



# Environmental Monitoring Report

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Project Number: 49125-001  
October 2017  
Period: March 2016 – December 2016

## IND: Second Jharkhand State Road Project

Submitted by

Project Management Unit, State Highways Authority of Jharkhand, Ranchi

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## झारखंड राज्य राजमार्ग प्राधिकार (साज)

(पथ निर्माण विभाग, झारखंड सरकार)

**State Highway Authority of Jharkhand (SHAJ)**

(Road Construction Department, Government of Jharkhand)

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Letter No.- 177 (we)  
From,

Ranchi, Dated :- 08/9/2017

General Manager (Project Director),  
Project Management Unit, ADB Cell,  
State Highway Authority of Jharkhand,  
Jharkhand, Ranchi

To,

Mr. Kenichi Yokoyama,  
Country Director,  
Indian Resident Mission, 4 San Martin Marg,  
Chanakyapuri, New Delhi- 110021, India



Sub: Environmental Monitoring Report since commencement to December 2016, Loan No. : 3276-IND.

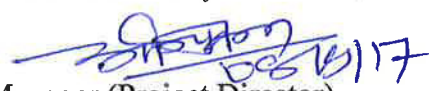
Sir,

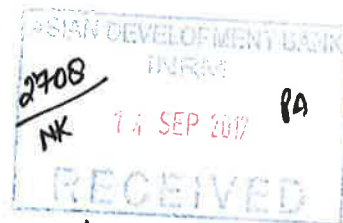
Kindly find enclosed herewith Environmental Monitoring Report since commencement to December 2016 along with statutory compliances.

The report has been prepared by the Environmental Specialist of CSC Team for the Second Jharkhand State Road Project.

Encl.- (1) Environmental Monitoring Report since commencement to December 2016 (01 Set Hard Copy as well as 01 set of Soft Copy in CD) \*

Yours faithfully

  
General Manager (Project Director),  
Project Management Unit, ADB Cell,  
State Highway Authority of Jharkhand,  
Jharkhand, Ranchi



Hard copy recd.



**Improvement / Upgrading / Widening of RD:01- Dumka-Hansdiha, 44.221 Km, RD:02- Pachamba-Jamua-Sarwan, 45.175 km, RD:03- Govindpur-Tundi-Giridih, 43.550 km, RD:04- Khunti-Tamar, 43.697km**

## **Annual Environmental Monitoring Report**

**March 2016 (Commencement) to December 2016**

**STATE HIGHWAYS AUTHORITY OF JHARKHAND (SHAJ)  
ADB LOAN NO: 3276-IND**

**EUROESTUDIOS S.L.  
Joint Venture with  
RODIC CONSULTANTS PVT LTD  
In Association with  
EUROESTUDIOS INDIA Pvt. Ltd.**

**Contractors of Second Jharkhand State Road Project (SJSRP):**

**Package – I Ashoka Buildcon Limited  
Package – II GKC Projects Limited  
Package – III Ashoka Buildcon Limited  
Package – IV YFC Projects Limited**





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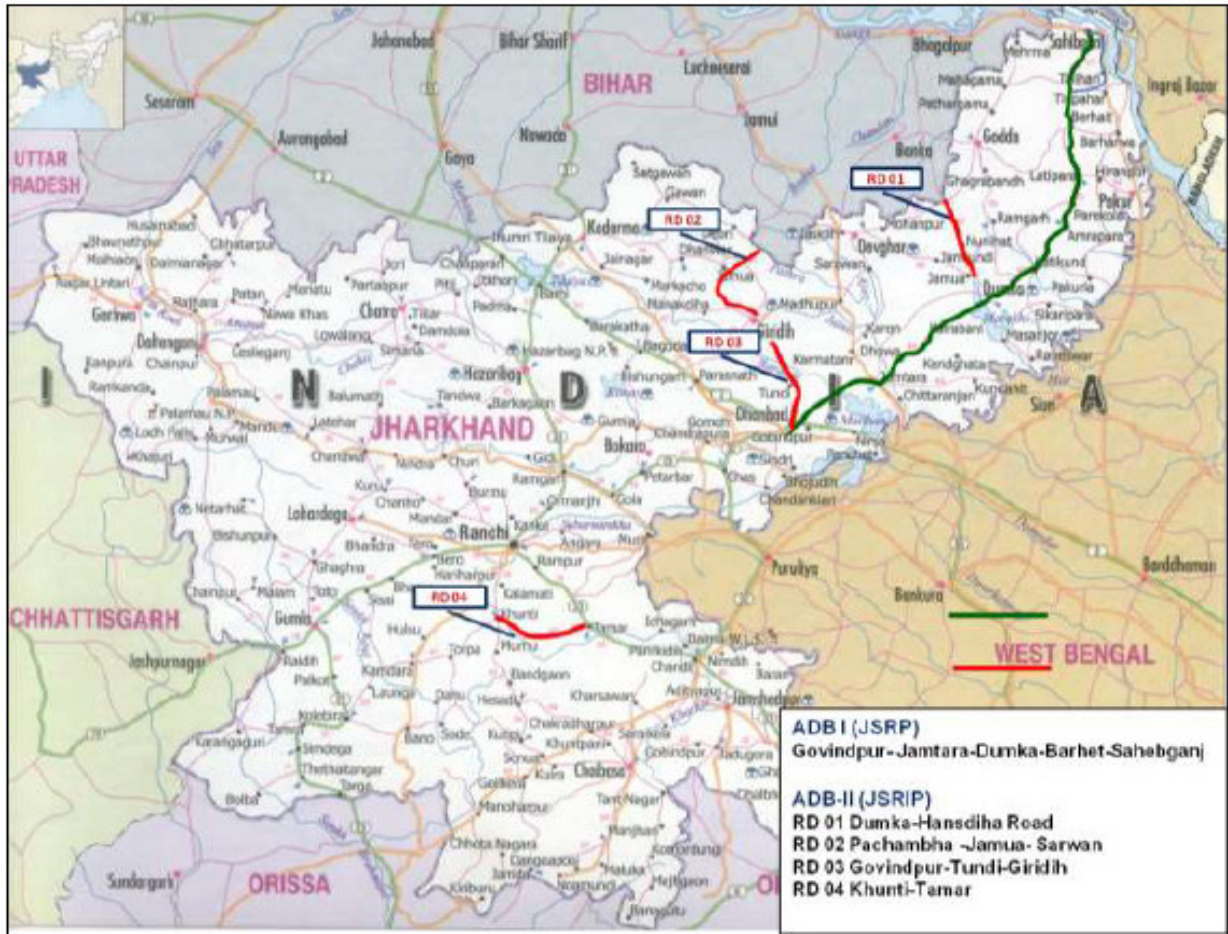
**1.0 INTRODUCTION**

1. The Government of Jharkhand has planned a consistent upgrading of its road network through State Highways Authority of Jharkhand (SHAJ). The Second Jharkhand State Road Project (SJSRP) has been conceptualized to improve state highways connectivity in the State of Jharkhand which came into existence at the initiative by the Government of Jharkhand after the implementation of the JSRP projects.
2. The Detailed Project Reports (DPR) was prepared in 20014-15 by the DPR consultants based on that, a loan component US\$200 Million has been provided to SHAJ. Further for implementing development of 4 selected priority State Highways under the external funding concept of Government of India the Government of Jharkhand has granted Loan under ID No. 3276 (INDIA).
3. The SHAJ projects have conceded into 4 separate contract packages as Package-1 to Package-4 under BOQ modality of financial loan assistance from the Asian Development Bank. The all Four contract packages has been awarded to separate Contractors for development of respective section of State Highways and Construction Supervision Consultant's Services entrusted to M/s EUROESTUDIOS S.L. in Joint Venture with RODIC CONSULTANTS PVT LTD In Association with EUROESTUDIOS INDIA Pvt. Ltd. for all four contract packages.
4. The Second Jharkhand State Road Project (SJSRP) project includes widening and improvement of three exiting State Highways and one Major District Roads totalling 176.643 km located in Dumka, Godda, Giridih, Dhanbad, Khunti and Ranchi districts of Jharkhand State. The Project Details are given in **Table-1** and the Location Map in **Fig-1**.

**Table-1: Project Road Details**

Pkg	Road ID	SH/MDR	Description	Length (KM)	District	Contractor Name
I	RD 01	SH-17	Dumka to Hansdiha	44.221	Dumka, Gonda,	Ashoka Buildcon Ltd.
II	RD 02	MDR-86 & 83	Pachamba-Jamua- Sarwan	45.175	Giridih	GKC Projects Ltd.
III	RD 03	SH-13	Govindpur-Tundi- Giridih	43.550	Dhanbad, Giridih	Ashoka Buildcon Ltd.
IV	RD 04	SH-3	Khunti to Tamar	43.697	Khunti, Ranchi	YFC Projects Ltd.
			<b>Total</b>	<b>176.643</b>		





**Fig-1: Location Map of Project Roads**

5. The Annual Environmental Monitoring Report (EMR) has been prepared to ensure the supervision and monitoring of the Contractors obligations is being carried out in accordance with the Contractors Contract Agreement and to apprise Employer and Asian Development Bank about the Contractors EMP implementation at each Contract Project sites.
6. The EMR covers the implementation of various parameters of Environmental Management Plan (EMP), and Construction safety during the Project Implementation for the Period March 2016 (Commencement) to December 2016.
7. As per ADB's Safeguard Policy Statement (2009) and the Environmental assessment guidelines 2003 all the four packages have been categorised as Category-"B".
8. The salient feature and progress as on December 2016 is given in **Table-2**.





**STATE HIGHWAYS AUTHORITY OF JHARKHAND  
(SHAJ) PHASE-II PROJECTS**



**Table-2: Salient Feature and Progress as on December 2016**

S/ N	Status of Road Projects	Package 1 Dumka-Hansdiha	Package 2 Pachamba-Jamua-Sarwan	Package 3 Gobindpur-Tundi-Giridih	Package 4 Khunti-Tamar
1	Total Length (km)	44.221	45.175	43.55	43.697
2	Contractor	Ashoka Buildcon Ltd.	GKC Projects Ltd	Ashoka Buildcon Ltd.	YFC Projects Ltd
3	Contract Sign Date	11.03.2016	11.04.2016	11.03.2016	03.05.2016
4	Contract Amount (Rs.)	2,114,905,455.00	1,701,015,184.00	1,901,047,663.00	1,514,296,367.00
5	Camp Details	Village- Tarbandha at Km 17+000, Installation of Base Camp and Labour Camp is in Progress.	Village- Lodharia at Km 17+000, Installation of Base Camp and Labour Camp is in Progress.	Village- Tikha Magha at Km 37+300, Installation of Base Camp and Labour Camp is in Progress.	Village- Simbukel at Km 03+420, Installation of Base Camp and Labour Camp is in Progress.
6	Major Project Features	Major Bridge: 01 Minor Bridge: 04 H P Culvert: 82 Box Culvert: 81 Slab Culvert: Nil Bypass: Nil	Major Bridge: 02 Minor Bridge: 03 H P Culvert: Nil Box Culvert: 18 Slab Culvert: Nil Bypass: Jamua (2.03 Kms) New scope <sup>1</sup>	Major Bridge: 03 Minor Bridge: 05 H P Culvert: 03 Box Culvert: 33 Slab Culvert: Nil Bypass: Nil	Major Bridge: Nil Minor Bridge: 09 H P Culvert: Nil Box Culvert: 51 Slab Culvert: Nil Bypass: Nil
7	Physical Progress	Survey work and Cross drainage works is in Progress	Survey work is in Progress	Survey work and Cross drainage works is in Progress	Survey work is in Progress
8	Plant Details	Crusher Plant at Maouza- Chorbatiya Km 45+000 (RHS) - about 3.00 Km Hot Mix Plant, WMM Plant & Batch Mix Plant at Km 17+000 (Base Camp)	Crusher Plant, Hot Mix Plant, WMM Plant & Batch Mix Plant at Km 17+000 (Base Camp)	Crusher Plant at Gorga, Km 17+000 (RHS) about 22 Km. Hot Mix Plant, WMM Plant & Batch Mix Plant at Km 37+300 (Base Camp)	Crusher Plant at Saedba at Km 11+000 (LHS) about 2 Kms. Hot Mix Plant, WMM Plant & Batch Mix Plant at Km 03+420 (Base Camp)
9	Forest Details	Nil	Section wise Forest details is given in Table-3(a)	Section wise Forest details is given in Table-3(b)	Nil
10	Tree Cutting Details	Dumka: 2316 Godda: 140	Giridih: 720	Dhanbad: 359 Giridih: 133	Khunti: 1459
11	Elephant Corridor Details	Study of Elephant corridor by the Wild Life Expert, CSC is under progress.			

<sup>1</sup> The ADB approved IEE report shall be updated



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**Table-3(a): Section wise Forest details in Package-2 (Pachamba-Jamua-Sarwan)**

S. No.	Chainage		Village	Forest Land (ha.)
	from	To		
1	3+210	4+570	Nawadih	0.192
2	4+570	5+900	Pariana	0.496
3	11+000	12+900	Karodih	0.572
4	12+900	14+375	Dharchachi	0.392
5	14+350	15+820	Bati	0.24
6	19+120	20+530	Kandajor	0.004
7	21+290	22+160	Chitardih	0.456
8	52+000	54+500	Chatro	0.104
9	54+500	55+920	Kantidighi	0.048
10	55+920	56+200	Gamhardih	0.584
11	57+000	58+250	Patharatand	0.432
<b>Total</b>				<b>3.52</b>

**Table-3(b): Section wise Forest details in Package-3 (Gobindpur-Tundi-Girdih)**

S. No.	Chainage		Village	Forest land (ha.)
	From	To		
<b>Dhanbad division</b>				
1	6.440	6.590	Sundar pahari	0.271
	6.880	6.910		
	6.520	6.630		
2	13.130	13.600	Pandugri	3.336
	13.600	14.190		
3	14.210	15.090	Durgadih	2.223
	15.420	15.600		
	15.220	15.420		
4	15.920	16.200	Lohariya	0.696
	15.600	15.870		
5	17.420	17.530	Mahtodih	0.073
6	17.390	18.340	Gaditundi	0.992
	17.530	18.060		
7	18.230	18.930	Sagbehri	0.951
	18.640	18.900		
	18.340	18.370		
8	18.930	19.120	Kammalpur	1.235
	19.310	19.690		
9	19.650	20.190	Lachnasar	0.235
10	19.690	20.190	Rajnagar	0.409
11	20.190	20.250	Bhagnahir	0.356







S. No.	Chainage		Village	Forest land (ha.)
	From	To		
	20.350	20.520		
	20.580	20.690		
12	23.280	23.420	Kolhar	1.178
	24.910	25.240		
13	25.240	25.450	Karitand	0.567
14	25.450	25.660	Jiyajori	1.506
	25.660	25.850		
	25.850	26.050		
15	25.660	25.850	Lakrakhundi	0.182
16	27.030	27.100	Dhadhkitand	0.061
17	37.135	37.380	Pratappur	0.652
<b>Total</b>				<b>14.923</b>
<b>Girdih division</b>				
1	28.110	28.210	Taratanr	0.2427
	28.370	28.450		
2	39.350	39.410	Barkitanr	1.5627
	39.400	39.490		
	39.540	39.860		
	39.890	39.950		
	40.030	40.360		
	40.380	40.510		
3	40.520	40.650	Gangapur	0.0809
<b>Total</b>				<b>1.880</b>

**2.0 Compliance status with National /State /Local statutory environmental requirements:**

9. SHAJ has initiated the forest clearances, tree cutting permission for non-forest area and forest area. Study on identification of Elephant Corridor within the sub project is in progress in consultation with concern forest department also the necessary permission from wildlife department shall be obtained before execution of the work in relevant section.
10. The requisite statutory permission by the civil contractor has been initiated and details of the same are given in Table-4.

**Table-4:** Status of Statutory Compliance initiated by the contractor during Project implementation

#	Applicable Permits	Pkg-1	Pkg-2	Pkg-3	Pkg-4
1	Permission for Stone Quarry from: a) Department of Mines and Geology, b) SEIAA /DEIAA c) State Revenue Department d) District Administration.	Stone Quarry has been finalized at Mauza – Chorbatiya Application is under process.	The location Stone Quarry has not been finalized.	Identification of Stone Quarry is under process. For time being, the Contractor has also procured the material from Authorized sources &	Stone Quarry has been Identify at Saedba at Km 11+000 (LHS) about 2 Kms. The permission from DEIAA has been obtained vide Lt.No.-13





**STATE HIGHWAYS AUTHORITY OF JHARKHAND  
(SHAJ) PHASE-II PROJECTS**



#	Applicable Permits	Pkg-1	Pkg-2	Pkg-3	Pkg-4
	e) If mining area comes under forest land, permission from State Forest Department			collection and submission of Royalties Clearance Certificate is under process.	dt. 28/10/2016.
2	DGMS Permission	Shall be obtained after Quarry permission.	Shall be obtained after Quarry permission.	Shall be obtained after Quarry permission.	Permission is under process.
3	License for use of explosive from the office of Explosives controller;	Under Process	Under Process	Under Process	Under Process
4	Permission for drawing water from bore well / pond / river from village Panchayat / Irrigation Department as applicable;	Under Process	Under Process	Under Process	Under Process
5	Consent to Establishment (CTE) <sup>2</sup> from JSPCB:				
	• Crusher Plant	Obtained vide Lt. No.-476 dt. 21/12/2016	Under Process	Under Process	Under Process
	• HMP	Obtained vide Lt. No.-472 dt. 19/12/2016	Under Process	Under Process	Under Process
	• WMM Plant	Obtained vide Lt. No.-474 dt. 19/12/2016	Under Process	Under Process	Under Process
	• Concrete Batching Plant	Obtained vide Lt. No.-473 dt. 19/12/2016	Under Process	Under Process	Under Process
6	Consent to Operate (CTO) from JSPCB:				
	• Crusher Plant	Under Process	Shall be initiated after obtaining the CTE.	Shall be initiated after obtaining the CTE.	Shall be initiated after obtaining the CTE.
	• HMP	Under Process	Shall be initiated after obtaining the CTE.	Shall be initiated after obtaining the CTE.	Shall be initiated after obtaining the CTE.
	• WMM Plant	Under Process	Shall be initiated after obtaining the CTE.	Shall be initiated after obtaining the CTE.	Shall be initiated after obtaining the CTE.
	• Concrete Batching	Under Process	Shall be	Shall be	Shall be initiated

<sup>2</sup> DG Sets consent has been obtained along with Plants.



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(SHAJ) PHASE-II PROJECTS**



#	Applicable Permits	Pkg-1	Pkg-2	Pkg-3	Pkg-4
	Plant		initiated after obtaining the CTE.	initiated after obtaining the CTE.	after obtaining the CTE.
7	Labour License	Obtained on 14/06/2016 & valid up to 13/06/2017	Obtained on 19/08/2016 & valid up to 18/08/2017	Obtained on 19/08/2016 & valid up to 24/08/2017	Obtained on 12/09/2016 & valid up to 11/09/2017
8	Contractor's All Risks (CAR) Insurance Policy	Obtained on 04/05/2016 & valid up to 03/05/2019	Obtained on 06/08/2016 & valid up to 05/08/2019	Obtained on 28/04/2016 & valid up to 29/04/2017	Obtained on 27/09/2016 & valid up to 26/09/2019
9	Borrow Earth	Identification of Borrow Area is in progress.	Identification of Borrow Area is in progress.	Identification of Borrow Area is in progress.	Identification of Borrow Area is in progress.
	<ul style="list-style-type: none"> <li>• Permission required from Village Panchayat and owner of the land in case of private land;</li> </ul>	Shall be initiated upon finalization of Borrow Area	Shall be initiated upon finalization of Borrow Area	Shall be initiated upon finalization of Borrow Area	Shall be initiated upon finalization of Borrow Area
	<ul style="list-style-type: none"> <li>• Permission from DIEAA / SEIAA</li> </ul>	Shall be initiated upon finalization of Borrow Area	Shall be initiated upon finalization of Borrow Area	Shall be initiated upon finalization of Borrow Area	Shall be initiated upon finalization of Borrow Area
10	Forest Clearances	Nil	In Progress	In Progress	Nil
11	Tree Cutting Permission	In Progress	In Progress	In Progress	In Progress
12	Study of Elephant Corridor and Permission from Wildlife Department	Study is in Progress and subsequently the permission shall be obtained from Wildlife Department	Study is in Progress and subsequently the permission shall be obtained from Wildlife Department	Study is in Progress and subsequently the permission shall be obtained from Wildlife Department	Study is in Progress and subsequently the permission shall be obtained from Wildlife Department
13	Permission for HSD Pump	Obtained	In Progress	Obtained	In Progress





**3.0 Compliance status with the environmental covenants as stipulated in the Loan Agreement**

11. The compliance status of Environmental Loan covenants as stipulated in the Loan Agreement is given in **Table-5**.

**Table-5:** compliance status of Environmental Loan covenants as stipulated in the Loan Agreement

<b>Sl. No</b>	<b>Loan Agreement Reference</b>	<b>Environmental Compliance Requirements</b>	<b>Compliance Status</b>
1	Para-5, Schedule-4 of Loan Agreement:	<p><b><u>Conditions of Award of Contract Commencement of Work:</u></b></p> <ul style="list-style-type: none"> <li>The Borrower shall ensure or cause the EA to ensure that no Works contract is awarded which involves environmental impacts until the EA has incorporated the relevant provisions from the EMP into the Works contract.</li> <li>The Borrower shall ensure or cause the EA to ensure that no commencement of Works is allowed under any Works contract which involves environmental impacts and requires environmental clearances, until EA has obtained the final approval of (i) the IEE from ADB, and (ii) environmental clearance including approval of the environmental assessment report, from the State Environmental Impact Assessment Authority.</li> </ul>	Being Complied
	Para-4, Schedule-5 of Loan Agreement:	<p><b><u>Environment:</u></b></p> <p>The Borrower shall ensure or cause the EA to ensure that the preparation, design, construction, implementation, operation and decommissioning of the Project and all Project facilities comply with</p> <ul style="list-style-type: none"> <li>(i) all applicable laws and regulations of the Borrower and the State relating to environment, health, and safety;</li> <li>(ii) the Environmental Safeguards; and</li> <li>(iii) all measures and requirements set forth in the IEE and EMP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report</li> </ul>	Being Complied
	Para-8, Schedule-5 of Loan Agreement:	<p><b><u>Human and Financial Resources to Implement Safeguards Requirements:</u></b></p> <p>The Borrower shall make available or cause the EA to make available necessary budgetary and human resources to fully implement the EMP and the RP.</p>	Being Complied
	Para-9, Schedule-5 of Loan Agreement:	<p><b><u>Safeguards — Related Provisions in Bidding Documents and Works Contracts:</u></b></p> <p>(a) The Borrower shall ensure or cause the EA to</p>	Being Complied





<u>Sl. No</u>	<u>Loan Agreement Reference</u>	<u>Environmental Compliance Requirements</u>	<u>Compliance Status</u>
		<p>ensure that all bidding documents and contracts for Works contain provisions that require contractors to:</p> <p>(b) comply with the measures relevant to the contractor set forth in the IEE, the EMP, and the RP (to the extent they concern impacts on affected people during construction), and any corrective or preventative actions set forth in a Safeguards Monitoring Report;</p> <p>(c) make available a budget for all such environmental and social measures;</p> <p>(d) provide the EA with a written notice of any unanticipated environmental, resettlement or indigenous peoples risks or impacts that arise during construction, implementation or operation of the Project that were not considered in the IEE, the EMP, and the RP;</p> <p>(e) adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction; and</p> <p>(f) reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction.</p>	
	<p>Para-10, Schedule-5 of Loan Agreement:</p>	<p><b><u>Safeguards Monitoring and Reporting:</u></b> The Borrower shall ensure or cause the EA to ensure the following:</p> <p>a) submit Safeguards Monitoring Reports semiannually for Involuntary Resettlement Safeguards and Indigenous Peoples Safeguards and annually for Environmental Safeguards to ADB and disclose relevant information from such reports to affected persons promptly upon submission;</p> <p>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 IEE, the EMP, and the RP, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan;</p> <p>c) no later than 3 months from award of the first Works contract, engage or cause to be engaged qualified and experienced external experts or qualified nongovernmental organizations under a selection process and terms of reference acceptable to ADB, to verify information produced through the Project monitoring process, and facilitate the carrying out of any verification</p>	<p>Being Complied – 1<sup>st</sup> EMR from March 2016 (Commencement) to December 2016 has been complied. Subsequently the frequency of annual EMR shall be maintained.</p>





<u>Sl. No</u>	<u>Loan Agreement Reference</u>	<u>Environmental Compliance Requirements</u>	<u>Compliance Status</u>
		activities by such external experts; and d) report any actual or potential breach of compliance with the measures and requirements set forth in the EMP or the RP promptly after becoming aware of the breach.	
	Para-11, Schedule-5 of Loan Agreement:	<b><u>Prohibited List of Investments:</u></b> The Borrower shall ensure or cause the EA to ensure that no proceeds of the Loan under the Project are used to finance any activity included in the list of prohibited investment activities provided in Appendix 5 of the SPS.	Being Complied
	Para-12, Schedule-5 of Loan Agreement:	<b><u>Labor Standards:</u></b> The Borrower and EA shall ensure that Works contracts under the Project follow all applicable labor laws of the Borrower and the State and that these further include provisions to the effect that contractors; (i) carry out HIV/AIDS awareness programs for labor and disseminate information at worksites on risks of sexually transmitted diseases and HIV/AIDS as part of health and safety measures for those employed during construction; and (ii) follow and implement all statutory provisions on labor (including not employing or using children as labor, equal pay for equal work), health, safety, welfare, sanitation, and working conditions. Such contracts shall also include clauses for termination in case of any breach of the stated provisions by the contractors.	(i) The HIV/AIDS awareness programs for labor and disseminate information at worksites on risks of sexually transmitted diseases and HIV/AIDS as part of health and safety measures for those employed during construction has not been initiated by the contractor. (ii) Being Complied

11. **Change of Scope:** The new “Jamua Bypass” has been identified in Package-II which was not covered in ADB approved Initial Environmental Examination (IEE). The IEE report shall be updated and approval from ADB will be obtained before commencement of civil works in Jamua Bypass.







**STATE HIGHWAYS AUTHORITY OF JHARKHAND  
(SHAJ) PHASE-II PROJECTS**



**4.0** Compliance status with environmental management and monitoring plans and environmental assessment and review framework/procedures as stipulated in the environmental documentation as agreed with ADB:

The compliance status of EMP implementation during project execution is given in **Table-6, Table-7, Table-8 & Table-9** for the Package-01, 02, 03 and 04 respectively.

