

Due Diligence Report on Environmental Safeguards

June 2018

IND: Second Rural Connectivity Investment Program
– Tranche 1

Prepared by Ministry of Rural Development, Government of India for the Asian Development Bank

CURRENCY EQUIVALENTS

(as of 8 June 2018)

Currency unit	–	Indian Rupees (INR/Rs)
INR1.00	=	\$ 0.014835
\$1.00	=	INR 67.41

ABBREVIATIONS

ADB	:	Asian Development Bank
APs	:	Affected Persons
BPL	:	Below Poverty Line
CD	:	Cross Drainage
DM	:	District Magistrate
EA	:	Executing Agency
EAF	:	Environment Assessment Framework
ECOP	:	Environmental Codes of Practice
FFA	:	Framework Financing Agreement
GOI	:	Government of India
GRC	:	Grievances Redressal Committee
IA	:	Implementing Agency
IEE	:	Initial Environmental Examination
MFF	:	Multitranchise Financing Facility
MORD	:	Ministry of Rural Development
MOU	:	Memorandum of Understanding
NC	:	Not Connected
NGO	:	Non-Government Organization
RCIP	:	Rural Connectivity Investment Programme
NRRDA	:	National Rural Road Development Agency
NREGP	:	National Rural Employment Guarantee Program
PIU	:	Project Implementation Unit
PIC	:	Project Implementation Consultants
PFR	:	Periodic Finance Request
PMGSY	:	Pradhan Mantri Gram Sadak Yojana
ROW	:	Right-of-Way
RRP	:	Report and Recommendation of the President
SRRDA	:	State Rural Road Development Agency
ST	:	Scheduled Tribes
TOR	:	Terms of Reference
TSC	:	Technical Support Consultants
UG	:	Upgradation

This due diligence report on environmental safeguards is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

CONTENTS

I.	INTRODUCTION	1
A.	Context and Purpose of the Report	1
II.	STATUS OF TRANCHE 1 WORKS UNDER SECOND RCIP	1
A.	Status of Works	1
B.	Methodology and Approach Used for Due Diligence	2
III.	FINDINGS OF THE DUE DILIGENCE	2
A.	Compliance to National Environmental Laws	2
B.	Review of Project Documentation	3
C.	Implementation of the Environmental Management Plan	4
D.	Compliance to the environmental provisions of the Loan Covenant	4
E.	Compliance to EARF	6
IV.	PUBLIC CONSULTATIONS	9
V.	CONCLUSIONS	9

ANNEXURES

Annexure 1: Sample Environmental; Monitoring Reports	10
Annexure 2: Community Consultations	72

LIST OF TABLES

Table 1: Compliance of Second RCIP-Tranche I to the Relevant Provisions of the Loan Covenant	4
Table 2: Compliance of Tranche 1 to the EARF	6

I. INTRODUCTION

A. Context and Purpose of the Report

1. Pradhan Mantri Gram Sadak Yojana (PMGSY) aims to provide all-weather road connectivity to currently unserved habitations in India's rural areas, where 70% of the population live. Government of India (GOI) launched "The Pradhan Mantri Gram Sadak Yojna (PMGSY) in year 2000. The objective of PMGSY is to provide all-weather road connectivity to all rural habitations with a population of more than 500 persons in plains and 250 persons in hill states. This program is being implemented through National Rural Road Development Agency (NRRDA) under the Ministry of Rural Development (MORD) at central level and through the State Rural Road Development Authorities/Agencies (SRRDAs) at state level.

2. The Second Rural Connectivity Investment Program (RCIP-2) Is continuation of Rural Connectivity Investment Program (RCIP) and is a Multitranche Financing Facility (MFF) that is being implemented in the states of Assam, Chhattisgarh, Orissa, Madhya Pradesh and West Bengal. Investments in rural roads will improve connectivity, cut transport costs, and provide enabling infrastructure to areas currently with poor access to markets and urban towns, and thus contribute to growth and equity in the country's largest sector.

3. The Government is now planning to submit to ADB the second Periodic Finance Request (PFR) that includes the proposal for about 2859.09 km of rural roads in the state of Madhya Pradesh. MPRRDA is the implementing agency (IA) for the ADB funded subprojects in the state of Madhya Pradesh. This environmental due diligence (EDD) report assesses the compliance of Second RCIP Tranche 1 to MoEF/GOIs' environmental policies, laws, and regulations particularly relating to forest and wildlife areas and the ADB's Safeguard Policy Statement (SPS), 2009 as translated into provisions of the Environmental Assessment and Review Framework (EARF), Environmental Management Plan (EMP), and Environmental Monitoring Plan (EMoP).

4. The preparatory works for the proposed roads under second tranche have been completed for the state. Environmental due diligence is a requirement of the Asian Development Bank (ADB) on individual tranches of MFF. This report is prepared to fulfill the requirement of this compliance.

STATUS OF TRANCHE 1 WORKS UNDER SECOND RCIP

A. Status of Works

5. All the subprojects included in tranche 1 of Second RCIP were prepared by the Executing Agency (EA) supported by the SRRDA appointed PICs. The details of the subprojects included in tranche 1 are as under:

Particulars	Assam	Chhattisgarh	Madhya Pradesh	Odisha	West Bengal
No. of Packages	303	42	132	376	151
No of Roads	303	80	169	390	181
Road Length (Km)	977.177	1001.08	2081.82	1560.0	597.5
No. project districts	15	10	29	26	3

6. Most of the civil works activities for tranche 1 are at an early stage and contractors are in the process of carrying out the initial activities. Status of contract award in different project states is presented below

State	No. of Packages	Packages Awarded	Remarks
Assam	303	64	As of end Apr 2018
Chhattisgarh	42	42	As of end Feb 2018
Madhya Pradesh	132	107	As of end Feb 2018
Odisha	376	220	As of end Apr 2018
West Bengal	151	50	As of end Apr 2018

7. The PICs in the states except in Assam and Chhattisgarh where the mobilization of contractors have just started have conducted the environmental monitoring for pre-construction stage for tranche 1 works. Environmental monitoring for during construction stage will start when the work progress reaches around 25% in the subprojects.

B. Methodology and Approach Used for Due Diligence

8. This report is prepared through file review, field monitoring work, and interview of relevant parties such as staff from PIUs, PICs, contractors, and local line department officials. The file review covered the technical specifications of bidding document, the bill of quantity (BoQ) submitted by the contractors, and other relevant project documents like project IEE reports including EMPs, EARF, and the monitoring reports submitted by PICs. Some samples of the environmental monitoring done in the states are presented in **Annexure 1**.

III. FINDINGS OF THE DUE DILIGENCE

A. Compliance to National Environmental Laws

9. The subprojects implemented in Second RCIP tranche 1 did not have any road passing through any national parks, sanctuary or other Government designated protected areas, and therefore, there was no road that requires any environmental clearance from the MOEF. As such rural road projects are exempted from seeking environmental clearance from MoEF.

10. None of the subprojects in the tranche 1 require an expansion of ROW in the Protected/ Reserved Forest area. Therefore, no forest clearance was required for any sub-project. Only in few cases road passes through social forest/unclassified forest, where tree cutting is not required.

11. In most of the cases the ready mix asphalt will be used for the project, and therefore the "Non Objection Certificate" from the State Pollution Board is not required. Similarly, the ready crush rock has been supplied from existing licensed quarries, and if small size rock needed, it will be done manually; therefore, the non-objection certificate from state pollution control board is also not required.

12. Vehicles engaged in the construction works will have the "Pollution Under Control" (PUC) certificate as stipulated in the Environment Management Plan.

13. The water for construction works will be obtained from various sources as per site conditions viz. from rivers/streams, private pond or using the existing tube well with the permission from the owners. The civil works are at the initial stages that has not required a significant amount of water for dust suppression, and embankment works.

B. Review of Project Documentation

1. The Initial Environmental Examination Document

14. The Initial environmental examination (IEE) Report for 1st tranche roads was prepared by the Technical Support Consultants (TSC). An environmental impact checklist was used for all the sub projects that were prepared by the PIC. This checklist focused on identifying the potential environmental impacts and mitigation measures. The sample checklists were verified through field visit and desk review by the TSC's Environmental Experts. Subsequently all the checklist was revised/ modified as necessary and EMPs were prepared specific for each road. These EMPs are being used by the PIC to monitor application of EMP during construction.

2. The Bidding Document

15. Second RCIP tranche 1 project was approved to have a retroactive financing, and therefore procurement was done by using only standard bidding document (SBD).

16. Although the bidding document did not specifically refer to the IEE, it contained road specific EMP, requirement on general environmental protection and health & safety measures that were listed in Section 4 part 1 clause 60 and 61. Some of the clauses in the SBD have direct implications on environmental management actions to be taken by the contractor at all stages of the project activity. They pertain to the following:

- Compliance with Labour Regulations
- Compliance with Pollution Control Regulations
- Health and Safety aspects during construction
- Issues relating to equipment, storage of hazardous materials, labour camp etc.
- Issues relating to borrow areas.

17. Based on the SBD, the contractor's proposal (BoQ) submitted to the SRRDA included works related to the requirements stated in the environmental management plan (EMP), such as cross drainage (CD) works, slope protection measures including pitching and turfing, road safety measures. The general work items mentioned in all DPRs included the following;

- Stripping of top soil from borrow areas located in agriculture fields, storing it at suitable places, spreading and relaying it after taking the borrow earth to maintain fertility of agricultural fields, and finishing it to the required level to the satisfaction of the farmer.
- Keeping the road way and surrounding clean and clear of dust by sprinkling water during different stages of construction from earth work to end of construction.

Extracts from Standard Bidding Document

Section 4 : Part I General conditions of Contract

60. Environment Protection

Contractor shall ensure that appropriate environmental mitigation measures as listed in the environmental Management Plan attached as Appendix are employed in all activities of project construction, operation and maintenance and in accordance with the Government's and ADB's environmental policies

61. Health & safety measures

Contractor shall

- (i) disseminate information at work sites on the risks of sexually transmitted diseases and HIV/AIDS as part of the health and safety measures for those employed during construction
- (ii) follow legally mandated provisions on health, sanitation and appropriate working conditions. Including accommodation where appropriate for construction workers at camp sites
- (iii) comply with all appropriate labour laws , not employ child labour for construction and maintenance activities, and provide appropriate facilities for children of labour in construction camp sites and
- (iv) provide equal opportunity for women for road construction activities and differentiate in wages for men and women for work of equal value

C. Implementation of the Environmental Management Plan

18. Field level regular monitoring on implementation of the Environmental Management plan have been already initiated by the Environmental Experts of the PICs in the states (except in Assam and Chhattisgarh). Sample reports of the pre-construction stage environmental monitoring is provided in **Annexure 1**. TSC environment experts will carry out sample review (desk review & field check) of these monitoring activities with progress in the construction activities.

19. Review of the monitoring reports reveal the following:

- Adequate cross drainage structures were planned and provided.
- DPRs identified licensed borrow areas for borrowing earth. In some cases, contractors with consent (no written record could be obtained) of the private owner procured borrow earth from the nearby fields.
- The water sprinkling system during construction is being carried out
- Adequate safety signage planned all along the rural road. Speed breakers are planned for construction near schools.
- Electric poles, telephone lines, well, tube wells etc. will be impacted due to the road construction and all those that are likely to be relocated will be carried out under the project cost. It was observed during the field visit that utility structures pose safety hazards, the project authorities were informed of the urgency for attending to this aspect. Subsequent to the visit of the PIC experts to the project sites, a summary of the actions to be taken by the PIU officials will be submitted for follow up action.
- As per pollution control board stipulation "Pollution Under Control" certificate for the vehicles engaged in construction work will be obtained.
- Tree plantation along the roads is not a cost item in the DPRs, Panchayats on their own are taking steps to plant trees along the roads under different rural development schemes like MGNREGA etc.
- Establishment of major construction camps has not been required for the construction of the rural roads in earlier batches and the contractors mobilised so far have established small camps for the staff deployed so far.
- As a good practice, Madhya Pradesh on a pilot basis is using new technology like plastic wastes in road construction

D. Compliance to the environmental provisions of the Loan Covenant

20. The requirements stipulated in the Loan Covenant for Second RCIP Tranche 1 are being complied with as detailed in the succeeding Table.

Table 1: Compliance of Second RCIP-Tranche I to the Relevant Provisions of the Loan Covenant

Loan Covenant Item	Description	Status of Compliance
Execution and Implementation Arrangements. Item 3. Execution of Project Schedule 5	.The Borrower through MoRD shall ensure, or cause the Project Executing Agencies to ensure that the Project implementing agencies (a) employ sufficient staff for the duration of the project with adequate and relevant expertise in the field of project management, financial management , engineering, construction supervision,	Complying. At the national-level the TSC performed environmental safeguards monitoring through the Environmental Experts. A new TSC has been contracted recently for a period of three

Loan Covenant Item	Description	Status of Compliance
	procurement, construction, road maintenance and safety, and environmental and social safeguards implementation.	years to continue with the monitoring works. At the state-level, the SRRDA focus safeguard persons have been appointed. Further, the PIC is continuing to assist the PIUs in carrying out the monitoring works.
Item 5. Selection Criteria and Approval Process for subprojects Schedule 5	The Borrower through MoRD shall ensure and cause the Project Executing Agency to ensure that all Subproject are selected and approved in accordance with the selection criteria and approval process stipulated in Schedule 4 to the FFA	Complied. The subprojects were selected by the SRRDAs from the district plans and core network following PMGSY guidelines. The selected subprojects were approved by the EC at MoRD level.
Item 7. Environment Schedule 5	The Borrower through MoRD shall ensure or cause the Project Executing Agencies to ensure that the preparation, design, construction, implementation, operation and decommissioning of the project, each subproject and all project facilities comply with (a) all applicable laws and regulations of the Borrower relating to environment, health and safety; (b) the environment safeguards; (c) the EARF; and (d) all measures and requirements set forth in the respective IEE and EMP, and any corrective or preventive actions set forth in a safeguard monitoring report	Complying. All relevant clearances and permits like tree cutting, no objection clearance (NOC) for hot mix plants (HMPs), and pollution under control (PUCs) certificates where required were either secured or have been filed and awaiting approval. Non-compliances to the EMP were noted and corrective actions are being implemented by the contractor and supervised by the PIC.
Item 12. Human and Financial Resources to implement Safeguards Requirement Schedule 5	The Borrower through MoRD shall ensure or cause the Project Executing Agencies to ensure that all necessary budgetary and human resources to fully implement the EMP and the CPF as required are made available.	Complying. Focal safeguard officers are designated at all SRRDAs, TSC appointed by the NRRDA and PICs appointed by the SRRDAs are at place. Award of contracts are ongoing.
Item 16. Safeguards-Related Provisions in Bidding Documents and Works Contract Schedule 5	The Borrower through MoRD shall ensure or cause the Project Executing Agencies to ensure that all bidding documents and contracts for Work contain provisions that require contractor to (a) Comply with the measures and requirements relevant to the contractor set forth in the IEEs, EMPs and CPFs and any corrective or preventive actions set out in a safeguards Monitoring Report. (b) Make available a budget for all such environmental and social measures (c) Provide the relevant Project Executing Agency with a written notice of any unanticipated environmental, social impacts that arise during construction, implementation or operation of the project that were not considered in the IEEs, EMPs, and CPFs (d) Adequately record the condition of roads, agricultural land and other infrastructure prior to	Complied. All bidding documents contain the road-specific EMPs and compliance by contractors are monitored by the PIUs with assistance from PICs at state level and reviewed by the TSC at central level.

Loan Covenant Item	Description	Status of Compliance
	starting to transport materials and construction (e) Fully reinstate pathways, other local infrastructure and agricultural land to at least their pre-project condition upon the completion of construction; and (f) Assist as necessary in resolving grievances which arise during construction activities.	
Item 17. Safeguards Monitoring and Reporting Schedule 5	The Borrower through MoRD shall ensure or cause the Project Executing Agencies to (a) Submit annual safeguards Monitoring Reports to ADB for disclosure on the ADB website, and disclose relevant information from such reports to affected persons promptly upon submission (b) If any unanticipated environmental and/or social risks and impacts arise during construction, implementation or operation of the Project that were not considered in the IEEs, EMPs or CPFs, promptly inform ADB of the occurrence of such risks or impacts with detailed description of the event and proposed corrective action plan; and (c) Report any breach of compliance with the measures and requirements set forth in the EARF, IEEs, EMPs and CPFs promptly after becoming aware of the breach.	Complying: Award of contracts has been completed in Chhattisgarh and is ongoing in other states. Regular monitoring activities are being carried out by the PICs at state level and reviewed by the TSC at central level.

E. Compliance to EARF

21. The requirements stipulated in the EARF have been or are being complied with. Table below shows the compliance of various conditions of the EARF.

Table 2: Compliance of Tranche 1 to the EARF

EARF Reference	Requirements	Compliance Status
Section II, Para 7	i) No Category A (as per ADB's SPS) subproject will be included in the MFF.	Complied. No 'Category A' subproject has been included in the tranche 1.
	All subprojects will be subject to the following requirements, based on SPS 2009:	Complied. REA checklists with all the annexes on trees, utility structures, community structures, strip plans and photographs have been prepared for all subprojects.
	i) Submission of a completed Rapid Environment Assessment (REA) checklist for Roads and Highways and a categorization form for each state level IEE that is prepared.	Complied. IEE including road specific EMPs were prepared for all subprojects included in tranche 1
	ii) An environmental assessment through the preparation of Initial Environmental Examination (IEE) report, Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMoP).	Complied. Regular monitoring activities are being carried out by the PICs at state level and reviewed by the TSC at central level and monitoring reports being prepared for different stages of the project.
	iii) Regular monitoring of implementation of the EMP and submission of monitoring reports and due diligence reports as necessary	Complied. Regular monitoring activities are being carried out by the PICs at state level and reviewed by the TSC at central level and monitoring reports being prepared for different stages of the project.

