

LT116 - 109

ASHOKA	ENVIRONMENTAL MANAGEMENT PLAN	REV NO DATE: R2 / 16.12.2015
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PROJECT NAME : Engineering, Procurement and Construction of Rehabilitation and Upgrading to 2 lanes / 2 lane with paved shoulders configuration and strengthening of Madhugiri-Mulbagal Road Section (Km 343.800 to Km 483.151) of NH-234 in the State of Karnataka (Package No. KSHIP-KA-234-10) for Lot-II Km 400.330 to Km 483.151" under Phase-I of National Highways Inter-connectivity Improvement Projects (NHIP)		

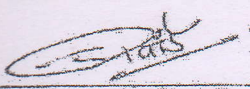
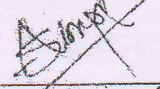
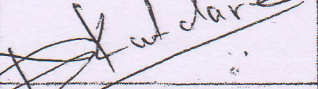
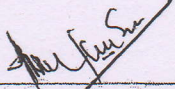
ENVIRONMENTAL MANAGEMENT PLAN

REVISED -02
Dated - 16.12.2015

EMPLOYER	MINISTRY OF ROAD TRANSPORT AND HIGHWAYS (MoRTH), GOI
PIU	PUBLIC WORKS, PORTS AND INLAND WATER TRASPORT (PWP&IWT) DEPARTMENT, Government of Karnataka, PPP Cell
PROJECT	NATIONAL HIGHWAY INTERCONNECTIVITY IMPROVEMENT PROJECTS (NHIP) PHASE - I, LOT-II

PROJECT NAME :

Engineering, Procurement and Construction of Rehabilitation and Upgrading to 2 lanes / 2 lane with paved shoulders configuration and strengthening of Madhugiri-Mulbagal Road Section (Km 343.800 to Km 483.151) of NH-234 in the State of Karnataka (Package No. KSHIP-KA-234-10) for Lot-II Km 400.330 to Km 483.151" under Phase-I of National Highways Inter-connectivity Improvement Projects (NHIP)

			
Prepared By	Reviewed By	Approved By	Authority's Engineer
Mr. Tushar Gawande	Mr. Anil Shimpi	Mr. Neelmani Katdare	Euroestudios S. L. in JV with Theme Engineering Services Pvt. Ltd.
Contractor : M/s ASHOKA BUILDCON LIMITED			

PROJECT NAME : Engineering, Procurement and Construction of Rehabilitation and Upgrading to 2 lanes / 2 lane with paved shoulders configuration and strengthening of Madhugiri-Mulbagal Road Section (Km 343.800 to Km 483.151) of NH-234 in the State of Karnataka (Package No. NHIIP-KA-234-10) for Lot-II Km 400.330 to Km 483.151" under Phase-I of National Highways Inter-connectivity Improvement Projects (NHIIP)

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PROJECT NAME : Engineering, Procurement and Construction of Rehabilitation and Upgrading to 2 lanes / 2 lane with paved shoulders configuration and strengthening of Madhugiri-Mulbagal Road Section (Km 343.800 to Km 483.151) of NH-234 in the State of Karnataka (Package No. NHIP-KA-234-10) for Lot-II Km 400.330 to Km 483.151" under Phase-I of National Highways Inter-connectivity Improvement Projects (NHIP)

1. PROJECT BRIEF INFORMATION

PROJECT NAME : Engineering, Procurement and Construction of Rehabilitation and Upgrading to 2 lanes / 2 lane with paved shoulders configuration and strengthening of Madhugiri-Mulbagal Road Section (Km 343.800 to Km 483.151) of NH-234 in the State of Karnataka (Package No. NHIP-KA-234-10) for Lot-II Km 400.330 to Km 483.151" under Phase-I of National Highways Inter-connectivity Improvement Projects (NHIP)

SCOPE OF PROJECT :

Sr.No.	Description	Details
1	Length of project	82.821 km
2	Built-Up Area	11.722 km (22 locations)
3	Major Junctions	12 No.
4	Minor Junctions	139 No.
5	Bypasses	3.54 km – 2 No. (Amithiganahalli, Mulbagal)
6	Box Culverts	109 No.
7	Slab Culverts	7 No.
8	Pipe Culverts	36 No.
9	Bridges	12 No.
10	W-Beam Crash Barrier	1.380 km
11	Retaining Wall	5.152 km
12	Earthen Drain	139.375 km
13	Concrete Drain	26.267 km
14	Kerb	10.236 km
15	Bus Stop	6 No.
16	Bus Stops-cum-Bus Bays	37 No.

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2. Policy and Objective



QHSE Policy

We, at ASHOKA Buildcon Ltd. are committed to become an icon in infrastructure development, through innovation, professionalism, active leadership in product quality and sustained growth by delivering value to our customers.

We shall conduct our operations in a manner so that we protect people, property and the environment by identifying, controlling and reducing all associated risks to a level As Low As Reasonably Practicable.

This will be achieved by:

1. Our commitment to continual improvement of quality, environmental and occupational health and safety management system performance.
2. Commitment to prevention of pollution, injuries and ill health.
3. Complying with all applicable legal and contractual requirements.
4. Adopting state of art technology available.
5. Communicating and consulting all associated stakeholders for establishing organizational objectives.

Chairman

Date: 1st August 2013

This Policy will be implemented by the road project Site and Management prior to commencement of construction of the Project. A copy will be provided to every employee of the company and will form part of the contract with sub-contractors engaged in activities associated with design, pre-construction, construction and operation and maintenance.

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Objectives and Targets



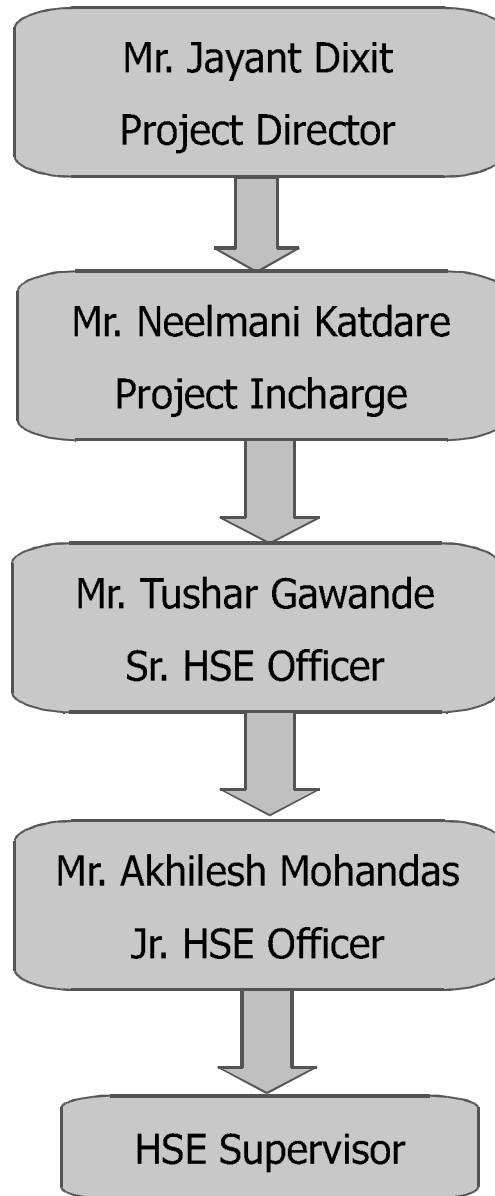
Quality, Health, Safety and
Environmental Objectives:

- To improve planning
- To reduce customer complaints
- To enhance motivation of employees
- To improve skills through training
- Complying with all the statutory rules and regulations.
- Minimizing Air, Land and Water Pollution and preventing injuries and ill health.

Ashoka Buildcon Limited
Ashoka House, Ashoka Marg, Nashik -422 001, Maharashtra, India

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2. ENVIRONMENTAL ORGNISATIONAL STRUCTURE:



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ROLES & RESPONSIBILITIES

The responsibility of implementation of the Environmental Management Plan rests with the following personnel involved in the implementation of the project.

PROJECT DIRECTOR

The Project Director is responsible for the overall implementation of the project. Project Director is responsible for undertaking the engineering, procurement and construction of the project.

- Guiding the formation of Policy & its Approval
- Giving the guideline for the Budget & its Approval
- Review of the safety & Environment Procedure & its Approval
- To provide guideline for All legal aspect of project & comply all environment legal rules & regulation.
- To provide guidance for the implementation of OHSAS & EMS System

PROJECT INCHARGE / SR. GENERAL MANGER

The Project Incharge / Sr. General Manager is responsible for the overall implementation of the project. The Project Incharge / SGM is responsible for undertaking the engineering, procurement and construction of the project. The SGM shall oversee the implementation of the EMP by assigning the necessary resources and periodically review the effective use of the EMP on site.

