45
D	Silence	50	40

Note-1 Day time is reckoned in between 6 AM to 10 PM

Note-2 Night time is reckoned in between 10 PM to 6 AM

Note-3 Silence zone is defined as areas upto 100 meters around such as premises as hospitals, educational institutions and courts. The silence zones are to be declared by the Competent Authority.

Note-4 Mixed categories of areas should be declared as one of the four above mentioned categories, by the Competent Authority and the corresponding standard shall apply

Emission norms for passenger cars

Norms	CO(g/km)	HC+ NO _x (g/km)
1991Norms	14.3-27.1	2.0(Only HC)
1996 Norms	8.68-12.40	3.00-4.36
1998Norms	4.34-6.20	1.50-2.18
India stage 2000 norms	2.72	0.97
Bharat stage-II	2.2	0.5
Bharat Stage-III	2.3	0.35(combined)
Bharat Stage-IV	1.0	0.18(combined)

Emission norms for Heavy Diesel vehicles

Norms	CO(g/kmhr)	HC (g/kmhr)	NO _x (g/kmhr)	PM(g/kwhr)
1991Norms	14	3.5	18	-
1996 Norms	11.2	2.4	14.4	-
India stage 2000 norms	4.5	1.1	8.0	0.36
Bharat stage-II	4.0	1.1	7.0	0.15
Bharat Stage-III	2.1	1.6	5.0	0.10
Bharat Stage-IV	1.5	0.96	3.5	0.02

Norms	CO(g/km)	HC+ NO _x (g/km)
1991Norms	12-30	8-12 (only HC)
1996 Norms	4.5	3.6
India stage 2000 norms	2.0	2.0
Bharat stage-II	1.6	1.5
Bharat Stage-III	1.0	1.0

Emission Norms for 2/3 wheeler

Auto Fuel Quality

DIESEL SPECIFICATION				
YEAR	1996	2000	2005	2010
Cetane No, Min	45	48	48	51
sulphur % W/w, Max	0.50	0.25 0.25(metro)	0.05	0.035
Distillation T95	-	370	370	360
Polyaromatic	-	-	-	11
GASOLINE SPECIFICATION				
RVP at 38Deg.c,kpa	35-70	-	35-60	60
BENZENE %by Vol.,max	5.0	5.0 3.0(Metro)	3.0(all) 1.0(Metro)	1.0
Lead G/m3, max	0.15 %(low pb) 0.013% (unleaded)	0.013	0.013	0.005
Sulphur % by mass, max	0.10(unleaded) 0.20 (leaded)	0.10	0.05	0.015
Aromatics % v/v., Max	-	-	45	42
Oxygen %by Vol., Max	-	-	2.0	2.7

Chapter - 7
SAFETY MANAGEMENT
AND ADDITIONAL STUDIES

CHAPTER 7

SAFETY MANAGEMENT AND ADDITIONAL STUDIES

7.1 ROAD SAFETY & TRAFFIC MANAGEMENT

Objectives of safety & traffic management are:

- To ensure protection of workers on site through strict enforcement of safety plans / standards, proper training to the workers and through deployment of trained & experience workers staff at site.
- To ensure applicable and adequate safety measures at site through proper barricading, safe access to site, lighting etc. and use of Personal Protective Equipments (PPE) & other safety tools and equipments.
- To ensure smooth, safe and uninterrupted traffic flow on the project highway at all times during construction.
- To give adequate information / warning sufficiently in advance about any situation / event / matter affecting the project highway through proper signage, demarcations etc.
- To ensure safety of road users against the hazards due to
 - ✓ Diversion
 - ✓ Road Condition
 - ✓ Low Visibility
 - ✓ Vehicle breakdown on carriageway
 - ✓ Repair work etc. in progress on carriageway *or* for any other reason resulting in disturbance in free flow of traffic.
- Avoid risk of damage/ disturbance to the properties adjacent to the project highway
- Ensure safety of project assets and public utilities.

7.1.1 Site Safety Rules and Regulations

General Rules

- No drugs, alcohol or alcoholic beverages are permitted on work site.

- All connection for electricity, water supply and other temporary facilities made by authorized persons only and shall be in accordance with legal and contractual requirements.
- Work shall only be carried out if an authorized person has ordered it.

General Safety Hints to the Workers

- Wear protective clothing or apparel where required to do so.
- Must wear other safety gear where required / indicated.
- Keep work site and work areas tidy.
- Maintain personal hygiene e.g. washing hands before meals.
- Report an unsafe condition to your supervisor and stop unsafe actions immediately.
- Think before you act.
- Don't horseplay or distract others.
- Don't take shortcuts, your safety and that of others is more important.
- Obey all safety rules and signs.

Report all accidents however small, and have them treated immediately.

7.1.2 Traffic Safety Plan

Work on the highway shall be carryout in a manner creating least interference to the flow of traffic. During execution of the work a passage would be constructed for traffic either along a part of the existing carriageway under improvement or along a temporary diversion constructed close to the highway, as per site requirement. At least 7.0 meter width of road will remain open to traffic at all the times with suitable traffic diversion measures on granular or suitable surface as applicable/required.

Guiding principles and precautions

The guiding principles for safety in road construction zones are:

- Warn the drivers road user clearly and sufficiently in advance
- Provide safe and clear marked lanes for guiding road users
- Provide safe and clearly marked buffer and work zones
- Provide adequate measures that control driver behavior through construction zones, lane closures or traffic diversions.

The following defined precautions shall be applied to all the work sites:

- All the signs and delineators shall be maintained in a clean and brightly painted condition at all times.
- Adequate lighting arrangements shall be made for proper visibility after sunset in construction zones.
- Adequate arrangements like frequent sprinkling of water shall be made to keep the area dust free.

For high traffic density roads, the following precautions must be taken:

(a) For safety of workmen:

- a. Workmen would be given safety induction before work commences.
- b. First Aid training programs would be given to certain identified workmen and would be given responsibility to provide first aid to all the workmen at site.
- c. Workers required on site during night hours must be provided with fluorescent jackets and safety helmet with reflective tapes.
- d. Adequate barriers are provided to protect the workforce
- e. Adequate temporary lighting is provided wherever it is required.
- f. Adequate measures to be taken for the supply, use and storage of bituminous materials.
- g. Suitable precautions to be taken for underground I overhead cables.

(b) For Safety of Road User:

- The material, equipment and machinery would be stocked / parked in places sufficiently away from the road.
- Machinery would be parked at appropriate places with red flags and red tights on during night.
- Adequate measures are implemented to prevent operatives, tools, materials, etc. from falling onto live carriageways.
- Speed limits are set, marked, and enforced.

7.1.3 Traffic safety measures and control:

Following traffic safety measures shall be ensured during construction:

- Erection and maintenance of bamboo stack poles, caution signs and markings and flagmen for the information and protection of traffic approaching or passing through the section of the highway under improvement.
- All culverts and bridges would be barricaded by providing two drums at the two ends of culvert. In between drums, bamboo with red and white stripes would be installed with reflective tapes on them for night visibility. The area to be cordoned off with safety barricading tape. Caution boards shall be placed at two ends of the bridge.
- Red lights or warning lights of similar type shall be mounted on the barricades at night and kept it throughout from sunset to sunrise.
- At the points where traffic is to deviate from its normal path as per site requirement, the channel for traffic shall be clearly marked. At high traffic area, Caution boards would be installed 60 meters before the respective diversion area “speed breaker” board. “DIVERSION” board would be installed at the both ends of the diversion road.
- All diversions would be kept free of dust by frequent application of water.
- Flagmen with red and green flag would be deployed at both ends of the respective diversion for the smooth flow of traffic as and when required.
- Deep excavation area would be barricaded by barricading tape.

For guidance of road user caution boards with regulatory and warning information such as “GO SLOW, MEN AT WORK” & for illiterates pictorial “GO SLOW, WORK IN PROGRESS” would be installed at 100 meter intervals.

7.1.4 Traffic Control Devices

Traffic control devices are the devices which perform the crucial task of warning, informing and alerting the driver / road user apart from guiding the vehicle movements so that the driver of the vehicle as well as the workers on site are protected and safe passage to the traffic is possible.

The primary traffic control devices used in work sub-zones are signs, delineators, cones, pylons, pavement markings, flashing lights etc. They shall be such that they are easily understood without any confusion, are clearly visible during day and night, conform to the prevailing speeds in immediate vicinity, stable against

sudden adverse weather conditions and are easy in installation, removal and maintenance.

Safety signs

“Safety sign” is a sign, which uses a pictorial symbol to provide health or safety information or instruction. The signs may also include a written message. The construction and maintenance signs fall into the same three major categories viz. barricades regulatory signs, warning signs and guide signs as other traffic signs do. Warning, Cautionary, Prohibition and command signs will be installed and will not be removed or changed till they are required at site. These signs shall be placed on left hand side of the road.. Some of the common types of signs which shall be provided in construction zones are shown in **Figure 7-1**.



Figure 7-1: Safety signs

Regulatory signs

Regulatory signs mean legal restrictions on the traffic. The most common types for use in construction zones are “Do not enter”, “Road Closed”, “Speed limit” etc



Figure 7-2: Regulatory signs

Warning signs

The most common type of warning signs to alert the drivers of the possible dangers ahead in construction zones are “Lane Closed”, “Diversion to other Carriageway”, “Divided Carriageway Starts”, “Divided Carriageway Ends” and “Two Way Traffic” etc. Sometimes it might be advisable to explain these signs with the help of a rectangular definition plate of size appropriate to the size of warning triangle and placed 0.15 m below, from the bottom of the triangle.



Figure 7-3: Warning signs

Guide signs

Guide signs in construction zones shall have different background colour than the normal informatory signs. These signs shall have black messages and arrows on yellow background. The commonly used guide signs are: “Diversion”, “Road Ahead Closed” and “Sharp Deviation of route” etc.

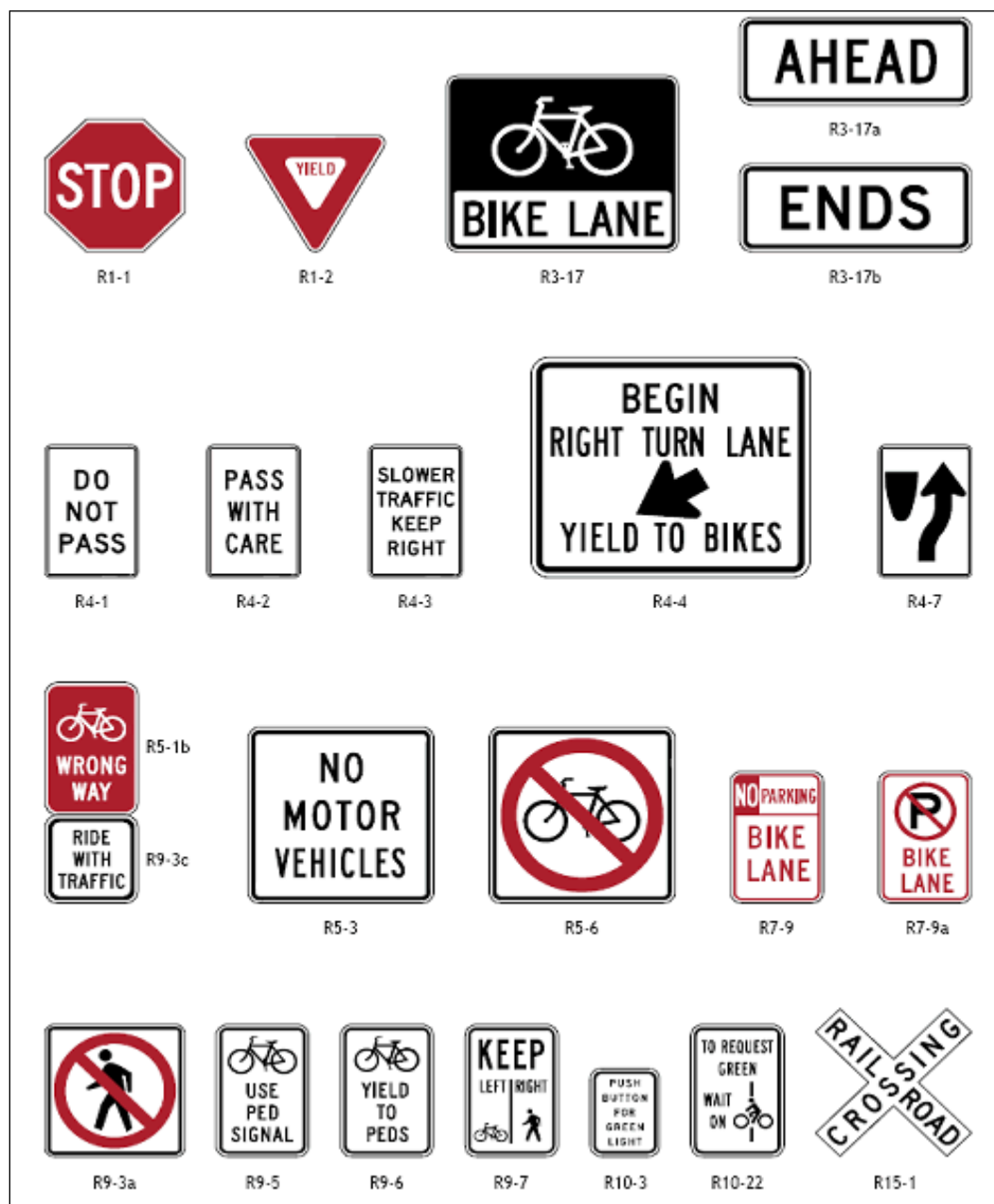


Figure 7-4: Guide signs

Delineators

Delineators are the channelising devices such as cones, traffic cylinders, tapes, drums, which shall be placed in or adjacent to the roadway to guide the drivers along a safe path and to control the flow of traffic. These shall normally be retro-reflectorised for night visibility.

Traffic cones and cylinders

Traffic cones are normally 0.5 m to 0.75 m high and 0.3m to 0.4m in diameter or are in square shape at the base. These are mostly made of plastic or rubber with retro reflectorised red and white band and have suitable anchoring so that they are not easily blown over or displaced. They shall be placed close enough together to give an impression of the continuity. The spacing shall be 3m (close) to 9m (normal). Larger size cones can be used for high speeds or where more conspicuous guidance is required.



Figure 7-5: Traffic cones signs

Barricades

Whenever the traffic has to be restricted from entering the work areas, such as excavations or material storage sites so that protection to workers is provided or there is a need for separating the two way traffic, barricades shall be used. The barricades can be portable or permanent type and can be made of wooden planks, metal or other suitable material. The horizontal component facing the traffic is made of 0.30 m wide wooden planks joined together and painted in alternate

yellow and white strips of 0.15 m width and sloping down at an angle of 45 degree in the direction of the traffic. **Figure 7-6** shows three types of barricades. Suitable support or ballasting shall be provided so that they do not over turn or are not blown away in strong winds.



Figure 7-6: Barricades Signs

In case of a permanent type barricade, a gate or movable section shall be separately provided to allow the movement of construction/supervision vehicles.

Flagmen

On large construction sites, flagmen with flags and sign paddles shall be effectively used to guide the safe movements. The flags for signaling shall be 0.60 m x 0.60 m size, made of a good red cloth and securely fastened to a staff of approximately 1m in length.



Figure 7-7: Flagmen Sign

7.1.5 Safety and Management Practices

Measures for providing safe movement of traffic in some of the most commonly occurring work zones on highways shall be as follows:

Temporary diversion

In the cases of major repairs or reconstruction of cross drainage structures on a highway section, damaged due to flood etc., the traffic may have to pass on a diversion, moving parallel to the highway.

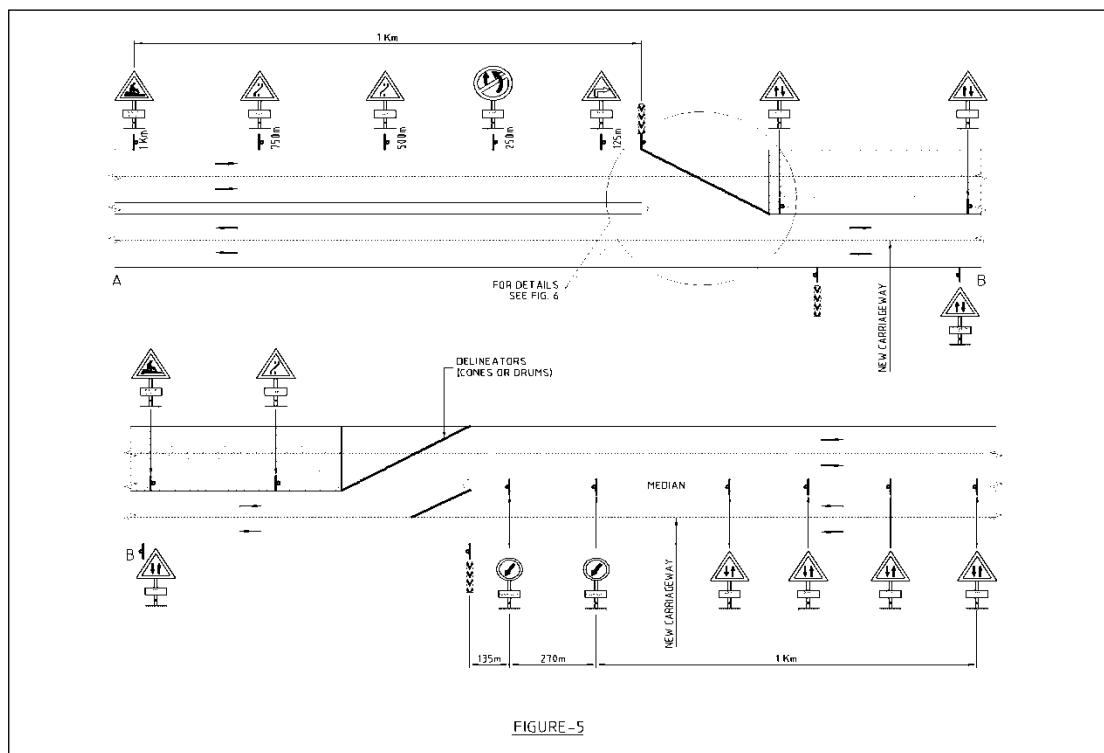


Figure 7-8: Temporary diversion

The warning for the construction ahead shall be provided by the sign “Men at Work” about 1 km earlier to the work zone or a supplementary plate indicating “Diversion 1 km ahead” and I or a sign “Road Closed Ahead” shall be placed. It shall be followed by “Compulsory Turn Right/Left Sign”. The “Detour” and “Sharp Deviation” sign shall be used to guide the traffic onto the diversion. Hazard markers shall be placed just where the railings for the cross drainage structures on the diversion starts. **Figure 7-8** illustrates a typical arrangement according to the above plan.

7.1.6 Closure for work on one side carriageway of a 4-lane divided carriageway

The first sign shall be for the “Men at Work” along with distance plate for construction zone. Thereafter the sign for “Road Narrowing” shall be provided, followed by the signs for lane closure one after another.

This shall be followed by sign for compulsory “Keep right/Left (depending upon site situation). The sign for the “Closure of carriageway” along with that for “keep Left/Right” will be provided at the point from where the vehicle is expected to change the lane for the diversion. The sign for the “Diversion to the other carriageway” shall be provided between the “Carriageway Closure” sign and the median gap. The sign for “Sharp Diversion of Route” along with compulsory “Turn right/Left” shall be provided at the location where the gap in median opening starts and traffic is expected to get diverted to the other carriageway. The warning signs for “Two way traffic” along with the plate indicating the distance up to which the two ways traffic is allowed, shall be placed at the median which shall be to the left of the moving traffic. Cones or painted drums shall be placed for delineation, starting from the sign location for “Carriageway Closed”.

Carriageway repairs

Whenever the work of small magnitude is to be carried out in the middle of the carriageway, such as minor repairs of potholes, cracks and patches, then the traffic control measures shall mainly consist of providing cautionary signs of “Men at Work”, about 500m before the work zone for the approaching vehicle and other cautionary sign of “Road Narrows”, shall be placed at 100m ahead of work area. Regulatory sign of “Keep Left/Right” shall be placed at the commencement point of the work zone and next to the barriers for the approaching vehicles. Movable type of barriers shall also be placed on both sides of the work area. Cones or drums shall be placed at suitable interval to demarcate the work area. The “Work Zone Ends” sign shall be installed 120m beyond the work area. if the operation is to continue during night time, necessary lighting arrangements with flashing lights shall also be provided. A Typical arrangement is shown in **Figure 7-9**.

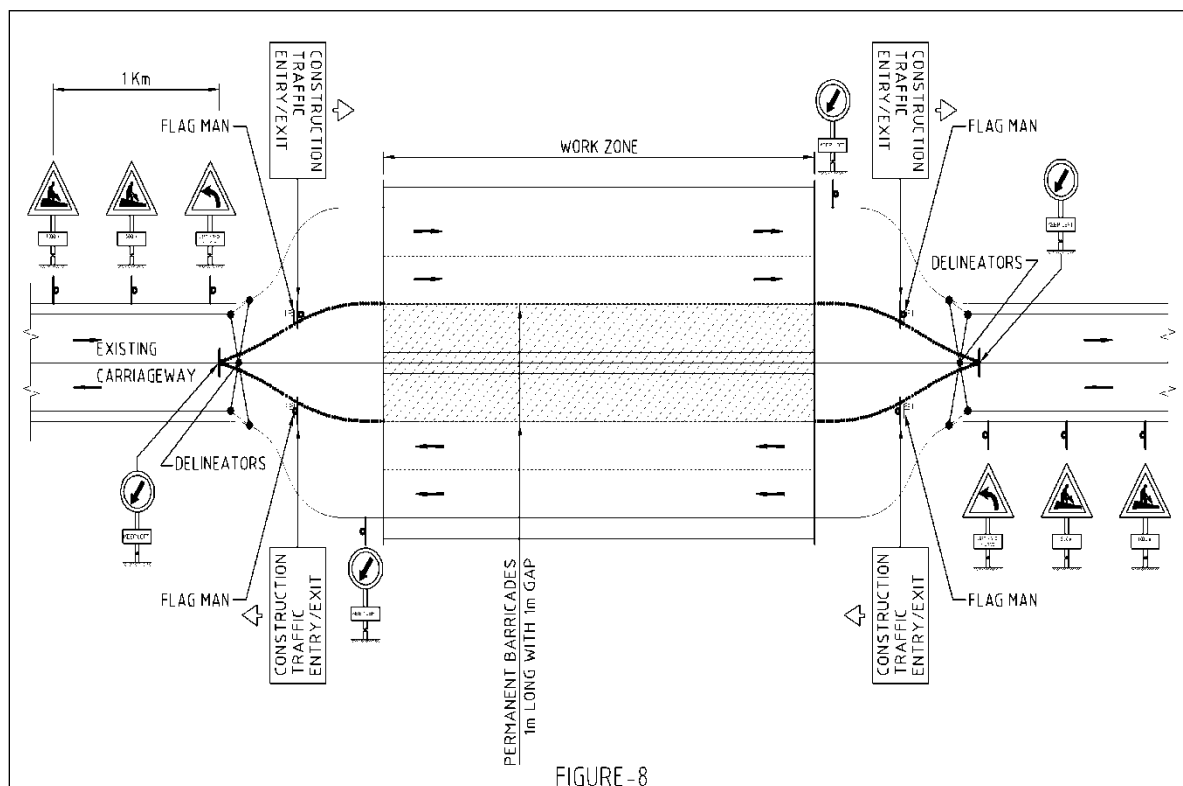


FIGURE -8

Figure 7-9: Flow chart diagram of Carriageway repairs**7.1.7 Safety measures during concession period**

During the concession period many activities are involved at different stages and at various periods in respect of construction operation and maintenance of the Project Highway. Safety of the road user and the project work man at site in Emergency arising on account of force secure due nature or administrative reasons especial safety masseurs used. Width of existing two lane carriageway is envisage to be used for passage of two way traffic. Traffic is to divide from its normal path the channel of traffic clearly marked with the aid of pavement marking at night the passage delineated with lamps or other light source regularity / warning sign approved by independent consultant in stalled for guidance or road users at list two sign put up one loose to the carriage way begins 120m ahead signs design reflecting type the safety standards specification schedule strictly complied with in the event of the any lane.

7.2 RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

7.2.1 General

Risk assessment forms an integral part of any plan of expansion of the road. Risk analysis consists of two parts viz. Risk identification and risk assessment. Risk identification can be as simple as asking “what if” questions at design review stage itself. Other method in use is preparing a checklist of the normal hazards associated with a particular situation or a piece of equipment. Risk assessment techniques are:

- ❖ Hazard and operability study (HZOP)
- ❖ Fault tree analysis (FTA)
- ❖ Safety studies
- ❖ Safety indices

Risk is associated with disaster and a disaster is the product of a hazard such as earthquake, flood or windstorm, coinciding with a vulnerable situation. There are four basic types of hazardous events, which put societies at risk:

- ❖ Those based in nature earthquakes, droughts, floods, avalanches etc.
- ❖ Those based in violence War, armed conflict, physical assault etc.
- ❖ Those based in deterioration declining health, education and other social services, environmental degradation etc.
- ❖ Those based in the failings of industrialized society
- ❖ Technical failures, effluent (chemical) discharge, factory explosions, fires, gas leakages, transport collisions.

7.2.2 Risk assessment

On the basis of the field studies and analysis, the following major risks or emergencies are identified associated with the proposed highway project:

Emergencies	Type of Risk	Project Execution Stage	Risk Level
Accidents	Human Related	Construction as well as Operation	Low
Fire	Human Related	Operation	High
Tsunami	Natural	Construction as well as Operation	Low
Cyclone	Natural	Construction as well as Operation	Low

7.2.3 Disaster management plan

All disasters, whether flood, earthquake, cyclone, Tsunami, drought or extensive fire, inevitably cause upheavals not only in the physical but also in the social and economic context where they occur. The study and analysis of factors that cause a disaster, the characteristics that shape its evolution, the effects on the population and the natural environment, the instruments that can mitigate their effects, and the various ways of reestablishing the optimal living conditions of the persons and communities involved have led to the creation of the new science of Disastrology, which studies disasters from all points of view and establishes guidelines for their management.

7.2.4 Elements of disaster management

Any disaster management plan outlines the function that need to be organized the section designated to perform them. It defines the Standard Operating Procedure (SOP) and consists of following four phases:

1. Mitigation – lessen the severity and impact of potential emergencies
2. Preparation – build organization capacity to manage effects of emergencies should one occur
3. Response – control the negative effects of emergency situations
4. Recovery – restore essential services and resume normal operation

Comprehensive mitigation measures are already built-in the design of the highway which can effectively negotiate and prevent or at least minimize the severity of the disaster should it happens.

7.2.5 Preparedness

The most important step in the preparation against the disaster is the formation/constitution of an Emergency Response Cell under District Collector's chairmanship. After this, district collector shall notify various institutions in setting up the Emergency Response Council (ERC). The notified institutions include all of the educational institutions, petrol stations, police stations and hospitals. This council will issue guidelines for the Emergency Response Plan (ERP) for the District. Graphically the functioning of ERC is provided in **Fig. 7-10**.

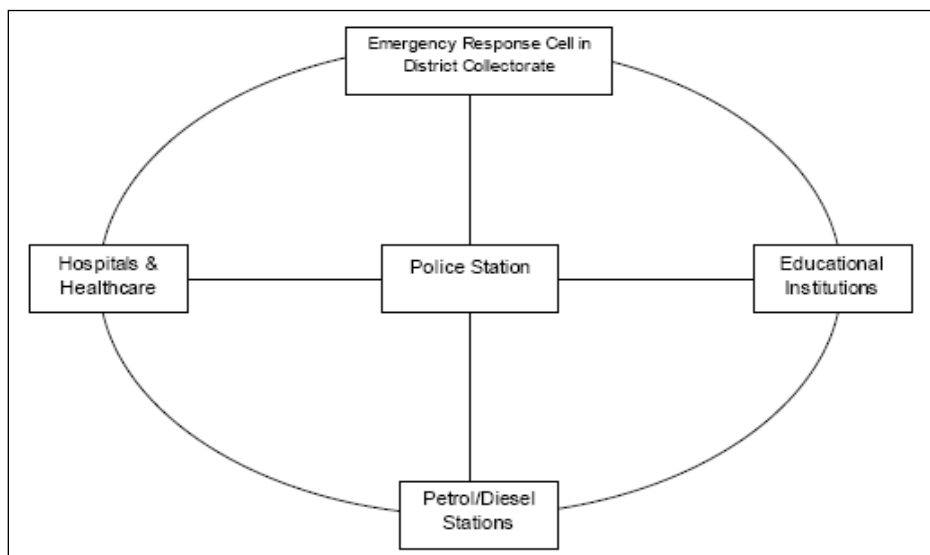


Figure 7-10: Functioning of ERC

Most of the time accident message flow will be both ways. Another way to reach the goal of “Full Preparedness” is training: training of the population at large and training of specialist deployed in ERC. The citizen has to be trained to know what to do and when and how to do it. The implementation of these plans must follow well defined programmes of teaching at school, starting from primary school level, through educational civil defense courses, periodic refreshers courses for physicians, nurses, volunteers, Red Cross, Red Crescent, fire brigade, police etc. as well as periodic exercise with simulated disasters, with the involvement of general population and the local rescue services. The list of available medical facilities with full knowledge of their infrastructure and name of doctors is to be with ERC which is to be updated at least once in three months. Evacuation and other mock drills are to be organized at least once an year to test the preparedness of the system. Besides above, the service roads, points and crossings are to be kept clear to have a free exit from and an access to the National Highway and never be blocked except for maintenance purpose. Every control room is to be equipped with an adequate First Aid System, including one or two stretchers. The communication system once installed is to be properly maintained so that it remains functional round the clock.