**Table-6: Environmental Management Plan Compliance Status of Package-1**

Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility	Observation during the reporting period	Corrective action and follow up if required	Environmental Issue/Component
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-1</b>									
<b>A. Design and Pre-construction Stage</b>									
<b>1. Alignment</b>									
1.1 Pavement damage and inadequate drainage provisions in habitat areas	<ul style="list-style-type: none"> <li>Soaked CBR value of sub grade is recommended to be 12 %.</li> <li>Overloading to be checked</li> <li>Raised embankment and provision of roadside drainage to prevent damage to pavement due to water logging on the road and also inconvenience caused to</li> <li>Provision of adequate no. of cross drainage structures.</li> <li>Increase (vent and height) in waterway of existing structures.</li> <li>Roadside drains have been proposed with suitable outfalls.</li> <li>Additional 19 culverts</li> </ul>	Design requirement	Entire stretch Embankment raised at 12 locations for a length of 4.33 km <b>(Refer Appendix 4 of ADB approved IEE report)</b> Roadside drains (both sides together) Covered=28.106 km Lined=46.246 km Unlined=12.734 km  For list of bridges with increased waterway Pls refer <b>Appendix 3 of ADB approved IEE report.</b>	MI: Design and number of cross and side drains, slab/box culverts, and Hume pipes  PT: Design and numbers are in accordance with site needs	Review of detail design documents & drawings and comparison with site conditions	Design Consultant	SHAJ	Complied	Not Required



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-1</b>									
	proposed								
1.2 Safety along the proposed alignment	<ul style="list-style-type: none"> <li>Provision of crash barriers at accident prone areas and high embankments.</li> <li>Rumble strips in habitat areas, schools, junction and curves to regulate speed.</li> <li>Provision of retro reflective warning signboards near school, hospital, religious places and forests</li> <li>Provision of sidewalks in the builtup sections, on both sides.</li> <li>Signs and marking viz., cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, etc</li> </ul>	Design requirement  IRC:SP:84-2014 IRC:8, IRC:25, IRC:26, IRC:35, IRC:67, IRC:103 and Section 800 of MoRTH Specifications  Horizontal geometry will be based on IRC: 38-1988 and vertical geometry will be based on IRC: SP 23-1993 IRC: SP: 67-2012	At embankment, height >3.0 m total length = 5.29 km  Rumble strip = 40 locations ( 27 built up areas, 1 school, 12 junctions)  Total 854 road delineators/chevron/ object markers  Pedestrian Guard Rails=7.1 km  Service Road for 7.1 km length at 13.800 to 14.800, 26.150 to 27.700 41.500 to 45.500 Total no. of street lights=534	MI: number and location of crash barriers, rumble strips, warning sign boards, sidewalks  PT: numbers and location are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Design Consultant	SHAJ	Complied	Not Required
	<ul style="list-style-type: none"> <li>Pedestrian cross-walks at all Junctions and where conflict exists between vehicular and pedestrian movements (bus bays, schools and habitation.</li> <li>Safety kerb at all</li> </ul>							Complied	Not Required



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	<ul style="list-style-type: none"> <li>bridges</li> <li>Service roads in densely habitated areas</li> <li>Horizontal and vertical geometry as per IRC Specification</li> <li>Zebra crossing with informatory warning sign on approach to school, warning sign with footways and speed limit sign</li> <li>Street Lighting in built-up sections</li> <li>Ambulance and medical aid posts</li> </ul>								
<b>2. Natural Hazards</b>									
2.2 Flooding/Waterlogging	<ul style="list-style-type: none"> <li>Provision of adequate number of CD structures. Additional culverts have been proposed.</li> <li>All CD structures designed for 50year HFL return period and bridges designed for 100 year HFL return period</li> <li>Water ways of bridges and culverts have been increased.</li> <li>Roadside drains also provided</li> <li>Embankment height</li> </ul>	IRC:34 Recommendation IRC:34 IRC:34 Recommendation s for road construction in waterlogged area and IRC: 75 and MORT&H guidelines for Design of High Embankments	Entire stretch.  Embankment raised at 12 locations for a length of 4.33 km (Refer <b>Appendix 4 of ADB approved IEE report</b> )  Roadside drains (both sides together) Covered=28.106 km Lined=46.246 km	MI: Design and numbers of cross & side drains, slab/box culverts Hume pipes, road embankment height, design and number of bridges  PT: Design and numbers are in accordance with site needs	Review of design documents and drawings and comparison with site conditions		SHAJ	Complied	Not Required



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	raised along low lying/ potential water logged areas <ul style="list-style-type: none"> <li>Improvement in existing culverts/ Bridges to increase their carrying capacity.</li> </ul>		Unlined=12.734 km For list of bridges with increased waterway Refer <b>Appendix 3 of ADB approved IEE report)</b>						
<b>3. Loss of Land and Assets</b>									
3.1 livelihood loss to affected persons	<ul style="list-style-type: none"> <li>affected persons</li> <li>Road improvement work to be accommodated within available ROW to the extent possible.</li> <li>Social Impact Assessment and Resettlement Plan to be undertaken as per national policy and ADB' guidelines.</li> <li>Complete all necessary land and property acquisition procedures prior to the commencement of civil work.</li> <li>Adhere to the Land Acquisition procedures in accordance to RP's Entitlement Framework.</li> <li>Compensation and assistance as per project Resettlement</li> </ul>	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation And Resettlement Act, 2013 and ADB's involuntary resettlement policy.  Contract Clause for preference to local people during employment	Throughout the corridor	MI: Payment of compensation and assistance to DPs as per RP  Number of complaints/grievances related to compensation and resettlement PT: Minimal number of complaints/grievances. All cases of resettlement and rehabilitation if any are resolved at GRC level. No case referred to arbitrator/court.	Check LA records; design drawings vs land plans;  Interview with affected persons  Check status of employment given to local people during construction	SHAJ and implementing NGO	SHAJ	Under Process	The details shall be updated in next EMR



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	Plan <ul style="list-style-type: none"> <li>Income restoration as per RP</li> <li>Preference in employment and petty contracts during construction to APs</li> <li>Constitute GRC as per RP</li> </ul>								
<b>4. Diversion of Forest Land and Cutting of Trees</b>									
4.1 Need for cutting of trees.	<ul style="list-style-type: none"> <li>Geometric adjustments made to minimize tree cutting.</li> <li>Obtain tree cutting permission from forest department</li> <li>Provision for mandatory compensatory afforestation (1:2) for deposit of payment to Forestry Department</li> <li>Provision for additional compensatory plantation on 1: 2 basis to be implemented by contractor through village Joint Forest Management (JFM) Committee</li> </ul>	Forest Conservation Act, 1980	Throughout the corridor Total number of affected trees=2457 Additional Plantation near sensitive receptors, river banks, borrow areas	MI: Number and location of geometric adjustments made to avoid forestland and tree cutting, budget amount allocated for compensatory afforestation and additional plantation  PT: Unnecessary tree felling on forest land avoided. Budget allocation is adequate	Review final design. Check budget provision for compensatory afforestation and additional plantation.	SHAJ, Design consultants forest	department SHAH/Forest department	Under Process	-
<b>5. Elephant Movement</b>									
5.1 Road design causing disruption in elephant	<ul style="list-style-type: none"> <li>Provision for rumble strip, cautionary sign boards for speed limits up to 30 Kmph on</li> </ul>	Project Requirement	Sirsanath gate near Barapalasi, bridge	MI: budget allocation for rumble strips, cautionary and informatory sign	Review of bid documents and project budget plan	SHAJ, Design Consultant	SHAJ/CSC in coordination with Forest Department	Review under process by CSC Wild	Provision for additional conservation measures to be



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movement/ Vehicle-Elephant collision and Human-Elephant Conflict	<p>both sides with gentle side slope and turfing for easy movement of Elephant.</p> <p>Provision for solar Street Lights in communities near elephant crossing areas to keep the elephants away</p> <p>Provision for supply of solar dragon light to local Joint Forest Management Committees in villages near elephant crossing areas for use to chase away elephants</p> <ul style="list-style-type: none"> <li>Provision for habitat enhancement viz. plantation of fodder plants in forest areas, through Joint Forest Management (JFM).</li> <li>Provision for additional conservation measures to be taken after elephant study that will be conducted by the</li> <li>CSC Wildlife Specialist.</li> </ul>		near Amarpur-Segatola, Loha bridge near Bhandaro and Lakradwani; No of Solar lights=40 Rumble Strips =8 Informatory sign boards=8 Cautionary Sign boards=8	boards, solar street lamps, solar dragon lamps, habitat enhancement and conservation activities PT: Budget amount is enough to fulfill the installation and construction of recommended facilities and structures				Life Specialist	taken after elephant study that will be conducted by the CSC Wildlife Specialist.
<b>6. Shifting of Utilities</b>									



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6.1 Disruption of utility services to local community	<ul style="list-style-type: none"> <li>All telephone and electrical poles/wires and underground cables should be shifted before start of construction</li> <li>Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services</li> <li>Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any</li> </ul>	Project requirement	Throughout the corridor	MI: Number of complaints from local people, number, timing and type of notifications issued to local people, time taken to shift utilities PT: No. of complaints should be 0. Effective and timely notification. Minimal time for utility shifting	Interaction with concerned utility authorities and local public	Contractor/ SHAJ/utility company	SHAJ/CSC	Under Process	-
<b>B. Construction Stage</b>									
<b>1. Air Quality</b>									
1.1 Dust Generation due to construction activities and transport, storage and handling of construction materials	<ul style="list-style-type: none"> <li>Contractor to submit location and layout plan for storage areas of construction materials approved by CSC</li> <li>Transport, loading and unloading of loose and fine materials through covered vehicles.</li> <li>Paved approach roads.</li> <li>Storage areas to be located downwind of the</li> </ul>	MORT&H Specifications for Road and Bridge works Air (P and CP) Act 1974 and Central Motor and Vehicle Act 1988 General Conditions of Bid Document	Throughout project corridor	MI: PM10 level measurements Complaints from locals due to dust  PT: PM10 level < 100 ug/m3 Number of complaints should be 0.	Standards CPCB methods Observations Public consultation  Review of monitoring data maintained by contractor	Contractor	SHAJ /CSC	Complied	Not Required



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	habitation area. <ul style="list-style-type: none"> <li>Water spraying on earthworks, unpaved haulage roads and other dust prone areas.</li> <li>Provision of PPEs to workers.</li> </ul>								
1.2 Emission of air pollutants (HC,SO2,NOX,CO etc) from vehicles due to traffic congestion and use of equipment and machinery	<ul style="list-style-type: none"> <li>Regular maintenance of machinery and equipment.</li> <li>Batching, asphalt mixing plants and crushers at downwind (1km) direction from the nearest settlement.</li> <li>Only crushers licensed by the PCB shall be used</li> <li>DG sets with stacks of adequate height and use of low sulphur diesel as fuel.</li> <li>LPG should be used as fuel source in construction camps instead of wood</li> <li>Ambient air quality monitoring</li> <li>Contractor to prepare traffic management and dust suppression plan duly approved by SHAJ</li> </ul>	The Air (Prevention and Control of Pollution) Act, 1981 (Amended 1987) and Rules 1982	Asphalt mixing plants, crushers, DG sets locations	MI: Levels of HC, SO2, NO2, and CO. Status of PUC certificates  PT: SO2 and NO2 levels are both less than 80ug/m3. PUC certificate of equipment and machinery is upto date	Standards CPCB methods  Review of monitoring data maintained by contractor	Contractor	SHAJ /CSC	The Environmental monitoring agency not been finalized and monitoring shall be carried out as per ADB approved monitoring Plan	Finalization of monitoring agency and initiation of Environmental monitoring
<b>2. Noise</b>									
2.1 Disturbance to	<ul style="list-style-type: none"> <li>All equipment to be</li> </ul>	Legal	Throughout project	MI: day and night	As per Noise	Contractor	SHAJ /CSC	The	Finalization of



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local residents and sensitive receptors due to excessive noise from construction activities and operation of equipment and machinery	timely serviced and properly maintained. <ul style="list-style-type: none"> <li>Construction equipment and machinery to be fitted with silencers and maintained properly.</li> <li>Only IS approved equipment shall be used for construction activities.</li> <li>Timing of noisy construction activities shall be done during night time and weekend near schools,</li> <li>Implement noisy operations intermittently to reduce the total noise generated</li> <li>Manage existing traffic to avoid traffic jams and accumulation of noise beyond standards.</li> <li>Restrict construction near residential, built up and forest areas construction today light hours.</li> <li>Initiation of multi-layered plantation, to serve as mitigation option for operation phase</li> <li>Honking restrictions</li> </ul>	requirement Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof + Clause No 501.8.6. MORT&H Specifications for Road and Bridge works	section especially at construction sites, residential and identified sensitive locations.  <b>Refer Table 21 of IEE</b> for information on sensitive receptors	Noise levels. Number of complaints from local people  PT: Zero complaints or no repeated complaints by local people. Average day and night time noise levels are within permissible limits for work zone areas	rule, 2000  Consultation with local people  Review of noise level monitoring data maintained by contractor  Observation of construction site			Environmental monitoring agency not been finalized and monitoring shall be carried out as per ADB approved monitoring Plan	monitoring agency and initiation of Environmental monitoring



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	<ul style="list-style-type: none"> <li>near sensitive areas</li> <li>PPEs to workers</li> <li>Noise monitoring as per EMoP.</li> </ul>								
<b>3. Land and Soil</b>									
3.1 Landuse Change and Loss of productive / topsoil	<ul style="list-style-type: none"> <li>Non-agricultural areas to be used as borrow areas to the extent possible.</li> <li>If using agricultural land, top soil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion.</li> <li>Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original land use</li> </ul>	Project requirement	<p>Throughout the project section and borrow areas</p> <p>Land identified for camp, storage areas etc</p>	<p>MI: Borrow pit locations/Top soil storage area</p> <p>PT: Zero complaints or disputes registered against contractor by land owner</p>	Review borrow area plan, site visits	Contractor	SHAJ /CSC	Under Process	-
3.2 Slope failure and Soil erosion due to Construction activities, earthwork, and cut and fill, stockpiles etc.	<ul style="list-style-type: none"> <li>Bio-turfing of embankments to protect slopes.</li> <li>Slope protection by providing frames, dry stone pitching, masonry retaining walls, planting of grass and trees.</li> <li>Side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per</li> </ul>	IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2 MORT&H Specifications for Road and Bridge works Guidelines	Throughout the entire project road	<p>MI: Occurrence of slope failure or erosion issues</p> <p>PT: No slope failures. Minimal erosion issues</p>	Review of design documents and site observation	Design consultant and Contractor,	SHAJ /CSC	Being Complied	-



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	design specifications. Care should be taken that the slope gradient shall not be greater than 2:1. <ul style="list-style-type: none"> <li>The earth stockpiles to be provided with gentle slopes to soil erosion.</li> </ul>	IX for Soil erosion							
3.3 Borrow area management	<ul style="list-style-type: none"> <li>Obtain EC from SEIAA before opening any new borrow area.</li> <li>Comply to EC conditions of SEIAA</li> <li>Non-productive, barren lands, upland shall be used for borrowing earth with the necessary permissions/ consents.</li> <li>Depths of borrow pits to be regulated and sides not steeper than 25%.</li> <li>Topsoil to be stockpiled and protected for use at the rehabilitation stage.</li> <li>Transportation of earth materials through covered vehicles.</li> <li>Follow IRC recommended practice for borrow pits (IRC 10: 1961) for identification of location, its operation and rehabilitation</li> </ul>	IRC Guidelines on borrow areas and for quarries (Environmental protection Act and Rules, 1986; Water Act, Air Act)+Clause 305.2.2 MORTH Specifications for Road and Bridgeworks Guidelines for Borrow Areas management	Borrow sites location	MI: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of accidents. Complaints from local people.  PT: No case of non-compliance to conditions stipulated by SEIAA in clearance letter. Zero accidents. Zero complaints.	Review of design documents and site observations  Compare site conditions with EC conditions by SEIAA	Contractor	SHAJ /CSC	Identification of Borrow Area is under process and the same shall be operated after obtaining the requisite permission from competent Authority.	Contractor has been suggested to process the Borrow area permission for all identified Borrow Area



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	<ul style="list-style-type: none"> <li>Borrow areas not to be dug continuously.</li> <li>To the extent borrow areas shall be sited away from habitated areas.</li> <li>Borrow areas shall be leveled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fish pond.</li> </ul>								
3.4 Quarry Operations	<ul style="list-style-type: none"> <li>Aggregates will be sourced from existing licensed quarries.</li> <li>Copies of consent/ approval / rehabilitation plan for a new quarry or use of existing source will be submitted to SHAJ.</li> <li>The contractor will develop a Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the approval to EA.</li> <li>Obtain environmental clearance from SEIAA in case of opening new quarry</li> </ul>	Clause No.111.3 MORT&H Specifications for Road and Bridge works Guidelines VI for Quarry Areas Management Environmental Protection Rules	Quarry area locations	MI: Existence of licenses quarry areas from which materials to be sourced and Existence of a quarry redevelopment plan  PT: Quarry license is valid.: No case of noncompliance to consent conditions and air quality meets the prescribed limit	Review of design documents, contractor documents and site observation Compliance to EC conditions in case of opening new quarries	Contractor	SHAJ /CSC	Identification of Stone Quarries is under process and the same shall be operated after obtaining the requisite permission from competent Authority.	Contractor has been suggested to process the Stone Quarries permission for all identified Stone Quarries



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3.5 Compaction of soil and impact on quarry haul roads due to movement of vehicles and equipment	<ul style="list-style-type: none"> <li>Construction vehicles, machinery, and equipment to be stationed in the designated ROW to avoid compaction.</li> <li>Approach roads/haulage roads shall be designed along the barren and hard soil area to reduce the compaction.</li> <li>Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/minor roads.</li> <li>Land taken for construction camp and other temporary facility shall be restored to its original conditions</li> </ul>	Design requirement	Parking areas, Haulage roads and construction yards	MI: Location of approach and haulage roads Presence of destroyed/compacted agricultural land or land which has not be restored to its original condition PT: Zero occurrence of destroyed/compacted land and undestroyed land	Site observation	Contractor	SHAJ /CSC	Being Complied	-
3.6 Contamination of soil due to leakage/ spillage of oil, bituminous and non bituminous debris generated from demolition and road construction	<ul style="list-style-type: none"> <li>Construction vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil.</li> <li>Fuel storage and refueling sites to be kept</li> </ul>	Design requirement	Fuelling station, construction m sites, and construction camps and disposal location	MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area  PT: Soil test conforming to no –	Site observation	Contractor	SHAJ /CSC	The location has been finalized for disposal of unusable debris at low lying areas. The necessary	Finalization of dumping location by the contractor with consultation with CSC / SHAJ.



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	away from drainage channels. <ul style="list-style-type: none"> <li>Unusable debris shall be dumped in ditches and low lying areas.</li> <li>To avoid soil contamination oil Interceptors shall be provided at wash down and refueling areas.</li> <li>Waste oil and oil soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF/SPCB authorized vendors</li> <li>Non-bituminous wastes to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit.</li> <li>Bituminous wastes will be disposed off in an identified dumping site approved by the State Pollution Control Board</li> </ul>			contamination. No sighting of spilled oil or bitumen in construction site or camp site				No Objection Certificate has been initiated from competent Authority.	
<b>4. Water Resources</b>									
4.1 Sourcing of water during Construction	<ul style="list-style-type: none"> <li>Requisite permission shall be obtained for abstraction of</li> </ul>	CGWA Guidelines	Throughout the Project section	MI: Approval from competent authority Complaints from	Checking of documentation	Contractor	SHAJ /CSC	The ground water sources has	Ground water permission from competent



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-1</b>									
	groundwater from Central Groundwater Authority. • Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected. □ Water intensive activities not to be undertaken during summer season. □ Provision of water harvesting structure to augment groundwater condition in the area		Check Dam at suitable locations	local people on water availability  PT: Valid approval from competent authority. Zero complaints from local people.	Talk to local people			been identified and requisite permission has been initiated by the contractor.	Authority by the contractor.
4.2 Disposal of water during construction	• Provisions shall be made to connect road side drains with existing nearby natural drains.	Clause No.1010 EP Act 1986 MORT&H Specifications for Road and Bridgeworks	Throughout the Project section	MI: Condition of drainage system in construction site. Presence/absence of water logging in project area.  PT: Existence of proper drainage system. No water logging in project area	Standards methods Site observation and review of documents	Contractor	SHAJ /CSC	Being Complied	-
4.3 Alteration in surface water hydrology	• Existing drainage system to be maintained • And further enhanced. • Provision shall be made for adequate size and number of cross	Design requirement, Clause No 501.8.6. MORT&H Specifications	Near all drainage channels, river/ nallah crossings etc.	MI: Proper flow of water in existing streams and rivers  PT: No complain of water shortage by downstream	Review of design documents  Site observation	Contractor	SHAJ /CSC	Being Complied	-



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-1</b>									
	drainage structures esp. in the areas where land is sloping towards road alignment. <ul style="list-style-type: none"> <li>Road level shall be raised above HFL level wherever road level is lesser than HFL.</li> <li>Culverts reconstruction shall be done during lean flow period. In some cases these minor channels may be diverted for a very short period (15-30 days) and will be bring back to its original course immediately after construction.</li> </ul>			communities. No record of overtopping/ water logging					
4.4 Siltation in water bodies due to construction activities /earthwork	<ul style="list-style-type: none"> <li>Embankment slopes to be modified suitably to restrict the soil debris entering water bodies.</li> <li>Provision of Silt fencing shall be made at water bodies.</li> <li>Silt/sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated.</li> <li>Earthworks and stone works to be</li> </ul>	Design requirement, ClauseNo501.8. 6.MORT&H Specifications for Road and Bridge works  Worldwide best practices	Near all water bodies /waterway Refer Table 15.  Retaining wall=250m	MI: Presence /absence of siltation in rivers, streams, ponds and other water bodies in project area. Turbidity test levels  PT: No records of siltation due to project activities. Surface water quality tests confirm to turbidity and TSS limit	Field observation	Contractor	SHAJ /CSC	Being Complied	-



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<b>Environmental Management Plan Compliance Status of Package-1</b>									
	<p>prevented from impeding natural flow of rivers, streams and water canals or existing drainage system.</p> <ul style="list-style-type: none"> <li>Retaining walls at water bodies /ponds to avoid siltation near ponds</li> </ul>								
4.5 Deterioration in Surface water quality due to leakage from vehicles and equipments and waste from construction camps	<ul style="list-style-type: none"> <li>No vehicles or equipment should be parked or refueled near water-bodies, so as to avoid contamination from fuel and lubricants.</li> <li>Oil and grease traps and fuelling platforms to be provided at re-fuelling locations.</li> <li>All chemicals and oil shall be stored away from water and concreted platform with catchment pit for spills collection.</li> <li>All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language</li> </ul>	The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof.	Water bodies, refueling stations, construction camps.	<p>MI: Water quality of ponds, streams, rivers and other water bodies in project</p> <p>Presence of oil floating in water bodies in project area</p> <p>PT: Surface water quality meets freshwater quality standards prescribed by CPCB</p>	<p>Conduction of water quality tests as per the monitoring plan</p> <p>Field observation</p>	Contractor	SHAJ /CSC	The Environmental monitoring agency not been finalized and monitoring shall be carried out as per ADB approved monitoring Plan	Finalization of monitoring agency and initiation of Environmental monitoring



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<b>Environmental Management Plan Compliance Status of Package-1</b>									
	emergency response procedure, including reporting, will be provided by the contractors. <ul style="list-style-type: none"> <li>Construction camp to be sited away from water bodies.</li> <li>Wastes must be collected, stored and taken to approve disposal site only.</li> <li>Water quality shall be monitored</li> </ul>								
<b>5. Flora and Fauna</b>									
5.1 Vegetation loss due to site preparation and construction activities	<ul style="list-style-type: none"> <li>Restrict tree cutting upto toe line considering safety to road users.</li> <li>Roadside trees to be removed with prior approval of competent authority.</li> <li>Mandatory compensatory plantation at 1:2 basis by Forestry Department</li> <li>Additional compensatory plantation 1:2 as per the IRC by contractor in partnership with respective village JFM Committee. Local villagers to be employed</li> </ul>	Forest Conservation Act1980 + IRC:SP:21 and IRC:SP:66	Throughout project corridor  Estimated No. of affected tree=2457  Additional Plantation near Sensitive receptors, river banks, borrow areas	MI: ROW width Number of trees for felling Compensatory plantation plan Number of trees replanted.  PT: Additional compensatory afforestation done on a 1:2 basis by contractor through JFM. Number of trees planted is double the number of trees removed. Tree survival rate is at least 70%.	Review of relevant documents – tree cutting permit, compensatory plantation plan. Meeting with JFM Committee members  Field observations	Mandatory Compensatory plantation by forest Department and Additional plantation by contractor in partnership with respective local JFM Committee	SHAJ /CSC	Shall be initiated after finalization of Tree cutting details	Compensatory afforestation against tree cutting.