HSE Officer:-

- Implementing the HSE&S Manual, Environment Safety and Social Management Plan, Emergency preparedness plan and EPC HSE-Work Instructions;
- Train the workers and employee as per the training programs ;
- Prepare the HSE Training program as per the site specific requirement;
- Carry out HIRA (Hazard identification and risk assessment) & EAI (Environmental Aspects and its Impacts) and prepare mitigation measures and approve it from Head- HSE&S ;
- Identify the IDLH /Risk and guide to process owner of risk for control measures.
- Daily Safety Observation Tour, Work place Monitoring, Safety Findings to be recorded & Informed to site Project Incharge and Process Owners;
- Conducting Safety Committee Meeting including preparation of agenda, near miss & accidents reports & forward to Corporate Office before 3rd of every month;
- Monthly HSE Report sending to be sent HSE- Corporate Manager before 3rd day of every month;
- Emergency preparedness plan and its effectiveness report (i.e. Mockdrill Report) on quarterly basis;
- Visit the labour camp, Workers canteen to do the audit on welfare provided and required.
- Accident reporting within 12 hours as per the Corporate guidelines to concern Govt. Authority and Head-HSE & S.

RESIDENT ENGINEER (RE) - ROAD AND BRIDGE WORKS

The Project Engineer - Road Works shall be responsible for implementation of the EMP during the construction of the road works. He being responsible for day to day operations with regards to road works shall supervise and oversee construction activities such as site clearances, stripping of top soil, excavations. Filling and laying material etc. which necessitates the operation of construction equipment and machinery at the site.

These activities would have environmental effects in terms of impairment to noise and air quality, tree cutting and severances and hence shall be responsible for implementing the EMP in the day to day activities of road construction. The Project Engineer – Bridge Works shall be responsible for implementation of the EMP during the construction of bridge works. These activities would necessitate diversion of roads, cutting of trees and diversion to natural drainage paths which would have a bearing on the environmental quality of the area. The RE (bridge works) shall be responsible for implementation of EMP with respect to environmental aspects during bridge construction.

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SITE ENGINEERS/SUPERVISORS

The site engineers/supervisors report to the RE and are responsible for day to day operations of construction works in their respective areas. They supervise and oversee the construction activities and hence shall be made responsible for ground the EMP and minimize the impacts during construction. Some of the key aspects that shall be taken up by the site engineers/ supervisors shall include periodic sprinkling of water in inhabited areas during transportation of material and operation of construction machinery.

SUBCONTRACTORS

Sub contractors shall be sensitized on environmental aspects as they form part of the road construction in terms of transportation, earthwork, concrete and form work.

The environmental effects due to and transportation of material, debris removal and residues shall be properly conducted to minimise damage to the environment. The site engineers/supervisors shall be responsible for monitoring the implementation of EMP at this level.

Overall Responsibility - All Employees

Overall responsibility for the environment, social, occupational health and safety management system lies with the Project Head of the SPV who will establish and maintain an organizational structure that defines roles, responsibilities, and authority to implement the EMP. This will include the designation of in-house personnel during the different phases of the Project as described below.

The HSE &S activities will be carried out by SPV, EPC and/or O&M contractor and third parties. All these activities will be undertaken under contract with company and will be supervised by company which will ensure that all contracts include terms and conditions requiring contractors to adopt management systems which comply with the ISO 14001, OHSAS 18001 and with the EMP requirements.

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4. Statutory Clearances / License Details

Legal and Regulatory Requirements and Applicable International Standards :

Company and its EPC, Sub-contractors are governed by the various legislative rules and regulation set by Ministry of Environment and Forest (MoEF) and concerned pollution control boards.

The following Rules and Regulation are applicable for Madhugiri-Mulbagal Road Section (Km 343.800 to Km 483.151) of NH-234 Project :-

- MOEF Requirement Road construction -- EIA Report & Environment clearance from MOEF – Not Applicable
- Environment Protection Act :1986 - – Applicable
- The Water (Prevention & control of pollution) Act, 1974 - – Applicable
- The Water (Prevention & Control of pollution) Cess Act, 1977, including rules, 1978 - – Applicable
- The Air (Prevention & control of pollution) Act, 1984 - – Applicable
- The Hazardous Waste (Management & Handling) Rules, 2000 - – Not Applicable
- Manufacture, Storage & Import of Hazardous Chemicals Rules, 1989 - – Applicable
- Forest clearance for tree cutting (Local, State and Center if required) -- Applicable
- Local authority or *Grampanchayat* permission (NOC) for establishment of plant - – Applicable
- District Industry Center permission for industry - – Applicable
- Factory Act: 1948 (Crusher, HMP, RMC & CRMB) Plant Establishment - – Applicable
- State Factory Rule (Director of Industrial Safety and Health requirement) - – Applicable
- Building and Other Construction worker Act, 1996 –Not Applicable
- The Mines & Minerals Act, 1957 -- Not Applicable
- Mineral Concession Rules, 1960 - – Not Applicable
- Land acquisition Rule-1998 – Not Applicable
- Petroleum Rules, 1976 (Petroleum & Explosive Department) - – Applicable
- The Indian Electricity Rules, 1956 - – Applicable
- Batteries Act, 1989 - – Applicable
- Minimum Wages Act, 1948 - – Applicable

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Environmental Management Measures - (Part-A)

Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
PRE-CONSTRUCTION STAGE					
Pre-construction activities by Karnataka state Highways Improvement Project (KSHIP)					
P 1	Land Acquisition (If required)	The acquisition of land and private properties shall be carried out in accordance with the RAP and entitlement framework of the Project. KSHIP has to ascertain that acquisition of land in the post design phase are addressed and integrated into the EMP and relevant contract documents.	LA Act 1984 and its Amendments, KSHIP	KSHIP, Revenue Dept, Collaborating Agencies	KSHIP
P 2	Clearance of Encroachment/Squatters (change in land use)	Advance notice, as per RAP shall be given to the encroachers & squatters present in the Corridor of Impact, who need to be relocated. All R&R activities shall be undertaken. Entitlements as per KSHIP entitlement framework shall be completed before construction starts.	RAP documents	KSHIP and Revenue Authority	KSHIP
P 3	Tree Cutting	Trees shall be removed from the Corridor of Impact before the actual commencement of the work with the permission from the state Forest Department. Cutting shall not start until the implementation of the project in that particular location of cutting 100% confirmed. Stacking, transport and storage of the wood shall be done as per the relevant norms.	MoRTH 201.6	ABL/Agency engaged by KSHIP	CSC and KSHIP /
P 4	Preservation of Trees	All efforts shall be made to preserve trees including evaluation of minor design adjustments/alternatives (as applicable) to save trees. Specific attention shall be given for protecting giant trees, green tunnels and locally important trees (religiously important etc.). Detail of the trees affected due to the proposed project road is given in (Appendix – 10) Tree cutting is to proceed only after all the legal requirements including attaining of In-principle and Formal Clearances from the Forest Dept./MoEF are completed and subsequently a written order is issued to the Contractor. Particular species declared as “protected” by the State’s Forest Dept. in the private land shall be felled only after due clearance from the Forest Dept. is obtained.	Appendix-10	ABL/Agency engaged by KSHIP	CSC and KSHIP /

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
P 5	Relocation of Community Utilities and Common Property Resources	In the event of design changes, additional assessments including the possibility to save trees shall be made. Systematic corridor level documentation for the trees cut and those saved shall be maintained by the KSHIP All community utilities and properties i.e., hand pumps, open wells, water supply lines, sewer lines, telephone cables, buildings and health centers shall not be relocated before construction starts in the project road. Details of the community properties affected are provided in Chapter-2 Summary of Impacts.	RAP document	KSHIP, other Agencies / ABL	KSHIP
P 6	Relocation of affected Cultural and Religious Properties	All religious property resources such as shrines, temples and mosques within the project road shall be relocated. A list of cultural properties affected is given in the Chapter-2 Summary of Impacts. If there is any relocation of the religious structures may happen then it shall be identified in accordance with the choice of the community. KSHIP in consultation with local people shall finalize those. The entire process (i.e. selection of relocation sites and design) shall be under supervision of Environmental Specialist of CSC, during the construction stage by the Contractor. The relocation shall be completed before the construction starts in these sites.	Chapter-2 Summary of Impacts	KSHIP/ ABL	CSC/ KSHIP
Pre-construction activities by the ABL/Environmental Specialist of CSC					
P 7	Field Verification and Modification of the Contract Documents				
P.7.1	Joint Field Verification	The Environmental Specialist of CSC and the Contractor shall carry out joint field verification to ascertain any possibilities of saving trees, environmental and community resources, & these activities are to be taken up by the construction Contractor.		ABL/ Environmental Specialist of CSC	KSHIP
P.7.2	Assessment of Impacts due to Changes/Revisio	The Environmental Specialist of CSC shall assess impacts and revise/modify the EMP and other required sections of the project document/s in the event of changes/revisions (including addition or deletion) in the project's scope of		ABL/ Environmental Specialist of	KSHIP

