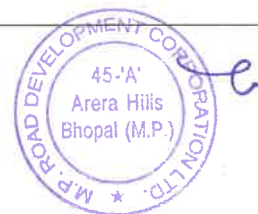


MADHYA PRADESH ROAD DEVELOPMENT CORPORATION LTD.

Reply of Pre-bid queries for Upgradation of following State Highways in the state of Madhya Pradesh on EPC Mode under proposed NDB Loan: Package No. 1, 2, 3, 4, 5, 6, 7, 8 & 9

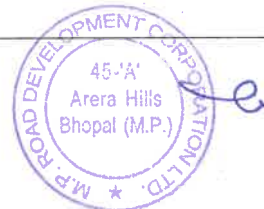
NIT No. 15825/644/Proc./MPRDC/NDB/CW/2024 Dated: 11/03/2024

Sn.	Clause	As per Document	Queries/Request	Reply of MPRDC
1.	EPC_Agreement Page – 59 Clause 11.16	11.16 Video recording & High Definition (HD) Photographs During the Construction Period, the Contractor shall provide to the Authority for every calendar quarter, a video recording, which will be compiled into a 3 (three)-hour compact disc or digital video disc, as the case may be, covering the status and progress of Works in that quarter. The video recording shall be provided to the Authority no later than 15 (fifteen) days after the close of each quarter after the Appointed Date. During the Construction Period, the Contractor shall provide to the authority High Definition (HD) Geotagged Photographs in soft copy of the major items executed during the month.	Throughout the construction phase, the client intends to access the video feed via a browser. Department already has existing ArcGIS software and the RAMS application, facilitated by an API. Bidders are required to propose the GIS solution in line and compliant with existing systems. The contractor needs to augment the existing Suite of software to fulfil these specifications on existing portal. This portal will feature the camera's location, provide a near real-time feed, and incorporate any additional metadata requested by the client. The contractor bears the responsibility of procuring new Software license, capturing and preserving this feed as a recording, with a maximum duration of 3 hours, illustrating the status and progress of works for the respective quarter. Subsequently, these recordings must be submitted to the Authority within 15 days following the conclusion of each quarter, based on the appointed date, on a quarterly basis.	No Change.



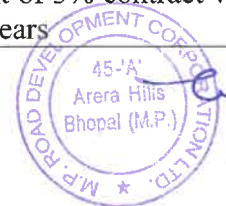
MADHYA PRADESH ROAD DEVELOPMENT CORPORATION LTD.

Sn.	Clause	As per Document	Queries/Request	Reply of MPRDC
2.	Page No. 22 of Technical Schedule Schedule C 1. Project Facilities	Package – 2 Ratlam – Jhabua Road (SH-26) Project Facilities The Concessionaire shall construct the Project Facilities described in this Annex-I to form part of the Two-Laning Project Highway. The Project Facilities shall include: (a) Toll plaza (b) Road Markings; (c) Road Boundary stones; (d) Kilometer and Hectometer stones (e) Landscaping and Plantation; (f) Rest Areas; (g) Truck lay-byes; (h) Bus bays/ Bus shelters; and (i) Others 1. Utility Services 2. Street lights	The Following Project facilities are not mentioned in Schedule C Project Facilities 1. Road Signs; 2. Delineators; 3. Inspection Vehicle; Please clarify that the abovementioned facilities Shall be in scope of EPC Contractor or Not.	Please refer Sr. No. 1 of Addendum -1.
3.	-	-	Looking to the huge amount of cash for Bid Security, It is requested to allow Bid security in the form of Bank Guarantee/Surety Bond also as it is accepted in the case of MoRTH/ National Highway and other State Governments for EPC Tenders.	No Change.



MADHYA PRADESH ROAD DEVELOPMENT CORPORATION LTD.

Sn.	Clause	As per Document	Queries/Request	Reply of MPRDC
4.	-	-	<p>As per sub-clause 2.7 the following formats are included as Appendices, but not available in the RFP:</p> <ol style="list-style-type: none"> Appendix II - Form of e-Bank Guarantee for Bid Security Appendix IIA - Form of Insurance Surety Bond for Bid Security Appendix VIIA - Form of Insurance Surety Bond (For Performance Security) Appendix XII and Sub-clause 2.11.1 (o)- Certificate regarding Compliance with Restrictions under Rule 144 (xi) of the General Financial Rules (GFRs). 	Please refer Sr. No. 2.2 to 2.5 of Addendum -1.
5.	-	-	<p>As per sub-clause 2.1, the selected Bidder has to initially provide a Performance Security valid for 5 (Five) years for an amount of 5% of the Contract value. Whereas as per Para 8 of the Appendix – VII Form of Bank Guarantee (Performance Security/ Additional Performance Security), the validity of the Performance Bank Guarantee is mentioned as at least 2 years from the date of issuance.</p> <p>As per the Standard RFP format for EPC Contract of MoRTH and NHAI, the selected bidder has to submit initially a performance security for an amount of 3% contract value for a validity of 2 (two) years</p>	Please refer Sr. No. 2.7 of Addendum -1.



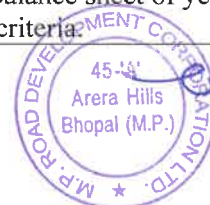
MADHYA PRADESH ROAD DEVELOPMENT CORPORATION LTD.

Sn.	Clause	As per Document	Queries/Request	Reply of MPRDC
6.	-	-	Para 14 of Annex – IV of Appendix IA : Certificates from Statutory Auditor for Construction Works. As per the para, for claiming experience under Category 3 & 4 as per Clause 2.2.2.5 and 2.2.2.6(ii) of the RPF, it should provide a certificate from its Statutory Auditor in the format below. However, the format as well as the notes provided below the said para is for “Certificate from the Statutory Auditor regarding PPP Projects”. The standard format for EPC contract of MoRTH and NHAI for Construction work (for Category 3 and 4) are different. It is requested to provide the format as well as notes for “Certificates from Statutory Auditor for Construction Works.”	Please refer Sr. No. 2.8 of Addendum -1.
7.	-	-	There are no formats in the Standard RFP format for EPC Contract of MoRTH and NHAI for Appendix – X : CERTIFICATE OF NET WORTH BY STATUTORY AUDITOR and Appendix XI : CERTIFICATE OF TURNOVER BY STATUTORY AUDITOR. Further the content in the formats are related to National Highways and Infrastructure Development Corporation of India Ltd. (NHIDCL) only. It is requested to delete the aforesaid formats from the RFP.	Please refer Sr. No. 2.9, 2.10 & 2.11 of Addendum -1.
8.	-	-	It is not clear in the Tender Document that the Estimated Cost and amount put to tender are inclusive of the Utility shifting charges or MPRDC will reimburse the same after executing the Utility shifting work. Kindly clarify.	The Estimated Project Cost is inclusive of Utility Shifting charges. Please refer Clause 9.2 of Article 9 of EPC Agreement.



MADHYA PRADESH ROAD DEVELOPMENT CORPORATION LTD.

Sn.	Clause	As per Document	Queries/Request	Reply of MPRDC
9.	-	-	It is not clear that the amount put to tender is inclusive of GST or not. Please clarify.	Please refer Sub-clause 1.1.1 of RFP Document.
10.	-	-	Package – 2 Ratlam – Jhabua Road (SH-26): a. The project facilities as mentioned in Schedule C for the above Package is not clear. Please Provide the same. b. It is also not clear in the Tender Document for Package 2 that the Contractor has to provide a Vehicle to MPRDC Officials during the construction period. Please clarify.	Please refer Sr. No. 1 of Addendum -1.
11.	2.20.1 Page no. 34,	The Bidder shall furnish as part of its Bid, a Bid Security online on MP Tenders Portal of amount specified in clause 1.1.1 hereinabove.	We request the authority to consider the Bid Security in the form of Bank Guarantee or Insurance Surety Bond. Or else kindly reduce the Bid Security amount to 0.5% of Estimated Project Cost by considering impact of end of financial year March 2024.	No Change.
12.	RFP Clause No. 2.2.2.3 Financial Capacity	RFP Clause No. 2.2.2.3 Financial Capacity (i) which state that The Bidder shall have a minimum Average Annual Turnover updated to the price level of the year based on factors indicated in table below) of 15% (Fifteen percent) of the Estimated Project Cost for the last 5 (Five) financial years.	With respect to the Financial Capacity “the bidder shall have minimum Average Annual Turnover (updated to the price level of the year based on factors indicated in table below) of 15% (Fifteen Percent) of the Estimated Project Cost for the last 5 (Five) financial years”, is given. In this regards, our Company was established since last 3 (Three) Years and our Average Annual Turnover (updated to the price level of the year based on factors indicated in table below) is more than 15% (Fifteen Percent) of the Estimated Project Cost in last 3 year. Hence, it is requested to clarify that we as interested bidder will be eligible and fulfil the criteria of such financial capacity or not. Also, we seek clarification that for Financial Criteria can we used provisional balance sheet of year 2023-24 for fulfilling turnover criteria.	The Average Annual Turnover shall be worked out after dividing the total turnover for 5 years by 5. If Company was not in existence in a particular year then the Turnover for that particular years shall be considered as zero (0) for evaluation purpose. The Provisional Balance Sheet shall not be considered for evaluation purpose. It is advised to submit the Balance Sheet as per Sub-clause 2.2.2.8 of RFP Document.



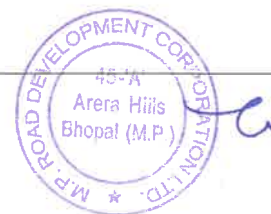
MADHYA PRADESH ROAD DEVELOPMENT CORPORATION LTD.

Sn.	Clause	As per Document	Queries/Request	Reply of MPRDC
13.	General – Bid Due Date	End of Bid Submission – 18.04.2024	As code of conduct is applied, we request you to extend time limit of bid due date for better and detailed study of the work.	Please refer Sr. No. 5 of Addendum -1.
14.	-	-	<p>1.As per above mentioned Subject the Bid due date falls on 18.04.2024 at 3.30 Pm, now we are involve in financial year closing and payments till 31.03.2024. and Preparation for the above tender documents & site visit, rate analysis in consideration, we request you to extend the bid Due date at least 15 days.</p> <p>2.And The Bid security amount is payable by the bidder online or RTGS, that is 1% of Estimated project cost, we are requesting you to kindly change the bid Security Percent from 1% to 0.50% , or allow to submit bank guarantee for bid security</p>	<p>1. Please refer Sr. No. 5 of Addendum -1.</p> <p>2. No Change.</p>
15.	-	-	In Package No 6, 2 nos. of Schedule H is uploaded but the bifurcation of cost is not mentioned in the tender documents. Kindly provide the bifurcation of cost for both the Schedule H.	<p>The road wise bifurcation of Estimated Project Cost for Package 6 is as follows:</p> <p>Badnawar – Petlawad – Thandla Road (SH-64) : Rs. 388.72 Cr.</p> <p>Thandla – Kushalgarh Road (SH-26A): Rs. 43.81 Cr.</p>



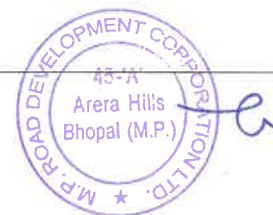
MADHYA PRADESH ROAD DEVELOPMENT CORPORATION LTD.

Sn.	Clause	As per Document	Queries/Request	Reply of MPRDC
16.	-	-	<p>In connection with the above subject , clarification regarding the below mentioned points are needed :-</p> <p>1 - As per Clause No. 2.2.2.2 Technical Capacity (ii) (a) - Clarification of term LWE is needed . Please give a description of LWE and please clarify that which type of road works comes under LWE .</p> <p>2 - As per Clause No. 2.2.2.2 Technical Capacity (ii) (c) - Clarification of term Roads that comes under Reconstruction of Roads in Municipal Corporation limits is needed . Please give a description of this category.</p>	<p>1. LWE shall mean Left Wing Extremism and rest is self-explanatory.</p> <p>2. Clause is self-explanatory.</p>
17.	Pg. 10 , 34 of RFP Document Cl. 1.1.1, Pg. 10 & Cl. 2.20.1, pg. no. 34 of RFP Document – Bid Security	The Bidder shall furnish as part of its Bid, a Bid Security online on MP Tenders Portal of amount specified in clause 1.1.1 hereinabove.	As per RFP document, neither any format attached nor any mode of submission of Bid Security given. Kindly clarify the process for submission of Bid Security.	The Bid Security shall be paid online on MP Tenders Portal through payment gateway.
18.	Pg. 10 Cl. 1.1.1, Pg. 10 Cost of Document	Cost of Document (In Rs.) 50,000/-	The Contractor requests to confirm the mode of payment for purchase of tender document for the same.	The Cost of Bid Document shall be paid online on MP Tenders Portal through <u>payment gateway</u> .
19.	Pg. 31,32 Section -2 Part 'C' Preparation and submission of bids , Cl. 2.11 Pg. 31,32	2.11. Document comprising Technical and financial Bid	As per mentioned clause only online submission of document has been mentioned, therefore, the Contractor understands that there is no physical submission is required for any document related to Technical Bid.	Yes, No physical submission of Technical & Financial bid is required.



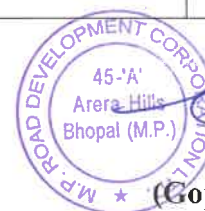
MADHYA PRADESH ROAD DEVELOPMENT CORPORATION LTD.