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-1</b>									
	for afforestation activities. Employment preference to women <ul style="list-style-type: none"> <li>• Regular maintenance trees planted.</li> <li>• Provision of LPG in construction camp as fuel source to avoid tree cutting.</li> <li>• Plantation of trees on both sides of the road where technically feasible. Trees should be offset 1m back from the ultimate edge of the roadway to prevent safety hazard and provide adequate sight distance.</li> <li>• Integrate vegetation management (IVM) with the carriage way completely clear of vegetation.</li> <li>• Additional plantation near sensitive receptors, river banks to minimize noise &amp; air pollution, and to check erosion.</li> <li>• Controlled use of pesticides/ fertilizers</li> </ul>								

**6. Construction Camps**



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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility	Observation during the reporting period	Corrective action and follow up if required	Environmental Issue/Component
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-1</b>									
6.1 Impact associated with location	<ul style="list-style-type: none"> <li>All camps should be established with prior permission from PCB. Camps to maintain minimum distance from following: # 500 m from habitation # 500 m from forest areas where possible # 500 m from water bodies where possible # 500 m from through traffic route # 500 m from identified elephant movement locations</li> </ul>	Design Requirement The Water (Prevention and Control of Pollution) Act, 1974 and its amendments thereof	All construction camps	MI: Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and construction camps PT: Distance of campsite is less than 500m from listed locations	On site observation  Interaction with workers and local community	Contractor and EO	SHAJ /CSC	Being Complied	-
6.2 Worker's Health in construction camp	<ul style="list-style-type: none"> <li>The location, layout and basic facility provision of each labor camp will be submitted to CSC and approved b EA. The contractor will maintain necessary living accommodation and ancillary facilities in hygienic manner.</li> <li>Adequate water and sanitary latrines with septic tanks with soak pits shall be provided.</li> <li>Preventive medical facilities in camp</li> <li>Waste disposal facilities such as dust bins must be provided in the camps and regular</li> </ul>	The Building and Other Construction workers (Regulation of Employment and Conditions of service) Act 1996 and The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof	All construction camps	MI: Camp health records  Existence of proper first aid kit in camp site  Complaints from workers.  PT: No record of illness due to unhygienic conditions or vectors. Zero cases of STD. Clean and tidy camp site conditions.	Camp records  Site observation  Consultation with contractor workers and local people living nearby	Contractor	SHAJ /CSC	Being Complied	-



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						Implementation	Supervision		
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	<p>disposal of waste The Contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations.</p> <ul style="list-style-type: none"> <li>No liquor or prohibited drugs will be imported to, sell, give and barter to the workers of host community.</li> <li>Awareness raising to immigrant workers/local community on communicable and sexually transmitted diseases.</li> </ul>								
<b>7. Management of Construction Waste/Debris</b>									
7.1 Selection of Dumping Sites	<ul style="list-style-type: none"> <li>Contractor to submit a waste/spoil disposal plan and get it approved by CSC and EA.</li> <li>Create controlled dumping sites with a non-permeable lining incorporated in the pit design to avoid leachate seepage into the soil, which may later affect ground water quality</li> </ul>	Design Requirement, MORT&H guidelines and General Conditions of Contract Document	At all Dumping/Disposal Sites	<p>MI: Location of dumping sites Number of public complaints.</p> <p>PT: No public complaints. Consent letters for all dumping sites available with contractor</p>	Field survey and interaction with local people. Review of consent letter	Contractor	SHAJ /CSC	Selection of Dumping Site is under Process	The identified dumping site shall be approved by CSC / SHAJ before its utilization



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-1</b>									
	<ul style="list-style-type: none"> <li>Unproductive/wastelands shall be selected for dumping sites away from residential areas and water bodies</li> <li>Dumping sites must be having adequate capacity equal to the amount of debris generated.</li> <li>Public perception and consent from the village Panchayats has to be obtained before finalizing the location</li> </ul>								
7.2 Reuse and disposal of construction and dismantled waste	<ul style="list-style-type: none"> <li>The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites and camps, temporary traffic diversions, and haulage routes.</li> <li>All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping.</li> <li>Unusable and non-bituminous debris</li> </ul>	Design Requirement, MORT&H guidelines and General Conditions of Contract Document	Throughout the project corridor	MI: Percentage of reuse of existing surface material  Method and location of disposal site of construction debris  PT: No public complaint and consent letters for all dumping sites available with contractor or CSC	Contractor records  Field observation  Interaction with local people	Contractor	SHAJ /CSC	Selection of Dumping Site is under Process	The identified dumping site shall be approved by CSC / SHAJ before its utilization



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	materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority. <ul style="list-style-type: none"> <li>The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal, MORTH guidelines should be followed.</li> <li>Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site.</li> </ul>								
<b>8. Traffic Management and Safety</b>									
8.1 Management of existing traffic and safety	<ul style="list-style-type: none"> <li>Traffic Management Plan shall be submitted by the contractor and approved by the CSC.</li> <li>The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials.</li> </ul>	Design requirement and IRC: SP: 27 - 1984, Report Containing Recommendation of IRC Regional Workshops on Highway Safety IRC:SP: 32 -1988 Road Safety for Children (5-12	Throughout the project corridor especially at intersections	MI: Traffic management plan. Presence/ absence of safety signs, traffic demarcations, flag men etc. on site. Complaints from road users. No of accidents PT: No complaints. No accidents due to poor traffic management. Traffic signs,	Review traffic management plan Field observation of traffic management and safety system  Interaction with people in vehicles using the	Contractor	SHAJ /CSC	Under Process	The contractor has been suggested to submit the Traffic Management Plan and get it approved from CSC.
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						Implementation	Supervision		
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	<p>Timing and scheduling to be done so that transportation of dangerous goods is done during least number of people and other vehicles on the road.</p> <ul style="list-style-type: none"> <li>The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed.</li> <li>Restriction of construction activity to only one side of the existing road</li> <li>The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer".</li> <li>Use of adequate</li> </ul>	<p>Years Old) in Construction Zones IRC:SP:55-2014 The Building and other Construction workers Act 1996 and Cess Act of 1996 Factories Act 1948+Section 6 of Employer's Requirement of Bid Document</p>		<p>demarcation lines etc. present in appropriate locations on site</p>	<p>road</p>				



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-1</b>									
	signage's to ensure traffic management and safety. Conduct of regular safety audit on safety measures.								
8.2 Pedestrians, animal movement	<ul style="list-style-type: none"> <li>Temporary access and diversion, with proper drainage facilities.</li> <li>Access to the schools, temples and other public places must be maintained when construction takes place near them.</li> <li>Fencing wherever cattle movement is expected.</li> <li>Large number of box culverts has been proposed. .All structures having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals</li> </ul>	Same as above	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	MI: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local people  PT: Easy access to schools, temples and public places. Zero complaints	Field Observation Interaction with local people	Contractor	SHAJ /CSC	Under Process	-
8.3 Safety of Workers and accident risk from construction activities	<ul style="list-style-type: none"> <li>Contractors to adopt and maintain safe working practices.</li> <li>Usage of fluorescent and retro refractory signage, in local language at the construction sites</li> <li>Training to workers on</li> </ul>	Same as above	Construction sites	MI: Availability of Safety gears to workers  Safety signage Training records on safety  Number of safety related accidents	Site observation  Review records on safety training and accidents  Interact with construction	Obligation of Contractor	SHAJ/CSC	Being Complied	-



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	safety procedures and precautions. <ul style="list-style-type: none"> <li>• Mandatory appointment of safety officer.</li> <li>• All regulations regarding safe scaffolding, ladders, working platforms, gangway, stair wells, excavations, trenches and safe means of entry and egress shall be complied with.</li> <li>• Provision of PPEs to workers.</li> <li>• Provision of a readily available first aid unit including an adequate supply of dressing materials.</li> <li>• The contractor will not employ any person below the age of 18years</li> <li>• Use of hazardous material should be minimized and/or restricted.</li> <li>• Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or emergencies.</li> </ul>			PT: Zero fatal accidents. Zero or minor nonfatal accidents.	workers				



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	<ul style="list-style-type: none"> <li>Accident Prevention Officer must be appointed by the contractor.</li> </ul>								
8.4 Accident risk to local community	<ul style="list-style-type: none"> <li>Restrict access to construction sites only to authorized personnel.</li> <li>Physical separation must be provided for movement of vehicular and human traffic.</li> <li>Adequate signage must be provided for safe traffic movement</li> <li>Provision of temporary diversions and awareness to locals before opening new construction fronts</li> </ul>	Same as above	Construction sites	MI: Safety signs and their location  Incidents of accidents  Complaints from local people PT: Zero incident of accidents. Zero complaints.	Site inspection  Consultation with local people	Contractor	SHAJ /CSC	Being Complied	-
<b>9. Site restoration and rehabilitation</b>									
9.1 Clean-up Operations, Restoration and Rehabilitation	<ul style="list-style-type: none"> <li>Contractor will prepare site restoration plans, which will be approved by the 'Engineer'.</li> <li>The clean-up and restoration operations are to be implemented by the contractor prior to demobilization.</li> <li>All construction zones including riverbeds, culverts, road-side areas, camps, hot mix plant sites, crushers,</li> </ul>	Project requirement	Throughout the project corridor, construction camp sites and borrow areas	MI: Condition of camp, borrow areas and construction sites, Presence/ absence of construction material/debris after completion of construction works on site. PT: Clean and tidy sites. No trash or debris left on site. Site restored and leveled.	Site observation  Interaction with locals  Issue completion certificate after restoration of all sites are found satisfactory	Contractor	SHAJ /CSC	Shall be initiated before closer of Camp and Plant sites.	-



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	batching plant sites and any other area used/affected by the project will be left clean and tidy, to the satisfaction of the Environmental officer. <ul style="list-style-type: none"> <li>All the opened borrow areas will be rehabilitated and 'Engineer' will certify</li> </ul>								
<b>Operation and Maintenance stage</b>									
<b>1. Elephant Movement</b>									
1.1 Anticipated risk of vehicle-elephant collision and human-animal conflict	<ul style="list-style-type: none"> <li>Effectiveness of mitigative measures (rumble strips, informatory /cautionary signage, solar street lighting, solar dragon lights etc.) recommended in design stage shall be monitored.</li> <li>Effectiveness of habitat enhancement measures shall be evaluated</li> <li>SHAJ to keep record of all accidents.</li> <li>If it is observed after the study that elephants establish a defined movement path and cross the road at specific locations,</li> </ul>	Project Requirement	At identified elephant crossing locations	MI: No. of vehicle - elephant collision. Time (day or night, season/month and location of collision. Cause of collision. No of incidence of human – elephant conflict. PT: Zero vehicle - elephant collisions. Reduced number of human elephant conflicts. Improvement in elephant habitat coverage and quality	Site Observation  Discussion with local People  Collection of information from Forestry Department	SHAJ field offices/Forest Department	SHAJ field offices/Forest Department	Not Applicable	-



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	provision of civil structure shall be made in consultation with forest department. <ul style="list-style-type: none"> <li>Fresh assessment in case of future widening</li> </ul>								
<b>2. Air Quality</b>									
2.1 Air pollution due to due to vehicular movement	<ul style="list-style-type: none"> <li>Roadside tree plantations shall be maintained at least with 70% survival rate.</li> <li>Regular maintenance of the road will be done to ensure good surface condition</li> <li>Ambient air quality monitoring. If monitored parameters exceeds prescribed limit, suitable control measures must be taken.</li> <li>Signage's shall be provided reminding them to properly maintain their vehicles to economize on fuel consumption.</li> <li>Enforcement of vehicle emission rules in coordination with transport department or installing emission checking equipments</li> </ul>	Environmental Protection Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981	Throughout the Corridor	MI: Ambient air quality (PM10, CO,SO2 NO2)  PT: Levels are equal to or below baseline levels given in the IEE report	As per CPCB requirements  Site inspection	SHAJ	SHAJ	Not Applicable	-
<b>3. Noise</b>									



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-1</b>									
3.1 Noise due to movement of traffic	<ul style="list-style-type: none"> <li>Effective traffic management and good riding conditions shall be maintained</li> <li>Speed limitation to 20 km/hour and honking restrictions near sensitive receptors and elephant movement areas</li> <li>Construction of noise barriers near sensitive receptors with consent of local community</li> <li>The effectiveness of the multilayered plantation should be monitored and if need be, solid noise barrier shall be placed.</li> <li>Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building near road</li> </ul>	Noise Pollution (Regulation and Control) Rules,2000 and amendments thereof	Sensitive receptors as identified in IEE	MI: Noise levels  PT: Levels are equal to or below baseline levels given in the IEE report	Noise monitoring as per noise rules ,2000  Discussion with people at sensitive receptor sites	SHAJ	SHAJ	Identification of Noise Barrier location at sensitive receptors such as School, College, Hospital & Court is under Process	The contractor and CSC has been suggested to follow the ADB approved EMP while finalizing the noise barrier locations along the project road.
<b>4. Land and Soil</b>									
4.1 Soil erosion at embankment during	<ul style="list-style-type: none"> <li>Periodic checking to be carried to assess the</li> </ul>	Project requirement	At bridge locations and embankment	MI: Existence of soil erosion sites Number	On site observation	SHAJ	SHAJ	Not Applicable	-



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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility	Observation during the reporting period	Corrective action and follow up if required	Environmental Issue/Component
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-1</b>									
heavy rainfall.	effectiveness of the stabilization measures viz. turfing, stone pitching, river training structures etc... <ul style="list-style-type: none"> <li>Necessary measures to be followed wherever there are failures</li> </ul>		slopes and other probable soil erosion areas.	of soil erosion sites  PT: Zero or minimal occurrences of soil erosion					
<b>5. Water resources/Flooding and Inundation</b>									
5.1 Siltation	<ul style="list-style-type: none"> <li>Regular checks shall be made for soil erosion and turfing conditions of river training structures for its effective maintenance.</li> </ul>	Project requirement	Near surface Water bodies	MI: Water quality  PT: No turbidity of surface water bodies due to the road	Site observation			Not Applicable	-
5.2 Water logging due to blockage of drains, culverts or streams	<ul style="list-style-type: none"> <li>Regular visual checks and cleaning (at least once before monsoon) of drains to ensure that flow of water is maintained through cross drains and other channels/streams.</li> <li>Monitoring of water borne diseases due to stagnant water bodies</li> </ul>	Project requirement IRC: SP:21-2009	Near surface Water bodies/cross drains/side drains	MI: Presence/ absence of water logging along the road  PT: No record of overtopping/ Water logging	Site observation	SHAJ	SHAJ	Not Applicable	-
<b>6. Flora</b>									
6.1 Vegetation	<ul style="list-style-type: none"> <li>Planted trees, shrubs, and grasses to be properly maintained.</li> <li>The tree survival audit to be conducted at least once in a year to assess the effectiveness</li> </ul>	Forest Conservation Act 1980	Project tree plantation sites	MI: Tree/plants survival rate  PT: Minimum rate of 70% tree survival	Records and field observations. Information from Forestry Department	SHAJ/JFM/Forest Department	SHAJ/JFM/Forest Department	Not Applicable	-



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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility	Observation during the reporting period	Corrective action and follow up if required	Environmental Issue/Component
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-1</b>									
<b>7. Maintenance of Right of Way and Safety</b>									
7.1 Accident Risk due to uncontrolled growth of vegetation	<ul style="list-style-type: none"> <li>Maintain shoulder completely clear of vegetation.</li> <li>Minimum offset as prescribed in IRC:SP:21-2009 to be maintained</li> <li>Regular maintenance/ trimming of plantation along the road side</li> <li>No invasive plantation near the road</li> </ul>	Project requirement IRC: SP:21-2009	Throughout the Project route	MI: Presence and extent of vegetation growth on either side of road. Number of accidents. PT: No accidents due to vegetation growth	Visual inspection  Check accident records	SHAJ	SHAJ	Not Applicable	-
7.2 Accident risks associated with traffic movement	<ul style="list-style-type: none"> <li>Traffic control measures, including speed limits, will be enforced strictly.</li> <li>Further encroachment of squatters within the ROW will be prevented.</li> <li>No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law</li> <li>Monitor/ensure that all safety provisions included in design and construction phase are properly maintained</li> <li>Highway patrol unit(s) for round the clock patrolling. Phone booth for accidental reporting</li> </ul>	IRC:SP:55-2014	Throughout the Project route	MI: Number of accidents Conditions and existence of safety signs, rumble strips etc. on the road Presence/absence of sensitive receptor structures inside the stipulated planning line as per relevant local law  PT: Fatal and non fatal accident rate is reduced after improvement	Review accident records  Site observations	SHAJ	SHAJ	Not Applicable	-



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Environmental Issue/ Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility		Observation during the reporting period	Corrective action and follow up if required	Environmental Issue/Component
						Implementation	Supervision			
<b>Environmental Management Plan Compliance Status of Package-1</b>										
	and ambulance services with minimum response time for rescue of any accident victims, if possible. <ul style="list-style-type: none"> <li>Tow-way facility for the breakdown vehicles if possible.</li> </ul>									
7.3.Transport of Dangerous Goods	<ul style="list-style-type: none"> <li>Existence of spill prevention and control and emergency responsive system</li> <li>Emergency plan for vehicles carrying hazardous material</li> </ul>	-	Throughout the project stretch	MI: Status of emergency system – whether operational or not  PT: Fully functional emergency system	Review of spill prevention and emergency response plan Spill accident records	SHAJ	SHAJ	Not Applicable	-	

**Table-7: Environmental Management Plan Compliance Status of Package-2**

Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility		Observation during the reporting period	Corrective action and follow up if required
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
<b>A. Design and Pre-construction Stage</b>									
<b>1. Alignment</b>									
1.1 Pavement damage and inadequate drainage provisions	<ul style="list-style-type: none"> <li>Soaked CBR value of sub grade is recommended to be 12 %.</li> <li>Overloading to be</li> </ul>	Design requirement	Entire stretch Embankment raised at 18 locations for a length of 5.785	MI: Design and number of cross and side drains, slab/box culverts,	Review of detail design documents & drawings and comparison with site conditions	Design Consultant	SHAJ	Complied	Not Required



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Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility		Observation during the reporting period	Corrective action and follow up if required	
						Implementation	Supervision			
<b>Environmental Management Plan Compliance Status of Package-2</b>										
in habitat areas	<ul style="list-style-type: none"> <li>checked</li> <li>Raised embankment and provision of roadside drainage to prevent damage to pavement due to water logging on the road and also inconvenience caused to</li> <li>Provision of adequate no. of cross drainage structures.</li> <li>Increase (vent and height) in waterway of existing structures.</li> <li>Roadside drains have been proposed with suitable outfalls.</li> <li>Additional 19 culverts proposed</li> </ul>		km <b>(Appendix 4 of ADB approved IEE report)</b> Roadside drains (both sides together) Covered=24.766 km unlined=65.534 km For list of bridges with increased waterway PIs refer <b>Appendix 3 of ADB approved IEE report</b>	and Hume pipes PT: Design and numbers are in accordance with site needs						
1.2 Safety along the proposed alignment	<ul style="list-style-type: none"> <li>Provision of crash barriers at accident prone areas and high embankments.</li> <li>Rumble strips in habitat areas, schools, junction and curves to regulate speed.</li> <li>Provision of retro</li> </ul>	Design requirement  IRC:SP:84-2014 IRC:8, IRC:25, IRC:26, IRC:35, IRC:67, IRC:103 and Section 800 of MoRTH Specifications	At embankment height >3.0 m total length = 1.76 km Rumble strip = 14 locations ( 13 built-up areas, 1 junction) Signs and marking	MI: number and location of crash barriers, rumble strips, warning sign boards, sidewalks  PT: numbers and location are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Design Consultant	SHAJ	Complied	Not Required	



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Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility		Observation during the reporting period	Corrective action and follow up if required
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
	reflective warning signboards near school, hospital ,religious places and forests <ul style="list-style-type: none"> <li>Provision of sidewalks in the built-up sections, on both sides.</li> <li>Signs and marking viz., cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, etc...</li> </ul>	Horizontal geometry will be based on IRC: 38-1988 and vertical geometry will be based on IRC: SP 23-1993 “.	viz., cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, etc						
	<ul style="list-style-type: none"> <li>Pedestrian cross-walks at all Junctions and where conflict exists between vehicular and pedestrian movements (bus bays, schools and habitation.</li> <li>Safety kerb at all bridges</li> <li>Service roads in densely habituated areas</li> <li>Horizontal and vertical geometry as per IRC</li> </ul>	IRC: SP: 67-2012	Total no. of street lights=704					Complied	Not Required



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
	<ul style="list-style-type: none"> <li>Specification</li> <li>Zebra crossing with informatory warning sign on approach to school, warning sign with footways and speed limit sign</li> <li>Street Lighting in built-up sections</li> <li>Ambulance and medical aid posts</li> </ul>								
<b>2. Natural Hazards</b>									
2.2 Flooding/Waterlogging	<ul style="list-style-type: none"> <li>Provision of adequate number of CD structures. Additional culverts have been proposed.</li> <li>All CD structures designed for 50year HFL return period and bridges designed for 100 year HFL return period</li> <li>Water ways of bridges and culverts have been increased.</li> <li>Roadside drains also provided</li> <li>Embankment height raised along low lying/ potential</li> </ul>	IRC:34 Recommendations IRC:34 Recommendations for road construction in waterlogged area and IRC: 75 and MORT&H guidelines for Design of High Embankments	Embankment raised at 18 locations for a length of 5.785 km (Refer <b>Appendix 4 of ADB approved IEE report</b> ) and for list of bridges with increased waterway Pls refer <b>Appendix 3 of ADB approved IEE report</b> .	MI: Design and numbers of cross & side drains, slab/box culverts Hume pipes, road embankment height, design and number of bridges  PT: Design and numbers are in accordance with site needs	Review of design documents and drawings and comparison with site conditions		SHAJ	Complied	Not Required



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
	water logged areas • Improvement in existing culverts/ Bridges to increase their carrying capacity.								
<b>3. Loss of Land and Assets</b>									
3.1 livelihood loss to affected persons	<ul style="list-style-type: none"> <li>affected persons</li> <li>Road improvement work to be accommodated within available ROW to the extent possible.</li> <li>Social Impact Assessment and Resettlement Plan to be undertaken as per national policy and ADB' guidelines.</li> <li>Complete all necessary land and property acquisition procedures prior to the commencement of civil work.</li> <li>Adhere to the Land Acquisition procedures in accordance to RP's Entitlement Framework.</li> <li>Compensation and</li> </ul>	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation And Resettlement Act, 2013 and ADB's involuntary resettlement policy.  Contract Clause for preference to local people during employment	Throughout the corridor	MI: Payment of compensation and assistance to DPs as per RP  Number of complaints/grievances related to compensation and resettlement PT: Minimal number of complaints/grievances. All cases of resettlement and rehabilitation if any are resolved at GRC level. No case referred to arbitrator/court.	Check LA records; design drawings vs land plans;  Interview with affected persons  Check status of employment given to local people during construction	SHAJ and implementing NGO	SHAJ	Under Process	The details shall be updated in next EMR



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
	assistance as per project Resettlement Plan <ul style="list-style-type: none"> <li>Income restoration as per RP</li> <li>Preference in employment and petty</li> <li>contracts during construction to APs</li> <li>Constitute GRC as per RP</li> </ul>								
<b>4. Diversion of Forest Land and Cutting of Trees</b>									
4.1 Need for cutting of trees.	<ul style="list-style-type: none"> <li>Geometric adjustments made to minimize tree cutting.</li> <li>Obtain tree cutting permission from forest department</li> <li>Provision for mandatory compensatory afforestation (1:2) for deposit of payment to Forestry Department</li> <li>Provision for additional compensatory plantation on 1: 2 basis to be implemented by contractor through</li> </ul>	Forest Conservation Act, 1980	Throughout the corridor Total number of affected trees=1344 Diversion of Forest Land=1.354 Ha Forest land=1.354 ha	MI: Number and location of geometric adjustments made to avoid forestland and tree cutting, budget amount allocated for compensatory afforestation and additional plantation  PT: Unnecessary tree felling on forest land avoided. Budget allocation is adequate	Review final design. Check budget provision for compensatory afforestation and additional plantation.	SHAJ, Design consultants forest	department SHAH/Forest department	Under Process	-



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
	village Joint Forest Management (JFM) Committee								
<b>5. Shifting of Utilities</b>									
5.1 Disruption of utility services to local community	<ul style="list-style-type: none"> <li>All telephone and electrical poles/wires and underground cables should be shifted before start of construction</li> <li>Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services</li> <li>Local people must be informed Through appropriate means about the time of shifting of utility structures and potential disruption of services if any</li> </ul>	Project requirement	Throughout the corridor	MI: Number of complaints from local people, number, timing and type of notifications issued to local people, time taken to shift utilities PT: No. of complaints should be 0. Effective and timely notification. Minimal time for utility shifting	Interaction with concerned utility authorities and local public	Contractor/ SHAJ/utility company	SHAJ/CSC	Under Process	-
<b>B. Construction Stage</b>									
<b>1. Air Quality</b>									
1.1 Dust Generation due to construction	<ul style="list-style-type: none"> <li>Contractor to submit location</li> </ul>	MORT&H Specifications	Throughout project corridor	MI: PM10 level measurements Complaints from	Standards CPCB methods Observations Public	Contractor	SHAJ /CSC	Complied	Not Required
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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
activities and transport, storage and handling of construction materials	and layout plan for storage areas of construction materials approved by CSC <ul style="list-style-type: none"> <li>• Transport, loading and unloading of loose and fine materials through covered vehicles.</li> <li>• Paved approach roads.</li> <li>• Storage areas to be located downwind of the habitation area.</li> <li>• Water spraying on earthworks, unpaved haulage roads and other dust prone areas.</li> <li>• Provision of PPEs to workers.</li> </ul>	for Road and Bridge works Air (P and CP) Act 1974 and Central Motor and Vehicle Act 1988 General Conditions of Bid Document		locals due to dust PT: PM10 level < 100 ug/m3 Number of complaints should be 0.	consultation Review of monitoring data maintained by contractor				
1.2 Emission of air pollutants (HC,SO2,NOX,CO etc) from vehicles due to traffic congestion and use of equipment and machinery	<ul style="list-style-type: none"> <li>• Regular maintenance of machinery and equipment.</li> <li>• Batching, asphalt mixing plants and crushers at downwind (1km) direction from the nearest settlement.</li> <li>• Only crushers licensed by the</li> </ul>	The Air (Prevention and Control of Pollution) Act, 1981 (Amended 1987) and Rules 1982	Asphalt mixing plants, crushers, DG sets locations	MI: Levels of HC, SO2, NO2, and CO. Status of PUC certificates PT: SO2 and NO2 levels are both less than 80ug/m3. PUC certificate of equipment and machinery is upto date	Standards CPCB methods Review of monitoring data maintained by contractor	Contractor	SHAJ /CSC	The Environmental monitoring agency not been finalized and monitoring shall be carried out as per ADB approved monitoring Plan	Finalization of monitoring agency and initiation of Environmental monitoring



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
	<ul style="list-style-type: none"> <li>PCB shall be used</li> <li>DG sets with stacks of adequate height and use of low sulphur diesel as fuel.</li> <li>LPG should be used as fuel source in construction camps instead of wood</li> <li>Ambient air quality monitoring</li> <li>Contractor to prepare traffic management and dust suppression plan duly approved by SHAJ</li> </ul>								
<b>2. Noise</b>									
2.1 Disturbance to local residents and sensitive receptors due to excessive noise from construction activities and operation of equipment and machinery	<ul style="list-style-type: none"> <li>All equipment to be timely serviced and properly maintained.</li> <li>Construction equipment and machinery to be fitted with silencers and maintained properly.</li> <li>Only IS approved equipment shall be used for construction activities.</li> </ul>	Legal requirement Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof + Clause No 501.8.6. MORT&H Specifications for Road and Bridge works	Throughout project section especially at construction sites, residential and identified sensitive locations.  Refer Table 22 of IEE for information on sensitive receptors	MI: day and night Noise levels. Number of complaints from local people  PT: Zero complaints or no repeated complaints by local people. Average day and night time noise levels are within permissible limits for work zone	As per Noise rule, 2000  Consultation with local people  Review of noise level monitoring data maintained by contractor  Observation of construction site	Contractor	SHAJ /CSC	The Environmental monitoring agency not been finalized and monitoring shall be carried out as per ADB approved monitoring Plan	Finalization of monitoring agency and initiation of Environmental monitoring



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
	<ul style="list-style-type: none"> <li>• Timing of noisy construction activities shall be done during night time and weekend near schools,</li> <li>• Implement noisy operations intermittently to reduce the total noise generated</li> <li>• Manage existing traffic to avoid traffic jams and accumulation of noise beyond standards.</li> <li>• Restrict construction near residential, built up and forest areas construction today light hours.</li> <li>• Initiation of multi-layered plantation, to serve as mitigation option for operation phase</li> <li>• Honking restrictions near sensitive areas</li> <li>• PPEs to workers</li> <li>• Noise monitoring as per EMoP.</li> </ul>			areas					
<b>3. Land and Soil</b>									