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
	ns/Additions in the Project Work	work.		CSC	
P.7.3	Crushers, Hot-mix plants and Batching Plants Location	<p>All construction plants shall be sited sufficiently away from settlements and agricultural operations or any commercial establishments. Such plants shall be located at least 100m away from the nearest dwelling preferably in the downwind direction.</p> <p>The Contractor shall submit a detailed layout plan for all such sites and approval of Environmental Specialist of CSC shall be necessary prior to the establishment.</p> <p>Arrangements to control dust pollution through provision of windscreens, water sprinklers, and dust extraction systems shall have to be provided at all such sites.</p> <p>Specifications for crushers, hot mix plants and batching plants shall comply with the requirements of the relevant emission control legislations. Consent for the Establishment and Operation from KSPCB shall be obtained before establishment and operation respectively and a copy should be submitted to the CSC and KSHIP.</p> <p>Wherever there is extremely water scarcity areas exist the Water sprinkling shall be limited to one time in the morning. To balance this deficient information boards shall be erected at appropriate locations with a message to "Dust prone area take precautions.</p>	MoRTH 111.1, Air Pollution Control Act, and Noise Rules	ABL/ Environmental Specialist of CSC	KSHIP
P.7.4	Other Construction Vehicles, Equipment and Machinery	<p>All vehicles, equipment and machinery to be procured for construction shall conform to the relevant Bureau of India Standard (BIS) norms. The discharge standards promulgated under the Environment Protection Act, 1986 and Motor Vehicles Act, 1988 shall be strictly adhered to.</p> <p>The silent/quiet equipment available in the market shall be used in the Project.</p> <p>The Contractor shall maintain a record of PUC for all vehicles and machinery</p>	Air pollution Control Act, and Noise Rules and Motor Vehicle Act, 1988	ABL/ Environmental Specialist of CSC	KSHIP

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision / Monitoring
P 8	Identification and Selection of Material Sources				
		used during the contract period which shall be produced to EO, KSHIP /PWD’s verification whenever required.			
P.8.1	Borrow Areas	Finalizing soil borrowing earth and all logistic arrangements as well as compliance to environmental requirements, as applicable, shall be the sole responsibility of the Contractor. (Appendix-17). The Contractor shall not start borrowing earth from selected borrow area until the formal agreement is signed between landowner and Contractor and a copy is submitted to the CSC. Locations finalized by the Contractor shall be reported to the Environmental Specialist of CSC and he shall submit the report to KSHIP. Planning of haul roads for accessing borrows areas shall be undertaken during this stage. The haul roads shall be routed to avoid agricultural areas as far as possible and shall use the existing village roads wherever available. The environmental personnel of the CSC shall be required to inspect every borrow area location prior to approval. The CSC should include the Request for Inspection form for borrow area approval from the environmental point of view. Contractor shall finalize the quarry for procurement of construction materials after assessment of the availability of sufficient quantity of materials, quality and other logistic arrangements. In case the Contractor decides to use quarries other than recommended by DPR consultant, then the Contractor should give substantiation. Contractor shall also work out haul road network and report to Environmental Specialist of CSC and CSC shall inspect and in turn report to KSHIP before approval	Appendix-16, 17	ABL/ Environmental Specialist of CSC	KSHIP
P.8.2	Quarry		MoRTH 111.3 & Appendix-17, 19	ABL	Environmenta l Specialist of CSC
P.8.3	Arrangement for Construction	In view of the special situation in Karnataka, Contractor shall prepare and implement the approved Water Management Plan in accordance with the	Appendix-15 and Appendix-16	ABL	Environmenta l Specialist of

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
	Water	<p>Appendix-16, Appendix-24 and BOQ Environment mitigation works</p> <p>The contractor shall use ground/surface water as a source of water for the construction and may set up own bore well facility for construction work.</p> <p>Contractor may take surface water from the Irrigation Canal with the written consent from the Irrigation Department.</p> <p>To avoid disruption/disturbance to other water users, the Contractor shall extract water from fixed locations and consult Environmental Specialist of CSC before finalizing the locations.</p> <p>The Contractor shall provide a list of locations and type of sources from where water for construction shall be extracted.</p> <p>The Contractor shall need to comply with the requirements of the State Ground Water Department for the extraction and seek their approval for doing so and submit copies of the permission to CSC and KSHIP .</p> <p>The Sand shall be procured from identified sand mines as far as possible. If the Contractor want to obtain from source other than listed in EMP, substitution shall be provided. has the details of the aggregates source and lead distance.</p> <p>The Contractor shall obtain copy of the Lease Agreement of the supplier and submit to CSC before procuring the sand.</p>			CSC
P 9	Sand		Chapter-2 Summary of Impacts	All riverbeds recommended for sand extraction for the project.	
P 10	Labour Requirements		Copy of Contract Document	ABL	Environmenta Specialist of CSC
P 11	Construction Camp Locations Selection, Design and Layout		Appendix-13, 21	ABL	Environmenta Specialist of CSC

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P 12	Arrangements for Temporary Land Requirement	300m away from watercourses. The sewage TP and solid waste treatment for the camp shall be designed, built and operated. Contractor's camps shall be identified at least 2km away from the Forest Reserves. The Contractor as per prevalent rules shall carry out negotiations with the landowners for obtaining their consent for temporary use of lands for construction camp/construction/borrow areas etc. Temporary land arrangements shall not be from the forest reserves except under special permission circumstances where it is un avoidable due to the vast forest reserves in the PIA.	Appendix-13, 16, 17	ABL	Environmenta l Specialist of CSC
P 13	Orientation of Implementing Agency and Contractors	The KSHIP shall organize Orientation Sessions and regular training sessions at all stages of the project. This shall include on-site training (general as well as in the specific context of a sub-project). These sessions shall involve all staff of KSHIP involved in the implementation of EMP, Environmental Specialists of CSC and Contractors.	EMP and other training plan developed by KSHIP	ABL/ CSC and KSHIP	KSHIP
CONSTRUCTION STAGE					
Activities to be Carried Out by the ABL					
C 1	Site Clearance				
C.1.1	Clearing and Grubbing	If required vegetation shall be removed from the construction zone before commencement of construction. All works shall be carried out such that the damage or disruption of flora other than those identified for cutting is minimum. Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works shall be removed with prior approval from the Environmental Expert of CSC. The Contractor, under any circumstances shall not cut or damage trees and forest reserves (refer Appendix-13). Trees identified under the project shall be cut only after receiving clearance from the Forest Dept./DoEF/MoEF (as applicable) and	MoRTH 201 & Appendix-10, 20	ABL	Environmenta l Specialist of CSC, KSHIP

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
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C.1.2	Disposal of Debris from dismantling structures, road surface and hill ward excavation for widening of the road	<p>after the receipt of KSHIP's written permission in this regard. Vegetation only with girth size of over 30 cm shall be considered as trees and shall be compensated, in the event of KSHIP's instruction to undertake tree cutting.</p> <p>Appendix-1 provides guidelines for the preparation of the contractors Debris disposal plan. This is mainly to deal with surplus debris materials that would be available after adjusting for all insitu applications. Other debris generated due to dismantling of the existing road shall be suitably reused in the proposed construction zone, subjected to the structure suitability of the materials and approval of the Resident Engineer and Environmental Expert of CSC as follows: For filling and levelling of School grounds and proposed parking areas. The sub grade of the existing pavement shall be used as embankment fill material. Existing base and sub-base material shall be recycled as sub-base of the haul road or access roads. The existing bitumen surface may be utilized for the paving of cross roads, access roads and paving works in construction sites and campus, temporary traffic diversions, haulage routes etc. (Appendix - 5) The Contractor shall suitably dispose off unutilized debris materials either through filling up of borrows areas located in wasteland or at pre-designated disposal locations, subject to the approval of the Environmental Expert of CSC. At locations identified for disposal of bituminous wastes, the disposal shall be carried out over a 30 mm thick layer of rammed clay so as to eliminate the possibility of scarified percolation of leachate into the ground water. The Contractor shall ensure that the surface area of such disposal pits is covered with a layer of soil & subsequent turfing (Appendix - 5). All arrangements for transportation during construction including provision, maintenance, dismantling and clearing debris, shall be considered incidental to the work and shall be planned and implemented by the Contractor as approved and</p>	MoRTH 202 Appendix-1	ABL	Environmenta l Specialist and Resident Engineer of CSC, EC, KSHIP

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
C.1.3	Other Construction Wastes Disposal	<p>directed by the Environmental Expert of CSC.</p> <p>The pre-designed disposal locations shall be a part of Waste Disposal Plan in consultation and with approval of Environmental Expert of CSC.</p> <p>Debris generated from pile driving or other construction activities shall be disposed such that it does not flow into the surface water bodies or for mud puddles in the area.</p> <p>The Contractor shall identify dumping sites as per the Debris Disposal Plan prepared using the Guidelines provided in the Appendix 1; The identified locations shall be reported to the Environmental Expert of CSC. These locations shall be checked on site and accordingly approved by Environmental Expert of CSC prior to any disposal of waste materials.</p> <p>The pre-identified disposal location shall be part of Comprehensive Waste Disposal Plan Solid Waste Management Plan to be prepared by the Contractor in consultation and with approval of Environmental Specialist of CSC.</p> <p>Location of disposal sites shall be finalized prior to initiation of the works on any particular section of the road.</p> <p>The Environmental Specialist of CSC shall approve these disposal sites after conducting a joint inspection on the site with the Contractor.</p> <p>Contractor shall ensure that any spoils or material unsuitable for embankment fill shall not be disposed off near any water course or agricultural land, Orchards and Natural Habitats like Grasslands. Such spoils from excavation can be used to reclaim borrow pits and low-lying areas located in barren lands along the project road (if it so desired by the owner/community and approved by the Environmental Specialist, CSC).</p> <p>Non-bituminous wastes shall be dumped in borrow pits covered with a layer of 30cm soil to ensure that borrow pit is restored to original use. No new disposal site shall be created as part of the project, except with prior approval of the Environmental Specialist of CSC.</p>	MoRTH:202.5 MoRTH:301.1 1 (Appendix-1)	ABL	Environmenta l Specialist of CSC, KSHIP