7.2.6 Recovery and Response

A rapid evaluation of the extent of a disaster is essential for calculating the size of the rescue forces that need to be involved (teams operating on the spot ,teams brought up to the operative area ,local first-aid units, regional/ interregional/ international units ,etc.) from health assistance to the injured. It amounts to the additional responsibility on ERC where technical inputs if need be ,will come from local project Implementation Unit (PIU).

7.2.7 Role of Doctors

It is the duty of doctors to provide medical treatment to road accident victims instantaneously and thereafter to leave resolution of other crisis needs to law enforcement agencies. There is no legal impediment to doctors in attending such cases immediately. Always remember that every second is precious after an accident has occurred for saving the victim. Large number of lives in accidents can be saved only if medical aid is provided immediately. This is also what the ethics of medical profession asks for.

As per section 134 of the motor vehicles act, it is duty of every registered medical practitioner or the doctor on duty in the hospital to immediately attend to the injured person and render medical aid or treatment without waiting for any procedural formalities.

7.2.8 Role of public

Highway users are to give passage of way to the vehicles on emergency duties, such as ambulances, fire brigade or police. They have the first right of passage. The public at large is expected to help in this regard and the policeman on duty is to ensure their immediate passage.

The successful resolution of any emergency situation largely depends on how fast the public react to a given emergency situation. As an example, the sequence after the accident is listed down below.

- ❖ Occurrence of an accident at any place on the highway
- ❖ Accident victims are taken to any of the notified places like a petrol or diesel station, police station, schools, any educational institution or local PWD office for first aid.
- ❖ Message reaches to petrol or diesel station or police station or schools or any

educational institutions or local PWD office

- ❖ Message is sent to District Collector from any or all the above places
- ❖ District collector receives a detailed report of the event with in not more than 6 hours by the fastest available communication by fax, phone, telegram or e-mail etc. from the nearest police station
- ❖ District Collector's office will evaluate the seriousness of the problem based on the report available. If details are not clear, further clarification will be sought from various notified places
- ❖ Then messages will be forwarded from the District Collector's office to all concerned if urgent necessary action is further required
- ❖ From the District Collector's office again the messages are sent to police station and PWD office to make sure that all relief operations are working smoothly and will be co- ordinate from District Collector's office. PWD office will in turn redirect the message to the local PWD office
- ❖ Depending upon the situation, serious cases will be referred to the hospitals

7.3 PUBLIC CONSULTATION

In keeping with the Govt. of India and MOEF guidelines, Public consultations have been conducted, as part of EIA study in all the major settlements. This chapter discusses on community consultations held with households/shop owner, government officials, stakeholders and incorporation of various measures pertaining to environmental issues based on the responses from the people.

7.3.1 Objectives of consultations

The process of public participation / consultations was taken up as an integral part of the project in accordance with EIA requirements. The objectives of these consultations are:

- To educate the general public, specially potentially impacted communities/ individuals and stakeholders about the proposed project activities;
- To familiarize the people with technical, environmental, social and economic issues of the project for better understanding;
- To solicit the opinion of the affected communities/ individuals on environmental issues and assess the significance of impacts due to the proposed development;

- To foster co-operation among officers, community and the stakeholders to achieve a cordial working relationship for smooth implementation of the project;
- To identify the environmental issues relating to widening and strengthening of the road.
- Assess the views of the beneficiary community and their willingness to participate in the project in a bottom up planning and decision making process;
- To secure people's inputs in respect of project design, selection of mitigation measures and monitoring strategies;
- To ensure lessening of public resistance to change by providing them a platform in the decision making process.

7.3.2 Methodology adopted for consultations

7.3.2.1 Identification of Stakeholders

Stakeholders were identified to ensure as wide coverage as possible of the project area as follows:

- Heads of households likely to be impacted;
- Household members;
- Clusters of APs;
- Villagers;
- Village panchayat;
- Major project stakeholders, such as women, tribal and ethnic communities, road-user groups, health professionals, and others.

As part of the consultation process, women were also given the opportunity to voice their views without the presence of men.

7.3.2.2 Stages and Levels of Consultation

Public consultations in the project area were held at village and Panchayat level. The main objectives of the consultation program were to minimize negative impact in the project corridors and to make people aware of the road rehabilitation project. The following methodologies were adopted for carrying out public consultations in this project:

- Disseminating information and requesting villagers to attend the public consulting meetings.
- Sharing the opinions and preferences of the APs.
- Involving the APs in decision-making including RP implementation.
- To understand views of the people affected with regard to the impacts of the road
- To identify and assess all major economic and sociological characteristics of the village to enable effective planning and implementation and,
- To resolve the issues relating to affect on community property.

Different techniques of consultation with stakeholders were used during project preparation, viz., in-depth interviews, public meetings, group discussions etc. To understand the socio-economic profile of the society, questionnaires were designed and information was collected from the individuals on one-to-one basis. The consultations have also been carried out with special emphasis on the vulnerable and women groups.

The various levels at which the consultations were held is shown in **Figure 7-11**:

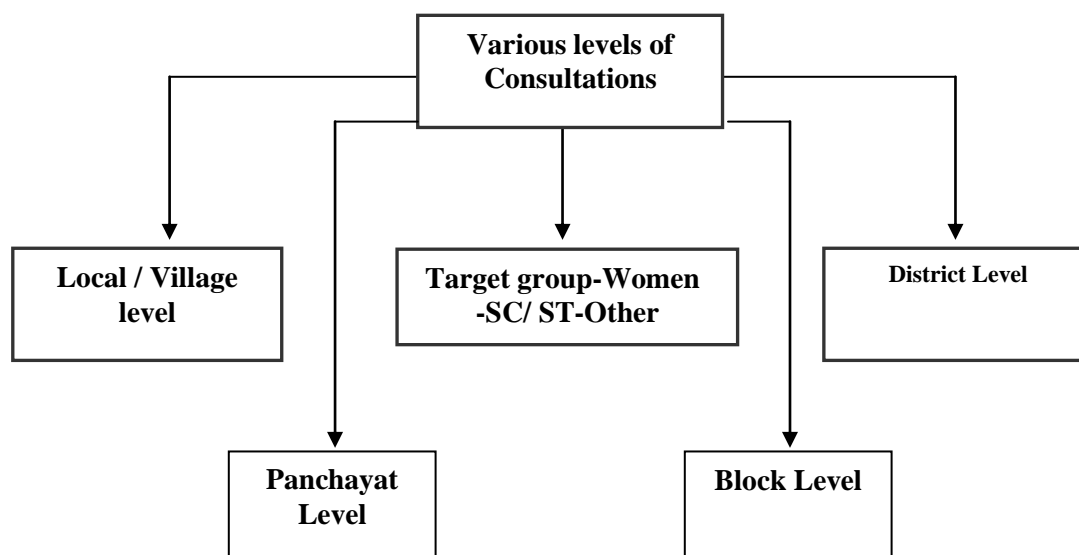


Figure 7-111: Various Level of Consultation

7.3.3 The Consultation Process Adopted in the Project Area

The public consultation in the project area was held at various levels; Local level, Block level, District level and State level. The consultation program during

project preparation was designed with the view to disseminate project information and to incorporate local peoples and PAPs opinion in mitigating negative impact on the population. These consultations also revealed that majority of the PAPs, were losing their structures and livelihood as well. The present chapter provides detail informations regarding the consultation process. The different techniques of consultation with stakeholders were used during project preparation, namely comprehensive interviews, public meetings and focus group discussion etc. The key informants during the project preparation phase included both individuals and group namely: -

- Head of the households, and member of households affected by the project
- Groups of PAPs, Village Panchayats.
- Local Voluntary Organization, CBOs / NGOs
- Government agencies and departments and
- Other projects stakeholders with special focus

During the public consultation core issues were discussed. The focus of the discussion was pondered on the fact that the project is directly related to the development of the people not simply on the widening of the existing road. Important benefits discussed while making public consultations are related to Minimization of land acquisition, sound resettlement and rehabilitation options, service road provision at important junctions/intersections, wayside amenities and public services, provision of bypasses/geometric improvement of existing road wherever required, parking sites, process of shifting, religious and public services, adequate compensation of affected properties, efforts towards restoration of affected livelihood, unbiased and fair treatments with all categories of society and safety measures.

7.3.4 Consultation during Project Preparation

Subsequently, keeping in mind the above objectives, stakeholder's participation and consultation with the people of different sections of society of the project area were made.

7.3.4.1 Consultation with Government Officials

In the process of disseminating important information, collecting relevant information and to acquaint the project formulators with social requirements of the project, the govt. officials, key informants & prominent person of the society and other stakeholders were consulted during social screening survey. At the time of public consultation the govt. officials welcomed the project and gave most relevant information regarding the project under implementation. the important and concerned government organizations like revenue department, statistical department, district rural development agency, social welfare department, welfare of SC/ST department and PWD office etc. These officials were consulted in order to resolve all the hurdles in the successful implementation of the project. Disputed issues relating to removal of unauthorized encroachments, shifting of religious properties where people's sentiments are involved and to remove all kind of barriers pertaining to social, political, historical, cultural and religious value were also discussed with the Govt. agencies.

7.3.5 Consultation and Participation of Potentially Affected Persons

In order to document the issues raised by the potential (Project Affected Persons) PAPs, public consultations at screening stage have been conducted at ten sensitive locations, with people of different categories and sections of society, principally with PAPs.

7.4 PUBLIC HEARING

Public hearing will be conducted as per the guidelines and procedure of in Environmental Impact Assessment Notification 2006 and revised 2009 under Environmental Protection Act' 1986.

7.5 R & R ACTION PLANS

R & R plan with data on the existing socio- economic status of the population in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony and rehabilitation of the displaced people, civil and housing amenities being offered, etc and the schedule of the implementation of the project specific R & R Plan (**Annexure 7A**).

Annexure 7A**RESETTLEMENT ACTION PLAN INCLUDING MAGNITUDE OF SOCIAL IMPACT****7.1 INTRODUCTION**

Social impact assessment (SIA) is a process of analyzing, predicting and evaluating the future inputs of development project on the well-being of people, and their businesses, institutions and communities. Its goal is to protect and enhance the quality of life by applying the mitigative measures.

Road projects are generally undertaken to improve the economic and social welfare of the society to whom it provides good connectivity. Augmented road capacity and improved pavements can reduce travel time and costs for both freight and passengers. Benefits include increased access to markets, Jobs, education and health services. For all the positive aspects of road projects, they may also bring significant negative impacts on nearby communities and the natural environment. People and properties may be in the direct path of road works and can be affected in a major way.

7.2 CENSUS AND SOCIAL –ECONOMIC SURVEY RESULTS

The project stretch of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan. Existing features of the project are shown in Table 7-1.

Table 7-1 Existing features of the project stretch

Sr. No.	Particulars	Existing	Proposed	
			Existing Alignment	Bypasses/Realignment
1.	Road Length	1. 43.028 km of NH-79 (Chittorgarh-Neemach Section) 2. 74.600 km of NH-113 (Nimbahera-Pratapgarh Section)	1. 25.679 km on NH-79 2. 51.945 km on NH-113	1. 18.385 km on NH-79 2. 20.970 km on NH-113
2.	Carriageway	1. NH-79 carriageway wide in 7.00 m	1. NH-79 is Four lane with paved	1. NH-79 is Four lane with paved shoulder (8.75 m

Sr. No.	Particulars	Existing	Proposed	
			Existing Alignment	Bypasses/Realignment
		2. NH-113 carriageway varies from 5.5 m -7.0 m	shoulder (8.75 m both side with 4.50 central median) 2. NH-113 is Two lane with hard shoulder (7.0 m wide)	both side with 4.50 central median) 2. NH-113 is Two lane with hard shoulder (7.0 m wide)
3.	ROW (m)	1. Varies from 15-45 m in NH 79 2. Varies from 08-45 m in NH 113	1. 60 m for NH-79 2. 45-60 for NH-113	60 m
4.	Realignment	Nil	1. 1.00 km on NH-79 2. 12.750 on NH-113	Nil
6.	Junctions	1. 33 Grade junctions in NH-79 2. 64 Grade Junction in NH-113	1. 19 on NH-79 2. 45 on NH-113	1. 14 on NH-79 2. 9 on NH-113
7.	Railway Over Bridge	1. NH-79 = 01 2. NH-113 = Nil	1. 01 on NH-79 2. Nil on NH-113	1. 02 on NH-79 2. Nil on NH-113
8.	Vehicular Underpass with Footpath	Nil	1. 04 on NH-79 2. Nil on NH-113	1. 02 on NH-79 2. Nil on NH-113
9.	Pedestrian	Nil	1. 01 on NH-79 2. Nil on NH-113	Nil
10.	Cattle Underpass	Nil	1. 01 on NH-79 2. Nil on NH-113	Nil
11.	Service Road on both Sides	Nil	1. 11.704 km in NH-79 2. 0.00 km in NH-113	1. 7.73 km in NH-79 2. 2.040 km in NH-113
12.	Bus bays	Nil	1. 05 Nos. on NH-79 2. 14 nos. on	1. 02 on NH-79 2. 02 on NH-113

Sr. No.	Particulars	Existing	Proposed	
			Existing Alignment	Bypasses/Realignment
			NH-113.	
13.	Truck Lay bay	Nil	➤ 1 Nos. on NH-79 ➤ 00 Nos. on NH-113.	➤ 1 Nos. on NH-79 ➤ 00 Nos. on NH-113.
14.	Rest Area	Nil	1. 01 on NH-79 2. Nil on NH-113	1. 01 on NH-79 2. Nil on NH-113
15.	TOLL PLAZA	Nil	1. 01 on Nh-79 2. 02 on NH-113	1. 01 on Nh-79 2. Nil on NH-113
16.	Major Bridges	NH-79 = 01 NH-113 = 01	1. Nil on Nh-79 2. 01 on Nh-113	1. 01 on NH-79 2. Nil on NH-113
17.	Minor Bridges	NH-79 = 04 NH-113 = 22	1. 03 on NH-79 2. 22 on NH-113	1. 02 on NH-79 2. 02 on NH-113
18.	Fly Over	Nil	1. 01 on NH-79 2. Nil on NH-113	1. 01 on NH-79 2. 01 on NH-113
19.	Culverts	NH-79 = 83 NH-113 = 64	1. 27 on NH-79 2. 75 on NH-113	1. 51 on NH-79 2. 04 on NH-113

The Social survey for the project road NH-113 and 79 has been conducted to establish Existing magnitude baseline, condition, the magnitude of impact due to widening and strengthening of the existing road and to ensure that social considerations have been given adequate weight-age in the selection and design of proposed highway improvements. Basic idea is to minimize adverse social impacts with best possible engineering solutions at the optimal cost.

The social Assessment process generally begins with screening at the time of project identification where steps are taken from the beginning and plans\ designs\ alignments are finalized in such a way that to the extent possible adverse impacts are avoided at the designing stage itself and make these roads people friendly:

These steps are:

- Predicts the nature and size of potential negative and positive effects on individuals, Businesses and communities;

- Develops and implements appropriate impact management measures to avoid or Decrease potential negative socio-economic impacts and enhance positive impacts;
- Identifies net social and economic impacts occurring after mitigation measures are Applied, including roadway routing, design and operating conditions; and,
- Helps resolve public issues by working with the community to address the potential Impacts

The overall objective of conducting social screening is to provide input of social concerns to be dovetailed in highway design and for complete co-ordination between the engineering, environmental and social teams during the entire design process.

Methodology:

Social impact assessment need clear definition of the Corridor of impact (COI) and the Right of way (ROW) for establishing the extent of social impact. To achieve the target which needs comprehensive data involves the following methodology:

- Establishing the width that may include carriageway, shoulder, safety zone, borrowed areas, etc. Determining the COI at the initial stage is important for undertaking social assessment surveys within the defined area
- 100% census, and 25% socio-economic survey
- Collection of data from different agencies and sources which is already existing and documented by them.

Thus, both primary and secondary data are required for establishing the extent of impact, which need to be collected by administering the questionnaire for collecting information on structures, properties, land and type of ownership and social groups etc. with the help of enumerators\investigators and by collecting secondary data from different govt. and non govt. sources. However, here the data has been collected on the basis of 100% social survey and Informal public consultation even when the present study is restricted to only feasibility stage. The Right of Way of the project highway in general varies from 24 m to 30 m based on reconnaissance survey. The socio-economic profile for the project influence area i.e. Two districts Hanumangarh and Sriganganagar has been discussed in chapter 2 of this report. The abutting land along the project corridor is predominately agricultural interspersed with residential areas.

The census/SES of the project roads collected a wide range of data, for example, Demography, age/sex distribution, education, Occupation, income/poverty data, types of small Business Enterprises (SBEs), types and ownership status of affected structures and other assets.

SOCIAL IMPACT OF THE PROJECT

The existing road is a part of NH-79 (Section-1) from Chhitorgarh to Nimbahera having two lane undivided carriageway with average width of C/w varies from 7.0m and NH-113 (Section-113) from Nimbahera to Pratapgarh having intermediate lane with average width of C/w varies from 5.5m.

The present project NH-79 (Section-1) starts from km 183+000 and ends at km 221+400, whereas NH-113 (Section-2) starts from km 0+000 and ends at km 80+000. The improvement works in Section-1 (NH-79) include widening of existing carriageway to 4 lanes divided carriageway, improvement of shoulders with side drains and rehabilitation and reconstruction of bridges and cross drainage structures and in Section-2 (NH-113) include widening of existing carriageway to 2 lanes carriageway, improvement of shoulders with side drains and rehabilitation and reconstruction of bridges and cross drainage structures. The road more or less follows the existing alignment and profile except Sambhupura, Bari and Chhoti Sadari towns where bypass has been proposed.

The existing Project Highway passes through very congested area of Sambhupura, Bari and Chhoti Sadari. There is a need for bypass to avoid these (city) areas.

There was limited social impacts issue and concerns may happen (based on the site appreciation and reconnaissance survey findings) because the existing Right of Way in the both the sections of project road are insufficient.

IMPACT ON STRUCTURES/ PROPERTIES

The Social Impact Assessment at an early stage of screening aims to identify congested areas, potential impacts on the community and settlement to provide the basic information to the Engineering Design team to integrate it with technical design. The

thrust of this integration is to minimize the adverse impacts, if any, with the best possible engineering solutions at the most appropriate cost.

The alignment of section – 1(NH-79) being passes through the 21 no's of City/villages/towns including Chittorgarh, Senth, Ochari, Jalampura, Arniya Panth, Shambhupura, Samri, mahmudganj, Satkhanda,rawliya, Bhopali, Bhawaliya, mangrol, Murilya, Fachar Ahiran, Lakshmipura, Ahirpura, Jaliya, Charliya Brahman, bagreda and Nimbahera.

The alignment of Section-2 (NH-113) being passes through the 36 no's of City/villages/towns like: - Nimbahera, Maddo, Sanpaliya, Aminpura, Sagwadai, Narsingh, Badi, Narsa khedi, Baseda, Semarthali, Karunda, Semarda, Chhoti Sadri, Gomana, Dhamniya, Jakhmiya, Barkheda, Ambawali, Kit Kheda, Baroj, Siya Khedi, Sewara, Talayan, kheda Narsingh Mata, Bawadi Kheda, Bhagwanpura, Mahudikheda, Dhamotar,Kulmioura, Tanda, Ambamata, Sidhpura, Gopalpura, Bamotar, and Bagwas.

Properties Likely to be affected

There are 111 properties will be affected in section-1 from Chhitorgarh to Nimbahera part of NH-79 and 44 properties likely to affected in section-2 from Nimbahera to Pratapgarh part of NH-113 along the project route proposed for the widening. There are considerably more properties on the left hand side of the road (80) then on the right hand side (75). Table gives a glimpse of likely to affected properties in left & right side.

Table : Legal Status of the ownership

Section-1 (NH-79)

S.No.	Status	Left	Right	Total
1.	Legal Title/ Encroacher/Squatters	62	49	111

Section-2 (NH-113)

S.No.	Status	Left	Right	Total
1.	Legal Title/ Encroacher/Squatters	18	26	44

Ownership of the Properties Likely to be affected

The project influence area of the road dominates with Residential, followed by Shops, Boundary/Retaining Wall of residential cum Commercial structures. Religious properties make only 03 Number in section-1 and 02 numbers in section-2 and 01 Government properties in section-2 are likely to be affected area. The details statuses of the properties which are likely to be affected in both the sections are given in tables as below.

Table: Status of Properties Affected

Section-1 (NH79)

Sl. No.	TYPES OF PROPERTIES					Area(m ²)
	Property Types	Properties	Left	Right	Total	
1	Private	House	2	1	3	94.34
		Shops	4	2	6	1250.09
		Building (Resi cum Commercial)	33	32	65	10255.11
		Boundary/Compound wall	13	5	18	2230.78
		Water Tank	2	0	2	10.83
		Well/Tube Well	3	4	7	0
		Hotel/Dhaba	1	1	2	360.06
		Private Office	1	0	1	196.43
		Petrol Pump	1	1	2	291.77
	Total		60	46	106	14689.41
2	Community	Hand Pump	2	3	5	0
	Total		2	3	5	0
3	Religious	Mosque	2	0	2	67.87
		Temple	1	0	1	10.84
	Total		3	0	3	78.71
Grand Total			65	49	114	14768.12

Table: Status of Properties Affected

Section-2 (NH-113)

Sl. No.	TYPES OF PROPERTIES					Area(m ²)
	Property Types	Properties	Left	Right	Total	
1	Private	House	2	1	3	59.86
		Shops	0	1	1	177.19
		Boundary wall	9	8	17	389.82
		Water Tank	2	10	12	42.61
		Well	5	3	8	150.58
	Total		18	23	41	820.06
2	Community	Hand Pump	0	3	3	
	Total		0	3	3	

3	Religious	Mosque	1	0	1	1.15
		Temple	-	1	1	5.04
	Total		1	1	2	6.19
4	Government	Police Station	1	0	1	100.84
		Total	1	0	1	100.84
Grand Total			20	27	47	927.09

SOCIAL PROFILE OF THE PAPs ALONG THE PROJECT ROAD

It is mentioned earlier that the purpose of our screening survey was to create a broad database of the affected properties as well as the project-affected persons (PAPs) in order to understand the social profile of the project-affected area. It will help in appraise the positive as well as negative change in the life style of the communities in the project influence area due to implementation of the project as an external intervention. Based on the social profile data, collected through the initial social survey, an initial impact analysis has been outlined in the preceding paragraphs.

Total Number of PAPs along the Project Road.

There are 721 potentially affected people in section-1 of NH-79 and 308 affected peoples in section-2 of NH-113 (except land loss affected population) along the proposed road project due to loss of structures only. The detail of number of PAPs enumerated has been mentioned in Table .

Table : Number of PAPs along the Project Road

Section-1 (NH-79)

Sl. No.	Particulars	Total
1	Male	375
2	Female	346
	Total	721

Section-2 (NH-113)

Sl. No.	Particulars	Total
1	Male	163
2	Female	145
	Total	308

Social Category of PAHs along the Project Road

The project road comprises of multi-ethnic population in its vicinity and ethnic tribal population in the remote areas. The project influence area is dominated by OBC and General Cast in section-1 and ST and SC are in section-2. The study reveals that the social category classified as the General Class is the dominating group in the surveyed population sample. The detail has been given in Table.

**Table : Social Categories of PAHs along the Project Road
Section-1 (NH-79)**

Sl. No.	Social Category	Left Side	Right Side	Total
1	SC	09	07	16
2	ST	08	05	13
3	OBC	22	16	38
4	General	23	21	44
Total		62	49	111

Section-2 (NH-113)

Sl. No.	Social Category	Left Side	Right Side	Total
1	SC	04	02	06
2	ST	09	11	20
3	OBC	02	07	09
4	General	03	06	09
Total		18	26	44

Income Level of the Project Affected Households

The information on annual income has been stated by 617 respondents. The largest group (26%) of households in the surveyed area has their annual income between Rs 50,000 to Rs 75,000. They are followed by 24% of those with an income ranging from Rs 75,000 to Rs 100, 000 yearly and 22% of households earning between Rs 24,000 and Rs 50, 000. An income between Rs100, 000 and Rs 150,000 a year has been reported by 11% of the respondents, while 8% reported a yearly income over Rs150, 000. The

group of respondents living on less than Rs 24,000 a year, which is also the BPL level, comprises 8% of all respondents.

Table : Income Level of the Project Affected Households

S. No.	Annual Income (Rs)	Percentage %
1	<=24000	7.75
2	>24000 and <=50000	22.45
3	>50000 and <=75000	26.45
4	>75000 and <=100000	24.32
5	>100000 and <=150000	10.75
6	>150000	8.25
	Total	99.97

Vulnerable Groups along the Project Road

It is prime aim of the social Impact Assessment to identify the vulnerable population in order to address their cause properly and adequately. An assessment was made through the survey data to bring out the vulnerable PAPs (The vulnerable category includes, SC, ST, below poverty line (BPL) families, Women headed households and households headed by physically handicapped persons. The number of households living below the poverty line is considerably significant in few numbers. PAHs are living below poverty line irrespective of their caste and creed small.

Human Development Index (HDI)

The Human Development Index (HDI) is a comparative measure of life expectancy, literacy, education and standards of living for countries worldwide. It is a standard means of measuring well-being, especially child welfare. It is used to distinguish whether the country is a developed, a developing or an under-developed country, and also to measure the impact of economic policies on quality of life. Human Development Index as included in a United Nations Development Program's Human Development Report released on October 5, 2009, compiled on the basis of data from 2007. Countries fall into four broad categories based on their HDI: very high (added in the report for 2007), high (split in the same report), medium and low human development. Starting in the report for 2007, the first category is referred to as developed countries, and the last three are all grouped in developing countries. Some older groupings (high/medium/low income countries) have been removed that were based on the gross national income (GNI) in

purchasing power parity (PPP) per capita, and have been replaced by another index based on the gross domestic product (GDP) in purchasing power parity per capita. Table showing HDI in 2007 in project district and Rajasthan state.

Table: Human Development Index

Human Development Index-2007: Districts and the State of Rajasthan				
District Name	Education Index [Ner+Lit(+15)]	Health Index	Income Index	Human Development Index
Chhitorgarh	0.705	0.383	0.585	0.558
Pratapgarh	-	-	-	-
Rajasthan	0.755	0.735	0.640	0.710
Coefficient of variance	7.9	27.8	31.5	15.5

Loss of Land

The project will involve the acquisition of land. The land to be acquired is for widening, realign as well as for the proposed bypasses at Shambhupura (Section-1) and at Bari & Chhoti Sadri in (Section-2). The proposed Right of Way (ROW) as per initial design of the widening proposal is 60 meters in Section-1 of NH-79 and 45m in Section-2 of NH-113 which is more than the existing ROW.

Total 342.42 ha of land required for proposed project (135.50 ha land on NH 79 and 206.92 ha land on NH 113).

7.3 AWARENESS HIV/AIDS AND CHILD LABOUR

In India alone, road traffic fatalities are expected to increase from 135,000 in 2000 to 330,000 in 2020. However, human and economic damage caused by road crashes is largely preventable if there is sound approach in road design and engineering including hard and fast enforcement of traffic rules.

Moreover, in order to know about these fatal highway diseases along the project area Social Expert has made individual interviews, personal contacts, and discussion with Restaurant owners, truckers and their helpers and assistant, pedestrians, local community people etc.

During social screening survey the discussion was made with concerned population with the focused and targeted intention to create mass awareness about the HIV /AIDS by R & R Expert. Several group discussions and meetings were organized with various

inhabitants living along the project road at different location with the objectives for prevention of AIDS and STDs transmission.

The meeting and consultation with various stakeholders didn't authenticate any case of HIV/AIDS in the project influence area. It was also confirmed by the local health officer that no case of HIV/AIDS and other STDs came to the notice in any health centre located in and around the project road.

7.3.1 Child Labour

The practice of child labor has been illegal in India since 1933, when the Children (Pledging of Labour) Act was enacted under British rule. Since independence, a plethora of additional protective legislation has been put in place. There are distinct laws governing child labour in factories, in commercial establishments, on plantations, and in apprenticeships. Recent law-the Child Labour (Prohibition and Regulation) Act of 1986-designates a child as "a person who has not completed their fourteenth year of age. It purports to regulate the hours and conditions of some child workers and to prohibit the use of child labour in certain enumerated hazardous industries. The Social Expert during public consultation came across many children, who are working as child labor and advised them and their parents to accept the free education which the government provides for their own betterment. It is mandate that No child labor will be employed during construction phase.