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
3.1 Land use Change and Loss of productive / topsoil	<ul style="list-style-type: none"> <li>Non-agricultural areas to be used as borrow areas to the extent possible.</li> <li>If using agricultural land, top soil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion.</li> <li>Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original land use</li> </ul>	Project requirement	Throughout the project section and borrow areas Land identified for camp, storage areas etc.	MI: Borrow pit locations/Top soil storage area  PT: Zero complaints or disputes registered against contractor by land owner	Review borrow area plan, site visits	Contractor	SHAJ /CSC	Under Process	-
3.2 Slope failure and Soil erosion due to Construction activities, earthwork, and cut and fill, stockpiles etc.	<ul style="list-style-type: none"> <li>Bio-turfing of embankments to protect slopes.</li> <li>Slope protection by providing frames, dry stone pitching, masonry retaining walls, planting of grass and trees.</li> <li>Side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design</li> </ul>	IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2 MORT&H Specifications for Road and Bridge works Guidelines IX for Soil erosion	Throughout the entire project road especially along hilly areas	MI: Occurrence of slope failure or erosion issues  PT: No slope failures. Minimal erosion issues	Review of design documents and site observation	Design consultant and Contractor,	SHAJ /CSC	Being Complied	-



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
	specifications. Care should be taken that the slope gradient shall not be greater than 2:1. <ul style="list-style-type: none"> <li>The earth stockpiles to be provided with gentle slopes to soil erosion.</li> </ul>								
3.3 Borrow area management	<ul style="list-style-type: none"> <li>Obtain EC from SEIAA before opening any new borrow area.</li> <li>Comply to EC conditions of SEIAA</li> <li>Non-productive, barren lands, upland shall be used for borrowing earth with the necessary permissions/ consents.</li> <li>Depths of borrow pits to be regulated and sides not steeper than 25%.</li> <li>Topsoil to be stockpiled and protected for use at the rehabilitation stage.</li> <li>Transportation of</li> </ul>	IRC Guidelines on borrow areas and for quarries (Environmental protection Act and Rules, 1986; Water Act, Air Act)+Clause 305.2.2 MORTH Specifications for Road and Bridgeworks Guidelines for Borrow Areas management	Borrow sites location	MI: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of accidents. Complaints from local people.  PT: No case of non-compliance to conditions stipulated by SEIAA in clearance letter. Zero accidents. Zero complaints.	Review of design documents and site observations  Compare site conditions with EC conditions by SEIAA	Contractor	SHAJ /CSC	Identification of Borrow Area is under process and the same shall be operated after obtaining the requisite permission from competent Authority.	Contractor has been suggested to process the Borrow area permission for all identified Borrow Area



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
	earth materials through covered vehicles. <ul style="list-style-type: none"> <li>Follow IRC recommended practice for borrow pits (IRC 10: 1961) for identification of location, its operation and rehabilitation</li> <li>Borrow areas not to be dug continuously.</li> <li>To the extent borrow areas shall be sited away from habitated areas.</li> <li>Borrow areas shall be leveled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fish pond.</li> </ul>								
3.4 Quarry Operations	<ul style="list-style-type: none"> <li>Aggregates will be sourced from existing licensed quarries.</li> <li>Copies of consent/ approval / rehabilitation plan for a new quarry or use of existing</li> </ul>	Clause No.111.3 MORT&H Specifications for Road and Bridge works Guidelines VI for Quarry Areas Management Environmental	Quarry area locations	MI: Existence of licenses quarry areas from which materials to be sourced and Existence of a quarry redevelopment plan	Review of design documents, contractor documents and site observation Compliance to EC conditions in case of opening new quarries	Contractor	SHAJ /CSC	Identification of Stone Quarries is under process and the same shall be operated after obtaining the requisite permission from	Contractor has been suggested to process the Stone Quarries permission for all identified Stone Quarries



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
	source will be submitted to SHAJ. <ul style="list-style-type: none"> <li>The contractor will develop a Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the approval to EA.</li> <li>Obtain environmental clearance from SEIAA in case of opening new quarry</li> </ul>	Protection Rules		PT: Quarry license is valid.: No case of noncompliance to consent conditions and air quality meets the prescribed limit				competent Authority.	
3.5 Compaction of soil and impact on quarry haul roads due to movement of vehicles and equipment	<ul style="list-style-type: none"> <li>Construction vehicles, machinery, and equipment to be stationed in the designated ROW to avoid compaction.</li> <li>Approach roads/haulage roads shall be designed along the barren and hard soil area to reduce the compaction.</li> <li>Transportation of quarry material to the dumping site through heavy vehicles shall be done through</li> </ul>	Design requirement	Parking areas, Haulage roads and construction yards	MI: Location of approach and haulage roads Presence of destroyed/compacted agricultural land or land which has not be restored to its original condition PT: Zero occurrence of destroyed/compacted land and undestroyed land	Site observation	Contractor	SHAJ /CSC	Being Complied	-



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भारत सरकार

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility		Observation during the reporting period	Corrective action and follow up if required
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
	existing major roads to the extent possible to restrict wear and tear to the village/minor roads. <ul style="list-style-type: none"> <li>Land taken for construction camp and other temporary facility shall be restored to its original conditions</li> </ul>								
3.6 Contamination of soil due to leakage/ spillage of oil, bituminous and non-bituminous debris generated from demolition and road construction	<ul style="list-style-type: none"> <li>Construction vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil.</li> <li>Fuel storage and refueling sites to be kept away from drainage channels.</li> <li>Unusable debris shall be dumped in ditches and low lying areas.</li> <li>To avoid soil contamination oil interceptors shall be provided at wash down and refueling areas.</li> </ul>	Design requirement	Fuelling station, construction sites, and construction camps and disposal location	MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area  PT: Soil test conforming to no –contamination. No sighting of spilled oil or bitumen in construction site or camp site	Site observation	Contractor	SHAJ /CSC	The location has been finalized for disposal of unusable debris at low lying areas. The necessary No Objection Certificate has been initiated from competent Authority.	Finalization of dumping location by the contractor with consultation with CSC / SHAJ.



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Environmental Issue/Component	Remedial Measure	Reference to laws/ guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility		Observation during the reporting period	Corrective action and follow up if required
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<b>Environmental Management Plan Compliance Status of Package-2</b>									
	<ul style="list-style-type: none"> <li>Waste oil and oil soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF/SPCB authorized vendors</li> <li>Non-bituminous wastes to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit.</li> <li>Bituminous wastes will be disposed off in an identified dumping site approved by the State Pollution Control Board</li> </ul>								
<b>4. Water Resources</b>									
4.1 Sourcing of water during Construction	<ul style="list-style-type: none"> <li>Requisite permission shall be obtained for abstraction of groundwater from Central Groundwater Authority.</li> <li>Arrangements shall be made by</li> </ul>	CGWA Guidelines	Throughout the Project section  Check Dam at suitable locations	MI: Approval from competent authority Complaints from local people on water availability  PT: Valid approval from competent	Checking of documentation  Talk to local people	Contractor	SHAJ /CSC	The ground water sources has been identified and requisite permission has been initiated by the contractor.	Ground water permission from competent Authority by the contractor.
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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
	contractor that the water availability and supply to nearby communities remain unaffected. <ul style="list-style-type: none"> <li>Water intensive activities not to be undertaken during summer season.</li> <li>Provision of water harvesting structure to augment groundwater condition in the area</li> </ul>			authority. Zero complaints from local people.					
4.2 Disposal of water during construction	<ul style="list-style-type: none"> <li>Provisions shall be made to connect road side drains with existing nearby natural drains.</li> </ul>	Clause No.1010 EP Act 1986 MORT&H Specifications for Road and Bridgeworks	Throughout the Project section	MI: Condition of drainage system in construction site. Presence/ absence of water logging in project area.  PT: Existence of proper drainage system. No water logging in project area	Standards methods Site observation and review of documents	Contractor	SHAJ /CSC	Being Complied	-
4.3 Alteration in surface water hydrology	<ul style="list-style-type: none"> <li>Existing drainage system to be maintained</li> <li>And further enhanced.</li> <li>Provision shall be made for adequate</li> </ul>	Design requirement, Clause No 501.8.6. MORT&H Specifications	Near all drainage channels, river/ nallah crossings etc.	MI: Proper flow of water in existing streams and rivers  PT: No complain of water shortage	Review of design documents  Site observation	Contractor	SHAJ /CSC	Being Complied	-



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
	size and number of cross drainage structures esp. in the areas where land is sloping towards road alignment. <ul style="list-style-type: none"> <li>Road level shall be raised above HFL level wherever road level is lesser than HFL</li> <li>Culverts reconstruction shall be done during lean flow period. In some cases these minor channels may be diverted for a very short period (15-30 days) and will be bring back to its original course immediately after construction.</li> </ul>			by downstream communities. No record of overtopping/ water logging					
4.4 Siltation in water bodies due to construction activities /earthwork	<ul style="list-style-type: none"> <li>Embankment slopes to be modified suitably to restrict the soil debris entering water bodies.</li> <li>Provision of Silt fencing shall be made at water bodies.</li> <li>Silt/sediment</li> </ul>	Design requirement, ClauseNo501.8. 6.MORT&H Specifications for Road and Br edge works  Worldwide bester actives	Near all water bodies /waterway Refer Table 15.  Retaining wall=140m	MI: Presence /absence of siltation in rivers, streams, ponds and other water bodies in project area. Turbidity test levels  PT: No records of siltation due to	Field observation	Contractor	SHAJ /CSC	Being Complied	-



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<b>Environmental Management Plan Compliance Status of Package-2</b>									
	<p>should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated.</p> <ul style="list-style-type: none"> <li>Earthworks and stone works to be prevented from impeding natural flow of rivers, streams and water canals or existing drainage system.</li> <li>Retaining walls at water bodies /ponds to avoid siltation near ponds</li> </ul>			<p>project activities. Surface water quality tests confirm to turbidity and TSS limit</p>					
4.5 Deterioration in Surface water quality due to leakage from vehicles and equipment's and waste from construction camps	<ul style="list-style-type: none"> <li>No vehicles or equipment should be parked or refueled near water-bodies, so as to avoid contamination from fuel and lubricants.</li> <li>Oil and grease traps and fuelling platforms to be provided at re-fuelling locations.</li> <li>All chemicals and oil shall be stored away from water and concreted</li> </ul>	The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof.	Water bodies, refueling stations, construction camps.	<p>MI: Water quality of ponds, streams, rivers and other water bodies in project</p> <p>Presence of oil floating in water bodies in project area</p> <p>PT: Surface water quality meets freshwater quality standards prescribed by CPCB</p>	<p>Conduction of water quality tests as per the monitoring plan</p> <p>Field observation</p>	Contractor	SHAJ /CSC	The Environmental monitoring agency not been finalized and monitoring shall be carried out as per ADB approved monitoring Plan	Finalization of monitoring agency and initiation of Environmental monitoring



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<b>Environmental Management Plan Compliance Status of Package-2</b>									
	platform with catchment pit for spills collection. <ul style="list-style-type: none"> <li>All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language emergency response procedure, including reporting, will be provided by the contractors.</li> <li>Construction camp to be sited away from water bodies.</li> <li>Wastes must be collected, stored and taken to approve disposal site only.</li> <li>Water quality shall be monitored</li> </ul>								
<b>5. Flora and Fauna</b>									
5.1 Vegetation loss due to site	<ul style="list-style-type: none"> <li>Restrict tree cutting upto toe line</li> </ul>	Forest Conservation	Throughout project corridor	MI: ROW width Number of trees	Review of relevant documents – tree	Mandatory Compensatory	SHAJ /CSC	Shall be initiated after	Compensatory afforestation
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<b>Environmental Management Plan Compliance Status of Package-2</b>									
preparation and construction activities	considering safety to road users. <ul style="list-style-type: none"> <li>Roadside trees to be removed with prior approval of competent authority.</li> <li>Mandatory compensatory plantation at 1:2 basis by Forestry Department</li> <li>Additional compensatory plantation 1:2 as per the IRC by contractor in partnership with respective village JFM Committee. Local villagers to be employed for afforestation activities. Employment preference to women</li> <li>Regular maintenance trees planted.</li> <li>Provision of LPG in construction camp as fuel source to avoid tree cutting.</li> <li>Plantation of trees on both sides of the road where</li> </ul>	Act1980 + IRC:SP:21 and IRC:SP:66	Estimated No. of affected tree=1344 Additional Plantation near Sensitive receptors, river banks, borrow areas	for felling Compensatory plantation plan Number of trees replanted.  PT: Additional compensatory afforestation done on a 1:2 basis by contractor through JFM. Number of trees planted is double the number of trees removed. Tree survival rate is at least 70%.	cutting permit, compensatory plantation plan. Meeting with JFM Committee members  Field observations	plantation by forest Department and Additional plantation by contractor in partnership with respective local JFM Committee		finalization of Tree cutting details	against tree cutting.



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	technically feasible. Trees should be offset 1m back from the ultimate edge of the roadway to prevent safety hazard and provide adequate sight distance. <ul style="list-style-type: none"> <li>Integrate vegetation management (IVM) with the carriage way completely clear of vegetation.</li> <li>Additional plantation near sensitive receptors, river banks to minimize noise &amp; air pollution, and to check erosion.</li> <li>Controlled use of pesticides/ fertilizers</li> </ul>								
<b>6. Construction Camps</b>									
6.1 Impact associated with location	<ul style="list-style-type: none"> <li>All camps should be established with prior permission from PCB. Camps to maintain minimum distance from following: # 500 m from</li> </ul>	Design Requirement The Water (Prevention and Control of Pollution) Act, 1974 and its	All construction camps	MI: Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and construction	On site observation  Interaction with workers and local community	Contractor and EO	SHAJ /CSC	Being Complied	-



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	habitation # 500 m from forest areas where possible # 500 m from water bodies where possible # 500 m from through traffic route # 500 m from identified elephant movement locations	amendments thereof		camps PT: Distance of campsite is less than 500m from listed locations					
6.2 Worker's Health in construction camp	<ul style="list-style-type: none"> <li>The location, layout and basic facility provision of each labor camp will be submitted to CSC and approved b EA. The contractor will maintain necessary living accommodation and ancillary facilities in hygienic manner.</li> <li>Adequate water and sanitary latrines with septic tanks with soak pits shall be provided.</li> <li>Preventive medical facilities in camp</li> <li>Waste disposal facilities such as dust bins must be</li> </ul>	The Building and Other Construction workers (Regulation of Employment and Conditions of service) Act 1996 and The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof	All construction camps	MI: Camp health records  Existence of proper first aid kit in camp site  Complaints from workers.  PT: No record of illness due to unhygienic conditions or vectors. Zero cases of STD. Clean and tidy camp site conditions.	Camp records  Site observation  Consultation with contractor workers and local people living nearby	Contractor	SHAJ /CSC	Being Complied	-



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	<p>provided in the camps and regular disposal of waste The Contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations.</p> <ul style="list-style-type: none"> <li>No liquor or prohibited drugs will be imported to, sell, give and barter to the workers of host community.</li> <li>Awareness raising to immigrant workers/local community on communicable and sexually transmitted diseases.</li> </ul>								
<b>7. Management of Construction Waste/Debris</b>									
7.1 Selection of Dumping Sites	<ul style="list-style-type: none"> <li>Contractor to submit a waste/spoil disposal plan and get it approved by CSC and EA.</li> <li>Create controlled</li> </ul>	Design Requirement, MORT&H guidelines and General Conditions of Contract	At all Dumping/Disposal Sites	MI: Location of dumping sites Number of public complaints.  PT: No public complaints.	Field survey and interaction with local people. Review of consent letter	Contractor	SHAJ /CSC	Selection of Dumping Site is under Process	The identified dumping site shall be approved by CSC / SHAJ before its utilization



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	dumping sites with a non-permeable lining incorporated in the pit design to avoid leachate seepage into the soil, which may later affect ground water quality <ul style="list-style-type: none"> <li>• Unproductive/waste lands shall be selected for dumping sites away from residential areas and water bodies</li> <li>• Dumping sites must be having adequate capacity equal to the amount of debris generated.</li> <li>• Public perception and consent from the village Panchayats has to be obtained before finalizing the location</li> </ul>	Document		Consent letters for all dumping sites available with contractor					
7.2 Reuse and disposal of construction and dismantled waste	<ul style="list-style-type: none"> <li>• The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites</li> </ul>	Design Requirement, MORT&H guidelines and General Conditions of Contract Document	Throughout the project corridor	MI: Percentage of reuse of existing surface material  Method and location of disposal site of construction	Contractor records  Field observation  Interaction with local people	Contractor	SHAJ /CSC	Selection of Dumping Site is under Process	The identified dumping site shall be approved by CSC / SHAJ before its utilization



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						Implementation	Supervision			
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	and camps, temporary traffic diversions, and haulage routes. <ul style="list-style-type: none"> <li>All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping.</li> <li>Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority.</li> <li>The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal, MORTH guidelines should be followed.</li> <li>Unusable and surplus materials,</li> </ul>			debris  PT: No public complaint and consent letters for all dumping sites available with contractor or CSC						



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	as determined by the Project Engineer, will be removed and disposed off-site.								
<b>8. Traffic Management and Safety</b>									
8.1 Management of existing traffic and safety	<ul style="list-style-type: none"> <li>Traffic Management Plan shall be submitted by the contractor and approved by the CSC.</li> <li>The traffic control plans shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Timing and scheduling to be done so that transportation of dangerous goods is done during least number of people and other vehicles on the road.</li> <li>The Contractor will ensure that the</li> </ul>	Design requirement and IRC: SP: 27 - 1984, Report Containing Recommendation of IRC Regional Workshops on Highway Safety IRC:SP: 32 -1988 Road Safety for Children (5-12 Years Old) in Construction Zones IRC:SP:55-2014 The Building and other Construction workers Act 1996 and Cess Act of 1996 Factories Act 1948+Section 6 of Employer's Requirement of Bid Document	Throughout the project corridor especially at intersections	MI: Traffic management plan. Presence/ absence of safety signs, traffic demarcations, flag men etc. on site. Complaints from road users. No of accidents PT: No complaints. No accidents due to poor traffic management. Traffic signs, demarcation lines etc. present in appropriate locations on site	Review traffic management plan Field observation of traffic management and safety system  Interaction with people in vehicles using the road	Contractor	SHAJ /CSC	Under Process	The contractor has been suggested to submit the Traffic Management Plan and get it approved from CSC.



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	diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed. <ul style="list-style-type: none"> <li>• Restriction of construction activity to only one side of the existing road</li> <li>• The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer".</li> <li>• Use of adequate signage's to ensure traffic management and safety. Conduct of regular safety audit</li> </ul>								



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<b>Environmental Management Plan Compliance Status of Package-2</b>									
	on safety measures.								
8.2 Pedestrians, animal movement	<ul style="list-style-type: none"> <li>Temporary access and diversion, with proper drainage facilities.</li> <li>Access to the schools, temples and other public places must be maintained when construction takes place near them.</li> <li>Fencing wherever cattle movement is expected.</li> <li>Large number of box culverts has been proposed. All structures having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals</li> </ul>	Same as above	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	MI: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local people  PT: Easy access to schools, temples and public places. Zero complaints	Field Observation Interaction with local people	Contractor	SHAJ /CSC	Under Process	-
8.3 Safety of Workers and accident risk from construction activities	<ul style="list-style-type: none"> <li>Contractors to adopt and maintain safe working practices.</li> <li>Usage of fluorescent and retro refractory signage, in local</li> </ul>	Same as above	Construction sites	MI: Availability of Safety gears to workers  Safety signage Training records on safety  Number of safety	Site observation  Review records on safety training and accidents  Interact with construction workers	Obligation of Contractor	SHAJ/CSC	Being Complied	-



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<b>Environmental Management Plan Compliance Status of Package-2</b>									
	language at the construction sites <ul style="list-style-type: none"> <li>• Training to workers on safety procedures and precautions.</li> <li>• Mandatory appointment of safety officer.</li> <li>• All regulations regarding safe scaffolding, ladders, working platforms, gangway, stair wells, excavations, trenches and safe means of entry and egress shall be complied with.</li> <li>• Provision of PPEs to workers.</li> <li>• Provision of a readily available first aid unit including an adequate supply of dressing materials.</li> <li>• The contractor will not employ any person below the age of 18years</li> <li>• Use of hazardous material should be minimized and/or restricted.</li> </ul>			related accidents  PT: Zero fatal accidents. Zero or minor nonfatal accidents.					



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	<ul style="list-style-type: none"> <li>Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or emergencies.</li> <li>Accident Prevention Officer must be appointed by the contractor.</li> </ul>								
8.4 Accident risk to local community	<ul style="list-style-type: none"> <li>Restrict access to construction sites only to authorized personnel.</li> <li>Physical separation must be provided for movement of vehicular and human traffic.</li> <li>Adequate signage must be provided for safe traffic movement</li> <li>Provision of temporary diversions and awareness to locals before opening new construction fronts</li> </ul>	Same as above	Construction sites	MI: Safety signs and their location  Incidents of accidents  Complaints from local people PT: Zero incident of accidents. Zero complaints.	Site inspection  Consultation with local people	Contractor	SHAJ /CSC	Being Complied	-
<b>9. Site restoration and rehabilitation</b>									
9.1 Clean-up Operations, Restoration and	<ul style="list-style-type: none"> <li>Contractor will prepare site restoration plans,</li> </ul>	Project requirement	Throughout the project corridor, construction	MI: Condition of camp, borrow areas and	Site observation  Interaction with	Contractor	SHAJ /CSC	Shall be initiated before closer of Camp	-



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
Rehabilitation	which will be approved by the 'Engineer'. <ul style="list-style-type: none"> <li>The clean-up and restoration operations are to be implemented by the contractor prior to demobilization.</li> <li>All construction zones including riverbeds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, to the satisfaction of the Environmental officer.</li> <li>All the opened borrow areas will be rehabilitated and 'Engineer' will certify</li> </ul>		camp sites and borrow areas	construction sites, Presence/ absence of construction material/debris after completion of construction works on site. PT: Clean and tidy sites. No trash or debris left on site. Site restored and leveled.	locals  Issue completion certificate after restoration of all sites are found satisfactory			and Plant sites.	
<b>Operation and Maintenance stage</b>									
<b>1. Air Quality</b>									
1.1 Air pollution due to due to vehicular movement	<ul style="list-style-type: none"> <li>Roadside tree plantations shall be maintained at least with 70% survival rate.</li> </ul>	Environmental Protection Act, 1986; The Air (Prevention and	Throughout the Corridor	MI: Ambient air quality (PM10, CO,SO2 NO2)  PT: Levels are	As per CPCB requirements  Site inspection	SHAJ	SHAJ	Not Applicable	-



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
	<ul style="list-style-type: none"> <li>Regular maintenance of the road will be done to ensure good surface condition</li> <li>Ambient air quality monitoring. If monitored parameters exceeds prescribed limit, suitable control measures must be taken.</li> <li>Signage's shall be provided reminding them to properly maintain their vehicles to economize on fuel consumption.</li> <li>Enforcement of vehicle emission rules in coordination with transport department or installing emission checking equipment's</li> </ul>	Control of Pollution) Act, 1981		equal to or below baseline levels given in the IEE report					
<b>2. Noise</b>									
2.1 Noise due to movement of traffic	<ul style="list-style-type: none"> <li>Effective traffic management and good riding conditions shall be maintained</li> </ul>	Noise Pollution (Regulation and Control) Rules,2000 and amendments	Sensitive receptors as identified in IEE	MI: Noise levels  PT: Levels are equal to or below baseline levels	Noise monitoring as per noise rules ,2000  Discussion with people at sensitive	SHAJ	SHAJ	Identification of Noise Barrier location at sensitive receptors such as School,	The contractor and CSC has been suggested to follow the ADB approved EMP while



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
	<ul style="list-style-type: none"> <li>Speed limitation to 20 km/hour and honking restrictions near sensitive receptors and elephant movement areas</li> <li>Construction of noise barriers near sensitive receptors with consent of local community</li> <li>The effectiveness of the multilayered plantation should be monitored and if need be, solid noise barrier shall be placed.</li> <li>Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building near road</li> </ul>	thereof		given in the IEE report	receptor sites			College, Hospital & Court is under Process	finalizing the noise barrier locations along the project road.
<b>3. Land and Soil</b>									
3.1 Soil erosion at embankment during heavy	<ul style="list-style-type: none"> <li>Periodic checking to be carried to assess the</li> </ul>	Project requirement	At bridge locations and embankment	MI: Existence of soil erosion sites Number of soil	On site observation	SHAJ	SHAJ	Not Applicable	-



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
rainfall.	effectiveness of the stabilization measures viz. turfing, stone pitching, river training structures etc <ul style="list-style-type: none"> <li>Necessary measures to be followed wherever there are failures</li> </ul>		slopes and other probable soil erosion areas.	erosion sites  PT: Zero or minimal occurrences of soil erosion					
<b>4. Water resources/Flooding and Inundation</b>									
4.1 Siltation	<ul style="list-style-type: none"> <li>Regular checks shall be made for soil erosion and turfing conditions of river training structures for its effective maintenance.</li> </ul>	Project requirement	Near surface Water bodies	MI: Water quality  PT: No turbidity of surface water bodies due to the road	Site observation			Not Applicable	-
4.2 Water logging due to blockage of drains, culverts or streams	<ul style="list-style-type: none"> <li>Regular visual checks and cleaning (at least once before monsoon) of drains to ensure that flow of water is maintained through cross drains and other channels/ stream.</li> <li>Monitoring of water borne diseases due to stagnant water bodies</li> </ul>	Project requirement IRC: SP:21-2009	Near surface Water bodies/cross drains/side drains	MI: Presence/ absence of water logging along the road  PT: No record of overtopping/ Water logging	Site observation	SHAJ	SHAJ	Not Applicable	-
<b>5. Flora</b>									



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
5.1 Vegetation	<ul style="list-style-type: none"> <li>Planted trees, shrubs, and grasses to be properly maintained.</li> <li>The tree survival audit to be conducted at least once in a year to assess the effectiveness</li> </ul>	Forest Conservation Act 1980	Project tree plantation sites	MI: Tree/plants survival rate PT: Minimum rate of 70% tree survival	Records and field observations. Information from Forestry Department	SHAJ/JFM/Forest Department	SHAJ/JFM/Forest Department	Not Applicable	-
<b>6. Maintenance of Right of Way and Safety</b>									
6.1 Accident Risk due to uncontrolled growth of vegetation	<ul style="list-style-type: none"> <li>Maintain shoulder completely clear of vegetation.</li> <li>Minimum offset as prescribed in IRC:SP:21-2009 to be maintained</li> <li>Regular maintenance/trimming of plantation along the road side</li> <li>No invasive plantation near the road</li> </ul>	Project requirement IRC: SP:21-2009	Throughout the Project route	MI: Presence and extent of vegetation growth on either side of road. Number of accidents. PT: No accidents due to vegetation growth	Visual inspection  Check accident records	SHAJ	SHAJ	Not Applicable	-
6.2 Accident risks associated with traffic movement	<ul style="list-style-type: none"> <li>Traffic control measures, including speed limits, will be enforced strictly.</li> <li>Further encroachment of squatters within the ROW will be prevented.</li> </ul>	IRC:SP:55-2014	Throughout the Project route	MI: Number of accidents Conditions and existence of safety signs, rumble strips etc. on the road Presence/absence of sensitive receptor	Review accident records  Site observations	SHAJ	SHAJ	Not Applicable	-