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
C.1.4	Stripping, and preservation of top soil	<p>All waste materials shall be completely disposed and the site shall be completely cleaned and certified by Environmental Specialist of CSC before handing over. The Contractor at his cost shall resolve any claim, arising out of waste disposal or any non-compliance that may arise on account of lack of action on his part.</p> <p>The topsoil from all areas of cutting and all areas to be permanently covered shall be stripped off to a specified depth of 150 mm and stored in stockpiles. A portion of the temporarily acquired area and/or Right of Way shall be earmarked for storing topsoil. The locations for stock piling shall be pre-identified in consultation and with approval of Environmental Specialist of CSC. The following precautionary measures shall be taken to preserve them till they are used:</p> <ul style="list-style-type: none"> ● Stockpile shall be designed such that the slope does not exceed 1:2 (Vertical to horizontal), and height of the pile is restricted to 2 m. To Retain soil and to allow percolation of water, silt fencing shall protect the edges of the pile. ● Stockpiles shall not be surcharged or otherwise loaded and multiple handling shall be kept to a minimum to ensure that no compaction shall occur. The stockpiles shall be covered with gunny bags or vegetation. ● It shall be ensured by the Contractor that the topsoil shall not be unnecessarily trafficked either before stripping or when in stockpiles. Such stockpiled topsoil shall be utilized for – <ol style="list-style-type: none"> 1. Covering all disturbed areas including borrow areas, only in case where they are to be rehabilitated. 2. Dressing of slopes of road embankment > Agricultural fields of farmers acquired temporarily land. <p>The Contractor shall provide safe and convenient passage for vehicles, pedestrians and livestock to and from roadsides and property access connecting the project road, providing temporary connecting road.</p> <p>The Contractor shall also ensure that the existing accesses shall not be undertaken without providing adequate provisions.</p>	MoRTH:301.3. 2 MoRTH:301.7 MoRTH:305.3. 3 and MoRTH:305.3. 9	ABL	Environmenta l Specialist of CSC, KSHIP
C.1.5	Accessibility			ABL	Environmenta l Specialist of CSC, KSHIP



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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
C.1.6	Planning for Traffic Diversions And Detours	<p>The Contractor shall take care that the cross roads are constructed in such a sequence that construction work on the adjacent cross roads are taken up one after one so that traffic movement in any given area not get affected much.</p> <p>Temporary diversions shall be constructed with the approval of the Resident Engineer and Environmental Specialist of CSC. Detailed Traffic Control Plans shall be prepared by the Contractor and approved by Environmental Specialist and Resident Engineer of CSC for approval, seven days prior to commencement of works on any section of road. The Traffic Control Plans shall contain details of temporary diversions, traffic safety arrangements for construction under traffic, details of traffic arrangement after cessation of work each day, safety measures for night time traffic and precaution for transportation of hazardous materials and arrangement of flagmen.</p> <p>The contractor shall ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow.</p> <p>The Contractor shall also inform local community of changes to traffic routes, conditions and pedestrian access arrangements with assistance from CSC and KSHIP. The temporary traffic detours shall be kept free of dust by sprinkling of water three times a day and as required under specific conditions (depending on weather conditions, construction in the settlement areas and volume of traffic).</p>	MoRTH:112 and its Amendments (Appendix-14)	ABL	Environmenta l Specialist and Resident Engineer of CSC, EO, KSHIPF
C.2	Procurement of Construction Material				
C.2.1	Earth from Borrow Areas for Construction	No borrow area shall be opened without permission of the Environmental Specialist of CSC. The location, shape and size of the designated borrow areas shall be approved by the Environmental Specialist of CSC and in accordance to the IRC recommended practice for borrow pits for road embankments (IRC: 10: 1961). The borrowing operations shall be carried out as specified in the guidelines for siting and operation of borrow areas. The unpaired surfaces used for the haulage of borrow materials, if passing through	MoRTH:305.2 (Appendix-16 and 17)	ABL	Environmenta l Specialist of CSC, KSHIP

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision / Monitoring
		<p>the settlement areas or habitations; shall be maintained dust free by the Contractor. Sprinkling of water shall be carried out twice a day to control dust along such roads during their period of use.</p> <p>During dry seasons (winter and summer) frequency of water sprinkling shall be increased in the settlement areas and Environmental Specialist of CSC shall decide the sprinkling time depending on the local requirements.</p> <p>Contractor shall rehabilitate the borrow areas as soon as borrowing of soil is over from a particular borrow area in accordance with the approved Borrow Area Redevelopment Plan.</p> <p>The Contractor shall obtain materials from quarries only after consent of the Department of Mines & Geology and District Administration. In view of special situation of excavation of the ward hill side, Contractor shall get an opportunity to use the same material for road construction. This shall require establishment of a number of crushers along the roadsides. The crushers and all related activities shall be under taken as per the Appendix-19 Policy guidelines for installation of stone Crushers.</p>			
C.2.2	Quarry Operations Crushers		MoRTH: 111.3 Appendix-19	ABL	Environmenta l Specialist of CSC, KSHIP
C.2.3	Blasting	<p>Except as may be provided in the contract or ordered or authorized by the Engineer, the Contractor shall not use explosives.</p> <p>Where the use of explosives is so provided or ordered or authorized, the Contractor shall comply with the requirements of the following Sub-Clauses of MoRTH 302 besides the law of the land as applicable.</p> <p>The Contractor shall at all times take every possible precaution and shall comply with appropriate laws and regulations relating to the importation, handling, transportation, storage and use of explosives. The contractor shall at all times when engaged in blasting operations, post sufficient warning flagmen, to the full satisfaction of the Engineer.</p> <p>The Contractor shall at all times make full liaison with and inform well in advance and obtain such permission as is required from all Government Authorities, public bodies and private parties whomsoever concerned or affected or likely to be</p>	Appendix-19	MoRTH:30 2.4	301.9 (i) 304.5

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
C.2.4	Transporting and Haul Road Management	<p>concerned or affected by blasting operations. Blasting shall be carried out only with permission of the Engineer. All the statutory laws, regulations, rules etc., pertaining to acquisition, transport, storage, handling and use of explosives shall be strictly followed. Blasting shall be carried out during fixed hours (preferably during mid-day) or as permitted by the Engineer. The timing should be made known to all the people within 1000m (200m for pre-splitting) from the blasting site in all directions. Contractor shall maintain all roads (existing or built for the project), which are used for transporting construction materials, equipment and machineries as precised. All vehicles delivering fine materials to the site shall be covered to avoid spillage of materials. All existing roads used by vehicles of the Contractor or any of his subcontractor or suppliers of materials and similarly roads, which are part of the works, shall be kept clear of all dust/mud or other extraneous materials dropped by such vehicles. Contractor shall arrange for regular water sprinkling as necessary for dust suppression of all such roads and surfaces. Contractor need to implement the finally approved contractors Construction Water Management Plan as per the guidelines provided in Appendix 15. This is linked to the contractor's work plan. Contractor shall arrange adequate supply and storage of water for the whole construction period at his own cost. The contractor shall submit a list of source/s from where water shall be used for the project to CSC and KSHIP. The Contractor shall source the requirement of water preferentially by conjunctive use of Surface water and groundwater but with prior permission from the Groundwater Authority. A copy of the permission shall be submitted to CSC and KSHIP prior to initiation of construction. The Contractor shall take all precaution to minimize the wastage of water in the construction process/operation.</p>	Appendix-16	ABL	Environmenta Specialist of CSC, KSHIP
C.2.5	Construction Water	<p>concerned or affected by blasting operations. Blasting shall be carried out only with permission of the Engineer. All the statutory laws, regulations, rules etc., pertaining to acquisition, transport, storage, handling and use of explosives shall be strictly followed. Blasting shall be carried out during fixed hours (preferably during mid-day) or as permitted by the Engineer. The timing should be made known to all the people within 1000m (200m for pre-splitting) from the blasting site in all directions. Contractor shall maintain all roads (existing or built for the project), which are used for transporting construction materials, equipment and machineries as precised. All vehicles delivering fine materials to the site shall be covered to avoid spillage of materials. All existing roads used by vehicles of the Contractor or any of his subcontractor or suppliers of materials and similarly roads, which are part of the works, shall be kept clear of all dust/mud or other extraneous materials dropped by such vehicles. Contractor shall arrange for regular water sprinkling as necessary for dust suppression of all such roads and surfaces. Contractor need to implement the finally approved contractors Construction Water Management Plan as per the guidelines provided in Appendix 15. This is linked to the contractor's work plan. Contractor shall arrange adequate supply and storage of water for the whole construction period at his own cost. The contractor shall submit a list of source/s from where water shall be used for the project to CSC and KSHIP. The Contractor shall source the requirement of water preferentially by conjunctive use of Surface water and groundwater but with prior permission from the Groundwater Authority. A copy of the permission shall be submitted to CSC and KSHIP prior to initiation of construction. The Contractor shall take all precaution to minimize the wastage of water in the construction process/operation.</p>	Appendix-15	ABL	Environmenta Specialist of CSC, KSHIP