7.4 MEASURES TO MINIMISE DISPLACEMENT

National policy recognizes that displacement results in "state-induced impoverishment". It also recognizes that "no developmental project can be justified if a section of society is pauperized by it." Displacement from one's habitual residence and the loss of property without fair compensation can, in itself constitute a violation of human rights. In addition to violating economic and social rights, arbitrary displacement can also lead to violations of civil and political rights, including arbitrary arrest, degrading treatment or punishment, temporary or permanent disenfranchisement and the loss of one's political voice. Finally, displacement carries not only the risk of human rights violations at the hands of state authorities and security forces but also the risk of communal violence when new settlers move in amongst existing populations (Robinson, 2003).

7.4.1 Public Consultation

To ensure peoples' participation in the planning phase of this project and to treat public consultation and participation as a continuous two way process, The Census/Survey Team carried out preliminary consultation, through Focus Group Discussions (FGDs) and meetings with the APs as well as the general public in the project area through individual interviews. The main objective of the public consultation are the promotion of public understanding and fruitful solutions of developmental problems, primarily in settlements with problems of traffic congestion, dense informal /squatter settlement, close junctions, road intersections, and concentration of APs. During the survey, intensive discussion and consultation meetings were conducted with large number of APs in nearly every affected village wherein policy related issues; displacements and other related issues were discussed.

7.4.2 Alternative Options Considered Minimizing Resettlement Impacts:

While finalizing the road alignment efforts have been made by adopting appropriate engineering designs, to minimize resettlement impacts. To minimize displacement and to reduce disruption of livelihoods, concentric widening in village sections, bypasses to avoid settlement and raised carriageways have been proposed. Public consultations and field visits helped in getting better planning and designing inputs towards minimizing negative social impacts.

7.5 RESETTLEMENT POLICY

7.5.1 The National Resettlement and Rehabilitation Policy, 2007

The National Rehabilitation and Resettlement Policy, 2007 (NRRP, 2007) was adopted by the Government of India on 31 October 2007 to address development-induced resettlement issues. The NRRP stipulates the minimum facilities to be ensured for persons displaced due to the acquisition of land for public purposes and to provide for the basic minimum requirements. All projects leading to involuntary displacement of people must address the rehabilitation and resettlement issues comprehensively. The State Governments, Public Sector Undertakings or agencies, and other requiring bodies shall be at liberty to put in place greater benefit levels than those prescribed in the NRRP. The principles of this policy may also apply to the rehabilitation and resettlement of persons

involuntarily displaced permanently due to any other reason. The objectives of the Policy are:

- (i) To minimize displacement and to promote, as far as possible, non-displacing or Least-displacing alternatives;
- (ii) To ensure adequate rehabilitation package and expeditious implementation of the rehabilitation process with the active participation of the affected families;
- (iii) To ensure that special care is taken for protecting the rights of the weaker sections of society, especially members of the Scheduled Castes and Scheduled Tribes, and to create obligations on the State for their treatment with concern and sensitivity;
- (iv) To provide a better standard of living, making concerted efforts for providing sustainable income to the affected families;
- (v) To integrate rehabilitation into development planning and implementation process; and
- (vi) Where displacement is on account of land acquisition, to facilitate harmonious relationship between the requiring body and affected families through mutual cooperation.

The NRRP is applicable for projects where over 400 families in the plains or 200 families in hilly or tribal or Desert Development Program areas are displaced. However, the basic principles can be applied to resettling and rehabilitating regardless of the number affected. However, the provisions under the NRRP can also be followed for other projects as a standard and best practice. Therefore, the relevant provisions of NRRP are applicable to this project. NRRP's provisions are intended to mitigate adverse impacts on Project Affected Families. The NRRP comprehensively deals with all the issues and provides wide range of eligibility to the affected persons and meets most of the requirement of ADB's Policy on Involuntary Resettlement (1995). The non title holders, under NRRP, are recognized as people living in the affected area not less than three years after the declaration of the area as affected. The NRRP addresses vulnerable families with adequate entitlements and provides special provisions for Scheduled Castes and Scheduled Tribes Families. The NRRP takes into account transparency as far as consultation, dissemination of information, disclosure and grievance is concerned.

However, the law relating to the acquisition of privately owned immovable property remains the LAA.

7.5.2 NH-ACT

The NH ACT and Rajasthan Act are described below:

NH- ACT

In India, compensation for land acquisition and resettlement assistance for project-affected people are governed by the Land Acquisition Act (1894), which has been amended from time to time. However, for the purpose of maintenance, sustenance and management of National Highways, a special act, The National Highways Act (NH Act), 1956 has been promulgated. Land acquisition in this project will be carried out under the NH Act, 1956. This Act provides for acquiring the land through "competent authority" which means any person or authority authorized by the Central Govt. by notification in the official Gazette to perform functions of the competent authority for such areas as may be specified in the notifications. For LA, the Act defines the various procedures as follows: (i) section 3A – intention of Central Govt. to acquire land, (ii) 3B - power to enter for survey, (iii) 3C - hearing of objections (iv) 3D - declaration of acquisition, (v) 3E - power to take possession, (vi) 3F - power to enter into the land where land has vested in the central government, (vii) 3G - determination of compensation and (viii) 3F - deposit and payment of the amount. The act requires that the processes must be completed within a year from 3A to 3D. Although NH act significantly reduces the timeframe for acquisition, the rules and principles of compensation have been derived from the LA Act of 1894. The Act covers only legal titleholders and provides for (i) market value of the land; (ii) additional amount for trees, crops, houses or other immovable properties; (iii) damage due to severing of land, residence, place of business.

Limitation of NH- ACT:

- NH ACT does not include any non-titleholder with respect to entitlement matrix.
- It provides compensation for the acquired properties & structures only
- It does not specify loss of income due to the acquisition of commercial establishment & agricultural land.
- It does not provide Economic Rehabilitation Grant to any vulnerable category.

7.5.3 Rajasthan R&R Policy

Rehabilitation Policy

The rehabilitation policy had four sections: rural rehabilitation package; urban rehabilitation package; employment and income generating schemes; and Redressal of grievances. The additional measures and benefits agreed after December 1998 for rural area was:

- “Minimum amount of cash in lieu of land allotment, equivalent to cost of 2 acres of allotted land, has been increased from Rs. 2 Lakh to Rs. 5 Lakh.
- House Construction Assistance to fully affected rural house owners, who’s Land/houses have been acquired, to be given @ Rs. 1 Lakh each.
- Cash Grants admissible for shifting and purchase of seeds and fertilizers” was also increased from the previous grants mentioned in the policy of 1995.
- Eligibility criteria for land allotment: GOUP orders of 1976/78 to stand modified so as to make eligible for land allotment, those land owners in rural area who sold their part land after 1978, but before issue of sector 4(1) notification under LA Act or 02.05.2001 whichever is earlier.
- Rural shopkeepers to be paid cash compensation @ Rs. 60,000/- each to those having shops on National/other Highways and large market areas, and @ Rs. 40,000/- each to shopkeepers on other roads in submergence areas.

This policy may act as a guideline for this linear road project as it covered several important aspects of R&R of Project Affected Persons and the policy was revised to address the requirements of the PAPs. Critical factors such as the standard of living, the worse off factor related to the material well-being of PAPs, compensation packages, employment and livelihood opportunities, civic facilities and multiple income-generation programs were addressed by this policy that may serve as a benchmark to develop the R&R Policy Framework of the PMGSY project.

However, a project-specific resettlement framework has been prepared consistent with the existing norms and guidelines of the State Government and NRRP 2007 & NH Act, on Involuntary Resettlement to cover losses and categories identified in this project. This framework reflects the borrowers land acquisition laws/ regulations, State Policy on resettlement and NRRP 2007 policy & NH Act on Involuntary Resettlement and other social

safeguard guidelines. It stipulates eligibility and provisions for all types of losses (land, crops/ trees, structures, business/ employment and workdays/ wages). Since land-for-land may not be a feasible option, the APs will be compensated at full replacement costs. Affected families to be compensated by the Competent Authority, following the NH Act, 1956, for lost assets will also receive additional assistance such as shifting allowance, compensation for loss of workdays/ income due to dislocation.

7.6 RECOMMENDED SOCIAL MANAGEMENT FRAMEWORKS

The policy framework for entitlement of the project affected families is based on the laws and practices of the Governments of India and Uttar Pradesh and the NHAI requirements. The resettlement entitlement matrix recognizes different types of losses associated with dislocation and resettlement.

Entitlement Matrix

The cut-off date for entitlement is the date (i) on which notification is issued U/s 4 of LA Act modified in 1984 for the titleholders, and (ii) the date on which census and socioeconomic surveys of PAPs begin for the non-titleholders. The eligibility of different categories of PAFs will be as per the Entitlement Matrix, as presented below. The titleholder PAFs would be eligible for compensation as well as assistance. The non- Titleholders PAFs will not be eligible for compensation of the land occupied by them. However, they will receive compensation for the investment made by them on the land such as structures, wells, etc. in addition to their assistance. As per the current practices compensation is provided as per government rates, determined by a legally constituted committee (District Land Price Fixation Committee). The PAFs will be allowed to salvage whatever material is useful to them from the structures after demolition to rebuild their structures. The following mitigating measures are being proposed in keeping with the R&R Policy framework prepared for this project by the Consultants.

Involuntary resettlement should be avoided, where feasible, or minimized, exploring all viable alternative project designs. Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable persons displaced by the project to share in project benefits. People unavoidably displaced should be compensated and assisted as per

the resettlement plan/ framework prepared for the project, so that their economic and social future would be generally as favorable as it would have been in the absence of the project.

- Gender equality and equity would be ensured and adhered to;
- APs shall be fully involved in the selection of relocation sites, livelihood compensation and development options at the earliest opportunity. RPs should also be prepared in full consultation with AP, including disclosure of RP and project related information;
- Replacement land shall be an option for compensation in the case of loss of land; in the absence of replacement land, cash-for-land compensation on replacement value option will be made available the APs;
- Compensation for loss of land, structures, other assets and income will be based on full replacement cost and will be paid before physical displacement of AP. This shall include transaction costs;
- All compensation payments and related activities will be completed prior to the commencement of civil works;
- RP will be planned and implemented with full participation of local authorities;
- In the event of necessary relocation, APs shall be assisted to integrate into host communities;
- Common property resources and community/public services will be provided to the APs;
- Resettlement will be planned as a development activity for the APs;

All Title holders are entitled to receive compensation/assistance. People moving in the project area after the cut-off date will not be entitled to any assistance. In case of land acquisition the date of notification for acquisition will be treated as cut-off date. For non-titleholders such as squatters and encroachers the date of census survey or a similar designated date declared by the executing agency will be considered as cut-off date; and

- 1) Replacement cost means the method of valuing assets to replace the loss at market value, or its nearest equivalent, plus any transaction costs such as administrative charges, taxes, registration, and titling costs.
- 2) While compensation is required prior to dispossession or displacement of affected people from their assets, the full resettlement plan implementation, which may

require income rehabilitation measures, might be completed only over a longer period of time after civil works have begun. Affected people will be provided with certain resettlement entitlements, such as land and asset compensation and transfer allowances, prior to their displacement, dispossession, or restricted access.

- Vulnerable groups (households below the recognized poverty line; disabled, elderly persons or female headed households) will be identified and given appropriate assistance to substantially restore their pre project status or improve their living standards.

Table 7-2: Detailed Entitlement Matrixes

S.No	Category	Type of Loss	Unit of Entitlement	Entitlement	Details
1A	Private Property	Agricultural land and assets	Titleholder	Compensation at “replacement cost” or “actual market value”	2. If the residual plot(s) is (are) not viable, i.e., less than average land holding of the district, the following options will be given to the EP. 1. If the replacement cost (determined as per para 5.7.1 of the policy framework) is more than the compensation, as determined by the Competent Authority, then the difference is to be paid by the project in the form of “assistance”. • The EP keeps the remaining land, and the compensation and assistance is paid to the EP for the land to be acquired. • Compensation and “assistance” are given for the entire plot including residual plot, if the owner of such land wishes that the project authority should also acquire his residual plot. The project authority will acquire the residual plot so paid. • If EP is from vulnerable group, compensation for the entire land is by means of land for land if so wished by EP provided that the land of equal or more productive value is available. 3. Transitional allowance of Rs.2000 per month for 9 months if the residual land is not viable (less than average district holding or land acquired is 75% or more of

S.No	Category	Type of Loss	Unit of Entitlement	Entitlement	Details
					the total land holding of the titleholder) or for 3 months if the residual land is viable 4. In case of severance of agricultural land, an additional grant of 10% of the amount paid for land acquisition. 5. All fees, taxes and other charges, as applicable under the relevant laws, incurred in the relocation and resource establishment, are to be borne by the project. 6. If the EP becomes landless or falls below the Poverty line, then: • Training would be provided for up-gradation of skills @ Rs. 1500/= per family • Such EPs would be provided one-time Economic Rehabilitation Grant @ Rs. 3000/= per family, in the form of productive assets
1B	Private Property	Nonagricultural land and assets	Titleholder / owner: Residential	Compensation at “replacement cost”	1. EP will be provided replacement cost of the residential structure (part or full), which will be calculated as per the prevailing basic schedule of rates without depreciation, subject to relevant “quality standards” of BSR as maintained by Government/Local Bodies Authorities. 2. Compensation for the loss of residential land will be paid at replacement value 3. If replacement cost is more than the compensation (as determined by the Competent

S.No	Category	Type of Loss	Unit of Entitlement	Entitlement	Details
					Authority), then the difference is to be paid by the project in the form of “assistance”. 4. Transitional assistance of Rs.2000 per month in the form of grant to cover a maximum nine months rental accommodation. 5. A lump sum shifting allowance of Rs.700 for temporary, Rs.1200 for semi-permanent and Rs.2200 for permanent structures. 6. Absentee landlords will receive only the compensation at “replacement cost”. 7. Right to salvage materials from the demolished structure.
			Titleholder / owner: Commercial		1. EP will be provided replacement cost of the commercial structure (part or full), which will be calculated as per the prevailing basic schedule of rates without depreciation, subject to relevant “quality standards” of BSR as maintained by Government/Local Bodies Authorities. 2. Compensation for the loss of commercial land will be paid at replacement value 3. If replacement cost is more than the compensation (as determined by the Competent Authority), then the difference is to be paid by the project in the form of “assistance”.

S.No	Category	Type of Loss	Unit of Entitlement	Entitlement	Details
					4. Transitional assistance of Rs.2000 per month in the form of grant to cover a maximum nine months rental accommodation. 5. A lump sum shifting allowance of Rs.700 for temporary, Rs.1200 for semi-permanent and Rs.2200 for permanent structures. 6. Absentee landlords will receive only the compensation at “replacement cost”. 7. Right to salvage materials from the demolished structure. 8. Training would be provided for up gradation of skills @ Rs. 1500/= per family 9. Vulnerable EPs would be provided one-time Economic Rehabilitation Grant @ Rs. 3000/= per family, in the form of productive assets
			Tenant: Residential		1. The amount of deposit or advance payment paid by the tenant to the landlord or the remaining amount at the time of expropriation. (This will be deducted from the payment to the landlord). 2. A sum equal to nine months rental @ Rs. 2000/= per month in consideration of disruption caused. 3. Compensation for any structure the tenant has erected on the property. (This will be deducted from the payment to the landlord). 4. Shifting allowance of Rs.800 lump sum for shifting.

S.No	Category	Type of Loss	Unit of Entitlement	Entitlement	Details
			Tenant: Commercial		1. The amount of deposit or advance payment paid by the tenant to the landlord or the remaining amount at the time of expropriation. (This will be deducted from the payment to the landlord). 2. A sum equal to nine months rental @ Rs. 2000/= per month in consideration of disruption caused. 3. Compensation for any structure the tenant has erected on the property. (This will be deducted from the payment to the landlord). 4. Shifting allowance of Rs.800 lump sum for shifting. 5. Training would be provided for up gradation of skills @ Rs. 1500/= per family 6. Vulnerable EPs would be provided one-time Economic Rehabilitation Grant @ Rs. 3000/= per family, in the form of productive assets
2	Others				
2A	Livelihood	Wage earners	Individual	Lump sum	They will be paid a flat sum of Rs. 2000.00 as transitional assistance. Training would be provided for up gradation of skills @ Rs. 1500/= Vulnerable EPs would be provided one-time Economic Rehabilitation Grant @ Rs. 3000/=, in the

S.No	Category	Type of Loss	Unit of Entitlement	Entitlement	Details
2B		Non-perennial crops	Family	Notice to harvest standing crops	They are entitled to be given a notice substantially 4 months in advance. Grant towards crop lost before harvest due to forced relocation, equal to market value of crop lost plus cost of replacement of seeds for the next season's harvest
2C		Perennial crops such as fruit trees	Family	Compensation at "market value"	Compensation for perennial crops and trees, calculated as annual produce value for one season.
3	Illegal Use of the ROW				
3A	Illegal use of the ROW	Encroachers	Family	Will receive no compensation for land but assistance for assets to the vulnerable	2. Compensation for structures at replacement cost to the vulnerable person. 1. Encroachers will be notified in time in which to remove their assets (except trees) and harvest their crops. 3. Training would be provided for up gradation of skills @ Rs. 1500/= per family to the EPs loosing commercial activities 4. Vulnerable EPs loosing commercial activities would be provided one-time Economic Rehabilitation Grant @ Rs. 3000/= per family, in the form of productive assets 5. Right to salvage materials from the demolished structure.

S.No	Category	Type of Loss	Unit of Entitlement	Entitlement	Details
3B		Squatters	Family	Will receive no compensation for land but assistance for assets.	2. A lump sum shifting allowance of Rs.700 for temporary, Rs.1200 for semi-permanent, and Rs.2200 for permanent structures. 1. Compensation for loss of structure at replacement cost. 3. Transitional allowance @ Rs.2000 per family lump sum. 4. 3. Training would be provided for up gradation of skills @ Rs. 1500/= per family to the EPs loosing commercial activities 5. Vulnerable EPs loosing commercial activities would be provided one-time Economic Rehabilitation Grant @ Rs. 3000/= per family, in the form of productive assets 6. Right to salvage materials from the demolished structure.
3C	Shifting Business	Mobile and ambulatory vendors (Kiosks)	Family	They are not eligible for compensation or “assistance”	They will receive lump sum shifting assistance of Rs. 2000.00 Ambulatory vendors licensed for fixed locations will be considered as kiosks.
4.	Community infrastructure, cohesion	Common property resources	Community	Conservation, protection, compensatory replacement	Easily replaced resources, such as cultural properties will be conserved (by means of special protection, relocation, replacement, etc.) in consultation with the community. Loss of access to firewood, etc. will be compensated by involving the communities in a social forestry scheme, in co-ordination

S.No	Category	Type of Loss	Unit of Entitlement	Entitlement	Details
	and amenities				with the Department of Forests, wherever possible. Adequate safety measures, particularly for pedestrians and children; Landscaping of community common areas; improved drainage; roadside rest areas, etc. are all provided in the design of the highways. Employment opportunities in the project, if possible. Loss of trees will be replaced by compensatory forestation.
4 A	Any other impact not yet identified, whether loss of asset or livelihood				Unforeseen impacts will be documented and mitigated based on the principles agreed upon in this policy framework.

7.7 R&R BUDGET

The budget is indicative of outlays for the different expenditure categories and is calculated as per current price index. These costs will be updated and adjusted to the inflation rate as the project continues and in respect of more specific information such as extra number of APs during the implementation, unit cost will be updated if the findings of the district level committee on market value assessment justify it.

Some of the features of this cost estimate are outlined below:

- The agricultural land will be compensated at replacement value worked out based on the methods given in the entitlement framework.
- NHAI will compensate the structures at replacement value to the legal titleholders.

Total 342.42 ha of land required for proposed project (135.50 ha land on NH 79 and 206.92 ha land on NH 113).

7.7.1 Resettlement Budget and Financing

The estimates budget for R&R is approximate 5.68 crore INR. Contingency provision would cover non-identified and other costs during R&R implementation.

7.8 RELOCATION AND INCOME RESTORATION MEASURES

The proposed subproject has limited negative impacts on the livelihood of the affected persons. The impact is limited to non-titleholders and all efforts are made through various provisions in this RP to mitigate negative social impacts on APs by supporting relocation of APs and by restoration of pre-project levels of income.

01 bypass has been proposed to reduce the magnitude of displacement of households, the possibility of block displacement has been reduced considerably. The households that be displaced are not concentrated at one location but at different points. Hence, the development of relocation sites is not required.

7.9 INSTITUTIONAL ARRANGEMENTS AND PROJECT IMPLEMENTATION

The NHAI will set up a Project Management Unit (PMU) headed by a Chief Engineer (CE) with one Superintending Engineer (SE) and three Executive Engineers (EEs). This office will be functional for the whole Project duration.

For resettlement activities, PMU will do the overall coordination, planning, implementation, and financing. The PMU will create a Resettlement Cell (RC) within itself with appointment of a Resettlement Officer (RO) and required support staff for the duration of the Project to ensure timely and effective planning and implementation of RPs. The candidate to be selected as RO is desired to have similar earlier experience in resettlement and social development planning and implementation. The RO will be assisted by the respective PIU and staff, NGO, for planning and implementation of resettlement activities in the project.

The Project Implementation Unit (PIU) headed by PD will be responsible for all subproject level resettlement planning and implementation. At this PIU level a RCD staff in the rank of Assistant Engineer (AE) will be designated for coordinating the R&R activities at the subproject level. He will be assisted by NGO and other required support staffs. The staffs at the PIU level will be provided with training and orientation program for implementation of the RP. The PIU will maintain all databases, work closely with APs and other stakeholders and monitor the day today resettlement activities

7.9.1 Implementation Schedule

The proposed subproject R&R activities are divided in to three broad categories based on the stages of work and process of implementation. The details of activities involved in these three phases, i.e. Project Preparation Phase, RP Implementation phase, Monitoring and Evaluation period are discussed in the following paragraphs.

The major activities to be performed in this period include establishment of PMU and PIU at project and subproject level respectively; submission of RP for NHAI's approval; appointment of NGO and establishment of GRC etc. The

information campaign & community consultation is an ongoing project for the entire duration of the process.

7.10 GRIEVANCE REDRESS COMMITTEE

A Grievance Redress Committee (GRC) at PIU level will be formed to deal with the disputes and AP's grievance and facilitate timely implementation of the Project. The GRC will be headed by the DC or a representative from the collector's office. The GRC will have R&R officer from the PIU office, representatives of APs, local government representatives, and NGO. The GRC will meet as and when grievances are referred to it for redress. Other than disputes relating to ownership rights under the court of law, GRC will review grievances involving all resettlement benefits, compensation, relocation, and other assistance

7.11 MONITORING AND EVALUATION

Monitoring and Evaluation (M&E) are critical activities in involuntary resettlement management and helps in order to ameliorate problems faced by the APs and develop solutions immediately. RP implementation for the subproject will be closely monitored by PMU internally.

The PIU responsible for supervision and implementation of the RP will prepare monthly progress reports on resettlement activities and submit to PMU. PMU will submit quarterly reports to PWD/MoRTH. The independent monitoring & evaluation expert will be hired under construction supervision consultation by EA in agreement with PWD/MoRTH to undertake overall monitoring of the subproject will submit a biannual review directly to PWD/MoRTH and determine whether resettlement goals have been achieved, more importantly whether livelihoods and living standards have been restored/enhanced and suggest suitable recommendations for improvement.

7.12 CONCLUSION

The impact of roads projects on people and their communities are important and are increasingly having greater influence on the route alignment decisions and road design. SIA methods help to identify the potential impacts and to avoid, reduce, eliminate, or compensate the social impacts.

- Helps to resolve the issues by developing an effective working relationship to allow the public and the project team to address the issues.
- Help to reduce the need for lengthy hearings and other project delays based on the public concern or opposition to the project.
- Can often assist the project management by helping to transform the public issues into manageable design standards and revised construction practices.

To enhance project benefits for roadside communities and road users, the project design has incorporated the following:

- Improvement of geometric deficiencies;
- Provision of underpasses that carry pedestrian walkways, cart track, village, district and other roads;
- Separate provision of footpaths;
- Provision of anti-crash barriers;
- Slope protection;
- Effective surface and sub-surface drainage system to ensure that there shall be no pooling of water on the highway and the adjacent area;
- Safety measures such as pedestrian rails, barriers, highway signs, pavement marking, traffic signals landscaping, illumination, Road furniture, truck lay-bys, and bus bays
- Addition of truck parking for improved road safety and reduced road congestion;
- Public amenities such as rest rooms, telephone booths, facilities for public conveniences.
- Other benefits include:
 - (a) Saving in vehicle operating cost
 - (b) Time saving- freight and passenger movement
 - (c) Employment potential-direct employment in road construction and allied Activities and greater mobility
 - (d) Lower accidents, quick access to services like hospitals, markets, offices etc.

Public Hearing in Chittorgarh

Public hearing in Chittorgarh district was conducted in Panchayat Samity, Nimbahera in regarding to advertisement in NEWS papers (Dainik Bhaskar-05.10.2012) on dated of 08.11.2012 at 11.00 am. Additional District Collector Chittorgarh district started the public hearing proceeding. Mr. M.C. Pandya told about designing features and Dr. Rajesh Singh discussed about baseline environmental conditions, possible environmental impacts and their mitigation measures adopted from MoEF and IRC guidelines. Most of public opinions were in favor of this road widening project. Additional District collector also awared to public about the importance of road infrastructure projects and their role in economy. The brief summary of the public hearing are presented in **proceeding details**.