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						Implementation	Supervision			
<b>Environmental Management Plan Compliance Status of Package-2</b>										
	<ul style="list-style-type: none"> <li>No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law</li> <li>Monitor/ensure that all safety provisions included in design and construction phase are properly maintained</li> <li>Highway patrol unit(s) for round the clock patrolling. Phone booth for accidental reporting and ambulance services with minimum response time for rescue of any accident victims, if possible.</li> <li>Tow-way facility for the breakdown vehicles if possible</li> </ul>			structures inside the stipulated planning line as per relevant local law  PT: Fatal and non fatal accident rate is reduced after improvement						
6.3.Transport of Dangerous Goods	<ul style="list-style-type: none"> <li>Existence of spill prevention and control and emergency responsive system</li> <li>Emergency plan for vehicles</li> </ul>	-	Throughout the project stretch	MI: Status of emergency system – whether operational or not  PT: Fully functional	Review of spill prevention and emergency response plan Spill accident records	SHAJ	SHAJ	Not Applicable	-	



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-2</b>									
	carrying hazardous material			emergency system					

**Table-8: Environmental Management Plan Compliance Status of Package-3**

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility		Observation during the reporting period	Corrective action and follow up if required
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
<b>A. Design and Pre-construction Stage</b>									
<b>1. Alignment</b>									
1.1 Pavement damage and inadequate drainage provisions in habitat areas	<ul style="list-style-type: none"> <li>Soaked CBR value of sub grade is recommended to be 12 %.</li> <li>Overloading to be checked</li> <li>Raised embankment and provision of roadside drainage to prevent damage to pavement due to water logging on the road and also inconvenience caused to</li> <li>Provision of adequate no. of cross drainage structures.</li> <li>Increase (vent and height) in</li> </ul>	Design requirement	Embankment raised at 18 locations for a length of 3.700 km <b>(Refer Appendix 4 of ADB approved IEE report)</b> Roadside drains (both sides together) Covered=4.6 km Unlined=82.5 km For list of bridges with increased waterway <b>Pls refer Appendix 3 of ADB approved</b>	MI: Design and number of cross and side drains, slab/box culverts, and Hume pipes PT: Design and numbers are in accordance with site needs	Review of detail design documents & drawings and comparison with site conditions	Design Consultant	SHAJ	Complied	Not Required



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Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility		Observation during the reporting period	Corrective action and follow up if required
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	waterway of existing structures. <ul style="list-style-type: none"> <li>Roadside drains have been proposed with suitable outfalls.</li> <li>Additional 19 culverts proposed</li> </ul>		IEE report						
1.2 Safety along the proposed alignment	<ul style="list-style-type: none"> <li>Provision of crash barriers at accident prone areas and high embankments.</li> <li>Rumble strips in habitat areas, schools, junction and curves to regulate speed.</li> <li>Provision of retro reflective warning signboards near school, hospital ,religious places and forests</li> <li>Provision of sidewalks in the built-up sections, on both sides.</li> <li>Signs and marking viz., cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations,</li> </ul>	Design requirement  IRC:SP:84-2014 IRC:8, IRC:25, IRC:26, IRC:35, IRC:67, IRC:103 and Section 800 of MoRTH Specifications  Horizontal geometry will be based on IRC: 38-1988 and vertical geometry will be based on IRC: SP 23-1993 ".	At embankment height >3.0 m total length = 3.0 km Rumble strip = 31 locations ( 19 builtup areas, 8 school, 4 junctions) Total 1863 road delineators/chevron/object markers Length of Guard rails=3.155 Km Service Road for, 1.4 km length at Total no. of street lights=776	MI: number and location of crash barriers, rumble strips, warning sign boards, sidewalks  PT: numbers and location are in accordance with site needs	Review of design documents and drawings and comparison with site conditions	Design Consultant	SHAJ	Complied	Not Required



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	pedestrian guardrails, etc								
	<ul style="list-style-type: none"> <li>• Pedestrian cross-walks at all Junctions and where conflict exists between vehicular and pedestrian movements (bus bays, schools and habitation.</li> <li>• Safety kerb at all bridges</li> <li>• Service roads in densely habitated areas</li> <li>• Horizontal and vertical geometry as per IRC Specification</li> <li>• Zebra crossing with informatory warning sign on approach to school, warning sign with footways and speed limit sign</li> <li>• Street Lighting in built-up sections</li> <li>• Ambulance and medical aid posts</li> </ul>	IRC: SP: 67-2012	Total no. of street lights=704					Complied	Not Required
<b>2. Natural Hazards</b>									
2.2 Flooding/Waterlogg	<ul style="list-style-type: none"> <li>• Provision of adequate number</li> </ul>	IRC:34 Recommendation	Entire stretch. Embankment	MI: Design and numbers of cross	Review of design documents and		SHAJ	Complied	Not Required



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						Implementation	Supervision			
<b>Environmental Management Plan Compliance Status of Package-3</b>										
ing	of CD structures. Additional culverts have been proposed. <ul style="list-style-type: none"> <li>All CD structures designed for 50year HFL return period and bridges designed for 100 year HFL return period</li> <li>Water ways of bridges and culverts have been increased.</li> <li>Roadside drains also provided</li> <li>Embankment height raised along low lying/ potential water logged areas</li> <li>Improvement in existing culverts/ Bridges to increase their carrying capacity.</li> </ul>	ns IRC:34 IRC:34 Recommendations for road construction in waterlogged area and IRC: 75 and MORT&H guidelines for Design of High Embankments	raised at 18 locations for a length of 3.700 km <b>(Refer Appendix 4 of ADB approved IEE report</b> Roadside drains (both sides together) Covered=4.6 km Unlined=82.5 km For list of bridges with increased waterway <b>Pls Refer Appendix 3 of ADB approved IEE report</b>	& side drains, slab/box culverts Hume pipes, road embankment height, design and number of bridges  PT: Design and numbers are in accordance with site needs	drawings and comparison with site conditions					
<b>3. Loss of Land and Assets</b>										
3.1 livelihood loss to affected persons	<ul style="list-style-type: none"> <li>affected persons</li> <li>Road improvement work to be accommodated within available ROW to the extent possible.</li> <li>Social Impact Assessment and</li> </ul>	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation And Resettlement	Throughout the corridor	MI: Payment of compensation and assistance to DPs as per RP  Number of complaints/grievances related to compensation	Check LA records; design drawings vs land plans;  Interview with affected persons  Check status of employment given to	SHAJ and implementing NGO	SHAJ	Under Process	The details shall be updated in next EMR	



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	Resettlement Plan to be undertaken as per national policy and ADB' guidelines. <ul style="list-style-type: none"> <li>Complete all necessary land and property acquisition procedures prior to the commencement of civil work.</li> <li>Adhere to the Land Acquisition procedures in accordance to RP's Entitlement Framework.</li> <li>Compensation and assistance as per project Resettlement Plan</li> <li>Income restoration as per RP</li> <li>Preference in employment and petty</li> <li>contracts during construction to APs</li> <li>Constitute GRC as per RP</li> </ul>	Act, 2013 and ADB's involuntary resettlement policy.  Contract Clause for preference to local people during employment		and resettlement PT: Minimal number of complaints/grievances. All cases of resettlement and rehabilitation if any are resolved at GRC level. No case referred to arbitrator/court.	local people during construction				
<b>4. Diversion of Forest Land and Cutting of Trees</b>									
4.1 Need for cutting of trees.	<ul style="list-style-type: none"> <li>Geometric adjustments made</li> </ul>	Forest Conservation	Throughout the corridor	MI: Number and location of	Review final design. Check budget	SHAJ, Design consultants forest	department SHAH/Forest	Under Process	-



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	to minimize tree cutting. <ul style="list-style-type: none"> <li>Obtain tree cutting permission from forest department</li> <li>Provision for mandatory compensatory afforestation (1:2) for deposit of payment to Forestry Department</li> <li>Provision for additional compensatory plantation on 1: 2 basis to be implemented by contractor through village Joint Forest Management (JFM) Committee</li> </ul>	Act, 1980	Total number of affected trees=1957 Additional Plantation near sensitive receptors, river banks, borrow areas Forest Land 0.5 Ha	geometric adjustments made to avoid forestland and tree cutting, budget amount allocated for compensatory afforestation and additional plantation  PT: Unnecessary tree felling on forest land avoided. Budget allocation is adequate	provision for compensatory afforestation and additional plantation.		department		
<b>5. Elephant Movement</b>									
5.1 Road design causing disruption in elephant movement/ Vehicle- Elephant collision and Human-Elephant Conflict	<ul style="list-style-type: none"> <li>Provision for rumble strip, cautionary</li> <li>sign boards for speed limits up to 30</li> <li>Kmph on both sides with gentle side</li> <li>slope and turfing for easy movement</li> </ul>	Project Requirement	Sangramdih village, Domunda village, Kolhar village, pond on RHS near Kamalpur/Gadi-Tundi and Tundi petrol pump, Barakar River, Pandri village	MI: budget allocation for rumble strips, cautionary and informatory sign boards, solar street lamps, solar dragon lamps, habitat enhancement and conservation	Review of bid documents and project budget plan	SHAJ, Design Consultant	SHAJ/CSC in coordination with Forest Department	Review under process by CSC Wild Life Specialist	Provision for additional conservation measures to be taken after elephant study that will be conducted by the CSC Wildlife Specialist.



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	<ul style="list-style-type: none"> <li>• of Elephant.</li> <li>• <input type="checkbox"/> Provision for solar Street Lights in</li> <li>• communities near elephant crossing</li> <li>• areas to keep the elephants away</li> <li>• <input type="checkbox"/> Provision for supply of solar dragon</li> <li>• light to local Joint Forest Management</li> <li>• Committees in villages near elephant</li> <li>• crossing areas for use to chase away</li> <li>• elephants</li> <li>• <input type="checkbox"/> Provision for habitat enhancement viz.</li> <li>• plantation of fodder plants in forest</li> <li>• areas, through Joint Forest Management (JFM).</li> <li>• <input type="checkbox"/> Provision for additional conservation</li> <li>• measures to be taken after elephant</li> <li>• study that will be</li> </ul>		and Usri River No of Solar street lights=59 Rumble Strips =12 Informatory sign boards=12 Cautionary Sign boards=12	activities PT: Budget amount is enough to fulfill the installation and construction of recommended facilities and structures					



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	<ul style="list-style-type: none"> <li>conducted by the</li> <li>CSC Wildlife Specialist.</li> </ul>								
<b>6. Shifting of Utilities</b>									
6.1 Disruption of utility services to local community	<ul style="list-style-type: none"> <li>All telephone and electrical poles/wires and underground cables</li> <li>should be shifted before start of construction</li> <li><input type="checkbox"/> Necessary permission and payments</li> <li>should be made to relevant utility service agencies to allow quick shifting and restoration of utility services</li> <li><input type="checkbox"/> Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any</li> </ul>	Project requirement	Throughout the corridor	MI: Number of complaints from local people, number, timing and type of notifications issued to local people, time taken to shift utilities PT: No. of complaints should be 0. Effective and timely notification. Minimal time for utility shifting	Interaction with concerned utility authorities and local public	Contractor/ SHAJ/utility company	SHAJ/CSC	Under Process	-
<b>B. Construction Stage</b>									
<b>1. Air Quality</b>									
1.1 Dust Generation due to	<ul style="list-style-type: none"> <li>Contractor to submit location</li> </ul>	MORT&H	Throughout project corridor	MI: PM10 level measurements	Standards CPCB methods	Contractor	SHAJ /CSC	Complied	Not Required
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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
construction activities and transport, storage and handling of construction materials	and layout plan for storage areas of construction materials approved by CSC <ul style="list-style-type: none"> <li>• Transport, loading and unloading of loose and fine materials through covered vehicles.</li> <li>• Paved approach roads.</li> <li>• Storage areas to be located downwind of the habitation area.</li> <li>• Water spraying on earthworks, unpaved haulage roads and other dust prone areas.</li> <li>• Provision of PPEs to workers.</li> </ul>	Specifications for Road and Bridge works Air (P and CP) Act 1974 and Central Motor and Vehicle Act 1988 General Conditions of Bid Document		Complaints from locals due to dust  PT: PM10 level < 100 ug/m3 Number of complaints should be 0.	Observations Public consultation  Review of monitoring data maintained by contractor				
1.2 Emission of air pollutants (HC, SO <sub>2</sub> , NO <sub>x</sub> , CO etc) from vehicles due to traffic congestion and use of equipment and machinery	<ul style="list-style-type: none"> <li>• Regular maintenance of machinery and equipment.</li> <li>• Batching, asphalt mixing plants and crushers at downwind (1km) direction from the nearest settlement.</li> <li>• Only crushers licensed by the</li> </ul>	The Air (Prevention and Control of Pollution) Act, 1981 (Amended 1987) and Rules 1982	Asphalt mixing plants, crushers, DG sets locations	MI: Levels of HC, SO <sub>2</sub> , NO <sub>2</sub> , and CO. Status of PUC certificates  PT: SO <sub>2</sub> and NO <sub>2</sub> levels are both less than 80ug/m <sup>3</sup> . PUC certificate of equipment and machinery is upto	Standards CPCB methods  Review of monitoring data maintained by contractor	Contractor	SHAJ /CSC	The Environmental monitoring agency not been finalized and monitoring shall be carried out as per ADB approved monitoring Plan	Finalization of monitoring agency and initiation of Environmental monitoring



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Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility		Observation during the reporting period	Corrective action and follow up if required
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	<ul style="list-style-type: none"> <li>PCB shall be used</li> <li>DG sets with stacks of adequate height and use of low sulphur diesel as fuel.</li> <li>LPG should be used as fuel source in construction camps instead of wood</li> <li>Ambient air quality monitoring</li> <li>Contractor to prepare traffic management and dust suppression plan duly approved by SHAJ</li> </ul>			date					
<b>2. Noise</b>									
2.1 Disturbance to local residents and sensitive receptors due to excessive noise from construction activities and operation of equipment and machinery	<ul style="list-style-type: none"> <li>All equipment to be timely serviced and properly maintained.</li> <li>Construction equipment and machinery to be fitted with silencers and maintained properly.</li> <li>Only IS approved equipment shall be used for construction activities.</li> </ul>	Legal requirement Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof + Clause No 501.8.6. MORT&H Specifications for Road and Bridge works	Throughout project section especially at construction sites, residential and identified sensitive locations.  Refer Table 23 of IEE for information on sensitive receptors	MI: day and night Noise levels. Number of complaints from local people  PT: Zero complaints or no repeated complaints by local people. Average day and night time noise levels are within permissible limits	As per Noise rule, 2000  Consultation with local people  Review of noise level monitoring data maintained by contractor  Observation of construction site	Contractor	SHAJ /CSC	The Environmental monitoring agency not been finalized and monitoring shall be carried out as per ADB approved monitoring Plan	Finalization of monitoring agency and initiation of Environmental monitoring



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	<ul style="list-style-type: none"> <li>• Timing of noisy construction activities shall be done during night time and weekend near schools,</li> <li>• Implement noisy operations intermittently to reduce the total noise generated</li> <li>• Manage existing traffic to avoid traffic jams and accumulation of noise beyond standards.</li> <li>• Restrict construction near residential, built up and forest areas construction today light hours.</li> <li>• Initiation of multi-layered plantation, to serve as mitigation option for operation phase</li> <li>• Honking restrictions near sensitive areas</li> <li>• PPEs to workers</li> <li>• Noise monitoring as per EMoP.</li> </ul>			for work zone areas					



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<b>3. Land and Soil</b>									
3.1 Land use Change and Loss of productive / topsoil	<ul style="list-style-type: none"> <li>Non-agricultural areas to be used as borrow areas to the extent possible.</li> <li>If using agricultural land, top soil to be preserved and laid over either on the embankment slope for growing vegetation to protect soil erosion.</li> <li>Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original landuse</li> </ul>	Project requirement	Throughout the project section and borrow areas Land identified for camp, storage areas etc.	MI: Borrow pit locations/Top soil storage area  PT: Zero complaints or disputes registered against contractor by land owner	Review borrow area plan, site visits	Contractor	SHAJ /CSC	Under Process	-
3.2 Slope failure and Soil erosion due to Construction activities, earthwork, and cut and fill, stockpiles etc.	<ul style="list-style-type: none"> <li>Bio-turfing of embankments to protect slopes.</li> <li>Slope protection by providing frames, dry stone pitching, masonry retaining walls, planting of grass and trees.</li> <li>Side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and</li> </ul>	IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2 MORT&H Specifications for Road and Bridge works Guidelines IX for	Throughout the entire project road especially along hilly areas	MI: Occurrence of slope failure or erosion issues  PT: No slope failures. Minimal erosion issues	Review of design documents and site observation	Design consultant and Contractor,	SHAJ /CSC	Being Complied	-



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	shrub as per design specifications. Care should be taken that the slope gradient shall not be greater than 2:1. <ul style="list-style-type: none"> <li>The earth stockpiles to be provided with gentle slopes to soil erosion.</li> </ul>	Soil erosion							
3.3 Borrow area management	<ul style="list-style-type: none"> <li>Obtain EC from SEIAA before opening any new borrow area.</li> <li>Comply to EC conditions of SEIAA</li> <li>Non-productive, barren lands, upland shall be used for borrowing earth with the necessary permissions/consents.</li> <li>Depths of borrow pits to be regulated and sides not steeper than 25%.</li> <li>Topsoil to be stockpiled and protected for use at the rehabilitation</li> </ul>	IRC Guidelines on borrow areas and for quarries (Environmental protection Act and Rules, 1986; Water Act, Air Act)+Clause 305.2.2 MORTH Specifications for Road and Bridgeworks Guidelines for Borrow Areas management	Borrow sites location	MI: Existence of borrow areas in inappropriate unauthorized locations. Poor borrow area management practices. Number of accidents. Complaints from local people.  PT: No case of non-compliance to conditions stipulated by SEIAA in clearance letter. Zero accidents. Zero complaints.	Review of design documents and site observations  Compare site conditions with EC conditions by SEIAA	Contractor	SHAJ /CSC	Identification of Borrow Area is under process and the same shall be operated after obtaining the requisite permission from competent Authority.	Contractor has been suggested to process the Borrow area permission for all identified Borrow Area



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	stage. <ul style="list-style-type: none"> <li>Transportation of earth materials through covered vehicles.</li> <li>Follow IRC recommended practice for borrow pits (IRC 10: 1961) for identification of location, its operation and rehabilitation</li> <li>Borrow areas not to be dug continuously.</li> <li>To the extent borrow areas shall be sited away from habitated areas.</li> <li>Borrow areas shall be leveled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fish pond.</li> </ul>								
3.4 Quarry Operations	<ul style="list-style-type: none"> <li>Aggregates will be sourced from existing licensed quarries.</li> <li>Copies of consent/ approval /</li> </ul>	Clause No.111.3 MORT&H Specifications for Road and Bridge works Guidelines VI for	Quarry area locations	MI: Existence of licenses quarry areas from which materials to be sourced and Existence of a	Review of design documents, contractor documents and site observation Compliance to EC	Contractor	SHAJ /CSC	Identification of Stone Quarries is under process and the same shall be operated after	Contractor has been suggested to process the Stone Quarries permission for all identified



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	rehabilitation plan for a new quarry or use of existing source will be submitted to SHAJ. <ul style="list-style-type: none"> <li>The contractor will develop a Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the approval to EA.</li> <li>Obtain environmental clearance from SEIAA in case of opening new quarry</li> </ul>	Quarry Areas Management Environmental Protection Rules		quarry redevelopment plan  PT: Quarry license is valid.: No case of noncompliance to consent conditions and air quality meets the prescribed limit	conditions in case of opening new quarries			obtaining the requisite permission from competent Authority.	Stone Quarries
3.5 Compaction of soil and impact on quarry haul roads due to movement of vehicles and equipment	<ul style="list-style-type: none"> <li>Construction vehicles, machinery, and equipment to be stationed in the designated ROW to avoid compaction.</li> <li>Approach roads/haulage roads shall be designed along the barren and hard soil area to reduce the compaction.</li> <li>Transportation of quarry material to</li> </ul>	Design requirement	Parking areas, Haulage roads and construction yards	MI: Location of approach and haulage roads Presence of destroyed/compacted agricultural land or land which has not be restored to its original condition PT: Zero occurrence of destroyed/compacted land and undestroyed land	Site observation	Contractor	SHAJ /CSC	Being Complied	-



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	<p>the dumping site through heavy vehicles shall be done through existing major roads to the extent possible to restrict wear and tear to the village/minor roads.</p> <ul style="list-style-type: none"> <li>Land taken for construction camp and other temporary facility shall be restored to its original conditions</li> </ul>								
3.6 Contamination of soil due to leakage/ spillage of oil, bituminous and non-bituminous debris generated from demolition and road construction	<ul style="list-style-type: none"> <li>Construction vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil.</li> <li>Fuel storage and refueling sites to be kept away from drainage channels.</li> <li>Unusable debris shall be dumped in ditches and low lying areas.</li> <li>To avoid soil</li> </ul>	Design requirement	Fuelling station, construction sites, and construction camps and disposal location	<p>MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area</p> <p>PT: Soil test conforming to no –contamination. No sighting of spilled oil or bitumen in construction site or camp site</p>	Site observation	Contractor	SHAJ /CSC	The location has been finalized for disposal of unusable debris at low lying areas. The necessary No Objection Certificate has been initiated from competent Authority.	Finalization of dumping location by the contractor with consultation with CSC / SHAJ.



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	contamination Oil Interceptors shall be provided at wash down and refueling areas. <ul style="list-style-type: none"> <li>Waste oil and oil soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF/SPCB authorized vendors</li> <li>Non-bituminous wastes to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit.</li> <li>Bituminous wastes will be disposed off in an identified dumping site approved by the State Pollution Control Board</li> </ul>								
<b>4. Water Resources</b>									
4.1 Sourcing of water during Construction	<ul style="list-style-type: none"> <li>Requisite permission shall be obtained for abstraction of</li> </ul>	CGWA Guidelines	Throughout the Project section	MI: Approval from competent authority Complaints from	Checking of documentation	Contractor	SHAJ /CSC	The ground water sources has been identified and	Ground water permission from competent Authority by the



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	groundwater from Central Groundwater Authority. <ul style="list-style-type: none"> <li>• Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected.</li> <li>• Water intensive activities not to be undertaken during summer season.</li> <li>• Provision of water harvesting structure to augment groundwater condition in the area</li> </ul>		Check Dam at suitable locations	local people on water availability  PT: Valid approval from competent authority. Zero complaints from local people.	Talk to local people			requisite permission has been initiated by the contractor.	contractor.
4.2 Disposal of water during construction	<ul style="list-style-type: none"> <li>• Provisions shall be made to connect road side drains with existing nearby natural drains.</li> </ul>	Clause No.1010 EP Act 1986 MORT&H Specifications for Road and Bridgeworks	Throughout the Project section	MI: Condition of drainage system in construction site.Presence/absence of water logging in project area.  PT: Existence of proper drainage system. No water logging in project area	Standards methods Site observation and review of documents	Contractor	SHAJ /CSC	Being Complied	-



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4.3 Alteration in surface water hydrology	<ul style="list-style-type: none"> <li>Existing drainage system to be maintained</li> <li>And further enhanced.</li> <li>Provision shall be made for adequate size and number of cross drainage structures esp. in the areas where land is sloping towards road alignment.</li> <li>Road level shall be raised above HFL level wherever road level is lesser than HFL</li> <li>Culverts reconstruction shall be done during lean flow period. In some cases these minor channels may be diverted for a very short period (15-30 days) and will be bring back to its original course immediately after construction.</li> </ul>	Design requirement, Clause No 501.8.6. MORT&H Specifications	Near all drainage channels, river/ nallah crossings etc.	MI: Proper flow of water in existing streams and rivers  PT: No complain of water shortage by downstream communities. No record of overtopping/ water logging	Review of design documents  Site observation	Contractor	SHAJ /CSC	Being Complied	-
4.4 Siltation in water bodies due to construction	<ul style="list-style-type: none"> <li>Embankment slopes to be modified suitably to</li> </ul>	Design requirement, ClauseNo501.8.	Near all water bodies/ waterway	MI: Presence /absence of siltation in rivers,	Field observation	Contractor	SHAJ /CSC	Being Complied	-



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activities /earthwork	restrict the soil debris entering water bodies. <ul style="list-style-type: none"> <li>Provision of Silt fencing shall be made at water bodies.</li> <li>Silt/sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated.</li> <li>Earthworks and stone works to be prevented from impeding natural flow of rivers, streams and water canals or existing drainage system.</li> <li>Retaining walls at water bodies /ponds to avoid siltation near ponds</li> </ul>	6.MORT&H Specifications for Road and Bridge works  Worldwide best practices	<b>Refer Table 15.</b> Retaining wall=820m	streams, ponds and other water bodies in project area. Turbidity test levels  PT: No records of siltation due to project activities. Surface water quality tests confirm to turbidity and TSS limit						
4.5 Deterioration in Surface water quality due to leakage from vehicles and equipment's and waste from construction camps	<ul style="list-style-type: none"> <li>No vehicles or equipment should be parked or refueled near water-bodies, so as to avoid contamination from fuel and lubricants.</li> </ul>	The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof.	Water bodies, refueling stations, construction camps.	MI: Water quality of ponds, streams, rivers and other water bodies in project  Presence of oil floating in water bodies in project	Conduction of water quality tests as per the monitoring plan  Field observation	Contractor	SHAJ /CSC	The Environmental monitoring agency not been finalized and monitoring shall be carried out as per ADB approved	Finalization of monitoring agency and initiation of Environmental monitoring	



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	<ul style="list-style-type: none"> <li>Oil and grease traps and fuelling platforms to be provided at re-fuelling locations.</li> <li>All chemicals and oil shall be stored away from water and concreted platform with catchment pit for spills collection.</li> <li>All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language emergency response procedure, including reporting, will be provided by the contractors.</li> <li>Construction camp to be sited away from water bodies.</li> </ul>			area PT: Surface water quality meets freshwater quality standards prescribed by CPCB				monitoring Plan	
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	<ul style="list-style-type: none"> <li>Wastes must be collected, stored and taken to approve disposal site only.</li> <li>Water quality shall be monitored</li> </ul>								
<b>5. Flora and Fauna</b>									
5.1 Vegetation loss due to site preparation and construction activities	<ul style="list-style-type: none"> <li>Restrict tree cutting up to toe line considering safety to road users.</li> <li>Roadside trees to be removed with prior approval of competent authority.</li> <li>Mandatory compensatory plantation at 1:2 basis by Forestry Department</li> <li>Additional compensatory plantation 1:2 as per the IRC by contractor in partnership with respective village JFM Committee. Local villagers to be employed for afforestation activities. Employment preference to</li> </ul>	Forest Conservation Act1980 + IRC:SP:21 and IRC:SP:66	Throughout project corridor Estimated No. of affected tree=1957 Additional Plantation near Sensitive receptors, river banks, borrow areas	MI: ROW width Number of trees for felling Compensatory plantation plan Number of trees replanted.  PT: Additional afforestation done on a 1:2 basis by contractor through JFM. Number of trees planted is double the number of trees removed. Tree survival rate is at least 70%.	Review of relevant documents – tree cutting permit, compensatory plantation plan. Meeting with JFM Committee members  Field observations	Mandatory Compensatory plantation by forest Department and Additional plantation by contractor in partnership with respective local JFM Committee	SHAJ /CSC	Shall be initiated after finalization of Tree cutting details	Compensatory afforestation against tree cutting.