EARF Reference	Requirements	Compliance Status
	i) Based on the requirements of the PMGSY guidelines separate ECOP checklists as given in Appendix 2 will be completed for bridges that are longer than 15 m.	No long span bridge was included in tranche 1.
	ii) Based on the completed ECOP checklists for roads and bridges, IEE reports will be prepared at a state level. These reports must contain a general EMP and a site specific EMP where there are site specific issues.	Complied. IEE including road specific EMPs were prepared for all subprojects included in tranche 1.
	iii) ADB's REA checklist for roads and highways will be completed based on the state level IEE reports prepared and submitted to ADB to confirm categorization.	Complied. REA checklists were prepared for all subprojects.
Section II, Para 8	Given that existing capacity of the SRRDAs and PIUs for implementing environmental safeguard issues are inadequate, necessary capacity building activities will be carried out. Capacity building activities will mainly comprise training workshops for SRRDA and PIU environmental officers on: i) Completion of Environment Checklists, ii) Preparation of Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMoP), iii) monitoring of EMP implementation and completion of monitoring checklists prior to, during and post construction; and iv) preparation of monitoring reports	Being Complied TSC and PIC have conducted trainings for the PIUs, DPR consultants during preparation of the DPRs for tranche 1. Trainings on environmental safeguards and monitoring are being conducted in the RCTRC for the PIU engineers
Section III, Para 10	i) Subprojects will be eligible for construction or upgrading in accordance with the PMGSY guidelines, and be included in the respective district core network	Complied. All tranche 1 subprojects were selected from district plans and the core network.
	ii) The subprojects shall not disturb any cultural heritage designated by the Government or by international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance.	Complied. None of the tranche 1 subprojects passes through cultural heritage site designated by the Government or international agencies, such as UNESCO etc.
	iii) The subproject will not pass through any designated wildlife sanctuaries, national parks, other sanctuaries, notified ecological sensitive areas or area of international significance (e.g., protected wetland designated by the Wetland Convention);	Complied. None of the tranche 1 subprojects is located in any wildlife or ecological sensitive areas.
	iv) No category A subproject, as per ADB's SPS will be included in the MFF	Complied. No 'Category A' subproject has been included in the tranche 1.
Section III, Para 11	ADB's Rapid Environmental Assessment (REA) Checklist for Roads and Highways including climate risk screening (appendix 1) will be completed for each state based on preliminary screening of impacts, completed Environment Checklists and/or state level IEE reports prepared and submitted to ADB to confirm categorization.	Complied REA checklists with all the annexes on trees, utility structures, community structures, strip plans and photographs have been prepared for all subprojects. IEE including road specific EMPs were prepared for all subprojects included in tranche 1 and submitted to ADB to confirm categorization.

EARF Reference	Requirements	Compliance Status
Section III, Para 12	Transect walks will be conducted and environment checklists completed for each road as per the PMGSY guidelines	Complied Transect walks were conducted in all the roads included in tranche 1 and environment checklists were prepared for each road as per the PMGSY guidelines
Section III, Para 13	In accordance with the PMGSY guidelines for bridges longer than 50m, separate transect walk will be conducted and Environment Checklist will be prepared	Complied No bridge longer than 50m was included in tranche 1.
Section III, Para 14	IEE reports will be prepared at the state level based on the Environment Checklists prepared by the Project Implementation Consultant (PIC) and reviewed by the Technical Support Consultant (TSC).	Complied State level IEE was prepared and submitted to ADB
Section III, Para 15	The IEE reports and their respective EMPs (including monitoring plans) must cover the most environmentally sensitive components in each state. There should be a general EMP and road specific EMP for each road.	Being Complied Regular monitoring activities are being carried out by the PICs at state level and reviewed by the TSC at central level and monitoring reports are being prepared for different stages of the project. IEE including road specific EMPs were prepared for all subprojects included in tranche 1
Section III, Para 16	The projects shall only involve activities that follow Government of India laws and regulations, ADB's Safeguard Policy Statement (2009), this EARF and respective subproject EMPs.	Complied. Tranche 1 subprojects involve activities that follow laws and regulations of Gol and ADB's Safeguard Policy Statement (2009).
Section III, Para 17	Climate Change Vulnerability Screening. Integral to the state-wise IEE that will be prepared for sample projects, rural roads that are vulnerable to climate change will be screened and corresponding mitigation measures will be prepared. Climate change risk screening, assessment and mitigation will cover the location and design of projects, the quality of construction materials and type of maintenance they will require and the performance of the project infrastructure in times of climatic events.	Complied. The state level IEE prepared included climate change vulnerability screening of the roads included in tranche 1 and mitigation measures as required were included in the project.
Section IV - Consultation, Information Disclosure, and Grievance Redress Mechanism Para 18	During the preparation of the DPR and filling up the checklist through the transect walk exercise, the PIU has to ensure that meaningful consultations are held with affected people and their concerns are recorded and included in the project design as required.	Complied. Transect walks were carried out in each roads included in tranche 1 and consultations were held with the local community members including women. Consultations were held with affected people and their concerns were recorded and included in the project design as required
Section IV - Consultation, Information Disclosure, and	Grievance Redress Mechanism: Public disclosure and complaints contact person will be designated by the PIU for each subproject to help address all concerns and grievances of the local communities and affected parties. Contact details will form part of the subproject identification display board that	Complied. Grievance redress committees have been formed at village level, PIUs and SRRDA to address grievances of the local communities and affected parties. Citizen information boards have been placed at the rural

EARF Reference	Requirements	Compliance Status
Grievance Redress Mechanism Para 20	will be placed at both ends of the rural road being constructed.	roads being constructed under tranche 1.

IV. PUBLIC CONSULTATIONS

22. The PMGSY employs a bottom-up approach for project planning and preparation. The Core Network, from which the roads to be improved are selected, is prepared at the block level in consultation with the concerned Panchayats and consolidated at the district level. The list of roads to be taken up in each yearly allocation is first prepared by the PIU, approved by the Zilla Parishad, and then forwarded to the state government for further approval. Thus, the subsequent consultations carried out by the PIU personnel for all the selected sub projects faced no objection from the community and there was active participation during the conduct of the transect walks and preparation of the environmental mitigation plans.

V. CONCLUSIONS

23. The implementation of second RCIP Tranche 1 in the project states complied with the environmental requirements of the loan covenant, national environmental laws, and EARF. State level IEE reports were prepared in accordance with the ADB SPS 2009 and publicly disclosed. All bidding documents contain the generic road specific EMP while all DPRs contain road-specific EMPs including monitoring plans. The state RRDA has continuously monitoring the implementation of construction activities and compliance to the EMP. Non-compliances to the EMPs will be timely recorded through environment specialist of PIC and corrective measures will be implemented.

24. The implementation of the sub projects under second RCIP tranche 1 have not resulted to significant adverse environmental impacts. None of the project roads passed through reserved forest or any national parks, sanctuary, or habitat of protected species. Therefore, there was no statutory requirement of obtaining environmental clearance from Ministry of Environment and Forest (MOEF), Government of India. The subprojects do not disturb any cultural heritage designated by the Government or by international agencies, such as UNESCO etc. and avoid disturbing any monuments of cultural or historical importance.

25. None of the sub-projects required "No Objection Certificate" from the State Pollution Control Board for setting up the asphalt plant or temporary storage areas for construction materials as they are planned to be away from the habitation areas.

26. The road specific management plans adequately assessed the potential environmental issues and suggested mitigation measures to be adopted. The contractors have implemented the mitigation measures at the initial construction stage. The monitoring exercise will be continued through the next stage of the project activities.

**ANNEXURE 1: SAMPLE ENVIRONMENTAL MONITORING REPORTS
(Pre-construction Stage)**

**ENVIRONMENTAL MONITORING
PRE-CONSTRUCTION STAGE**

i	Road Name	T07-Gandhigram Saro Khurd Road
ii	Package No.	MP-41601
iii	District Name	Sidhi
iv	Block Name	Sidhi
v	Total Length of the Roads	17.22km
vi	Monitoring Period	19/03/2018
vii	Physical progress (stage of work) (Completed /Ongoing)	First stage CD ongoing
viii	Type of Road (New/Upgradation)	Upgradation

S. No.	Mitigation Activities and Method	Existing Scenario	Responsible for Mitigation	Responent	Monitoring Frequency	Responsibility	Action Taken	
							Yes	No
B. Construction Phase:								
B.1 Land Clearing								
1.	Felling trees falling within roadways and vegetative cover	No tree loss identified	PIU & Contractor	BCE	Once	PIC/PIU		No
2.	Shifting of small temples, shrines, if any is within the roads land width to adjacent areas in consultation with local community leaders	Shifting is not required	PIU & Contractor	BC	Quarterly	PIC/PIU		No
3.	During clearing operation, any treasure, trove, slabs with epigraphically evidence or edicts, sculptural or any material found and appear to have historical importance.	No historical evidence were found during clearing operation	PIU & Contractor	BC	Quarterly	PIC		No
4.	All public utilities like power transmission cables, telephone cables, water/sewage lines, drains, tube wells, etc. falling within the road land width inventoried, and arrange for relocation/ shifting to adjacent areas.	EP shifting is not required.	PIU & Contractor	CD	Quarterly	PIC		No
B.2 Establishment of Temporary Office, Storage Space and Construction camp site								
5.	Location of temporary office and storage area for construction work away from human settlement areas (minimum 500 m) and forest areas (minimum 1 km).	Temporary office and storage area is away form settlement and forest area	PIU & Contractor	CE	Quarterly	PIC		No
6.	All fuel lubricants/oils loading/unloading and storage areas paved (impermeable), and have separate storm water collection system with facility for separation of oil/lubricants prior to discharge.	Storage not required	PIU & Contractor	CE	Quarterly	PIC		No
7.	Temporary office and storage area provided with adequate water supply, sanitation, septic tank/soak pit of adequate capacity and function properly	Temporary office having a water facility	PIU & Contractor	CE	Quarterly	PIC		No

S. No.	Mitigation Activities and Method	Existing Scenario	Responsible for Mitigation	Respondent	Monitoring Frequency	Responsibility	Action Taken	
							Yes	No
8.	Worker camp site away from human settlement forest areas (500 meters away) and located in barren and waste land	Workers camp is not required because local labour is working	PIU & Contractor	CE	Quarterly	PIC		No
9.	Worker camp provided with kerosene/LPG to avoid dependence on firewood for cooking to the extent possible	Workers camp is not required	PIU & Contractor	ACE	Quarterly	PIC		No
B.3 Mobilization of construction materials – Stone aggregates, earth and construction water								
10.	Whether stone aggregates sourced only from licensed existing quarries.	Yes, aggregates source is licensed. Letter attached	Contractor	CD	Quarterly	PIC		No
11.	Whether areas demarcated with signboards and operational areas are access controlled.	Yes, working area is properly demarcated as required	Contractor	E	Quarterly	PIC		No
12.	Topsoil from borrow areas (first 30cm) are preserved and used for redevelopment to borrow areas or as a base for turbing along embankment slopes.	Soil is not taken from the agricultural field	Contractor	BCE	Quarterly	PIC		No
13.	In case water is sourced from existing private tube wells, well owner informed about the quantity and duration for which water drawls will be carried out	Tube well digging not required	PIU & Contractor	BC	Once	PIC		No
14.	The alignment of haul roads (in case of new ones) is finalized to avoid agricultural lands to the extent possible.	Diversion is not passing through any agriculture land	PIU & Contractor	B	Quarterly	PIC/PIU		No
15.	Dust suppression along transportation links	Water sprinkling is done as required	PIU & Contractor	ABCE	Quarterly	PIC/PIU		No
16.	The spillage proof vehicles deployed for material transportation.	Deployed spillage proof vehicles material transportation	Contractor	CE	Quarterly	PIC/PIU		No
B.4 Traffic Diversion								
17.	Taken up appropriate traffic diversion schemes (in specific stretches as per progress of construction work)	Appropriate diversion chosen	Contractor	BE	Once	PIC/PIU		No
18.	The traffic diversion signs – bold and clearly visible particularly at night.	Yes, its visible	Contractor	E	Quarterly	PIC/PIU		No
B.5 Cross drainage Structure								
19.	Require construction of several cross drainage structures, across streams / rivers flowing across the road	Provided all CD structures as required	PIU & Contractor	E	Quarterly	PIC/PIU		No
20.	Ensure all construction wastes are removed from work site and stream / river beds are to be cleaned up after completion of construction but prior to onset of monsoon	Yes, it will monitor during final stage. Meanwhile contractor know the fact	PIU & Contractor	BCE	Annual before monsoon	PIC/PIU		No
B.6 Tree Plantation								
21.	Tree planting operations commenced	No tree plantation proposed	PIU	BE	Quarterly	PIC/PIU		No
22.	The species selected – suitable for local climate and available.	No tree loss identified	PIU	BE	Half early	PIC/PIU		No
23.	Proper care taken up to increase survival rate of saplings like regular watering, pruning, provision of tree guards, manure for better nourishment etc.	No tree loss identified	PIU	E	Half early	PIU/PIC		No

S. No.	Mitigation Activities and Method	Existing Scenario	Responsible for Mitigation	Respondent	Monitoring Frequency	Responsibility	Action Taken	
							Yes	No
B.7 Hot mix Plant and Lying of Bitumen								
24.	Hot mix plants located 500 m away from human settlements and reverse site of dominant wind direction	Follow the SPCB guidelines. Concern letter is attached	PIU & Contractor	BCDE	Once	PIC/PIU		No
25.	Consent/permits to establish – obtained from State Pollution Control Board	Concern letter is attached	PIU & Contractor	CD	Once	PIC/PIU		No
26.	Hot mix plants measures to control of dust, air, and noise pollution as per regulatory limits of State Pollution Control Board measures.	Concern letter is attached	PIU & Contractor	E	Quarterly	PIC/PIU		No
B.8 Equipment / Vehicles Deployed for Construction Works								
27.	All diesel run equipment / vehicles / deployed for construction activities regularly maintained for smooth operation	Yes, vehicle fitness certificate attached	Contractor	E	Quarterly	PIC/PIU		No
28.	Vehicles / equipment periodically subjected for emission tests and have pollution under control certificates. Revalidation of certificates to be done once in 3 months	Yes, vehicle fitness certificate attached	Contractor	CE	Once	PIC/PIU		No
B.9 Occupational Safety and Health Hazards at Works and Camp Site								
29.	All personnel at work sites provided with PPE like helmets, boots, etc.	Yes, Using PPEs	PIC/PIU	ACE	Quarterly	PIC/PIU		No
30.	Children (less than 18 years) and pregnant women engaged in work or not	Children not working	PIC/PIU	ACE	Quarterly	PIC/PIU		No
31.	No personnel work at site for more than 10 hours per day	Not working more than 8 hrs	PIC/PIU	CE	Quarterly	PIC/PIU		No
32.	The construction camps have health care facilities for adults, pregnant women and children	Yes, its provide as required	PIU & Contractor	CE	Quarterly	PIC/PIU		No
33.	During working any causality was occurring.	No	Contractor	AC	Once			No
34.	Working Labour Male Female Numbers	M 15 F 12	Contractor	AC	Once			No
35.	All construction personnel subjected to routine vaccinations and other preventive / healthcare measures	Yes, its provide as required	Contractor, PIU	AC	Quarterly	PIC/PIU		No
36.	The work and campsites have suitable facilities for handling any emergency situation like fire, explosion etc.	Yes	Contractor, PIU	C	Quarterly	PIC/PIU		No
37.	All required permits for storage of inflammable / hazardous materials are obtained	Not storage any inflammable material	Contractor, PIU	C	Quarterly	PIC/PIU		No

**ENVIRONMENTAL MONITORING
PRE-CONSTRUCTION STAGE**

i	Road Name	T21-Chand to Linga Via Parasgaon-Ubhegaon
ii	Package No.	MP-07608
iii	District Name	Chindwara
iv	Block Name	Chourai
v	Total Length of the Roads	31.00 km
vi	Monitoring Period	12/02/2018
vii	Physical progress (stage of work) (Completed /Ongoing)	First stage CD ongoing
viii	Type of Road (New/Upgradation)	New

S. No.	Mitigation Activities and Method	Existing Scenario	Responsible for Mitigation	Respondent	Monitoring Frequency	Responsibility	Action Taken	
							Yes	No
B. Construction Phase:								
B.1 Land Clearing								
1.	Felling trees falling within roadways and vegetative cover	No tree loss identified	PIU & Contractor	BCE	Once	PIC/PIU		No
2.	Shifting of small temples, shrines, if any is within the roads land width to adjacent areas in consultation with local community leaders	Shifting is not required	PIU & Contractor	BC	Quarterly	PIC/PIU		No
3.	During clearing operation, any treasure, trove, slabs with epigraphically evidence or edicts, sculptural or any material found and appear to have historical importance.	No historical evidence were found during clearing operation	PIU & Contractor	BC	Quarterly	PIC		No
4.	All public utilities like power transmission cables, telephone cables, water/sewage lines, drains, tube wells, etc. falling within the road land width inventoried, and arrange for relocation/ shifting to adjacent areas.	EP shifting is required. Letter sent to the Concern department	PIU & Contractor	CD	Quarterly	PIC	Yes	
B.2 Establishment of Temporary Office, Storage Space and Construction camp site								
5.	Location of temporary office and storage area for construction work away from human settlement areas (minimum 500 m) and forest areas (minimum 1 km).	Temporary office and storage area is away form settlement and forest area	PIU & Contractor	CE	Quarterly	PIC		No
6.	All fuel lubricants/oils loading/unloading and storage areas paved (impermeable), and have separate storm water collection system with facility for separation of oil/lubricants prior to discharge.	Storage not required	PIU & Contractor	CE	Quarterly	PIC		No
7.	Temporary office and storage area provided with adequate water supply, sanitation, septic tank/soak pit of adequate capacity and function properly	Temporary office having a water facility	PIU & Contractor	CE	Quarterly	PIC		No
8.	Worker camp site away from human settlement forest areas (500 meters away) and located in barren and waste land	Workers camp is not required because local labour is working	PIU & Contractor	CE	Quarterly	PIC		No