01472-250077

क्षेत्रीय कार्यालय
राजस्थान राज्य प्रदूषण नियंत्रण मण्डल,
प्लॉट नम्बर 12, स्कीम नं.-6, कुम्भा नगर, चित्तौड़गढ़

क्रमांक : राप्रनिम/क्षै.कां चित्तौड़गढ़/सी.आई./1052

दिनांक : 04/12/12

सदस्य सचिव,
राजस्थान राज्य प्रदूषण नियंत्रण मण्डल,
जयपुर।

(ग्रुप एम.यू.आई.डी)

विषय:- सार्वजनिक निर्माण विभाग द्वारा प्रस्तावित परियोजना, डवलपमेन्ट एण्ड ऑपरेशन ऑफ एनएच- 79 चित्तौड़गढ़ से नीमच खण्ड (मध्यप्रदेश सीमा तक) कि.मी. 183.000 से कि.मी. 221.400 तक तथा एनएच- 113 टू लेन निम्बाहेड़ से प्रतापगढ़ खण्ड कि.मी. 5.400 से 80.000 तक (चित्तौड़गढ़ जिले में आने वाला खण्ड) हेतु पर्यावरण एवं वन मन्त्रालय, भारत सरकार की अधिसूचना दिनांक 14.09.2006 के अन्तर्गत आयोजित लोक सुनवाई विवरण भिजवाने बाबत।

महोदय,

उपरोक्त विषयान्तर्गत निवेदन है कि सार्वजनिक निर्माण विभाग द्वारा प्रस्तावित परियोजना, डवलपमेन्ट एण्ड ऑपरेशन ऑफ एनएच- 79 चित्तौड़गढ़ से नीमच खण्ड (मध्यप्रदेश सीमा तक) कि.मी. 183.000 से कि.मी. 221.400 तक तथा एनएच- 113 टू लेन निम्बाहेड़ से प्रतापगढ़ खण्ड कि.मी. 5.400 से 80.000 तक (चित्तौड़गढ़ जिले में आने वाला खण्ड) हेतु पर्यावरण एवं वन मन्त्रालय, भारत सरकार की अधिसूचना दिनांक 14.09.2006 के अन्तर्गत लोक सुनवाई का आयोजन दिनांक 31.10.2012 को समय प्रातः 11:00 बजे पंचायत समिति, निम्बाहेड़ा में अतिरिक्त जिला कलेक्टर चित्तौड़गढ़ की अध्यक्षता में किया गया था।

लोक सुनवाई विवरण की हस्ताक्षरित प्रति, फोटो एलबम एवं विडियोग्राफी की सीडी सूचनार्थ एवं अग्रिम कार्यवाही हेतु सादर प्रेषित है।

भवदीय,

संलग्न : उरोक्तानुसार (तीन प्रतियाँ)

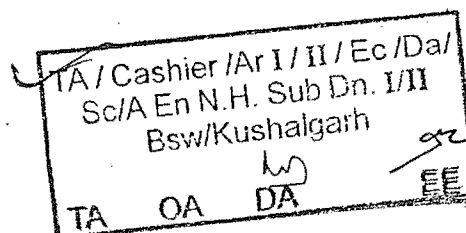
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क्षेत्रीय अधिकारी

प्रतिलिपि:- लोक सुनवाई का विवरण निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित है।

1 अतिरिक्त जिला कलेक्टर, चित्तौड़गढ़।

2 अधिशासी अभियन्ता, सार्वजनिक निर्माण विभाग, एनएच खण्ड, बांसवाड़ा।



[Signature]
क्षेत्रीय अधिकारी

सार्वजनिक निर्माण विभाग द्वारा प्रस्तावित परियोजना, डवलपमेन्ट एण्ड ऑपरेशन ऑफ एनएच- 79 चित्तौड़गढ़ से नीमच खण्ड (मध्यप्रदेश सीमा तक) कि.मी. 183.000 से कि.मी. 221.400 तक तथा एनएच- 113 टू लेन निम्बाहेड़ा से प्रतापगढ़ खण्ड कि.मी. 5.400 से 80.000 तक (चित्तौड़गढ़ जिले में आने वाला खण्ड) के लिये पर्यावरण एवं वन मन्त्रालय, भारत सरकार की अधिसूचना दिनांक 14.09.2006 के अन्तर्गत आयोजित

लोक सुनवाई दिनांक 08.11.2012 का कार्यवृत्त (मिनिट्स)

वन एवं पर्यावरण मन्त्रालय भारत सरकार द्वारा जारी पर्यावरणीय प्रभाव आंकलन अधिसूचना (EIA Notification) दिनांक 14.09.2006 के अन्तर्गत जिला कलेक्टर चित्तौड़गढ़ के पत्र क्रमांक विकास/प-6 (2-1)2012/1492 दिनांक 27.09.2012 एवं म क्षेत्रीय कार्यालय राजस्थान राज्य प्रदूषण नियंत्रण मण्डल, चित्तौड़गढ़ के पत्रांक आरपीसीबी/आर.ओ./चित्तौड़/1049-52 दिनांक 03.10.2012 की अनुपालना में सार्वजनिक निर्माण विभाग द्वारा प्रस्तावित परियोजना, डवलपमेन्ट एण्ड ऑपरेशन ऑफ एनएच- 79 चित्तौड़गढ़ से नीमच खण्ड (मध्यप्रदेश सीमा तक) कि.मी. 183.000 से कि.मी. 221.400 तक तथा एनएच- 113 टू लेन निम्बाहेड़ा से प्रतापगढ़ खण्ड कि.मी. 5.400 से 80.000 तक (चित्तौड़गढ़ जिले में आने वाला खण्ड) हेतु परियोजना से संबंधित लोक सुनवाई दिनांक 08.11.2012 को प्रातः 11.00 बजे, अतिरिक्त जिला कलेक्टर, चित्तौड़गढ़ की अध्यक्षता में पंचायत समिति निम्बाहेड़ा, जिला चित्तौड़गढ़ के परिसर में आयोजित की गई।

लोक सुनवाई में उपस्थित व्यक्तियों का विवरण मय हस्ताक्षर परिशिष्ट-अ पर संलग्न हैं। लोक सुनवाई बाबत विज्ञापित दिनांक 05.10.2012 को दैनिक भास्कर एवं राजस्थान पत्रिका में प्रकाशित करवा दी गयी थी जिसकी फोटो प्रति परिशिष्ट-ब पर संलग्न हैं।

लोक सुनवाई की कार्यवाही प्रारम्भ करते हुये श्री के.सी. गुप्ता, क्षेत्रीय अधिकारी, राजस्थान राज्य प्रदूषण नियंत्रण मण्डल, चित्तौड़गढ़ ने सभी आगन्तुकों का स्वागत किया एवं वन एवं पर्यावरण मन्त्रालय, भारत सरकार द्वारा जारी अधिसूचना दिनांक 14.09.2006 के अन्तर्गत लोक सुनवाई की आवश्यकता/प्रक्रिया के बारे में अवगत करवाया तथा अध्यक्ष महोदय की अनुमति से सार्वजनिक निर्माण विभाग के प्रतिनिधि को प्रस्तावित परियोजना के संबंध में विस्तृत रूप से प्रस्तुतीकरण हेतु आमंत्रित किया।

तत्पश्चात परियोजना के कन्सलटेन्ट मै. थीम इंजिनियरिंग सर्विसेज प्रा. लि. के प्रतिनिधि श्री एम.सी. पांड्या द्वारा प्रस्तुतीकरण दिया गया। प्रस्तावित सड़क योजना राष्ट्रीय राजमार्ग संख्या-79 चित्तौड़गढ़ से राजस्थान-मध्यप्रदेश सीमा तक वाया निम्बाहेड़ा व राष्ट्रीय राजमार्ग संख्या 113 (निम्बाहेड़ा-दाहोद) निम्बाहेड़ा से प्रारम्भ होकर प्रतापगढ़ तक है। प्रस्तावित सड़क योजना में राष्ट्रीय राजमार्ग संख्या 79 की वर्तमान लम्बाई 43.028 कि. मी. व राष्ट्रीय राजमार्ग संख्या 113 की वर्तमान लम्बाई 74.600 कि.मी. है। राष्ट्रीय राजमार्ग संख्या 79 की प्रस्तावित लम्बाई 44.084 कि.मी. व राष्ट्रीय राजमार्ग संख्या 113 की प्रस्तावित लम्बाई 72.915 कि.मी. है। प्रस्तावित सड़क योजना के अन्तर्गत वर्तमान राष्ट्रीय राजमार्ग संख्या 79 को 2 लेन से 4 लेन विथ पेव्ड व ग्रेनुलर सोल्डर व राष्ट्रीय राजमार्ग संख्या 113 को 2 लेन से 2 लेन विथ ग्रेनुलर सोल्डर में परिवर्तित किया जायेगा। प्रस्तावित सड़क परियोजना राजस्थान के दो जिलों क्रमशः चित्तौड़गढ़ एवं प्रतापगढ़ से होकर गुजर रही है। परियोजना की कुल लागत रु० 511.21 करोड़ है। पर्यावरण प्रबन्धन

लागत लगभग ₹0 2.3 करोड़ है। पुनर्स्थापना एवं पुनर्वास लागत लगभग ₹0 36.77 करोड़ है।

चित्तौड़गढ़ जिले के अन्तर्गत प्रस्तावित सड़क योजना में आने वाले गांव :

सेंती, औछड़ी, ओरड़ी, जालमपुरा, अरनियां पथ, शम्भुपुरा, सामरी, मड्डा गुलफरोशन, सौपलिया खेड़ी, अमीनपुरा, सागवाड़िया, नरसिंह गढ़, बाड़ी, नरसाखेड़ी, महमूदगंज, सतखण्डा, रावलिया, भोपाली, भावलिया, मांगरोल, लक्ष्मीपुरा, अहीरपुरा, बोराखेड़ी, निम्बाहेड़ा, इशाकपुरा, सांकरिया, रानीखेड़ा, मण्ड गुल्फरोशन, कासोद, सिगरी, सेमलिया, आक्या, जलिया, पिपलिया, चरलिया ब्राह्मणान, बागरेड़ा आदि।

वायु की गुणवत्ता : वायु की गुणवत्ता की जाँच अप्रैल से जून 2012 के मध्य चित्तौड़गढ़ (कि.मी. 186.000) निकट टोल प्लाजा (कि.मी. 121.000) व निम्बाहेड़ा (कि.मी. 5.400) पर की गई थी। PM₁₀ का औसत 84 से 96 माइक्रोग्राम प्रति क्यूबिक मीटर PM_{2.5} का औसत 38 से 50 माइक्रोग्राम प्रति क्यूबिक मीटर एवं NO₂ का औसत 18 से 25 माइक्रोग्राम प्रति क्यूबिक मीटर, SO₂ का औसत 10 से 14 माइक्रोग्राम प्रति क्यूबिक मीटर व कार्बन मोनो आक्साइड की मात्रा निर्धारित औसत मानको से कम पायी गई।

ध्वनि गुणवत्ता : ध्वनि की गुणवत्ता की जाँच चित्तौड़गढ़ (कि.मी. 186.000) निकट टोल प्लाजा (कि.मी. 121.000) व निम्बाहेड़ा (कि.मी. 5.400) पर की गई। दिन के समय ध्वनि गुणवत्ता 58.5 से 62.1 dB व रात्रि के समय 48.7 से 54.2 dB पायी गई। जो निर्धारित मापदण्डों की सीमा के अन्दर हैं। प्रस्तावित सड़क के क्रियान्वित अवस्था में कम हो जाने की संभावना है।

जल की गुणवत्ता : जल की गुणवत्ता की जाँच चित्तौड़गढ़ (कि.मी. 186.000) निकट टोल प्लाजा (कि.मी. 121.000) व निम्बाहेड़ा (कि.मी. 5.400) पर की गई। पानी की pH 7.18 से 8.11, कुल कठोरता 321 से 584 mg/l, TDS 624 से 974 mg/l, क्लोराइड 134 से 312 mg/l, व क्षारीयता 208 से 325 mg/l, पायी गई।

पर्यावरणीय प्रभाव व उनका निराकरण वायु प्रवेशिका

प्रभाव

निर्माण स्थलों, खुदाई स्थलों व पत्थर पिसाई स्थलों से धूलीय कणों का वायु में मिलना, ढुलाई वाहनों, होटमिक्स प्लान्ट्स व सड़क निर्माण में काम आने वाली मशीनों से वायु प्रदूषण।

निराकरण उपाय

धूल कणों को रोकने के लिये निर्माण व खुदाई स्थलों पर पानी का नियमित छिड़काव।

निर्माण सामग्री की ढुलाई ढक कर करना व पानी छिड़काव के बाद करना।

निर्माण सामग्री का परिवहन पक्के रास्तों से करना।

सड़क निर्माण में कम प्रदूषण करने वाली नई तकनीक की मशीनों व वाहनों का उपयोग।

सड़क के दोनों तरफ लम्बे पत्ते वाले पेड़ लगाना।

होट मिक्स प्लांट को आबादी व संवेदनशील स्थानों से लगभग 500 मी. दूरी पर लगाना।

ध्वनि पर्यावरण

प्रभाव

सड़क निर्माण सामग्री की ढुलाई व निर्माण कार्यों के कारण ध्वनि का स्तर बढ़ना, क्रशिंग प्रक्रियाओं के कारण शोर व कम्पन का उत्पन्न होना, सड़क निर्माण के दौरान यातायात की गति का धीमा होना व इससे ज्यादा शोर का उत्पन्न होना।

निराकरण उपाय

पर्यावरण कानून 1986 के तहत कम शोर करने वाली मशीनों का उपयोग तथा इनका समय-समय पर रख-रखाव करना, सड़क निर्माण के दौरान ट्रेफिक जाम को डायवर्जन के द्वारा दूर करना, शोर गुल वाले वातावरण में काम करने वाले कर्मचारियों का कार्य समय ध्वनि के अनुसार निर्धारित करना जैसे कि 85 डेसीबल शोर में अधिकतम 8 घंटे, शैक्षणिक संस्थाओं व अस्पतालों के निकट पेड़-पौधों की हरी पट्टी लगवाना, शोर उत्पन्न करने वाली मशीनों को ध्वनि अवरोधकों से ढकना ।

जल पर्यावरण

प्रभाव

सड़क निर्माण गतिविधियों के कारण सतही जल के प्राकृतिक बहाव में बदलाव ।
सड़क निर्माण में जलदोहन के कारण स्थानीय जल स्रोतों के स्तर में कमी, वाहन सर्विस स्टेशनों के कारण सतही जल स्रोतों का दूषित होना ।

निराकरण उपाय

निर्माण कार्य के दौरान जल स्रोतों के ऊपर सिल्ट फेन्सिंग लगाना ।
जल स्रोतों के निकट ठोस अपशिष्टों के डालने पर रोक ।
श्रमिक शिविर की स्थापना स्थानीय जल स्रोतों व आबादी क्षेत्रों से दूर करना ।
श्रमिक शिविर के पास चलते फिरते शौचालयों की व्यवस्था करना ।
सड़क निर्माण में रोड़ी व मिट्टी बिछाने का कार्य बरसात के मौसम में करना जिससे जल की आवश्यकता कम हो ।
जल भराव की समस्या के निराकरण के लिये उचित स्थानों पर पुलिया (कलवर्ट्स) का निर्माण ।

भूमि पर्यावरण

प्रभाव

अधिग्रहित भूमि की ऊपरी उपजाऊ मिट्टी का ह्रास ।
मिट्टी खुदाई वाले स्थानों पर मिट्टी का कटाव व ह्रास ।
निर्माण सामग्री से उत्पन्न ठोस कचरे के कारण भूमि ह्रास ।

निराकरण उपाय

सड़क निर्माण क्षेत्र में आने वाली उपजाऊ भूमि की ऊपरी सतह को हटाकर इसका उपयोग सड़क की नव्य पट्टिका व ढलान पर पेड़-पौधे लगाने के लिये करना ।
मिट्टी खुदाई वाले स्थानों का चयन कृषि भूमि से दूर बेकार पड़ी भूमि पर करना ।
मिट्टी खुदाई वाले स्थानों को उपयोग के बाद समतल करना या बरसात के पानी को इकट्ठा करने में उपयोग करना ।

जैविक पर्यावरण

प्रभाव

सड़क चौड़ीकरण के कारण पेड़-पौधों का ह्रास ।
वन भूमि का प्रत्यार्पण व इसके कारण आर्थिक व औषधीय पादपों का ह्रास ।
वन्य जीवों के विचरण में बाधा उत्पन्न होना ।
सड़क निर्माण के दौरान चितौडगढ़ जिले में लगभग 5389 पेड़ प्रभावित होंगे ।

निराकरण उपाय

नये वृक्षों का आरोपण आई.आर.सी. के नियमानुसार करना ।
लगाये जाने वाले पेड़-पौधों का चयन इस प्रकार करना कि इनसे छाया, आर्थिक लाभ व औषधियाँ मिल सकें ।

लगाये जाने वाले पेड़-पौधों की जीवित रहने की उचित दर बनाये रखना ।

सामाजिक व आर्थिक पर्यावरण

प्रभाव

प्रस्तावित सड़क चौड़ीकरण के कारण कुछ सम्पत्तियों का नुकसान ।
तेज यातायात व रोड़ डिवाइडर के कारण स्थानीय यातायात में बाधा

निराकरण उपाय

प्रभावित होने वाले लोगों को नियमानुसार मुआवजा ।

स्थानीय लोगों को सड़क निर्माण में रोजगार का प्रस्ताव ।

तेज यातायात व रोड़ डिवाइडर के कारण स्थानीय यातायात में बाधा को दूर करने हेतु
अन्डर पास व फलाई ओवर का निर्माण करना ।

पब्लिक स्वास्थ्य व सुरक्षा

रोड़ निर्माण कर्मियों की सुरक्षा

रोड़ निर्माण कर्मियों को सुरक्षा साधन जैसे मास्क, ऐनक, हाथों के दस्ताने, गमबूट इत्यादि
उपलब्ध करवाना ।

समय-समय पर सुरक्षा प्रशिक्षण देना ।

श्रमिक शिविर के पास प्राथमिक स्वास्थ्य केन्द्रों की व्यवस्था करना ।

पब्लिक सुरक्षा

निर्माण कार्य प्रारंभ करने से पूर्व आगे पीछे निर्माण संकेत बोर्ड लगवाना ।

रोड़ निर्माण के बाद तीव्र घुमावों में दुर्घटना बाधा पट्टी लगाना ।

स्कूल व अस्पताल के नजदीक गति अवरोधक व संकेत बोर्ड लगवाना ।

स्थानीय वाहनों को गुजरने के लिये वाहन अन्डर पास बनवाना ।

पैदल यात्री व पशुओं के लिये अन्डर पास बनवाना ।

शहरी इलाकों में पैदल यात्री पट्टी बनवाना ।

एक निश्चित अंतराल पर एम्बुलेंस उपलब्ध करवाना ।

उक्त परियोजना के महाप्रबन्धक, श्री ए.एस. पाण्डे ने अवगत करवाया कि उक्त परियोजना का कार्य दो वर्ष में पूर्ण कर लिया जावेगा। यह पब्लिक प्राईवेट पार्टनरशिप (पीपीपी) परियोजना है तथा इसमें सरकार का कोई भी पैसा नहीं लगेगा। उक्त सड़क परियोजना से क्षेत्र का विकास होगा, साथ ही सरकार को 19 वर्षों तक लगभग 22 करोड़ रु. प्रति वर्ष टोल टेक्स के रूप में राजस्व की प्राप्ति होगी। उक्त सड़क रख-रखाव का कार्य भी चेतक इन्टरप्राइजेज द्वारा ही किया जावेगा।

तत्पश्चात अतिरिक्त जिला कलक्टर, चित्तौड़गढ़ ने लोक सुनवाई में उपस्थित लोगों को प्रस्तावित परियोजना बाबत सुझाव/आक्षेप/प्रश्न/शिकायत/जानकारी हेतु आमंत्रित किया।

उपस्थित जनता में से प्राप्त सुझाव/आक्षेप/प्रश्न/शिकायत/जानकारी का विवरण इस प्रकार है :-

1. श्री पंकज बडल्या, निवासी सतखण्डा

इन्होंने राय जाहिर की कि प्रस्तावित सड़क परियोजना से क्षेत्र का विकास होगा तथा लोगों को रोजगार मिलेगा। उक्त परियोजना हेतु सड़क के आस-पास की भूमि का अधिग्रहण किया जा रहा है। इसमें उनका भी एक भूखण्ड आना

क्षेत्रीय अधिकारी

9/10

बताया। इन्होंने मांग रखी कि उनके भूखण्ड के एवज उनके परिवार के एक सदस्य को सरकार अथवा परियोजना प्रबन्धकों द्वारा नौकरी दी जावे।

2. श्री उदित मीणा, निवासी जलिया

इन्होंने बताया कि हमारे गांव के पास में बाईपास निकला हुआ है उस पर दुर्घटना का भय रहता है। इसलिये यहां पर अण्डरपास बनवाया जावे। इससे आस पास के ग्राम वासियों को यहां से निकलने में आसानी रहेगी एवं दुर्घटनाये घटित नहीं होगी।

3. श्री गोपाल लाल आंजना, प्रधान, पंचायत समिति, निम्बाहेड़ा

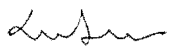
इन्होंने बताया कि इस फोरलेन से पर्यावरण पर कोई विशेष प्रतिकूल प्रभाव नहीं होगा। इस इलाके में फोरलेन रोड़ बनने जा रहा है। इससे आस-पास के क्षेत्रों के विकास को गति मिलेगी। इस फोरलेन निर्माण से यहां के निवासियों को कोई आपत्ति नहीं है।

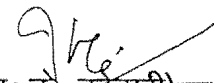
तत्पश्चात् अतिरिक्त जिला कलेक्टर ने लोक सुनवाई के दौरान प्राप्त उपरोक्त सुझावों/आक्षेपों/शिकायतों का जवाब देने हेतु सार्वजनिक निर्माण विभाग के प्रतिनिधि को आमंत्रित किया।

सार्वजनिक निर्माण विभाग के प्रतिनिधि श्री एम.सी. पाण्डे कन्सलटेंट द्वारा बताया गया कि यहां के स्थानीय निवासियों का योग्यता के आधार पर रोजगार दिया जायेगा। इस प्रोजेक्ट में अवाप्ति में जा रही भूमि के मुआवजे का निर्धारण सक्षम प्राधिकारी द्वारा नियमानुसार तय किया जाकर भूमिधारियों को इसका भुगतान किया जायेगा। इसके बाद ही आगे की कार्यवाही की जावेगी। अण्डरपास से सम्बन्धित मांग के बारे में बताया गया कि उक्त स्थल का परियोजना अभियन्ता द्वारा निरीक्षण किया जाकर आवश्यक कार्यवाही की जावेगी।

तत्पश्चात् लोक सुनवाई के अध्यक्ष, श्री एन.के. कोठारी, अतिरिक्त जिला कलेक्टर, चित्तौड़गढ़ ने लोगों को लोक सुनवाई की कार्यवाही का सांराश बताते हुए अवगत करवाया कि लोक सुनवाई के दौरान प्राप्त सभी आक्षेपों/सुझावों/शिकायतों को वन एवं पर्यावरण मंत्रालय भारत सरकार को यथावत् प्रेषित कर दिया जावेगा।

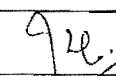
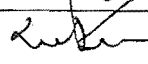
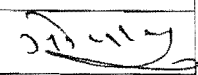
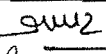
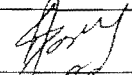

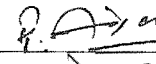
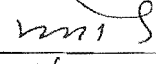

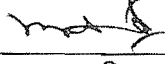
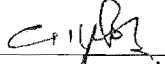
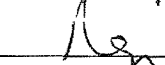
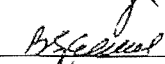
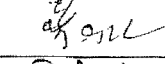
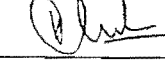
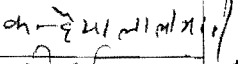
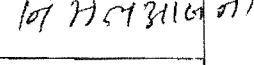
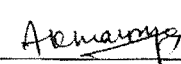
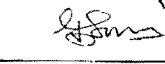
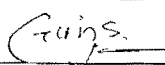

लोक सुनवाई के पूर्व तथा दौरान लिखित में कोई प्रतिवेदन/आक्षेप प्राप्त नहीं हुआ है।


(कै.सी. अण्ठाणी)
क्षेत्रीय अधिकारी,
राजस्थान राज्य प्रदूषण नियन्त्रण मण्डल,
चित्तौड़गढ़


(एन.के. कोठारी)
अतिरिक्त जिला कलेक्टर,
चित्तौड़गढ़

पर्यावरणीय स्वीकृति हेतु जन सुनवाई

सार्वजनिक निर्माण विभाग द्वारा प्रस्तावित परियोजना, डवलपमेन्ट एण्ड ऑपरेशन ऑफ एनएच- 79 चित्तौड़गढ़ से नीमच खण्ड (मध्यप्रदेश सीमा) कि.मी. 183.000 से कि.मी. 221.400 तक तथा एनएच- 113 टू लेन निम्बाहेड़ से प्रतापगढ़ खण्ड कि.मी. 5.400 से 80.000 तक (चित्तौड़गढ़ जिले में आने वाला खण्ड) हेतु पर्यावरणीय स्वीकृति बाबत जन सुनवाई दिनांक 08.11.2012 को समय प्रातः 11:00 बजे, स्थान- पंचायत समिति, निम्बाहेड़ा जिला, चित्तौड़गढ़ (राज.) में उपस्थित अधिकारी एवं नागरिकगण :-

क्रमांक	नाम	पता/विभाग का नाम	हस्ताक्षर
1	श्री. एन के कोठारी	अति. जिला कलेक्टर, चित्तौड़गढ़	
2	श्री. के.सी गुप्ता	क्षेत्रीय अधिकारी, रा.प्र.नि.म. चित्तौड़गढ़	
3	गोपाल लाल झा	प्रधान प. निम्बाहेड़ा	
4	जं. आर. जीतगार	अधिराषी अग्नि. PWD. NH बा.स.वा.डा	
5	A.S. Pandey	G.M. Chetak Enterprises	
6	Kul Bhanu Bhat	Chetak Enterprises -	
7	PURAN ANJAN	Chetak Enterprises	
8	Manohar Anjan	" "	
9	Mohammad Hussain	Nimbaharee	
10	M. C. Pandya	TES, Jaipur	
11	Dr. Rajesh Singh	TES, Jaipur	
12	MSN MAHU	Chetak Enterprises Ltd	
13	Shripadra Singh Gaud	Chetak	
14	CHITZ - चित्तौड़ आवासीय	सरकारी (चि.स.)	
15	Khilan Bhanawat	Savita colony/SMS	
16	Ram Laxmi Lal Mali	अति-पति	
17	LI. MARVEE	काल-काल	
18	Anil K. Mavrya	Chetak Enterprises	
19	Gopal Bansal	Chetak Enterprises	
20	HARIS SHARMA	Account	
21	KALURAM SHARMA	Account	

मानों को दिए निःशुल्क कृषि यंत्र

पंचायत समिति पीपलखूंट
बायल कालीघाटी में गुरुवार
दिन एवं आदान शिविर का
किया गया। मुख्य अतिथि
सचिव नानालाल निनामा
को निःशुल्क खाद-बीज
किट और कृषि यंत्र वितरित
अवसर पर ग्राम पंचायत
रश कुमार, ब्लॉक अध्यक्ष
चरपोटा, राधेश्याम बुझ, पूर्व
निदेशक दिनेश जी जागा,
निदेशक उद्यान ए के खान,
नायक, पशु सहायक कृषि
कुशल चरपोटा, लैम्पस
चरपोटा आदि मौजूद थे।
शालुराम ने माना। घाटोल
में गुरुवार को सरपंच
निनामा की अध्यक्षता
कृषि आदान व ज्ञान शिविर



पीपलखूंट, किसानों को निःशुल्क कृषि यंत्र देते संसदीय सचिव नानालाल निनामा।

हुआ। कृषि अधिकारी रामसेवक
बघेल, धनपाल खराड़ी, पशुपालन
के डॉ. विनीत व्यास, रकमचंद मईड़ा,
कृषि पर्यवेक्षक धर्मवीर ने अपने
विभाग की योजनाओं व उन्नत तरीकों
की जानकारी दी। इस मौके पर 15
मिनरल मिक्सचर वितरित किए गए।
सज्जनगढ़, ग्राम पंचायत मस्का बड़ा
में सरपंच दलसिंह एवं कसारवाड़ी
में सरपंच बाबूलाल की अध्यक्षता में
कृषि ज्ञान आदान शिविर आयोजित
हुए। कसारवाड़ी में लैम्पस अध्यक्ष
आंकार भाई ने संबोधित करते हुए
किसानों को सरकार की कल्याणकारी
योजनाओं का लाभ लेने का
आह्वान किया।

का आयोजन होत किया

क विद्यालय सामरिया में संस्था
के सानिध्य और अध्यापक
में दसवीं बोर्ड परीक्षा परिणाम
विकास समिति की बैठक हुई।
विस्थापित तीन विषयाध्यपकों
किया। शिक्षक हेरालाल पटेल
आ में प्रथम श्रेणी में उत्तीर्ण होने
देने, द्वितीय को 500 रुपये

जित

योजना के अन्तर्गत राजस्थान
अल्पसंख्यक विभाग बांसवाड़ा
का पंजीयन होने पर संस्थान
आयोजित किया। संस्था सचिव
थो कि समारोह में हाजी अन्सार
जलानी, हाफिजुर्रहमान, हाजी
अब्दुल काजीर, जमनाल ठाकुर
उपस्थित थे।

विकास शिविर 6 से

दर बांसवाड़ा द्वारा संचालित
विद्या निकेतन के बालकों का
विकास शिविर 6 अक्टूबर से
छो निकेतन खमस में शुरू होगा।
एवार को खमस में समाजसेवी
व्यवस्था एवं घाटोल विरिण प्रभाती
आतिथ्य में बैठक आयोजित की
नेकर व्यापक विचार करे।

नहा मिल रहा हत्या का आरोपी मामा

बांसवाड़ा। दस दिन पूर्व हुई हत्या के
मामले में अभी तक आरोपी मामा को
पुलिस गिरफ्तार नहीं कर पाई है। सात
वर्ष की बच्ची की हत्या के मामले में
मां ने अपने भाई के खिलाफ रिपोर्ट
दर्ज कराई थी। अमरदीप नगर में बहने
वाले नाले के किनारे से 25 सितंबर को
अंजा (7) पुत्री रामा का शव मिला
था। सड़ी गली अवस्था में मिले का
पोस्टमार्टम करा कर दाह संस्कार किया
था। मृतका की मां नारायणी ने अपने
भाई कालिलाल के खिलाफ रिपोर्ट दी
थी। अभी तक आरोपी मामा कालि
लाल भी पुलिस पकड़ से दूर है। इधर,
पीड़ित परिवार के लोगों ने एक बार फिर
पुलिस अधिकारियों से मुलाकात कर
एक अन्य संदिग्ध व्यक्ति के बारे में
जानकारी दी है। पुलिस दूसरे संदिग्ध
की तलाश में भी जुट गई है।



क्षेत्रीय कार्यालय राजस्थान राज्य प्रदूषण नियंत्रण मण्डल

प्लॉट नम्बर 12, स्कीम नं.-6, कुम्भा नगर, चित्तौड़गढ़

क्रमांक : राप्रनिम/क्षे.का. चित्तौड़/सीआई/

दिनांक :

पर्यावरणीय स्वीकृति हेतु लोक सुनवाई के लिए आम सूचना

- सर्व साधारण को सूचित किया जाता है कि अधीक्षण अभियन्ता, सार्वजनिक निर्माण विभाग, सर्किल कोटा द्वारा प्रस्तावित परियोजना, डबलपमेन्ट एण्ड ऑपरेशन ऑफ एनएच-79 चित्तौड़गढ़ से नीमच खण्ड (मध्यप्रदेश सीमा) कि.मी. 183.000 से कि.मी. 221.400 तक तथा एनएच-113 टू लेन निम्बाहेड़ा से प्रतापगढ़ खण्ड कि.मी. 5.400 से 80.000 तक (चित्तौड़गढ़ जिले में आने वाला खण्ड) के लिए पर्यावरणीय स्वीकृति हेतु प्रस्ताव राजस्थान राज्य प्रदूषण नियंत्रण मण्डल (यहाँ तथा बाद में मण्डल के नाम से अभिलिखित) के समक्ष प्रस्तुत किये गये हैं।
- और चूंकि अधीक्षण अभियन्ता, सार्वजनिक निर्माण विभाग, सर्किल कोटा ने मण्डल को परियोजना की पर्यावरणीय स्वीकृति के लिए आवेदन किया है।
- और चूंकि मण्डल को उक्त परियोजना हेतु भारत सरकार के वन एवं पर्यावरण मंत्रालय, नई दिल्ली द्वारा जारी अधिसूचना दिनांक 14.09.2006 के अनुसार लोक जन सुनवाई हेतु इस आशय की सूचना जारी कर 30 दिवस का नोटिस दिया जाना आवश्यक है।
- उक्त परियोजना से संबंधित संक्षिप्त अभिलेख (कार्यकारी सारांश) निम्नांकित कार्यालयों पर उपलब्ध है-
 - जिला कलेक्टर, चित्तौड़गढ़
 - क्षेत्रीय अधिकारी, राजस्थान राज्य प्रदूषण नियंत्रण मण्डल, प्लॉट नम्बर 12, स्कीम नं.-6, कुम्भा नगर, चित्तौड़गढ़
 - राजस्थान राज्य प्रदूषण नियंत्रण मण्डल, मुख्यालय-4, संस्थानिक क्षेत्र झालाना डूंगरी, जयपुर।
 - पर्यावरण विभाग, राजस्थान सरकार, शासन सचिवालय, जयपुर।
 - क्षेत्रीय कार्यालय, वन एवं पर्यावरण मंत्रालय, भारत सरकार, लखनऊ।
 - महाप्रबंधक, जिला उद्योग केन्द्र, चित्तौड़गढ़।
 - कार्यकारी अधिकारी, जिला परिषद, चित्तौड़गढ़।
 - उपखण्ड अधिकारी, निम्बाहेड़ा, जिला चित्तौड़गढ़