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	<ul style="list-style-type: none"> <li>women</li> <li>Regular maintenance trees planted.</li> <li>Provision of LPG in construction camp as fuel source to avoid tree cutting.</li> <li>Plantation of trees on both sides of the road where technically feasible. Trees should be offset 1m back from the ultimate edge of the roadway to prevent safety hazard and provide adequate sight distance.</li> <li>Integrate vegetation management (IVM) with the carriage way completely clear of vegetation.</li> <li>Additional plantation near sensitive receptors, river banks to minimize noise &amp; air pollution, and to check erosion.</li> </ul>								



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	<ul style="list-style-type: none"> <li>Controlled use of pesticides/ fertilizers</li> </ul>								
<b>6. Construction Camps</b>									
6.1 Impact associated with location	<ul style="list-style-type: none"> <li>All camps should be established with prior permission from PCB. Camps to maintain minimum distance from following: # 500 m from habitation # 500 m from forest areas where possible # 500 m from water bodies where possible # 500 m from through traffic route # 500 m from identified elephant movement locations</li> </ul>	Design Requirement The Water (Prevention and Control of Pollution) Act, 1974 and its amendments thereof	All construction camps	MI: Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and construction camps PT: Distance of campsite is less than 500m from listed locations	On site observation  Interaction with workers and local community	Contractor and EO	SHAJ /CSC	Being Complied	-
6.2 Worker's Health in construction camp	<ul style="list-style-type: none"> <li>The location, layout and basic facility provision of each labor camp will be submitted to CSC and approved by EA. The contractor will maintain necessary living accommodation and ancillary</li> </ul>	The Building and Other Construction workers (Regulation of Employment and Conditions of service) Act 1996 and The Water (Prevention and	All construction camps	MI: Camp health records  Existence of proper first aid kit in camp site  Complaints from workers.  PT: No record of illness due to	Camp records  Site observation  Consultation with contractor workers and local people living nearby	Contractor	SHAJ /CSC	Being Complied	-



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	facilities in hygienic manner. <ul style="list-style-type: none"> <li>Adequate water and sanitary latrines with septic tanks with soak pits shall be provided.</li> <li>Preventive medical facilities in camp</li> <li>Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste. The Contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations.</li> <li>No liquor or prohibited drugs will be imported to, sell, give and barter to the workers of host community.</li> <li>Awareness raising to immigrant</li> </ul>	Control of Pollution) Act, 1974 and amendments thereof		unhygienic conditions or vectors. Zero cases of STD. Clean and tidy camp site conditions.					



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भारत सरकार

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<b>Environmental Management Plan Compliance Status of Package-3</b>									
	workers/local community on communicable and sexually transmitted diseases.								
<b>7. Management of Construction Waste/Debris</b>									
7.1 Selection of Dumping Sites	<ul style="list-style-type: none"> <li>Contractor to submit a waste/spoil disposal plan and get it approved by CSC and EA.</li> <li>Create controlled dumping sites with a non-permeable lining incorporated in the pit design to avoid leachate seepage into the soil, which may later affect ground water quality</li> <li>Unproductive/wast elands shall be selected for dumping sites away from residential areas and water bodies</li> <li>Dumping sites must be having adequate capacity equal to the amount of debris generated.</li> </ul>	Design Requirement, MORT&H guidelines and General Conditions of Contract Document	At all Dumping/Disposal Sites	MI: Location of dumping sites Number of public complaints.  PT: No public complaints. Consent letters for all dumping sites available with contractor	Field survey and interaction with local people. Review of consent letter	Contractor	SHAJ /CSC	Selection of Dumping Site is under Process	The identified dumping site shall be approved by CSC / SHAJ before its utilization



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Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility		Observation during the reporting period	Corrective action and follow up if required
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	<ul style="list-style-type: none"> <li>Public perception and consent from the village Panchayats has to be obtained before finalizing the location</li> </ul>								
7.2 Reuse and disposal of construction and dismantled waste	<ul style="list-style-type: none"> <li>The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites and camps, temporary traffic diversions, and haulage routes.</li> <li>All excavated materials from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping.</li> <li>Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations,</li> </ul>	Design Requirement, MORT&H guidelines and General Conditions of Contract Document	Throughout the project corridor	MI: Percentage of reuse of existing surface material  Method and location of disposal site of construction debris  PT: No public complaint and consent letters for all dumping sites available with contractor or CSC	Contractor records  Field observation  Interaction with local people	Contractor	SHAJ /CSC	Selection of Dumping Site is under Process	The identified dumping site shall be approved by CSC / SHAJ before its utilization





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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	with approval of the concerned authority. <ul style="list-style-type: none"> <li>The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal, MORTH guidelines should be followed.</li> <li>Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site.</li> </ul>								
<b>8. Traffic Management and Safety</b>									
8.1 Management of existing traffic and safety	<ul style="list-style-type: none"> <li>Traffic Management Plan shall be submitted by the contractor and approved by the CSC.</li> <li>The traffic control plans shall contain details of diversions; traffic safety arrangements during construction;</li> </ul>	Design requirement and IRC: SP: 27 - 1984, Report Containing Recommendation of IRC Regional Workshops on Highway Safety IRC:SP: 32 -1988 Road Safety for Children (5-12 Years Old) in	Throughout the project corridor especially at intersections	MI: Traffic management plan. Presence/ absence of safety signs, traffic demarcations, flag men etc. on site. Complaints from road users. No of accidents PT: No complaints. No accidents due to poor traffic management.	Review traffic management plan Field observation of traffic management and safety system  Interaction with people in vehicles using the road	Contractor	SHAJ /CSC	Under Process	The contractor has been suggested to submit the Traffic Management Plan and get it approved from CSC.
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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	<p>safety measures for night time traffic and precautions for transportation of hazardous materials. Timing and scheduling to be done so that transportation of dangerous goods is done during least number of people and other vehicles on the road.</p> <ul style="list-style-type: none"> <li>The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed.</li> <li>Restriction of construction activity to only one</li> </ul>	<p>Construction Zones IRC:SP:55-2014 The Building and other Construction workers Act 1996 and Cess Act of 1996 Factories Act 1948+Section 6 of Employer's Requirement of Bid Document</p>		<p>Traffic signs, demarcation lines etc. present in appropriate locations on site</p>					



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Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility		Observation during the reporting period	Corrective action and follow up if required
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	side of the existing road <ul style="list-style-type: none"> <li>The contractor shall inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer".</li> <li>Use of adequate signage's to ensure traffic management and safety. Conduct of regular safety audit on safety measures.</li> </ul>								
8.2 Pedestrians, animal movement	<ul style="list-style-type: none"> <li>Temporary access and diversion, with proper drainage facilities.</li> <li>Access to the schools, temples and other public places must be maintained when construction takes place near them.</li> <li>Fencing wherever cattle movement is expected.</li> <li>Large number of box culverts has been proposed.</li> </ul>	Same as above	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	MI: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local people  PT: Easy access to schools, temples and public places. Zero complaints	Field Observation Interaction with local people	Contractor	SHAJ /CSC	Under Process	-



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Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility		Observation during the reporting period	Corrective action and follow up if required
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	.All structures having vertical clearance above 3m and not catering to perennial flow of water may serve as underpass for animals								
8.3 Safety of Workers and accident risk from construction activities	<ul style="list-style-type: none"> <li>Contractors to adopt and maintain safe working practices.</li> <li>Usage of fluorescent and retro refractory signage, in local language at the construction sites</li> <li>Training to workers on safety procedures and precautions.</li> <li>Mandatory appointment of safety officer.</li> <li>All regulations regarding safe scaffolding, ladders, working platforms, gangway, stair wells, excavations, trenches and safe means of entry and egress shall be</li> </ul>	Same as above	Construction sites	MI: Availability of Safety gears to workers  Safety signage Training records on safety  Number of safety related accidents  PT: Zero fatal accidents. Zero or minor nonfatal accidents.	Site observation  Review records on safety training and accidents  Interact with construction workers	Obligation of Contractor	SHAJ/CSC	Being Complied	-



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Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility		Observation during the reporting period	Corrective action and follow up if required
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	complied with. <ul style="list-style-type: none"> <li>• Provision of PPEs to workers.</li> <li>• Provision of a readily available first aid unit including an adequate supply of dressing materials.</li> <li>• The contractor will not employ any person below the age of 18years</li> <li>• Use of hazardous material should be minimized and/or restricted.</li> <li>• Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents or emergencies.</li> <li>• Accident Prevention Officer must be appointed by the contractor.</li> </ul>								
8.4 Accident risk to local community	<ul style="list-style-type: none"> <li>• Restrict access to construction sites only to authorized personnel.</li> <li>• Physical separation must be provided for movement of</li> </ul>	Same as above	Construction sites	MI: Safety signs and their location  Incidents of accidents  Complaints from local people PT:	Site inspection  Consultation with local people	Contractor	SHAJ /CSC	Being Complied	-



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	<ul style="list-style-type: none"> <li>vehicular and human traffic.</li> <li>Adequate signage must be provided for safe traffic movement</li> <li>Provision of temporary diversions and awareness to locals before opening new construction fronts</li> </ul>			Zero incident of accidents. Zero complaints.					
<b>9. Site restoration and rehabilitation</b>									
9.1 Clean-up Operations, Restoration and Rehabilitation	<ul style="list-style-type: none"> <li>Contractor will prepare site restoration plans, which will be approved by the 'Engineer'.</li> <li>The clean-up and restoration operations are to be implemented by the contractor prior to demobilization.</li> <li>All construction zones including riverbeds, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by</li> </ul>	Project requirement	Throughout the project corridor, construction camp sites and borrow areas	MI: Condition of camp, borrow areas and construction sites, Presence/ absence of construction material/debris after completion of construction works on site. PT: Clean and tidy sites. No trash or debris left on site. Site restored and leveled.	Site observation  Interaction with locals  Issue completion certificate after restoration of all sites are found satisfactory	Contractor	SHAJ /CSC	Shall be initiated before closer of Camp and Plant sites.	-



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	the project will be left clean and tidy, to the satisfaction of the Environmental officer. • All the opened borrow areas will be rehabilitated and 'Engineer' will certify								
<b>Operation and Maintenance stage</b>									
<b>1. Elephant Movement</b>									
1.1 Anticipated risk of vehicle-elephant collision and human-animal conflict	<ul style="list-style-type: none"> <li>Effectiveness of mitigative measures (rumble strips, informatory/cautionary signage, solar street lighting, solar dragon lights etc.) recommended in design stage shall be monitored.</li> <li>Effectiveness of habitat enhancement measures shall be evaluated</li> <li>SHAJ to keep record of all accidents.</li> <li>If it is observed after the study that elephants establish</li> </ul>	Project Requirement	At identified elephant crossing locations	MI: No. of vehicle - elephant collision. Time (day or night, season/month and location of collision. Cause of collision. No of incidence of human – elephant conflict. PT: Zero vehicle - elephant collisions. Reduced number of human elephant conflicts. Improvement in elephant habitat coverage and quality	Site Observation  Discussion with local People  Collection of information from Forestry Department	SHAJ field offices/Forest Department	SHAJ field offices/Forest Department	Not Applicable	-



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	a defined movement path and cross the road at specific locations, provision of civil structure shall be made in consultation with forest department. <ul style="list-style-type: none"> <li>Fresh assessment in case of future widening</li> </ul>								
<b>2. Air Quality</b>									
2.1 Air pollution due to due to vehicular movement	<ul style="list-style-type: none"> <li>Roadside tree plantations shall be maintained at least with 70% survival rate.</li> <li>Regular maintenance of the road will be done to ensure good surface condition</li> <li>Ambient air quality monitoring. If monitored parameters exceeds prescribed limit, suitable control measures must be taken.</li> <li>Signage's shall be provided reminding them to properly maintain their</li> </ul>	Environmental Protection Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981	Throughout the Corridor	MI: Ambient air quality (PM10, CO,SO2 NO2)  PT: Levels are equal to or below baseline levels given in the IEE report	As per CPCB requirements  Site inspection	SHAJ	SHAJ	Not Applicable	-



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	vehicles to economize on fuel consumption. <ul style="list-style-type: none"> <li>Enforcement of vehicle emission rules in coordination with transport department or installing emission checking equipment's</li> </ul>								
<b>3. Noise</b>									
3.1 Noise due to movement of traffic	<ul style="list-style-type: none"> <li>Effective traffic management and good riding conditions shall be maintained</li> <li>Speed limitation to 20 km/hour and honking restrictions near sensitive receptors and elephant movement areas</li> <li>Construction of noise barriers near sensitive receptors with consent of local community</li> <li>The effectiveness of the multilayered plantation should be monitored and if need be, solid noise barrier shall</li> </ul>	Noise Pollution (Regulation and Control) Rules,2000 and amendments thereof	Sensitive receptors as identified in IEE	MI: Noise levels  PT: Levels are equal to or below baseline levels given in the IEE report	Noise monitoring as per noise rules ,2000  Discussion with people at sensitive receptor sites	SHAJ	SHAJ	Identification of Noise Barrier location at sensitive receptors such as School, College, Hospital & Court is under Process	The contractor and CSC has been suggested to follow the ADB approved EMP while finalizing the noise barrier locations along the project road.



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	be placed. <ul style="list-style-type: none"> <li>Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building near road</li> </ul>								
<b>4. Land and Soil</b>									
4.1 Soil erosion at embankment during heavy rainfall.	<ul style="list-style-type: none"> <li>Periodic checking to be carried to assess the effectiveness of the stabilization measures viz. turfing, stone pitching, river training structures etc...</li> <li>Necessary measures to be followed wherever there are failures</li> </ul>	Project requirement	At bridge locations and embankment slopes and other probable soil erosion areas.	MI: Existence of soil erosion sites Number of soil erosion sites  PT: Zero or minimal occurrences of soil erosion	On site observation	SHAJ	SHAJ	Not Applicable	-
<b>5. Water resources/Flooding and Inundation</b>									
5.1 Siltation	<ul style="list-style-type: none"> <li><input type="checkbox"/> Regular checks shall be made for soil erosion and turfing conditions of river training</li> </ul>	Project requirement	Near surface Water bodies	MI: Water quality  PT: No turbidity of surface water bodies due to the	Site observation			Not Applicable	-



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	structures for its effective maintenance.			road					
5.2 Water logging due to blockage of drains, culverts or streams	<ul style="list-style-type: none"> <li>Regular visual checks and cleaning (at least once before monsoon) of drains to ensure that flow of water is maintained through cross drains and other channels/streams.</li> <li>Monitoring of water borne diseases due to stagnant water bodies</li> </ul>	Project requirement IRC: SP:21-2009	Near surface Water bodies/cross drains/side drains	MI: Presence/ absence of water logging along the road  PT: No record of overtopping/ Water logging	Site observation	SHAJ	SHAJ	Not Applicable	-
<b>6. Flora</b>									
6.1 Vegetation	<ul style="list-style-type: none"> <li>Planted trees, shrubs, and grasses to be properly maintained.</li> <li>The tree survival audit to be conducted at least once in a year to assess the effectiveness</li> </ul>	Forest Conservation Act 1980	Project tree plantation sites	MI: Tree/plants survival rate  PT: Minimum rate of 70% tree survival	Records and field observations. Information from Forestry Department	SHAJ/JFM/Forest Department	SHAJ/JFM/Forest Department	Not Applicable	-
<b>7. Maintenance of Right of Way and Safety</b>									
7.1 Accident Risk due to uncontrolled growth of vegetation	<ul style="list-style-type: none"> <li>Maintain shoulder completely clear of vegetation.</li> <li>Minimum offset as prescribed in</li> </ul>	Project requirement IRC: SP:21-2009	Throughout the Project route	MI: Presence and extent of vegetation growth on either side of road. Number of	Visual inspection  Check accident records	SHAJ	SHAJ	Not Applicable	-



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	IRC:SP:21-2009 to be maintained <input type="checkbox"/> Regular maintenance/trimming of plantation along the road side <ul style="list-style-type: none"> <li>No invasive plantation near the road</li> </ul>			accidents. PT: No accidents due to vegetation growth					
7.2 Accident risks associated with traffic movement	<ul style="list-style-type: none"> <li>Traffic control measures, including speed limits, will be enforced strictly.</li> <li>Further encroachment of squatters within the ROW will be prevented.</li> <li>No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law</li> <li>Monitor/ensure that all safety provisions included in design and construction phase are properly maintained</li> <li>Highway patrol unit(s) for round</li> </ul>	IRC:SP:55-2014	Throughout the Project route	MI: Number of accidents Conditions and existence of safety signs, rumble strips etc. on the road Presence/absence of sensitive receptor structures inside the stipulated planning line as per relevant local law  PT: Fatal and non-fatal accident rate is reduced after improvement	Review accident records  Site observations	SHAJ	SHAJ	Not Applicable	-



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-3</b>									
	the clock patrolling. Phone booth for accidental reporting and ambulance services with minimum response time for rescue of any accident victims, if possible. <ul style="list-style-type: none"> <li>Tow-way facility for the breakdown vehicles if possible.</li> </ul>								
7.3.Transport of Dangerous Goods	<ul style="list-style-type: none"> <li>Existence of spill prevention and control and emergency responsive system</li> <li>Emergency plan for vehicles carrying hazardous material</li> </ul>	-	Throughout the project stretch	MI: Status of emergency system – whether operational or not  PT: Fully functional emergency system	Review of spill prevention and emergency response plan Spill accident records	SHAJ	SHAJ	Not Applicable	-

**Table-9: Environmental Management Plan Compliance Status of Package-4**

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility	Observation during the reporting period	Corrective action and follow up if required	Environmental Issue/Component
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-4</b>									
<b>A. Design and Pre-construction Stage</b>									
<b>1. Alignment</b>									
1.1 Pavement damage and inadequate	<ul style="list-style-type: none"> <li>Soaked CBR value of sub grade is</li> </ul>	Design requirement	Entire stretch Embankment raised	MI: Design and number of cross	Review of detail design	Design Consultant	SHAJ	Complied	Not Required



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-4</b>									
drainage provisions in habitat areas	<p>recommended to be 12 %.</p> <ul style="list-style-type: none"> <li>Overloading to be checked</li> <li>Raised embankment and provision of roadside drainage to prevent damage to pavement due to water logging on the road and also inconvenience caused to</li> <li>Provision of adequate no. of cross drainage structures.</li> <li>Increase (vent and height) in waterway of existing structures.</li> <li>Roadside drains have been proposed with suitable outfalls.</li> <li>Additional 19 culverts proposed</li> </ul>		<p>at 12 locations for a length of 4.33 km <b>(Refer Appendix 4 of ADB approved IEE report)</b> Roadside drains (both sides together) Covered=28.106 km Lined=46.246 km Unlined=12.734 km</p> <p>For list of bridges with increased waterway Pls refer <b>Appendix 3 of ADB approved IEE report.</b></p>	<p>and side drains, slab/box culverts, and Hume pipes</p> <p>PT: Design and numbers are in accordance with site needs</p>	documents & drawings and comparison with site conditions				
1.2 Safety along the proposed alignment	<ul style="list-style-type: none"> <li>Provision of crash barriers at accident prone areas and high embankments.</li> <li>Rumble strips in habitat areas, schools, junction and curves to regulate speed.</li> <li>Provision of retro reflective warning signboards near school, hospital ,religious places</li> </ul>	<p>Design requirement</p> <p>IRC:SP:84-2014 IRC:8, IRC:25, IRC:26, IRC:35, IRC:67, IRC:103 and Section 800 of MoRTH Specifications</p> <p>Horizontal</p>	<p>At embankment height &gt;3.0 m total length = 1.4 km Rumble strip = 20 locations ( 17 built-up areas, 1 school, 2 junctions) Total 573 road delineators/chevron / object markers</p>	<p>MI: number and location of crash barriers, rumble strips, warning sign boards, sidewalks</p> <p>PT: numbers and location are in accordance with site needs</p>	Review of design documents and drawings and comparison with site conditions	Design Consultant	SHAJ	Complied	Not Required



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-4</b>									
	<ul style="list-style-type: none"> <li>and forests</li> <li>Provision of sidewalks in the built-up sections, on both sides.</li> <li>Signs and marking viz., cat's eyes, delineators, object markers, hazard markers, safety barriers at hazardous locations, pedestrian guardrails, etc...</li> </ul>	geometry will be based on IRC: 38-1988 and vertical geometry will be based on IRC: SP 23-1993 ".  IRC: SP: 67-2012	Pedestrian Guard Rails=6.120 km Service Road Length= 4.4 km. (km) 0+000 to Km 2+200 on Both sides Total no. of street lights=629						
	<ul style="list-style-type: none"> <li>Pedestrian cross-walks at all Junctions and where conflict exists between vehicular and pedestrian movements (bus bays, schools and habitation.</li> <li>Safety kerb at all bridges</li> <li>Service roads in densely habitated areas</li> <li>Horizontal and vertical geometry as per IRC Specification</li> <li>Zebra crossing with informatory warning sign on approach to school, warning sign with footways and speed limit sign</li> <li>Street Lighting in built-up sections</li> <li>Ambulance and medical aid posts</li> </ul>							Complied	Not Required



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-4</b>									
<b>2. Natural Hazards</b>									
2.2 Flooding/Water Logging	<ul style="list-style-type: none"> <li>Provision of adequate number of CD structures. Additional culverts have been proposed.</li> <li>All CD structures designed for 50 year HFL return period and bridges designed for 100 year HFL return period</li> <li>Water ways of bridges and culverts have been increased.</li> <li>Roadside drains also provided</li> <li>Embankment height raised along low lying/potential water logged areas</li> <li>Improvement in existing culverts/ Bridges to increase their carrying capacity.</li> </ul>	IRC:34 Recommendation s IRC:34 IRC:34 Recommendation s for road construction in waterlogged area and IRC: 75 and MORT&H guidelines for Design of High Embankments	Entire stretch Embankment raised at 17 locations for a length of 4.1 km (Refer <b>Appendix 4 of ADB approved IEE report</b> ) Roadside drains (both sides together) Covered=8.4 km Unlined=79.0 km For list of bridges with increased waterway Pls refer <b>Appendix 3 of ADB approved IEE report</b>	MI: Design and numbers of cross & side drains, slab/box culverts Hume pipes, road embankment height, design and number of bridges  PT: Design and numbers are in accordance with site needs	Review of design documents and drawings and comparison with site conditions		SHAJ	Complied	Not Required
<b>3. Loss of Land and Assets</b>									
3.1 livelihood loss to affected persons	<ul style="list-style-type: none"> <li>Road improvement work to be accommodated within available ROW to the extent possible.</li> <li>Social Impact Assessment and Resettlement Plan to be undertaken</li> </ul>	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation And Resettlement Act, 2013 and ADB's involuntary resettlement	Throughout the corridor	MI: Payment of compensation and assistance to DPs as per RP  Number of complaints/ grievances related to compensation	Check LA records; design drawings vs land plans; Interview with affected persons	SHAJ and implementing NGO	SHAJ	Under Process	The details shall be updated in next EMR



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-4</b>									
	as per national policy and ADB' guidelines. <ul style="list-style-type: none"> <li>Complete all necessary land and property acquisition procedures prior to the commencement of civil work.</li> <li>Adhere to the Land Acquisition procedures in accordance to RP's Entitlement Framework.</li> <li>Compensation and assistance as per project Resettlement Plan</li> <li>Income restoration as per RP</li> <li>Preference in employment and petty contracts during construction to APs</li> <li>Constitute GRC as per RP</li> </ul>	policy.  Contract Clause for preference to local people during employment		and resettlement PT: Minimal number of complaints/ grievances. All cases of resettlement and rehabilitation if any are resolved at GRC level. No case referred to arbitrator/court.	Check status of employment given to local people during construction				
<b>4. Diversion of Forest Land and Cutting of Trees</b>									
4.1 Need for cutting of trees.	<ul style="list-style-type: none"> <li>Geometric adjustments made to minimize tree cutting.</li> <li>Obtain tree cutting permission from forest department</li> <li>Provision for mandatory</li> </ul>	Forest Conservation Act, 1980	Throughout the corridor Total number of affected trees=3050 Additional Plantation near	MI: Number and location of geometric adjustments made to avoid forestland and tree cutting,	Review final design. Check budget provision for compensatory afforestation and additional	SHAJ, Design consultants forest	department SHAH/Forest department	Under Process	-



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भारत सरकार

Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility	Observation during the reporting period	Corrective action and follow up if required	Environmental Issue/Component
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-4</b>									
	compensatory afforestation (1:2) for deposit of payment to Forestry Department <ul style="list-style-type: none"> <li>Provision for additional compensatory plantation on 1: 2 basis to be implemented by contractor through village Joint Forest Management (JFM) Committee</li> </ul>		sensitive receptors, river banks, borrow areas	budget amount allocated for compensatory afforestation and additional plantation  PT: Unnecessary tree felling on forest land avoided. Budget allocation is adequate	plantation.				
<b>5. Elephant Movement</b>									
5.1 Road design causing disruption in elephant movement/ Vehicle-Elephant collision and Human-Elephant Conflict	<ul style="list-style-type: none"> <li>Provision for rumble strip, cautionary sign boards for speed limits up to 30 Kmph on both sides with gentle side slope and turfing for easy movement of Elephant.</li> <li>Provision for solar Street Lights in communities near elephant crossing areas to keep the elephants away</li> <li>Provision for supply of solar dragon light to local Joint Forest Management Committees in villages near elephant crossing areas for use to</li> </ul>	Project Requirement	Serenghatu, Jaranga, Sindri village and Dodya More No of Solar lights=35 Rumble Strips =8 Informatory sign boards=8 Cautionary Sign boards=8	MI: budget allocation for rumble strips, cautionary and informatory sign boards, solar street lamps, solar dragon lamps, habitat enhancement and conservation activities PT: Budget amount is enough to fulfill the installation and construction of recommended facilities and structures	Review of bid documents and project budget plan	SHAJ, Design Consultant	SHAJ/ Forest Department	Review under process by CSC Wild Life Specialist	Provision for additional conservation measures to be taken after elephant study that will be conducted by the CSC Wildlife Specialist.