S. No.	Mitigation Activities and Method	Existing Scenario	Responsible for Mitigation	Respondent	Monitoring Frequency	Responsibility	Action Taken	
							Yes	No
9.	Worker camp provided with kerosene/LPG to avoid dependence on firewood for cooking to the extent possible	Workers camp is not required	PIU & Contractor	ACE	Quarterly	PIC		No
B.3 Mobilization of construction materials – Stone aggregates, earth and construction water								
10.	Whether stone aggregates sourced only from licensed existing quarries.	Yes, aggregates source is licensed. Letter attached	Contractor	CD	Quarterly	PIC		No
11.	Whether areas demarcated with signboards and operational areas are access controlled.	Yes, working area is properly demarcated as required	Contractor	E	Quarterly	PIC		No
12.	Topsoil from borrow areas (first 30cm) are preserved and used for redevelopment to borrow areas or as a base for turfing along embankment slopes.	Soil is not taken from the agricultural field	Contractor	BCE	Quarterly	PIC		No
13.	In case water is sourced from existing private tube wells, well owner informed about the quantity and duration for which water drawls will be carried out	Tube well digging not required	PIU & Contractor	BC	Once	PIC		No
14.	The alignment of haul roads (in case of new ones) is finalized to avoid agricultural lands to the extent possible.	Diversion is not passing through any agriculture land	PIU & Contractor	B	Quarterly	PIC/PIU		No
15.	Dust suppression along transportation links	Water sprinkling is done as required	PIU & Contractor	ABCE	Quarterly	PIC/PIU		No
16.	The spillage proof vehicles deployed for material transportation.	Deployed spillage proof vehicles material transportation	Contractor	CE	Quarterly	PIC/PIU		No
B.4 Traffic Diversion								
17.	Taken up appropriate traffic diversion schemes (in specific stretches as per progress of construction work)	Appropriate diversion chosen	Contractor	BE	Once	PIC/PIU		No
18.	The traffic diversion signs – bold and clearly visible particularly at night.	Yes, its visible	Contractor	E	Quarterly	PIC/PIU		No
B.5 Cross drainage Structure								
19.	Require construction of several cross drainage structures, across streams / rivers flowing across the road	Provided all CD structures as required	PIU & Contractor	E	Quarterly	PIC/PIU		No
20.	Ensure all construction wastes are removed from work site and stream / river beds are to be cleaned up after completion of construction but prior to onset of monsoon	Yes, it will monitor during final stage. Meanwhile contractor know the fact	PIU & Contractor	BCE	Annual before monsoon	PIC/PIU		No
B.6 Tree Plantation								
21.	Tree planting operations commenced	No tree plantation proposed	PIU	BE	Quarterly	PIC/PIU		No
22.	The species selected – suitable for local climate and available.	No tree loss identified	PIU	BE	Half early	PIC/PIU		No
23.	Proper care taken up to increase survival rate of saplings like regular watering, pruning, provision of tree guards, manure for better nourishment etc.	No tree loss identified	PIU	E	Half early	PIU/PIC		No
B.7 Hot mix Plant and Lying of Bitumen								
24.	Hot mix plants located 500 m away from human settlements and reverse site of dominant wind direction	Follow the SPCB guidelines. Concern letter is attached	PIU & Contractor	BCDE	Once	PIC/PIU		No

S. No.	Mitigation Activities and Method	Existing Scenario	Responsible for Mitigation	Respondent	Monitoring Frequency	Responsibility	Action Taken	
							Yes	No
25.	Consent/permits to establish – obtained from State Pollution Control Board	Concern letter is attached	PIU & Contractor	CD	Once	PIC/PIU		No
26.	Hot mix plants measures to control of dust, air, and noise pollution as per regulatory limits of State Pollution Control Board measures.	Concern letter is attached	PIU & Contractor	E	Quarterly	PIC/PIU		No
B.8 Equipment / Vehicles Deployed for Construction Works								
27.	All diesel run equipment / vehicles / deployed for construction activities regularly maintained for smooth operation	Yes, vehicle fitness certificate attached	Contractor	E	Quarterly	PIC/PIU		No
28.	Vehicles / equipment periodically subjected for emission tests and have pollution under control certificates. Revalidation of certificates to be done once in 3 months	Yes, vehicle fitness certificate attached	Contractor	CE	Once	PIC/PIU		No
B.9 Occupational Safety and Health Hazards at Works and Camp Site								
29.	All personnel at work sites provided with PPE like helmets, boots, etc.	Yes, Using PPEs	PIC/PIU	ACE	Quarterly	PIC/PIU		No
30.	Children (less than 18 years) and pregnant women engaged in work or not	Children not working	PIC/PIU	ACE	Quarterly	PIC/PIU		No
31.	No personnel work at site for more than 10 hours per day	Not working more than 8 hrs	PIC/PIU	CE	Quarterly	PIC/PIU		No
32.	The construction camps have health care facilities for adults, pregnant women and children	Yes, its provide as required	PIU & Contractor	CE	Quarterly	PIC/PIU		No
33.	During working any causality was occurring.	No	Contractor	AC	Once			No
34.	Working Labour Male Female Numbers	M 10 F 3	Contractor	AC	Once			No
35.	All construction personnel subjected to routine vaccinations and other preventive / healthcare measures	Yes, its provide as required	Contractor, PIU	AC	Quarterly	PIC/PIU		No
36.	The work and campsites have suitable facilities for handling any emergency situation like fire, explosion etc.	Yes	Contractor, PIU	C	Quarterly	PIC/PIU		No
37.	All required permits for storage of inflammable / hazardous materials are obtained	Not storage any inflammable material	Contractor, PIU	C	Quarterly	PIC/PIU		No

**Environmental Monitoring
PRE-CONSTRUCTION STAGE**

i	Road Name	T37-Maihar Nagod Road to Pahadi
ii	Package No.	MP-34603
iii	District Name	Satna
iv	Block Name	Uchehara
v	Total Length of the Roads	5.60 km
vi	Monitoring Period	17/03/2018
vii	Physical progress (stage of work) (Completed /Ongoing)	First stage ongoing
viii	Type of Road (New/Upgradation)	Upgradation

S. No.	Mitigation Activities and Method	Existing Scenario	Responsible for Mitigation	Responsible	Monitoring Frequency	Responsibility	Action Taken	
							Yes	No
B. Construction Phase:								
B.1 Land Clearing								
1.	Felling trees falling within roadways and vegetative cover	No tree loss identified	PIU & Contractor	BCE	Once	PIC/PIU		No
2.	Shifting of small temples, shrines, if any is within the roads land width to adjacent areas in consultation with local community leaders	Shifting is not required	PIU & Contractor	BC	Quarterly	PIC/PIU		No
3.	During clearing operation, any treasure, trove, slabs with epigraphically evidence or edicts, sculptural or any material found and appear to have historical importance.	No historical evidence were found during clearing operation	PIU & Contractor	BC	Quarterly	PIC		No
4.	All public utilities like power transmission cables, telephone cables, water/sewage lines, drains, tube wells, etc. falling within the road land width inventoried, and arrange for relocation/ shifting to adjacent areas.	EP shifting is required.	PIU & Contractor	CD	Quarterly	PIC	Yes	
B.2 Establishment of Temporary Office, Storage Space and Construction camp site								
5.	Location of temporary office and storage area for construction work away from human settlement areas (minimum 500 m) and forest areas (minimum 1 km).	Temporary office and storage area is away from settlement and forest area	PIU & Contractor	CE	Quarterly	PIC		No
6.	All fuel lubricants/oils loading/unloading and storage areas paved (impermeable), and have separate storm water collection system with facility for separation of oil/lubricants prior to discharge.	Storage not required	PIU & Contractor	CE	Quarterly	PIC		No
7.	Temporary office and storage area provided with adequate water supply, sanitation, septic tank/soak pit of adequate capacity and function properly	Temporary office having a water facility	PIU & Contractor	CE	Quarterly	PIC		No

S. No.	Mitigation Activities and Method	Existing Scenario	Responsible for Mitigation	Respondent	Monitoring Frequency	Responsibility	Action Taken	
							Yes	No
8.	Worker camp site away from human settlement forest areas (500 meters away) and located in barren and waste land	Workers camp is not required because local labour is working	PIU & Contractor	CE	Quarterly	PIC		No
9.	Worker camp provided with kerosene/LPG to avoid dependence on firewood for cooking to the extent possible	Workers camp is not required	PIU & Contractor	ACE	Quarterly	PIC		No
B.3 Mobilization of construction materials – Stone aggregates, earth and construction water								
10.	Whether stone aggregates sourced only from licensed existing quarries.	Yes, aggregates source is licensed. Letter attached	Contractor	CD	Quarterly	PIC		No
11.	Whether areas demarcated with signboards and operational areas are access controlled.	Yes, working area is properly demarcated as required	Contractor	E	Quarterly	PIC		No
12.	Topsoil from borrow areas (first 30cm) are preserved and used for redevelopment to borrow areas or as a base for turfing along embankment slopes.	Soil is not taken from the agricultural field	Contractor	BCE	Quarterly	PIC		No
13.	In case water is sourced from existing private tube wells, well owner informed about the quantity and duration for which water draws will be carried out	Tube well digging not required	PIU & Contractor	BC	Once	PIC		No
14.	The alignment of haul roads (in case of new ones) is finalized to avoid agricultural lands to the extent possible.	Diversion is not passing through any agriculture land	PIU & Contractor	B	Quarterly	PIC/PIU		No
15.	Dust suppression along transportation links	Water sprinkling is done as required	PIU & Contractor	ABCE	Quarterly	PIC/PIU		No
16.	The spillage proof vehicles deployed for material transportation.	Deployed spillage proof vehicles material transportation	Contractor	CE	Quarterly	PIC/PIU		No
B.4 Traffic Diversion								
17.	Taken up appropriate traffic diversion schemes (in specific stretches as per progress of construction work)	Appropriate diversion chosen	Contractor	BE	Once	PIC/PIU		No
18.	The traffic diversion signs – bold and clearly visible particularly at night.	Yes, its visible	Contractor	E	Quarterly	PIC/PIU		No
B.5 Cross drainage Structure								
19.	Require construction of several cross drainage structures, across streams / rivers flowing across the road	Provided all CD structures as required	PIU & Contractor	E	Quarterly	PIC/PIU		No
20.	Ensure all construction wastes are removed from work site and stream / river beds are to be cleaned up after completion of construction but prior to onset of monsoon	Yes, it will monitor during final stage. Meanwhile contractor know the fact	PIU & Contractor	BCE	Annual before monsoon	PIC/PIU		No
B.6 Tree Plantation								
21.	Tree planting operations commenced	No tree plantation proposed	PIU	BE	Quarterly	PIC/PIU		No
22.	The species selected – suitable for local climate and available.	No tree loss identified	PIU	BE	Half early	PIC/PIU		No
23.	Proper care taken up to increase survival rate of saplings like regular watering, pruning, provision of tree guards, manure for better nourishment etc.	No tree loss identified	PIU	E	Half early	PIU/PIC		No

S. No.	Mitigation Activities and Method	Existing Scenario	Responsible for Mitigation	Respondent	Monitoring Frequency	Responsibility	Action Taken	
							Yes	No
B.7 Hot mix Plant and Lying of Bitumen								
24.	Hot mix plants located 500 m away from human settlements and reverse site of dominant wind direction	Follow the SPCB guidelines. Concern letter is attached	PIU & Contractor	BCDE	Once	PIC/PIU		No
25.	Consent/permits to establish – obtained from State Pollution Control Board	Concern letter is attached	PIU & Contractor	CD	Once	PIC/PIU		No
26.	Hot mix plants measures to control of dust, air, and noise pollution as per regulatory limits of State Pollution Control Board measures.	Concern letter is attached	PIU & Contractor	E	Quarterly	PIC/PIU		No
B.8 Equipment / Vehicles Deployed for Construction Works								
27.	All diesel run equipment / vehicles / deployed for construction activities regularly maintained for smooth operation	Yes, vehicle fitness certificate attached	Contractor	E	Quarterly	PIC/PIU		No
28.	Vehicles / equipment periodically subjected for emission tests and have pollution under control certificates. Revalidation of certificates to be done once in 3 months	Yes, vehicle fitness certificate attached	Contractor	CE	Once	PIC/PIU		No
B.9 Occupational Safety and Health Hazards at Works and Camp Site								
29.	All personnel at work sites provided with PPE like helmets, boots, etc.	Yes, Using PPEs	PIC/PIU	ACE	Quarterly	PIC/PIU		No
30.	Children (less than 18 years) and pregnant women engaged in work or not	Children not working	PIC/PIU	ACE	Quarterly	PIC/PIU		No
31.	No personnel work at site for more than 10 hours per day	Not working more than 8 hrs	PIC/PIU	CE	Quarterly	PIC/PIU		No
32.	The construction camps have health care facilities for adults, pregnant women and children	Yes, its provide as required	PIU & Contractor	CE	Quarterly	PIC/PIU		No
33.	During working any causality was occurring.	No	Contractor	AC	Once			No
34.	Working Labour Male Female Numbers	M 6 F 4	Contractor	AC	Once			No
35.	All construction personnel subjected to routine vaccinations and other preventive / healthcare measures	Yes, its provide as required	Contractor, PIU	AC	Quarterly	PIC/PIU		No
36.	The work and campsites have suitable facilities for handling any emergency situation like fire, explosion etc.	Yes	Contractor, PIU	C	Quarterly	PIC/PIU		No
37.	All required permits for storage of inflammable / hazardous materials are obtained	Not storage any inflammable material	Contractor, PIU	C	Quarterly	PIC/PIU		No

ENVIRONMENTAL MONITORING DURING DESIGN AND PRE-CONSTRUCTION STAGE

Monitoring Responsibility: PIU with Support from PIC

Monitoring Frequency: Once during pre-construction stage

Road Name: Baghiapada to Birigada Road

Package No.: OR-06-ADB-29/RCIP-II/Tr-I

Block: Boudh, **District:** Boudh, **Road Length:** 4.82Km.

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
1.	Climate Change Consideration and Vulnerability screening	Compliance to climate change vulnerability check point given under EARF and adoption of necessary mitigative measures as may be required	All through the alignment	Complied	Not Applicable
		Efforts shall be made to plant additional trees for increasing the carbon sink. The tree may be planted with help of PRI (Panchayati-Raj Institution).	Along road side except habitation areas	Complied	Not Applicable
2.	Finalization of alignment	The road will be part of district core network and will comply with PMGSY guidelines	Not Applicable	Complied	Not Applicable
		Subproject shall not disturb any cultural heritage designated by the government or by the international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance.	Not Applicable	Complied	Not Applicable
		Subproject will not pass through any designated wild life sanctuaries, national park, notified Eco sensitive areas or area of international significance such as protective wet land designated under Wetland Convention, and reserve forest area	Not Applicable	Complied	Not Applicable
		Subproject to comply with local and National legislative requirements such as forest clearance for diversion of forestland and ADB's Safeguard Policy Statement 2009.	Not Applicable	Complied	Not Applicable
		Alignment finalization considering availability of right of way and in consultation with local people.	Total length of proposed road is 4.82 Km.	Complied	Not Applicable
		ROW may be reduced in built up area or constricted areas to minimize land acquisition as per PMGSY Guidelines.	422 mtr CC road from Ch. 0/568 to 0/650, 4/335 to 4/430, 4/575 to 4/820 Km	Complied	Not Applicable
		Adjust alignment to the extent feasible to avoid tree cutting, shifting of utilities or community structure.	All along the alignment	Complied	Not Applicable
		The road shall follow natural topography to avoid excessive cut and fill.	All along the alignment	Complied	Not Applicable
3.	Land acquisition	Land acquisition, compensation packages, resettlement and rehabilitation, poverty alleviation programs for affected	Social Impacts and Resettlement & Rehabilitation	All along the alignment /road	Not Applicable

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
		people and all other related issues are addressed through Social Impacts and Resettlement & Rehabilitation report.	report shall be prepared to address the related issues		
4.	Clearing of vegetation and removing trees	All efforts shall be taken to avoid tree cutting wherever possible.	Not Applicable	Complied	Not Applicable
		Requisite permission from forest department shall be obtained for cutting of roadside trees.	Not Applicable	Not required	Not Applicable
		Provision of Compensatory Afforestation shall be made on 1:3.ratio basis (1:6 for Assam state).	Not Applicable	Not required	Not Applicable
		Permission shall be taken for diversion of any forest land if involved. Provision shall be made for additional compensatory tree plantation.	Not Applicable	Not required	Not Applicable
		The vegetative cover shall be removed and disposed in consultation with community.	All along the alignment	Complied	Not Applicable
5.	Shifting of utilities and common property resources	The road land width shall be clearly demarcated on the ground.	Sufficient land is available to construct the proposed road in and outside the village area.	Complied	Not Applicable
		All efforts will be made to minimize shifting of utilities and common property resources	Not Applicable	Complied	Not Applicable
		Utility and community structure shifting shall be planned in consultations and concurrence of the community.	Not Applicable	Complied	Not Applicable
		Required permissions and necessary actions will be taken on a timely basis for removing and shifting utility structures and common property resources before road construction activities begin.	Not Applicable	Complied	Not Applicable
6.	Design planning and of embankment construction	The alignment design shall consider options to minimize excessive cuts and fills.	All along the alignment	Complied	Not Applicable
		The cut off material shall be planned to be used for embankment to minimize borrow earth requirement.	All along the alignment	Complied	Not Applicable
		The design shall be as per relevant IRC provisions for cut and fill, slope protection and drainage.	345 mtr. Retention wall at Ch. 3/585 to 3/765 L, 4/525 to 4/690 R km and 455 mtr. CC drain at Ch. 2/560 to 3/015 km	Complied	Not Applicable
		The top soil of the cut and fill area shall be used for embankment slope protection	All along the alignment	Complied	Not Applicable
		Embankment will be designed above High Flood Level (HFL) in flood prone areas where feasible.	345 mtr. Retention wall at Ch. 3/585 to 3/765 L, 4/525 to 4/690 R km and 455 mtr. CC drain at Ch. 2/560 to 3/015 km	Complied	Not Applicable

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
7.	Hydrology and Drainage	Provision of adequate cross drainage structure shall be made to ensure smooth passage of water and maintaining natural drainage pattern of the area.	Community suggested for 11 new CD works (2 nos. 600 mm SR) at Ch. 1/657, 3/087 Km, (8 nos. 1000 mm SR) at Ch. 0/329, 0/514, 0/641, 0/845, 1/555, 1/808, 3/450, 4/810 Km, (1 no. RCC culvert 1.5x2 mtr.) at Ch. 3/766 Km	Complied	Not Applicable
		The discharge capacity of the CD structure shall be designed accordingly.		Complied	Not Applicable
		Provision of adequate drainage structures shall be made in water stagnant/logging areas.	Not Applicable	Complied	Not Applicable
		The construction work near water body shall be planned preferably in dry season so that water quality of the water channel is not affected due to siltation and rain water runoff.	Not Applicable	Complied	Not Applicable
		Provision of additional cross drainage structure shall be made in the areas where nearby land is sloping towards road alignment on both the sides.	Not Applicable	Complied	Not Applicable
		Provision of concrete road construction in habitat area with drainage of both side of the road shall be made as per the design provision and with adequate slope to prevent any water logging.	Not required	Complied	Not Applicable
8.	Establishment of Construction Camp, temporary office and storage area	Construction camp sites shall be located away from any local human settlements and forested areas (minimum 0.5 km away) and preferably located on lands, which are not productive (barren/waste lands presently).	Not Applicable	Complied	Not Applicable
		Similarly temporary office and storage areas shall be located away from human settlement areas and forested areas (minimum 0.5 km).	Not Applicable	Complied	Not Applicable
		The construction camps, office and storage areas shall have provision of adequate water supply, sanitation and all requisite infrastructure facilities.	At Work-Site	Complied	Not Applicable
		The construction camps, office and storage areas shall have provision of septic tank/soak pit of adequate capacity so that it can function properly for the entire duration of its use.	Not Applicable	Complied	Not Applicable
		All construction camps shall have provision of rationing facilities particularly for kerosene/LPG so that dependence on firewood for cooking is avoided to the extent possible.	Only LPG/ Kerosene to be used for cooking if any	Complied	Not Applicable
		The construction camps, office and storage areas shall have provision of health care facilities for adults, pregnant women and children.	At Work-Site	Complied	Not Applicable