अतः समस्त संबंधित को इस नोटिस के माध्यम से एतद द्वारा सूचित किया जाता है कि वे उक्त परियोजना की पर्यावरणीय स्वीकृति से संबंधित लोक सुनवाई दिनांक 08.11.2012, प्रातः 11.00 बजे, पंचायत समिति निम्बाहेड़ा, जिला चित्तौड़गढ़ में उपस्थित होकर अपने आक्षेप प्रस्तुत कर सकते हैं।

किसी भी संबंधित व्यक्ति द्वारा मौखिक लिखित सुझाव भी इस सूचना के प्रकाशन तिथि से 30 दिवस के अन्दर, राजस्थान राज्य प्रदूषण नियंत्रण मण्डल, प्लॉट नम्बर 12, स्कीम नं.-6, कुम्भा नगर, चित्तौड़गढ़ में दिये जा सकते हैं।

दिनांक 5/10/2012

क्षेत्रीय अधिकारी





Public hearing in Pratapgarh

Public hearing in Pratapgarh district was conducted in Circuit House, Pratapgarh in regarding to advertisement in NEWS papers (Dainik Bhaskar) on dated of 22.11.2012 at 11.00 am. Additional District Collector Chittorgarh district started the public hearing proceeding. Mr. M.C. Pandya told about designing features and Dr. Rajesh Singh discussed about baseline environmental conditions, possible environmental impacts and their mitigation measures adopted from MoEF and IRC guidelines. Most of public opinions were in favor of this road widening project. The brief summary of the public hearing are presented in **proceeding details.**



क्षेत्रीय कार्यालय
राजस्थान राज्य प्रदूषण नियंत्रण मण्डल,
प्लॉट नम्बर 12, स्कीम नं.-6, कुम्भा नगर, चित्तौड़गढ़

क्रमांक : राप्रनिम/क्षै.का चित्तौड़गढ़/सी.आई./1043

दिनांक : 04/12/12

सदस्य सचिव,
राजस्थान राज्य प्रदूषण नियंत्रण मण्डल,
जयपुर।

(ग्रुप एम.यू.आई.डी)

विषय:-सार्वजनिक निर्माण विभाग द्वारा प्रस्तावित परियोजना, डवलपमेन्ट एण्ड ऑपरेशन ऑफ एनएच- 113 टू लेन निम्बाहेड़ा से प्रतापगढ़ खण्ड कि.मी. 5400 से 80000 तक (प्रतापगढ़ जिले में आने वाला खण्ड) के लिये पर्यावरण एवं वन मन्त्रालय, भारत सरकार की अधिसूचना दिनांक 14.03.2006 के अन्तर्गत आयोजित लोक सुनवाई विवरण भिजवाने बाबत।

महोदय,

उपरोक्त विषयान्तर्गत निवेदन है कि सार्वजनिक निर्माण विभाग द्वारा प्रस्तावित परियोजना, डवलपमेन्ट एण्ड ऑपरेशन ऑफ एनएच- 113 टू लेन निम्बाहेड़ा से प्रतापगढ़ खण्ड कि.मी. 5400 से 80000 तक (प्रतापगढ़ जिले में आने वाला खण्ड) हेतु परियोजना से संबंधित लोक सुनवाई दिनांक 22.11.2012 को प्रातः 11.00 बजे, अतिरिक्त जिला कलेक्टर, प्रतापगढ़ की अध्यक्षता में सर्किट हाउस, प्रतापगढ़ के परिसर में आयोजित की गई।

लोक सुनवाई विवरण की हस्ताक्षरित प्रति, फोटो एलबम एवं विडियोग्राफी की सीडी सूचनार्थ एवं आग्रेम कार्यवाही हेतु सादर प्रेषित है।

संलग्न : उरोक्तानुसार (तीन प्रतियाँ)

भवदीय,

क्षेत्रीय अधिकारी

प्रतिलिपि:- लोक सुनवाई का विवरण निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित है।

1 अतिरिक्त जिला कलेक्टर, प्रतापगढ़।

2 अधिशाषी अभियन्ता, सार्वजनिक निर्माण विभाग, एनएच खण्ड, बांसवाड़ा।

क्षेत्रीय अधिकारी

TA / Cashier / Ar I / II / Ec / Da /
Sc / A En N.H. Sub Dn. I / II
Bsw / Kushalgarh
TA OA DA EE

सार्वजनिक निर्माण विभाग द्वारा प्रस्तावित परियोजना, डवलपमेन्ट एण्ड ऑपरेशन ऑफ एनएच- 113 टू लेन निम्बाहेड़ा से प्रतापगढ़ खण्ड कि.मी. 5.400 से 80.000 तक (प्रतापगढ़ जिले में आने वाला खण्ड) के लिये पर्यावरण एवं वन मन्त्रालय, भारत सरकार की अधिसूचना दिनांक 14.09.2006 के अन्तर्गत आयोजित

लोक सुनवाई दिनांक 22.11.2012 का कार्यवृत्त (मिनिट्स)

वन एवं पर्यावरण मन्त्रालय भारत सरकार द्वारा जारी पर्यावरणीय प्रभाव आंकलन अधिसूचना (EIA Notification) दिनांक 14.09.2006 के अन्तर्गत जिला कलेक्टर, प्रतापगढ़ के पत्र क्रमांक न्याय/ज.सुं./2012/4841-46 दिनांक 08.10.2012 एवम् क्षेत्रीय कार्यालय राजस्थान राज्य प्रदूषण नियंत्रण मण्डल, चित्तौड़गढ़ के पत्रांक आरपीसीबी/आर.ओ./चित्तौड़/1187-90 दिनांक 15.10.2012 की अनुपालना में सार्वजनिक निर्माण विभाग द्वारा प्रस्तावित परियोजना, डवलपमेन्ट एण्ड ऑपरेशन ऑफ एनएच- 113 टू लेन निम्बाहेड़ा से प्रतापगढ़ खण्ड कि.मी. 5.400 से 80.000 तक (प्रतापगढ़ जिले में आने वाला खण्ड) हेतु परियोजना से संबंधित लोक सुनवाई दिनांक 22.11.2012 को प्रातः 11.00 बजे, अतिरिक्त जिला कलेक्टर, प्रतापगढ़ की अध्यक्षता में सर्किट हाउस, प्रतापगढ़ के परिसर में आयोजित की गई।

लोक सुनवाई में उपस्थित व्यक्तियों का विवरण मय हस्ताक्षर परिशिष्ट-अ पर संलग्न हैं। लोक सुनवाई बाबत विज्ञापित दिनांक 16.10.2012 को दैनिक भास्कर एवं राजस्थान पत्रिका में प्रकाशित करवा दी गयी थी जिसकी फोटो प्रति परिशिष्ट-ब पर संलग्न हैं।

लोक सुनवाई की कार्यवाही प्रारम्भ करते हुये श्री के.सी. गुप्ता, क्षेत्रीय अधिकारी, राजस्थान राज्य प्रदूषण नियंत्रण मण्डल, चित्तौड़गढ़ ने सभी आगन्तुकों का स्वागत किया एवं वन एवं पर्यावरण मन्त्रालय, भारत सरकार द्वारा जारी अधिसूचना दिनांक 14.09.2006 के अन्तर्गत लोक सुनवाई की आवश्यकता/प्रक्रिया के बारे में अवगत करवाया तथा अध्यक्ष महोदय की अनुमति से सार्वजनिक निर्माण विभाग के प्रतिनिधि को प्रस्तावित परियोजना के संबंध में विस्तृत रूप से प्रस्तुतीकरण हेतु आमंत्रित किया।

तत्पश्चात परियोजना के कन्सलटेन्ट मै. थीम इंजिनियरिंग सर्विसेज प्रा. लि. के प्रतिनिधि श्री एम.सी. पांड्या द्वारा प्रस्तुतीकरण दिया गया। प्रस्तावित सड़क योजना राष्ट्रीय राजमार्ग संख्या 113 (निम्बाहेड़ा-दाहोद) निम्बाहेड़ा से प्रारम्भ होकर प्रतापगढ़ तक है। प्रस्तावित सड़क योजना में राष्ट्रीय राजमार्ग संख्या 113 की वर्तमान लम्बाई 74.600 कि.मी. है। राष्ट्रीय राजमार्ग संख्या 113 की प्रस्तावित लम्बाई 72.915 कि.मी. है। प्रस्तावित सड़क योजना के अन्तर्गत वर्तमान राष्ट्रीय राजमार्ग संख्या 113 को 2 लेन से 2 लेन विथ ग्रैनुलर सोल्डर में परिवर्तित किया जायेगा। प्रस्तावित सड़क परियोजना राजस्थान के दो जिलों क्रमशः चित्तौड़गढ़ एवं प्रतापगढ़ से होकर गुजर रही है। परियोजना की कुल लागत रु0 164.51 करोड़ है। पर्यावरण प्रबन्धन लागत लगभग रु0 1.4 करोड़ है। पुनर्स्थापना एवं पुनर्वास लागत लगभग रु0 16.20 करोड़ है।

प्रतापगढ़ जिले के अन्तर्गत प्रस्तावित सड़क योजना में आने वाले गांव :

बसेड़ा, खेड़ी आर्यनगर, कारुण्डा, सेमरथली, सेमरड़ा, बडेखन, छोटीसादड़ी, गोमाना, चौहान

क्षेत्रीय अधिकारी

रा.स. नि.म. चित्तौड़गढ़

अतिरिक्त जिला कलेक्टर
प्रतापगढ़ (राज.)

खेड़ा, बरखटी, धामनिया, बरखेड़ा, नरवल खेड़ा, जाखमिया, धूलकोट, अम्बावली, कीटखेड़ा, बरोल, सियाखेड़ी, सेवरा, तलाया, हनुमान चौराहा, खेड़ा नरसिंह माता, बावड़ीखेड़ा, महूड़ीखेड़ा, भगवानपुरा, धमोत्तर, कुल्मीपुरा, टाडा, सिद्धपुरा, गोपालपुरा, अम्बामाता, बमोत्तर, बगवांस, रघुनाथपुरा, प्रतापगढ़।

वायु की गुणवत्ता : वायु की गुणवत्ता की जाँच अप्रैल से जून 2012 के मध्य छोटीसादड़ी (कि.मी. 31.000) धमोत्तर (कि.मी. 67.000) व प्रतापगढ़ (कि.मी. 72.000) पर की गई थी। PM₁₀ का औसत 78 से 86 माइक्रोग्राम प्रति क्यूबिक मीटर PM_{2.5} का औसत 4 से 48 माइक्रोग्राम प्रति क्यूबिक मीटर एवं NO₂ का औसत 14 से 21 माइक्रोग्राम प्रति क्यूबिक मीटर, SO₂ का औसत 8 से 13 माइक्रोग्राम प्रति क्यूबिक मीटर व कार्बन मोनो आक्साईड की मात्रा निर्धारित औसत मानको से कम पायी गई।

ध्वनि गुणवत्ता : ध्वनि की गुणवत्ता की जाँच छोटीसादड़ी (कि.मी. 31.000) धमोत्तर (कि.मी. 67.000) व प्रतापगढ़ (कि.मी. 72.000) पर की गई। दिन के समय ध्वनि गुणवत्ता 53.7 से 62.7 dB व रात्रि के समय 46.7 से 54.1 dB पायी गई। जो निर्धारित मापदण्डों की सीमा के अन्दर हैं। प्रस्तावित सड़क के क्रियान्वित होने पर इसके ओर कम होने की संभावना है।

जल की गुणवत्ता : जल की गुणवत्ता की जाँच छोटीसादड़ी (कि.मी. 31.000) धमोत्तर (कि.मी. 67.000) व प्रतापगढ़ (कि.मी. 72.000) पर की गई। पानी की pH 7.16 से 7.18, कुल कठोरता 112 से 479 mg/l, TDS 268 से 876 mg/l, क्लोराइड 34 से 198 mg/l, व क्षारीयता 81 से 277 mg/l, पायी गई।

पर्यावरणीय प्रभाव व उनका निराकरण वायु प्रवेशिका

प्रभाव

निर्माण स्थलों, खुदाई स्थलों व पत्थर पिसाई स्थलों से धूलीय कणों का वायु में मिलना, ढुलाई वाहनों, होटमिक्स प्लान्ट्स व सड़क निर्माण में काम आने वाली मशीनों से वायु प्रदूषण।

निराकरण उपाय

धूल कणों को रोकने के लिये निर्माण व खुदाई स्थलों पर पानी का नियमित छिड़काव।

निर्माण सामग्री की ढुलाई ढक कर करना व पानी छिड़काव के बाद करना।

निर्माण सामग्री का परिवहन पक्के रास्तों से करना।

सड़क निर्माण में कम प्रदूषण करने वाली नई तकनीक की मशीनों व वाहनों का उपयोग।

सड़क के दोनों तरफ लम्बे पत्ते वाले पेड़ लगाना।

होट मिक्स प्लांट को आबादी व संवेदनशील स्थानों से लगभग 500 मी. दूरी पर लगाना।


ध्वनि पर्यावरण


प्रभाव

सड़क निर्माण सामग्री की ढुलाई व निर्माण कार्यों के कारण ध्वनि का स्तर बढ़ना, क्रशिंग प्रक्रियाओं के कारण शोर व कम्पन्न का उत्पन्न होना, सड़क निर्माण के दौरान यातायात की गति का धीमा होना व इससे ज्यादा शोर का उत्पन्न होना।

निराकरण उपाय

ध्वनि का स्तर कम करने हेतु कम शोर करने वाली मशीनों का उपयोग तथा इनका समय-समय पर रख-रखाव करना, सड़क निर्माण के दौरान ट्रेफिक जाम को डायवर्जन के द्वारा दूर करना, शोर गुल वाले वातावरण में काम करने वाले कर्मचारियों का कार्य समय ध्वनि के अनुसार निर्धारित करना जैसे कि 85 डेसीबल शोर में अधिकतम 8 घंटे, शैक्षणिक


क्षेत्रीय अधिकारी
रा.प्र.नि.मं. चित्तौड़गढ़


अतिरिक्त जिला कलेक्टर
प्रतापगढ़ (राज.)

संस्थाओं व अस्पतालों के निकट पेड़-पौधों की हरी पट्टी लगवाना, शोर उत्पन्न करने वाली मशीनों को ध्वनि अवरोधकों से ढकना ।

जल पर्यावरण

प्रभाव

सड़क निर्माण गतिविधियों के कारण सतही जल के प्राकृतिक बहाव में बदलाव ।
सड़क निर्माण में जलदोहन के कारण स्थानीय जल स्रोतों के स्तर में कमी, वाहन सर्विस स्टेशनों के कारण सतही जल स्रोतों का दूषित होना ।

निराकरण उपाय

निर्माण कार्य के दौरान जल स्रोतों के ऊपर सिल्ट फेन्सिंग लगाना ।
जल स्रोतों के निकट ठोस अपशिष्टों के डालने पर रोक ।
श्रमिक शिविर की स्थापना स्थानीय जल स्रोतों व आबादी क्षेत्रों से दूर करना ।
श्रमिक शिविर के पास चलते फिरते शौचालयों की व्यवस्था करना ।
सड़क निर्माण में रोड़ी व मिट्टी बिछाने का कार्य बरसात के मौसम में करना जिससे जल की आवश्यकता कम हो ।
जल भराव की समस्या के निराकरण के लिये उचित स्थानों पर पुलिया (कलवर्ट्स) का निर्माण ।

भूमि पर्यावरण

प्रभाव

अधिग्रहित भूमि की ऊपरी उपजाऊ मिट्टी का ह्रास ।
मिट्टी खुदाई वाले स्थानों पर मिट्टी का कटाव व ह्रास ।
निर्माण सामग्री से उत्पन्न ठोस कचरे के कारण भूमि ह्रास ।

निराकरण उपाय

सड़क निर्माण क्षेत्र में आने वाली उपजाऊ भूमि की ऊपरी सतह को हटाकर इसका उपयोग सड़क की मध्य पट्टिका व ढलान पर पेड़-पौधे लगाने के लिये करना ।
मिट्टी खुदाई वाले स्थानों का चयन कृषि भूमि से दूर बेकार पड़ी भूमि पर करना ।
मिट्टी खुदाई वाले स्थानों को उपयोग के बाद समतल करना या बरसात के पानी को इकट्ठा करने में उपयोग करना ।

जैविक पर्यावरण

प्रभाव

सड़क चौड़ीकरण के कारण पेड़-पौधों का ह्रास ।
वन भूमि का प्रत्यार्पण व इसके कारण आर्थिक व औषधीय पादपों का ह्रास ।
वन्य जीवों के विचरण में बाधा उत्पन्न होना ।
सड़क निर्माण के दौरान प्रतापगढ़ जिले में लगभग 2130 पेड़ प्रभावित होंगे ।

निराकरण उपाय

नये वृक्षों का आरोपण आई.आर.सी. के नियमानुसार करना ।
लगाये जाने वाले पेड़-पौधों का चयन इस प्रकार करना कि इनसे छाया, आर्थिक लाभ व औषधियाँ मिल सकें ।
लगाये जाने वाले पेड़-पौधों की जीवित रहने की उचित दर बनाये रखना ।

प्रभाव

प्रस्तावित सड़क चौड़ीकरण के कारण कुछ सम्पत्तियों का नुकसान ।
तेज यातायात व रोड़ डिवाइडर के कारण स्थानीय यातायात में बाधा

निराकरण उपाय

प्रभावित होने वाले लोगों को नियमानुसार मुआवजा ।
स्थानीय लोगों को सड़क निर्माण में रोजगार का प्रस्ताव ।
तेज यातायात व रोड़ डिवाइडर के कारण स्थानीय यातायात में बाधा को दूर करने हेतु
अन्डर पास व फ्लाई ओवर का निर्माण करना ।

पब्लिक स्वास्थ्य व सुरक्षा

रोड़ निर्माण कर्मियों की सुरक्षा

रोड़ निर्माण कर्मियों को सुरक्षा साधन जैसे मास्क, ऐनक, हाथों के दस्ताने, गमबूट इत्यादि
उपलब्ध करवाना । समय-समय पर सुरक्षा प्रशिक्षण देना ।
श्रमिक शिविर के पास प्राथमिक स्वास्थ्य केन्द्रों की व्यवस्था करना ।

पब्लिक सुरक्षा

निर्माण कार्य प्रारंभ करने से पूर्व आगे पीछे निर्माण संकेत बोर्ड लगवाना ।
रोड़ निर्माण के बाद तीव्र घुमावों में दुर्घटना बाधा पट्टी लगाना ।
स्कूल व अस्पताल के नजदीक गति अवरोधक व संकेत बोर्ड लगवाना ।
स्थानीय वाहनों को गुजरने के लिये वाहन अन्डर पास बनवाना ।
पैदल यात्री व पशुओं के लिये अन्डर पास बनवाना ।
शहरी इलाकों में पैदल यात्री पट्टी बनवाना । एक निश्चित अंतराल पर एम्बुलेंस उपलब्ध
करवाना ।


उक्त परियोजना के सम्बन्ध में श्री ए.एस. पाण्डे, महाप्रबन्धक, चेतक एन्टरप्राइजेज
(सड़क निर्माता कम्पनी) ने अवगत करवाया कि उक्त परियोजना का कार्य दो वर्ष में पूर्ण
कर लिया जावेगा। यह परियोजना डिजाइन बिल्ट फाईनेन्स ऑपरेट एण्ड ट्रान्सफर
(डीबीएफओटी) पर आधारित है तथा इसमें सरकार का कोई भी पैसा नहीं लगेगा। उक्त
सड़क परियोजना से क्षेत्र का विकास होगा, साथ ही सरकार को 19 वर्षों तक लगभग 22
करोड़ रु. प्रति वर्ष टोल टेक्स के रूप में राजस्व की प्राप्ति होगी। उक्त सड़क का
रख-रखाव का कार्य भी चेतक एन्टरप्राइजेज द्वारा ही किया जावेगा। इसके साथ ही साथ
यहां के लोगों के रोजगार एवं आय में भी वृद्धि होगी।

तत्पश्चात अतिरिक्त जिला कलक्टर, प्रतापगढ़ ने लोक सुनवाई में उपस्थित लोगों
को प्रस्तावित परियोजना बाबत सुझाव/आक्षेप/प्रश्न/शिकायत/जानकारी हेतु आमंत्रित
किया।

उपस्थित जनता में से प्राप्त सुझाव/आक्षेप/प्रश्न/शिकायत/जानकारी का विवरण
इस प्रकार है :-

1. श्री महेश शर्मा, पत्रकार

इन्होंने इस परियोजना के लिए खुशी जाहिर करते हुए विचार व्यक्त किये
कि प्रस्तावित सड़क परियोजना से क्षेत्र का विकास होगा तथा लोगों को रोजगार
मिलेगा। इन्होंने जानकारी चाही कि प्रस्तावित सड़क से धमोत्तर तालाब में जल की
आवक पर कोई असर होगा या नहीं ?


क्षेत्रीय अधिकारी
रा.प्र.नि.मं. चित्तौड़गढ़


अतिरिक्त जिला कलक्टर
प्रतापगढ़ (राज.)

2. श्री सुन्दर लाल, तहसीलदार, छोटीसादड़ी

इन्होंने जानना चाहा कि प्रस्तावित सड़क की मध्य रेखा (सेन्टर लाईन) कहां-कहां से गुजर रही है ? इन्होंने यह भी जानकारी चाही कि कारुण्डा चौराहा पर अम्बामाता का मन्दिर, रोड़ के पास ही स्थित है तो वह आरओडब्ल्यू में आ रहा है या नहीं ?

3. श्री राजेश पालीवाल, प्रतापगढ़

इन्होंने जानना चाहा कि इस रोड़ की सिटी एरिया में रोड़ की चौड़ाई कितनी होगी ? इन्होंने जानना चाहा कि इसमें अवाप्ताधीन भूमि का मुआवजा किस प्रकार से दिया जायेगा ?

तत्पश्चात् अतिरिक्त जिला कलेक्टर ने लोक सुनवाई के दौरान प्राप्त उपरोक्त सुझावों/आक्षेपों/शिकायतों का जवाब देने हेतु सार्वजनिक निर्माण विभाग के प्रतिनिधि को आमंत्रित किया।

सार्वजनिक निर्माण विभाग के प्रतिनिधि श्री एम.सी. पण्डया, कन्सलटेंट द्वारा बताया गया कि इस रोड़ की चौड़ाई (आरओडब्ल्यू) ग्रामीण क्षेत्र में 60 मीटर तथा शहरी क्षेत्र में 45 मीटर होगी। प्रस्तावित सड़क 2 लेन विथ ग्रेनुलर सोल्डर होगा। यहां के स्थानीय निवासियों को योग्यता के आधार पर रोजगार दिया जायेगा। इस प्रोजेक्ट में अवाप्ति में जा रही, भूमि के मुआवजे का निर्धारण सक्षम प्राधिकारी द्वारा नियमानुसार तय किया जाकर भूमिधारियों को इसका भुगतान किया जायेगा। इसके बाद ही आगे की कार्यवाही की जावेगी। धमोत्तर तालाब में पानी की आवक पर कोई प्रभाव नहीं पड़ेगा।

कारुण्डा चौराहा स्थित अम्बामाता मंदिर के बारे में सार्वजनिक निर्माण विभाग के सहायक अभियन्ता श्री के.के. शर्मा द्वारा बताया गया कि उक्त मंदिर आरओडब्ल्यू में नहीं आता है। प्रस्तावित सड़क की सेन्टर लाईन के बारे में उन्होंने अवगत करवाया कि इसका निर्धारण हो गया है शीघ्र ही मौके पर भी इसका सीमांकन कर दिया जावेगा। धमोत्तर तालाब में पानी की आवक पर कोई प्रभाव नहीं पड़ेगा।

तत्पश्चात् लोक सुनवाई के अध्यक्ष, श्री जी.एस. मीणा, अतिरिक्त जिला कलेक्टर, प्रतापगढ़ ने लोगों को लोक सुनवाई की कार्यवाही का सारांश बताते हुए अवगत करवाया कि लोक सुनवाई के दौरान प्राप्त सभी आक्षेपों/सुझावों/शिकायतों को वन एवं पर्यावरण मंत्रालय भारत सरकार को यथावत प्रेषित कर दिया जावेगा।

लोक सुनवाई के दौरान लिखित में कोई प्रतिवेदन/आक्षेप प्राप्त नहीं हुआ।

अन्त में अतिरिक्त जिला कलेक्टर, प्रतापगढ़ श्री जी.एस. मीणा ने लोक सुनवाई में उपस्थित जनसमूह का आभार प्रकट किया एवं लोक सुनवाई का समापन किया।

(के.सी. गुप्ता)

क्षेत्रीय अधिकारी,

राजस्थान राज्य निर्माण विभाग, चित्तौड़गढ़

अतिरिक्त जिला कलेक्टर
(जी.एस. मीणा)
प्रतापगढ़

पर्यावरणीय स्वीकृति हेतु जन सुनवाई

सावेजनिक निमोण विभाग द्वारा प्रस्तावित परियोजना, डबलपमेन्ट एण्ड ऑपरेशन ऑफ एनएच- 113 टू लेन निम्बाहेड़ा से प्रतापगढ़ खण्ड कि.मी. 5.400 से 80.000 तक (प्रतापगढ़ जिले में आने वाला खण्ड) हेतु पर्यावरणीय स्वीकृति बाबत जन सुनवाई दिनांक 22.11.2012 को समय प्रातः 11:00 बजे, स्थान- सर्किट हाउस, जिला प्रतापगढ़ (राज.) में उपस्थित अधिकारी एवं नागरिकगण :-

क्रमांक	नाम	पता/विभाग का नाम	हस्ताक्षर
1	श्री. जी.एस मीणा	अति. जिला कलेक्टर, प्रतापगढ़	
2	श्री. के.सी गुप्ता	क्षेत्रीय अधिकारी, रा.प्र.नि.म, चित्तौड़गढ़	
3	सुरेश कुमार	उपखण्ड अधिकारी, प्रतापगढ़	
4	इमानमोह रवरी	उपख. क्षेत्री सादरी	
5	जे. आर. जीनगर	अधिक्षापी अभिनन्ता. सा. नि. वि. N.H. 20एण्ड व्यासवाडी	
6	A.S. Pandey	G.M. Chatak Enkpur	
7	Kul Bhaskar Bina	DGM (Const)	
8	Ma Pandey	Chhatrapati Sagarpur T.E.S	
9	Dr. Rajesh Singh	Env. Expert, T.E.S Jampur	
10	Kamlesh mena	Patwardi Gamanag (Chhatrapati)	
11	के. के. शर्मा	A.E.M. प.स. प्रतापगढ़	
12	सुन्दरलाल सखोडा	गृहीतक रवरी सादरी	
13	मजुलकर उमर	पटवारी जे.स.	
14	दीपक कुमार	पटवारी जे.स.	
15	रमेश चडपानीवाल	पटवारी जे.स.	
16	Sayra	Chhatrapati	
17	Dharmendra Paliwal	Sagar Bazar Pocharigada	
18	शिवप्रसाद शर्मा	गई रानी मंडी	
19	शिवप्रसाद शर्मा	बस	
20	Mahesh	पटवारी जे.स.	
21	Manmendra	Chhatrapati Sagar	

[illegible]

नोट :- 1. आवेदन पत्र शुल्क रु. 300/- का डिमाण्ड डू।

स्वीकार किये जायेंगे।

2. अभ्यर्थी साक्षात्कार हेतु निर्धारित तिथि एवं समय पर सम्बन्धित संस्थान (जहां प्रवेश चाहता है) में मूल दस्तावेज मय, राज्य सरकार द्वारा निर्धारित शुल्क के साथ उपस्थित होंगे।
3. प्रवेश हेतु विवरणिका एवं आवेदन पत्र विभागीय वेबसाइट पर उपलब्ध है।