Sn.	Clause	As per Document	Queries/Request	Reply of MPRDC
20.	Pg. 5,6 pg. 43 , Appendix IB Pg. 46 and Annex – V Pg. 57	NIT - 15825/644/Procu./ MPRDC/NDB/CW/2024 Dated – 11-03-2024 RFP - Appendix IA pg. 43 , Appendix IB Pg. 46 and Annex – V Pg. 57 Notice Inviting Tender & Key Dates Appendix IA – Letter Comprising Technical Bid Appendix IA – Letter Comprising Financial Bid Annex V – Statement of Legal Capacity	As per NIT document, Designated Officer is, Managing Director and Chief Engineer (Proc.) whereas, as per RFP Document Appendix IA, Appendix IB and Annex – V, The Managing Director has mentioned. Please Clarify the name of designated officer.	The Managing Director MPRDC is the designated officer.
21.	Pg. No. 10 of RFP Pg. 1 of Schedule_ Technical A,B,C,D Clause 1.1 of RFP	RFP : Name of Road – Raisen – Rahatgarh Road (SH-62) Schedule - Upgradation of Raisen – Rahatgarh Road (SH 29 & 62) from design Ch. 3.600 to Ch. 50.480, Ch. 55.480 to Ch. 76.750, Ch. 79.500 to Ch. 83.250 and Ch. 92.355 to Ch. 101.225, design length 80.770 Km) to Two Laning with Paved Shoulders of in the State of Madhya Pradesh on EPC Mode	Referring to mentioned clauses, kindly clarify the name of project which needs to be fill in forms, as there's contradiction in RFP and Schedules.	Please refer Sr. No. 2.12 to 2.20 of Addendum -1.



MADHYA PRADESH ROAD DEVELOPMENT CORPORATION LTD.

Sn.	Clause	As per Document	Queries/Request	Reply of MPRDC
22.	Pg. No. 13 Clause – 1.3, Sr. No. 8	End of Bid Submission – 18-04-2024	We are in process to prepare our bid also scheduled site visit for more precise and competitive working, which will take a while to prepare and submit our bid, therefore we request to your good self to extend the date of bid submission at least by three weeks, in order to enable us to submit our competitive offer for the project.	Please refer Sr. No. 5 of Addendum -1.



(Gopal Singh)

Chief Engineer

(Procurement)

MPRDC, Bhopal

Tel: 0755-2597216

Email: procu-mprdc@mp.gov.in



M.P. Road Development Corporation Ltd.

(M.P. State Highway Authority)

(Govt. of M.P. Undertaking)

45-A, Arera Hills, Bhopal-462011

☎ : 0755-2597290 / 2765205 Fax : 0755-2572643, Website : mprdc.gov.in

No.335...../644/Procu./MPRDC/NDB/CW/2024

Date ..08..04/03/2024

ADDENDUM-1

NIT No. 15825/644/Procu./MPRDC/NDB/CW/2024 Dated: 11/03/2024

**Upgradation of following State Highways in the state of Madhya Pradesh
on EPC Mode under proposed NDB Loan:**

Package No. 1, 2, 3, 4, 5, 6, 7, 8 & 9

1. The Schedule C of **Package No. 2: Ratlam – Jhabua Road (SH-26)** is hereby replaced with **Revised Schedule C**, which is enclosed herewith.
2. Following modifications are hereby made in **RFP Document** of Package No. 1, 2, 3, 4, 5, 6, 7, 8 & 9:
 - 2.1. Add following new Sub-clause 2.1.17 below the Sub-clause 2.1.16 of RFP Document:
“2.1.17 The bidders from NDB member countries are eligible for bidding.”
 - 2.2. Replace the words **“Form of e-Bank Guarantee for BID Security”** from Para II of Appendices of Sub-clause 2.7.1 of RFP Document with the words **“Deleted”**.
 - 2.3. Replace the words **“Form of Insurance Surety Bond for Bid Security”** from Para IIA of Appendices of Sub-clause 2.7.1 of RFP Document with the words **“Deleted”**.
 - 2.4. Replace the words **“Form of Insurance Surety Bond (For Performance Security)”** from Para VIIA of Appendices of Sub-clause 2.7.1 of RFP Document with the words **“Deleted”**.
 - 2.5. Replace the words **“Certificate regarding Compliance with Restrictions under Rule 144 (xi) of the General Financial Rules (GFRs)”** from Para XII of Appendices of Sub-clause 2.7.1 of RFP Document with the words **“Deleted”**.
 - 2.6. Replace the words **“Certificate regarding compliance with restrictions under Rule 144 (xi) of the General Financial Rules (GFRs) as per format given in Appendix-XII shall be submitted by the Bidder with the RFP bid duly signed by Authorized signatory & shall be part of the Contract Agreement”** from Para o. of Sub-clause 2.11.1 of RFP Document with the words **“Deleted”**
 - 2.7. Replace the words **“Insert date atleast 2 (two) years from the date of issuance of this Guarantee (in accordance with Clause 2.21 of the RFP). The Contractors can submit the BG for periods of two years at one time and keep on renewing the same till the DLP is over if they have problems in getting the BG in one go for the entire DLP”** from footnote ‘\$’ of Appendix VII of RFP Document with the words **“Insert date atleast 5 (five) years from the date of issuance of this Guarantee (in accordance with Clause 2.21 of the RFP).”**

2.8. The contents of **Point No. 14 of Instructions Annex – IV to Appendix – IA of RFP Document** are hereby **replaced** with the following:

“If the Bidder is claiming experience under Category 3 & 4*, as per Clauses 2.2.2.5 and 2.2.2.6(ii) of the RFP, it should provide a certificate from its Statutory Auditor in the format below:

<p style="text-align: center;">Certificate regarding construction works^Φ</p> <p>Based on its books of accounts and other published information authenticated by it, This is to certify that(name of the Bidder) was engaged by.....(title of the project company)to execute (name of project) for (nature of project). The construction of the project commenced on(date) and the project was/</p> <p>is likely to be commissioned on(date, if any). It is certified that Bidder received</p> <p>payments from its Clients for Construction Works executed by them and certified by the Engineer-in- charge/Independent Engineer/Authority’s Engineer, in the aforesaid construction works. We further certify that the total estimated capital cost of the project is Rs. cr.(Rupeescrore), of which the Applicant received as certified by the Engineer-in-charge/Independent Engineer/Authority’s Engineer Rs.....cr. (Rupees crore), during the past five financial years as per year-wise details noted below:</p> <p>.....</p> <p>.....</p> <p>It is further certified that the receipts indicated above are restricted to the share of the Applicant who undertook these works as a partner or a member of joint venture.♣</p> <p>We further certify that applicant has a share of % in the Joint Venture/Consortium</p> <p style="text-align: right;">(Authorized Signatory)</p> <p style="text-align: right;">Date:</p>
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♣Refer Clauses 2.2.2.5 and 2.2.2.6(ii) of the RFP.

ΦProvide Certificate as per this format only. Attach Explanatory Notes to the Certificate, if necessary. Statutory auditor means the entity that audits and certifies the annual accounts of the company. However, in case the work of other member(s) is also executed by the applicant, then this fact should also be certified by the Statutory Auditor and accordingly the language may be suitably modified.

♣ This certification should be strike out in case of jobs/ contracts, which are executed a sole firm. The payments indicated in the certificate should be restricted to the share of Applicant in such partnership/ joint venture or as authorize sub-contractor. This portion may be omitted if the contract did not involve a partnership/ joint venture or authorize sub-contractor. In case where work is not executed by partnership/ joint venture or authorize sub-contractor, this paragraph may be deleted.

In case of unauthorized sub-contractor proof of authorize sub-contracting has to be submitted”

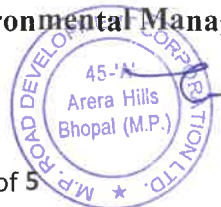


- 2.9. Replace the words **“National Highways and Infrastructure Development Corporation of India Ltd.”** from Para 1. of Appendix – X of RFP Document with the words **“Madhya Pradesh Road Development Corporation Limited”**.
- 2.10. Replace the words **“National Highways and Infrastructure Development Corporation of India Ltd.”** from Para 1. of Appendix – XI of RFP Document with the words **“Madhya Pradesh Road Development Corporation Limited”**.
- 2.11. Replace the words **“NHIDCL”** from Para 4. of Appendix - X of RFP Document with the words **“MPRDC”**.
- 2.12. Replace the words **“Upgradation of State Highways in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”** from cover page of RFP Document of Package 1 with the words **“Upgradation of Package 1: Beohari (Tetka Mod) to Shahdol Road (SH-57) in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”**.
- 2.13. Replace the words **“Upgradation of State Highways in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”** from cover page of RFP Document of Package 2 with the words **“Upgradation of Package 2: Ratlam – Jhabua Road (SH-26) in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”**.
- 2.14. Replace the words **“Upgradation of State Highways in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”** from cover page of RFP Document of Package 3 with the words **“Upgradation of Package 3: Raisen – Rahatgarh Road (SH-62) in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”**.
- 2.15. Replace the words **“Upgradation of State Highways in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”** from cover page of RFP Document of Package 4 with the words **“Upgradation of Package 4: Guna – Fatehgarh – Paron Road (SH-54) in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”**.
- 2.16. Replace the words **“Upgradation of State Highways in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”** from cover page of RFP Document of Package 5 with the words **“Upgradation of Package 5: Lukwasa – Isagarh – Chanderi (Piprod)**



Road (SH-04) in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”.

- 2.17. Replace the words **“Upgradation of State Highways in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”** from cover page of RFP Document of Package 6 with the words **“Upgradation of Package 6: Badnawar – Petlawad – Thandla Road (SH-64) and Thandla – Kushalgarh Road (SH-26A) in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”**.
- 2.18. Replace the words **“Upgradation of State Highways in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”** from cover page of RFP Document of Package 7 with the words **“Upgradation of Package 7: Shivpuri – Pohri – Karahal – Goras Road (SH-51A) in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”**.
- 2.19. Replace the words **“Upgradation of State Highways in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”** from cover page of RFP Document of Package 8 with the words **“Upgradation of Package 8: Damoh – Hata – Gaisabad – Simariya Road (SH-55) in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”**.
- 2.20. Replace the words **“Upgradation of State Highways in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”** from cover page of RFP Document of Package 9 with the words **“Upgradation of Package 9: Neemuch – Singoli Road upto Rajasthan Border (SH- 7 & 53) in the state of Madhya Pradesh on Engineering, Procurement & Construction (EPC) Mode under proposed NDB Loan”**.
3. Add the following below the **Sub-clause 10.1 (vi) of Article 10 of EPC Agreement of Package No. 1, 2, 3, 4, 5, 6, 7, 8 & 9:**
 - “(vii) Prepare an updated Environmental Management Plan that is inline with Schedule-S, including the action plan and checklist and submit to the Authority Engineer for review and concurrence. Failure of the Authority Engineer to review the Environmental Management Plan and convey its concurrence shall not relieve the Contractor of its obligations and liabilities under this Agreement. In addition, the Contractor shall carry out necessary works also inline with ISO 14000:2004/15 Environmental Management Standards.**



(viii) Social Impact assessment, rehabilitation & relocation of all Government Building, Religious Structures, common Property resources etc. shall be complied and implemented as under:

- (a) The Contractor shall undertake appropriate health and safety programs to, amongst others, disseminate information to the construction workers on human immunodeficiency virus/acquired immunodeficiency syndrome and preventive measures;
- (b) The Contractor shall comply with all applicable labor laws of India and the State Government, and does not employ child labour for construction and maintenance activities;
- (c) The Contractor shall comply with the Employment targets, as acceptable, are set for women in road construction activities;
- (d) The Contractor shall not differentiate between wages of men and women workers for work of equal value; and
- (e) The Contractor shall insure appropriate child-care facilities are provided at or around the construction campsites.
- (f) The Contractor shall ensure relocation of all Government Building, Religious Structures, common Property resources etc.”

4. The **Schedule S** for Package No. 1, 2, 3, 4, 5, 6, 7, 8 & 9 are enclosed herewith.

5. The following key dates for Package No. 1, 2, 3, 4, 5, 6, 7, 8 & 9 are hereby extended as mentioned below:

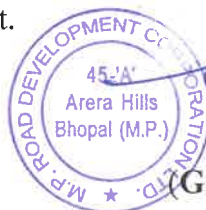
The End Date & Time of Document Sale : 25th April 2024 upto 15:30 Hrs IST

The End Date & Time of Bid Submission : 25th April 2024 upto 15:30 Hrs IST

The Date & Time for opening of Technical Bid : 26th April 2024 at 15:30 Hrs IST

This Addendum – 1 shall take precedence over the previously issued Bid documents. This Addendum – 1 shall form part of the contract agreement.

Encl: As Above.