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
		Personal Protective Equipment (PPE) like helmet, boots and earplugs for workers, first aid and firefighting equipment shall be available at construction sites before start of construction. An emergency plan shall be prepared to fight with any emergency like fire.	At Work-Site	Complied	Not Applicable
		Provision shall be made for domestic solid waste disposal in a controlled manner. The recyclable waste shall be sold off and non-saleable and biodegradable waste shall be disposed through secured land filling.	Not Applicable	Complied	Not Applicable
		Provision of paved area for unloading and storage of fuel oil, lubricant oil, away from storm water drainage.		Complied	Not Applicable
9.	Traffic Management and Road Safety	Identify the areas where temporary traffic diversion may be required.	Contractor to submit a traffic movement plan to PIU for proposed traffic diversions in identified places during construction	Complied	Not Applicable
		Prepare appropriate traffic movement plan approved by respective PIU for ensuring continued safe flow of traffic, pedestrians and all road users during construction.		Complied	Not Applicable
		Wherever, cross drainage structure work require longer construction time and road is to be blocked for longer duration, the PIU/DPR consultant shall define appropriate measures for traffic diversion before the start of the construction.	Community suggested for 11 new CD works (2 nos. 600 mm SR) at Ch. 1/657, 3/087 Km, (8 nos. 1000 mm SR) at Ch. 0/329, 0/514, 0/641, 0/845, 1/555, 1/808, 3/450, 4/810 Km, (1 no. RCC culvert 1.5x2 mtr.) at Ch. 3/766 Km	Complied	Not Applicable
		Adequate signboards shall be placed much ahead of diversion site to caution the road users. The road signs should be bold and retro reflective in nature for good visibility both during the day and night.	Cautionary signboards, speed breakers are suggested at Junction at Ch. 0/0, 4/450, 4/750 Km, Curve at Ch. 0/090 L, 0/250 R, 0/380 R, 0/590 L, 0/690 L, 0/790 L, 1/190 L, 1/290 R, 1/360 R, 1/490 L, 1/690 L, 2/090 R, 2/170 R, 2/350 L, 2/590 R, 2/880 R, 2/990 L, 3/090 R, 3/180 R, 3/290 R, 3/390 R, 3/690 L, 3/780 L, 3/990 R, 4/090 L, 4/190 R Km, Sharp Curve at Ch. 2/470 L, 4/290 R, 4/690 R Km, S-curve at Ch. 0/040Km.		Not Applicable

SL. NO.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
			Village Area at Ch. 1/400 to 1/500, 3/500 to 3/700, 3/800 to 3/900, 4/100 to 4/820, CS (4/430 R)Km.		
		It is proposed for the respective PIU to discuss with the railways division/department for providing adequate safety measures at unmanned railway crossing where applicable. Adequate clearly visible sign shall be provided on both sides of the railway crossing All measures for traffic control and safety in accordance with IRC codes: 99-1988 will be followed.	Not Applicable	Complied	Not Applicable
10.	Grievance Redress	Maintaining records of all environment related grievances raised, if any, and the actions taken to address them through the village level grievance redress committee (GRC) and PIU as applicable	All project roads.	Complied	Not Applicable

ENVIRONMENTAL MONITORING DURING DESIGN AND PRE-CONSTRUCTION STAGE

Monitoring Responsibility: PIU with Support from PIC
Monitoring Frequency: Once during pre-construction stage
Road Name: MDR 32 to Tulsikani
Package NoOR-30-ADB/171/RC-II/TR-I
Block: Birsa, **District:** Sundergarh, **Road Length:** 2.70Km.

Sl. No.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
1.	Climate Change Consideration and Vulnerability screening	Compliance to climate change vulnerability check point given under EARF and adoption of necessary mitigative measures as may be required	All through the alignment	Complied	Not Applicable
		Efforts shall be made to plant additional trees for increasing the carbon sink. The tree may be planted with help of PRI (Panchayati-Raj Institution).	Along road side except habitation areas	Complied	Not Applicable
2.	Finalization of alignment	The road will be part of district core network and will comply with PMGSY guidelines	Not Applicable	Complied	Not Applicable
		Subproject shall not disturb any cultural heritage designated by the government or by the international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance.	Not Applicable	Complied	Not Applicable
		Subproject will not pass through any designated wild life sanctuaries, national park, notified Eco sensitive areas or area of international significance such as protective wet land designated under Wetland Convention, and reserve forest area	Not Applicable	Complied	Not Applicable
		Subproject to comply with local and National legislative requirements such as forest clearance for diversion of forestland and ADB's Safeguard Policy Statement 2009.	Not Applicable	Complied	Not Applicable
		Alignment finalization considering availability of right of way and in consultation with local people.	Total length of proposed road is 2.700 Km	Complied	Not Applicable
		ROW may be reduced in built up area or constricted areas to minimize land acquisition as per PMGSY Guidelines.	Not Applicable	Complied	Not Applicable
		Adjust alignment to the extent feasible to avoid tree cutting, shifting of utilities or community structure.	All along the alignment	Complied	Not Applicable
		The road shall follow natural topography to avoid excessive cut and fill.	All along the alignment	Complied	Not Applicable
3.	Land acquisition	Land acquisition, compensation packages, resettlement and rehabilitation, poverty alleviation programs for affected people and all other related issues are addressed through Social Impacts and Resettlement & Rehabilitation report.	Social Impacts and Resettlement & Rehabilitation report shall be prepared to address the related issues	Not required	Not Applicable
4.		All efforts shall be taken to avoid tree cutting wherever possible.	Not Applicable	Complied	Not Applicable

Sl. No.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
	Clearing of vegetation and removing trees	Requisite permission from forest department shall be obtained for cutting of roadside trees.	Not Applicable	Not required	Not Applicable
		Provision of Compensatory Afforestation shall be made on 1:3.ratio basis (1:6 for Assam state).	Not Applicable	Not required	Not Applicable
		Permission shall be taken for diversion of any forest land if involved. Provision shall be made for additional compensatory tree plantation.	Not Applicable	Not required	Not Applicable
		The vegetative cover shall be removed and disposed in consultation with community.	All along the alignment	Complied	Not Applicable
5.	Shifting of utilities and common property resources	The road land width shall be clearly demarcated on the ground.	Sufficient land is available to construct the proposed road in village area and outside the village area.	Complied	Not Applicable
		All efforts will be made to minimize shifting of utilities and common property resources	Not Applicable	Complied	Not Applicable
		Utility and community structure shifting shall be planned in consultations and concurrence of the community.	Not Applicable	Complied	Not Applicable
		Required permissions and necessary actions will be taken on a timely basis for removing and shifting utility structures and common property resources before road construction activities begin.	Not Applicable	Complied	Not Applicable
6.	Design and planning of embankment construction	The alignment design shall consider options to minimize excessive cuts and fills.	All along the alignment	Complied	Not Applicable
		The cut off material shall be planned to be used for embankment to minimize borrow earth requirement.	All along the alignment	Complied	Not Applicable
		The design shall be as per relevant IRC provisions for cut and fill, slope protection and drainage.	165RM of protective structures have been provided at Chainage - community suggested for 65 m protection work (Toe wall) and 100 Mtr CC Drain at Ch. 1/100 to 1/200	Complied	Not Applicable
		The top soil of the cut and fill area shall be used for embankment slope protection	All along the alignment	Complied	Not Applicable
		Embankment will be designed above High Flood Level (HFL) in flood prone areas where feasible.	Same as Response to previous-but-one Sub-Point of this Sub-Head.	Complied	Not Applicable
7.	Hydrology and Drainage	Provision of adequate cross drainage structure shall be made to ensure smooth passage of water and maintaining natural drainage pattern of the area.	Community suggested for 3 new CD works- HPC 1000 MM	Complied	Not Applicable

Sl. No.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
		The discharge capacity of the CD structure shall be designed accordingly.	DIA SR at Ch. 0/150, 0/650 and 1/050	Complied	Not Applicable
		Provision of adequate drainage structures shall be made in water stagnant/logging areas.	Not Applicable	Complied	Not Applicable
		The construction work near water body shall be planned preferably in dry season so that water quality of the water channel is not affected due to siltation and rain water runoff.	Not Applicable	Complied	Not Applicable
		Provision of additional cross drainage structure shall be made in the areas where nearby land is sloping towards road alignment on both the sides.	Same as Response to 1 st two Sub-Points of this Sub-Head.	Complied	Not Applicable
		Provision of concrete road construction in habitat area with drainage of both side of the road shall be made as per the design provision and with adequate slope to prevent any water logging.	Not Applicable	Complied	Not Applicable
8.	Establishment of Construction Camp, temporary office and storage area	Construction camp sites shall be located away from any local human settlements and forested areas (minimum 0.5 km away) and preferably located on lands, which are not productive (barren/waste lands presently).	Not Applicable	Complied	Not Applicable
		Similarly temporary office and storage areas shall be located away from human settlement areas and forested areas (minimum 0.5 km).	Not Applicable	Complied	Not Applicable
		The construction camps, office and storage areas shall have provision of adequate water supply, sanitation and all requisite infrastructure facilities.	At Work-Site	Complied	Not Applicable
		The construction camps, office and storage areas shall have provision of septic tank/soak pit of adequate capacity so that it can function properly for the entire duration of its use.	Not Applicable	Complied	Not Applicable
		All construction camps shall have provision of rationing facilities particularly for kerosene/LPG so that dependence on firewood for cooking is avoided to the extent possible.	Not Applicable	Complied	Not Applicable
		The construction camps, office and storage areas shall have provision of health care facilities for adults, pregnant women and children.	At Work-Site	Complied	Not Applicable
		Personal Protective Equipment (PPE) like helmet, boots, earplugs for workers, first aid and firefighting equipment shall be available at construction sites before start of construction. An emergency plan shall be prepared to fight with any emergency like fire.	At Work-Site	Complied	Not Applicable
		Provision shall be made for domestic solid waste disposal in a controlled manner. The recyclable waste shall be sold off and	Not Applicable	Complied	Not Applicable

Sl. No.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
		non-saleable and biodegradable waste shall be disposed through secured land filling.			
		Provision of paved area for unloading and storage of fuel oil, lubricant oil, away from storm water drainage.		Complied	Not Applicable
9.	Traffic Management and Road Safety	Identify the areas where temporary traffic diversion may be required.	The contractor will identify the areas where temporary traffic diversion may be required. He would prepare appropriate traffic movement plan for ensuring continued flow of traffic during construction phase.	Complied	Not Applicable
		Prepare appropriate traffic movement plan approved by respective PIU for ensuring continued safe flow of traffic, pedestrians and all road users during construction.		Complied	Not Applicable
		Wherever, cross drainage structure work require longer construction time and road is to be blocked for longer duration, the PIU/DPR consultant shall define appropriate measures for traffic diversion before the start of the construction.	Community suggested for 3 new CD works- HPC 1000 MM DIA SR at Ch. 0/150, 0/650 and 1/050	Complied	Not Applicable
		Adequate signboards shall be placed much ahead of diversion site to caution the road users. The road signs should be bold and retro reflective in nature for good visibility both during the day and night.	Cautionary signboards, speed breakers are suggested at Junction 0/000, 0/062, 1/830 Km, Curve 0/730, 0/840, 2/125 2/350,Km. and Village Area from 0/000 to 0/200, 1/500 to 1/800, 2/600 to 2/700 Km	Complied	Not Applicable
		It is proposed for the respective PIU to discuss with the railways division/department for providing adequate safety measures at unmanned railway crossing where applicable. Adequate clearly visible sign shall be provided on both sides of the railway crossing All measures for traffic control and safety in accordance with IRC codes:99-1988 will be followed.	Not Applicable	Complied	Not Applicable
10.	Grievance Redress	Maintaining records of all environment related grievances raised, if any, and the actions taken to address them through the village level grievance redress committee (GRC) and PIU as applicable	All project roads.	Complied	Not Applicable

ENVIRONMENTAL MONITORING DURING DESIGN AND PRE-CONSTRUCTION STAGE

Monitoring Responsibility: PIU with Support from PIC

Monitoring Frequency: Once during pre-construction stage

Road Name: PWD Road to Malikmunda

Package No.: NO.-OR-24-ADB/66/RC-II/TR-I

Block: Komna, **District:** Nuapara, **Road Length:** 4.00Km.

Sl. No.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
1.	Climate Change Consideration and Vulnerability screening	Compliance to climate change vulnerability check point given under EARF and adoption of necessary mitigative measures as may be required	All through the alignment	Complied	Not Applicable
		Efforts shall be made to plant additional trees for increasing the carbon sink. The tree may be planted with help of PRI (Panchayati-Raj Institution).	Along road side except habitation areas	Complied	Not Applicable
2..	Finalization of alignment	The road will be part of district core network and will comply with PMGSY guidelines	Not Applicable	Complied	Not Applicable
		Subproject shall not disturb any cultural heritage designated by the government or by the international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance.	Not Applicable	Complied	Not Applicable
		Subproject will not pass through any designated wild life sanctuaries, national park, notified Eco sensitive areas or area of international significance such as protective wet land designated under Wetland Convention, and reserve forest area	Not Applicable	Complied	Not Applicable
		Subproject to comply with local and National legislative requirements such as forest clearance for diversion of forestland and ADB's Safeguard Policy Statement 2009.	Not Applicable	Complied	Not Applicable
		Alignment finalization considering availability of right of way and in consultation with local people.	Total length of proposed road 4.00KM	Complied	Not Applicable
		ROW may be reduced in built up area or constricted areas to minimize land acquisition as per PMGSY Guidelines.	Not Applicable	Complied	Not Applicable
		Adjust alignment to the extent feasible to avoid tree cutting, shifting of utilities or community structure.	All along the alignment	Complied	Not Applicable
		The road shall follow natural topography to avoid excessive cut and fill.	All along the alignment	Complied	Not Applicable
3.	Land acquisition	Land acquisition, compensation packages, resettlement and rehabilitation, poverty alleviation programs for affected people	Social Impacts and Resettlement & Rehabilitation	All along the alignment /road	Not Applicable

Sl. No.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
		and all other related issues are addressed through Social Impacts and Resettlement & Rehabilitation report.	report shall be prepared to address the related issues		
4.	Clearing of vegetation and removing trees	All efforts shall be taken to avoid tree cutting wherever possible.	Not Applicable	Complied	Not Applicable
		Requisite permission from forest department shall be obtained for cutting of roadside trees.	Not Applicable	Not required	Not Applicable
		Provision of Compensatory Afforestation shall be made on 1:3.ratio basis (1:6 for Assam state).	Not Applicable	Not required	Not Applicable
		Permission shall be taken for diversion of any forest land if involved. Provision shall be made for additional compensatory tree plantation.	Not Applicable	Not required	Not Applicable
		The vegetative cover shall be removed and disposed in consultation with community.	All along the alignment	Complied	Not Applicable
5.	Shifting of utilities and common property resources	The road land width shall be clearly demarcated on the ground.	Sufficient land is available to construct the proposed road in and outside village area.	Complied	Not Applicable
		All efforts will be made to minimize shifting of utilities and common property resources	Not Applicable	Complied	Not Applicable
		Utility and community structure shifting shall be planned in consultations and concurrence of the community.	Not Applicable	Complied	Not Applicable
		Required permissions and necessary actions will be taken on a timely basis for removing/ shifting utility structures and common property resources before road construction activities begin.	Not Applicable	Complied	Not Applicable
6.	Design and planning of embankment construction	The alignment design shall consider options to minimize excessive cuts and fills.	All along the alignment	Complied	Not Applicable
		The cut off material shall be planned to be used for embankment to minimize borrow earth requirement.	All along the alignment	Complied	Not Applicable
		The design shall be as per relevant IRC provisions for cut and fill, slope protection and drainage.	140 RM of protective structures have been provided at Chainages - 60 mtr Toe wall from Ch. 0/850 to 0/910 Km. (LHS) 80 mtr CC Drain from Ch. 1/745 to 1/825 km.	Complied	Not Applicable
		The top soil of the cut and fill area shall be used for embankment slope protection	All along the alignment	Complied	Not Applicable
		Embankment will be designed above High Flood Level (HFL) in flood prone areas where feasible.	140 RM of protective structures have been provided at Chainages -	Complied	Not Applicable

Sl. No.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
			60 mtr Toe wall from Ch. 0/850 to 0/910 Km. (LHS) 80 mtr CC Drain from Ch. 1/745 to 1/825 km.		
7.	Hydrology and Drainage	Provision of adequate cross drainage structure shall be made to ensure smooth passage of water and maintaining natural drainage pattern of the area.	Community suggested for 9 new CD Works at Ch. 0/010, 1/820, 2/497, 3/363, 1/218, 2/738 Km (6 HPC) and 2 RCC Culvert at Ch. 1/317, 3/120 Km along with 1 Boxcell Culvert at Ch. 2/250 km	Complied	Not Applicable
		The discharge capacity of the CD structure shall be designed accordingly.		Complied	Not Applicable
		Provision of adequate drainage structures shall be made in water stagnant/logging areas.	Not Applicable	Complied	Not Applicable
		The construction work near water body shall be planned preferably in dry season so that water quality of the water channel is not affected due to siltation and rain water runoff.	Not Applicable	Complied	Not Applicable
		Provision of additional cross drainage structure shall be made in the areas where nearby land is sloping towards road alignment on both the sides.	Not Applicable	Complied	Not Applicable
		Provision of concrete road construction in habitat area with drainage of both side of the road shall be made as per the design provision and with adequate slope to prevent any water logging.	Not Applicable	Complied	Not Applicable
8.	Establishment of Construction Camp, temporary office and storage area	Construction camp sites shall be located away from any local human settlements and forested areas (minimum 0.5 km away) and preferably located on lands, which are not productive (barren/waste lands presently).	Not Applicable	Complied	Not Applicable
		Similarly temporary office and storage areas shall be located away from human settlement areas and forested areas (minimum 0.5 km).	Not Applicable	Complied	Not Applicable
		The construction camps, office and storage areas shall have provision of adequate water supply, sanitation and all requisite infrastructure facilities.	At Work-Site	Complied	Not Applicable
		The construction camps, office and storage areas shall have provision of septic tank/soak pit of adequate capacity so that it can function properly for the entire duration of its use.	Not Applicable	Complied	Not Applicable