निदेशक, प्राविधिक शिक्षा



क्षेत्रीय कार्यालय

01472-250077

राजस्थान राज्य प्रदूषण नियंत्रण मण्डल,

प्लॉट नम्बर 12, स्कीम नं.-6, कुम्भा नगर, चित्तौड़गढ़

क्रमांक:राप्रनिम/क्षे.का चित्तौड़/पीआई/1187

दिनांक: 15.10.2012

पर्यावरणीय स्वीकृति हेतु लोक सुनवाई के लिए आम सूचना

1. सर्वसाधारण को सूचित किया जाता है कि अधीक्षण अभियन्ता, सार्वजनिक निर्माण विभाग सर्किल कोटा द्वारा प्रस्तावित परियोजना, डवलपमेन्ट एण्ड ऑपरेशन ऑफ एनएच-113 टू लेन निम्बाहेड़ा से प्रतापगढ़ खण्ड किसी 5.400 से 80.000 तक [प्रतापगढ़ जिले में स्थित वाला खण्ड] के लिए पर्यावरणीय स्वीकृति हेतु प्रस्ताव राजस्थान राज्य प्रदूषण नियंत्रण मण्डल [यहां तथा बाद में मण्डल के नाम से अभिलिखित] के समक्ष प्रस्तुत किए गए हैं।

2. और चूंकि अधीक्षण अभियन्ता, सार्वजनिक निर्माण विभाग, सर्किल [राष्ट्रीय राजमार्ग] कोटा ने मण्डल को परियोजना की पर्यावरणीय स्वीकृति के लिए आवेदन किया है।

3. और चूंकि मण्डल को उक्त परियोजना हेतु भारत सरकार के वन एवं पर्यावरण मंत्रालय, नई दिल्ली द्वारा जारी अधिसूचना दिनांक 14.09.2006 के अनुसार लोक जन सुनवाई हेतु इस आशय की सूचना जारी कर 30 दिवस का नोटिस दिया जाना आवश्यक है।

4. उक्त परियोजना से संबंधित संक्षिप्त अभिलेख [कार्यकारी सारांश] निम्नांकित कार्यालयों पर उपलब्ध है:-

- a जिला कलक्टर प्रतापगढ़। b क्षेत्रीय अधिकारी, राजस्थान राज्य प्रदूषण नियंत्रण मण्डल, प्लॉट नम्बर 12, स्कीम नं.-6 कुम्भा नगर, चित्तौड़गढ़। c राजस्थान राज्य प्रदूषण नियंत्रण मण्डल, मुख्यालय, 4 संस्थानिक क्षेत्र, झालाना डूंगरी, जयपुर। d पर्यावरण विभाग, राजस्थान सरकार, शासन सचिवालय, जयपुर। e क्षेत्रीय कार्यालय, वन एवं पर्यावरण मंत्रालय, भारत सरकार, लखनऊ। f महाप्रबंधक, जिला उद्योग केन्द्र, प्रतापगढ़। g कार्यकारी अधिकारी, जिला परिषद, प्रतापगढ़। h उपखण्ड अधिकारी, प्रतापगढ़, जिला प्रतापगढ़।

अतः समस्त संबंधित को इस नोटिस के माध्यम से एतद् द्वारा सूचित किया जाता है कि वे उक्त परियोजना की पर्यावरणीय स्वीकृति से संबंधित लोक सुनवाई हेतु दिनांक 22.11.2012, प्रातः 11.00 बजे, सर्किट हाउस, प्रतापगढ़, जिला प्रतापगढ़ में उपस्थित होकर अपने आक्षेप प्रस्तुत कर सकते हैं। किसी भी संबंधित व्यक्ति द्वारा मौखिक/लिखित सुझाव भी इस सूचना के प्रकाशन की तिथि से 30 दिवस के अन्दर, राजस्थान राज्य प्रदूषण नियंत्रण मण्डल, प्लॉट नम्बर 12, स्कीम नं.-6 कुम्भा नगर, चित्तौड़गढ़ में दिए जा सकते हैं।

क्षेत्रीय अधिकारी

राजस्थान सरकार

प्राविधिक शिक्षा निदेशालय, राजस्थान, जोधपुर

:- प्रवेश विज्ञप्ति :-

द्वितीय वर्ष डिप्लोमा इंजीनियरिंग पाठ्यक्रमों में (सत्र 2012-13)

पार्श्व प्रवेश (Lateral Entry) प्रक्रिया पश्चात् रिक्त रही सीटों पर संस्थान स्तर पर प्रवेश की अवधि बढ़ाने के सम्बन्ध में

राज्य के समस्त राजकीय एवं निजी पॉलिटेक्निक महाविद्यालयों के द्वितीय वर्ष डिप्लोमा इंजीनियरिंग पाठ्यक्रमों में पार्श्व प्रवेश (Lateral Entry) सीधे प्रवेश प्रक्रिया पश्चात् रिक्त रहे स्थानों पर संस्थान स्तर पर किये जाने हेतु प्रवेश के इच्छुक अभ्यर्थियों से आवेदन-पत्र आमंत्रित करने के लिए निदेशालय की वेबसाइट

क्षेत्रीय अधिकारी





Chapter – 8

PROJECT BENEFITS

CHAPTER 8

PROJECT BENEFITS

8.1 GENERAL

Highways projects generally promote access to markets, materials and opportunities by facilitating movement of persons and goods and improve earning and thereby level of living. This in turn enhances the demand for transport. This two-way interactions works through a host of inter-sectoral forward and backward linkages effects and dynamic externalities, tends to relocate industries, services and labour thus help the shape the economic geography of the region.

The ultimate aim of the developmental activities, such as widening of NH-113 and 79 is to promote social welfare of the various districts and villages which reside along the road stretch. The developments of above widening project play a significant roll in changing the socio-economic condition of the living of people of a region through dynamic externalities that such development often generates.

The benefits of proposed widening of NH –113 and 79 may also be seen from a different angle, viz., the local benefit and the wider regional or national level benefit. The entire regional and national economy lying beyond this neighborhood should also be benefited from the development such effect may be called the regional or national level benefits. Further the benefit may be direct or indirect in nature.

All these should have a bearing on the level of well being of the households, although some of them may not themselves necessarily use more of the highway facility created. These would in turn lead to changes in the level of well-being and human development, through their benefit on consumption level, educational attainment, health status etc.

8.1.1 Tourism Development

India is a multi-destination country with a variety of tourist attractions and facilities. All in all, India has in abundance what a tourist desires. The tourist places are accessed and reached also serves the comfort travel benefits to the people. Rajasthan is an important tourist destination in India and the proposed widening of the road will give important connection to other places of Rajasthan. National Highway 113 (NH 113) is a National Highway in western India. NH-113 connects Nimbahera in Rajasthan with Dahod, in Gujarat. It runs for a distance of 240 km (150 mi), of which 200 km (120 mi) is in Rajasthan and 40 km (25 mi) is in Gujarat. National Highway 79 (NH 79) is a National Highway that links Ajmer in Rajasthan and Dhar in Madhya Pradesh. The highway is 500 km (310 mi) long, of which 220 km (140 mi) is in Rajasthan and 280 km (170 mi) is in Madhya Pradesh.

Chittorgarh is an important district of the State having historical importance & flow of tourist traffic is quite substantial. It is situated on the broad gauge railway line of Ajmer – Ratlam section. It is also connected by broad gauge to Udaipur & Kota also. Chittorgarh is also connected on Golden Quadrilateral of NHAI that is Delhi to Bombay. It is also connected on Silcher – Porbandar East – West corridor of National Highway Development Programme. Chittorgarh is also rich in mineral wealth. The abundance of lime stone deposits have generated cement factories at Chittorgarh – Nimbahera – Shambhupura on NH -79. The lime stone deposits in adjoining state Madhya Pradesh have also established the cement factories at Naya Gaon in Neemach District.

It is very important route of Western Madhya Pradesh & life line of Western M.P. Ajmer is the one end of this national highway and other end is Ghatabillod Dist Dhar(M.P.) which is a small town 40 km (25 mi) away from Indore and approx. 10 km (6.2 mi) from Mhow. It covers many important industrial, commercial & tourist places i.e. Ajmer(religious place), Nasirabad (Army cantt.), Bhilwara (known for industries), Chittorgarh (Famous tourist place & cement Industries), Nimbahera (cement industries & stone), Nimach (Cement Industries, Agriculture Business, Major Opium crop center & Govt. Opium Factory, Major CRPF Center), Mandsour(known for Pashupatinath temple), Ratlam (Division & Important center of Western Railway), Indore (Commercial Capital

of M.P.) and Mhow (A major Army Head Quarter). Now Four Lane road construction is in full swing.

Economic Development

Highways Development program can contribute to economic development by encouraging the attraction of businesses to sites equipped with good access and by improving the travel efficiencies of existing businesses and to start a new avenues. They also help for:

- The development of new project sites,
- The development of industrial parks,
- Infrastructure projects and
- Development of IT parks,

8.2 EMPLOYMENT OPPORTUNITY

Highway development project serves as an important employment generator and provide employment opportunity during construction period. In the operation stage it provides employment to local people.

8.3 REDUCTIONS IN ACCIDENTS, MORBIDITY AND MORTALITY

Development of projects highway NH-113 and 79 will reduce the number of accidents through the following tasks.

- Improved crossing and alternatives access routes by use of signage, junctions, & alternate arrangement for local traffic circulation has been provided.
- Installation of proper road safety system through signage, barricades, crash barriers, edge posts / parapets will add to be safety of the vehicular traffic on the stretch of the road.
- Sharp turns and curves of the roads have been realigned to improve public safety in operational stage.
- Proper lighting/ illumination will be provided in order to avoid accidents during night as well as adverse climatologically conditions.
- Reduces loss of life by avoiding head to head direct collision and also reduces damages to vehicles etc.

8.4 REDUCTIONS IN OPERATION COST

Vehicle Operating Cost (VOC) will be reduced when a road is improved. Fuel consumption, wear and tear of tyres, suspension will be benefited when a geometric design is improved and the road surface is made more even. The savings are perceived by the road user in the form of lower expenditure, VOC consist of the following components:

- Fuel Consumption;
- Lubricating oil consumption;
- Spare part consumption;
- Type consumption and
- Vehicle depreciation

8.5 INDIRECT BENEFITS

In addition to direct impacts, a number indirect benefit attributed to highways project. Lowering transportation cost for users and improving access to goods and services enables new and increased economic and social activity. Over time individuals, households and firms adjusts to take the advantage of those benefits, leading to several indirect impacts. These indirect impacts include changes in Landuse and development, changes in decision to locate houses and business in areas where houses and land are less expensive or more desirable, and changes in warehouse and delivery procedure for businesses in order to take advantage of improved speed and reliability in the transportation system.

These impacts then lead to increased property values, increased productivity, employment and economic growth.

The indirect benefit of proposed widening would work through the dynamic developmental externalities generated through the forward and backward linkages. The change in Landuse pattern in the areas that are greater connectivity due the highway, since there will be a change in the patterns of settlement, agricultural land use and location of industries, trading and other services and non-farm unorganized sector activities. All the above would reflect in the changes in the pattern of economic activities, income generation, price evolution, employment condition and ground rent prevailing in the connected area.

A new Land use pattern may in turn induce greater accessibility to job market, health and educational facilities etc. attract investment for development of feeder roads, power distribution networks, telecommunication facilities and other modes of connectivity among other, leading to a greater access to of the local people to markets and infrastructure facilities.

8.5.1 Environmental Benefits

Reductions in adverse environmental impacts of transportations – Reduced emissions, noise and other impacts are also the direct benefits of highways projects. However, these benefits are difficult to quantify and value them; as a result, they are less often included in benefit cost analysis of transportation investment.

Chapter – 9

ENVIRONMENT MANAGEMENT PLAN

CHAPTER 9

ENVIRONMENT MANAGEMENT PLAN

9.1 ENVIRONNEMENTAL MANAGEMENT

The EMP report is prepared to facilitate the Contractor, PWD, Consultants and their personnel to incorporate the necessary environmental input during construction and operational phases of the project. This document will assist the Contractor to appreciate the environmental impacts and the necessary mitigation measures required to minimize those impacts as well as to enhance the positive factors with suitable environment enhancement measures.

9.2 OBJECTIVES OF EMP

The Environmental Management Plan (EMP) consists of a set of mitigation, monitoring and institutional measures to be taken during the design, construction and operational phases of the project to eliminate adverse environmental impacts, to offset them, or to reduce them to acceptable levels. The main aim of the Environmental Management Plan is to ensure that the various adverse impacts are mitigated and the positive impacts are enhanced.

Table 5.8 and 5.9 tabulates the measures identified for all phases i.e., the pre-construction, construction and operational phases. The table identifies the nature of potential environmental impacts, the measures, which will be taken, the time frame in which they are taken, the implementing agency, responsible organization, and, where appropriate, the contractual clause referring to the measure.

1. Some of the mitigation measures are preventive in nature, while others include additional measures in terms of environmental conservation and involve physical and constructional work.
2. The contract document refers to the followings: Ministry of Road Transport and Highway, Government of India, Specification for Road and Bridges Works, Specific and General Conditions of Contract.
3. Unless other wise stated, the project site covers area beyond the corridor of impact and / or the RoW such as borrow areas, access roads, service roads and equipment storage sites (MOST: 306.3)

4. Time frame refers to the duration or instant of time when mitigation measures will be taken.

The Environmental Management Plan describes the practical means to ensure effective implementation of the mitigation measures recommended for the potential environmental impacts identified during the environment impact assessment exercise. The detailed action plan during different phases of the project, i.e. pre-construction, construction and operation period is presented below.

9.2.1 Pre-Construction Stage

9.2.1.1 Pre-construction activities by PIU/ Independent consultant

Prior to the contractor mobilization, the PIU will ensure that an encumbrance free Corridor of Impact is handed over to enable the start of construction. Clearance involves the following activities:

- Removal and felling of trees is very minimal,
- Relocation of common property resources and community assets like telephone poles, electric poles and hand pumps will be impacted.
- Formal arrangements for maintenance of enhancement sites. This includes plantation of trees and barricades along the road.
- Modification (if any), of the contract documents by the Engineer of the Independent Consultant.

9.2.1.2 Pre-construction activities by contractor

- Pre-construction stage involves mobilization of the contractor and the activities undertaken by the contractor pertaining to the planning of logistics and site preparation necessary for commencing construction activities. The activities include:
- Joint field verification of EMP by the Environment Specialist of the Independent consultant and contractor.
- Identification and selection of material sources (quarry and borrow material, water, sand etc).
- Procurement of construction equipment / machinery such as crushers, hot mix plants, batching plants and other construction equipment and machinery.
- Selection, design and layout of construction areas, hot mix and batching plants, labour camps etc.

- Apply for and obtain all the necessary clearances/ NOC, s/ consents from the agencies concerned.
- Planning traffic diversions and detours including arrangements for temporary land acquisition.

9.2.2 Construction Stage

9.2.2.1 Construction activities by the contractor

- Construction stage is the most crucial stage in terms of activities that require careful management to avoid environmental impacts.
- There are several other environmental issues that have been addressed as part of good engineering practices, the costs for which have been accounted for in the Engineering Costs. They include providing roadside drainage, provision of cross drainage structures etc.

9.2.2.2 Construction activities by the PIU/Independent consultants

- The PIU/Independent Consultant shall be involved in the smooth execution of the project and assisting the contractor during this phase. Their work shall include but not limited to:
- Monitoring and guiding the contractor on adopting good environmental and engineering practices.
- Arrangement of plantation through the Forest Department
- Arranging training to the contractor and other stakeholders according to the needs arising.
- Making changes in the design if need so arises.

9.2.3 Operation Stage

The operational stage involves the following activities by PIU

- Monitoring of environmental conditions through approved monitoring agency
- Monitoring of operational performance of the various mitigation/enhancement measures carried out.

9.3 OBJECTIVES AND GENERAL GUIDELINES

Green areas not only improve the floral status, land-use and aesthetic look of an area, but also serve the dual purpose of filtering any fugitive dust from unpaved or open areas, help to abate noise effects through dampening, and replenish oxygen and ameliorate the surrounding temperature. Therefore development of plantation is now a days imperative as a part of development projects.

The main objectives of plantation along the project road and bypasses are:

- a) To reduce impacts of air and dust pollution
- b) To provide shade on hot glaring road surface during summer
- c) To arrest soil erosion at embankment slopes
- d) Beautification of project corridor by planting selected ornamental trees and shrubs
- e) Prevention of glare from headlights of incoming vehicles during night time
- f) To compensate for trees to be felled during construction

Adequate plantation programme along the project road has been planned considering the inadequacy or limitation of space, a simple plantation has been considered along the road stretch in addition to patches of hedges on the earthen shoulder on both side and plantation of hedges in the median. Development of greenbelt will include:

- a) Plantation in the median to enhance the aesthetic look and reduce headlight glare.
- b) Plantation on roadside earthen shoulder on both sides of the road to enhance the aesthetic look and to prevent soil erosion.
- c) Plantation on the slopes along roadsides in certain locations on both sides of the road to enhance the aesthetic look and to prevent soil erosion.
- d) Plantation on either side of the road in the space available for greenbelt.
- e) The following general guidelines and measures have been adopted:
- f) Destruction of existing trees will be minimized.
- g) The plantation of trees will be completed in the construction stage so that substantial growth is achieved when the project is completed.
- h) The plantation programme has been drawn to confirm to natural climatic conditions and adaptability of the species.
- i) The plantation would consist of a mixture of carefully chosen locally available indigenous, fast growing sturdy species of trees, shrubs and herbs having ornamental value and large crown volume to surface area ratio.
- j) Preferential plantation of flowering trees with less timber and fruit value will be carried out. Fruit bearing trees will not be planted (to avoid entry of people into the access-controlled highway for collecting fruits).
- k) Proper drainage system and proper plantation techniques will be adopted.
- l) Plantation in the initial stage of 3 years will be properly maintained and protected by fencing from grazing and felling.

9.3.1 Species Suggested for Plantation

The plant species have been selected based on following criteria

- Indigenous, fast growing, sturdy and perennial having ornamental values, preferably evergreen.
- Growth and morphological characteristics (height, crown and flowering season).
- Other factors like availability of local species, tolerance to pollutants and adverse environmental conditions.
- Adaptability to local climatic conditions and water availability.

The list of plants suggested for plantation along the project road is given in **Annexure 9C**.

9.3.2 Plantation Strategy

The spacing of trees and shrubs and their arrangement in different situations has been done as per IRC: SP – 21, 1979 and IRC: 66 – 1976.

- The median in most of the stretches is 4.5m wide, hedges are to be planted at 3m interval on either side at a distance of 1m from the edge of the median, i.e., in two rows all along the median. However on bridges and flyovers the median will not be planted.
- Along the sides of the proposed road stretches, trees are to be planted. In this space 2 rows of trees are to be planted in staggered manner. The first row is to be planted 3m from the edge and will consist of large and medium size trees alternately at an interval of 7.5m. In the second row, tall conical trees are proposed at 7.5m interval (in a staggered manner from the first row). The space between two rows will be 3m.
- In cases, where the proposed road is on high embankment, the embankment slopes situated on either side of the road will be turfed with grasses.

9.3.3 Technical Specification for Plantation

A. Tree plantation along the roadsides of NH-113&79 and Proposed bypasses

- Rows of large shade trees and middle size trees alternately planted (first row)

Spacing between plants	:	7.5 m
Size of pits	:	90x90x90 cm (for large size trees)
	:	60x60x60 cm (for small size trees)
		Species recommended
No. of plants per km per row	:	133 (approx. 1 tree/7.5m)

Height of plant sapling at the time : Not less than 2m for large trees and not less than 1.3 m for small trees

ii) Rows of tall conical canopy trees (second row)

Row to row distance from the first : 3m (in staggered manner from the first row)

Spacing between plants : 7.5m

Size of pits : 60x60x60cm

Species recommended : List of species provided in Annexure 9B

No. of plants per km per row : 133 (approx. 1 tree/7.5m)

Height of plant sapling at the time : Not less than 2m

It is proposed to use the same species on either side of the road. This will ensure regularly grown avenues of the same form and type. Such avenue plantation will achieve uniform size at about the same time and will give pleasant and consistent avenue appearance.

B. Shrub Plantation along the road median of NH-113 & 79 and bypasses

i) In case of median the width is almost uniform for the entire median which are to be planted (medians on bridges and flyover will not be planted)

Distance from edge of the median : 1m

Spacing between plants : 3.0m

Size of pits : 45 X 45 X 45 cm

No. of plants per km per row : 333 (approx. 1 hedge plant/3

Height of plant sapling at the time : Not less than 45 cm

Age of Plant : Not less than one year

It is proposed to use the same species in the two rows running parallel on the median. This will ensure regularly grown median of the same form and pattern. Such median plantation will achieve uniform size at about the same time and will give pleasant and consistent appearance.

Shrubs, which are suggested on the median provide a strong surface cover, and needs a well-prepared surface. Therefore it is suggested to remove all loose debris, fill up all convexities and concavities by good soil to level the median before planting. To ensure better growth and survival of grasses and shrubs, surface should have sufficient layer of good quality soil (up to 45cm).

C. Precautionary Measures for Roadside Trees and Median Plantation

- Plantation will be done in the monsoon season.
- The height of plant saplings should not be less than specified above and should be in polythene bags, which must be removed at the time of planting.
- All the supplied plants must be planted within three days of removal from nursery beds.
- The contractor will be required to water the plants regularly in non-rainy season and will have to maintain the plantation up to three years.
- Before plantation each plantation pit shall be applied with the following: 2kg of compost manure, bio-fertilizer @1 g/plant, micronutrient @1 g/plant, D.A.P. @2.5 g/plant, insecticide (BHC Powder) @ 5g per pit.

9.3.4 Protection Measures

Brick guard along the two sides of the proposed road shall be provided to protect the plantation. In case the same is not erected by the time of plantation then barbed wire fencing shall have to be provided. Barbed wire fencing around the plantation area will be provided on angle iron will be fixed at a spacing of 5m and 3-strand barbed wire will be stretched.

9.3.5 Turfing of Side Slopes of Road Embankments with Grasses

Grass lines shall be used to provide a strong surface cover at the slope. For the side slopes a well-prepared surface on which the grass is to be planted shall be prepared. To obtain a well spread grass cover, the surface shall not be disturbed in the initial stages of turfing. The grass species recommended for median and for side slopes *Cyanodon dactylon*, *Cyathocline purpurea*, *Desmostachya bipinnata*, *Cenchrus ciliaris* are recommended. However, for side embankment of eroded and dry patches *Aristida hystrix* is recommended. All these species are locally available in the surrounding area of the proposed project Contractor will ensure that the condition of the site is good enough for successful establishment of grasses. They will also supervise all field operations like preparation of surface, sowing of grasses and quality of grass seeds used.

9.4 PREPARING PLANS TO OPERATIONALIZE / IMPLEMENT THE EMP

- These plans should be prepared by the Contractor with the help of the information included in the EMP, standard reference literature on the subject and these notes.

- These plans should be approved by the Supervision Consultants.
- At least, three copies of these plans should be prepared. One copy should be retained by the Contractor, another with the Supervision Consultants and the third should be for the PMT.

These plans should be seen as dynamic documents that will be improved with implementation requirements and experiences. Addendums to these plans should be prepared and approved whenever changes or modifications are required.

9.5 BORROW AREA MANAGEMENT PLAN

The plan should contain an introductory chapter that provides information on (a) the total borrow material requirement for each link and for the contract package as a whole, and (b) the different sources that have been identified along with their specific chainages. For each borrow area identified, the plan should contain a separate section and this should include the following:

- Name of the location.
- Nearest project road chainage
- Name of the owner
- Area involved.
- Borrow material available
- Borrow material proposed to be taken
- Type of material available
- Existing land use
- Land use of the area surrounding the borrow area
- Proposed top soil management
- Schematic map of the borrow area
- Tree-cutting required, if any.
- Arrangement with the owner (agreement with land owner, including the restoration aspects, should be attached as an Annexure)
- Operating practices to be adopted, e.g. slope, depth of cutting and demarcation of boundaries and safety requirements in view of surrounding areas.
- Machinery & equipment to be used in the borrow area
- Access road condition and proposed maintenance
- Photographs depicting the present condition of borrow area & access road.
- Roles, responsibilities and authorities related to implementing the plan
- Closure / completion plan

It is to be noted that paddy fields should not be selected as borrow areas.

In preparing the plan, the relevant MoRT&H specifications should be referred.

9.6 CONSTRUCTION CAMP & WORKFORCE MANAGEMENT PLAN

The plan should contain an introductory chapter that provides information on (1) the number of camps and (2) the proposed activities of the camp vis-à-vis project roads.

For each camp, the plan should contain a separate section and this should include the following:

- Name of the location.
- Nearest project road chainage.
- Name of the owner
- Area involved
- Arrangement with the owner (agreement with land owner, including the restoration aspects, should be attached as an Annexure)
- Existing land use
- Photographs depicting the present condition of the construction camp & access road.
- Land use of the area surrounding the borrow area including a map
- Site layout plan of the construction camp
- Establishment and maintenance of demarcated and labelled different areas within the camp
- Number of trees to be removed, if any, along with compensation measures
- Proposed top soil management
- Activities planned in the construction camp
- Machinery & equipment to be used onsite
- Labour camp facilities onsite
- Health facilities
- Site drainage provisions
- Copy of the consents to establish and operate should be attached as an Annexure.
- Conditions laid down in the clearances / licences and plans to ensure compliance
- Staff strength and details such as contractor staff vs subcontractors, women labour, migrant vs local labour and skilled & unskilled labour

- Facilities given to the Environmental Engineer and defining his roles, responsibilities, authorities and work plan.
- Access road condition and proposed maintenance
- Safety provisions such as fire protection equipment and personal protective equipment (e.g. helmets, gloves, face masks, ear plugs / muffs)
- Closure / completion plan

In preparing the plan, the relevant MoRT&H specifications should be referred.

9.7 WASTE MANAGEMENT PLAN

The plan refers to the waste management in all the construction plans. The plan should contain an introductory chapter that provides information on (1) the different types of waste that include municipal solid waste, sewage, bitumen wastes, used drums, cotton waste, oil-contaminated saw dust, used oil / grease / lubricants.

The plan should contain the following:

- Description of the management practices for each type of waste. This should include storage (labelling and concrete platforms wherever required), transportation (within the camp and outside) and disposal practices of the different wastes (use of authorized waste disposal companies)
- Roles, responsibilities and authorities related to implementing the plan
- Establishment and maintenance of different waste records

Solid waste from the project during construction will be mainly domestic scraps and wastes from the construction camps and construction spoils from construction sites. The garbage will be cleared at regular intervals and disposed of in pre-identified areas.

The small amount of construction debris will be disposed of in suitable pre-identified dumping areas in tune with the local condition to avoid land degradation and water logging due to indiscriminate dumping.

- Dumping areas shall be covered with topsoil and subsequently plantation shall be done over the same.
- Regular inspection of haul roads, construction site and camp shall be carried out to ensure regular and timely removal of construction debris to the dumping site.

9.8 SPOIL & SCARIFIED DISPOSAL PLAN

The plan should contain an introductory chapter that provides information on (1) estimates of spoil & scarified material and (2) the proposed disposal locations / sinks (both major & minor) along with estimates of disposal quantities. For each disposal location, the plan should contain a separate section and this should include the following:

- Name / identity of the location.
- Nearest project road chainage.
- Name of the owner
- Area involved
- Arrangement with the owner (agreement with land owner, including the restoration aspects, should be attached as an Annexure)
- Existing land use
- Land use of the area surrounding the proposed disposal site
- A map of the area showing the surrounding land use
- Number of trees to be removed, if any, along with compensation measures
- Top soil management, if required
- Access road condition and proposed maintenance
- Photograph depicting the present condition of disposal area & access road.
- Closure / completion plan

The plan should recognize that there should be no dumping on rivers and natural stream courses. If the disposal site is alongside a river, then additional precautions should be taken.

9.9 QUARRY MANAGEMENT PLAN

The plan should contain an introductory chapter that provides (1) estimates of the aggregate, quarry sand and river sand material required, (2) the different locations from which this material is to be sourced, (3) the type of arrangement, i.e. whether it is own-managed or sub-contractor and (4) whether it is a new or existing quarry.

For each aggregate-cum-quarry sand source, the plan should contain a separate section. If the quarry is an existing one and is managed directly by the Contractor, the plan should contain the following:

- Name / identity of the location
- Nearest project road chainage

- Name of the owner
- Area involved
- Arrangement with the owner (agreement with land owner should be attached as an Annexure)
- Quantity of material to be withdrawn vis-à-vis the material available
- Machinery & equipment to be used
- Copy of the consents to establish and operate should be attached as an Annexure.
- Copy of the licence from Mining & Geology, Police & Fire
- Conditions laid down in the clearances / licences and plans to ensure compliance
- Photographs of the quarry prior to commencing operations.
- Access roads condition and proposed maintenance
- Tree-cutting required, if any, along with compensation measures
- Information on whether or not the quarry will be closed under this project. If yes, the proposed closure & restoration plan.
- Sketch of the layout of the quarry
- Description of the operating practices to be adopted.