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
C.3	Construction Work				
C.3.1	River Training and Disruption to Other Users of Water	While working across or close to any perennial water bodies, Contractor shall not obstruct/prevent the flow of water. Construction over and close to the non-perennial streams shall be undertaken in the dry season. If construction work is expected to disrupt users of community water bodies, notice shall be served well in advance to the affected community. Contractor shall ensure that no construction materials like earth, stone, or appendage disposed off in a manner that block the flow of water of any water course and cross drainage channels. Contractor shall take all necessary measures to prevent any blockage to the water flow. In addition to the design requirements, the Contractor shall take all required measures as directed by the Environmental Specialist of CSC to prevent temporary or permanent flooding of the site or any adjacent area.	MoRTH:304.3.2	ABL	Environmenta Specialist of CSC, KSHIP
C.3.2	Drainage and Flood Control	The Contractor shall not excavate beds of any stream/canals/any other water body for borrowing earth for embankment construction. Contractor shall construct silt fencing at the base of the embankment construction for the entire perimeter of any water body (including springs and wells) adjacent to the project road and around the stockpiles at the construction sites including ancillary sites close to water bodies. The fencing shall be provided prior to commencement of earthwork and continue till the stabilization of the embankment slopes, on the particular sub-section of the road. Contractor shall ensure that construction materials containing fine particles are stored in an enclosure such that sediment-laden water does not drain into nearby watercourse.	MoRTH:305.3.7 MoRTH:306 Appendix 1	ABL	Environmenta Specialist of CSC, KSHIP
C.3.3	Siltation of Water Bodies and Degradation of Water Quality	The Contractor shall construct slope Protection works as per design, or as directed by the Environmental Specialist of CSC to control soil erosion and sedimentation through use of Breast walls, Retaining Walls, Plot Bioengineering methods, dykes, sedimentation chambers, basins, fiber mats, mulches, grasses, slope, drains and other devices.	MoRTH:306 (Silt Fencing) Appendix-3	ABL	Environmenta Specialist of CSC, KSHIP
C.3.4	Slope Protection and Control of Soil Erosion		MoRTH:305.2.2.2 MoRTH:306.2 & Appendix 10 and 18	ABL	Environmenta Specialist of CSC, KSHIP

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision / Monitoring
		<p>All temporary sedimentation, pollution control works and maintenance thereof shall be deemed as incidental to the earth work or other items of work and as such no separate payment shall be made for them. Contractor shall ensure the following aspects:</p> <p>After construction of road embankment, the side slopes shall be covered with grass and shrubs (refer Appendix-10 and 18) as per design specifications.</p> <p>Turfing works shall be taken up as soon as possible provided the season is favourable for the establishment of grass sods. Other measures of slope stabilization shall include mulching netting and seeding of batters and drains immediately on completion of earthworks.</p> <p>In borrow pits, the depth shall be so regulated that the sides of the excavation shall have a slope no steeper than 1 vertical to 2 horizontal, from the edge of the final section of the bank.</p> <p>Along sections abutting water bodies, pitching as per design specification shall protect slopes.</p>			
C-4	Pollution				
C-4.1	Water Pollution				
C.4.1.1	Water Pollution from Construction Wastes	<p>The Contractor shall take all precautionary measures to prevent entering of waste water into streams, water bodies or the irrigation system during construction. Contractor shall avoid construction works close to the streams or water bodies during monsoon. Contractor shall not wash his vehicles in river water and shall not enter riverbed for that purpose.</p>	MoRTH:111.4 MoRTH:111.1	ABL	Environmental Specialist of CSC, KSHIP

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
C.4.1.2	Water Pollution from Fuel and Lubricants	<p>The Contractor shall ensure that all construction vehicle parking locations, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance and refueling sites shall be located at least 500 m away from rivers and irrigation canal/ponds.</p> <p>The Contractor shall submit all locations and layout plans of such sites prior to their establishment and shall be approved by the Environmental Specialist of CSC.</p> <p>Contractor shall ensure that all vehicle/machinery and equipment operation, maintenance and refueling shall be carried out in such a manner that spillage of fuels and lubricants does not contaminate the ground. Waste water from vehicle parking, fuel storage areas, workshops, wash down and refueling areas shall be treated in an oil interceptor before discharging it on land or into surface water bodies or into other treatment system.</p> <p>In all, fuel storage and refueling areas, if located on agricultural land or areas supporting vegetation, the topsoil shall be stripped, stockpiled and returned after cessation of such storage.</p> <p>Contractor shall arrange for collection, storing and disposal of oily wastes to the pre-identified disposal sites (list to be submitted to CSC and KSHIP) and approved by the Environmental Specialist of CSC. All spills and collected petroleum wastes shall be disposed off in accordance with Petroleum Rules and PCB guidelines.</p>	<p>MoRTH:111.4 MoRTH:111.1 (Oil Interceptors) Petroleum Act and Rules MoEF/CPCB Notifications (Appendix-8)</p> <p>ABL</p>	<p>Environmenta l Specialist of CSC, KSHIP</p>	
C.4.2	Air Pollution				
C.4.2.1	Dust Pollution	<p>The Contractor shall take every precaution to reduce the level of dust from construction plants, construction sites involving earthwork by sprinkling of water, encapsulation of dust source.</p> <p>Due to the acute water scarcity in certain areas, Contractor should limit water sprinkling once in the early morning hours. Contractor should erect warning boards on dust nuisance to the road users.</p> <p>The Contractor shall procure the construction plants and machinery, which shall conform to the pollution control norms specified by MoEF/CPCB/KSPCB.</p> <p>The concentration of suspended particulate matter at a distance of 40m from a</p>	<p>MoRTH:111.1 MoRTH:111.5 MoRTH:111.9 MoRTH:111.10 Contract Agreement (Appendix-7 and Appendix-</p> <p>ABL</p>	<p>Environmenta l Specialist of CSC, EO, KSHIP through Engineer</p>	

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
C.4.2.	Emission from Construction Vehicles, Equipment and Machineries	<p>construction plant located in a cluster of industries should be less than 500 µg. The environmental monitoring is to be conducted as per the monitoring plan. Alternatively, only crushers licensed by the KSPCB shall be used. The Environmental Specialist, EO and KSHIP through the Engineer shall submit required certificates and consents.</p> <p>Contractor shall ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant statutory requirements of CPCB and/Motor Vehicles Rules. The Contractor shall submit PUC certificates for all vehicles/equipment/machinery used for the Project.</p>	16)	ABL	Environmenta Specialist of CSC, KSHIP
C.4.3	Noise Pollution				
C.4.3.1	Noise Pollution: Noise from Vehicles, Plants and Equipments	<p>The Contractor shall confirm the following:</p> <p>All Construction plants and equipment used in construction shall strictly conform to the MoEF/CPCB noise standards.</p> <p>All Vehicles and equipment used in construction shall be fitted with exhaust silencers.</p> <p>Servicing of all construction vehicles and machinery shall be done regularly and during routine servicing operations, the effectiveness of exhaust silencers shall be checked and if found defective shall be replaced.</p> <p>The equipment available in the market should be procured, if the Contractor plans to purchase new equipment. For the old equipment, necessary or possible alterations must be carried out to reduce the noise levels to the possible extent.</p> <p>Maintenance of vehicles, equipment and machinery shall be regular and up to the satisfaction of the Environmental Specialist of CSC to keep noise levels at the minimum.</p> <p>At the construction sites within 150 m of the nearest habitation, noisy construction work such as crushing, operation of DG sets, use of high noise generation equipment shall be stopped during the night time between 10.00 pm to 6.00 am.</p>	Noise Rules Published by MoEF Appendix-6 & Appendix-7	ABL	Environmenta Specialist of CSC, KSHIP

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
C.5	Safety				
C.5.1	Personnel Safety Measures for Labour	<p>Contractor shall provide:</p> <ul style="list-style-type: none"> • Protective footwear, protective goggles and nose masks to the workers employed in asphalt works to protect from the Benzene fumes, concrete works, crusher etc. • Welder's protective eye-shields to workers who are engaged in welding works • Earplugs to workers exposed to loud noise, and workers working in crushing or compaction • The Contractor shall comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress. <p>The Contractor shall comply with all the precautions as required for ensuring the safety of the workmen as per the International Labour Organization (ILO) Convention No. 62 as far as those are applicable to this contract.</p> <p>The Contractor shall make sure that during the construction work all relevant provisions of Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996 are adhered to.</p> <p>The Contractor shall not employ any person below the age of 14 years for any work and no woman shall be employed on the work of painting with products containing lead in any form</p>	Appendix-9	ABL	Environmental Specialist of CSC, KSHIP