Sl. No.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
		All construction camps shall have provision of rationing facilities particularly for kerosene/LPG so that dependence on firewood for cooking is avoided to the extent possible.	Only LPG/ Kerosene to be used for cooking if any	Complied	Not Applicable
		The construction camps, office and storage areas shall have provision of health care facilities for adults, pregnant women and children.	At Work-Site	Complied	Not Applicable
		Personal Protective Equipment (PPE) like helmet, boots, earplugs for workers, first aid and firefighting equipment shall be available at construction sites before start of construction. An emergency plan shall be prepared to fight with any emergency like fire.	At Work-Site	Complied	Not Applicable
		Provision shall be made for domestic solid waste disposal in a controlled manner. The recyclable waste shall be sold off and non-saleable and biodegradable waste shall be disposed through secured land filling.	Not Applicable	Complied	Not Applicable
		Provision of paved area for unloading and storage of fuel oil, lubricant oil, away from storm water drainage.		Complied	Not Applicable
9.	Traffic Management and Road Safety	Identify the areas where temporary traffic diversion may be required.	at Ch. 0/010, 1/820, 2/497, 3/363, 1/218, 2/738 Km (6 HPC) and 2 RCC Culvert at Ch. 1/317, 3/120 Km along with 1 Boxcell Culvert at Ch. 2/250 km	Complied	Not Applicable
		Prepare appropriate traffic movement plan approved by respective PIU for ensuring continued safe flow of traffic, pedestrians and all road users during construction.		Complied	Not Applicable
		Wherever, cross drainage structure work require longer construction time and road is to be blocked for longer duration, the PIU/DPR consultant shall define appropriate measures for traffic diversion before the start of the construction.	Contractor to ensure implementation of traffic movement plan	Complied	Not Applicable
		Adequate signboards shall be placed much ahead of diversion site to caution the road users. The road signs should be bold and retro reflective in nature for good visibility both during the day and night.	Cautionary signboards, speed breakers are suggested at Junction: 0/000, 0/470, 1/050, 3/780 (Y junction) Curve: 0/160, 1/080 R, 1/750 L, 1/840 L, 2/270 L, 2/580 L, 3/330 L Sharp Curve : 1/930 L S-Curve: 0/970, 2/840, River/BoxCell: 2/200	Complied	Not Applicable

Sl. No.	Environmental Attributes	Mitigation Measures	Location	Compliance status (Complied, partly complied, not complied)	Corrective action proposed if any
			Village Area: Ch. 1/250 to 1/450, 3/400 to 3/800, 3/900 to 4/000 km		
		It is proposed for the respective PIU to discuss with the railways division/department for providing adequate safety measures at unmanned railway crossing where applicable. Adequate clearly visible sign shall be provided on both sides of the railway crossing All measures for traffic control and safety in accordance with IRC codes: 99-1988 will be followed.	Not Applicable	Complied	Not Applicable
10.	Grievance Redress	Maintaining records of all environment related grievances raised, if any, and the actions taken to address them through the village level grievance redress committee (GRC) and PIU as applicable	All project roads.	Complied	Not Applicable

Environmental Monitoring (Pre Construction Stage)

Road Name: Chandrahati Bazar To Strk Road Part Of Uttar Hazipur
 Block Name: Chinsura- Mogra
 Package No: WB 08 ADB 149

Total length: 1.658 km.
 District Name: Hooghly

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
1	Design and Preconstruction Stage					
1.	Climate Change Consideration and Vulnerability screening	<ul style="list-style-type: none"> o Compliance to climate change vulnerability check point given under EARF and adoption of necessary mitigative measures as may be required o Efforts shall be made to plant additional trees for increasing the carbon sink. The tree may be planted with help of PRI (Panchayati Raj Institution) 	All through the alignment of project road.	Design costs.	PIU, Design consultants	PIU, WBSRDA
2.	Finalization of alignment	<ul style="list-style-type: none"> o The road will be part of district core network and will comply with PMGSY guidelines o Subproject shall not disturb any cultural heritage designated by the government or by the international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance. o Subproject will not pass through any designated wild life sanctuaries, national park, notified Eco sensitive areas or area of international significance such as protective wet land designated under Wetland Convention, and reserve forest area. o Subproject to comply with local and National legislative requirements such as forest clearance for diversion of forestland and ADB's Safeguard Policy Statement 2009. o Alignment finalization considering availability of right of way and in consultation with local people. o ROW may be reduced in built up area or constricted areas to minimize land acquisition as per PMGSY Guidelines. o Adjust alignment to the extent feasible to avoid tree cutting, shifting of utilities or community structure. 	All through the alignment of project road.	Design costs	PIU, Design consultants	PIU, WBSRDA

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring																				
		<ul style="list-style-type: none"> The road shall follow natural topography to avoid excessive cut and fill. 																								
3.	Land acquisition	<ul style="list-style-type: none"> Land acquisition, compensation packages, resettlement and rehabilitation, poverty alleviation programs for affected people and all other related issues are addressed through Social Impacts and Resettlement & Rehabilitation report. 	All through the alignment of project road.	Land to be made available and necessary costs if any to be borne by the state	PIU	PIU, WBSRDA, PIC, TSC																				
4.	Clearing of vegetation and removing trees	<ul style="list-style-type: none"> All efforts shall be taken to avoid tree cutting wherever possible. Requisite permission from forest department shall be obtained for cutting of roadside trees. Provision of Compensatory Afforestation shall be made on 1:3.ratio basis (1:6 for Assam state). Permission shall be taken for diversion of any forest land if involved. Provision shall be made for additional compensatory tree plantation. The vegetative cover shall be removed and disposed in consultation with community. 	All through the alignment of project road. No tree-felling is required during the land clearing operations. Again, according to environmental checklist there is no forest land abutting the alignment. However tree plantation will be conducted on both side of the road, particularly near tree-less zones (Resolution obtained from concerned G.P.). Vacant land, bamboo thicket, grazing area also exist at some places	Costs for Forestry for diversion of forest land, obtaining tree cutting permit to be borne by state. Costs for compensatory forestation to be borne by state or by PRI – MGNREGA scheme.	Forestry clearance and permit to be obtained by the PIU. Compensatory plantation to be carried out in coordination with PRI under schemes such as MGNREGA or local Forestry Department	PIU, PIC, TSC																				
5.	Shifting of utilities and common property resources	<ul style="list-style-type: none"> The road land width shall be clearly demarcated on the ground. All efforts will be made to minimize shifting of utilities and common property resources Utility and community structure shifting shall be planned in consultations and concurrence of the community Required permissions and necessary actions will be taken on a timely basis for removing and shifting utility structures and common property resources before road construction activities begin. 	Existing utilities within proposed roadway width as per the following table: <table border="1"> <thead> <tr> <th>Ch. (Km.)</th> <th>EP</th> <th>TRF</th> <th>TP</th> <th>TW</th> </tr> </thead> <tbody> <tr> <td>Km 0+000 – Km 1+000</td> <td>16</td> <td>0</td> <td>0</td> <td>2</td> </tr> <tr> <td>Km 1+000 – Km 1+658</td> <td>12</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>Total</td> <td>28</td> <td>0</td> <td>0</td> <td>3</td> </tr> </tbody> </table> There is no affected community structure on either side of the alignment.	Ch. (Km.)	EP	TRF	TP	TW	Km 0+000 – Km 1+000	16	0	0	2	Km 1+000 – Km 1+658	12	0	0	1	Total	28	0	0	3	Costs to cover shifting and reconstruction of common property resources must be included under project costs. (i) EP - 28x17000 = Rs. 4,76,000/- G. Total=4,76,000/-	PIU, contractor, utility agencies (Internal procedures to be discussed and agreed between the above parties)	PIU, PIC, TSC
Ch. (Km.)	EP	TRF	TP	TW																						
Km 0+000 – Km 1+000	16	0	0	2																						
Km 1+000 – Km 1+658	12	0	0	1																						
Total	28	0	0	3																						

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
6.	Design and planning of embankment construction	<ul style="list-style-type: none"> o The alignment design shall consider options to minimize excessive cuts and fills. o The cut off material shall be planned to be used for embankment to minimize borrow earth requirement. o The design shall be as per relevant IRC provisions for cut and fill, slope protection and drainage. o The top soil of the cut and fill area shall be used for embankment slope protection o Embankment will be designed above High Flood Level (HFL) in flood prone areas where feasible. 	All through the alignment of this project road. No part of the project road is prone to flooding.	Part of Project Cost	PIU, Design Consultants	PIU, WBSRDA
7.	Hydrology and Drainage	<ul style="list-style-type: none"> o Provision of adequate cross drainage structure shall be made to ensure smooth passage of water and maintaining natural drainage pattern of the area. o The discharge capacity of the CD structure shall be designed accordingly. o Provision of adequate drainage structures shall be made in water stagnant/logging areas. o The construction work near water body shall be planned preferably in dry season so that water quality of the water channel is not affected due to siltation and rain water runoff. o Provision of additional cross drainage structure shall be made in the areas where nearby land is sloping towards road alignment on both the sides. o Provision of concrete road construction in habitat area with drainage of both side of the road shall be made as per the design provision and with adequate slope to prevent any water logging. 	<p>Near all drainage crossings, nalas, rivers, streams and ponds. Adequate cross drainage structures will be constructed as well as renovated: There are seven numbers existing CD structure (Pipe Culvert – 4 Nos, Agricultural conduits -3 Nos)</p> <p>Some small & big ponds exist beside the project road near Ch. 994m, 1150m, (LHS) 1238m, 1275m, 1352m (RHS). Few ponds are large & deep with tilted bamboo pilling and accordingly community have suggested to keep provision for proper pilling works beside the above water-bodies to save them as well as the road shoulder.</p>	<p>Included in project costs. 4 culverts=11192 34.29/ 3 conduits=66910 .28 Rs.1186144.57/ -</p> <p>Total cost of CD works = RS-1186144.57/</p>	PIU, Design consultants	PIU, WBSRDA
8.	Establishment of Construction Camp, temporary office and storage area	<ul style="list-style-type: none"> o Construction camp sites shall be located away from any local human settlements and forested areas (minimum 0.5 km away) and preferably located on lands, which are not productive (barren/waste lands presently). o Similarly temporary office and storage areas shall be located away from human settlement areas and forested areas (minimum 0.5 km). 	Construction camp, site office, storage area will be established after discussion with respective PIU and PRI authorities.	Included in contractor's cost	Contractor	PIU, PIC, TSC

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<ul style="list-style-type: none"> ○ The construction camps, office and storage areas shall have provision of adequate water supply, sanitation and all requisite infrastructure facilities. ○ The construction camps, office and storage areas shall have provision of septic tank/soak pit of adequate capacity so that it can function properly for the entire duration of its use. ○ All construction camps shall have provision of rationing facilities particularly for kerosene/LPG so that dependence on firewood for cooking is avoided to the extent possible. ○ The construction camps, office and storage areas shall have provision of health care facilities for adults, pregnant women and children. ○ Personal Protective Equipment (PPE) like helmet, boots, earplugs for workers, first aid and firefighting equipment shall be available at construction sites before start of construction. An emergency plan shall be prepared to fight with any emergency like fire. ○ Provision shall be made for domestic solid waste disposal in a controlled manner. The recyclable waste shall be sold off and non-saleable and biodegradable waste shall be disposed through secured land filling. ○ Provision of paved area for unloading and storage of fuel oil, lubricant oil, away from storm water drainage. 				
9.	Traffic Management and Road Safety	<ul style="list-style-type: none"> ○ Identify the areas where temporary traffic diversion may be required. ○ Prepare appropriate traffic movement plan approved by respective PIU for ensuring continued safe flow of traffic, pedestrians and all road users during construction. ○ Wherever, cross drainage structure work require longer construction time and road is to be blocked for longer duration, the PIU/DPR consultant shall define appropriate measures for traffic diversion before the start of the construction. 	<p>As proposed under DPR and determined by contractor and approved by PIC/PIU</p> <ul style="list-style-type: none"> ○ 50:50 method will be followed during bituminous work because of low traffic volume in rural areas. ○ During construction of CD structures diversion will be made for small segments of the alignment & the sites will be restored to its previous state after the construction period. 	Included in contractor's cost	Contractor	PIU, PIC, TSC

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<ul style="list-style-type: none"> ○ Adequate signboards shall be placed much ahead of diversion site to caution the road users. The road signs should be bold and retro reflective in nature for good visibility both during the day and night. ○ It is proposed for the respective PIU to discuss with the railways division/department for providing adequate safety measures at unmanned railway crossing where applicable. Adequate clearly visible sign shall be provided on both sides of the railway crossing. All measures for traffic control and safety in accordance with IRC codes:99-1988 will be followed 	<ul style="list-style-type: none"> ○ Adequate signboards (MEN AT WORK, GO SLOW etc.) will be placed much ahead of work sites as well as the diversion sites to avoid any probable risk of accident (these will be bold & retro-reflective in nature for good visibility). ○ Other than these, passing places at regular intervals, extra width for curves/ bends will be provided for safe flow of traffic, pedestrians & all road users during construction. ○ However, there is no railway crossing. ○ Other than these, village roads meet the main alignment at Ch. 50m, 735m, 960m, 975m, 1238m, 1320m, and 1530m. where adequate safety measures will be taken. 			
II.	Construction Stage					
10.	Sourcing and transportation of construction material	<p>Borrow Earth:</p> <ul style="list-style-type: none"> ○ The borrow earth shall be obtained from identified locations and with prior permission of landowner and clear understanding for its rehabilitation. ○ The re-habilitation plan may include the following: <ul style="list-style-type: none"> ▪ Borrow pits shall be backfilled with rejected construction wastes and will be given a vegetative cover. If this is not possible, then excavation sloped will be smoothed and depression will be filled in such a way that it looks more or less like the original ground surface. ▪ Borrow areas might be used for aquaculture in case landowner wants such development. ○ The Indian Road Congress (IRC):10-1961 guideline should be used for selection of borrow pits and amount that can be borrowed. 	The filling soil will have to be procured from borrow pit. Borrow area will be so excavated that the lands can be reused as agriculture field. The depth of borrow pit shall not exceed 450mm (150mm top soil included). The top soil shall be stripped & stacked & shall be spread back on the land. As far as possible the borrow pit shall not be dug close to the embankment. The redevelopment of borrow area will be done before closure of the same & it will be as per agreement between land owner & the contractor. For stone aggregates & sand, lead from source to work site is calculated from the district map and block map of core network & finalizing the same in discussion with PIU.	Included under contractors costs	Contractor	PIC, PIU, TSC

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<ul style="list-style-type: none"> ○ Borrowing earth from agricultural land shall be minimized to the extent possible. Further, no earth shall be borrowed from already low-lying areas. ○ A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal). ○ Borrowing of earth will not be done continuously throughout the stretch. ○ Ridges of not less than 8m widths will be left at intervals not exceeding 300m. ○ Small drains will be cut through the ridges, if necessary, to facilitate drainage. ○ The slope of the edges will be maintained not steeper than 1:4 (vertical: Horizontal). ○ The depth of borrow pits will not be more than 30 cm after stripping the 15 cm topsoil aside. ○ Fly ash will be used in road embankment as per IRC guidelines wherever thermal power plant is located within 100 km of the road alignment. <p>Aggregate :</p> <ul style="list-style-type: none"> ○ The stone aggregate shall be sourced from existing licensed quarries ○ Copies of consent/ approval / rehabilitation plan for use of existing source will be submitted to PIU. ○ Topsoil to be stockpiled and protected for use at the rehabilitation stage <p>Transportation of Construction Material</p> <ul style="list-style-type: none"> ○ Existing tracks / roads are to be used for hauling of materials to the extent possible. ○ Prior to construction of roads, topsoil shall be preserved and shall be used for other useful purposes like using in turfing of embankment. ○ The vehicles deployed for material transportation shall be spillage proof to avoid or minimize the spillage of the material during transportation. In any case, the transportation 	<p>Stone aggregates will be collected from PAKUR under the BIRBHUM district. Brick bats & sand will be carried from local source. The lead distance from the quarry to site will be finalized in discussion with the PIU. Earth will be collected from identified borrow-pits and top soil will be preserved and reused. Total volume of earth required is to the tune of 4106.429 CUM.</p>			

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		links are to be inspected at least twice daily to clear accidental spillage, if any.				
11.	Loss of Productive Soil, erosion and land use change	<ul style="list-style-type: none"> ○ The top soil from the productive land (borrow areas, road widening areas etc.) shall be preserved and reused for plantation purposes. ○ It shall also be used as top cover of embankment slope for growing vegetation to protect soil erosion. ○ Cut and fill shall be planned as per IRC provisions and rural road manual. ○ All steep cuts shall be flattened and benched. ○ Shrubs shall be planted in loose soil area. ○ IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control shall be taken into consideration. ○ It shall be ensured that the land taken on lease for access road, construction camp and temporary office of the storage facilities is restored back to its original land use before handing it over back to land owner. 	All though the alignment of project road.	Included under contractors costs	Contractor	PIU / WBSRDA
12.	Compaction and Contamination of Soil	<ul style="list-style-type: none"> ○ To prevent soil compaction in the adjoining productive lands beyond the ROW, the movement of construction vehicles, machinery and equipment shall be restricted to the designated haulage route. ○ The productive land shall be reclaimed after construction activity. ○ Fuel and lubricants shall be stored at the predefined storage location. ○ The storage area shall be paved with gentle slope to a corner and connected with a chamber to collect any spills of the oils. ○ All efforts shall be made to minimise the waste generation. Unavoidable waste shall be stored at the designated place prior to disposal. ○ To avoid soil contamination at the wash-down and re-fuelling areas, "oil interceptors" shall be provided. Oil and grease spill and oil soaked materials are to be collected and stored in labelled containers (Labelled: WASTE OIL; and 	All though the alignment of project road.	Included under contractors costs	Contractor,	PIU, PIC, TSC

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		hazardous sign be displayed) and sold off to SPCB/ MoEF authorized re-refiners.				
13.	Construction Debris and waste	<ul style="list-style-type: none"> o Excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. o Unusable debris material should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. o The bituminous wastes shall be disposed in secure manner at designated landfill sites only in an environmentally accepted manner. o For removal of debris, wastes and its disposal MOSRTH guidelines should be followed. Unproductive/wastelands shall be selected with the consent of villagers and Panchayat for the same. The dumping site should be of adequate capacity. It should be located at least 500 m away from the residential areas. Dumping sites should be away from water bodies to prevent any contamination of these bodies. 	All though the alignment of project road.	Included under contractors costs	Contractor	PIU, PIC, TSC
14.	Air and Noise Quality	<ul style="list-style-type: none"> o Vehicles delivering loose and fine materials like sand and aggregates shall be covered. o Dust suppression measures like water sprinkling, shall be applied in all dust prone locations such as unpaved haulage roads, earthworks, stockpiles and asphalt mixing areas. o Mixing plants and asphalt (hot mix) plants shall be located at least 0.5 km away and in downwind direction of the human settlements. o Material storage areas shall also be located downwind of the habitation area. o Hot mix plant shall be fitted with stack of adequate height (30 m) or as may be prescribed by SPCB to ensure enough dispersion of exit gases. Consent to establish and operate shall be obtained from State Pollution Control Board and comply with all consent conditions. 	Throughout the project road section.	Included under contractors costs	Contractor	PIU, WBSRDA