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-4</b>									
	chase away elephants <ul style="list-style-type: none"> <li>Provision for habitat enhancement viz. plantation of fodder plants in forest areas, through Joint Forest Management (JFM).</li> <li>Provision for additional conservation measures to be taken after elephant study that will be conducted by the CSC Wildlife Specialist.</li> </ul>								
<b>6. Shifting of Utilities</b>									
6.1 Disruption of utility services to local community	<ul style="list-style-type: none"> <li>All telephone and electrical poles/wires and underground cables should be shifted before start of construction</li> <li>Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services</li> <li>Local people must be</li> </ul>	Project requirement	Throughout the corridor	MI: Number of complaints from local people, number, timing and type of notifications issued to local people, time taken to shift utilities PT: No. of complaints should be 0. Effective and timely notification. Minimal time for utility shifting	Interaction with concerned utility authorities and local public	Contractor/ SHAJ/utility company	SHAJ/CSC	Under Process	-



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						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-4</b>									
	informed through appropriate means about the time of shifting of utility structures and potential disruption of services if any								
<b>B. Construction Stage</b>									
<b>1. Air Quality</b>									
1.1 Dust Generation due to construction activities and transport, storage and handling of construction materials	<ul style="list-style-type: none"> <li>Contractor to submit location and layout plan for storage areas of construction materials approved by CSC</li> <li>Transport, loading and unloading of loose and fine materials through covered vehicles.</li> <li>Paved approach roads.</li> <li>Storage areas to be located downwind of the habitation area.</li> <li>Water spraying on earthworks, unpaved haulage roads and other dust prone areas.</li> <li>Provision of PPEs to workers.</li> </ul>	MORT&H Specifications for Road and Bridge works Air (P and CP) Act 1974 and Central Motor and Vehicle Act 1988 General Conditions of Bid Document	Throughout project corridor	MI: PM10 level measurements Complaints from locals due to dust  PT: PM10 level < 100 ug/m3 Number of complaints should be 0.	Standards CPCB methods Observations Public consultation  Review of monitoring data maintained by contractor	Contractor	SHAJ /CSC	Complied	Not Required



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Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility	Observation during the reporting period	Corrective action and follow up if required	Environmental Issue/Component
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-4</b>									
1.2 Emission of air pollutants (HC,SO <sub>2</sub> ,NO <sub>x</sub> ,CO etc) from vehicles due to traffic congestion and use of equipment and machinery	<ul style="list-style-type: none"> <li>Regular maintenance of machinery and equipment.</li> <li>Batching, asphalt mixing plants and crushers at downwind (1km) direction from the nearest settlement.</li> <li>Only crushers licensed by the PCB shall be used</li> <li>DG sets with stacks of adequate height and use of low sulphur diesel as fuel.</li> <li>LPG should be used as fuel source in construction camps instead of wood</li> <li>Ambient air quality monitoring</li> <li>Contractor to prepare traffic management and dust suppression plan duly approved by SHAJ</li> </ul>	The Air (Prevention and Control of Pollution) Act, 1981 (Amended 1987) and Rules 1982	Asphalt mixing plants, crushers, DG sets locations	MI: Levels of HC, SO <sub>2</sub> , NO <sub>2</sub> , and CO. Status of PUC certificates  PT: SO <sub>2</sub> and NO <sub>2</sub> levels are both less than 80ug/m <sup>3</sup> . PUC certificate of equipment and machinery is up to date	Standards CPCB methods  Review of monitoring data maintained by contractor	Contractor	SHAJ /CSC	The Environmental monitoring agency not been finalized and monitoring shall be carried out as per ADB approved monitoring Plan	Finalization of monitoring agency and initiation of Environmental monitoring
<b>2. Noise</b>									
2.1 Disturbance to local residents and sensitive receptors due to excessive noise from construction activities and operation of equipment and	<ul style="list-style-type: none"> <li>All equipment to be timely serviced and properly maintained.</li> <li>Construction equipment and machinery to be fitted with silencers and maintained properly.</li> <li>Only IS approved</li> </ul>	Legal requirement Noise Pollution (Regulation and Control) Rules, 2000 and amendments thereof + Clause No 501.8.6.	Throughout project section especially at construction sites, residential and identified sensitive locations.  Refer Table 21 of	MI: day and night Noise levels. Number of complaints from local people  PT: Zero complaints or no	As per Noise rule, 2000  Consultation with local people  Review of	Contractor	SHAJ /CSC	The Environmental monitoring agency not been finalized and monitoring shall be	Finalization of monitoring agency and initiation of Environmental monitoring



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<b>Environmental Management Plan Compliance Status of Package-4</b>									
machinery	equipment shall be used for construction activities. <ul style="list-style-type: none"> <li>Timing of noisy construction activities shall be done during night time and weekend near schools,</li> <li>Implement noisy operations intermittently to reduce the total noise generated</li> <li>Manage existing traffic to avoid traffic jams and accumulation of noise beyond standards.</li> <li>Restrict construction near residential, built up and forest areas construction today light hours.</li> <li>Initiation of multi-layered plantation, to serve as mitigation option for operation phase</li> <li>Honking restrictions near sensitive areas</li> <li>PPEs to workers</li> <li>Noise monitoring as per EMoP.</li> </ul>	MORT&H Specifications for Road and Bridge works	IEE for information on sensitive receptors	repeated complaints by local people. Average day and night time noise levels are within permissible limits for work zone areas	noise level monitoring data maintained by contractor  Observation of construction site			carried out as per ADB approved monitoring Plan	
<b>3. Land and Soil</b>									
3.1 Landuse Change and Loss of productive / topsoil	<ul style="list-style-type: none"> <li>Non-agricultural areas to be used as borrow areas to the extent possible.</li> <li>If using agricultural land, top soil to be preserved</li> </ul>	Project requirement	Throughout the project section and borrow areas  Land identified for	MI: Borrow pit locations/Top soil storage area  PT: Zero	Review borrow area plan, site visits	Contractor	SHAJ /CSC	Under Process	-



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<b>Environmental Management Plan Compliance Status of Package-4</b>									
	and laid over either on the embankment slope for growing vegetation to protect soil erosion. <ul style="list-style-type: none"> <li>Land for temporary facilities like construction camp, storage areas etc. shall be brought back to its original land use</li> </ul>		camp, storage areas etc	complaints or disputes registered against contractor by land owner					
3.2 Slope failure and Soil erosion due to Construction activities, earthwork, and cut and fill, stockpiles etc.	<ul style="list-style-type: none"> <li>Bio-turfing of embankments to protect slopes.</li> <li>Slope protection by providing frames, dry stone pitching, masonry retaining walls, planting of grass and trees.</li> <li>Side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. Care should be taken that the slope gradient shall not be greater than 2:1.</li> <li>The earth stockpiles to be provided with gentle slopes to soil erosion.</li> </ul>	IRC: 56 -1974 recommended practice for treatment of embankment slopes for erosion control Clause No. 306 and 305.2.2 MORT&H Specifications for Road and Bridge works Guidelines IX for Soil erosion	Throughout the entire project road	MI: Occurrence of slope failure or erosion issues  PT: No slope failures. Minimal erosion issues	Review of design documents and site observation	Contractor,	SHAJ /CSC	Being Complied	-
3.3 Borrow area management	<ul style="list-style-type: none"> <li>Obtain EC from SEIAA before opening any new borrow area.</li> <li>Comply to EC conditions of SEIAA</li> </ul>	IRC Guidelines on borrow areas and for quarries (Environmental protection Act and	Borrow sites location	MI: Existence of borrow areas in inappropriate unauthorized locations. Poor	Review of design documents and site observations	Contractor	SHAJ /CSC	Identification of Borrow Area is under process and the same	Contractor has been suggested to process the Borrow area permission for all identified Borrow



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Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility	Observation during the reporting period	Corrective action and follow up if required	Environmental Issue/Component
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<b>Environmental Management Plan Compliance Status of Package-4</b>									
	<ul style="list-style-type: none"> <li>Non-productive, barren lands, upland shall be used for borrowing earth with the necessary permissions/consents.</li> <li>Depths of borrow pits to be regulated and sides not steeper than 25%.</li> <li>Topsil to be stockpiled and protected for use at the rehabilitation stage.</li> <li>Transportation of earth materials through covered vehicles.</li> <li>Follow IRC recommended practice for borrow pits (IRC 10: 1961) for identification of location, its operation and rehabilitation</li> <li>Borrow areas not to be dug continuously.</li> <li>To the extent borrow areas shall be sited away from habitated areas.</li> <li>Borrow areas shall be leveled with salvaged material or other filling materials which do not pose contamination of soil. Else, it shall be converted into fish pond.</li> </ul>	Rules, 1986; Water Act, Air Act)+Clause 305.2.2 MORTH Specifications for Road and Bridgeworks Guidelines for Borrow Areas management		borrow area management practices. Number of accidents. Complaints from local people.  PT: No case of non-compliance to conditions stipulated by SEIAA in clearance letter. Zero accidents. Zero complaints.	Compare site conditions with EC conditions by SEIAA			shall be operated after obtaining the requisite permission from competent Authority.	Area
3.4 Quarry Operations	<ul style="list-style-type: none"> <li>Aggregates will be sourced from existing</li> </ul>	Clause No.111.3 MORT&H	Quarry area locations	MI: Existence of licenses quarry	Review of design	Contractor	SHAJ /CSC	Identification of Stone	Contractor has been suggested to



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<b>Environmental Management Plan Compliance Status of Package-4</b>									
	<ul style="list-style-type: none"> <li>licensed quarries.</li> <li>Copies of consent/ approval / rehabilitation plan for a new quarry or use of existing source will be submitted to SHAJ.</li> <li>The contractor will develop a Quarry Redevelopment plan, as per the Mining Rules of the state and submit a copy of the approval to EA.</li> <li>Obtain environmental clearance from SEIAA in case of opening new quarry</li> </ul>	Specifications for Road and Bridge works Guidelines VI for Quarry Areas Management Environmental Protection Rules		<p>areas from which materials to be sourced and Existence of a quarry redevelopment plan</p> <p>PT: Quarry license is valid.: No case of noncompliance to consent conditions and air quality meets the prescribed limit</p>	documents, contractor documents and site observation Compliance to EC conditions in case of opening new quarries			Quarries is under process and the same shall be operated after obtaining the requisite permission from competent Authority.	process the Stone Quarries permission for all identified Stone Quarries
3.5 Compaction of soil and impact on quarry haul roads due to movement of vehicles and equipment	<ul style="list-style-type: none"> <li>Construction vehicles, machinery, and equipment to be stationed in the designated ROW to avoid compaction.</li> <li>Approach roads/haulage roads shall be designed along the barren and hard soil area to reduce the compaction.</li> <li>Transportation of quarry material to the dumping site through heavy vehicles shall be done through existing major roads to the extent</li> </ul>	Design requirement	Parking areas, Haulage roads and construction yards	<p>MI: Location of approach and haulage roads Presence of destroyed/compacted agricultural land or land which has not be restored to its original condition</p> <p>PT: Zero occurrence of destroyed/compacted land and undestroyed land</p>	Site observation	Contractor	SHAJ /CSC	Being Complied	-



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<b>Environmental Management Plan Compliance Status of Package-4</b>									
	<p>possible to restrict wear and tear to the village/minor roads.</p> <ul style="list-style-type: none"> <li>Land taken for construction camp and other temporary facility shall be restored to its original conditions</li> </ul>								
3.6 Contamination of soil due to leakage/ spillage of oil, bituminous and non-bituminous debris generated from demolition and road construction	<ul style="list-style-type: none"> <li>Construction vehicles and equipment will be maintained and refueled in such a fashion that oil/diesel spillage does not contaminate the soil.</li> <li>Fuel storage and refueling sites to be kept away from drainage channels.</li> <li>Unusable debris shall be dumped in ditches and low lying areas.</li> <li>To avoid soil contamination Oil Interceptors shall be provided at wash down and refueling areas.</li> <li>Waste oil and oil soaked cotton/ cloth shall be stored in containers labeled 'Waste Oil' and 'Hazardous' sold off to MoEF/SPCB authorized vendors</li> <li>Non-bituminous wastes</li> </ul>	Design requirement	Fuelling station, construction sites, and construction camp sand disposal location	<p>MI: Quality of soil near storage area Presence of spilled oil or bitumen in project area</p> <p>PT: Soil test conforming to no –contamination. No sighting of spilled oil or bitumen in construction site or camp site</p>	Site observation	Contractor	SHAJ /CSC	<p>The location has been finalized for disposal of unusable debris at low lying areas. The necessary No Objection Certificate has been initiated from competent Authority.</p>	Finalization of dumping location by the contractor with consultation with CSC / SHAJ.



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	to be dumped in borrow pits with the concurrence of landowner and covered with a layer of topsoil conserved from opening the pit. <ul style="list-style-type: none"> <li>Bituminous wastes will be disposed off in an identified dumping site approved by the State Pollution Control Board</li> </ul>								
<b>4. Water Resources</b>									
4.1 Sourcing of water during Construction	<ul style="list-style-type: none"> <li>Requisite permission shall be obtained for abstraction of groundwater from Central Groundwater Authority.</li> <li>Arrangements shall be made by contractor that the water availability and supply to nearby communities remain unaffected.</li> <li>Water intensive activities not to be undertaken during summer season.</li> <li>Provision of water harvesting structure to augment groundwater condition in the area</li> </ul>	CGWA Guidelines	Throughout the Project section  Check Dam at suitable locations	MI: Approval from competent authority Complaints from local people on water availability  PT: Valid approval from competent authority. Zero complaints from local people.	Checking of documentation  Talk to local people	Contractor	SHAJ /CSC	The ground water sources has been identified and requisite permission has been initiated by the contractor.	Ground water permission from competent Authority by the contractor.
4.2 Disposal of water during construction	<ul style="list-style-type: none"> <li>Provisions shall be made to connect road side drains with existing</li> </ul>	Clause No.1010 EP Act 1986 MORT&H	Throughout the Project section	MI: Condition of drainage system in construction	Standards methods Site observation	Contractor	SHAJ /CSC	Being Complied	-



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<b>Environmental Management Plan Compliance Status of Package-4</b>									
	nearby natural drains.	Specifications for Road and Bridgeworks		<p>site. Presence/absence of water logging in project area.</p> <p>PT: Existence of proper drainage system. No water logging in project area</p>	and review of documents				
4.3 Alteration in surface water hydrology	<ul style="list-style-type: none"> <li>Existing drainage system to be maintained</li> <li>And further enhanced.</li> <li>Provision shall be made for adequate size and number of cross drainage structures esp. in the areas where land is sloping towards road alignment.</li> <li>Road level shall be raised above HFL level wherever road level is lesser than HFL</li> <li>Culverts reconstruction shall be done during lean flow period. In some cases these minor channels may be diverted for a very short period (15-30 days) and will be bring back to its original course immediately after construction.</li> </ul>	Design requirement, Clause No 501.8.6. MORT&H Specifications	Near all drainage channels, river/nallah crossings etc.	<p>MI: Proper flow of water in existing streams and rivers</p> <p>PT: No complain of water shortage by downstream communities. No record of overtopping/ water logging</p>	<p>Review of design documents</p> <p>Site observation</p>	Contractor	SHAJ /CSC	Being Complied	-



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<b>Environmental Management Plan Compliance Status of Package-4</b>									
4.4 Siltation in water bodies due to construction activities /earthwork	<ul style="list-style-type: none"> <li>Embankment slopes to be modified suitably to restrict the soil debris entering water bodies.</li> <li>Provision of Silt fencing shall be made at water bodies.</li> <li>Silt/sediment should be collected and stockpiled for possible reuse as surfacing of slopes where they have to be re-vegetated.</li> <li>Earthworks and stone works to be prevented from impeding natural flow of rivers, streams and water canals or existing drainage system.</li> <li>Retaining walls at water bodies /ponds to avoid siltation near ponds</li> </ul>	Design requirement, ClauseNo501.8. 6.MORT&H Specifications for Road and Bridge works  Worldwide best practices	Near all water bodies /waterway Refer Table 15.	MI: Presence /absence of siltation in rivers, streams, ponds and other water bodies in project area. Turbidity test levels  PT: No records of siltation due to project activities. Surface water quality tests confirm to turbidity and TSS limit	Field observation	Contractor	SHAJ /CSC	Being Complied	-
4.5 Deterioration in Surface water quality due to leakage from vehicles and equipment's and waste from construction camps	<ul style="list-style-type: none"> <li>No vehicles or equipment should be parked or refueled near water-bodies, so as to avoid contamination from fuel and lubricants.</li> <li>Oil and grease traps and fuelling platforms to be provided at re-fuelling locations.</li> <li>All chemicals and oil shall be stored away</li> </ul>	The Water (Prevention and Control of Pollution) Act, 1974 and amendments thereof.	Water bodies, refueling stations, construction camps.	MI: Water quality of ponds, streams, rivers and other water bodies in project  Presence of oil floating in water bodies in project area  PT: Surface water quality meets	Conduction of water quality tests as per the monitoring plan  Field observation	Contractor	SHAJ /CSC	The Environmental monitoring agency not been finalized and monitoring shall be carried out as per ADB approved monitoring Plan	Finalization of monitoring agency and initiation of Environmental monitoring



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Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility	Observation during the reporting period	Corrective action and follow up if required	Environmental Issue/Component
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<b>Environmental Management Plan Compliance Status of Package-4</b>									
	from water and concreted platform with catchment pit for spills collection. <ul style="list-style-type: none"> <li>All equipment operators, drivers, and warehouse personnel will be trained in immediate response for spill containment and eventual clean-up. Readily available, simple to understand and preferably written in the local language emergency response procedure, including reporting, will be provided by the contractors.</li> <li>Construction camp to be sited away from water bodies.</li> <li>Wastes must be collected, stored and taken to approve disposal site only.</li> <li>Water quality shall be monitored</li> </ul>			freshwater quality standards prescribed by CPCB					
<b>5. Flora and Fauna</b>									
5.1 Vegetation loss due to site preparation and construction activities	<ul style="list-style-type: none"> <li>Restrict tree cutting up to toe line considering safety to road users.</li> <li>Roadside trees to be removed with prior</li> </ul>	Forest Conservation Act1980 + IRC:SP:21 and IRC:SP:66	Throughout project corridor  Estimated No. of affected tree=2457	MI: ROW width Number of trees for felling Compensatory plantation plan Number of trees	Review of relevant documents – tree cutting permit, compensatory	Mandatory Compensatory plantation by forest Department and Additional	SHAJ /CSC	Shall be initiated after finalization of Tree cutting details	Compensatory afforestation against tree cutting.



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<b>Environmental Management Plan Compliance Status of Package-4</b>									
	approval of competent authority. <ul style="list-style-type: none"> <li>Mandatory compensatory plantation at 1:2 basis by Forestry Department</li> <li>Additional compensatory plantation 1:2 as per the IRC by contractor in partnership with respective village JFM Committee. Local villagers to be employed for afforestation activities. Employment preference to women</li> <li>Regular maintenance trees planted.</li> <li>Provision of LPG in construction camp as fuel source to avoid tree cutting.</li> <li>Plantation of trees on both sides of the road where technically feasible. Trees should be offset 1m back from the ultimate edge of the roadway to prevent safety hazard and provide adequate sight distance.</li> <li>Integrate vegetation management (IVM) with the carriage way</li> </ul>		Additional Plantation near Sensitive receptors, river banks, borrow areas	replanted.  PT: Additional compensatory afforestation done on a 1:2 basis by contractor through JFM. Number of trees planted is double the number of trees removed. Tree survival rate is at least 70%.	plantation plan. Meeting with JFM Committee members  Field observations	plantation by contractor in partnership with respective local JFM Committee			



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	<ul style="list-style-type: none"> <li>completely clear of vegetation.</li> <li>Additional plantation near sensitive receptors, river banks to minimize noise &amp; air pollution, and to check erosion.</li> <li>Controlled use of pesticides/ fertilizers</li> </ul>								
<b>6. Construction Camps</b>									
6.1 Impact associated with location	<ul style="list-style-type: none"> <li>All camps should be established with prior permission from PCB. Camps to maintain minimum distance from following: # 500 m from habitation # 500 m from forest areas where possible # 500 m from water bodies where possible # 500 m from through traffic route # 500 m from identified elephant movement locations</li> </ul>	Design Requirement The Water (Prevention and Control of Pollution) Act, 1974 and its amendments thereof	All construction camps	MI: Location of campsites and distance from habitation, forest areas, water bodies, through traffic route and construction camps PT: Distance of campsite is less than 500m from listed locations	<ul style="list-style-type: none"> <li>On site observation</li> <li>Interaction with workers and local community</li> </ul>	Contractor and EO	SHAJ /CSC	Being Complied	-
6.2 Worker's Health in construction camp	<ul style="list-style-type: none"> <li>The location, layout and basic facility provision of each labor camp will be submitted to CSC and approved by EA. The contractor will maintain necessary living accommodation and ancillary facilities in hygienic manner.</li> </ul>	The Building and Other Construction workers (Regulation of Employment and Conditions of service) Act 1996 and The Water (Prevention and	All construction camps	<ul style="list-style-type: none"> <li>MI: Camp health records</li> <li>Existence of proper first aid kit in camp site</li> <li>Complaints from workers.</li> </ul>	<ul style="list-style-type: none"> <li>Camp records</li> <li>Site observation</li> <li>Consultation with contractor workers and local people</li> </ul>	Contractor	SHAJ /CSC	Being Complied	-



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	<ul style="list-style-type: none"> <li>Adequate water and sanitary latrines with septic tanks with soak pits shall be provided.</li> <li>Preventive medical facilities in camp</li> <li>Waste disposal facilities such as dust bins must be provided in the camps and regular disposal of waste The Contractor will take all precautions to protect the workers from insect and pest to reduce the risk to health. This includes the use of insecticides which should comply with local regulations.</li> <li>No liquor or prohibited drugs will be imported to, sell, give and barter to the workers of host community.</li> <li>Awareness raising to immigrant workers/local community on communicable and sexually transmitted diseases.</li> </ul>	Control of Pollution) Act,1974 and amendments thereof		PT: No record of illness due to unhygienic conditions or vectors. Zero cases of STD. Clean and tidy camp site conditions.	living nearby				
<b>7. Management of Construction Waste/Debris</b>									
7.1 Selection of Dumping Sites	<ul style="list-style-type: none"> <li>Contractor to submit a waste/spoil disposal plan and get it approved by</li> </ul>	Design Requirement, MORT&H	At all Dumping Sites	MI: Location of dumping sites Number of public	Field survey and interaction	Contractor	SHAJ /CSC	Selection of Dumping Site is under	The identified dumping site shall be approved by



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	CSC and EA. <ul style="list-style-type: none"> <li>Create controlled dumping sites with a non-permeable lining incorporated in the pit design to avoid leachate seepage into the soil, which may later affect ground water quality</li> <li>Unproductive/wastelands shall be selected for dumping sites away from residential areas and water bodies</li> <li>Dumping sites must be having adequate capacity equal to the amount of debris generated.</li> <li>Public perception and consent from the village Panchayats has to be obtained before finalizing the location</li> </ul>	guidelines and General Conditions of Contract Document		complaints. PT: No public complaints. Consent letters for all dumping sites available with contractor/ CSC	with local people. Review of consent letter			Process	CSC / SHAJ before its utilization
7.2 Reuse and disposal of construction and dismantled waste	<ul style="list-style-type: none"> <li>The existing bitumen surface shall be utilized for paving of cross roads, access roads, and paving works in construction sites and camps, temporary traffic diversions, and haulage routes.</li> <li>All excavated materials</li> </ul>	Design Requirement, MORT&H guidelines and General Conditions of Contract Document	Throughout the project corridor	MI: Percentage of reuse of existing surface material  Method and location of disposal site of construction debris	Contractor records  Field observation  Interaction with local people Contractor records	Contractor	SHAJ /GSC	Selection of Dumping Site is under Process	The identified dumping site shall be approved by CSC / SHAJ before its utilization



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	from roadway, shoulders, verges, drains, cross drainage will be used for backfilling embankments, filling pits, and landscaping. <ul style="list-style-type: none"> <li>Unusable and non-bituminous debris materials should be suitably disposed off at pre-designated disposal locations, with approval of the concerned authority.</li> <li>The bituminous wastes shall be disposed in secure landfill sites only in environmentally accepted manner. For removal of debris, wastes and its disposal, MORTH guidelines should be followed.</li> <li>Unusable and surplus materials, as determined by the Project Engineer, will be removed and disposed off-site.</li> </ul>			PT: No public complaint and consent letters for all dumping sites available with contractor or CSC					
<b>8. Traffic Management and Safety</b>									
8.1 Management of existing traffic and safety	<ul style="list-style-type: none"> <li>Traffic Management Plan shall be submitted by the contractor and approved by the CSC.</li> <li>The traffic control plans</li> </ul>	Design requirement and IRC: SP: 27 - 1984, Report Containing Recommendation	Throughout the project corridor especially at intersections	MI: Traffic management plan. Presence/ absence of safety signs, traffic demarcations,	Review traffic management plan Field observation of traffic management	Contractor	SHAJ /CSC	Under Process	The contractor has been suggested to submit the Traffic Management Plan and get it approved from CSC.