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision / Monitoring
C.5.2	Traffic and Safety	<p>The Contractor shall also ensure that paint containing lead or lead products is used except in the form of paste or ready-made paint.</p> <p>The Contractor shall take all necessary measures for the safety of traffic during construction and provide erect and maintain such barricades, including signs, markings, flags, lights and flagmen as proposed in the Traffic Control Plan/Drawings and as required by the Environmental Expert of CSC for the information and protection on traffic approaching or passing through the section of any existing cross roads.</p> <p>The Contractor shall ensure that all signs, barricades, pavement markings are provided as per the MoRTH specifications. Before taking up of construction on any section of the existing lanes of the highway, a Traffic Control Plan shall be devised and implemented to the satisfaction of the Environmental Expert of CSC.</p> <p>The Contractor shall take all required precautions to prevent danger from electrical equipment and ensure that –</p> <ul style="list-style-type: none"> • No material shall be so stacked or placed as to cause danger or inconvenience to any person or the public. • All necessary fencing and lights shall be provided to protect the public in construction zones. <p>All machines to be used in the construction shall conform to the relevant Indian Standards (IS) codes, shall be free from patent defect, shall be kept in good working order, shall be regularly inspected and properly maintained as per IS provision and to the satisfaction of the Environmental Expert of CSC.</p> <p>Contractor shall take all reasonable precautions to prevent danger to the workers and public from fire, flood etc. resulting due to construction activities.</p> <p>Contractor shall make required arrangements so that in case of any mishap all necessary steps can be taken for prompt first aid treatment. Construction Safety Plan prepared by the Contractor shall identify necessary actions in the event of an emergency.</p>	<p>MoRTH: 112.4</p> <p>MoRTH: 112.1</p> <p>IRC: SP:55</p> <p>Appendix-9 & 14</p>	ABL	<p>Environmenta Specialist of CSC, KSHIP</p>
C.5.3	Risk from Electrical Equipments	<p>The Contractor shall take all required precautions to prevent danger from electrical equipment and ensure that –</p> <ul style="list-style-type: none"> • No material shall be so stacked or placed as to cause danger or inconvenience to any person or the public. • All necessary fencing and lights shall be provided to protect the public in construction zones. <p>All machines to be used in the construction shall conform to the relevant Indian Standards (IS) codes, shall be free from patent defect, shall be kept in good working order, shall be regularly inspected and properly maintained as per IS provision and to the satisfaction of the Environmental Expert of CSC.</p> <p>Contractor shall take all reasonable precautions to prevent danger to the workers and public from fire, flood etc. resulting due to construction activities.</p> <p>Contractor shall make required arrangements so that in case of any mishap all necessary steps can be taken for prompt first aid treatment. Construction Safety Plan prepared by the Contractor shall identify necessary actions in the event of an emergency.</p>		ABL	<p>Environmenta Expert of SC, PIU</p>
C.5.4	Risk Measure Force	<p>The Contractor shall take all required precautions to prevent danger from electrical equipment and ensure that –</p> <ul style="list-style-type: none"> • No material shall be so stacked or placed as to cause danger or inconvenience to any person or the public. • All necessary fencing and lights shall be provided to protect the public in construction zones. <p>All machines to be used in the construction shall conform to the relevant Indian Standards (IS) codes, shall be free from patent defect, shall be kept in good working order, shall be regularly inspected and properly maintained as per IS provision and to the satisfaction of the Environmental Expert of CSC.</p> <p>Contractor shall take all reasonable precautions to prevent danger to the workers and public from fire, flood etc. resulting due to construction activities.</p> <p>Contractor shall make required arrangements so that in case of any mishap all necessary steps can be taken for prompt first aid treatment. Construction Safety Plan prepared by the Contractor shall identify necessary actions in the event of an emergency.</p>	<p>Contract Agreement Appendix-9</p>	ABL	<p>Environmenta Specialist of CSC, KSHIP</p>

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
C.5.6	First Aid	The Contractor shall arrange for – A readily available first aid unit including an adequate supply of sterilized dressing materials and appliances as per the Factories Rules in every work zone. Availability of suitable transport at all times to take injured or sick person(s) to the nearest hospital. Equipment and trained nursing staff at construction camp.	Contract requirement Appendix-9	ABL	Environmenta Specialist of CSC, KSHIP
C.5.7	Informatory and Hoardings	The Contractor shall provide, erect and maintain informatory/safety signs, hoardings written in English and local language (Kannada), wherever required or as suggested by the Environmental Specialist of CSC.	MoRTH:801 MoRTH:802 & Appendix-4	ABL	Environmenta Specialist of CSC, KSHIP
C.6	Flora and Fauna:	Plantation/Preservation/Conservation Measures			
C.6.1	Road side Plantation Strategy	The Contractor shall do turfing on embankment slopes, plantation of shrubs as specified in the Contract. The compensatory forestation shall be carried out by the State Forest Department. Minimum 80 percent survival rate of the saplings shall be acceptable otherwise the Contractor/Forest Department shall replace dead plants at his own cost. The Environmental Specialist of CSC shall inspect regularly the survival rate of the trees planted by the Contractor in accordance with the plantation strategy suggested. The Contractor shall take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body and hunting of any animal. If any animal is found near the construction site at any point of time, the Contractor shall immediately upon discovery thereof acquaint in the Environmental Specialist of CSC and carry out his instructions for dealing with the same. Environmental Specialist of CSC shall report to the near by forest office (range office or divisional office) and shall take appropriate steps/measures, if required in consultation with the forest officials.	Appendix-10	ABL	Environmenta Specialist of CSC, KSHIP
C.6.2	Flora and chance found Fauna		Appendix-13	ABL	Environmenta Specialist of CSC, KSHIP
C.6.3	Chance Found	All fossils, coins, articles of value of antiquity, structures and other remains of	Appendix-11	ABL	Environmenta

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
	Archaeological Property	archaeological interest discovered on the site shall be the property of the Government and shall be dealt with as per provisions of the relevant legislation. The Contractor shall take reasonable precautions to prevent his workmen or any other persons from removing and damaging any such article or thing. He shall, immediately upon discovery thereof and before removal acquaint the Environmental Specialist of CSC of such discovery and carry out the CSC's instructions for dealing with the same, waiting which all work shall be stopped. The CSC shall seek direction from the Archaeological Survey of India (ASI) before instructing the Contractor to recommence the work in the site. The Archaeological structures identified along the road sides should be protected/ preserved or enhanced as per the law.			I Specialist of CSC, KSHIP
C.7.1	Accommodation	Contractor shall follow all relevant provisions of the Building and the other Construction Workers (Regulations of Employment and Conditions of Service) Act, 1996 for construction and maintenance of labour camp. The location, layout and basic facility provision of each labour camp shall be submitted to CSC and KSHIP prior to their construction. The Construction shall commence only upon the written approval of the Environmental Specialist of CSC. The Contractor shall maintain necessary living accommodation and ancillary facilities in functional and hygienic manner and as approved by the CSC.	Contract Agreement Appendix-21	ABL	Environmenta I Specialist of CSC, KSHIP
C.7.2	Potable Water	The Contractor shall construct and maintain all labour accommodation in such a fashion that uncontaminated water is available for drinking, cooking and washing. The Contractor shall also provide potable water facilities within the premises of every camp at an accessible place, as per standards set by the Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996. The Contractor shall also guarantee the following: o Supply of sufficient quantity of Potable Water (as per IS) in every workplace/labour camp (Site at suitable and easily accessible places and	Appendix-21	ABL	Environmenta I Specialist of CSC, KSHIP

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision / Monitoring
		<p>regular maintenance of such facilities.</p> <ul style="list-style-type: none"> ○ If any water storage tank is provided that shall be kept such that the bottom of the tank at least 1 m above the surrounding ground level. ○ If water is drawn from any existing well, which is within 30 m proximity of any toilet, drain or other source of pollution, the well shall be disinfected before water is used for drinking. ○ All such wells shall be entirely covered and provided with a trap door, which shall be dust proof and water proof. ○ A reliable pump shall be fitted to each covered well. The trap door shall be kept locked and opened only for cleaning or inspection, which shall be done at least once in a month. ○ Analysis of water shall be done every month as per parameters prescribed in IS 10500-1991. <p>Environmental Specialist of CSC shall be required to inspect the labour camp once in a week to ensure the compliance of the EMP</p> <p>The Contractor shall ensure that –</p> <ul style="list-style-type: none"> • The Sewage system for the camp are designed, built and operated in such a manner that no health hazards occurs and no pollution to the air, ground water or adjacent water courses take place • Separate toilets/bathrooms, wherever required, Screened from those form men (marked in vernacular) are to be provided for women • Adequate water supply is to be provided in all toilets and urinals • Night soil can be disposed of with the help of local municipal extractor or disposed of by putting layer of it at the bottom of a permanent tank prepared for the purpose and covered with 15 cm layer of waste or refuse and then covered with a layer of earth for fortnight. <p>The Contractor shall provide garbage bins in the camps and ensure that these are regularly emptied and disposed off in a hygienic manner as per the Comprehensive Solid Waste Management Plan approved by the Environmental Specialist of CSC.</p>			
C.7.3	Sanitation and Sewage System		MoRTH:114.14 4 Appendix-21	ABL	Environmental Specialist of CSC, KSHIP
C.7.4	Waste Disposal		Appendix-21	ABL	Environmental Specialist of CSC, KSHIP