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<ul style="list-style-type: none"> ○ Diesel Generating (DG) sets shall also be fitted with stack of adequate height (as per regulation height of the stack of open to air DG set shall be about 0.5 m for 5 KVA and about 0.7 m for 10 KVA DG sets, above top of sound proofing enclosure of the DG set). Low sulphur diesel shall be used in DG sets and other construction machineries where available. Construction vehicles and machineries shall be periodically maintained. 				
15.	Tree plantation	<ul style="list-style-type: none"> ○ Compensatory Afforestation shall be made on 1:3.ratio basis.(1;6 for Assam state) ○ Additional trees shall be planted wherever feasible. ○ Follow up maintenance of planted saplings will be carried out for a minimum of 3 years 	All through the alignment of this project road. No tree-felling is required during the land clearing operations. Again, according to environmental checklist there is no forest land abutting the alignment. However tree plantation will be conducted on both side of the road, particularly near tree-less zones (Resolution obtained from concerned G.P.). Vacant land, bamboo thicket, grazing area also exist at some places.	Costs to be covered by state or PRI under schemes such as NREGA	PIU to coordinate compensatory forestation with PRI under schemes such as NREGA or local Forestry Department	PIU, PIC, TSC
16.	Ground Water and Surface Water Quality and Availability	<ul style="list-style-type: none"> ○ Requisite permission shall be obtained for abstraction of groundwater from State Ground Water Board/Central Ground Water Authority if applicable. ○ The contractor shall arrange for water required during construction in such a way that the water availability and supply to nearby communities remains unaffected. ○ Water intensive activities shall not be undertaken during summer period to the extent feasible. ○ Provision shall be made to link side drains with the nearby ponds for facilitating water harvesting if feasible ○ Where ponds are not available, the water harvesting pits shall be constructed as per the requirement and rainfall intensity. 	Throughout the project road.	Included under contractors costs	Contractor	PIU, PIC, TSC

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<ul style="list-style-type: none"> Preventive measures like slope stabilisation, etc shall be taken for prevention of siltation in water bodies. 				
17	Occupational Health and Safety	<ul style="list-style-type: none"> The requisite PPE (helmet, mask, boot, hand gloves, earplugs) shall be provided to the construction workers. Workers' exposure to noise will be restricted to less than 8 hours a day. Workers duty shall be regulated accordingly. Septic tank or mobile toilets fitted with anaerobic treatment facility shall be provided at construction camp/temporary office/storage areas. Domestic solid waste at construction camp shall be segregated into biodegradable and non-biodegradable waste. 	Throughout the project road.	Costs to be borne by Contractor	Contractor	PIC, PIU, TSC
III	Post Construction and Operation Stage					
18.	Air and Noise Quality	<ul style="list-style-type: none"> Awareness sign board shall be provided for slow driving near the habitat areas to minimize dust generation due to vehicle movement. Speed limitation and honking restrictions may be enforced near sensitive locations. 	Throughout the project section at the locations determined by contractor and approved by PIU.	Construction cost	Contractor,	PIC, PIU, TSC
19.	Site restoration	<ul style="list-style-type: none"> All construction camp/temporary office/material storage areas are to be restored to its original conditions. The borrow areas rehabilitation will be ensured as per the agreed plan with the landowner. Obtain clearance from PIU before handing over the site to SRRDA. PIC to undertake survivability assessment and report to PIU the status of compensatory tree plantation at a stage of completion of construction with recommendation for improving the survivability of the tree if required 	All locations of construction camps/temporary office/ material storage, and borrow areas.	To be borne by the Contractor	Contractor	PIU, PIC, TSC
20.	Hydrology and Drainage	<ul style="list-style-type: none"> Regular removal/cleaning of deposited silt shall be done from drainage channels and outlet points before the monsoon season. Rejuvenation of the drainage system by removing encroachments/ congestions shall be regularly conducted 	At the locations of drainage structures on the project road.	To be covered under road maintenance costs.	PIU	PIU, WBSRDA

Environmental Monitoring (Pre Construction Stage)

Road Name: Chatra to Maheswerpur
 Block Name: Raninagar-I
 Package No: WB 13 ADB 43

Total length: 2.930km.
 District Name: Murshidabad

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
I	Design and Preconstruction Stage					
1.	Climate Change Consideration and Vulnerability screening	<ul style="list-style-type: none"> o Compliance to climate change vulnerability check point given under EARF and adoption of necessary mitigative measures as may be required o Efforts shall be made to plant additional trees for increasing the carbon sink. The tree may be planted with help of PRI (Panchayati Raj Institution) 	All through the alignment of project road.	Design costs.	PIU, Design consultants	PIU, WBSRDA
2.	Finalization of alignment	<ul style="list-style-type: none"> o The road will be part of district core network and will comply with PMGSY guidelines o Subproject shall not disturb any cultural heritage designated by the government or by the international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance. o Subproject will not pass through any designated wild life sanctuaries, national park, notified Eco sensitive areas or area of international significance such as protective wet land designated under Wetland Convention, and reserve forest area. o Subproject to comply with local and National legislative requirements such as forest clearance for diversion of forestland and ADB's Safeguard Policy Statement 2009. o Alignment finalization considering availability of right of way and in consultation with local people. 	All through the alignment of project road.	Design costs	PIU, Design consultants	PIU, WBSRDA

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring															
		<ul style="list-style-type: none"> ○ ROW may be reduced in built up area or constricted areas to minimize land acquisition as per PMGSY Guidelines. ○ Adjust alignment to the extent feasible to avoid tree cutting, shifting of utilities or community structure. ○ The road shall follow natural topography to avoid excessive cut and fill. 																			
3.	Land acquisition	<ul style="list-style-type: none"> ○ Land acquisition, compensation packages, resettlement and rehabilitation, poverty alleviation programs for affected people and all other related issues are addressed through Social Impacts and Resettlement & Rehabilitation report. 	All through the alignment of project road.	Land to be made available and necessary costs if any to be borne by the state	PIU	PIU, WBSRDA, PIC, TSC															
4.	Clearing of vegetation and removing trees	<ul style="list-style-type: none"> ○ All efforts shall be taken to avoid tree cutting wherever possible. ○ Requisite permission from forest department shall be obtained for cutting of roadside trees. ○ Provision of Compensatory Afforestation shall be made on 1:3.ratio basis (1:6 for Assam state). ○ Permission shall be taken for diversion of any forest land if involved. Provision shall be made for additional compensatory tree plantation. ○ The vegetative cover shall be removed and disposed in consultation with community. 	All through the alignment of project road. According to environmental checklist, no tree-felling is required during land clearing operation. Also no part of the project road passes through any forest area. Tree plantation will be conducted on both side of the road, particularly near tree-less zones (Resolution obtained from concerned G.P.).	Costs for Forestry clearance for diversion of forest land, obtaining tree cutting permit to be borne by state. Costs for compensatory forestation to be borne by state or by PRI – MGNREGA scheme.	Forestry clearance and permit to be obtained by the PIU. Compensatory plantation to be carried out in coordination with PRI under schemes such as NREGA or local Forestry Department	PIU, PIC, TSC															
5.	Shifting of utilities and common property resources	<ul style="list-style-type: none"> ○ The road land width shall be clearly demarcated on the ground. ○ All efforts will be made to minimize shifting of utilities and common property resources ○ Utility and community structure shifting shall be planned in 	Existing utilities within proposed roadway width as per the following; <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Proposed Ch. (Km.)</th> <th>EP</th> <th>TRF</th> <th>TP</th> <th>Tube Well</th> </tr> </thead> <tbody> <tr> <td>Km 0+000 – Km 1+000</td> <td>--</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>Km 1+000 – Km 2+000</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> </tbody> </table>	Proposed Ch. (Km.)	EP	TRF	TP	Tube Well	Km 0+000 – Km 1+000	--	-	-	-	Km 1+000 – Km 2+000	--	--	--	--	Costs to cover shifting and reconstruction of common property resources must be included	PIU, contractor, utility agencies (Internal procedures to be discussed and agreed between the above parties)	PIU, PIC, TSC
Proposed Ch. (Km.)	EP	TRF	TP	Tube Well																	
Km 0+000 – Km 1+000	--	-	-	-																	
Km 1+000 – Km 2+000	--	--	--	--																	

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring															
		<p>consultations and concurrence of the community</p> <ul style="list-style-type: none"> Required permissions and necessary actions will be taken on a timely basis for removing and shifting utility structures and common property resources before road construction activities begin. 	<table border="1"> <tr> <td>Km 2+000 – Km 3+000</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> <tr> <td>Km 3+000 – Km 3+449</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> <tr> <td>Total</td> <td>--</td> <td>--</td> <td>--</td> <td>--</td> </tr> </table> <p>There is no affected community structure on either side of the alignment.</p>	Km 2+000 – Km 3+000	--	--	--	--	Km 3+000 – Km 3+449	--	--	--	--	Total	--	--	--	--	under project costs.		
Km 2+000 – Km 3+000	--	--	--	--																	
Km 3+000 – Km 3+449	--	--	--	--																	
Total	--	--	--	--																	
6.	Design and planning of embankment construction	<ul style="list-style-type: none"> The alignment design shall consider options to minimize excessive cuts and fills. The cut off material shall be planned to be used for embankment to minimize borrow earth requirement. The design shall be as per relevant IRC provisions for cut and fill, slope protection and drainage. The top soil of the cut and fill area shall be used for embankment slope protection Embankment will be designed above High Flood Level (HFL) in flood prone areas where feasible. 	All through the alignment of project road. No part of the project road is prone to flooding.	Part of Project Cost	PIU, Design Consultants	PIU, WBSRDA															
7.	Hydrology and Drainage	<ul style="list-style-type: none"> Provision of adequate cross drainage structure shall be made to ensure smooth passage of water and maintaining natural drainage pattern of the area. The discharge capacity of the CD structure shall be designed accordingly. Provision of adequate drainage structures shall be made in water stagnant/logging areas. The construction work near water body shall be planned preferably in dry season so that water quality of the water channel is not affected due to siltation and rain water runoff. Provision of additional cross drainage structure shall be made in 	<p>Near all drainage crossings, nalas, rivers, streams and ponds. Adequate cross drainage structures will be constructed as well as renovated as per the following:</p> <p>List of CD Structures:</p> <table border="1"> <thead> <tr> <th>Ch.</th> <th>CD Type</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>692m</td> <td>Slab culvert</td> <td>Replaced</td> </tr> <tr> <td>2925m</td> <td>Slab culvert</td> <td>Replaced</td> </tr> </tbody> </table> <p>There are ponds and water bodies at Ch. 54m, 341m, 791m, 1076m, 2135m, 2152m, 2650m,(LHS) & 56m, 804m, 2473m, 2922m (RHS) exists beside the alignment.</p>	Ch.	CD Type	Remarks	692m	Slab culvert	Replaced	2925m	Slab culvert	Replaced	Included in project costs. Total cost of CD works = 4.94 Lakhs	PIU, Design consultants	PIU, WBSRDA						
Ch.	CD Type	Remarks																			
692m	Slab culvert	Replaced																			
2925m	Slab culvert	Replaced																			

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<p>the areas where nearby land is sloping towards road alignment on both the sides.</p> <ul style="list-style-type: none"> ○ Provision of concrete road construction in habitat area with drainage of both side of the road shall be made as per the design provision and with adequate slope to prevent any water logging. 				
8.	Establishment of Construction Camp, temporary office and storage area	<ul style="list-style-type: none"> ○ Construction camp sites shall be located away from any local human settlements and forested areas (minimum 0.5 km away) and preferably located on lands, which are not productive (barren/waste lands presently). ○ Similarly temporary office and storage areas shall be located away from human settlement areas and forested areas (minimum 0.5 km). ○ The construction camps, office and storage areas shall have provision of adequate water supply, sanitation and all requisite infrastructure facilities. ○ The construction camps, office and storage areas shall have provision of septic tank/soak pit of adequate capacity so that it can function properly for the entire duration of its use. ○ All construction camps shall have provision of rationing facilities particularly for kerosene/LPG so that dependence on firewood for cooking is avoided to the extent possible. ○ The construction camps, office and storage areas shall have provision of health care facilities for adults, pregnant women and children. 	Construction camp, site office, storage area will be established after discussion with respective PIU and PRI authorities.	Included in contractor's cost	Contractor	PIU, PIC, TSC

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<ul style="list-style-type: none"> ○ Personal Protective Equipment (PPE) like helmet, boots, earplugs for workers, first aid and firefighting equipment shall be available at construction sites before start of construction. An emergency plan shall be prepared to fight with any emergency like fire. ○ Provision shall be made for domestic solid waste disposal in a controlled manner. The recyclable waste shall be sold off and non-saleable and biodegradable waste shall be disposed through secured land filling. ○ Provision of paved area for unloading and storage of fuel oil, lubricant oil, away from storm water drainage. 				
9.	Traffic Management and Road Safety	<ul style="list-style-type: none"> ○ Identify the areas where temporary traffic diversion may be required. ○ Prepare appropriate traffic movement plan approved by respective PIU for ensuring continued safe flow of traffic, pedestrians and all road users during construction. ○ Wherever, cross drainage structure work require longer construction time and road is to be blocked for longer duration, the PIU/DPR consultant shall define appropriate measures for traffic diversion before the start of the construction. ○ Adequate signboards shall be placed much ahead of diversion site to caution the road users. The road signs should be bold and retro reflective in nature for good visibility both during the day and night. 	<p>As proposed under DPR and determined by contractor and approved by PIC/PIU/</p> <ul style="list-style-type: none"> ○ 50:50 method will be followed during bituminous work because of low traffic volume in rural areas. ○ During construction of CD structures diversion will be made for small segments of the alignment & the sites will be restored to its previous state after the construction period. ○ Adequate signboards (MEN AT WORK, GO SLOW etc.) will be placed much ahead of work sites as well as the diversion sites to avoid any probable risk of accident (these will be bold & retro-reflective in nature for good visibility). ○ Other than these, passing places at regular intervals, extra width for curves/ bends will be provided for safe flow of traffic, pedestrians & all road users during construction. 	Included in contractor's cost	Contractor	PIU, PIC, TSC

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<ul style="list-style-type: none"> ○ It is proposed for the respective PIU to discuss with the railways division/department for providing adequate safety measures at unmanned railway crossing where applicable. Adequate clearly visible sign shall be provided on both sides of the railway crossing. All measures for traffic control and safety in accordance with IRC codes:99-1988 will be followed. 	<ul style="list-style-type: none"> ○ However, there is no railway line crossing the alignment. But some curve & junction exist at Ch.0m, 414m, 707m, 750m, 890m, 977m, 1660m, 2213m, 2415m, 2550m, & 2929m where safety measures will be taken. 			
II. Construction Stage						
10.	Sourcing and transportation of construction material	<p>Borrow Earth:</p> <ul style="list-style-type: none"> ○ The borrow earth shall be obtained from identified locations and with prior permission of landowner and clear understanding for its rehabilitation. ○ The re-habilitation plan may include the following: <ul style="list-style-type: none"> ▪ Borrow pits shall be backfilled with rejected construction wastes and will be given a vegetative cover. If this is not possible, then excavation sloped will be smoothed and depression will be filled in such a way that it looks more or less like the original ground surface. ▪ Borrow areas might be used for aquaculture in case landowner wants such development. ○ The Indian Road Congress (IRC):10-1961 guideline should be used for selection of borrow pits and amount that can be borrowed. ○ Borrowing earth from agricultural land shall be minimized to the extent possible. Further, no earth shall be borrowed from already low-lying areas. 	<p>The filling soil will have to be procured from borrow pit. Borrow area will be so excavated that the lands can be reused as agriculture field. The depth of borrow pit shall not exceed 450mm (150mm top soil included). The top soil shall be stripped & stacked & shall be spread back on the land. As far as possible the borrow pit shall not be dug close to the embankment.</p> <p>The redevelopment of borrow area will be done before closure of the same & it will be as per agreement between land owner & the contractor. For stone aggregates & sand, lead from source to work site is calculated from the district map and block map of core network & finalizing the same in discussion with PIU.</p> <p>Stone aggregates will be collected from PAKUR under the BIRBHUM district. Sand will be carried from local source. The lead distance from the quarry to site will be finalized in discussion with the PIU.</p> <p>Earth will be collected from identified borrow-pits and top soil will be preserved and reused. Total volume of earth required is to the tune of 10085.3CUM.</p>	Included under contractors costs	Contractor	PIC, PIU, TSC

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<ul style="list-style-type: none"> ○ A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal). ○ Borrowing of earth will not be done continuously through out the stretch. ○ Ridges of not less than 8m widths will be left at intervals not exceeding 300m. ○ Small drains will be cut through the ridges, if necessary, to facilitate drainage. ○ The slope of the edges will be maintained not steeper than 1:4 (vertical: Horizontal). ○ The depth of borrow pits will not be more than 30 cm after stripping the 15 cm topsoil aside. ○ Fly ash will be used in road embankment as per IRC guidelines wherever thermal power plant is located within 100 km of the road alignment. <p>Aggregate:</p> <ul style="list-style-type: none"> ○ The stone aggregate shall be sourced from existing licensed quarries ○ Copies of consent/ approval / rehabilitation plan for use of existing source will be submitted to PIU. ○ Topsoil to be stockpiled and protected for use at the rehabilitation stage <p>Transportation of Construction Material</p> <ul style="list-style-type: none"> ○ Existing tracks / roads are to be used for hauling of materials to the extent possible. 				