If the quarry is an existing one and is managed directly by a sub-contractor from whom the Contractor is sourcing the materials, the plan should contain the following:

- Name / identity of the location
- Nearest project road chainage.
- Name of the owner
- Area involved
- Arrangement with the owner
- Arrangement with the sub-contractor (agreement with sub-contractor should be attached as an Annexure and should necessarily require the adoption of good quarry management practices – a description of the requirements should be included)
- Quantity of material to be withdrawn vis-à-vis the material available
- Machinery & equipment to be used
- Drainage plans
- Top soil management

- Description of the operating practices
- Health facilities
- Safety provisions made including fire protection systems and the availability of different personal protective equipment such as helmets, ear plugs / muffs and face masks
- Copy of the sub-contractor licences from PCB, Mining & Geology, Police & Fire
- Conditions laid down in the clearances / licences
- Monitoring plans for air quality
- Information on whether or not the quarry will be closed under this project. If yes, the proposed closure & restoration plan.
- Sketch of the layout of the quarry
- Photographs of the quarry before material sourcing for the project
- If the quarry is a new one and is managed directly by the Contractor from whom the contractor is sourcing the materials, the plan should contain the following:
 - Name / identity of the location
 - Nearest project road chainage.
 - Name of the owner
 - Area involved
 - Existing land use (verification required from land records with revenue department)
 - Land use of the area surrounding the proposed site including a map
 - Access roads – existing conditions, proposed development and maintenance
 - Tree-cutting and vegetation clearance required, if any, along with compensation measures
 - Arrangement with the owner (Agreement should necessarily include commitment of the contractor to adopt good quarry management practices – a description of the requirements should be included - and should indicate proposed restoration plans)
 - Quantity of material to be withdrawn vis-à-vis the material available
 - Particular areas to be quarried should be clearly identified
 - Pre-establishment activities, e.g. purchase / lease of nearby properties
 - Machinery & equipment to be used

- Drainage plans
- Top soil management
- Description of the operating practices
- Health facilities
- Safety provisions made including fire protection systems and the availability of different personal protective equipment such as helmets, ear plugs / muffs and face masks
- Monitoring plans for air quality
- Copy of the sub-contractor licenses from PCB, Mining & Geology, Police & Fire
- Conditions laid down in the clearances / licences
- Information on whether or not the quarry will be closed under this project. If yes, the proposed closure & restoration plan.
- Sketch of the layout of the quarry
- Concerns of the local people living in the immediate / near vicinity should be identified and appropriate measures should be reflected
- Tree-cutting required, if any, along with compensation measures
- Photographs of the quarry before the project.

It is to be noted that quarries within the reserve areas, other eco-sensitive areas and locations of cultural / archaeological importance cannot be used. This needs to be explicitly expressed in the plan. The plan should include information on the locations of the river sand sources; the sub-contractor who supplies the contractor with the sand, the copy of the licenses from the contractor should be included in the Annexure.

9.10 PLANTATION DEVELOPMENT PLAN

The detail Plantation Development Plan contains

- a) Species suggested for plantation
- b) Plantation strategy
- c) Total number of trees / shrubs to be planted
- d) Technical specification for plantation
- e) Precautionary and protection measures
- f) Cost of plantation

9.10.1 Objectives and General Guidelines

Green areas not only improve the floral status, land-use and aesthetic look of an area, but also serve the dual purpose of filtering any fugitive dust from unpaved or open areas, help to abate noise effects through dampening, and replenish oxygen and ameliorate the surrounding temperature. Therefore development of plantation is now a days imperative as a part of development projects.

The main objectives of plantation along the project road and bypasses are:

- a) To reduce impacts of air and dust pollution
- b) To provide shade on hot glaring road surface during summer
- c) To arrest soil erosion at embankment slopes
- d) Beautification of project corridor by planting selected ornamental trees and shrubs
- e) Prevention of glare from headlights of incoming vehicles during night time
- f) To compensate for trees to be felled during construction

Adequate plantation programme along the project road has been planned. Considering the inadequacy or limitation of space, a simple plantation has been considered along the road stretch in addition to patches of hedges on the earthen shoulder on both side and plantation of hedges in the median. Development of greenbelt will include:

- a) Plantation in the median to enhance the aesthetic look and reduce headlight glare.
- b) Plantation on roadside earthen shoulder on both sides of the road to enhance the aesthetic look and to prevent soil erosion.
- c) Plantation on the slopes along roadsides in certain locations on both sides of the road to enhance the aesthetic look and to prevent soil erosion.
- d) Plantation on either side of the road in the space available for greenbelt.

The following general guidelines and measures have been adopted:

- a) Destruction of existing trees will be minimized.
- b) The plantation of trees will be completed in the construction stage so that substantial growth is achieved when the project is completed.
- c) The plantation programme has been drawn to confirm to natural climatic conditions and adaptability of the species.

- d) The plantation would consist of a mixture of carefully chosen locally available indigenous, fast growing sturdy species of trees, shrubs and herbs having ornamental value and large crown volume to surface area ratio.
- e) Preferential plantation of flowering trees with less timber and fruit value will be carried out. Fruit bearing trees will not be planted (to avoid entry of people into the access-controlled highway for collecting fruits).
- f) Proper drainage system and proper plantation techniques will be adopted.
- g) Plantation in the initial stage of 3 years will be properly maintained and protected by fencing from grazing and felling.

Generic Environmental Management Plan

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
PRE-CONSTRUCTION STAGE					
Pre-construction activities by PIU					
P.1	Alignment, Width of the road and religious structures	The proposed alignment was selected by shifting / adjusting the centerline of the road, adopting of suitable cross-sections and adjustment of the median width to minimize land acquisition, loss of settlements and to avoid environmentally sensitive features like religious structures etc. compatible with project activities.	NH Act 1956	PIU, Revenue Dept., NGOs, Collaborating Agencies	EO-IC (Independent Consultant)
P.2	Land Acquisition	Information dissemination and community consultation. The acquisition of land and private properties will be carried out in accordance with the RAP and entitlement framework for the project. It will be ensured that all R & R activities including implementation of Environment Management Plan are completed before the start of work. Affected person must vacate the land area before construction starts. ROW to be acquired has already been identified. PIU has to ascertain that any additional environmental impacts resulting from acquisition of land are addressed and integrated into the EMP and	NH Act 1956	PIU, Revenue Dept., NGOs, Collaborating Agencies	EO-IC

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		other relevant documents.			
P.3	Preservation of Trees	<p>All efforts will be made to preserve trees including evaluation of minor design adjustments/ alternatives to save trees. Specific attention will be given for protecting giant trees, and locally important trees (religiously important etc.).</p> <p>Tree cutting is to proceed only after all the legal requirements including attaining of In-principle and Formal Clearances from the Forest Dept./ DoEF/ MoEF are completed and subsequently a written order is issued to the Contractor.</p> <p>Particular species declared as ‘protected’ by the State’s Forest Dept. in the private land will be felled only after due clearance from the Forest Dept./ concerned agencies is obtained.</p> <p>In the event of design changes, additional assessments including the possibility to save trees shall be made.</p> <p>Stacking, transport and storage of the wood will be done as per the relevant norms.</p> <p>Systematic corridor level documentation for the trees cut and those saved will be maintained with “EO-IC”.</p>	<p>Clause No. 201.2</p> <p>MORT&H</p> <p>Specifications for Road and Bridge works</p>	PIU, Forest Department, Contractor	EO-IC
P.4	Relocation of	All community utilities and properties i.e., water supply lines, sewer	As in RAP	PIU, Concerned	EO-IC

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
	Community Utilities and Common Property Resources	lines, hand pumps will be relocated before construction starts, on any section of the project corridor. The PIU will relocate these properties in consultation and written agreement with the agency/ owner/community. Environmental considerations with suitable/required actions including health and hygiene aspects will be kept in mind while relocating all community utilities and resources.		Agencies, Contractor	
P.5	Orientation of Implementing Agency and Contractors	The PIU shall organize orientation sessions and regular training sessions during all stages of the project. This shall include on-site training (general as well as in the specific context of a sub-project). These sessions shall involve all staff of Independent Consultants, field level implementation staff of PIU and Contractor, Environmental Experts. The contractor will ensure that his staff including engineers, supervisors and operators attend the training sessions.	Project Requirements	Contractor	EO-IC
	Clearances, Approvals and Permits	<ul style="list-style-type: none"> Obtain all necessary clearances and approvals including Environmental Clearance, Forest Clearance and consent to Fell Trees prior to commencing any road works. Only licensed quarries shall be used. Obtain permits for borrow pits and quarries from the concerned person or authority. No quarry or borrow area shall be developed within sensitive areas like R.F. & 		PIU, Concerned Agencies, Contractor	PIU-PWD

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<p>Wildlife Sanctuary. Prepare quarry & borrow area management plan.</p> <ul style="list-style-type: none"> Obtain Consent to Establish & Operate for the Crusher, Batch Mix and Hot Mix Plants. Provide a copy of all necessary clearances to the IC Adhere to all clearances terms and conditions Obtain written permission from private landholders to conduct activities on their land prior to commencing. 			
P.6.1	Joint Field Verification	<p>The Environmental Expert of IC and the Contractor will carry out joint field verification to ascertain any additional possibility to saving trees, environmental and community resources.</p> <p>The verification exercise should assess the need for additional protection measures or changes in design/ scale/ nature of protection measures including the efficacy of enhancement measures suggested in the EMP. Proper documentation and justifications/reasons shall be maintained in all such cases where deviation from the original EMP is proposed.</p>	Project Requirements	Contractor/ Environmental Expert of IC	PIU, PWD
P.6.2	Assessment of Impacts due to Changes/Revision	The Environmental Expert of IC will assess impacts and revise/ modify the EMP and other required sections of the project documents in the event of changes/ revisions (including addition or deletion) in the	Project Requirements	Contractor/ Environmental Expert of IC	PIU, PWD

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
	s/Additions in the Project Work	project's scope of work.			
P.6.3	Crushers, hot-mix plants and Batching Plants Location	<p>Hot mix plants and batching plants will be sited sufficiently away from settlements and agricultural operations or any commercial establishments. Such plants will be located at least 1000 m away from the nearest village/ settlement preferably in the downwind direction.</p> <p>The Contractor shall submit a detailed layout plan for all such sites and approval of Environmental Expert of IC shall be necessary prior to their establishment.</p> <p>Arrangements to control dust pollution through provision of windscreens, sprinklers, and dust encapsulation will have to be provided at all such sites.</p> <p>Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations and Consent/NOC for all such plants shall be submitted to the "PIU through Independent Consultant.</p> <p>The Contractor shall not initiate plant/s operation till the required legal clearances are obtained and submitted. The engineer will ensure that the regulatory and legal requirements are being complied with.</p>	<p>Clause No 111.1</p> <p>MoRT&H</p> <p>Air (P&CP)</p> <p>Act 1981,</p>	Contractor	Engineer, EO-IC

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
P.6.4	Other Construction Vehicles, Equipment and Machinery	<p>All vehicles, equipment and machinery to be procured for construction will confirm to the relevant Indian Standard (IS) norms. The discharge standards promulgated under the Environment Protection Act, 1986 will be strictly adhered to.</p> <p>Noise limits for construction equipments to be procured such as compactors, rollers, front loaders concrete mixers, cranes (moveable), vibrators and saws will not exceed 75 dB (A), measured at one meter from the edge of the equipment in free field, as specified in the Environment (Protection) Rules, 1986.</p> <p>The Contractor shall maintain a record of PUC for all vehicles and machinery used during the contract period, which shall be produced for EO - IC and NHAI verification whenever required.</p> <p>Mobile equipment shall be placed at least 100metres away from the nearest dwelling.</p>	Project Requirement,	Contractor	Engineer, EO-IC I
P.7					
7.1	Borrow Areas	Finalizing borrows areas for borrowing earth and all logistic arrangements as well as compliance to environmental requirements, as applicable, will be the sole responsibility of the contractor.	Clause No. 111.2 & 305.2.2 MORT&H Specifications for	Contractor	EO-IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<p>The Contractor will not start borrowing earth from select borrow area until the formal agreement is signed between landowner and contractor and a copy is submitted to the “EO-IC/PIU through the Engineer.</p> <p>Locations finalized by the contractor shall be reported to the Environmental Expert of IC and who will in turn report to PIU.</p> <p>Planning of haul roads for accessing borrows materials will be undertaken during this stage. The haul roads shall be routed to avoid agricultural areas as far as possible (in case such a land is disturbed, the Contractor will rehabilitate it as per Borrow Area Rehabilitation Guidelines) and will use the existing village roads wherever available.</p> <p>In addition to testing for the quality of borrow materials by the IC, the environmental personnel of the IC will be required to inspect every borrow area location prior to approval</p> <p>The IC will make sure that each such site is in line with IRC and other Project Guidelines.</p>	Road and Bridge works		
P.7.2	Quarry	<p>Contractor will finalize the quarry for procurement of construction materials after assessment of the availability of sufficient materials, quality and other logistic arrangements.</p> <p>In case the contractor decides to use quarries other than recommended</p>	Clause No. 111.3 & MORT&H Specifications for Road and Bridge	Contractor	EO-IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<p>by Feasibility consultants, then it will be selected based on the suitability of the materials and as per established law.</p> <p>The contractor will procure necessary permission for procurement of materials from Mining Department, District Administration and State Pollution Control Board and shall submit a copy of the approval and the rehabilitation plan to the “PIU through Engineer.</p> <p>Contractor will also work out haul road network and report to Environmental Expert of IC and IC will inspect and in turn report to PIU before approval.</p>	works		
P.7.3	Arrangement for Construction Water	<p>The contractor will use ground water as a source of water for the construction and can set up the own bore well facility for construction work.</p> <p>Contractor can use the ponds with written agreement of owner, but in this case since ponds are not present along the road hence not applicable.</p> <p>To avoid disruption/disturbance to other water users, the contractor will extract water from fixed locations and consult the Environmental Expert of IC before finalizing the locations.</p>	<p>Clause No. 1010 MORT&H Specifications for Road and Bridge works</p> <p>EP Act 1986</p>	Contractor	EO-IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<p>The Contractor will provide a list of locations and type of sources from where water for construction will be used. The contractor will seek approval from the EO-IC prior to the finalization of these locations</p> <p>The contractor will not be allowed to pump from any irrigation canal and surface water bodies used by community.</p> <p>The contractor will need to comply with the requirements of the State Ground Water Department and seek their approval for doing so and submit copies of the permission to IC and PIU prior to initiation of any construction work.</p>			
P.7.4	Labor Requirements	The contractor preferably will use unskilled labor drawn from local communities to give the maximum benefit to the local community.	Special Conditions of Contract	Contractor	EO-IC, PIU
P.7.5	Construction Camp Locations – Selection, Design and Lay-out	<p>Siting of the construction camps will be selected by the contractor as per the guidelines.</p> <p>Construction camps will not be proposed within 500 m from the nearest settlements to avoid conflicts and stress over the infrastructure facilities with the local community applies only in case where a construction camp doesn't house plant sites.</p> <p>Location for stockyards for construction materials will be identified at</p>		Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<p>least 1000 m from watercourses.</p> <p>The waste disposal and sewage system for the camp will be designed, built and operated such that no odor is generated.</p>			
P.7.6	Arrangements for Temporary Land Requirement	<p>The contractor as per prevalent rules will carry out negotiations with the landowners for obtaining their consent for temporary use of lands for construction sites/hot mix plants/traffic detours/borrow areas etc.</p> <p>The Contractor will submit a copy of agreement to the Environment Expert of Independent Consultant.</p> <p>The Environmental Expert of IC will be required to ensure that the clearing up of the site prior to handing over to the owner (after construction or completion of the activity) is included in the contract.</p>	Project Requirements	Contractor	EO- IC, PIU
P.7.7	Implementation - Information Meetings	<p>The contractor will organize at least 2 implementation information meetings in the vicinity of Project Site (minimum one in each section) for general public to consult and inform people about his plans covering overall construction schedule, safety, use of local resources (such as earth, water), traffic safety and management plans of debris disposal, drainage protection, canal training work during construction, pollution abatement and other plans, measures to minimize disruption, damage and in convenience to roadside users</p>	Project Requirements	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		and people along the road. The first Implementation information meeting be conducted within four weeks of mobilization. The people should be informed about the date, time and venue atleast 7 days prior to meetings. Public shall be informed about the meeting through display of posters at prominent public places (panchayat offices, offices of Market committees, Notice board of religious places etc.) and distribution of pamphlets along roadside communities or in any manner deemed fit. The contractor will maintain a channel of communication with the communities through his designated Environment and Safety Officer to address any concern or grievances. Periodic meetings will also be conducted during the construction period to take feedback from communities or their representatives to ensure minimum disturbance. The mechanism and contents for disclosure shall be approved by PIU prior to the meetings.			
CONSTRUCTION STAGE					
C.1					
C.1.1	Clearing and Grubbing	Vegetation will be removed from the construction zone before commencement of construction. All works will be carried out such that the damage or disruption to flora is minimum other than those identified	Clause No. 201 MORT&H Specifications for	Contractor	EO-IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<p>for cutting.</p> <p>Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works will be removed with prior approval from the Environmental Expert of IC.</p> <p>The Contractor under any circumstances will not cut trees other than those identified for cutting and for which he has written instructions from the PIU. The PIU will issue these instructions only after receiving all stages of clearances from the Forest Department/ MoEF.</p> <p>Vegetation only with girth of over 30 cm will be considered as trees and shall be compensated, in the event of PIU's instruction to undertake tree cutting.</p> <p>The sub grade of the existing pavement shall be used as embankment fill material.</p> <p>The existing base and sub-base material shall be recycled as sub-base of the haul road or access roads.</p> <ul style="list-style-type: none"> • The existing bitumen surface may be utilized for the paving of cross roads, access roads and paving works in construction sites and campus, temporary traffic diversions, haulage routes etc. 	Road and Bridge works		
C.1.2	Disposal of debris	The contractor shall identify disposal sites. The identified locations will	Clause No. 201.4	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
	from dismantling structures and road surface	<p>be reported to the Environmental Expert of IC. These locations will be checked on site and accordingly approved by Environmental Expert of IC prior to any disposal of waste materials.</p> <p>All arrangements for transportation during construction including provision, maintenance, dismantling and clearing debris, will be considered incidental to the work and will be planned and implemented by the contractor as approved and directed by the Environmental Expert of IC.</p> <p>The pre-designed disposal locations will be a part of Comprehensive Solid Waste Management Plan to be prepared by Contractor in consultation and with approval of Environmental Expert of IC.</p> <p>Debris generated from pile driving or other construction activities shall be disposed such that it does not flow into the surface water bodies or form mud puddles in the area.</p>	MORT&H Specifications for Road and Bridge works		
C.1.3	Other Construction Wastes Disposal	<p>The pre-identified disposal locations will be a part of Comprehensive Waste Disposal Management Plan to be prepared by the Contractor in consultation and with approval of Environmental Expert of IC.</p> <p>Location of disposal sites will be finalized prior to initiation of works on any particular section of the road.</p>	<p>Clause No. 301.3.2</p> <p>MORT&H Specifications for Road and Bridge works</p>	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<p>The Environmental Expert of IC will approve these disposal sites after conducting a joint inspection on the site with the Contractor.</p> <p>Contractor will ensure that any spoils of material unsuitable for embankment fill will not be disposed off near any water course, agricultural land, and natural habitat like grass lands or pastures. Such spoils from excavation can be used to reclaim borrow pits and low-lying areas located in barren lands along the project corridors (if so desired by the owner/community and approved by the Environment Expert IC).</p> <p>Non-bituminous wastes other than fly ash may be dumped in borrow pits (preferably located in barren lands) covered with a layer of the soil.</p> <p>No new disposal site shall be created as part of the project, except with prior approval of the Environmental Expert of IC.</p> <p>All waste materials will be completely disposed and the site will be fully cleaned and certified by Environmental Expert of IC before handing over.</p> <p>The contractor at its cost shall resolve any claim, arising out of waste disposal or any non-compliance that may arise on account of lack of action on his part.</p>			
C.1.4	Stripping, stocking	The topsoil from all areas of cutting and all areas to be permanently	Clause No. 301.2.2	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
	and preservation of top soil	<p>covered will be stripped to a specified depth of 150 mm and stored in stockpiles. A portion of the temporarily acquired area and/or Right of Way will be earmarked for storing topsoil. The locations for stock piling will be pre-identified in consultation and with approval of Environmental Expert of IC. The following precautionary measures will be taken to preserve them till they are used:</p> <p>(a) Stockpile will be designed such that the slope does not exceed 1:2 (vertical to horizontal), and height of the pile is restricted to 2 m. To retain soil and to allow percolation of water, silt fencing will protect the edges of the pile.</p> <p>(b) Stockpiles will not be surcharged or otherwise loaded and multiple handling will be kept to a minimum to ensure that no compaction will occur. The stockpiles shall be covered with gunny bags or vegetation.</p> <p>(c) It will be ensured by the contractor that the topsoil will not be unnecessarily trafficked either before stripping or when in stockpiles.</p> <p>Such stockpiled topsoil will be utilized for -</p> <ul style="list-style-type: none"> • covering all disturbed areas including borrow areas only in case 	MORT&H Specifications for Road and Bridge works		

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<p>where these are to be rehabilitated as farm lands (not those in barren areas)</p> <ul style="list-style-type: none"> • top dressing of the road embankment and fill slopes • filling up of tree pits, in the median and • in the agricultural fields of farmers, acquired temporarily. <p>Residual topsoil, if there is any will be utilized for the plantation at median and side of the main carriageway.</p>			
C.1.5	Accessibility	<p>The contractor will provide safe and convenient passage for vehicles, pedestrians and livestock to and from roadsides and property accesses connecting the project road, providing temporary connecting road.</p> <p>The Contractor will take care that Schools and religious places are accessible to Public. The contractor will also ensure that the work on / at existing accesses will not be undertaken without providing adequate provisions and to the prior satisfaction of Environmental Expert of IC.</p> <p>The contractor will take care that the cross roads are constructed in such a sequence that construction work over the adjacent cross roads are taken up one after one so that traffic movement in any given area not get affected much.</p>	As per detailed guidelines provided in EIA/EMP report	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
C.1.6	Planning for Traffic Diversions and Detours	<p>Detailed Traffic Control Plans will be prepared and submitted to the Resident Engineer for approval, seven days prior to commencement of works on any section of road. The traffic control plans shall contain details diversions; traffic safety arrangement during construction; safety measures for night – time traffic and precautions for transportation of hazardous materials. Traffic control plans shall be prepared in line with requirements of IRC's SP- 55 document and The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow.</p> <p>The contractor will also inform local community of changes to traffic routes, conditions and pedestrian access arrangements with assistance from IC and PIU. The temporary traffic detours will be kept free of dust by sprinkling of water three times a day.</p>	<p>Clause No. 112 MORT&H Specifications for Road and Bridge works IRC; SP 55</p>	Contractor	EO- IC, PIU
C.2					
C.2.1	Earth from Borrow Areas for Construction	No borrow area will be opened without permission of the Environmental Expert of IC. The location, shape and size of the designated borrow areas will be as approved by the Environmental Expert of IC and in accordance to the IRC recommended practice for borrow pits for road	<p>Clause No. 305.2.2 MORT&H Specifications for Road and Bridge</p>	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<p>embankments (IRC 10: 1961).</p> <p>The location and quantity of Aggregate, soil and other earth material are given in Annexure 9D.</p> <p>The unpaved surfaces used for the haulage of borrow materials, if passing through the settlement areas or habitations; will be maintained dust free by the contractor. Sprinkling of water will be carried out twice a day to control dust along such roads during their period of use.</p> <p>During dry seasons (winter and summer) frequency of water sprinkling will be increased in the settlement areas.</p> <p>Contractor will rehabilitate the borrow areas as soon as borrowing is over from a particular borrow area in accordance with the Guidelines for Redevelopment of Borrow Areas or as suggested by Environmental Expert of IC.</p> <p>The final rehabilitation plans will be approved by the EO from the IC.</p>	works		
C.2.2	Quarry Operations	<p>The contractor shall obtain materials from quarries only after the consent of the Department of Mining / SPCB (both the states) / District Administration or will use existing approved sources of such materials.</p> <p>Copies of consent/ approval/ rehabilitation plan for opening a new</p>	<p>Clause No. 111.3</p> <p>MORT&H</p> <p>Specifications for</p> <p>Road and Bridge</p>	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		quarry or use of an existing quarry source will be submitted to Environment Expert IC and the Resident Engineer. The contractor will develop a Comprehensive Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy to PIU and IC prior to opening of the quarry site. The quarry operations will be undertaken within the rules and regulations in force in the state.	works		
C.2.3	Transporting Construction Materials and Haul Road Management	Contractor will maintain all roads (existing or built for the project), which are used for transporting construction materials, equipment and machineries as précised. All vehicles delivering fine materials to the site will be covered to avoid spillage of materials. Contractor will arrange for regular water sprinkling as necessary for dust suppression of all such roads and surfaces with specific attention to the settlement areas. The unloading of materials at construction sites/close to settlements will be restricted to daytime only.	Project Requirement	Contractor	EO- IC, PIU
C.2.4	Construction Water	Contractor will arrange adequate supply and storage of water for the whole construction period at his own costs. The Contractor will submit a	Clause No. 1010 EP Act 1986	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<p>list of source/s from where water will be used for the project to 'PIU' through the Engineer.</p> <p>The contractor will source the requirement of water preferentially from ground water but with prior permission from the Ground Water Board. A copy of the permission will be submitted to 'PIU' through the Engineer prior to initiation of construction.</p> <p>The contractor will take all precaution to minimize the wastage of water in the construction process/ operation.</p>	MORT&H Specifications for Road and Bridge works		
C.3					
C.3.1	Disruption to Other Users of Water	<p>While working across or close to any perennial water bodies, contractor will not obstruct/ prevent the flow of water.</p> <p>Construction over and close to the non-perennial streams shall be undertaken in the dry season. If construction work is expected to disrupt users of community water bodies, notice shall be served well in advance to the affected community by the contractor.</p> <p>The contractor will take prior approval of the River Authority or Irrigation Department for any such activity. The PIU and the Engineer will ensure that contractor has served the notice to the downstream users</p>	Guidelines provided in DPR	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		of water well in advance.			
C.3.2	Drainage	Contractor will ensure that no construction materials like earth, stone, ash or appendage is disposed off in a manner that blocks the flow of water of any water course and cross drainage channels. Contractor will take all-necessary measures to prevent any blockage to water flow. In addition to the design requirements, the contractor will take all required measures as directed by the 'EO-IC' and the 'Resident Engineer' to prevent temporary or permanent flooding of the site or any adjacent area.	Clause No. 501.8.6 MORT&H Specifications for Road and Bridge works	Contractor	EO- IC, PIU
C.3.3	Siltation of Water Bodies and Degradation of Water Quality	The Contractor will not excavate beds of any stream/canals/ any other water body for borrowing earth for embankment construction. Contractor will construct silt fencing at the base of the embankment construction for the entire perimeter of any water body (including wells) adjacent to the ROW and around the stockpiles at the construction sites close to water bodies. The contractor will also put up sedimentation cum grease traps at the outer mouth of the drains located in truck lay byes and bus bays which are ultimately entering into any surface water bodies / water channels with a fall exceeding 1.5 m. in present case three Sedimentation Cum Grease Trap are proposed, However the item has	Clause No. 501.8.6 MORT&H Specifications for Road and Bridge works Water (P & CP) Act 1981	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<p>been kept in case need arises during construction.</p> <p>Contractor will ensure that construction materials containing fine particles are stored in an enclosure such that sediment-laden water does not drain into nearby watercourse.</p>			
C.3.4	Slope Protection and Control of Soil Erosion	<p>The contractor will take slope protection measures as per design, or as directed by the Environmental Expert of IC to control soil erosion and sedimentation.</p> <p>All temporary sedimentation, pollution control works and maintenance thereof will be deemed as incidental to the earth work or other items of work and as such as no separate payment will be made for them.</p> <p><u>Contractor will ensure the following aspects:</u></p> <ul style="list-style-type: none"> • During construction activities on road embankment, the side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. • Turfing works will be taken up as soon as possible provided the season is favorable for the establishment of grass sods. Other measures of slope stabilization will include mulching netting and seeding of batters and drains immediately on completion of earthworks. 	<p>Clause No. 306 & 305.2.2 MORT&H Specifications for Road and Bridge works</p>	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<ul style="list-style-type: none"> In borrow pits, the depth shall be so regulated that the sides of the excavation will have a slope not steeper than 1 vertical to 2 horizontal, from the edge of the final section of the bank. Along sections abutting water bodies, stone pitching as per design specification will protect slopes. 			
C.4					
C.4.1					
C.4.1.1	Water Pollution from Construction Wastes	<p>The Contractor will take all precautionary measures to prevent the wastewater generated during construction from entering into streams, water bodies or the irrigation system. Contractor will avoid construction works close to the streams or water bodies during monsoon.</p> <p>All waste arising from the project is to be disposed off in the manner that is acceptable and as per norms of the State Pollution Control Board.</p>	<p>Clause No. 501.8.6 MORT&H Specifications for Road and Bridge works</p> <p>Water (P & CP) Act 1974</p>	Contractor	EO- IC, PIU
C.4.1.2	Water Pollution from Fuel and Lubricants	The contractor will ensure that all construction vehicle parking location, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance and refueling sites will be located at least 500 m from rivers and irrigation canal/ponds.	<p>Clause No. 501.8.6 MORT&H Specifications for Road and Bridge</p>	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<p>All location and layout plans of such sites will be submitted by the Contractor prior to their establishment and will be approved by the 'EO-IC, PIU/ NHAI'.</p> <p>Contractor will ensure that all vehicle/machinery and equipment operation, maintenance and refueling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. Oil interceptors will be provided for vehicle parking, wash down and refueling areas as per the design provided.</p> <p>Contractor will arrange for collection, storing and disposal of oily wastes to the pre-identified disposal sites (list to be submitted to IC and PIU) and approved by the Environmental Expert of IC. All spills and collected petroleum products will be disposed off in accordance with MoEF and state PCB guidelines.</p> <p>'EO-IC and Resident Engineer' will certify that all arrangements comply with the guidelines of PCB/ MoEF or any other relevant laws.</p>	<p>works</p> <p>Water (P & CP) Act 1974</p>		
C.4.1.3	Chemical Attack	<p>To limit the potential chemical attack the concrete foundation should contain minimum cement concrete of 330 kg/cc</p> <p>For Under water concrete 10% extra cement is used.</p> <p>Clear Concrete cover of minimum 75mm shall be provided to under</p>	<p>Project Requirements</p>	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		water structures.			
C.4.2					
C.4.2.1	Dust Pollution	<p>All the plants will be sited at least 1 km in the downwind direction from the nearest human settlement.</p> <p>The contractor will provide necessary certificates to confirm that all crushers used in construction conform to relevant dust emission control legislation.</p> <p>The suspended particulate matter value at a distance of 40m from a unit located in a cluster should be less than 500 g/m³. The pollution monitoring is to be conducted as per the monitoring plan.</p> <p>Alternatively, only crushers licensed by the SPCB shall be used. Required certificates and consents shall be submitted by the Contractor in such a case to the 'EO-PIU' through the 'Engineer'.</p> <p>Dust screening vegetation will be planted on the edge of the RoW for all existing roadside crushers. Hot mix plant will be fitted with dust extraction units.</p>	<p>Clause No. 111 & 501.8.6 MORT&H Specifications for Road and Bridge works</p> <p>Air (P & CP) Act 1981</p>	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
C.4.2.2	Emission from Construction Vehicles, Equipment and Machineries	<p>Contractor will ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of SPCB.</p> <p>The Contractor will submit PUC certificates for all vehicles/ equipment/machinery used for the project. Monitoring results will also be submitted to 'PIU' through the 'Engineer'.</p>	<p>Clause No. 501.8.6 MORT&H Specifications for Road and Bridge works Air (P & CP) Act 1981 Central Motor & Vehicle Act 1988</p>	Contractor	EO- IC, PIU,
C.4.3					
C.4.3.1	Noise Pollution: Noise from Vehicles, Plants and Equipments	<p>The Contractor will confirm the following:</p> <ul style="list-style-type: none"> • All plants and equipment used in construction shall strictly conform to the MoEF/CPCB noise standards. • All vehicles and equipment used in construction will be fitted with exhaust silencers. • Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective will be replaced. • Limits for construction equipment used in the project such as 	<p>Clause No. 501.8.6 MORT&H Specifications for Road and Bridge works EP Act 1986 Noise Rules 2002</p>	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<p>compactors, rollers, front loaders, concrete mixers, cranes (moveable), vibrators and saws shall not exceed 75 dB (A) (measured at one meter from the edge of equipment in the free field), as specified in the Environment (Protection) rules, 1986.</p> <ul style="list-style-type: none"> • Maintenance of vehicles, equipment and machinery shall be regular to keep noise levels at the minimum. <p>No construction activities will be permitted around educational institutes/health centers (silence zones) up to a distance of 100 m from the sensitive receptors i.e., school, health centers and hospitals between 9.00 am to 6.0 pm.</p> <p>Monitoring shall be carried out at the construction sites as per the monitoring schedule and results will be submitted to 'EO PIU' through the 'Engineer'.</p>			
C.5					
C.5.1	Personal Safety Measures for Labour	<p>Contractor will provide:</p> <ul style="list-style-type: none"> • Protective footwear and protective goggles to all workers employed on mixing asphalt materials, cement, lime mortars, concrete etc. • Welder's protective eye-shields to workers who are engaged in welding works 	The Building and Other Construction workers (Regulation of Employment and Conditions of Service)	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<ul style="list-style-type: none"> • Protective goggles and clothing to workers engaged in stone breaking activities and workers will be seated at sufficiently safe intervals • Earplugs to workers exposed to loud noise, and workers working in crushing, compaction, or concrete mixing operation. • Adequate safety measures for workers during handling of materials. • The contractor will comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress. <p>The contractor will comply with all the precautions as required for ensuring the safety of the workmen as per the International Labor Organization (ILO) Convention No. 62 as far as those are applicable to this contract.</p> <p>The contractor will make sure that during the construction work all relevant provisions of the Factories Act, 1948 and the Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996 are adhered to.</p> <p>The contractor will not employ any person below the age of 14 years for any work and no woman will be employed on the work of painting with products containing lead in any form.</p>	Act 1996 and cess Act of 1996 Factories Act 1948		