(Gopal Singh)

Chief Engineer
(Procurement)

MPRDC, Bhopal

Tel: 0755-2597216

Email: procu-mprdc@mp.gov.in

Schedule-S

Badnawar-Petlawad-Thandla Road

ENVIRONMENTAL MANAGEMENT PLAN

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
							Implementatio n	Supervisio n
A. Pre-Construction and Design Stage								
1. Alignment								
1.1: Pavement Damage and Inadequate Drainage Provisions in Habitat Areas.	<ul style="list-style-type: none">Construction of concrete pavement in habitat areas considering alignment level and drainage.Raise road level above the nearby areas with provision of adequate side drains to evacuate the rain water and domestic discharges (drained by habitats occasionally) to prevent damage to road and rain water entry to habitats' houses.Provision of adequate number of cross drainage structures based on drainage pattern around the alignment.	Design Requirement.	All habitat areas throughout the alignment.	Design of both cross and side drains no. 32 of slab/box culverts, Hume pipes.	Review of detail design documents and drawings.	Included in construction cost.	Design Consultant.	AE/ MPRDC
1.2: Loss of Tree and Vegetation.	<ul style="list-style-type: none">Restricting tree cutting within construction limit.Avoid tree cutting at ancillary site.Martian compensatory tree plantation of 410 trees @ 1: 10.	Design Requirement.	Throughout the alignment.	41 No. of tree will be cut.	Observation	Included in construction cost	Design Consultant.	AE/ MPRDC
1.3: Protection of Sensitive Receptors.	<ul style="list-style-type: none">Careful selection of alignment to the sensitive receptor.	Project Requirement.	Location of sensitive receptors	Design and alignment plan	Review of design	Included in construction cost	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
							Implementatio n	Supervisio n
	<ul style="list-style-type: none"> Timely schedule ling of construction activity Provision of noise suitable barriers. 		(Refer Table).					
1.4: Safety along the Proposed Alignment.	<ul style="list-style-type: none"> Make provisions of crash barriers at accident prone areas as identified in the road safety studies. Provision of rumble strips in habitat areas to regulate speed. Provision of retro-reflective warning sign boards nears school, hospital, and religious places and forests areas. Provision of proper sidewalks/pedestrian zone along the road near habitat areas, school, hospital, religious places and forests. Compliance with norms specified in IRC codes for state highway for curvature and grading. Provision of safety curve at all bridges. The design should attempt to equalize cut and fill. Minimize the cutting in hill areas. Incorporate slope stabilization measures to prevent any land slide situation. Incorporate slope stabilization measures 	Design Requirement.	Places where height of embankmen t is more than 3.0 m.	No. of accident and vehicle collision.	Field observation, interview of locals.	Included in constructio n cost.	Design Consultant.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
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	to prevent any land slide situation.							
2. Natural Hazards								
2.1: Protection for Damage from Earthquake.	<ul style="list-style-type: none"> Design considering relevant seismic standard in the clause under IRC 6-2014 for earthquakes in bridges. 		Throughout the stretch.	Incorporation of IRC 6-2014 guidelines for earthquake in bridge design.	Review of bridge design.	Project preparation cost.	Design Consultant.	AE/ MPRDC
2.2: Protection of Road Embankment in Flood Prone Areas.	<ul style="list-style-type: none"> Raise embankment height above the HFL levels in the flood prone areas. Provision of adequate balancing culverts. Improvement in existing culverts/ bridges to increase their carrying capacity. 	IRC: 34 Recommendations for road construction in waterlogged area and IRC: 75 and MORT and H guidelines for Design of High Embankments (DHE).	All the existing culverts/ bridges.	Design of both cross and side drains, no. of slab/box culverts, no. and size of Hume pipes.	-----	Included in construction cost.	Design Consultant.	AE/ MPRDC
3. Shifting of Utility Structures								
3.1: Disruption of Utility Services to Local Community.	<ul style="list-style-type: none"> All telephone and electrical poles/ wires and underground cables should be shifted before start of construction. Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services. Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any. 	Project Requirement.	Throughout the corridor.	Utility shifting plan. Complaints from local people. Status of local utility services.	Interaction with concerned utility authorities and local public.	Included in construction cost.	Contractor.	AE/ MPRDC

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B. Construction Stage								
1. Air Quality								
1.1: Dust Generation due to Construction Activities and Transport, Storage and Handling of Construction Materials.	<ul style="list-style-type: none">Transport, loading and unloading of loose and fine materials through covered vehicles.Paved approach roads.Storage areas to be located downwind of the habitation area.Water spraying on earthworks, unpaved haulage roads and other dust prone areas.	MORT and H Specifications for Road and Bridge Works Air (P and CP) Act-1981 and Central Motor and Vehicle Act-1988.	Throughout Project corridor.	PM ₁₀ level measurements dust pollution or complain of locals.	Standards CPCB methods observations public consultation.	Included in project cost.	Contractor.	AE/ MPRDC
1.2: Emission of Air Pollutants (HC, SO ₂ , NO _x , CO etc.) from Vehicles due to Traffic Congestion and use of Equipment and Machinery.	<ul style="list-style-type: none">Regular maintenance of machinery and equipment.Batching, asphalt mixing plants and crushers at downwind (1 Km) direction from the nearest settlement.Only crushers licensed by the PCB shall be used.DG sets with stacks of adequate height and use of low sulphur diesel as fuel.Ambient air quality monitoring.Follow traffic management plan as given in Section-8.	The Air (Prevention and Control of Pollution) Act, 1981 (Amended 1987) and Rules1982.	Asphalt mixing plants, crushers, DG sets locations.	Monitoring of ambient air quality and checking PUC certificates.	Standards CPCB methods.	Included in project cost.	Contractor.	AE/ MPRDC
2. Noise								
2.1: Noise from Construction Vehicle, Equipment	<ul style="list-style-type: none">All equipment to be timely serviced and properly maintained.Bottlenecks to be removed.	Legal requirement noise Pollution (Regulation and Control) Rules, 2000 and	Throughout project section especially at construction sites,	Noise levels measurements. Complaints from local people.	As per noise rule, 2000. Consultation with local people.	Included in Project Cost Plantation Cost is Separate.	Contractor.	AE/ MPRDC

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and Machinery.	<ul style="list-style-type: none"> Construction equipment and machinery to be fitted with silencers and maintained properly. Only IS approved equipment shall be used for construction activities. The regulation near residential, built up and forest area construction shall be restricted to daylight hours. Timing of noisy construction activities shall be done during night time and weekends near schools and selected suitable times near temples when there are no visitors, concurrent noisy operations may be separated to reduce the total noise generated, and if possible re-route traffic during construction to avoid the accumulation of noise beyond standards. Else provision of temporary noise barrier at sensitive locations or near sources. 	amendments there of . Clause No. 501.8.6. MORT and Highway Specifications for Road and Bridge Works.	residential and identified sensitive locations.					
3. Land and Soil								
3.1: Land use Change and Loss of Productive/ Top Soil.	<ul style="list-style-type: none"> Non-agricultural areas to be used as borrow areas to the extent possible. 	Project Requirement.	Throughout the project section and borrow areas.	Borrow pit locations. Top soil storage area.	Review borrow area plan, site visits.	Included in Construction Cost.	Contractor.	AE/ MPRDC

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	<ul style="list-style-type: none"> If using agricultural land, top soil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion. 							
3.2: Slope Failure and Soil Erosion due to Construction Activities, Earthwork, and Cut and Fill, Stockpiles etc.	<ul style="list-style-type: none"> Bio-turfing of embankments to protect slopes. Slope protection by providing frames, dry stone pitching, masonry retaining walls, planting of grass and trees. The side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. Care should be taken that the slope gradient shall not be greater than 2:1. The earth stockpiles to be provided with gentle slopes to prevent soil erosion. 	IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2 MORT and Highway Specifications for Road and Bridge Works Guidelines IX for Soil Erosion.	Throughout the entire project road Especially along hilly areas.	Occurrence of slope failure or erosion issues.	Review of design documents and site observation.	Included in Construction Cost.	Design Consultant and Contractor.	AE/ MPRDC
3.3: Borrow Area Management.	<ul style="list-style-type: none"> Non-productive, barren lands, upland shall be used for borrowing earth with the necessary permissions/ consents. Depths of borrow pits to be regulated and sides not steeper than 25%. 	IRC Guidelines on borrow areas and for quarries (Environmental Protection Act And Rules-1986; Water Act, Air Act) . Clause No. 305.2.2 MORT and Highway Specifications for Road and Bridge	Borrow sites location.	Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Incidents of accidents.	Review of design documents and site observation.	Included in Construction Cost.	Design Consultant and Contractor.	AE/ MPRDC

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	<ul style="list-style-type: none"> Topsoil to be stockpiled and protected for use at the rehabilitation stage. Transportation of earth materials through covered vehicles. IRC recommended practice for borrow pits (IRC-10: 1961). Borrow areas not to be dug continuously. To the extent borrow areas shall be sited away from habituated areas. Borrow areas shall be levelled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fishpond in consultation with fishery department and land owner/ community. Rehabilitation of the borrow areas as per guidelines for redevelopment of borrow areas. 	Works Guidelines V for Borrow Areas Management.		Complaints from local people.				
3.4: Quarry Operations.	<ul style="list-style-type: none"> Aggregates will be sourced from existing licensed quarries. Copies of consent/ approval/ rehabilitation plan for a new quarry or use of existing source will be submitted to Environmental Officer (EO), NDB. 	Clause No. 111.3 MORT and Highway Specifications for Road and Bridge Work Guidelines VI for Quarry Areas Management.	Quarry area locations.	Existence of licenses for all quarry areas from which materials are being sourced existence of a quarry redevelopment plan.	Review of design documents, contractor documents and site observation.	Included in Construction cost.	Contractor.	AE/ MPRDC

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	<ul style="list-style-type: none"> The contractor will develop a Quarry redevelopment plan, as per the mining rules of the state and submit a copy of approval to Executing Agency (EA). 							
3.5: Compaction of Soil and Impact on Quarry Haul Roads due to Movement of Vehicles and Equipment.	<ul style="list-style-type: none"> Construction vehicles, machinery, and equipment to be stationed in the designated Right of Way (ROW) to avoid compaction. Approach roads/ haulage roads shall be designed along the barren and hard soil area to reduce the compaction. Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/ minor roads. Load of haulage trucks will be monitored to ensure they do not exceed the standard limits to avoid safety issues and excessive damage on the roads. Land taken for construction camp and other temporary facility 	Design Requirement.	Parking areas, haulage roads and construction yards.	Location of approach and haulage roads presence of destroyed/ compacted agricultural land or land which has not be restored to its original condition.	Site observation.	Included in Construction Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
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	shall be restored to its original conditions.							
3.6: Contamination of Soil due to Leakage/ Spillage of Oil, Bituminous and Non-Bituminous Debris Generated from Demolition and Road Construction.	<ul style="list-style-type: none"> Construction vehicles and equipment will be maintained and refuelled in such a fashion that oil/ diesel spillage does not contaminate the soil. Fuel storage and refuelling sites to be kept away from drainage channels. Unusable debris shall be dumped in ditches and low lying areas. To avoid soil contamination Oil-Interceptors shall be provided at wash down and refuelling areas. Waste oil and oil soaked cotton/ cloth shall be stored in containers labelled 'Waste Oil' and 'Hazardous' sold off to MOEF/ SPCB authorized vendors. Non-bituminous wastes to be dumped in approved borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit. Bituminous wastes will be disposed off in an identified dumping site approved, 	Design Requirement.	Fuelling station, construction sites, and construction camps and disposal location.	<p>Quality of soil near storage area.</p> <p>Presence of spilled oil or bitumen in project area.</p>	Site observation.	Included in Construction Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
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	appropriately designed, compliant waste management facilities (land-fills).							
4. Water Resources								
4.1: Sourcing of Water during Construction.	<ul style="list-style-type: none"> Requisite permission shall be obtained for abstraction of groundwater from Central Groundwater Authority (CGA). Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected. 	-----	Throughout the project section.	Approval from competent Authority. Complaints from local people on water availability.	Checking of documentation on. Talk to local people.	Included in Construction Cost.	Contractor.	AE/ MPRDC
4.2: Disposal of Water during Construction.	<ul style="list-style-type: none"> Provisions shall be made to connect road side drains with exiting nearby ponds otherwise make provision of water harvesting pits intermittently. 	Clause No. 1010 EP Act-1986 MORT and Highway Specifications for Road and Bridge Works.	Throughout the project section.	Design of road side drains existence of proper drainage system for disposal of waste water.	Standards methods site observation and review of documents.	Included in Construction Cost.	Contractor.	AE/ MPRDC
4.3: Alteration in Surface Water Hydrology due to Embankment.	<ul style="list-style-type: none"> Existing drainage system to be maintained and further enhanced. Provision shall be made for adequate size and number of cross drainage structures especially in the areas where land is sloping towards road alignment. Road level shall be raised above High Flood Level (HFL); level wherever road 	Design Requirement, Clause No. 501.8.6. MORT and Highway Specifications.	Near all drainage channels, river crossings etc.	Design of road side drains.	Review of design documents. Site observation.	Included in Construction Cost.	Contractor.	AE/ MPRDC

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	level is lesser than HFL.							
4.4: Siltation in Water Bodies due to Construction Activities/ Earthwork.	<ul style="list-style-type: none"> Embankment slopes to be modified suitably to restrict the soil debris entering water bodies. Provision of silt fencing shall be made at water bodies. Silt/ sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated. Earthworks and stone works to be prevented from impeding natural flow of rivers, streams and water canals or existing drainage system. 	Design Requirement, Clause No. 501.8.6. MORT and Highway Specifications for Road and Bridge Works (CP and CP) and Worldwide Best Practices.	Near all water bodies, river embankment slopes.	Siltation of rivers, streams, ponds and other water bodies in project area.	Field observation.	Included in Construction Cost.	Contractor.	AE/ MPRDC
4.5: Deterioration in Surface Water Quality due to Leakage from Vehicles and Equipments and Waste from Construction Camps.	<ul style="list-style-type: none"> No vehicles or equipment should be parked or refuelled near water-bodies, so as to avoid contamination from fuel and lubricants. Oil and grease traps and fuelling platforms to be provided at re-fuelling locations. All chemicals and oil shall be stored away from water and concreted platform with catchment pit for spills collection. All equipment operators, drivers, and 	The Water (Prevention and Control of Pollution) Act-1974 and Amendments Thereof.	Water bodies, refueling stations, construction camps.	Water quality of ponds, streams, rivers and other water bodies in project. Presence of oil floating in water bodies in project area.	Conduction of water quality tests as per the monitoring plan. Field observation.	Included in Construction Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
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	<p>warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language emergency response procedure, including reporting, will be provided by the contractors.</p> <ul style="list-style-type: none"> • Construction camp to be sited away from water bodies. • Solid wastes shall be collected, strong and taken to the approved, appropriately designed, compliant waste management facility (landfills) only. • Water quality shall be monitored periodically. • All equipments operators, divers, and ware house personal will be trained in immediate response for spill containment and eventual cleanup. Readily available, simple to understand and preferably retain in the local language emergency response procedure, including reporting, will be provided by the contractor. 							