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<ul style="list-style-type: none"> ○ Prior to construction of roads, topsoil shall be preserved and shall be used for other useful purposes like using in turfing of embankment. ○ The vehicles deployed for material transportation shall be spillage proof to avoid or minimize the spillage of the material during transportation. In any case, the transportation links are to be inspected at least twice daily to clear accidental spillage, if any. 				
11.	Loss of Productive Soil, erosion and land use change	<ul style="list-style-type: none"> ○ The top soil from the productive land (borrow areas, road widening areas etc.) shall be preserved and reused for plantation purposes. ○ It shall also be used as top cover of embankment slope for growing vegetation to protect soil erosion. ○ Cut and fill shall be planned as per IRC provisions and rural road manual. ○ All steep cuts shall be flattened and benched. ○ Shrubs shall be planted in loose soil area. ○ IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control shall be taken into consideration. ○ It shall be ensured that the land taken on lease for access road, construction camp and temporary office of the storage facilities is restored back to its original land use before handing it over back to land owner. 	All though the alignment of project road.	Included under contractors costs	Contractor	PIU / WBSRDA
12.	Compaction and Contamination of Soil	<ul style="list-style-type: none"> ○ To prevent soil compaction in the adjoining productive lands beyond the ROW, the movement of construction vehicles, machinery 	All though the alignment of project road.	Included under contractors costs	Contractor,	PIU, PIC, TSC

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<p>and equipment shall be restricted to the designated haulage route.</p> <ul style="list-style-type: none"> ○ The productive land shall be reclaimed after construction activity. ○ Fuel and lubricants shall be stored at the predefined storage location. ○ The storage area shall be paved with gentle slope to a corner and connected with a chamber to collect any spills of the oils. ○ All efforts shall be made to minimise the waste generation. Unavoidable waste shall be stored at the designated place prior to disposal. ○ To avoid soil contamination at the wash-down and re-fuelling areas, "oil interceptors" shall be provided. Oil and grease spill and oil soaked materials are to be collected and stored in labelled containers (Labelled: WASTE OIL; and hazardous sign be displayed) and sold off to SPCB/ MoEF authorized re-refiners. 				
13.	Construction Debris and waste	<ul style="list-style-type: none"> ○ Excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. ○ Unusable debris material should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. ○ The bituminous wastes shall be disposed in secure manner at designated landfill sites only in an environmentally accepted manner. ○ For removal of debris, wastes and its disposal MOSRTH guidelines should be followed. Unproductive/wastelands shall be 	All though the alignment of project road.	Included under contractors costs	Contractor	PIU, PIC, TSC

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<p>selected with the consent of villagers and Panchayat for the same. The dumping site should be of adequate capacity. It should be located at least 500 m away from the residential areas. Dumping sites should be away from water bodies to prevent any contamination of these bodies.</p>				
14.	Air and Noise Quality	<ul style="list-style-type: none"> ○ Vehicles delivering loose and fine materials like sand and aggregates shall be covered. ○ Dust suppression measures like water sprinkling, shall be applied in all dust prone locations such as unpaved haulage roads, earthworks, stockpiles and asphalt mixing areas. ○ Mixing plants and asphalt (hot mix) plants shall be located at least 0.5 km away and in downwind direction of the human settlements. ○ Material storage areas shall also be located downwind of the habitation area. ○ Hot mix plant shall be fitted with stack of adequate height (30 m) or as may be prescribed by SPCB to ensure enough dispersion of exit gases. Consent to establish and operate shall be obtained from State Pollution Control Board and comply with all consent conditions. ○ Diesel Generating (DG) sets shall also be fitted with stack of adequate height (as per regulation height of the stack of open to air DG set shall be about 0.5 m for 5 KVA and about 0.7 m for 10 KVA DG sets, above top of sound proofing enclosure of the DG set). Low sulphur diesel shall be used in DG sets and other construction machineries where 	Throughout the project road section.	Included under contractors costs	Contractor	PIU, WBSRDA

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		available. Construction vehicles and machineries shall be periodically maintained.				
15.	Tree plantation	<ul style="list-style-type: none"> ○ Compensatory Afforestation shall be made on 1:3.ratio basis.(1;6 for Assam state) ○ Additional trees shall be planted wherever feasible. ○ Follow up maintenance of planted saplings will be carried out for a minimum of 3 years 	All through the alignment of project road. According to environmental checklist, no tree-felling is required during land clearing operation. Also, no part of the project road passes through any forest area. Tree plantation will be conducted on both side of the road, particularly near tree-less zones (Resolution obtained from concerned G.P.).	Costs to be covered by state or PRI under schemes such as MGNREGA	PIU to coordinate compensatory forestation with PRI under schemes such as NREGA or local Forestry Department	PIU, PIC, TSC
16.	Ground Water and Surface Water Quality and Availability	<ul style="list-style-type: none"> ○ Requisite permission shall be obtained for abstraction of groundwater from State Ground Water Board/Central Ground Water Authority if applicable. ○ The contractor shall arrange for water required during construction in such a way that the water availability and supply to nearby communities remains unaffected. ○ Water intensive activities shall not be undertaken during summer period to the extent feasible. ○ Provision shall be made to link side drains with the nearby ponds for facilitating water harvesting if feasible ○ Where ponds are not available, the water harvesting pits shall be constructed as per the requirement and rainfall intensity. ○ Preventive measures like slope stabilisation, etc shall be taken for prevention of siltation in water bodies. 	Throughout the project road.	Included under contractors costs	Contractor	PIU, PIC, TSC
17	Occupational Health and Safety	<ul style="list-style-type: none"> ○ The requisite PPE (helmet, mask, boot, hand gloves, earplugs) shall be provided to the construction workers. 	Throughout the project road.	Costs to be borne by Contractor	Contractor	PIC, PIU, TSC

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<ul style="list-style-type: none"> ○ Workers' exposure to noise will be restricted to less than 8 hours a day. Workers duty shall be regulated accordingly. ○ Septic tank or mobile toilets fitted with anaerobic treatment facility shall be provided at construction camp/temporary office/storage areas. ○ Domestic solid waste at construction camp shall be segregated into biodegradable and non-biodegradable waste. 				
III Post Construction and Operation Stage						
18.	Air and Noise Quality	<ul style="list-style-type: none"> ○ Awareness sign board shall be provided for slow driving near the habitat areas to minimize dust generation due to vehicle movement. Speed limitation and honking restrictions may be enforced near sensitive locations. 	Throughout the project section at the location determined by contractor and approved by PIU.	Construction cost	Contractor,	PIC, PIU, TSC
19.	Site restoration	<ul style="list-style-type: none"> ○ All construction camp/temporary office/material storage areas are to be restored to its original conditions. ○ The borrow areas rehabilitation will be ensured as per the agreed plan with the landowner. ○ Obtain clearance from PIU before handing over the site to SRRDA. ○ PIC to undertake survivability assessment and report to PIU the status of compensatory tree plantation at a stage of completion of construction with recommendation for improving the survivability of the tree if required 	All locations of construction camps/temporary office/ material storage and borrow areas.	To be borne by the Contractor	Contractor	PIU, PIC, TSC
20.	Hydrology and Drainage	<ul style="list-style-type: none"> ○ Regular removal/cleaning of deposited silt shall be done from drainage channels and outlet points before the monsoon season. 	At the locations of drainage structures on the project road.	To be covered under road maintenance costs.	PIU	PIU, WBSRDA

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		○ Rejuvenation of the drainage system by removing encroachments/ congestions shall be regularly conducted				

Environmental Monitoring (Pre Construction Stage)

Road Name: Palashi Math to Harinathpur
 Block Name: Kaliganj
 Package No: WB 14 ADB 42

Total length: 24.276km.
 District Name: Nadia

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
I	Design and Preconstruction Stage					
1.	Climate Change Consideration and Vulnerability screening	<ul style="list-style-type: none"> ○ Compliance to climate change vulnerability check point given under EARF and adoption of necessary mitigative measures as may be required ○ Efforts shall be made to plant additional trees for increasing the carbon sink. The tree may be planted with help of PRI (Panchayati Raj Institution) 	All through the alignment of project road.	Design costs.	PIU, Design consultants	PIU, WBSRDA
2.	Finalization of alignment	<ul style="list-style-type: none"> ○ The road will be part of district core network and will comply with PMGSY guidelines ○ Subproject shall not disturb any cultural heritage designated by the government or by the international agencies, such as UNESCO, and shall avoid any monuments of cultural or historical importance. ○ Subproject will not pass through any designated wild life sanctuaries, national park, notified Eco sensitive areas or area of international significance such as protective wet land designated under Wetland Convention, and reserve forest area. ○ Subproject to comply with local and National legislative requirements such as forest clearance for diversion of forestland and ADB's Safeguard Policy Statement 2009. ○ Alignment finalization considering availability of right of way and in consultation with local people. ○ ROW may be reduced in built up area or constricted areas to minimize land acquisition as per PMGSY Guidelines. ○ Adjust alignment to the extent feasible to avoid tree cutting, shifting of utilities or community structure. 	All through the alignment of project road.	Design costs	PIU, Design consultants	PIU, WBSRDA

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring																																
		<ul style="list-style-type: none"> The road shall follow natural topography to avoid excessive cut and fill. 																																				
3.	Land acquisition	<ul style="list-style-type: none"> Land acquisition, compensation packages, resettlement and rehabilitation, poverty alleviation programs for affected people and all other related issues are addressed through Social Impacts and Resettlement & Rehabilitation report. 	All through the alignment of project road.	Land to be made available and necessary costs if any to be borne by the state	PIU	PIU, WBSRDA, PIC, TSC																																
4.	Clearing of vegetation and removing trees	<ul style="list-style-type: none"> All efforts shall be taken to avoid tree cutting wherever possible. Requisite permission from forest department shall be obtained for cutting of roadside trees. Provision of Compensatory Afforestation shall be made on 1:3.ratio basis (1:6 for Assam state). Permission shall be taken for diversion of any forest land if involved. Provision shall be made for additional compensatory tree plantation. The vegetative cover shall be removed and disposed in consultation with community. 	All through the alignment of project road. No tree-felling is required during the land clearing operations. Again, according to environmental checklist there is no forest land abutting the alignment. However tree plantation will be conducted on both side of the road, particularly near tree-less zones (Resolution obtained from concerned G.P.). Bamboo thicket, Mango garden, Vacant land, banana plantation area, guava garden, teak garden also exists at some places.	Costs for Forestry for diversion of forest land, obtaining tree cutting permit to be borne by state. Costs for compensatory forestation to be borne by state or by PRI – MGNREGA scheme.	Forestry clearance and permit to be obtained by the PIU. Compensatory plantation to be carried out in coordination with PRI under schemes such as MGNREGA or local Forestry Department	PIU, PIC, TSC																																
5.	Shifting of utilities and common property resources	<ul style="list-style-type: none"> The road land width shall be clearly demarcated on the ground. All efforts will be made to minimize shifting of utilities and common property resources Utility and community structure shifting shall be planned in consultations and concurrence of the community Required permissions and necessary actions will be taken on a timely basis for removing and shifting utility structures and common property resources before road construction activities begin. 	Existing utilities within proposed roadway width as per the following table: <table border="1"> <thead> <tr> <th>Proposed Ch. (Km.)</th> <th>EP</th> <th>TRF</th> <th>TP</th> </tr> </thead> <tbody> <tr> <td>Km 0+000 – Km 0+500</td> <td>5</td> <td>0</td> <td>0</td> </tr> <tr> <td>Km 0+500 – Km 1+000</td> <td>5</td> <td>0</td> <td>0</td> </tr> <tr> <td>Km 1+000 – Km 1+500</td> <td>7</td> <td>0</td> <td>0</td> </tr> <tr> <td>Km 1+500 – Km 2+000</td> <td>8</td> <td>0</td> <td>4</td> </tr> <tr> <td>Km 2+000 – Km 2+500</td> <td>7</td> <td>0</td> <td>1</td> </tr> <tr> <td>Km 2+500 – Km 3+000</td> <td>2</td> <td>0</td> <td>0</td> </tr> <tr> <td>Km 3+000 –</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	Proposed Ch. (Km.)	EP	TRF	TP	Km 0+000 – Km 0+500	5	0	0	Km 0+500 – Km 1+000	5	0	0	Km 1+000 – Km 1+500	7	0	0	Km 1+500 – Km 2+000	8	0	4	Km 2+000 – Km 2+500	7	0	1	Km 2+500 – Km 3+000	2	0	0	Km 3+000 –	0	0	0	Costs to cover shifting and reconstruction of common property resources must be included under project costs. (i) EP - 275x27000 = Rs. 74,25,000/- (ii) TRF - 3x40,000 = Rs. 1,20,000/-	PIU, contractor, utility agencies (Internal procedures to be discussed and agreed between the above parties)	PIU, PIC, TSC
Proposed Ch. (Km.)	EP	TRF	TP																																			
Km 0+000 – Km 0+500	5	0	0																																			
Km 0+500 – Km 1+000	5	0	0																																			
Km 1+000 – Km 1+500	7	0	0																																			
Km 1+500 – Km 2+000	8	0	4																																			
Km 2+000 – Km 2+500	7	0	1																																			
Km 2+500 – Km 3+000	2	0	0																																			
Km 3+000 –	0	0	0																																			

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers			Costs	Responsible for Implementing	Responsible for Monitoring
			Km 3+500				(iii) TP -	
			Km 3+500 – Km 4+000	2	0	0	27x16,500 =	
			Km 4+000 – Km 4+500	6	0	0	Rs.	
			Km 4+500 – Km 5+000	7	0	1	4,45,500/-	
			Km 5+000 – Km 5+500	11	1	5	G.	
			Km 5+500 – Km 6+000	4	0	0	Total=79,90,500/	
			Km 6+000 – Km 6+500	11	0	0	-	
			Km 6+500 – Km 7+000	1	0	0		
			Km 7+000 – Km 7+500	3	0	0		
			Km 7+500 – Km 8+000	8	0	0		
			Km 8+000 – Km 8+500	4	0	1		
			Km 8+500 – Km 9+000	4	0	0		
			Km 9+000 – Km 9+500	15	0	4		
			Km 9+500 – Km 10+000	14	0	0		
			Km 10+000 – Km 10+500	9	0	1		
			Km 10+500 – Km 11+000	7	0	0		
			Km 11+000 – Km 11+500	9	0	0		
			Km 11+500 – Km 12+000	5	0	0		
			Km 12+000 – Km 12+500	1	0	0		
			Km 12+500 – Km 13+000	0	0	0		
			Km 13+000 – Km 13+500	0	0	0		
			Km 13+500 – Km 14+000	0	0	0		
			Km 14+000 – Km 14+500	6	0	0		

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers			Costs	Responsible for Implementing	Responsible for Monitoring	
			Km 14+500 – Km 15+000	7	0	0			
			Km 15+000 – Km 15+500	9	1	0			
			Km 15+500 – Km 16+000	10	0	1			
			Km 16+000 – Km 16+500	6	0	0			
			Km 16+500 – Km 17+000	1	0	0			
			Km 17+000 – Km 17+500	4	0	0			
			Km 17+500 – Km 18+000	9	0	0			
			Km 18+000 – Km 18+500	0	0	0			
			Km 18+500 – Km 19+000	0	0	0			
			Km 19+000 – Km 19+500	0	0	0			
			Km 19+500 – Km 20+000	7	0	0			
			Km 20+000 – Km 20+500	13	0	0			
			Km 20+500 – Km 21+000	9	1	0			
			Km 21+000 – Km 21+500	4	0	0			
			Km 21+500 – Km 22+000	6	0	1			
			Km 22+000 – Km 22+500	11	0	8			
			Km 22+500 – Km 23+000	6	0	0			
			Km 23+000 – Km 23+500	3	0	0			
			Km 23+500 – Km 24+000	3	0	0			
			Km 24+000 – Km 24+276	3	0	0			
			Total	275	3	27			
			There is no affected community structure on either side of the alignment.						

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring																														
6.	Design and planning of embankment construction	<ul style="list-style-type: none"> The alignment design shall consider options to minimize excessive cuts and fills. The cut off material shall be planned to be used for embankment to minimize borrow earth requirement. The design shall be as per relevant IRC provisions for cut and fill, slope protection and drainage. The top soil of the cut and fill area shall be used for embankment slope protection Embankment will be designed above High Flood Level (HFL) in flood prone areas where feasible. 	All through the alignment of this project road. No part of the project road is prone to flooding.	Part of Project Cost	PIU, Design Consultants	PIU, WBSRDA																														
7.	Hydrology and Drainage	<ul style="list-style-type: none"> Provision of adequate cross drainage structure shall be made to ensure smooth passage of water and maintaining natural drainage pattern of the area. The discharge capacity of the CD structure shall be designed accordingly. Provision of adequate drainage structures shall be made in water stagnant/logging areas. The construction work near water body shall be planned preferably in dry season so that water quality of the water channel is not affected due to siltation and rain water runoff. Provision of additional cross drainage structure shall be made in the areas where nearby land is sloping towards road alignment on both the sides. Provision of concrete road construction in habitat area with drainage of both side of the road shall be made as per the design provision and with adequate slope to prevent any water logging. 	<p>Near all drainage crossings, nalas, rivers, streams and ponds.</p> <p>Adequate cross drainage structures will be constructed as well as renovated as per the following table:</p> <p>List of CD Structures</p> <table border="1"> <thead> <tr> <th>Ch.</th> <th>CD Type</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>0+006</td> <td>Slab Culvert</td> <td>Retained</td> </tr> <tr> <td>0+218</td> <td>Slab Culvert</td> <td>Retained</td> </tr> <tr> <td>0+512</td> <td>Slab Culvert</td> <td>Replaced</td> </tr> <tr> <td>2+055</td> <td>Slab Culvert</td> <td>Replaced</td> </tr> <tr> <td>2+353</td> <td>Irrigation Conduit</td> <td>New Proposed</td> </tr> <tr> <td>2+651</td> <td>Slab Culvert</td> <td>Replaced</td> </tr> <tr> <td>3+095</td> <td>Irrig. Conduit</td> <td>New Proposed</td> </tr> <tr> <td>3+537</td> <td>Slab Culvert</td> <td>Replaced</td> </tr> <tr> <td>3+916</td> <td>Slab Culvert</td> <td>New Proposed</td> </tr> </tbody> </table>	Ch.	CD Type	Remarks	0+006	Slab Culvert	Retained	0+218	Slab Culvert	Retained	0+512	Slab Culvert	Replaced	2+055	Slab Culvert	Replaced	2+353	Irrigation Conduit	New Proposed	2+651	Slab Culvert	Replaced	3+095	Irrig. Conduit	New Proposed	3+537	Slab Culvert	Replaced	3+916	Slab Culvert	New Proposed	Included in project costs. Total cost of CD works = 99.08 Lakhs	PIU, Design consultants	PIU, WBSRDA
Ch.	CD Type	Remarks																																		
0+006	Slab Culvert	Retained																																		
0+218	Slab Culvert	Retained																																		
0+512	Slab Culvert	Replaced																																		
2+055	Slab Culvert	Replaced																																		
2+353	Irrigation Conduit	New Proposed																																		
2+651	Slab Culvert	Replaced																																		
3+095	Irrig. Conduit	New Proposed																																		
3+537	Slab Culvert	Replaced																																		
3+916	Slab Culvert	New Proposed																																		