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	<p>shall contain details of diversions; traffic safety arrangements during construction; safety measures for night time traffic and precautions for transportation of hazardous materials. Timing and scheduling to be done so that transportation of dangerous goods is done during least number of people and other vehicles on the road.</p> <ul style="list-style-type: none"> <li>The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. On stretches where it is not possible to pass the traffic on the part width of existing carriageway, temporary paved diversions will be constructed.</li> <li>Restriction of construction activity to only one side of the existing road</li> <li>The contractor shall</li> </ul>	<p>of IRC Regional Workshops on Highway Safety IRC:SP: 32 -1988 Road Safety for Children (5-12 Years Old) in Construction Zones IRC:SP:55-2014</p> <p>The Building and other Construction workers Act 1996 and Cess Act of 1996 Factories Act 1948+Section 6 of Employer's Requirement of Bid Document</p>		<p>flag men etc. on site. Complaints from road users. No of accidents PT: No complaints. No accidents due to poor traffic management. Traffic signs, demarcation lines etc. present in appropriate locations on site</p>	<p>and safety system</p> <p>Interaction with people in vehicles using the road</p>					



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	inform local community of changes to traffic routes, and pedestrian access arrangements with assistance from "Engineer". <ul style="list-style-type: none"> <li>Use of adequate signage's to ensure traffic management and safety. Conduct of regular safety audit on safety measures.</li> </ul>								
8.2 Pedestrians, animal movement	<ul style="list-style-type: none"> <li>Temporary access and diversion, with proper drainage facilities.</li> <li>Access to the schools, temples and other public places must be maintained when construction takes Place near them.</li> <li>Fencing wherever cattle movement is expected.</li> <li>To avoid the need for cattle underpasses, some of the reposed culverts near habitations may be widened to facilitate cattle movement.</li> </ul>	Same as above	Near habitation on both sides of schools, temples, hospitals, graveyards, construction sites, haulage roads, diversion sites.	MI: Presence/ absence of access routes for pedestrians. Road signage Number of complaints from local people  PT: Easy access to schools, temples and public places. Zero complaints	Field Observation Interaction with local people	Contractor	SHAJ /CSC	Under Process	-
8.3 Safety of Workers and accident risk from construction activities	<ul style="list-style-type: none"> <li>Contractors to adopt and maintain safe working practices.</li> <li>Usage of fluorescent and</li> </ul>	Same as above	Construction sites	MI: Availability of Safety gears to workers	Site observation  Review	Obligation of Contractor	SHAJ/CSC	Being Complied	-



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	retro refectory signage, in local language at the construction sites <ul style="list-style-type: none"> <li>• Training to workers on safety procedures and precautions.</li> <li>• Mandatory appointment of safety officer.</li> <li>• All regulations regarding safe scaffolding, ladders, working platforms, gangway, stair wells, excavations, trenches and safe means of entry and egress shall be complied with.</li> <li>• Provision of PPEs to workers.</li> <li>• Provision of a readily available first aid unit including an adequate supply of dressing materials.</li> <li>• The contractor will not employ any person below the age of 18years</li> <li>• Use of hazardous material should be minimized and/or restricted.</li> <li>• Emergency plan (to be approved by engineer) shall be prepared to respond to any accidents</li> </ul>			Safety signage Training records on safety  Number of safety related accidents  PT: Zero fatal accidents. Zero or minor nonfatal accidents.	records on safety training and accidents  Interact with construction workers				



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	<ul style="list-style-type: none"> <li>or emergencies.</li> <li>Accident Prevention Officer must be appointed by the contractor.</li> </ul>								
8.4 Accident risk to local community	<ul style="list-style-type: none"> <li>Restrict access to construction sites only to authorized personnel.</li> <li>Physical separation must be provided for movement of vehicular and human traffic.</li> <li>Adequate signage must be provided for safe traffic movement</li> <li>Provision of temporary diversions and awareness to locals before opening new construction fronts</li> </ul>	Same as above	Construction sites	MI: Safety signs and their location  Incidents of accidents  Complaints from local people PT: Zero incident of accidents. Zero complaints.	Site inspection  Consultation with local people	Contractor	SHAJ /CSC	Being Complied	-
<b>9. Site restoration and rehabilitation</b>									
9.1 Clean-up Operations, Restoration and Rehabilitation	<ul style="list-style-type: none"> <li>Contractor will prepare site restoration plans, which will be approved by the 'Engineer'.</li> <li>The clean-up and restoration operations are to be implemented by the contractor prior to demobilization.</li> <li>All construction zones including riverbeds, culverts, road-side areas, camps, hot mix plant</li> </ul>	Project requirement	Throughout the project corridor, construction camp sites and borrow areas	MI: Condition of camp, borrow areas and construction sites, Presence/ absence of construction material/debris after completion of construction works on site. PT: Clean and tidy sites. No trash or	Site observation  Interaction with locals  Issue completion certificate after restoration of all sites are found	Contractor	SHAJ /CSC	Shall be initiated before closer of Camp and Plant sites.	-



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	sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, to the satisfaction of the Environmental officer. <ul style="list-style-type: none"> <li>All the opened borrow areas will be rehabilitated and 'Engineer' will certify</li> </ul>			debris left on site. Site restored and leveled.	satisfactory				
<b>Operation and Maintenance stage</b>									
<b>1. Elephant Movement</b>									
1.1 Anticipated risk of vehicle-elephant collision and human-animal conflict	<ul style="list-style-type: none"> <li>Effectiveness of mitigative measures (rumble strips, informatory /cautionary signage, solar street lighting, solar dragon lights etc.) recommended in design stage shall be monitored.</li> <li>Effectiveness of habitat enhancement measures shall be evaluated</li> <li>SHAJ to keep record of all accidents.</li> <li>If it is observed after the study that elephants establish a defined movement path and cross the road at specific locations, provision of civil structure shall be made in consultation with</li> </ul>	Project Requirement	At identified elephant crossing locations	MI: No. of vehicle - elephant collision. Time (day or night, season/month and location of collision. Cause of collision. No of incidence of human – elephant conflict. PT: Zero vehicle - elephant collisions. Reduced number of human elephant conflicts. Improvement in elephant habitat coverage and quality	Site Observation  Discussion with local People  Collection of information from Forestry Department	SHAJ field offices/Forest Department	SHAJ field offices/Forest Department	Not Applicable	-



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	forest department. • Fresh assessment in case of future widening								
<b>2. Air Quality</b>									
2.1 Air pollution due to due to vehicular movement	<ul style="list-style-type: none"> <li>Roadside tree plantations shall be maintained at least with 70% survival rate.</li> <li>Regular maintenance of the road will be done to ensure good surface condition</li> <li>Ambient air quality monitoring. If monitored parameters exceeds prescribed limit, suitable control measures must be taken.</li> <li>Signages shall be provided reminding them to properly maintain their vehicles to economize on fuel consumption.</li> <li>Enforcement of vehicle emission rules in coordination with transport department or installing emission checking equipment's</li> </ul>	Environmental Protection Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981	Throughout the Corridor	MI: Ambient air quality (PM10, CO,SO2 NO2)  PT: Levels are equal to or below baseline levels given in the IEE report	As per CPCB requirements  Site inspection	SHAJ	SHAJ	Not Applicable	-
<b>3. Noise</b>									
3.1 Noise due to movement of traffic	<ul style="list-style-type: none"> <li>Effective traffic management and good riding conditions shall be maintained</li> </ul>	Noise Pollution (Regulation and Control) Rules,2000 and	Sensitive receptors as identified in IEE	MI: Noise levels  PT: Levels are	Noise monitoring as per noise rules ,2000	SHAJ	SHAJ	Identification of Noise Barrier location at	The contractor and CSC has been suggested to follow the ADB approved



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	<ul style="list-style-type: none"> <li>Speed limitation to 20 km/hour and honking restrictions near sensitive receptors and elephant movement areas</li> <li>Construction of noise barriers near sensitive receptors with consent of local community</li> <li>The effectiveness of the multilayered plantation should be monitored and if need be, solid noise barrier shall be placed.</li> <li>Create awareness amongst the residents about likely noise levels from road operation at different distances, the safe ambient noise limits and easy to implement noise reduction measures while constructing a building near road</li> </ul>	amendments thereof		equal to or below baseline levels given in the IEE report	Discussion with people at sensitive receptor sites			sensitive receptors such as School, College, Hospital & Court is under Process	EMP while finalizing the noise barrier locations along the project road.
<b>4. Land and Soil</b>									
4.1 Soil erosion at embankment during heavy rainfall.	<ul style="list-style-type: none"> <li>Periodic checking to be carried to assess the effectiveness of the stabilization measures viz. turfing, stone pitching, river training structures etc</li> <li>Necessary measures to</li> </ul>	Project requirement	At bridge locations and embankment slopes and other probable soil erosion areas.	MI: Existence of soil erosion sites Number of soil erosion sites  PT: Zero or minimal occurrences of soil erosion	On site observation	SHAJ	SHAJ	Not Applicable	-



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	be followed wherever there are failures								
<b>5. Water resources/Flooding and Inundation</b>									
5.1 Siltation	<ul style="list-style-type: none"> <li>Regular checks shall be made for soil erosion and turfing conditions of river training structures for its effective maintenance.</li> </ul>	Project requirement	Near surface Water bodies	MI: Water quality PT: No turbidity of surface water bodies due to the road	Site observation	SHAJ	SHAJ	Not Applicable	-
5.2 Water logging due to blockage of drains, culverts or streams	<ul style="list-style-type: none"> <li>Regular visual checks and cleaning (at least once before monsoon) of drains shall be done along the alignment to ensure that flow of water is maintained through cross drains and other channels/streams.</li> <li>Monitoring of water borne diseases due to stagnant water bodies</li> <li>SHAJ will ensure that all drains (side drains and all cross drainages) are periodically cleared especially before monsoon season to facilitate the quick passage of rainwater and avoid flooding.</li> </ul>	Project requirement	Near surface Water bodies, Flood prone/low lying sections	MI: Presence/absence of water logging along the road PT: No record of overtopping/ Water logging	Site observation. Interaction with local community	SHAJ	SHAJ	Not Applicable	-
<b>6. Flora</b>									
6.1 Vegetation	<ul style="list-style-type: none"> <li>Planted trees, shrubs, and grasses to be properly maintained</li> </ul>	Forest Conservation Act 1980	Project tree plantation sites	MI: Tree/plants survival rate	Records and field observations.	SHAJ/JFM/Forest Department	SHAJ/JFM/Forest Department	Not Applicable	-



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	<ul style="list-style-type: none"> <li>The tree survival audit to be conducted at least once in a year to assess the effectiveness</li> </ul>			PT: Minimum rate of 70% tree survival	Information from Forestry Department				
<b>7. Maintenance of Right of Way and Safety</b>									
7.1 Accident Risk due to uncontrolled growth of vegetation	<ul style="list-style-type: none"> <li>Efforts shall be made to make shoulder completely clear of vegetation.</li> <li>Minimum offset as prescribed in IRC:SP:21-2009 to be maintained</li> <li>Regular maintenance of plantation along the roadside</li> <li>No invasive plantation near the road.</li> </ul>	Project requirement IRC: SP:21-2009	Throughout the Project route	MI: Presence and extent of vegetation growth on either side of road. Number of accidents. PT: No accidents due to vegetation growth	Visual inspection  Check accident records	SHAJ	SHAJ	Not Applicable	-
7.2 Accident risks associated with traffic movement	<ul style="list-style-type: none"> <li>Traffic control measures, including speed limits, will be enforced strictly.</li> <li>Further encroachment of squatters within the ROW will be prevented.</li> <li>No school or hospital will be allowed to be established beyond the stipulated planning line as per relevant local law</li> <li>Monitor/ensure that all safety provisions included in design and construction phase are properly maintained</li> <li>Highway patrol unit(s) for</li> </ul>	IRC:SP:55-2014	Throughout the Project route	MI: Number of accidents Conditions and existence of safety signs, rumble strips etc. on the road Presence/absence of sensitive receptor structures inside the stipulated planning line as per relevant local law  PT: Fatal and non	Review accident records  Site observations	SHAJ	SHAJ	Not Applicable	-



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Environmental Issue/Component	Remedial Measure	Reference to laws/guideline	Location	Monitoring indicators (MI)/ Performance Target (PT)	Monitoring Methods	Institutional Responsibility	Observation during the reporting period	Corrective action and follow up if required	Environmental Issue/Component
						Implementation	Supervision		
<b>Environmental Management Plan Compliance Status of Package-4</b>									
	round the clock patrolling. Phone booth for accidental reporting and ambulance services with minimum response time for rescue of any accident victims, if possible. <ul style="list-style-type: none"> <li>Tow-way facility for the breakdown vehicles if possible.</li> </ul>			fatal accident rate is reduced after improvement					
7.3.Transport of Dangerous Goods	<ul style="list-style-type: none"> <li>Existence of spill prevention and control and emergency responsive system</li> <li>Emergency plan for vehicles carrying hazardous material</li> </ul>	-	Throughout the project stretch	MI: Status of emergency system – whether operational or not  PT: Fully functional emergency system	Review of spill prevention and emergency response plan Spill accident records	SHAJ	SHAJ	Not Applicable	-



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**5.0 Monitoring of environmental receptors/ attributes (e.g. ambient air, surface water, ground water, land, ecological aspects, noise, hazardous/toxic wastes, etc.)**

12. The ADB approved Environmental Monitoring plan is given in **Table-10**. The monitoring has not being initiated during the reporting period and same shall be cover next EMR for the period Jan to Dec 2017.

**Table-10:** Environmental Monitoring plan

Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Implementation	Supervision	Observation during the reporting period	Corrective action and follow up if required
Air Quality	Construction stage	PM 10 PM2.5 SO2, NOX, CO	High volume sampler to be located 50 m from the selected locations in the Downwind direction. Use method specified by CPCB	Active construction site and representative sample each for residential, commercial and industrial area (Total 4 Locations)- Each Road	24 hr continuous, 3/year for 3 years	Air quality standard by CPCB	Contractor through approved monitoring agency	SHAJ /CSC	The Contractors for Pkg 1, 2, 3 & 4 are still not finalized any NABL approved pollution sampling and monitoring agency. The next EMR report will include the Environmental Indicators reports on receiving of contractors report.	NA
	Operation stage			Representative sample each for residential, commercial and industrial area (4 Locations)- Each Road	24 hr continuous, 3/year for 1 year	Water quality standard by CPCB	SHAJ through approved monitoring agency	SHAJ		NA
Water Quality	Construction stage	Ground water: (IS:10500:1991) And Surface water criteria for Freshwater classification	Grab sample collected from source and analyses as per Standard Methods for Examination of Water and Wastewater	Groundwater at Construction Camps and Surface water of Perennial Rivers/Ponds (3 Samples) – Each Road	3/year for 3 years	Water quality standard by CPCB	Contractor through approved monitoring agency	SHAJ /CSC	The Contractors for Pkg 1, 2, 3 & 4 are still not finalized any NABL approved pollution sampling and monitoring agency. The next EMR report will include the Environmental Indicators reports on receiving of	NA



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Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Implementation	Supervision	Observation during the reporting period	Corrective action and follow up if required
									contractors report.	
	Operation stage			Groundwater at 1 locations and surface water at 2 locations and pond developed due to Borrows areas – Each Road	3/year for 1 year	Air quality standard by CPCB	SHAJ through approved monitoring agency	SHAJ		NA
Noise levels	Construction stage	Equivalent Noise levels on dB (A) scale for day and night	IS:4954-1968 as adopted by CPCB for Identified Study Area CPCB/IS:4954-1968 Using Noise level meter	Construction site, and 1each at residential, commercial and sensitive locations along the alignment. (4Locations) Each Road	24 hr continuous, 3*/year for 3 years	National Ambient Noise Standard specified in Environment Protection Act, 1986	Contractor through approved monitoring agency	SHAJ /CSC	The Contractors for Pkg 1, 2, 3 & 4 are still not finalized any NABL approved pollution sampling and monitoring agency. The next EMR report will include the Environmental Indicators reports on receiving of contractors report.	NA
	Operation stage			Near Sensitive locations and residential areas (4 Locations)	3 / year for 1 yea		SHAJ through approved monitoring agency	SHAJ		NA
Soil Quality	Construction stage	NPK (ICAR standard ) and heavy metals	As specified by the site engineer SHAJ / Supervision Consultants	Camp, Dumping and HMP sites Each Road At oil spillage locations and other probable soil contamination location	Once during whole construction stage Once for the first year of operation	ICAR standard	Contractor through approved monitoring agency	SHAJ /CSC	The Contractors for Pkg 1, 2, 3 & 4 are still not finalized any NABL approved pollution sampling and monitoring agency. The next EMR report will include the Environmental Indicators reports on receiving of contractors report.	NA
	Operation stage	Oil and grease		Throughout the Project Corridor especially	3 / year for 1 yea	CPCB standard	SHAJ through approved monitoring	SHAJ		NA



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Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Implementation	Supervision	Observation during the reporting period	Corrective action and follow up if required
				at River banks, bridge locations and river training structures			agency			
Soil Erosion	Construction stage	Visual check for Soil erosion and siltation		Visual check for Soil erosion and siltation	After first rain	Visual Checks	Contractor	SHAJ/CSC	Being Complied	The contractor and CSC have been suggested to follow the ADB approved EMP and IRC guidelines to control soil erosion wherever noticed along the project road.
	Operation stage				Once during operation of 1st year	Visual Checks	Engineering Team of SHAJ	NA		
Drainage Congestion	Construction stage	Visual check for Soil erosion and siltation	IRC guidelines	Throughout the Project Corridor especially Probable drainage congestion areas	Once in a year before rainy season	None Specific	Contractor'	SHAJ/CSC	Being Complied	The contractor and CSC have been suggested to follow the ADB approved EMP and IRC guidelines to ensure congestion free drainage system all along the project road.
	Operation stage				Once in a year before rainy season	None Specific	SHAJ		NA	
Borrow Areas	Construction stage	Visual check	IRC guidelines	Borrow areas to be operated	Once in a month	IRC guidelines + Compliance conditions of SEIAA	Contractor with approval from SHAJ, SHAJ	SHAJ/CSC	Being Complied	The contractor and CSC has been suggested to strictly follow the ADB approved EMP and IRC guidelines to ensure necessary permits and EMP OPM for borrow area operations in across the packages.



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Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Implementation	Supervision	Observation during the reporting period	Corrective action and follow up if required
	Operation stage	Visual check	Rehabilitation As per IRC guidelines	Closed Borrow Areas	Quarterly for 1 year		SHAJ		NA	
Construction Sites and Labour Camp	Construction stage	Hygiene, drainage Medical Facilities Etc.	Rapid audit as per reporting format	Construction Sites and Camp	Quarterly during construction period	IRC guidelines	Contractor with approval from SHAJ, SHAJ	SHAJ/CSC	Being Complied	The contractor and CSC has been suggested to follow the ADB approved EMP and IRC guidelines
Tree Plantation	Construction stage	Surveillance monitoring of trees felling		Throughout the Project Section	During site clearance in construction phase	As suggested by Forest Dept.	Compensatory: SHAJ/Local Forest Departments Additional Plantation: Contractor through JFM		NA	NA
	Operation stage	Audit for survival rate of trees plantation		Throughout the Project Section	Once in a year for years		The Engineer will be responsible for monitoring up to the Defect Liability Period in any particular stretch. After this period SHAJ through maintenance contractor will be responsible for monitoring involving JFM		NA	NA
Record of Accident	Construction stage	Type, nature and cause of accidents. Methodology as suggested by CSC and approved by SHAJ		Throughout the stretch including construction sites, crusher, diversions, HMP, earthwork, demolition site etc.	occurrence of accidents	As suggested by PMC/SC	Contractor	SHAJ/CSC	Being Complied	The contractor and CSC has been suggested to follow the ADB approved EMP and IRC guidelines
	Operation stage			Throughout the stretch	occurrence of accidents		Road Safety unit of SHAJ with support from local police	NA	NA	
Elephant-Vehicle Collisions*	Construction stage	Nature and cause of collision, season, Month and time of collision.		Elephant Crossing Locations as identified in IEE	occurrence of collision	As suggested by forest department	SHAJ in coordination with forest department or through an specialized wildlife expert team		Being Complied	The contractor and CSC has been suggested to follow the ADB approved EMP and MoEF guidelines
	Operation stage	1. Success of road furniture's viz. rumble strip, cautionary signage's etc. designed for safe movement 2. Nature and cause of collision, season, Month and time of collision		Elephant Crossing Locations as identified in IEE	Continuous during Oct-Nov and Jul-Aug and random visits during				NA	NA



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Env. Indicators	Project Stage	Parameters	Method/ Guidelines	Location	Frequency and Duration	Standards	Implementation	Supervision	Observation during the reporting period	Corrective action and follow up if required
		3. Monitoring of movement path based on information's available with Forest department and local people.			re					



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**6.0 Any other environmental aspects, impacts observed during implementation which were not covered earlier**

13. Not any.

**7.0 Details of Grievance Redress Committee and complaints received from public and actions taken thereof to resolve**

14. The grievance related to the implementation of Safeguard related issues (Environment and Social) for Second Jharkhand state Road project, Grievance Redress committee is formed on September 2016. Objective of the committee is to facilitate displaced persons in registering their grievances at the PIU level. A complaint register will be maintained at PIU level to facilitate ease of access of the DPs to the grievance redress mechanism. The details related to the date of complaint, complaint, date of personal hearing, action taken and date of communication sent to complainant will be recorded. This complaint register has been initiated at the PIU level as soon as possible. Investigation of grievances will involve site visits and consultation with relevant parties like affected persons, contractors etc. 2.At the PIU level the following are the members of Grievance Redress committee

1. DGM (PIU) SHAJ -Chairman
2. A representative from local NGOs or a local person of repute and standing in the society, elected representative from Zila Parisad –Member
3. One representatives from the affected village -Member
4. A representative for women from a relevant agency which could be from the government, or NGO or local community -Member
5. A representative from IP community or NGO for IP related issue-Member

Representative of sl. no.2 to 5 will be selected by District level Task force committee.

15. Copy of GRC Constitution at PIU level is given in **Appendix-1**

16. Till December 2016 no complain related to Environmental issue have been recorded.

**8.0 Public consultation during project implementation**

17. The Public Consultation during the project implementation from March 2016 (Commencement) to December 2016 has been carried out in Package- 4<sup>3</sup> and details of the same are given in **Table 11**. The details of public consultation such as attendance sheet and photographs are also given in **Appendix-1**. The public consultation for other packages have not been carried out during the reporting period and it shall be done at regular intervals and the details for all packages shall be updated in next EMR for the period January to December 2017.

**Table 11:** Public consultation carried out for package 4 till December 2016

Date	Location	Issues discussed	Outcomes of public Consultation
09.04.2016	Seadba	Exploration of Stone Boulder	The suggestion of Safety

<sup>3</sup> Some consultation undertaken during Implementation of Social Safeguards also reflected Environmental aspects.

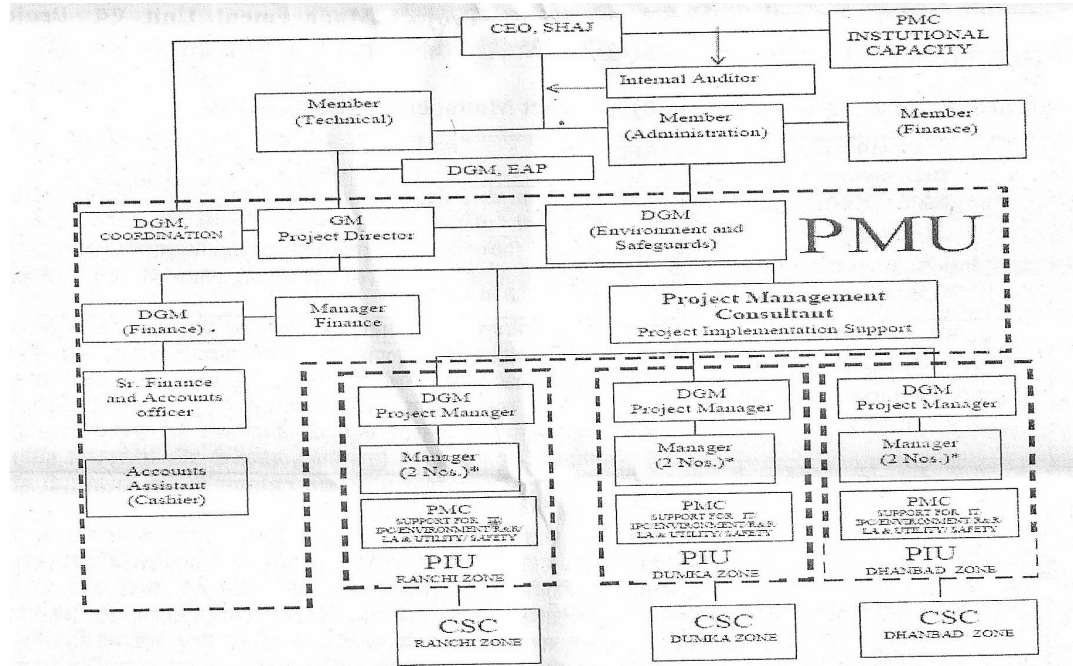




		from Quarry and Establishment of Crusher Plant and Safety measures.	measures shall be implemented while quarry and crusher operation.
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**9.0 Institutional set-up for EMP implementation**

18. To enhance the effective implementation of proposed mitigation measures and monitoring the resultant effects, the Environmental Management Cell as established for SJSRP is depicted in **Figure No.-2** and **Table-12**.



**Figure No.-2: Organisation Chart for EMP Implementation**

**Table-12: SJSRP, Environmental Management Cell**

EHS Personal	Name	Designation	Date of joining
SHAJ	Mr. V.K. Jha	DGM (Env & Safety)	Since Inception of Project
PIU, Pkg-I	Mr. Jitendra Kumar	Manager (Env & Safety)	-
PIU, Pkg-II & III	Mr. Kumud Bandhu Poddar	Manager (Env & Safety)	-
PIU, Pkg-IV	Mr. Subodh Kumar	Manager (Env & Safety)	-
CSC - TL Office	Mr. Manish Kr. Tiwary	Environment Specialist	-
CSC - TL Office	Dr. Alok Pandey	Wild Life Expert	April 2016
PMC Office	PMC Yet to mobilised	Environment Specialist	-
PMC Office	PMC Yet to mobilised	Jr. Environment Specialist	-
PIU- Package 1	Md. Muataque Ali	HSE Engineer	2016
PIU- Package 2	Mr. Priya Ranjan Sahoo	HSE Engineer	2016
PIU- Package 3	Mr. Nitesh Rbetkar	HSE Engineer	2016
PIU- Package 4	Mr. Nadia Bihari Bishwal	HSE Engineer	2016





## 10.0 Follow-up actions

The following follow-up action has been discussed with Consultants and the Contractor for immediate compliances.

### Applicable for all Packages:

- Permission for Stone Quarry from Mines and Geology and SEIAA / DEIAA.
- DGMS Permission
- License for use of explosive from the office of Explosives controller;
- Permission for drawing water from bore well / pond / river from village Panchayat / Irrigation Department as applicable
- Borrow Earth Permission from DIEAA / SEIAA
- Tree Cutting Permission
- Study for Elephant corridor
- Environmental Monitoring as per ADB approved Monitoring Plan
- Public Consultation during Project Implementation
- Finalization of Noise Barrier

### Package-I:

- Consent to Operate (CTO) from JSPCB: Crusher Plant, HMP, WMM Plant, Concrete Batching Plant

### Package-II:

- Consent to Establishment (CTE) from JSPCB: Crusher Plant, HMP, WMM Plant, Batch mix Plant
- Consent to Operate (CTO) from JSPCB: Crusher Plant, HMP, WMM Plant, Concrete Batching Plant
- The IEE report shall be updated due to new proposed Jamua Bypass. It shall be submitted to ADB for review and approval.
- Forest Clearance
- Permission for HSD Pump

### Package-III:

- Consent to Establishment (CTE) from JSPCB: Crusher Plant, HMP, WMM Plant, Batch mix Plant
- Consent to Operate (CTO) from JSPCB: Crusher Plant, HMP, WMM Plant, Concrete Batching Plant
- Forest Clearance

### Package-IV:

- Consent to Establishment (CTE) from JSPCB: Crusher Plant, HMP, WMM Plant, Batch mix Plant
- Consent to Operate (CTO) from JSPCB: Crusher Plant, HMP, WMM Plant, Concrete Batching Plant





Appendix-1

Attendance sheet of public consultation at package 4

माज दिनांक 31/04/2016 को दिन शनिवार ग्राम पंच-  
बुद्धहातु के अंतर्गत ग्राम-सेदवा में ग्राम प्रधान  
श्री सुचिराय मुंडा के अध्यक्षता में एक ग्राम  
सभा का आयोजन किया गया जिसमें मुख्य  
रूप में J M T प्राइवेट लिमिटेड की क्रेडर-  
प्रधान एवं पब्लिक खानन करने हेतु ग्राम सभा में  
विशेष अर्थों किया गया इस बैठक में निम्नलिखित  
ग्रामवासी उपस्थित हुए।

ग्रामवासी का टेपा निम्नानुसार एवं है।

सुचिराय  
मुंडा  
ग्राम प्रधान  
ग्राम साहदवा  
ग्राम पंच बुद्धहातु  
झारखण्ड मुसह जिला (खूंटी)

1. सेदवा-मुंडा
2. जेठवा मुंडा
3. गौड़वा मुंडा
4. सनिका पाहन
5. बांगो हस्सा
6. मडकी हस्सा
7. जहन मुंडा
8. सोगा मुंडा
9. विरसिंह मुंडा
10. पुन्नर हस्सा
11. राम हस्सा
12. लीवा पाहन
13. सनिका हस्सा
14. सुरावा हस्सा
15. सुरावा हस्सा
16. तुला हस्सा
17. कड हस्सा



**Photographs of public consultation at package 4**