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5. Flora and Fauna								
5.1: Vegetation Loss due to Site Preparation and Construction Activities and Structure Development.	<ul style="list-style-type: none">Minimize tree cutting to the extent possible.Roadside total LHS and RHS are 42 Trees to be removed with prior approval of competent authority.Compensatory plantation at 1: 10 basis and additional plantation as per the IRC: guidelines in consultation with Forest Department (FD).Regular maintenance of all trees planted.Provision of LPG in construction camp as fuel source to avoid tree cutting, wherever possible.Plantation of trees on both sides of the road. Integrate Vegetation Management (IVM) with the carriage way completely clear of vegetation. From the edge of the road to the boundary of Right of Way (ROW), vegetation structured with smaller plants near the line and larger trees further away to avoid costly and provide habitats for a wide variety of plants and animals. Additional plantation near river	Forest Conservation Act-1980 and IRC: SP: 21 and IRC: SP: 66.	Throughout project corridor.	Right of Way (ROW) width 41 number of trees for felling. Compensatory plantation plan 410 number of trees replanted.	Review of relevant documents – tree cutting permit, compensatory plantation plan. Field observations.	Road side Plantation Cost is Included in Project Costs.	Relevant agency specialized in a forestation.	AE/ MPRDC

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	<p>banks to check erosion as part of compensatory plantation.</p> <ul style="list-style-type: none"> In the event of design changes during the construction stages additional assessments including the possibility to save trees shall be made by the Executing Agency (EA). Road side Plantation Strategy as per IRC specifications including manuring. 							
6. Construction Camps								
6.1: Impact Associated with Location.	<ul style="list-style-type: none"> All camps should maintain minimum distance from following: <ul style="list-style-type: none"> I. 500 m from habitation; II. 500 m from forest areas where possible; III. 500 m from water bodies where possible; IV. 500 m from through traffic route where possible; The average distance between two camps should be 50 Km. 	Design Requirement.	All construction camps.	Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and other construction camps.	On site observation. Interaction with workers and local community.	Included in Construction Costs.	Contractor and Environmental Officer (EO).	AE/ MPRDC
6.2: Worker's Health in Construction Camp.	<ul style="list-style-type: none"> The location, layout and basic facility provision of each labour camp will be submitted to SQC prior to their construction. 	The Building and Other Construction Workers (Regulation of Employment and Conditions of	All construction camps.	Camp health records. Existence of proper First-Aid-Kit (FAK) in camp site.	Camp records. Site observation.	Part of the Contractors Cost.	Contractor.	AE/ MPRDC

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	<p>The construction shall commence only after approval of SQC.</p> <ul style="list-style-type: none"> The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic manner as approved by the Executing Agency (EA). Adequate water and sanitary latrines with septic tanks attached to soak pits shall be provided. Preventive medical care to be provided to workers including a First-Aid-Kit (FAK) that must be available in the camp. Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste must be carried out. The contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides, which should comply with local regulations. No alcoholic liquor or prohibited drugs will be imported to, sell, give, and barter to the 	Service) Act-1996 and The Water (Prevention and Control of Pollution) Act-1974 and Amendments Thereof.		Complaints from local people.	Consultation with local people living nearby.			

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	<p>workers of host community.</p> <ul style="list-style-type: none"> Awareness rising, to immigrant workers/ local community on communicable and sexually transmitted diseases. 							
7. Management of Construction Waste/ Debris								
7.1: Selection of Dumping Sites.	<ul style="list-style-type: none"> Unproductive/wastelands shall be selected for dumping sites. Away from residential areas and water bodies. Dumping sites have adequate capacity equal to the amount of debris generated. Public perception and consent from the village Panchayats has to be obtained before finalizing the location. 	Design Requirement and MORT and Highway Guidelines.	At all dumping sites.	Location of dumping sites. Public complaints.	Field survey and interaction with local people.	Included in Construction Costs.	Contractor.	AE/ MPRDC
7.2: Reuse and Disposal of Construction and Dismantled Waste.	<ul style="list-style-type: none"> The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites and camps, temporary traffic diversions, and haulage routes. Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. 	MORT and Highway Guidelines.	Throughout the project corridor.	Percentage of reuse of existing surface material. Method and location of disposal site of construction debris.	Contractor records. Field observation. Interaction with local people.	Included in Construction Costs.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
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	<p>The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal MORT and Highway guidelines should be followed.</p> <ul style="list-style-type: none"> Unusable and surplus materials, as determined by the Project Engineer (PE), will be removed and disposed off-site. All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. 							
8. Traffic Management and Safety								
8.1: Management of Existing Traffic and Safety.	<ul style="list-style-type: none"> Temporary traffic diversion shall be planned by the contractor and approved by the "Engineer". The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Traffic control plans 	Design Requirement and IRC: SP: 55.	Throughout the project corridor especially at intersection s.	<p>Traffic management plan.</p> <p>Safety signs on site.</p> <p>Number of traffic accidents.</p>	<p>Review traffic management plan field observation of traffic management and safety system.</p> <p>Interaction with people in vehicles using the road.</p>	Included in Construction Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
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	<p>shall be prepared in line with requirements of "IRC's: SP: 55-Document".</p> <ul style="list-style-type: none"> The Contractor will ensure that the diversion/ detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed. Restriction of construction activity to only one side of the existing road. The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer". 							
8.2: Pedestrians, Animal Movement.	<ul style="list-style-type: none"> Temporary access and diversion, with proper drainage facilities. Access to the schools, temples and other public places must be maintained when construction takes place near them. 	Design requirement And IRC: SP: 27-1984; IRC: SP: 32-1988; Road Safety for Children (5-12 Years Old) IRC: SP: 44-1994 Highway Safety Code IRC: SP:	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage	Road signage and drainage as per IRC-guideline. Complaints from local people.	Field observation interaction with local people.	Included in Construction Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
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	<ul style="list-style-type: none"> Fencing wherever cattle movement is expected. To avoid the need for cattle underpasses, some of the proposed culverts near habitations may be widened to facilitate cattle movement. 	55-2001; Guidelines for The Building and other Construction Workers Act-1996 and Cess Act of 1996 Factories Act-1948.	roads, diversion sites.					
8.3: Safety of Workers and Accident Risk from Construction Activities.	<ul style="list-style-type: none"> Contractors to adopt and maintain safe working practices. Usage of fluorescent and retro-reflectory signage, in local language at the construction sites. Training to workers on safety procedures and precautions. Mandatory appointment of safety officer. All regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress shall be complied with. Provision of PPEs to workers. Provision of a readily available first aid unit including an adequate supply of dressing materials. 	-----	Constructio n sites.	<p>Availability of safety gears to workers.</p> <p>Safety signage training records on safety.</p> <p>Number of safety related accidents.</p>	<p>Site observation.</p> <p>Review records on safety training and accidents.</p> <p>Interact with construction workers.</p>	Included in Constructio n Cost.	Obligation of Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
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	<ul style="list-style-type: none"> The contractor will not employ any person below the age of 18 years for any work. Use of hazardous material should be minimized and/ or restricted. Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or emergencies. Accident Prevention Officer (APO) must be appointed by the contractor. 							
8.4: Accident Risk to Local Community.	<ul style="list-style-type: none"> Restrict access to construction sites to authorized personnel. Physical separation must be provided for movement of vehicular and human traffic. Adequate signage must be provided for safe traffic movement. 	-----	Constructio n sites.	Safety signs and their location. Incidents of accidents. Complaints from local people.	Site Inspection. Consultation with local people.	Included in Constructio n Cost.	Contractor.	AE/ MPRDC
9. Site Restoration and Rehabilitation								
9.1: Clean-up Operations, Restoration and Rehabilitation.	<ul style="list-style-type: none"> Contractor will prepare site restoration plans, which will be approved by the "Engineer". The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. All construction zones including river-beds, culverts, road-side 	Project Requirement.	Throughout the project corridor, construction ; camp sites and borrow areas.	Clean and restored camp sites. Presence/ absence of construction material/ debris after completion of construction works on construction site.	Site observation. Interaction with locals. Issue completion certificate after restoration of all sites are	Included in Constructio n Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
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	<p>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 satisfaction of the Environmental Officer (EO).</p> <ul style="list-style-type: none"> All the opened borrow areas will be rehabilitated and "Engineer" will certify in this regard. 				found satisfactory.			

C. Operation Stage

1. Air quality

1.1: Air Pollution due to Vehicular Movement or Vehicles Playing on the Road.	<ul style="list-style-type: none"> Roadside tree plantations shall be maintained. Regular maintenance of the road will be done to ensure good surface condition. Vehicular air pollution will be managed and monitored. Ambient air quality monitoring. If monitored parameters are above the prescribed limit, suitable control measures must be taken. Technological and behavioural changes. Road signs shall be provided reminding the motorist to properly 	Environmental Protection Act-1986; The Air (Prevention and Control of Pollution) Act-1981.	Throughout the corridor.	Ambient air quality (PM ₁₀ , CO, NO _x) survival rate of trees planted.	As per CPCB requirements site inspection.	Included in Operation/Maintenance Cost.	Contractor.	AE/ MPRDC
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Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
							Implementatio n	Supervisio n
	maintain their vehicles to economize on fuel consumption and unprotect the environment.							
2. Noise								
2.1: Noise Pollution due to Movement of Traffic.	<ul style="list-style-type: none"> Effective traffic management and good riding conditions shall be maintained to reduce the noise level throughout the stretch and speed limitation and honking restrictions may be enforced near sensitive locations. The effectiveness of the multilayered plantation should be monitored and if needed solid noise barrier shall be placed. Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building close to the road. 	Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof.	Sensitive receptors.	Noise levels.	Noise monitoring as per noise rules, 2000. Discussion with people in sensitive receptor sites.	Included in Operation/ Maintenance Cost.	Contractor.	AE/ MPRDC
3. Land and Soil								
3.1: Soil Erosion at Embankment during Heavy Rainfall.	<ul style="list-style-type: none"> Periodic checking to be carried to assess the effectiveness of the stabilization measures viz. turfing, stone 	Project Requirement.	At bridge locations and embankment slopes and other	Existence of soil erosion sites. Number of soil erosion sites.	On site observation.	Included in Construction Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
							Implementatio n	Supervisio n
	pitching, river training structures etc. <ul style="list-style-type: none"> Necessary measures to be followed wherever there are failures. 		probable soil erosion areas.					
4. Water Resources/ Flooding and Inundation								
4.1: Siltation.	<ul style="list-style-type: none"> Regular checks shall be made for soil erosion and turfing conditions of river training structures for its effective maintenance. 	Project Requirement.	Near surface water bodies.	Water quality.	Site observation.	Included in Operation/ Maintenance Cost.	Contractor.	AE/ MPRDC
4.2: Water Logging due to Blockage of Drains, Culverts or Streams.	<ul style="list-style-type: none"> Regular visual checks and cleaning of drains shall be done along the alignment to ensure that flow of water is maintained through cross drains and other channels/ streams. Monitoring of water borne diseases due to stagnant water bodies. 	Project Requirement.	Near surface water bodies.	Presence of flooded areas or areas with water stagnation.	Site observation.	Included in Operation/ Maintenance Cost.	Contractor.	AE/ MPRDC
4.3: Road Inundation due to Choking of Drainage Channels.	<ul style="list-style-type: none"> NDB will ensure that all drains (side drains and all cross drainages) are periodically cleared especially before monsoon season to facilitate the quick passage of rainwater and avoid flooding. 	Project Requirement.	Flood prone sections.	Incidents of flooding and road inundation with details on change.	Field observation Interaction with local community.	Included in Operation/ Maintenance Cost.	Contractor.	AE/ MPRDC
5. Flora								
5.1: Vegetation.	<ul style="list-style-type: none"> Planted trees, shrubs, and grasses to be properly maintained. The tree survivalist audit to be conducted at least once in a year 	Forest Conservation Act-1980.	Project tree plantation sites.	Minimum of 70% of tree survival.	Records and fields observations.	Operation and Maintenance Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
							Implementatio n	Supervisio n
	to assess the effectiveness.							
6. Maintenance of Right of Way and Safety								
6.1: Accident Risk due to Uncontrolled Growth of Vegetation.	<ul style="list-style-type: none"> Efforts shall be made to make shoulder completely clear of vegetation. Regular maintenance of plantation along the road side. Invasive plant not to be planted near the road. 	Project Requirement.	Throughout the project route.	Presence of and extent of vegetation growth on either side of road. Accident data.	Visual inspection. Accident records.	Included in Operation/ Maintenance Cost.	Contractor.	AE/ MPRDC
6.2: Accident Risks Associated with Traffic Movement.	<ul style="list-style-type: none"> Traffic control measures, including speed limits, will be enforced strictly. Further encroachment of squatters within the Right of Way (ROW) will be prevented. No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law. Monitor/ ensure that all safety provisions included in design and construction phase are properly maintained. Highway patrol unit(s) for round the clock patrolling. Phone booths for accidental reporting and ambulance services with minimum response time for rescue of any accident victims, if possible. 	IRC: SP: 55	Throughout the project route.	Police records on accident. Condition and existence of safety signs, rumble strips etc. on the road. Presence/absenc e of sensitive receptor structures inside the stipulated planning line as per relevant local law.	Review accident records. Site observation.	Included in Operation/ Maintenance Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
							Implementatio n	Supervisio n
	<ul style="list-style-type: none"> Tow-away facility for the break down vehicles if possible. 							
6.3: Transport of Dangerous Goods.	<ul style="list-style-type: none"> Existence of spill prevention and control and emergency responsive system. Emergency plan for vehicles carrying hazardous material. 	-----	Throughout the project stretch.	Status of emergency system – whether operational or not.	Review of spill prevention and emergency response system.	Included in Operation/ Maintenance Cost.	Contractor.	AE/ MPRDC