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
C.8	ABL’s Demobilization				
C.8.1	Environmental Conditions	The KSHIP shall undertake seasonal monitoring of air, water, and noise and soil quality through an approved monitoring agency. The parameters to be monitored, frequency and duration of monitoring as well as the locations to be monitored shall be as per the Monitoring Plan prepared. National Standard of Air, Noise and Water given in Appendix-7.	Appendix-7 and Appendix-12	ABL	Environmenta Specialist of CSC and KSHIP, NHAI
C.8.2	Continuous Community Participation	The Environmental Specialist of CSC shall have continuous interactions with local people around the project area to ensure that the construction activities are not causing undue inconvenience to the locals residing in the vicinity of project site under construction due to noise, dust or disposal of debris etc.	Appendix-16	Environme ntal Specialist of CSC	Environmenta Specialist of CSC and KSHIP, NHAI
C.8.3	Clean-up Operations, Restoration and Rehabilitation	Contractor shall prepare site restoration plans, which shall be approved by the Environmental Specialist of CSC. The clean-up and restoration operations are to be implemented by the Contractor prior to demobilization. The Contractor shall clear all temporary structures; dispose all garbage, night soils and POL (Petroleum, Oil and Lubricants) wastes as per Comprehensive Waste Management Plan and as approved by CSC. All disposal pits or trenches shall be filled in and effectively sealed off. Residual topsoil, if any shall be distributed on adjoining/proximate barren land or areas identified by the Contractor and approved by the Environmental Specialist of CSC in a layer of thickness of 75 mm – 150 mm.All construction zones and facilities including culverts, road side areas, camps, Hot Mix plant sites, Crushers, batching plant sites and any other area used/affected due to the project operations shall be left clean and tidy, at the Contractor’s expense, to the entire satisfaction to the Environmental Specialist of CSC.	Appendix-1 and Appendix-21	ABL	Environmenta Specialist of CSC, KSHIP
C.9	Construction Activities by KSHIP/PWD				
C.9.1	Tree Plantation	The plantation at the following locations shall be implemented by the KSHIP through the State Forest Department; <ul style="list-style-type: none"> • Road side • Enhancement sites 	Appendix-13 Appendix-11	State Forest Departmen t	KSHIP

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
		<ul style="list-style-type: none"> • Forest land • Community Forestation <p>A forest area management plan is provided in Appendix-13 & 11 is the list of various enhancements sites included in the project.</p>			
C.9.2	Oxbow lands and other left over portions of the existing project road	Development of the enhancement sites identified where PWD land is already available are provided in Appendix-11.	Appendix-11	State PWD	KSHIP
OPERATION STAGE					
Activities to be Carried Out by the KSHIP/PWD					
O.1	Monitoring Operation Performance	The KSHIP shall monitor the operational performance of the various mitigation/enhancement measures carried out as a part of the project. The indicators selected for monitoring include the survival rate of trees; utility of enhancement provision made under the project; status of rehabilitation of borrow areas; and effectiveness of noise barriers.	Appendix-12	KSHIP/PWD	KSHIP/PWD
O.2	Maintenance of Drainage	PWD shall ensure that all drains (side drains, median drain and all cross drainages) are periodically cleared especially before monsoon season to facilitate the quick passage of rainwater and avoid flooding.	Appendix-12	KSHIP/PWD	KSHIP/PWD
O.3	Pollution Monitoring	The periodic monitoring of the ambient air quality, noise level, water (both ground and surface water) quality, soil quality in the selected locations as suggested in pollution monitoring plan through the KSPCB or its approved monitoring agency.	Appendix-12	Pollution Monitoring Agency	KSHIP/PWD
O.4	Soil Erosion and Monitoring of Borrow Areas	Visual Monitoring and inspection of soil erosion at borrow areas, quarries (if closed and rehabilitated), embankments and other places expected to be affected, shall be carried out once in every three months as suggested in monitoring plan.	Appendix-12	KSHIP/PWD	KSHIP/PWD
O.5	Public awareness on Noise levels and Health Affects	However the public shall be advised to construct the noise barriers such as walls, double glazed windows and tree plantation between the roads and their property. The public awareness is necessary regarding the human health through the news papers and consultations and distribution of pamphlets during the operation stage.	Appendix-6	KSHIP	KSHIP

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Environmental Management Measures – Bridges (Part-B)

Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
PRE-CONSTRUCTION STAGE					
Pre-construction activities by Construction Management Unit					
P.1	Permission from Irrigation Department	Permission from Irrigation Department shall be taken prior to start of construction work on bridges	Contract Agreement	“EO KSHIP”	CSC & CMU (KSHIP)
P.2	Pollution Monitoring	Water Quality upstream and down stream of bridges shall be tested prior to initiation of any work at the site of new construction of Bridges to establish baseline.	Appendix-7	CMU through approved Pollution Monitoring Laboratory	“EO KSHIP”
ABL/Environmental Expert of TA Consultant/CMU (KSHIP)					
P.3	Arrangements for Temporary Land Requirement	The contractor as per prevalent rules shall carry out negotiations with the landowners for obtaining their consent for temporary use of lands for traffic detours, material storage, construction machinery & equipment, vehicle parking etc. Contractor shall enter into a written agreements with land owners for all such sites and Environmental Officer shall be required to ensure that the rehabilitation/clearing up of the sites prior to handing over to the owners have been carried out as per written agreement.	Appendix-14 Appendix-21	ABL	CSC & CMU (KSHIP)
CONSTRUCTION STAGE					
Activities to be Carried Out by the ABL					
C.1	Dismantling of Structures/Components and Debris Disposal	The contractor shall identify disposal sites and shall report the same to the Environmental Officer. These locations shall be checked on site and accordingly approved by Environmental Officer prior to any disposal of waste materials. Contractor shall prepare Comprehensive Solid Waste Management Plan in consultation with Environmental Officer and after approval of plan by EO debris shall be disposed off accordingly. This plan also should include ways and means to dispose off the Municipal Garbage’s dumped on the bridge side of the existing alignment to the make the area	Appendix-1 Appendix-16	ABL	CSC & Environmental Officer, CMU (KSHIP)



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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
C.1.2	Construction of temporary traffic diversions	<p>congenial for working.</p> <p>No dismantling work shall be carried out at night, or during storm or heavy rain. No dismantling shall be carried out without identification and approval of site by Environmental Officer of CSC. Dismantled material shall not be stored in canal bed, embankment slopes except material which shall be reused in Construction. All debris requiring disposal shall be directly taken to the Pre identified disposal site and deposited as per approved Comprehensive Waste Disposal Locations.</p> <p>Debris generated shall be reused in the construction of temporary diversion of traffic, filling in embankment, slope protection work etc subject to the suitability of the materials and approval of the Engineer and Environmental Officer.</p> <p>All arrangements for dismantling, clearing debris and its transportation shall be considered incidental to the work and shall be planned and implemented by the Contractor as approved and directed by the Environmental Officer.</p> <p>Construction of temporary traffic diversions shall be carried out in accordance with the plans prepared and approved during pre-construction stage.</p> <p>Temporary diversions shall be constructed after receipt of approval from concerned authorities and under supervision of Environmental Officer.</p> <p>Warning boards should be placed at least 500 m and 200 m from the construction sites on both sides along with battery operated lamp/retro reflective lamps.</p> <p>Flashlights are provided at least 200 m before the construction site on either side giving warning to drivers before reaching construction sites.</p> <p>Signs, lights, barriers, cones, and other traffic control devices, as well as the riding surface of diversions shall be maintained in a satisfactory condition till such time they are required as directed by the engineer.</p> <p>Contractor shall keep the temporary traffic diversions free of dust by sprinkling of water three times a day and as required under specific conditions (depending on weather conditions, construction in the settlement areas and volume of traffic).</p> <p>Contractor shall prepare a Detailed Traffic Control Plans and shall submit it to the Environmental Officer for approval, five days prior to commencement of works on any bridge.</p>	IRC:SP 55 Appendix-4 Appendix-14	ABL	CSC & Environmental Officer, CMU (KSHIP)