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers			Costs	Responsible for Implementing	Responsible for Monitoring
			4+585	Slab Culvert	New Proposed			
			5+053	Slab Culvert	Replaced			
			5+768	Slab Culvert	Retained			
			5+953	Slab Culvert	Replaced			
			6+439	Slab Culvert	Retained			
			6+810	Slab Culvert	New Proposed			
			7+121	Slab Culvert	New Proposed			
			7+432	Irrig.Culvert	New Proposed			
			7+825	Slab Culvert	New Proposed			
			8+253	Slab Culvert	New Proposed			
			8+674	HP Culvert	Retained			
			9+410	Slab Culvert	New Proposed			
			9+705	Slab Culvert	New Proposed			
			10+640	Slab Culvert	New Proposed			
			10+995	Irrig.Culvert	New Proposed			
			11+321	Slab Culvert	New Proposed			
			11+670	Slab Culvert	New Proposed			
			11+990	Irrig.Culvert	New Proposed			
			12+316	Slab Culvert	New Proposed			
			12+642	Irrig.Culvert	New Proposed			
			12+953	Slab Culvert	Replaced			
			13+284	Slab Culvert	New Proposed			
			13+615	Irrig.Culvert	New Proposed			

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers			Costs	Responsible for Implementing	Responsible for Monitoring
			14+27 7	Slab Culvert	New Proposed			
			14+60 8	Irrig.Cond uit	New Proposed			
			14+93 9	Slab Culvert	New Proposed			
			15+26 0	Slab Culvert	New Proposed			
			15+61 0	Slab Culvert	New Proposed			
			15+94 0	Irrig.Cond uit	New Proposed			
			16+27 1	Slab Culvert	New Proposed			
			16+60 2	Slab Culvert	New Proposed			
			16+93 3	Irrig.Cond uit	New Proposed			
			17+26 4	Irrig.Cond uit	New Proposed			
			17+54 5	Slab Culvert	New Proposed			
			17+94 5	Slab Culvert	New Proposed			
			18+27 6	Slab Culvert	New Proposed			
			18+60 7	Irrig.Cond uit	New Proposed			
			18+91 3	Slab Culvert	Replaced			
			19+24 5	Irrig.Cond uit	New Proposed			
			19+56 6	Slab Culvert	New Proposed			
			19+84 0	Slab Culvert	New Proposed			
			20+51 0	Slab Culvert	New Proposed			
			20+83 1	Irrig.Cond uit	New Proposed			
			21+15 2	Irrig.Cond uit	New Proposed			
			21+47 3	Slab Culvert	New Proposed			
			21+75 5	Slab Culvert	New Proposed			

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring																					
			<table border="1"> <tr> <td>22+44 9</td> <td>Slab Culvert</td> <td>Replaced</td> </tr> <tr> <td>22+92 4</td> <td>Slab Culvert</td> <td>Replaced</td> </tr> <tr> <td>23+05 8</td> <td>Slab Culvert</td> <td>Replaced</td> </tr> <tr> <td>23+19 4</td> <td>Slab Culvert</td> <td>Replaced</td> </tr> <tr> <td>23+55 9</td> <td>Slab Culvert</td> <td>Replaced</td> </tr> <tr> <td>23+60 8</td> <td>Slab Culvert</td> <td>Replaced</td> </tr> <tr> <td>24+01 0</td> <td>Slab Culvert</td> <td>New Proposed</td> </tr> </table> <p>Some small & big ponds exist beside the project road near Ch.417m, 627m, 730m, 1898m, 4750m & so on. Few ponds are deep and dry and accordingly community have suggested to keep provision for protective works (like ballah pilling etc.) beside the above water-bodies Large water body was noted near Ch. 10021 – 10547m. (RHS)</p>	22+44 9	Slab Culvert	Replaced	22+92 4	Slab Culvert	Replaced	23+05 8	Slab Culvert	Replaced	23+19 4	Slab Culvert	Replaced	23+55 9	Slab Culvert	Replaced	23+60 8	Slab Culvert	Replaced	24+01 0	Slab Culvert	New Proposed			
22+44 9	Slab Culvert	Replaced																									
22+92 4	Slab Culvert	Replaced																									
23+05 8	Slab Culvert	Replaced																									
23+19 4	Slab Culvert	Replaced																									
23+55 9	Slab Culvert	Replaced																									
23+60 8	Slab Culvert	Replaced																									
24+01 0	Slab Culvert	New Proposed																									
8.	Establishment of Construction Camp, temporary office and storage area	<ul style="list-style-type: none"> ○ Construction camp sites shall be located away from any local human settlements and forested areas (minimum 0.5 km away) and preferably located on lands, which are not productive (barren/waste lands presently). ○ Similarly temporary office and storage areas shall be located away from human settlement areas and forested areas (minimum 0.5 km). ○ The construction camps, office and storage areas shall have provision of adequate water supply, sanitation and all requisite infrastructure facilities. ○ The construction camps, office and storage areas shall have provision of septic tank/soak pit of adequate capacity so that it 	Construction camp, site office, storage area will be established after discussion with respective PIU and PRI authorities.	Included in contractor's cost	Contractor	PIU, PIC, TSC																					

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<p>can function properly for the entire duration of its use.</p> <ul style="list-style-type: none"> ○ All construction camps shall have provision of rationing facilities particularly for kerosene/LPG so that dependence on firewood for cooking is avoided to the extent possible. ○ The construction camps, office and storage areas shall have provision of health care facilities for adults, pregnant women and children. ○ Personal Protective Equipment (PPE) like helmet, boots, earplugs for workers, first aid and firefighting equipment shall be available at construction sites before start of construction. An emergency plan shall be prepared to fight with any emergency like fire. ○ Provision shall be made for domestic solid waste disposal in a controlled manner. The recyclable waste shall be sold off and non-saleable and biodegradable waste shall be disposed through secured land filling. ○ Provision of paved area for unloading and storage of fuel oil, lubricant oil, away from storm water drainage. 				
9.	Traffic Management and Road Safety	<ul style="list-style-type: none"> ○ Identify the areas where temporary traffic diversion may be required. ○ Prepare appropriate traffic movement plan approved by respective PIU for ensuring continued safe flow of traffic, pedestrians and all road users during construction. ○ Wherever, cross drainage structure work require longer construction time and road is to be blocked for longer duration, the PIU/DPR consultant shall define appropriate measures for traffic diversion before the start of the construction. ○ Adequate signboards shall be placed much ahead of diversion site to caution the road users. The road signs should be bold and 	<p>As proposed under DPR and determined by contractor and approved by PIC/PIU/</p> <ul style="list-style-type: none"> ○ 50:50 method will be followed during bituminous work because of low traffic volume in rural areas. ○ During construction of CD structures diversion will be made for small segments of the alignment & the sites will be restored to its previous state after the construction period. ○ Adequate signboards (MEN AT WORK, GO SLOW etc.) 	Included in contractor's cost	Contractor	PIU, PIC, TSC

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<p>retro reflective in nature for good visibility both during the day and night.</p> <ul style="list-style-type: none"> ○ It is proposed for the respective PIU to discuss with the railways division/department for providing adequate safety measures at unmanned railway crossing where applicable. Adequate clearly visible sign shall be provided on both sides of the railway crossing All measures for traffic control and safety in accordance with IRC codes:99-1988 will be followed 	<p>will be placed much ahead of work sites as well as the diversion sites to avoid any probable risk of accident (these will be bold & retro-reflective in nature for good visibility).</p> <ul style="list-style-type: none"> ○ Other than these, passing places at regular intervals, extra width for curves/bends will be provided for safe flow of traffic, pedestrians & all road users during construction. ○ However, railway line, crosses the alignment near Ch. 256m, 3542m. ○ Other than these, village roads & higher order roads meet the main alignment at Ch. 230m, 256m, 763m, 998m, 1060m, 1451m & so on where adequate safety measures will be taken. 			
II.	Construction Stage					
10.	Sourcing and transportation of construction material	<p>Borrow Earth:</p> <ul style="list-style-type: none"> ○ The borrow earth shall be obtained from identified locations and with prior permission of landowner and clear understanding for its rehabilitation. ○ The rehabilitation plan may include the following: <ul style="list-style-type: none"> ▪ Borrow pits shall be backfilled with rejected construction wastes and will be given a vegetative cover. If this is not possible, then excavation sloped will be smoothed and depression will be filled in such a way that it looks more or less like the original ground surface. 	<p>The filling soil will have to be procured from borrow pit. Borrow area will be so excavated that the lands can be reused as agriculture field. The depth of borrow pit shall not exceed 450mm (150mm top soil included). The top soil shall be stripped & stacked & shall be spread back on the land. As far as possible the borrow pit shall not be dug close to the embankment. The redevelopment of borrow area will be done before closure of the same & it will be as per</p>	Included under contractors costs	Contractor	PIC, PIU, TSC

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<ul style="list-style-type: none"> ▪ Borrow areas might be used for aquaculture in case landowner wants such development. ○ The Indian Road Congress (IRC):10-1961 guideline should be used for selection of borrow pits and amount that can be borrowed. ○ Borrowing earth from agricultural land shall be minimized to the extent possible. Further, no earth shall be borrowed from already low-lying areas. ○ A 15 cm topsoil will be stripped off from the borrow pit and this will be stored in stockpiles in a designated area for height not exceeding 2m and side slopes not steeper than 1:2 (Vertical: Horizontal). ○ Borrowing of earth will not be done continuously through out the stretch. ○ Ridges of not less than 8m widths will be left at intervals not exceeding 300m. ○ Small drains will be cut through the ridges, if necessary, to facilitate drainage. ○ The slope of the edges will be maintained not steeper than 1:4 (vertical: Horizontal). ○ The depth of borrow pits will not be more than 30 cm after stripping the 15 cm topsoil aside. ○ Fly ash will be used in road embankment as per IRC guidelines wherever thermal power plant is located within 100 km of the road alignment. <p>Aggregate :</p> <ul style="list-style-type: none"> ○ The stone aggregate shall be sourced from existing licensed quarries ○ Copies of consent/ approval / rehabilitation plan for use of existing source will be submitted to PIU. ○ Topsoil to be stockpiled and protected for use at the rehabilitation stage <p>Transportation of Construction Material</p> <ul style="list-style-type: none"> ○ Existing tracks / roads are to be used for hauling of materials to the extent possible. 	<p>agreement between land owner & the contractor. For stone aggregates & sand, lead from source to work site is calculated from the district map and block map of core network & finalizing the same in discussion with PIU. Stone aggregates will be collected from PAKUR under the BIRBHUM district. Brick bats & s'and will be carried from local source. The lead distance from the quarry to site will be finalized in discussion with the PIU. Earth will be collected from identified borrow-pits and top soil will be preserved and reused. Total volume of earth required is to the tune of 55809.00CUM.</p>			

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<ul style="list-style-type: none"> ○ Prior to construction of roads, topsoil shall be preserved and shall be used for other useful purposes like using in turfing of embankment. ○ The vehicles deployed for material transportation shall be spillage proof to avoid or minimize the spillage of the material during transportation. In any case, the transportation links are to be inspected at least twice daily to clear accidental spillage, if any. 				
11.	Loss of Productive Soil, erosion and land use change	<ul style="list-style-type: none"> ○ The top soil from the productive land (borrow areas, road widening areas etc.) shall be preserved and reused for plantation purposes. ○ It shall also be used as top cover of embankment slope for growing vegetation to protect soil erosion. ○ Cut and fill shall be planned as per IRC provisions and rural road manual. ○ All steep cuts shall be flattened and benched. ○ Shrubs shall be planted in loose soil area. ○ IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control shall be taken into consideration. ○ It shall be ensured that the land taken on lease for access road, construction camp and temporary office of the storage facilities is restored back to its original land use before handing it over back to land owner. 	All though the alignment of project road.	Included under contractors costs	Contractor	PIU / WBSRDA
12.	Compaction and Contamination of Soil	<ul style="list-style-type: none"> ○ To prevent soil compaction in the adjoining productive lands beyond the ROW, the movement of construction vehicles, machinery and equipment shall be restricted to the designated haulage route. ○ The productive land shall be reclaimed after construction activity. ○ Fuel and lubricants shall be stored at the predefined storage location. 	All though the alignment of project road.	Included under contractors costs	Contractor,	PIU, PIC, TSC

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<ul style="list-style-type: none"> ○ The storage area shall be paved with gentle slope to a corner and connected with a chamber to collect any spills of the oils. ○ All efforts shall be made to minimise the waste generation. Unavoidable waste shall be stored at the designated place prior to disposal. ○ To avoid soil contamination at the wash-down and re-fuelling areas, "oil interceptors" shall be provided. Oil and grease spill and oil soaked materials are to be collected and stored in labelled containers (Labelled: WASTE OIL; and hazardous sign be displayed) and sold off to SPCB/ MoEF authorized re-refiners. 				
13.	Construction Debris and waste	<ul style="list-style-type: none"> ○ Excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. ○ Unusable debris material should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. ○ The bituminous wastes shall be disposed in secure manner at designated landfill sites only in an environmentally accepted manner. ○ For removal of debris, wastes and its disposal MOSRTH guidelines should be followed. Unproductive/wastelands shall be selected with the consent of villagers and Panchayat for the same. The dumping site should be of adequate capacity. It should be located at least 500 m away from the residential areas. Dumping sites should be away from water bodies to prevent any contamination of these bodies. 	All though the alignment of project road.	Included under contractors costs	Contractor	PIU, PIC, TSC
14.	Air and Noise Quality	<ul style="list-style-type: none"> ○ Vehicles delivering loose and fine materials like sand and aggregates shall be covered. ○ Dust suppression measures like water sprinkling, shall be applied in all dust prone 	Throughout the project road section.	Included under contractors costs	Contractor	PIU, WBSRDA

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		<p>locations such as unpaved haulage roads, earthworks, stockpiles and asphalt mixing areas.</p> <ul style="list-style-type: none"> ○ Mixing plants and asphalt (hot mix) plants shall be located at least 0.5 km away and in downwind direction of the human settlements. ○ Material storage areas shall also be located downwind of the habitation area. ○ Hot mix plant shall be fitted with stack of adequate height (30 m) or as may be prescribed by SPCB to ensure enough dispersion of exit gases. Consent to establish and operate shall be obtained from State Pollution Control Board and comply with all consent conditions. ○ Diesel Generating (DG) sets shall be fitted with stack of adequate height (as per regulation height of the stack of open to air DG set shall be about 0.5 m for 5 KVA and about 0.7 m for 10 KVA DG sets, above top of sound proofing enclosure of the DG set). Low sulphur diesel shall be used in DG sets and other construction machineries where available. Construction vehicles and machineries shall be periodically maintained. 				
15.	Tree plantation	<ul style="list-style-type: none"> ○ Compensatory Afforestation shall be made on 1:3.ratio basis.(1;6 for Assam state) ○ Additional trees shall be planted wherever feasible. ○ Follow up maintenance of planted saplings will be carried out for a minimum of 3 years 	<p>All through the alignment of this project road. No tree-felling is required during the land clearing operations. Again, according to environmental checklist there is no forest land abutting the alignment. However tree plantation will be conducted on both side of the road, particularly near tree-less zones (Resolution obtained from concerned G.P.). Bamboo thicket, Mango garden, Vacant land, banana plantation</p>	<p>Costs to be covered by state or PRI under schemes such as NREGA</p>	<p>PIU to coordinate compensatory forestation with PRI under schemes such as NREGA or local Forestry Department</p>	<p>PIU, PIC, TSC</p>

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
			area, guava garden, teak garden also exists at some places			
16.	Ground Water and Surface Water Quality and Availability	<ul style="list-style-type: none"> ○ Requisite permission shall be obtained for abstraction of groundwater from State Ground Water Board/Central Ground Water Authority if applicable. ○ The contractor shall arrange for water required during construction in such a way that the water availability and supply to nearby communities remains unaffected. ○ Water intensive activities shall not be undertaken during summer period to the extent feasible. ○ Provision shall be made to link side drains with the nearby ponds for facilitating water harvesting if feasible ○ Where ponds are not available, the water harvesting pits shall be constructed as per the requirement and rainfall intensity. ○ Preventive measures like slope stabilisation, etc shall be taken for prevention of siltation in water bodies. 	Throughout the project road.	Included under contractors costs	Contractor	PIU, PIC, TSC
17	Occupational Health and Safety	<ul style="list-style-type: none"> ○ The requisite PPE (helmet, mask, boot, hand gloves, earplugs) shall be provided to the construction workers. ○ Workers' exposure to noise will be restricted to less than 8 hours a day. Workers duty shall be regulated accordingly. ○ Septic tank or mobile toilets fitted with anaerobic treatment facility shall be provided at construction camp/temporary office/storage areas. ○ Domestic solid waste at construction camp shall be segregated into biodegradable and non-biodegradable waste. 	Throughout the project road.	Costs to be borne by Contractor	Contractor	PIC, PIU, TSC
III	Post Construction and Operation Stage					
18.	Air and Noise Quality	<ul style="list-style-type: none"> ○ Awareness sign board shall be provided for slow driving near the habitat areas to minimize dust generation due to vehicle movement. Speed limitation and honking 	Throughout the project section at the locations determined by contractor and approved by PIU.	Construction cost	Contractor,	PIC, PIU, TSC

Sl. No.	Project Action/Environmental Attributes	Mitigation Measures	Location/numbers	Costs	Responsible for Implementing	Responsible for Monitoring
		restrictions may be enforced near sensitive locations.				
19.	Site restoration	<ul style="list-style-type: none"> ○ All construction camp/temporary office/material storage areas are to be restored to its original conditions. ○ The borrow areas rehabilitation will be ensured as per the agreed plan with the landowner. ○ Obtain clearance from PIU before handling over the site to SRRDA. ○ PIC to undertake survivability assessment and report to PIU the status of compensatory tree plantation at a stage of completion of construction with recommendation for improving the survivability of the tree if required 	All locations of construction camps/temporary office/material storage, and borrow areas.	To be borne by the Contractor	Contractor	PIU, PIC, TSC
20.	Hydrology and Drainage	<ul style="list-style-type: none"> ○ Regular removal/cleaning of deposited silt shall be done from drainage channels and outlet points before the monsoon season. ○ Rejuvenation of the drainage system by removing encroachments/ congestions shall be regularly conducted 	At the locations of drainage structures on the project road.	To be covered under road maintenance costs.	PIU	PIU, WBSRDA

ANNEXURE 2: COMMUNITY CONSULTATIONS