Note: EA: Executing Agency, PWD: New Development Bank(NDB), EO: Environmental Officer, IRC: Indian Road Congress. AE : Authority Engineer

Appendix: Environmental Monitoring Plan

Environmental Components	Monitoring			Location	Frequency	Institutional Responsibility	
	Parameters	Special Guidance	Standards			Implementation	Supervision
Air	PM _{2.5} , PM ₁₀ , SO ₂ , NO _x , CO	As per CPCB guidelines	The Air (Prevention & Control of Pollution) Rules, CPCB, 1982	At sites where hot mix plant/ batching plant is located	3 times in a year for 3 years or construction period at 3 sites & once in year for five years at 3 sites during operation/ defect liability period	Contractor through approved monitoring agency	AE/ MPRDC
Water	pH, BOD, COD, TDS, TSS, DO, Total coliform, Conductivity, Oil & Grease	Grab sample collected from source and analyze as per standard methods for examination of water and wastewater	Water quality standards by CPCB	River tributaries, roadside ponds and ground water at construction camp sites	Once during preconstruction stage 3 times in a year for 3 years or construction period at 3 locations	Contractor through approved monitoring agency	AE/ MPRDC
Noise Levels	Noise level for day and night on dB(A) scale	In free field at 1m distance from the equipment to be monitored	Noise standard by CPCB	At equipment yards, camp and villages along the alignment.	3 times in a year for 3 years or construction period, 3 locations & once in a year for 5 years at 3 sites during operation/defect liability period.	Contractor through approved monitoring agency	AE/ MPRDC
Soil Quality	Monitoring of NPK & heavy metals and grease		As per IRC code of practice	Ad- hoc if accident/ spill locations involving bulk transport of carrying hazardous materials	-	PIU through an approved agency	AE/ MPRDC
Road side Plantation	Monitoring of felling of trees	It should be ensured that the marked trees are felled only	As given in the IEE report	All along the corridor	During the felling of trees	Forest department	AE/ MPRDC
	Survival rate of trees, success of re-vegetation	The number of trees surviving during each visit should be compared with the number of saplings planted	The survival rate should be at least 75% below which re-plantation should be done	At locations of compensatory afforestation	Every year for 3 years	PIU	AE/ MPRDC

Note :- Madhya Pradesh Development Corporation, PIU- Project Implementation Unit, AE – Authority Engineer

Appendix: NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Concentration in ambient Air			
	Average	Industrial, Residential and other rural area	Ecologically Sensitive Area (Notified by Central Government)	Methods of Measurement
SO ₂ µg/m ³	Annual* 24 hours**	50 80	20 80	- Improved West and Geake - Ultraviolet Fluorescence
NO _x µg/ m ³	Annual* 24 hours**	40 80	30 80	- Modified Jacob and Hochheiser - Chemiluminescence
PM ₁₀ µg/ m ³	Annual* 24 hours**	60 100	60 100	- Gravimetric - TEOM - Beta Attenuation
PM _{2.5} µg/ m ³	Annual* 24 hours**	40 60	40 60	- Gravimetric - TEOM - Beta Attenuation
Ozone (O ₃) µg/m ³	8 Hours** 1 Hour**	100 180	100 180	- UV Photometric - Chemiluminescence - Chemical Method
Lead µg/m ³	Annual* 24 hours**	0.50 1.0	0.50 1.0	- AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper - ED-XRF using Teflon filter
CO µg/m ³	8 Hours** 1 Hour**	2000 4000	2000 4000	- Non Dispersive Infra-Red Spectroscopy
NH ₃ µg/m ³	Annual* 24 hours**	100 400	100 400	- Chemiluminescence - Indophenol blue method
Benzene (C ₆ H ₆) µg/m ³	Annual*	05	05	- Gas Chromatography based Continuous Analyzer - Adsorption followed by GC Analysis
Benzo Pyrene- Particulate Phase only µg/m ³	Annual*	01	01	- Solvent extraction followed by HPLC/GC analysis
Arsenic µg/m ³	Annual*	06	06	- AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
Nickel µg/m ³	Annual*	20	20	- AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

Note:

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

** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable shall comply 98% of the time in a year. However 2% of the time, it may exceed but not on two consecutive days.

Appendix: INDIAN STANDARD DRINKING WATER SPECIFICATION (10500:1991)

S. No.	Parameters	Essential Standards	Relaxed Standards
1.0	Physical Standards		
1.1	Color (Hazen units)	10	50
1.2	Taste	Agreeable	Agreeable
1.3	Odour	Unobjectionable	Unobjectionable
1.4	PH	6.5-8.5	6.5-8.5
1.5	Turbidity (NTU)	10	25
1.6	TDS (mg/l)	500 (without treatment)	1500 (with treatment)
1.7	Total Hardness (mg/l)	300	600
2.0	Inorganic Parameters		
2.1	Ca (mg/l)	75	200
2.2	KMg (mg/l)	30	100
2.3	Fe (mg/l)	0.3	1
2.4	Mn (mg/l)	0.1	0.5
2.5	Cl (mg/l)	250	1000
2.6	SO ₄ (mg/l)	150	400 if Mg<30mg/l
2.7	NO ₃ (mg/l)	45	45
2.8	F (mg/l)	0.6-1.2	1.5
2.9	Free Cl (mg/l)	0.2	0.5
3.0	Heavy Metals		
3.1	Hg (mg/l)	0.001	0.001
3.2	Cd (mg/l)	0.01	0.01
3.3	Se (mg/l)	0.01	0.01
3.4	As (mg/l)	0.05	0.05
3.5	Pb (mg/l)	0.1	0.1
3.6	Zn (mg/l)	5	10
3.7	Cr+6 (mg/l)	0.05	0.05
3.8	Cu (mg/l)	0.05	1.5
4.0	Other Parameters		
4.1	Phenolic Compounds mg/l) (as C ₆ H ₅ HO)	0.001	0.002
4.2	CN (mg/l)	0.05	0.05
4.3	Anionic Detergents(mg/l) (as MBAS)	0.2	1.0
4.4	Mineral Oil (mg/l)	0.01	0.03
4.5	Pesticides	Absent	Absent
5.1	Microbiological Parameters		
	Total Coliforms (MPN)	95% of the sample should not contain coliform in 100 ml	
6.0	Radiological Parameters		
6.1	Gross alpha (µc/ml)	10-6	
6.2	Gross beta (µc/ml)	10-7	

Note: A-Desirable or essential

B- Relatable under certain circumstances such as no alternate source being available

Appendix: AMBIENT NOISE QUALITY STANDARDS

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

Note: 1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
3. Silence zone is defined as an area comprising not less than 100 meters around hospitals, educational institutions and courts. The silence zones are zones, which are declared as such by the competent authority.
4. Mixed categories of areas may be declared as one of the four above-mentioned categories by the competent authority.

PART 2: GENDER ACTION PLAN

Gender Issue/ Component	Remedial Measure	Reference to laws/ Guidelines	Location	Monitoring indicators	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
Elderly, women, children and Disability (EWCD)-friendly construction of Road and safety measures	EWCD-friendly features include well-marked crossings, safety signage, and pedestrian walkways	Gender action Plan Review of design and safety measures	Concerned road	About 78.86 km of road upgraded with EWCD-friendly features and road safety measures	Review of detail design documents & drawings	Including in construction cost	Contractor	AE / MPRDC
EWCD-friendly bus shelters construction	Construction of Bus shelter is recommended with bricks and concrete, The appropriate location for Bus shelter may be identified by the participatory approach (PRA) in presence of elderly, women, children and disable person	Participatory Rural appraisal (PRA) tools and exercises may adopt	Concerned Road	About 50 bus shelters constructed	<ul style="list-style-type: none"> Review the design of the bus shelter the concrete base bus shelter is recommended 	Including in construction cost	Contractor	AE / MPRDC
Solar light provision included in bus shelters close to educational and health facilities	Local authority (Panchayat / urban body) may take in confidence and have a MoU with Panchayat for the protection of such Asset	PRI and Gram Sabha Act 2002	Concerned bus shelter/ road	100 % bus shelters to be installed the solar light	Local committee/ group may form at location to take care of the safety of the asset	Including in construction cost	Contractor	AE / MPRDC

PART 2: GENDER ACTION PLAN

Gender Issue/ Component	Remedial Measure	Reference to laws/ Guidelines	Location	Monitoring indicators	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
Information Elderly, women, children and disability govt benefitted schemes and helpline numbers displayed at bus shelters	Selected schemes to empower EWCD May display and emergency helpline numbers for women, children, police, fire etc. One seat will Demarcated for the women/ elderly / disable seat	Line department i.e. women and child development, social justice	Concerned bus shelter/ road	100% bus shelters will be displayed the schemes and helpline numbers	Review of detail design documents & drawings,	Including in construction cost	Contractor	AE / MPRDC
Health camps organized at different habitations alongside the Roads with representation of women community members	Awareness building on Breast cancer, cervical cancer, HIV AIDs and general checkup Local institution, SHG members, Asha workers, Aganwari workers may mobilized along with their SHG members	Convergence with the line department As per concerned multi-lateral bank	Concerned road location/ PHC/ CHC	At least 2 health camps at each package At least 40 women attend the camp Convergence with the line department i.e. health, WCD and panchayat	Contractor records Field observation Interaction with community women Interaction with the line department	Including in construction cost	Contractor	AE / MPRDC

PART 2: GENDER ACTION PLAN

Gender Issue/ Component	Remedial Measure	Reference to laws/ Guidelines	Location	Monitoring indicators	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
Road safety awareness campaigns planned for schools and college students	Students from Schools, colleges and other academic institutions	Traffic rules, regulation as per the Indian motor vehicle act 1988	Concerned road and available school, colleges, academic institutions	4 campaigns on each roads conducted Convergence with the traffic police in charge	Contractor records Field observation Interaction with community women Interaction with the line department	Including in construction cost	Contractor	AE / MPRDC
formation and orientation of road safety clubs at school, colleges and locality with the girls/ women representation	Students from Schools, colleges and other academic institutions	Traffic rules, regulation as per the Indian motor vehicle act, 1988	Concerned road and available school, colleges, academic institutions	<ul style="list-style-type: none"> At least one road safety club formed on each road/ locality Convergence with the traffic police in charge 	<ul style="list-style-type: none"> Contractor records Field observation Interaction with community women 	Including in construction cost	Contractor	AE / MPRDC
Gender awareness campaigns and action plan to stop the Gender based Violence in school, colleges and locality.	Awareness and orientation about the gender and SHEA (sexual harassment, exploitation and abuse)	<ul style="list-style-type: none"> Sexual harassment (prevention, prohibition and redressal) act 2013 The prohibition of Child marriage act 2006 	Concerned colleges/ schools/ academic institution, locality	<ul style="list-style-type: none"> 3 orientations at concerned road/ package internal committees formed at on 100% worksites. 	Contractor records Field observation Interaction with community women/ girls Interaction with schools/ college staff / education	Including in construction cost	Contractor	AE / MPRDC

PART 2: GENDER ACTION PLAN

Gender Issue/ Component	Remedial Measure	Reference to laws/ Guidelines	Location	Monitoring indicators	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
digital literacy and computer trainings to the girls at school/ college/ community level.	Orientation / training on the basic knowledge about the digital literacy and computer operations	As per the concerned multi-lateral bank	Concerned colleges/ schools/ academic institution, locality	3 orientations at concerned road/ package	Contractor records Field observation Interaction with community / girls Interaction with schools/ college staff / education department	Including in construction cost	Contractor	AE / MPRDC
Contractors encouraged to engage female workforce in construction across skilled and unskilled categories	Sex disaggregated data of the labour workforce, supervision and technical staff (Junior/ senior) engaged in construction staff	As per the concerned multi-lateral banks	Concerned road	Contractors provided with an advisory on enhancing female workforce participation and maintaining sex-disaggregated data on construction workers	Contractor records Field observation Interaction with community / girls Interaction with the workforce	Including in construction cost	Contractor	AE / MPRDC
engaged in social forestry (sapling plantations)	Women self-help groups and Mahatma Gandhi National Rural Employment Guarantee Act job card holders (women) Women engaged in social forestry, nursery to earn their livelihood	As per the concerned multi-lateral banks	Concerned road location	7800 saplings planted (30% women self-help group members)	Contractor records Field observation Interaction with community / girls Interaction with the workforce	Including in construction cost	Contractor	AE / MPRDC