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<p>The contractor will also ensure that no paint containing lead or lead products is used except in the form of paste or readymade paint.</p> <p>Contractor will provide facemasks for use to the workers when paint is applied in the form of spray or a surface having lead paint dry is rubbed and scrapped.</p> <p>The Contractor will mark ‘hard hat’ and ‘no smoking’ and other ‘high risk’ areas and enforce non-compliance of use of PPE with zero tolerance. These will be reflected in the Construction Safety Plan to be prepared by the Contractor during mobilization and will be approved by ‘IC’ and ‘PIU’.</p>			
C.5.2	Traffic and Safety	<p>The contractor will take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, markings, flags, lights and flagmen as proposed in the Traffic Control Plan/Drawings and as required by the ‘EO-IC’ and ‘Resident Engineer’ for the information and protection of traffic approaching or passing through the section of any existing cross roads.</p> <p>The contractor will ensure that all signs, barricades, pavement markings</p>	IRC: SP: 55	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		are provided as per the MOSRT&H specifications. Before taking up of construction on any section of the existing lanes of the highway, a Traffic Control Plan will be devised and implemented to the satisfaction of 'EO-IC' and 'Resident Engineer'			
C.5.3	Risk from Electrical Equipment(s)	<p>The Contractor will take all required precautions to prevent danger from electrical equipment and ensure that -</p> <ul style="list-style-type: none"> • No material will be so stacked or placed as to cause danger or inconvenience to any person or the public. • All necessary fencing and lights will be provided to protect the public in construction zones. <p>All machines to be used in the construction will conform to the relevant Indian Standards (IS) codes, will be free from patent defect, will be kept in good working order, will be regularly inspected and properly maintained as per IS provision and to the satisfaction of the 'Resident Engineer'.</p>	The Building and other construction workers (Regulation of Employment and Conditions of Service) Act 1996 and Cess Act of 1996 Factories Act 1948	Contractor	EO- IC, PIU
C.5.4	Risk Force Measure	<p>The contractor will take all reasonable precautions to prevent danger to the workers and public from fire, flood etc. resulting due to construction activities.</p> <p>The contractor will make required arrangements so that in case of any</p>	The Building and other construction workers (Regulation of Employment and	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		mishap all necessary steps can be taken for prompt first aid treatment. Construction Safety Plan prepared by the Contractor will identify necessary actions in the event of an emergency.	Conditions of Service) Act 1996 and Cess Act of 1996 Factories Act 1948		
C.5.5	First Aid	The contractor will arrange for - <ul style="list-style-type: none"> • a readily available first aid unit including an adequate supply of sterilized dressing materials and appliances as per the Factories Rules in every work zone • availability of suitable transport at all times to take injured or sick person(s) to the nearest hospital • Equipment and trained nursing staff at construction camp. 	The Building and other construction workers (Regulation of Employment and Conditions of Service) Act 1996 and Cess Act of 1996 Factories Act 1948	Contractor	EO- IC, PIU
C.5.6	Informatory Signs and Hoardings	The contractor will provide, erect and maintain informatory/safety signs, hoardings written in English and local language, wherever required as per IRC and MoSRT&H specifications.	IRC:SP:55	Contractor	EO- IC, PIU
C.6					
C.6.1	Road side Plantation Strategy	The contractor will do the plantation at median and/or turfing at embankment slopes as per the tree plantation strategy prepared for the project.	Forest Conservation Act 1980	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<p>Minimum 80 percent survival rate of the saplings will be acceptable otherwise the contractor will replace dead plants at his own cost. The contractor will maintain the plantation till they handover the project site to NHAI.</p> <p>The Environmental Expert of IC will inspect regularly the survival rate of the plants and compliance of tree plantation guidelines.</p>			
C.6.2	Flora and Chance found Fauna	<p>The contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body and hunting of any animal.</p> <p>If any wild animal is found near the construction site at any point of time, the contractor will immediately upon discovery thereof acquaint the Environmental Expert of IC and carry out the IC's instructions for dealing with the same.</p> <p>The Environmental Expert of IC will report to the near by forest office (range office or divisional office) and will take appropriate steps/ measures, if required in consultation with the forest officials.</p>	<p>Forest Conservation Act 1980</p> <p>Wild Life Act 1972</p>	Contractor	EO- IC, PIU
C.6.3	Chance Found Archaeological	All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or archaeological interest discovered on	The Ancient Monument and	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
	Property	<p>the site shall be the property of the Government and shall be dealt with as per provisions of the relevant legislation.</p> <p>The contractor will take reasonable precautions to prevent his workmen or any other persons from removing and damaging any such article or thing. He will, immediately upon discovery thereof and before removal acquaint the Environmental Expert of IC of such discovery and carry out the IC's instructions for dealing with the same, waiting which all work shall be stopped.</p> <p>The IC will seek direction from the Archaeological Survey of India (ASI) before instructing the Contractor to recommence the work in the site.</p>	Archaeological Site Remains Act 1958		
C.7					
<u>C.7.1</u>	Accommodation	<p>Contractor will follow all relevant provisions of the Factories Act, 1948 and the Building and the other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 for construction and maintenance of labor camp.</p> <p>The location, layout and basic facility provision of each labor camp will be submitted to IC and 'EO-PIU' prior to their construction.</p> <p>The construction will commence only upon the written approval of the</p>	The Building and other construction workers (Regulation of Employment and Conditions of Service) Act 1996 and Cess Act of 1996	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		Environmental Expert of IC. The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic manner and as approved by the IC.	Factories Act 1948		
C.7.2	Potable Water	<p>The Contractor will construct and maintain all labour accommodation in such a fashion that uncontaminated water is available for drinking, cooking and washing.</p> <p>The Contractor will also provide potable water facilities within the precincts of every workplace in an accessible place, as per standards set by the Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996.</p> <p><u>The contractor will also guarantee the following:</u></p> <p>a) Supply of sufficient quantity of potable water (as per IS) in every workplace/labor campsite at suitable and easily accessible places and regular maintenance of such facilities.</p> <p>b) If any water storage tank is provided that will be kept such that the</p>	<p>The Building and other construction workers (Regulation of Employment and Conditions of Service) Act 1996 and Cess Act of 1996</p> <p>Factories Act 1948</p>	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		<p>bottom of the tank at least 1mt. from the surrounding ground level.</p> <p>c) If water is drawn from any existing well, which is within 30mt. proximity of any toilet, drain or other source of pollution, the well will be disinfected before water is used for drinking.</p> <p>d) All such wells will be entirely covered and provided with a trap door, which will be dust proof and waterproof.</p> <p>e) A reliable pump will be fitted to each covered well. The trap door will be kept locked and opened only for cleaning or inspection, which will be done at least once in a month.</p> <p>Testing of water will be done as per parameters prescribed in IS 10500:1991.</p>			
C.7.3	Sanitation and Sewage System	<p>The contractor will ensure that -</p> <ul style="list-style-type: none"> the sewage system for the camp are designed, built and operated in such a fashion that no health hazards occurs and no pollution to the air, ground water or adjacent water courses take place separate toilets/bathrooms, wherever required, screened from those from men (marked in vernacular) are to be provided for women adequate water supply is to be provided in all toilets and urinals 	Project Specific Requirement	Contractor	EO- IC, PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
		All toilets in workplaces are with dry-earth system (receptacles) which are to be cleaned and kept in a strict sanitary condition.			
C.7.4	Waste Disposal	<p>The contractor will provide garbage bins in the camps and ensure that these are regularly emptied and disposed off in a hygienic manner as per the Comprehensive Solid Waste Management Plan approved by the Environmental Expert of IC.</p> <p>Unless otherwise arranged by local sanitary authority, arrangements for disposal of night soils (human excreta) suitably approved by the local medical health or municipal authorities or as directed by Environmental Expert of IC will have to be provided by the contractor.</p>		Contractor	EO- IC, PIU
C.8					
C.8.1		<p>The 'EO-IC' will contact the responsible people with the enhancement drawing of the site for which enhancement has been proposed and take their consent before the start of work.</p> <p>Accesses to Different Schools along the road will be developed to the satisfaction of 'PIU'.</p>		Contractor	EO- IC, PIU
C.9					

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
C.9.1	Clean-up Operations, Restoration and Rehabilitation	<p>Contractor will prepare site restoration plans, which will be approved by the Environmental Expert of IC. The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. The contractor will clear all temporary structures; dispose all garbage, night soils and POL waste as per Comprehensive Waste Management Plan and as approved by IC.</p> <p>All disposal pits or trenches will be filled in and effectively sealed off. Residual topsoil, if any will be distributed in pre identified approved areas or in places suggested by the 'EO - IC' areas in a layer of thickness of 75 mm-150 mm. All construction zones including river-beds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, at the contractor's expense, to the entire satisfaction to the Environmental Expert of IC.and PIU/ NHAI will certify in this regard.</p>		Contractor	EO- IC, PIU
OPERATION STAGE					
Activities to be Carried Out by the PIU					
O.1	Monitoring Operation	The PIU will monitor the operational performance of the various mitigation/ enhancement measures carried out as a part of the project.	-	PIU	PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
	Performance	The indicators selected for monitoring include the survival rate of trees; utility of enhancement provision, status of rehabilitation of borrow areas and disposal sites,			
O.2	Maintenance of Drainage	PIU will ensure that all drains (side drains, median drain and all cross drainages) are periodically cleared especially before monsoon season to facilitate the quick passage of rainwater and avoid flooding. PIU will ensure that all the sediment and oil and grease traps set up at the water bodies are cleared once in every three months.	Guidelines provided in DPR.	PIU	PIU
O.3	Pollution Monitoring	The periodic monitoring of the ambient air quality, noise level, water (both ground and surface water) quality, soil pollution/ contamination in the selected locations as suggested in pollution monitoring plan (Refer Chapter 4 for Monitoring Locations of air, water and noise) will be responsibility of PIU. PIU will either appoint PCB or its approved pollution-monitoring agency for the purpose.		PIU through Pollution Monitoring Agency	PIU
O.3.1	Atmospheric Pollution	Ambient air concentrations of various pollutants shall be monitored as envisaged in the pollution-monitoring plan	Air (P & CP) Act 1981	PIU through Pollution Monitoring Agency	PIU

Sl. No.	Environmental Issue	Management Measures	Reference	Responsibility	
				Planning and Execution	Supervision/ Monitoring
O.3.2	Noise Pollution	(d) Noise pollution will be monitored as per monitoring plan at sensitive locations. Noise control programs are to be enforced strictly. Monitoring the effectiveness of the pollution attenuation barriers Hospital Boundary wall will be taken up thrice in the operation period.	Noise Rules 2002	PIU through Pollution Monitoring Agency	PIU
O.3.3	Water Pollution	(e) Water Quality will be monitored as per monitoring plan	Water (P & CP) Act 1974	PIU through Pollution Monitoring Agency	PIU
O.4.	Soil Erosion and Monitoring of Borrow Areas	Visual monitoring and inspection of soil erosion at borrow areas, quarries (if closed and rehabilitated), embankment > 2m. and other places expected to be affected, will be carried out once in every three months as suggested in monitoring plan.		PIU	PIU
O.5	Road Safety	Road Safety will be monitored during operation especially at location where traffic-calming measures have been proposed.		PIU	PIU

Annexure 9B

Species Recommended Near Settlements

Scientific name	Common Name	Best Propagation
<i>Anthocephalus cadamba</i>	Kadamba	Seeds
<i>Artocarpus heterophyllus</i>	Jackfruit,	Seeds
<i>Azadirachta indica</i>	Neem	Seeds
<i>Bauhinia variegata</i> , <i>Bauhinia purpurea</i> , <i>Bauhinia racemosa</i>	Kachnar	Seeds
<i>Emblica officinalis</i>	Amalaka	Seeds, cutting, budding, inarching
<i>Ficus bengalensis</i>	Banyan	Seeds, cutting
<i>Ficus religiosa</i>	Peepal, Ashwatha	Seeds, cutting
<i>Magnifera indica</i>	Mango	Seeds, transplanting, grafting, budding, and root cutting
<i>Spondias pinnata</i>	Ambate	Seeds
<i>Tamarindus indica</i>	Tamarind	Seeds

Species recommended for Landscaping in Areas further away from Settlements		
Scientific Name	Common Name	Best propagation
<i>Acacia auriculiformis</i>	Australian Wattle, Accacia	Seeds.
<i>Albizia procera</i>	Tellachinduga	Seeds / polypots
<i>Anthocephalus cadamba</i>	Kadamba	Seeds
<i>Azadirachta indica</i>	Neem tree, Veepachettu	Seeds
<i>Bauhinia purpurea</i> , <i>B. racemosa</i> , <i>B. Variegata</i>	Kachnar, Devakanchanamu, Kaanchanamu	Seeds
<i>Butea monosperma</i>	Flame of the forest, Mooduga, Palaasamu.	Seeds
<i>Cassia fistula</i>	Indian laburnum, Reelachettu, Vkoolaponna	Seeds, suckers
<i>Dalbergia sisoo</i>	Sissoo, Errassissoo	Seeds, root and Stem cuttings.
<i>Delonix regia</i>	Gulmohar, Seemasantkesula.	Seeds, cutting
<i>Emblica officinalis</i>	Amla, Amalakama, Raatausirika	Seeds, cutting, budding, inarching
<i>Ficus bengalensis</i>	Banyan, Peddamarri	Seeds, cutting
<i>Ficus glomerata</i>	Atti, Medichettu	Seeds, cutting
<i>Ficus infectoria</i>	Pakur, jatijuvi, Badijuvvi	Seeds, cutting
<i>Ficus religiosa</i>	Peepal, Ashwatha	Seeds, cutting
<i>Ficus semicordata</i>	Bommamarri	Seeds / polypots
<i>Jacaranda mimosaeifolia</i>	Nil – Gulmohur, Jacaranda	Seeds
<i>Mangifera indica</i>	Mango, Maamidichettu, Maavi	Seeds, transplanting, grafting, budding, and root cutting
<i>Mimusops hexandra</i>	Pala	Seeds
<i>Polyalthia longifolia</i>	Asokamu, Debbaru	Seeds (fresh).

Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

Species recommended for Landscaping in Areas further away from Settlements		
Scientific Name	Common Name	Best propagation
<i>Putranjiva roxburghii</i>	Kadrojuvi, Kudrajini, Putrajivika	Seeds and vegetative method
<i>Saraca asoka</i>	Ashok, Asokamu	Seeds
<i>Spathodea campanulata</i>	Indian Tulip Tree	Seeds, cutting.
<i>Syzygium cumini</i>	Jaman, Neereedu	Seeds, cutting, budding and grafting
<i>Tamarindus indica</i>	Tamarind, Chintachettu	Seeds
<i>Terminalia arjuna</i>	Arjun, Yerramaddi	Seeds, cutting and air layering
<i>Terminilia chebula</i>	Haritaki, Karakkaaya	Seeds
<i>Thespesia populnea</i>	Indian Tulip tree, Gangaraavichettu	Seeds or cuttings
Species recommended for median plantation		
Scientific name	Local Name	Best Propagation
<i>Bauhinia acuminata</i>	Kanchan	Seeds
<i>Bouganvillea sp.</i>	Bouganvillea	Cutting
<i>Hibiscus rosa sinensis</i>	Chinese Hibiscus, Dasanam	Cutting
<i>Lawsonia inermis</i>	Henna, Gorinta	Seeds and cutting
<i>Nerium indicum</i>	Pink oleander, Karaviram	Cutting
<i>Thevetia nerifolia</i>	Pila Kaneer, Yellow oleander, Pachaganneru	Seeds, cutting

Chapter – 10

ENVIRONMENTAL BUDGET

CHAPTER 10

ENVIRONMENTAL BUDGET

10.1. GENERAL

The environmental budget for the various environmental management measures proposed in the EMP and environmental monitoring plan are presented in **Table 10.1**. There are several other environmental issues that have been addressed as part of good engineering practices, the costs for which have been accounted for in the Engineering Cost. Various environmental aspects covered under engineering costs are listed below:

- Safety signage
- Junction development
- Turfing and Pitching of slopes
- Construction of slope protection works as retaining walls, crash barriers etc.
- Cleaning of culverts

10.2. CONSTRUCTION RELATED ENVIRONMENTAL MITIGATION COSTS

This includes the mitigation costs for the following items as indicated in **Table 10-1**.

Dust Suppression/Management - The contractor shall take an all out effort to reduce the level of dust during construction. As a good practice, the contractor shall use the “vehicle mounted vacuum cleaner brooms” instead through manual labour and brooms, which creates lot of dust during road cleaning operation. The cost for this is a part of good engineering practices, while cost incurred for additional water sprinkling along the construction surface to suppress excessive dust will be completely met from the environmental mitigation costs.

Prevention of Water and Soil Pollution - In order that water and soil does not get polluted from discharge of oil and grease from construction vehicle area, vehicle parking area, and workshops, etc. an oil interceptor shall be provided at such locations.

Borrow Area Rehabilitation - The borrow areas shall be rehabilitated as per the Contractor’s Environmental Management Plan.

Compensatory Afforestation and its Maintenance – Due to proposed widening activity about 7521 trees will be affected and have to be removed. Afforestation work @ 1:3 that

is 22563 saplings shall be planted to enhance the environmental quality as well as aesthetics.

Environmental Enhancement Measures – In general environmental enhancement measures such as landscaping, selective tree planting, improvement of the natural resources for the local population (provision of fodder, fuel wood, etc. by careful selection of species to be planted within the ROW) etc. shall be carried out to improve the aesthetics in the project area. Environmental enhancement measures pertaining to Bus Shelter / Bus Bay, Truck Terminals, and Junction improvement should be provided as per engineering designs.

Waste Disposal – Disposal of waste shall be carried out as per the Contractor's Environmental Management Plan and waste disposal guideline. (Details are provided in Ch-5 –page no -5.8)

Site Restoration – Restoration of construction sites such as diversions, workers camps (with respect to drainage arrangements, sanitation and storage area), and at construction yards shall be taken up once the works at such locations have been completed as per the Contractor's Site Restoration Plan and Environmental Management Plan.

10.3. CONSTRUCTION / OPERATION RELATED MONITORING COSTS

This includes the mitigation costs for the following items as indicated in **Table 10-1.**

Air Quality – Air quality parameters such as, PM₁₀, PM_{2.5}, SO₂, NO₂, CO shall be monitored at hot-mix plant / batching plant locations at stretches of the project road where construction is in progress. During operational stage the same parameters shall be measured at locations as given in Chapter- 4.

Water Quality – Water quality parameters such as pH, BOD, COD, TDS, TSS, DO, Oil and grease etc. shall be monitored as indicated in chapter-6 and at other locations as advised by the EO Independent Consultant (IC).

Noise Levels – Noise quality parameters during construction stage will be monitored at equipment yards and at other locations as indicated in Chapter-6 or as directed by the EO of the IC.

Soil Erosion – During construction, parameters such as turbidity in storm water, silt load in pond and Canals as listed in Chapter -6 shall be monitored as directed in the monitoring plan. Similarly during operational stage the same parameters shall be monitored.

COMPONENT	STAGE	ITEM	UNIT	UNIT COST (Rs.)	QUANTITY	TOTAL COST (INR)
(A) Mitigation cost						
Air	Construction	Dust Management with sprinkling of water, covers for vehicles transporting construction material	Km	75,000	116.00 Kms (NH 79 and 113)	8,700,000.00
Water	Pre-Construction	Relocation of Hand Pumps	No.	-	-	Covered in Engineering
Flora	Construction	Plantation of saplings and its maintenance (Compensatory Afforestation rate is 1:3)	No.	500	22563	11,281,500.00
Safety	Constructions	Demarcating borrow areas clearly using fencing if needed	-	-	-	Covered in Engineering cost.
		Miscellaneous informatory signs and others	-	-	-	Covered in Engineering cost.
(A) Mitigation cost						19,981,500.00

(B) Monitoring costs						
Air Quality	Construction	Monitoring along the road by contractor	No. of Samples	3,000	At 7 locations, thrice in a year for a period of 2 years and for 24 hours in 3 shifts (Total $7 \times 3 \times 2 \times 3 = 126$ Samples)	378000.00
		Monitoring at Hot mix plant, Crusher plant and batch plant (ambient air quality)	No. of Samples	3,000	At 7 locations thrice in a year for 2 years, for 24 hours in 3 shifts (Total $7 \times 3 \times 2 \times 3 = 126$ Samples)	378000.00
		Monitoring at Hot mix plant (Stack Monitoring)	No. of Samples	4,000	At 2 locations thrice in a year for 1 years (Total $2 \times 3 \times 1 = 6$ Samples)	24,000.00
	Operation	Monitoring along the road at locations where monitoring was done during constructions	No. of Samples	3,000	At 4 locations, thrice in a year for a period of one years (Total $4 \times 3 \times 1 \times 3 = 36$ samples)	1,08,000.00
Water Quality	Construction	Drinking water quality monitoring of labour camps/ works site	No. of Samples	4,000	At 6 location, Thrice in a year for 2 years (Total $6 \times 3 \times 2 = 36$	1,44,000.00

Development and Operation of NH- 79 on Chittorgarh-Neemach (MP Border) Section (Km183.000 to Km 221.400) by Four Laning and Nimbahera-Partapgarh Section (Km 5.400 to Km 80.000) of NH-113 by Two Laning in the State of Rajasthan through Public-Private Partnership on Design, Build, Finance, Operate and Transfer (DBFOT) basis Under NHDP-IVB

					samples)	
	Operation	Monitoring along the road at locations where monitoring was done during constructions	-do-	4,000	At 3 locations thrice in a year for 1 year (Total $3 \times 3 \times 1 = 9$ samples)	36,000.00
Noise Quality	Construction	Monitoring along the Hot mix plant and Batch plant	No. of Samples	1,000	At 6location, Thrice in a year for 2 years for 24 hours in day time & night time (Total $6 \times 3 \times 2 = 36$ Samples)	36,000.00
	Operation	Monitoring along the road at locations where monitoring was done during constructions	No, of Samples	1,000	At 3 locations, Thrice in a year for 1 years (Total $3 \times 3 \times 1 = 9$ Samples)	9,000.00
Soil Quality	Construction	Monitoring along hot mix plant and batch plant	No of Samples	2,000	At 6 locations, thrice in a year for 2 years (Total $6 \times 3 \times 2 = 36$ samples)	72,000.00
Sub-Total B- Monitoring Costs						933000.00
Sub-Total C-Training & Other costs						
Training & Mobilization costs	Construction and operation	As per modules developed	L.S.			10,000,00.00

Enhancement	Construction and operation	As per Engineering Design	Covered in Engineering Cost
Sub-Total C: Training & Mobilization costs			10,00000.00
SUMMARY			
Sub Total A: Mitigation			19,981,500.00
Sub Total B: Monitoring Cost			933000.00
Sub Total C: Training & Mobilization Costs			10,00000.00
TOTAL			21,914,500.00
Contingency @ 5%			1095725
TOTAL BUDGETED COSTS			23,010,225.00
Rupees Two Crore Thirty Lakhs Ten Thousand Two Hundred Twenty Five Only/-			

Chapter – 11

DISCLOSURE OF CONSULTANTS

CHAPTER 11

DISCLOSURE OF CONSULTANTS

M/S Mantec consultants Pvt. Ltd, New Delhi were engaged as consultants for carrying out Environmental Impact Assessment Study. Brief resume of the consultants is given in **Table-11.1**.

Name of the Firm	<i>mantec Consultants Pvt. Ltd, New Delhi</i>
Status	Incorporated in Delhi on 29.07.1979 under Companies Act, 1956
Addresses	805, Vishal Bhavan 95, Nehru Place, New Delhi-110019
In-Charge of Env. Division	Mr. Sanjeev Sharma, Executive Director
Name of Consultancy Service Rendered	Field Monitoring, Secondary Data Collection Impact Assessment and Preparation of EIA documents
Total Period of Consultancy Contract	One year
QCI No. (Provisional)	09

Table-11.1: Consultants engaged with the project

S. No.	Functional Areas / EIA Coordinator	Name of the expert/s
1	EIA Coordinator	Mr. Sanjeev Sharma
2	AP	Mr. Sanjeev Sharma
3	WP	Mr. S. B. Sinha
4	SHW	Mr. Sanjeev Sharma
5	SE	Mr. Shabarish Nambiar
6	EB	Dr. Vivek Narayan Singh
7	HG	Mr. Yamesh Sharma
8	GS	Mr. Mukesh Sirolia
9	AQ	Mr. Sanjeev Sharma
10	NV	Mr. Sanjeev Sharma
11	LU	Mr. Yamesh Sharma
12	RH	Mr. soumya Dwivedi

I, hereby, certify that I was a part of the EIA team in the following capacity that developed the above EIA.

EIA Coordinator:

Name : Mr. Sanjeev Sharma
Signature & Date :