Schedule-S

Thandla-Kushalagarh Road

ENVIRONMENTAL MANAGEMENT PLAN

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Cost	Institutional Responsibility and Requirement	
							Implementation	Supervision
A. Pre-Construction and Design Stage								
1. Alignment								
1.1: Pavement Damage and Inadequate Drainage Provisions in Habitat Areas.	<ul style="list-style-type: none">Construction of concrete pavement in habitat areas considering alignment level and drainage.Raise road level above the nearby areas with provision of adequate side drains to evacuate the rain water and domestic discharges (drained by habitats occasionally) to prevent damage to road and rain water entry to habitats' houses.Provision of adequate number of cross drainage structures based on drainage pattern around the alignment.	Design Requirement.	All habitat areas throughout the alignment.	Design of both cross and side drains no. 23 of slab/box culverts, Hume pipes.	Review of detail design documents and drawings.	Included in construction cost.	Design Consultant.	AE/ MPRDC
1.2: Loss of Tree and Vegetation.	<ul style="list-style-type: none">Restricting tree cutting within construction limit.Avoid tree cutting at ancillary site.Martian compensatory tree plantation of 410 trees @ 1: 10.	Design Requirement.	Throughout the alignment.	41 No. of tree will be cut.	Observation	Included in construction cost	Design Consultant.	AE/ MPRDC
1.3: Protection of Sensitive Receptors.	<ul style="list-style-type: none">Careful selection of alignment to the sensitive receptor.Timely schedule ling of construction activityProvision of noise suitable barriers.	Project Requirement.	Location of sensitive receptors (Refer Table).	Design and alignment plan	Review of design	Included in construction cost	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Cost	Institutional Responsibility and Requirement	
							Implementation	Supervision
1.4: Safety along the Proposed Alignment.	<ul style="list-style-type: none"> • Make provisions of crash barriers at accident prone areas as identified in the road safety studies. • Provision of rumble strips in habitat areas to regulate speed. • Provision of retro-reflective warning sign boards nears school, hospital, and religious places and forests areas. • Provision of proper sidewalks/pedestrian zone along the road near habitat areas, school, hospital, religious places and forests. • Compliance with norms specified in IRC codes for state highway for curvature and grading. • Provision of safety curve at all bridges. • The design should attempt to equalize cut and fill. • Minimize the cutting in hill areas. Incorporate slope stabilization measures to prevent any land slide situation. • Incorporate slope stabilization measures to prevent any land slide situation. 	Design Requirement.	Places where height of embankment is more than 3.0m.	No. of accident and vehicle collision.	Field observation, interview of locals.	Included in construction cost.	Design Consultant.	AE/ MPRDC)
2. Natural Hazards								
2.1: Protection for Damage from Earthquake.	<ul style="list-style-type: none"> • Design considering relevant seismic standard in the clause 		Throughout the stretch.	Incorporation of IRC6-2014 guidelines for	Review of bridge design.	Project preparation cost.	Design Consultant.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
							Implementation	Supervision
	under IRC 6-2014 for earthquakes in bridges.			earthquake in bridge design.				
2.2: Protection of Road Embankment in Flood Prone Areas.	<ul style="list-style-type: none"> Raise embankment height above the HFL levels in the flood prone areas. Provision of adequate balancing culverts. Improvement in existing culverts/ bridges to increase their carrying capacity. 	IRC: 34 Recommendations for road construction in waterlogged area and IRC: 75 and MORT and H guidelines for Design of High Embankments (DHE).	All the existing culverts/ bridges.	Design of both cross and side drains, no. of slab/box culverts, no. and size of Hume pipes.	----- -	Included in construction cost.	Design Consultant.	AE/ MPRDC
3. Shifting of Utility Structures								
3.1: Disruption of Utility Services to Local Community.	<ul style="list-style-type: none"> All telephone and electrical poles/ wires and underground cables should be shifted before start of construction. Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services. Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any. 	Project Requirement.	Throughout the corridor.	Utility shifting plan. Complaints from local people. Status of local utility services.	Interaction with concerned utility authorities and local public.	Included in construction cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
							Implementation	Supervision
B. Construction Stage								
1. Air Quality								
1.1: Dust Generation due to Construction Activities and Transport, Storage and Handling of Construction Materials.	<ul style="list-style-type: none">Transport, loading and unloading of loose and fine materials through covered vehicles.Paved approach roads.Storage areas to be located downwind of the habitation area.Water spraying on earthworks, unpaved haulage roads and other dust prone areas.	MORT and H Specifications for Road and Bridge Works Air (P and CP) Act-1981 and Central Motor and Vehicle Act-1988.	Throughout Project corridor.	PM10 level measurements dust pollution or complain of locals.	Standards CPC B methods observations public consultation.	Included in project cost.	Contractor.	AE/ MPRDC
1.2: Emission of Air Pollutants (HC, SO ₂ , NO _x , CO etc.) from Vehicles due to Traffic Congestion and use of Equipment and Machinery.	<ul style="list-style-type: none">Regular maintenance of machinery and equipment.Batching, asphalt mixing plants and crushers at downwind (1 Km) direction from the nearest settlement.Only crushers licensed by the PCB shall be used.DG sets with stacks of adequate height and use of low sulphur diesel as fuel.Ambient air quality monitoring.Follow traffic management plan as given in Section-8.	The Air (Prevention and Control of Pollution) Act, 1981 (Amended 1987) and Rules1982.	Asphalt mixing plants, crushers, DG sets locations.	Monitoring of ambient air quality and checking PUC certificates.	Standards CPC B methods.	Included in project cost.	Contractor.	AE/ MPRDC
2. Noise								
2.1: Noise from Construction Vehicle, Equipment and Machinery.	<ul style="list-style-type: none">All equipment to be timely serviced and properly maintained.Bottlenecks to be removed.Construction equipment and machinery to be fitted with silencers and maintained properly.	Legal requirement noise Pollution (Regulation and Control) Rules, 2000 and amendments there of . Clause No.	Throughout project section especially at construction sites, residential and identified sensitive locations.	Noise levels measurements. Complaints from local people.	As per noise rule, 2000. Consultation with local people.	Included in Project Cost Plantation Cost is Separate.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Cost	Institutional Responsibility and Requirement	
							Implementation	Supervision
	<ul style="list-style-type: none"> Only IS approved equipment shall be used for construction activities. The regulation near residential, built up and forest area construction shall be restricted to daylight hours. Timing of noisy construction activities shall be done during night time and weekends near schools and selected suitable times near temples when there are no visitors, concurrent noisy operations may be separated to reduce the total noise generated, and if possible re-route traffic during construction to avoid the accumulation of noise beyond standards. Else provision of temporary noise barrier at sensitive locations or near sources 	501.8.6. MORT and Highway Specifications for Road and Bridge Works.						
3. Land and Soil								
3.1: Land use Change and Loss of Productive/ Top Soil.	<ul style="list-style-type: none"> Non-agricultural areas to be used as borrow areas to the extent possible. If using agricultural land, top soil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion. 	Project Requirement.	Throughout the project section and borrow areas.	Borrow pit locations. Top soil storage area.	Review borrow area plan, site visits.	Included in Construction Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Cost	Institutional Responsibility and Requirement	
							Implementation	Supervision
3.2: Slope Failure and Soil Erosion due to Construction Activities, Earthwork, and Cut and Fill, Stockpiles etc.	<ul style="list-style-type: none"> Bio-turfing of embankments to protect slopes. Slope protection by providing frames, dry stone pitching, masonry retaining walls, planting of grass and trees. The side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. Care should be taken that the slope gradient shall not be greater than 2:1. The earth stockpiles to be provided with gentle slopes to prevent soil erosion. 	IRC: 56 - 1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2 MORT and Highway Specifications for Road and Bridge Works Guidelines IX for Soil Erosion.	Throughout the entire project road Especially along hilly areas.	Occurrence of slope failure or erosion issues.	Review of design documents and site observation.	Included in Construction Cost.	Design Consultant and Contractor.	AE/ MPRDC
3.3: Borrow Area Management.	<ul style="list-style-type: none"> Non-productive, barren lands, upland shall be used for borrowing earth with the necessary permissions/ consents. Depths of borrow pits to be regulated and sides not steeper than 25%. Topsoil to be stockpiled and protected for use at the rehabilitation stage. Transportation of earth materials through covered vehicles. IRC recommended practice for borrow pits (IRC-10: 1961). Borrow areas not to be dug continuously. To the extent borrow areas shall be sited away from habituated 	IRC Guidelines on borrow areas and for quarries (Environmental Protection Act And Rules-1986; Water Act, Air Act). Clause No. 305.2.2 MORT and Highway Specifications for Road and Bridge Works Guidelines V for Borrow Areas Management.	Borrow sites location.	<p>Existence of borrow areas in inappropriate unauthorized locations.</p> <p>Poor borrow area management practices.</p> <p>Incidents of accidents.</p> <p>Complaints from local people.</p>	Review of design documents and site observation.	Included in Construction Cost.	Design Consultant and Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
							Implementation	Supervision
	<p>areas. Borrow areas shall be levelled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fishpond in consultation with fishery department and land owner/ community.</p> <ul style="list-style-type: none"> Rehabilitation of the borrow areas as per guidelines for redevelopment of borrow areas. 							
3.4:Quarry Operations.	<ul style="list-style-type: none"> Aggregates will be sourced from existing licensed quarries. Copies of consent/ approval/ rehabilitation plan for a new quarry or use of existing source will be submitted to Environmental Officer (EO), NDB. The contractor will develop a Quarry redevelopment plan, as per the mining rules of the state and submit a copy of approval to Executing Agency (EA). 	Clause No. 111.3 MORT and Highway Specifications for Road and Bridge Work Guidelines VI for Quarry Areas Management.	Quarry area locations.	Existence of licenses for all quarry areas from which materials are being sourced existence of a quarry redevelopment plan.	Review of design documents, contractor documents and site observation.	Included in Construction cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Cost	Institutional Responsibility and Requirement	
							Implementation	Supervision
3.5: Compaction of Soil and Impact on Quarry Haul Roads due to Movement of Vehicles and Equipment.	<ul style="list-style-type: none"> Construction vehicles, machinery, and equipment to be stationed in the designated Right of Way (ROW) to avoid compaction. Approach roads/ haulage roads shall be designed along the barren and hard soil area to reduce the compaction. Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/ minor roads. Load of haulage trucks will be monitored to ensure they do not exceed the standard limits to avoid safety issues and excessive damage on the roads. Land taken for construction camp and other temporary facility shall be restored to its original conditions. 	Design Requirement.	Parking areas, haulage roads and construction yards.	Location of approach and haulage roads presence of destroyed/ compacted agricultural land or land which has not be restored to its original condition.	Site observation.	Included in Construction Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Cost	Institutional Responsibility and Requirement	
							Implementation	Supervision
3.6: Contamination of Soil due to Leakage/ Spillage of Oil, Bituminous and Non-Bituminous Debris Generated from Demolition and Road Construction.	<ul style="list-style-type: none"> Construction vehicles and equipment will be maintained and refuelled in such a fashion that oil/ diesel spillage does not contaminate the soil. Fuel storage and refuelling sites to be kept away from drainage channels. Unusable debris shall be dumped in ditches and low lying areas. To avoid soil contamination Oil-Interceptors shall be provided at wash down and refuelling areas. Waste oil and oil soaked cotton/ cloth shall be stored in containers labelled 'Waste Oil' and 'Hazardous' sold off to MOEF/ SPCB authorized vendors. Non-bituminous wastes to be dumped in approved borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit. Bituminous wastes will be disposed off in an identified dumping site approved, appropriately designed, compliant waste management facilities (land-fills). 	Design Requirement.	Fuelling station, construction sites, and construction camps and disposal location.	<p>Quality of soil near storage area.</p> <p>Presence of spilled oil or bitumen in project area.</p>	Site observation.	Included in Construction Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
							Implementation	Supervision
4. Water Resources								
4.1: Sourcing of Water during Construction.	<ul style="list-style-type: none">Requisite permission shall be obtained for abstraction of groundwater from Central Groundwater Authority (CGA).Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected.	-----	Throughout the project section.	Approval from competent Authority. Complaints from local people on water availability.	Checking of documentation on. Talk to local people.	Included in Construction Cost.	Contractor.	AE/ MPRDC
4.2: Disposal of Water during Construction.	<ul style="list-style-type: none">Provisions shall be made to connect road side drains with exiting nearby ponds otherwise make provision of water harvesting pits intermittently.	Clause No. 1010 EP Act- 1986 MORT and Highway Specifications for Road and Bridge Works.	Throughout the project section.	Design of road side drains existence of proper drainage system for disposal of waste water.	Standards methods site observation and review of documents.	Included in Construction Cost.	Contractor.	AE/ MPRDC
4.3: Alteration in Surface Water Hydrology due to Embankment.	<ul style="list-style-type: none">Existing drainage system to be maintained and further enhanced.Provision shall be made for adequate size and number of cross drainage structures especially in the areas where land is sloping towards road alignment.Road level shall be raised above High Flood Level (HFL); level wherever road level is lesser than HFL.	Design Requirement, Clause No. 501.8.6. MORT and Highway Specifications.	Near all drainage channels, river crossings etc.	Design of road side drains.	Review of design documents. Site observation.	Included in Construction Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Cost	Institutional Responsibility and Requirement	
							Implementation	Supervision
4.4: Siltation in Water Bodies due to Construction Activities/ Earthwork.	<ul style="list-style-type: none"> • Embankment slopes to be modified suitably to restrict the soil debris entering water bodies. • Provision of silt fencing shall be made at water bodies. • Silt/ sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re- vegetated. • Earthworks and stone works to be prevented from impeding natural flow of rivers, streams and water canals or existing drainage system. 	Design Requirement, Clause No. 501.8.6. MORT and Highway Specifications for Road and Bridge Works (CP and CP) and Worldwide Best Practices.	Near all water bodies, river embankment slopes.	Siltation of rivers, streams, ponds and other water bodies in project area.	Field observation.	Included in Construction Cost.	Contractor.	AE/ MPRDC
4.5: Deterioration in Surface Water Quality due to Leakage from Vehicles and Equipments and Waste from Construction Camps.	<ul style="list-style-type: none"> • No vehicles or equipment should be parked or refuelled near water-bodies, so as to avoid contamination from fuel and lubricants. • Oil and grease traps and fuelling platforms to be provided at re-fuelling locations. • All chemicals and oil shall be stored away from water and concreted platform with catchment pit for spills collection. <p>All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available,</p>	The Water (Prevention and Control of Pollution) Act- 1974 and Amendments Thereof.	Water bodies, refueling stations, construction camps.	<p>Water quality of ponds, streams, rivers and other water bodies in project.</p> <p>Presence of oil floating in water bodies in project area.</p>	<p>Conduction of water quality tests as per the monitoring plan.</p> <p>Field observation.</p>	Included in Construction Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
							Implementation	Supervision
	<p>simple to understand and preferably written in the local language emergency response procedure, including reporting, will be provided by the contractors.</p> <ul style="list-style-type: none"> • Construction camp to be sited away from water bodies. • Solid wastes shall be collected, strong and taken to the approved, appropriately designed, compliant waste management facility (landfills) only. • Water quality shall be monitored periodically. • All equipments operators, divers, and ware house personal will be trained in immediate response for spill containment and eventual cleanup. Readily available, simple to understand and preferably retain in the local language emergency response • procedure, including reporting, will be provided by the contractor. 							

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Cost	Institutional Responsibility and Requirement	
							Implementation	Supervision
5. Flora and Fauna								
5.1: Vegetation Loss due to Site Preparation and Construction Activities and Structure Development.	<ul style="list-style-type: none">Minimize tree cutting to the extent possible.Roadside total LHS and RHS are 42 Trees to be removed with prior approval of competent authority.Compensatory plantation at 1: 10 basis and additional plantation as per the IRC: guidelines in consultation with Forest Department (FD).Regular maintenance of all trees planted.Provision of LPG in construction camp as fuel source to avoid tree cutting, wherever possible.Plantation of trees on both sides of the road. Integrate Vegetation Management (IVM) with the carriage way completely clear of vegetation. From the edge of the road to the boundary of Right of Way (ROW), vegetation structured with smaller plants near the line and larger trees further away to avoid costly and provide habitats for a wide variety of plants and animals. Additional plantation near river banks to check erosion as part of compensatory plantation.	Forest Conservation Act- 1980 and IRC: SP: 21 and IRC: SP: 66.	Throughout project corridor.	Right of Way (ROW) width 41 number of trees for felling. Compensatory plantation plan 410 number of trees replanted.	Review of relevant documents – tree cutting permit, compensatory plantation plan. Field observations.	Road side Plantation Cost is Included in Project Costs.	Relevant agency specialized in a forestation.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Cost	Institutional Responsibility and Requirement	
							Implementation	Supervision
	<ul style="list-style-type: none"> In the event of design changes during the construction stages additional assessments including the possibility to save trees shall be made by the Executing Agency (EA). Road side Plantation Strategy as per IRC specifications including manuring. 							
6. Construction Camps								
6.1: Impact Associated with Location.	<ul style="list-style-type: none"> All camps should maintain minimum distance from following: <ol style="list-style-type: none"> 500 m from habitation; 500 m from forest areas where possible; 500 m from water bodies where possible; 500 m from through traffic route where possible; The average distance between two camps should be 50 Km. 	Design Requirement.	All construction camps.	Location campsites and distance from habitation, forest areas, water bodies, through traffic route and other construction camps.	On site observation. Interaction with workers and local community.	Included in Construction Costs.	Contractor and Environmental Officer (EO).	AE/ MPRDC
6.2: Worker's Health in Construction Camp.	<ul style="list-style-type: none"> The location, layout and basic facility provision of each labour camp will be submitted to SQC prior to their construction. The construction shall commence only after approval of SQC. The contractor will maintain necessary living accommodation and ancillary facilities in functional and hygienic 	The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act-1996 and The Water (Prevention and Control of Pollution) Act-1974 and Amendments	All construction camps.	Camp records. health Existence of proper First-Aid-Kit (FAK) in camp site. Complaints from local people.	Camp records. Site observation. Consultation with local people living nearby.	Part of the Contractors Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
							Implementation	Supervision
	<p>manner as approved by the Executing Agency (EA).</p> <ul style="list-style-type: none"> • Adequate water and sanitary latrines with septic tanks attached to soak pits shall be provided. • Preventive medical care to be provided to workers including a First-Aid-Kit (FAK) that must be available in the camp. • Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste must be carried out. • The contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides, which should comply with local regulations. • No alcoholic liquor or prohibited drugs will be imported to, sell, give, and barter to the workers of host community. • Awareness rising, to immigrant workers/ local community on communicable and sexually transmitted diseases. 	Thereof.						

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
							Implementation	Supervision
7. Management of Construction Waste/ Debris								
7.1: Selection of Dumping Sites.	<ul style="list-style-type: none">Unproductive/wastelands shall be selected for dumping sites.Away from residential areas and waterbodies.Dumping sites have adequate capacity equal to the amount of debris generated.Public perception and consent from the village Panchayats has to be obtained before finalizing the location.	Design Requirement and MORT and Highway Guidelines.	At all dumping sites.	Location of dumping sites. Public complaints.	Field survey and interaction with local people.	Included in Construction Costs.	Contractor.	AE/ MPRDC
7.2: Reuse and Disposal of Construction and Dismantled Waste.	<ul style="list-style-type: none">The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites and camps, temporary traffic diversions, and haulage routes.Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal MORT and Highway guidelines should be followed.	MORT and Highway Guidelines.	Throughout the project corridor.	Percentage of reuse of existing surface material. Method and location of disposal site of construction debris.	Contractor records. Field observation. Interaction with local people.	Included in Construction Costs.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
							Implementation	Supervision
	<ul style="list-style-type: none"> Unusable and surplus materials, as determined by the Project Engineer (PE), will be removed and disposed off-site. All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. 							
8. Traffic Management and Safety								
8.1: Management of Existing Traffic and Safety.	<ul style="list-style-type: none"> Temporary traffic diversion shall be planned by the contractor and approved by the "Engineer". The traffic control plans shall contain details of diversions; traffic safety arrangements 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". The Contractor will ensure that the diversion/ detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. On stretches where it is 	Design Requirement and IRC: SP: 55.	Throughout the project corridor especially at intersections.	Traffic management plan. Safety signs on site. Number of traffic accidents.	Review traffic management plan field observation of traffic management and safety system. Interaction with people in vehicles using the road.	Included in Construction Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Cost	Institutional Responsibility and Requirement	
							Implementation	Supervision
	<p>not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed.</p> <ul style="list-style-type: none"> Restriction of construction activity to only one side of the existing road. The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer". 							
8.2: Pedestrians, Animal Movement.	<ul style="list-style-type: none"> Temporary access and diversion, with proper drainage facilities. Access to the schools, temples and other public places must be maintained when construction takes place near them. Fencing wherever cattle movement is expected. To avoid the need for cattle underpasses, some of the proposed culverts `near habitations may be widened to facilitate cattle movement. 	Design requirement And IRC: SP: 27-1984; IRC: SP: 32-1988; Road Safety for Children (5-12 Years Old) IRC: SP: 44-1994 Highway Safety Code IRC: SP: 55-2001; Guidelines for The Building and other Construction Workers Act- 1996 and Cess Act of 1996 Factories Act- 1948.	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulag e roads, diversion sites.	Road signage and drainage as per IRC- guideline. Complaints from local people.	Field observation interaction with local people.	Included in Construction Cost.	Contractor.	AE/ MPRDC
8.3: Safety of Workers and Accident Risk from Construction Activities.	<ul style="list-style-type: none"> Contractors to adopt and maintain safe working practices. Usage of fluorescent and retro-flectory signage, in local language at the 	-----	Construction sites.	Availability of safety gears to workers. Safety signage training records on safety.	Site observation. Review records on safety training and accidents.	Included in Construction Cost.	Obligation of Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
							Implementation	Supervision
	<p>construction sites.</p> <ul style="list-style-type: none"> • Training to workers on safety procedures and precautions. • Mandatory appointment of safety officer. • All regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress shall be complied with. • Provision of PPEs to workers. • Provision of a readily available first aid unit including an adequate supply of dressing materials. • The contractor will not employ any person below the age of 18 years for any work. • Use of hazardous material should be minimized and/ or restricted. • Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or emergencies. • Accident Prevention Officer (APO) must be appointed by the contractor. 			Number of safety related accidents.	Interact with construction workers.			

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Cost	Institutional Responsibility and Requirement	
							Implementation	Supervision
8.4: Accident Risk to Local Community.	<ul style="list-style-type: none"> Restrict access to construction sites to authorized personnel. Physical separation must be provided for movement of vehicular and human traffic. Adequate signage must be provided for safe traffic movement. 	----- -	Construction sites.	Safety signs and their location. Incidents of accidents. Complaints from local people.	Site Inspection. Consultation with local people.	Included in Construction Cost.	Contractor.	AE/ MPRDC
9. Site Restoration and Rehabilitation								
9.1: Clean-up Operations, Restoration and Rehabilitation.	<ul style="list-style-type: none"> Contractor will prepare site restoration plans, which will be approved by the "Engineer". The clean-up and restoration operations are to be implemented by the contractor prior to demobilization. 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 satisfaction of the Environmental Officer (EO). All the opened borrow areas will be rehabilitated and "Engineer" will certify in this regard. 	Project Requirement.	Throughout the project corridor, construction; camp sites and borrow areas.	Clean and restored camp sites. Presence/ absence of construction material/ debris after completion of construction works on construction site.	Site observation. Interaction with locals. Issue completion certificate after restoration of all sites are found satisfactory.	Included in Construction Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Coast	Institutional Responsibility and Requirement	
							Implementation	Supervision
C. Operation Stage								
1. Air quality								
1.1: Air Pollution due to Vehicular Movement or Vehicles Playing on the Road.	<ul style="list-style-type: none">Roadside tree plantations shall be maintained.Regular maintenance of the road will be done to ensure good surface condition.Vehicular air pollution will be managed and monitored.Ambient air quality monitoring. If monitored parameters are above the prescribed limit, suitable control measures must be taken.Technological and behavioural changes.Road signs shall be provided reminding the motorist to properly maintain their vehicles to economize on fuel consumption and unprotect the environment.	Environmental Protection Act-1986; The Air (Prevention and Control of Pollution) Act-1981.	Throughout the corridor.	Ambient air quality (PM10, CO, NOX) survival rate of trees planted.	As per CPCB requirements site inspection.	Included in Operation/ Maintenance Cost.	Contractor.	AE/ MPRDC
2. Noise								
2.1: Noise Pollution due to Movement of Traffic.	<ul style="list-style-type: none">Effective traffic management and good riding conditions shall be maintained to reduce the noise level throughout the stretch and speed limitation and honking restrictions may be enforced near sensitive locations.The effectiveness of the multilayered plantation	Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof.	Sensitive receptors.	Noise levels.	Noise monitoring as per noise rules, 2000. Discussion with people in sensitive receptor sites.	Included in Operation/ Maintenance Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Cost	Institutional Responsibility and Requirement	
							Implementation	Supervision
	<p>should be monitored and if needed solid noise barrier shall be placed.</p> <ul style="list-style-type: none"> Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building close to the road. 							
3. Land and Soil								
3.1: Soil Erosion at Embankment during Heavy Rainfall.	<ul style="list-style-type: none"> Periodic checking to be carried to assess the effectiveness of the stabilization measures viz. turfing, stone pitching, river training structures etc. Necessary measures to be followed wherever there are failures. 	Project Requirement.	At bridge locations and embankment slopes and other probable soil erosion areas.	<p>Existence of soil erosion sites.</p> <p>Number of soil erosion sites.</p>	On site observation.	Included in Construction Cost.	Contractor.	AE/ MPRDC
4. Water Resources/ Flooding and Inundation								
4.1: Siltation.	Regular checks shall be made for soil erosion and turfing conditions of river training structures for its effective maintenance.	Project Requirement.	Near surface water bodies.	Water quality.	Site observation.	Included in Operation/	Contractor.	AE/ MPRDC
4.2: Water Logging due to Blockage of Drains, Culverts or Streams.	<ul style="list-style-type: none"> Regular visual checks and cleaning of drains shall be done along the alignment to ensure that flow of water is maintained through cross drains and other channels/ streams. Monitoring of water borne diseases due to stagnant water bodies. 	Project Requirement.	Near surface water bodies.	Presence of flooded areas or areas with water stagnation.	Site observation.	Included in Operation/ Maintenance Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Cost	Institutional Responsibility and Requirement	
							Implementation	Supervision
4.3: Road Inundation due to Choking of Drainage Channels.	<ul style="list-style-type: none"> NDB will ensure that all drains (side drains and all cross drainages) are periodically cleared especially before monsoon season to facilitate the quick passage of rainwater and avoid flooding. 	Project Requirement.	Flood prone sections.	Incidents of flooding and road inundation with details on change.	Field observation Interaction with local community.	Included in Operation/ Maintenance Cost.	Contractor.	AE/ MPRDC
5. Flora								
5.1: Vegetation.	<ul style="list-style-type: none"> Planted trees, shrubs, and grasses to be properly maintained. The tree survivalist audit to be conducted at least once in a year to assess the effectiveness. 	Forest Conservation Act-1980.	Project tree plantation sites.	Minimum of 70% of tree survival.	Records and fields observations.	Operation and Maintenance Cost.	Contractor.	AE/ MPRDC
6. Maintenance of Right of Way and Safety								
6.1: Accident Risk due to Uncontrolled Growth of Vegetation.	<ul style="list-style-type: none"> Efforts shall be made to make shoulder completely clear of vegetation. Regular maintenance of plantation along the road side. Invasive plant not to be planted near the road. 	Project Requirement.	Throughout the project route.	Presence of and extent of vegetation growth on either side of road. Accident data.	Visual inspection. Accident records.	Included in Operation/ Maintenance Cost.	Contractor.	AE/ MPRDC
6.2: Accident Risks Associated with Traffic Movement.	<ul style="list-style-type: none"> Traffic control measures, including speed limits, will be enforced strictly. Further encroachment of squatters within the Right of Way (ROW) will be prevented. No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law. Monitor/ ensure that all 	IRC: SP: 55	Throughout the project route.	Police records on accident. Condition and existence of safety signs, rumble strips etc. on the road. Presence/absence of sensitive receptor structures inside the stipulated planning line as per relevant	Review accident records. Site observation.	Included in Operation/ Maintenance Cost.	Contractor.	AE/ MPRDC

Environmental Issues/ Components	Remedial Measure Statements	Reference to Laws/ Guidelines	Locations/ Areas	Monitoring Indicators	Monitoring Methods	Mitigation Cost	Institutional Responsibility and Requirement	
							Implementation	Supervision
	<p>safety provisions included in design and construction phase are properly maintained.</p> <ul style="list-style-type: none"> Highway patrol unit(s) for round the clock patrolling. Phone booths for accidental reporting and ambulance services with minimum response time for rescue of any accident victims, if possible. Tow-away facility for the break down vehicles if possible. 			local law.				
6.3: Transport of Dangerous Goods.	<ul style="list-style-type: none"> Existence of spill prevention and control and emergency responsive system. Emergency plan for vehicles carrying hazardous material. 	----- -	Throughout the project stretch.	Status of emergency system – whether operational or not.	Review of spill prevention and emergency response system.	Included in Operation/ Maintenance Cost.	Contractor.	AE/ MPRDC

Note: EA: Executing Agency, PWD: New Development Bank(NDB), EO: Environmental Officer, IRC: Indian Road Congress. AE : Authority Engineer

Appendix: Environmental Monitoring Plan

Environmental Components	Monitoring			Location	Frequency	Institutional Responsibility	
	Parameters	Special Guidance	Standards			Implementation	Supervision
Air	PM _{2.5} , PM ₁₀ , SO ₂ , NO _x , CO	As per CPCB guidelines	The Air (Prevention & Control of Pollution) Rules, CPCB, 1982	At sites where hot mix plant/ batching plant is located	3 times in a year for 3 years or construction period at 3 sites & once in year for five years at 3 sites during operation/ defect liability period	Contractor through approved monitoring agency	AE/ MPRDC
Water	pH, BOD, COD, TDS, TSS, DO, Total coliform, Conductivity, Oil & Grease	Grab sample collected from source and analyze as per standard methods for examination of water and wastewater	Water quality standards by CPCB	River tributaries, roadside ponds and ground water at construction camp sites	Once during preconstruction stage 3 times in a year for 3 years or construction period at 3 locations	Contractor through approved monitoring agency	AE/ MPRDC
Noise Levels	Noise level for day and night on dB(A) scale	In free field at 1m distance from the equipment to be monitored	Noise standard by CPCB	At equipment yards, camp and villages along the alignment.	3 times in a year for 3 years or construction period, 3 locations & once in a year for 5 years at 3 sites during operation/defect liability period.	Contractor through approved monitoring agency	AE/ MPRDC
Soil Quality	Monitoring of NPK & heavy metals and grease		As per IRC code of practice	Ad- hoc if accident/ spill locations involving bulk transport of carrying hazardous materials	-	PIU through an approved agency	AE/ MPRDC
Road side Plantation	Monitoring of felling of trees	It should be ensured that the marked trees are felled only	As given in the IEE report	All along the corridor	During the felling of trees	Forest department	AE/ MPRDC
	Survival rate of trees, success of re-vegetation	The number of trees surviving during each visit should be compared with the number of saplings planted	The survival rate should be at least 75% below which re-plantation should be done	At locations of compensatory afforestation	Every year for 3 years	PIU	AE/ MPRDC

Note :- Madhya Pradesh Development Corporation, PIU- Project Implementation Unit, AE – Authority Engineer

Appendix: NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Concentration in ambient Air			
	Average	Industrial, Residential and other rural area	Ecologically Sensitive Area (Notified by Central Government)	Methods of Measurement
SO ₂ µg/m ³	Annual* 24 hours**	50 80	20 80	- Improved West and Geake - Ultraviolet Fluorescence
NO _x µg/ m ³	Annual* 24 hours**	40 80	30 80	- Modified Jacob and Hochheiser - Chemiluminescence
PM ₁₀ µg/ m ³	Annual* 24 hours**	60 100	60 100	- Gravimetric - TEOM - Beta Attenuation
PM _{2.5} µg/ m ³	Annual* 24 hours**	40 60	40 60	- Gravimetric - TEOM - Beta Attenuation
Ozone (O ₃) µg/m ³	8 Hours** 1 Hour**	100 180	100 180	- UV Photometric - Chemiluminescence - Chemical Method
Lead µg/m ³	Annual* 24 hours**	0.50 1.0	0.50 1.0	- AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper - ED-XRF using Teflon filter
CO µg/m ³	8 Hours** 1 Hour**	2000 4000	2000 4000	- Non Dispersive Infra-Red Spectroscopy
NH ₃ µg/m ³	Annual* 24 hours**	100 400	100 400	- Chemiluminescence - Indophenol blue method
Benzene (C ₆ H ₆) µg/m ³	Annual*	05	05	- Gas Chromatography based Continuous Analyzer - Adsorption followed by GC Analysis
Benzo Pyrene-Particulate Phase only µg/m ³	Annual*	01	01	- Solvent extraction followed by HPLC/GC analysis
Arsenic µg/m ³	Annual*	06	06	- AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
Nickel µg/m ³	Annual*	20	20	- AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

Note:

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

** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable shall complied 98% of the time in a year. However 2% of the time, it may exceed but not on two consecutive days.

Appendix: INDIAN STANDARD DRINKING WATER SPECIFICATION (10500:1991)

S. No.	Parameters	Essential Standards	Relaxed Standards
1.0	Physical Standards		
1.1	Color (Hazen units)	10	50
1.2	Taste	Agreeable	Agreeable
1.3	Odour	Unobjectionable	Unobjectionable
1.4	PH	6.5-8.5	6.5-8.5
1.5	Turbidity (NTU)	10	25
1.6	TDS (mg/l)	500 (without treatment)	1500 (with treatment)
1.7	Total Hardness (mg/l)	300	600
2.0	Inorganic Parameters		
2.1	Ca (mg/l)	75	200
2.2	KMg (mg/l)	30	100
2.3	Fe (mg/l)	0.3	1
2.4	Mn (mg/l)	0.1	0.5
2.5	Cl (mg/l)	250	1000
2.6	SO ₄ (mg/l)	150	400 if Mg<30mg/l
2.7	NO ₃ (mg/l)	45	45
2.8	F (mg/l)	0.6-1.2	1.5
2.9	Free Cl (mg/l)	0.2	0.5
3.0	Heavy Metals		
3.1	Hg (mg/l)	0.001	0.001
3.2	Cd (mg/l)	0.01	0.01
3.3	Se (mg/l)	0.01	0.01
3.4	As (mg/l)	0.05	0.05
3.5	Pb (mg/l)	0.1	0.1
3.6	Zn (mg/l)	5	10
3.7	Cr+6 (mg/l)	0.05	0.05
3.8	Cu (mg/l)	0.05	1.5
4.0	Other Parameters		
4.1	Phenolic Compounds mg/l) (as C ₆ H ₅ HO)	0.001	0.002
4.2	CN (mg/l)	0.05	0.05
4.3	Anionic Detergents(mg/l) (as MBAS)	0.2	1.0
4.4	Mineral Oil (mg/l)	0.01	0.03
4.5	Pesticides	Absent	Absent
5.1	Microbiological Parameters		
	Total Coliforms (MPN)	95% of the sample should not contain coliform in 100 ml	
6.0	Radiological Parameters		
6.1	Gross alpha (µc/ml)	10-6	
6.2	Gross beta (µc/ml)	10-7	

Note: A-Desirable or essential

B- Relatable under certain circumstances such as no alternate source being available

Appendix: AMBIENT NOISE QUALITY STANDARDS

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

- Note: 1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
3. Silence zone is defined as an area comprising not less than 100 meters around hospitals, educational institutions and courts. The silence zones are zones, which are declared as such by the competent authority.
4. Mixed categories of areas may be declared as one of the four above-mentioned categories by the competent authority.

PART 2: GENDER ACTION PLAN								
Gender Issue/ Component	Remedial Measure	Reference to laws/ Guidelines	Location	Monitoring indicators	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
Elderly, women, children and Disability (EWCD)-friendly construction of Road and safety measures	EWCD-friendly features include well-marked crossings, safety signage, and pedestrian walkways	Gender action Plan Review of design and safety measures	Concerned road	About 11.19 km of road upgraded with EWCD-friendly features and road safety measures	Review of detail design documents & drawings	Including in construction cost	Contractor	AE / MPRDC
EWCD-friendly bus shelters construction	Construction of Bus shelter is recommended with bricks and concrete, The appropriate location for Bus shelter may be identified by the participatory approach (PRA) in presence of elderly, women, children and disable person	Participatory Rural appraisal (PRA) tools and exercises may adopt	Concerned Road	About 04 bus shelters constructed	<ul style="list-style-type: none"> Review the design of the bus shelter the concrete base bus shelter is recommended 	Including in construction cost	Contractor	AE / MPRDC
Solar light provision included in bus shelters close to educational and health facilities	Local authority (Panchayat / urban body) may take in confidence and have a MoU with Panchayat for the protection of such Asset	PRI and Gram Sabha Act 2002	Concerned bus shelter/ road	100 % bus shelters to be installed the solar light	Local committee/ group may form at location to take care of the safety of the asset	Including in construction cost	Contractor	AE / MPRDC

PART 2: GENDER ACTION PLAN

Gender Issue/ Component	Remedial Measure	Reference to laws/ Guidelines	Location	Monitoring indicators	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
Information Elderly, women, children and disability govt benefitted schemes and helpline numbers displayed at bus shelters	Selected schemes to empower EWCD May display and emergency helpline numbers for women, children, police, fire etc. One seat will Demarcated for the women/ elderly / disable seat	Line department i.e. women and child development, social justice	Concerned bus shelter/ road	100% bus shelters will be displayed the schemes and helpline numbers	Review of detail design documents & drawings,	Including in construction cost	Contractor	AE / MPRDC
Health camps organized at different habitations alongside the Roads with representation of women community members	Awareness building on Breast cancer, cervical cancer, HIV AIDs and general checkup Local institution, SHG members, Asha workers, Aganwari workers may mobilized along with their SHG members	Convergence with the line department As per concerned multi-lateral bank	Concerned road location/ PHC/ CHC	At least 2 health camps at each package At least 40 women attend the camp Convergence with the line department i.e. health, WCD and panchayat	Contractor records Field observation Interaction with community women Interaction with the line department	Including in construction cost	Contractor	AE / MPRDC
Road safety awareness campaigns planned for schools and college students	Students from Schools, colleges and other academic institutions	Traffic rules, regulation as per the Indian motor vehicle act 1988	Concerned road and available school, colleges, academic institutions	4 campaigns on each roads conducted Convergence with the traffic police in charge	Contractor records Field observation Interaction with community women Interaction with the line department	Including in construction cost	Contractor	AE / MPRDC

PART 2: GENDER ACTION PLAN

Gender Issue/ Component	Remedial Measure	Reference to laws/ Guidelines	Location	Monitoring indicators	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
formation and orientation of road safety clubs at school, colleges and locality with the girls/ women representation	Students from Schools, colleges and other academic institutions	Traffic rules, regulation as per the Indian motor vehicle act, 1988	Concerned road and available school, colleges, academic institutions	<ul style="list-style-type: none"> At least one road safety club formed on each road/ locality Convergence with the traffic police in charge 	<ul style="list-style-type: none"> Contractor records Field observation Interaction with community women 	Including in construction cost	Contractor	AE / MPRDC
Gender awareness campaigns and action plan to stop the Gender based Violence in school, colleges and locality.	Awareness and orientation about the gender and SHEA (sexual harassment, exploitation and abuse)	<ul style="list-style-type: none"> Sexual harassment (prevention, prohibition and redressal) act 2013 The prohibition of Child marriage act 2006 	Concerned colleges/ schools/ academic institution, locality	<ul style="list-style-type: none"> 3 orientations at concerned road/ package internal committees formed at on 100% worksites. 	Contractor records Field observation Interaction with community women/ girls Interaction with schools/ college staff / education	Including in construction cost	Contractor	AE / MPRDC
digital literacy and computer trainings to the girls at school/ college/ community level.	Orientation / training on the basic knowledge about the digital literacy and computer operations	As per the concerned multi-lateral bank	Concerned colleges/ schools/ academic institution, locality	3 orientations at concerned road/ package	Contractor records Field observation Interaction with community / girls Interaction with schools/ college staff / education department	Including in construction cost	Contractor	AE / MPRDC

PART 2: GENDER ACTION PLAN

Gender Issue/ Component	Remedial Measure	Reference to laws/ Guidelines	Location	Monitoring indicators	Monitoring Methods	Mitigation Costs	Institutional Responsibility	
							Implementation	Supervision
Contractors encouraged to engage female workforce in construction across skilled and unskilled categories	Sex disaggregated data of the labour workforce, supervision and technical staff (Junior/ senior) engaged in construction staff	As per the concerned multi-lateral banks	Concerned road	Contractors provided with an advisory on enhancing female workforce participation and maintaining sex-disaggregated data on construction workers	Contractor records Field observation Interaction with community / girls Interaction with the workforce	Including in construction cost	Contractor	AE / MPRDC
engaged in social forestry (sapling plantations)	Women self-help groups and Mahatma Gandhi National Rural Employment Guarantee Act job card holders (women) Women engaged in social forestry, nursery to earn their livelihood	As per the concerned multi-lateral banks	Concerned road location	1100 saplings planted (30% women self-help group members)	Contractor records Field observation Interaction with community / girls Interaction with the workforce	Including in construction cost	Contractor	AE / MPRDC