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
		<p>The traffic control plans shall contain details of temporary diversions, traffic safety arrangements i.e. lighting arrangement, signage's, arrangement of flagmen etc. The Contractor shall provide specific measures for safety of pedestrians and workers as a part of traffic control plans. The Contractor shall ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption of traffic flow.</p> <p>The Contractor shall also inform local community of changes to traffic routes, conditions and pedestrian access arrangements with assistance from local bodies and KSHIP.</p>			
C.1.3	Handling and storing materials	<p>Contractor shall not store/dump the construction material in water course.</p> <p>Area of storage of material near the work site shall be earmarked in consultation with Environmental Officer of CSC/CMU. This area shall not be at a distance of less than 50 from bank of the water course.</p> <p>The access road should be free from water logging.</p> <p>Storage area should be leveled ground; stacking area should be planned and have racks, stands, sleepers, access traces etc and properly lighted, all materials consumables, including raw steel or fabricated materials shall be stored properly on platforms, skids or other supports</p> <p>IS: 7293 & IS: 7969 dealing with handling of materials and equipment for safe working should be followed.</p> <p>Contractor shall prepare a plan for handling & storing of material at bridge construction site and shall submit it for approval from Environmental Officer/Engineer.</p>	IS: 7293 IS: 7969	ABL	CSC & Environmental Officer, CMU (KSHIP)
C.1.4	Water Training and Disruption to Other Users of Water	<p>Contractor shall no obstruct the flow of water while constructing/rehabilitating bridges.</p> <p>Contractor shall ensure that velocity in the constructed portion does not increase more than twice the lean season velocity. This shall help turbidity control in downstream and minimum disruption of flora and fauna.</p> <p>Contractor shall carry out the excavation for foundation & construction of substructures during lean season to reduce turbidity levels and soil erosion, which may cause disruption to flora and fauna.</p> <p>Construction over and close to the non-perennial streams shall be undertaken in the dry season.</p>	Appendix-16	ABL	CSC & Environmental Officer, CMU (KSHIP)



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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
		<p>Contractor shall construct river training and protection work i.e. construction of guide bunds, guide walls, bank protection, flooring and approach embankment protection etc. as given in engineering design/drawing in such a fashion that shall provide safety to the bridge structure and its approaches against damage by flood/flowing water and at the same time shall not pollute water.</p> <p>Contractor shall prevent the soil erosion by minimizing the amount of exposed soil, minimizing the time the soil is exposed, avoiding steep cutting of slope (steeper than 1:2), and constructing all slope protection measures whether incidental or payable, temporary or permanent in time.</p> <p>The Contractor shall serve notice to the down stream users well in advance if construction work is expected to disrupt users of community water bodies or flow of surface water body is diverted. The Engineer/CMU shall ensure that contractor has served the notice to the downstream users of water well in advance.</p> <p>The Contractor shall take prior approval of the Irrigation Department or CMU (KSHIP) for any such activity.</p>			
	Aquatic Fauna	Since the rivers along the project road are most of the time dry, Aquatic Fauna are very limited. Any impacts to the aquatic fauna shall be avoided.	Appendix-16	ABL	CSC & Environmental Officer, CMU (KSHIP)
	Labour	Minimum required labour should stay at night at bridge site and Contractor shall make necessary arrangement of toilets, waste sanitation, and Drinking Water requirement at site.	Appendix-21		
C.2	Pollution				
C.2.1	Water Pollution				
C.2.1.1	Water Pollution from Construction Wastes	The Contractor should not discharge wastewater, generated during construction, into streams, water bodies or the irrigation system without preliminary treatment and should conform to Karnataka State Pollution Control Board. Cofferdams or formwork shall be such as to ensure still water conditions. All waste arising from the bridges construction activity is to be disposed off in the manner that is acceptable to the State Pollution Control Board and as per approved Comprehensive Waste Management	Clause 501.86 MoRTH Specification for Road and Bridge Works	No ABL	CSC & Environmental Officer, CMU (KSHIP)

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
C.2.1.2	Contamination of water from fuel and lubricants	<p>Plan. Wastes must be collected, stored and reused in the construction/taken to approved disposal sites. The Environmental Officer shall certify that all wastes generated on bridge site have been disposed off as per norms or in environment friendly manner. To avoid contamination from fuel and lubricants, the vehicle and equipments shall be properly maintained and refueling/maintenance of vehicles shall not be done near the bridge sites. Diesel Generator set shall be placed on a cement concrete platform with oil and grease trap to control the oil ingress into soil/water bodies.</p>	<p>W (P&C) P Act 1981 Appendix-16 Clause No 501.8.6 MoRTH Specification for Road and Bridge Works W (P&C) P Act 1981 Appendix-8</p>	ABL	CSC & Environmental Officer, CMU (KSHIP)
C.2.1.3	Drainage and runoff	<p>Contractor shall ensure that no construction materials like earth; stone or any other obstructing construction material is disposed in watercourse and shall take all necessary measures to prevent the blockage of water flow blocking the flow of water. In addition to the design requirements, the Contractor shall take all required measures as directed by the Environmental Officer to prevent temporary or permanent flooding of the site or any adjacent area.</p>	<p>Appendix-1 Appendix-16</p>	ABL	CSC & Environmental Officer, CMU (KSHIP)
C.2.1.4	Siltation of Water Bodies and Degradation of Water Quality	<p>The Contractor shall not excavate beds of any stream/canals/nala for borrowing earth for embankment construction. Silt fencing shall be provided at bridge locations where rehabilitation /New construction is proposed as per drawing and locations attached in Appendix-3 to avoid siltation of water bodies.</p>	<p>Appendix-3</p>	ABL	CSC & Environmental Officer, CMU (KSHIP)
C.2.2	Air Pollution				
C.2.2.1	Dust Pollution	<p>The Contractor shall follow good engineering practices during demolishing of bridges or part thereof and during Construction and rehabilitation of bridges. (Refer Appendices EA & EMP) The Contractor should provide Screen around the demolition sites as possible where feasible.</p>	<p>Clause No 111 & 501.8.6 MoRTH</p>	ABL	CSC & Environmental Officer, CMU

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
C.2.3	Noise Pollution				
C.2.3.1	Noise Pollution: from Noise Vehicles, Plants and Equipments	The Contractor shall reduce dust nuisance from construction sites by sprinkling of water, encapsulation of dust source and by erection of screen/barriers. Vehicle delivering material shall be covered. End boards in loaders shall be provided to prevent spillage. Water shall also be sprayed on temporary access roads and diversions. The air pollution monitoring shall be carried out as per monitoring and reporting programme detailed in Environment Assessment and Management Plan.	Specifications for Road and Bridge Works Air (P&CP) Act Appendix-7 Appendix-16		(KSHIP)
C.3	Safety				
	Tool Meetings	The demolition of bridges/rehabilitation of bridges shall be done using good engineering practices so that noise levels are kept at acceptable levels. If required screens shall be erected around the construction sites.	Appendix-16	ABL	CSC & Environmental Officer, CMU (KSHIP)
C.3.1	Personal Safety Measures for Labour	Tool box meeting shall be held at least once a week in order to brief workers about safety, do's and don't during construction. Toolbox safety meetings are on the job meetings and shall keep employees alert to work related accidents and illness. A toolbox meeting helps alert employees to workplace hazards, and by preventing accidents, illness and on the job injuries. The meeting should involve groups of people who work together and face same sort of injury risks. The meetings should be so designed to raise employee's awareness following hazardous incidents, a recent injury or near miss. Toolbox meeting improve workplace safety and health, provide information and instructions, improve consultation and help identify hazards and deciding what action needs to be taken to reduce the risks. Contractor shall provide: <ul style="list-style-type: none"> • Protective footwear, goggles and clothing to all workers employed on laying of wearing coat, preparing cement mortars for brick work, concreting, painting etc. • Welder's protective eye shields to workers who are engaged in welding works • Earplugs to workers exposed to loud noise, and workers working with jack hammer, joint cutting machines, vibrators etc. • Adequate safety measures for workers during handling of materials at site are taken up. 	Appendix-9	ABL	CSC & Environmental Officer, CMU (KSHIP)



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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
		<ul style="list-style-type: none">• The Contractor shall comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress.• At every workplace, good and sufficient water supply shall be maintained to avoid water-borne/water related/water based diseases to ensure the health and hygiene of workers.• Persons working should wear safety helmets and rubber gloves• Contractor at his own expenses shall put up necessary shoring, shuttering and planking or cut slopes to a safer angle or both with due regard to the safety of personnel and workers and to the satisfaction of the Engineer <p>The Contractor shall comply with all the precautions as required for ensuring the safety of the workmen as per the International Labour Organization (ILO) Convention No. 62 as far as those are applicable to this contract.</p> <p>The Contractor shall make sure that during the construction work all relevant provisions of the Factories Act, 1948 and the Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996 are adhered to.</p> <p>The Contractor shall not employ any person below the age of 14 years for any work and no woman shall be employed on the work of painting with products containing lead in any form.</p> <p>The Contractor shall also ensure that no paint containing lead or lead products is used to except in the form of paste or ready-made paint.</p> <p>Contractor shall provide face-masks for use to the workers when paint is applied in the form of spray or a surface having lead paint dry is rubbed and scrapped.</p> <p>The Contractor shall mark 'hard hat' and 'no smoking' and other 'high risk' areas and enforce non-compliance of use PPE with zero tolerance. These shall be reflected in the Construction Safety Plan to be prepared by the Contractor during mobilization and shall be approved by SC</p> <p>Contractor shall install a warning device in the area to be used to warn the workers in case of mishap/emergency.</p> <p>Contractor shall provide Safety Helmets conforming to IS 2925 to all the workmen engaged in dismantling work.</p>			

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
C.3.2	Handling of Hazardous fumes/ Materials / Chemicals	<p>The shed and tool boxes should be located away from work site.</p> <p>Goggles preferably made up of celluloid's and gas masks shall be worn at the time of dismantling, especially where tools like jack hammers are deployed to protect eyes from injuries from flying pieces, dirt, dust etc.</p> <p>The workers shall wear leather or rubber gloves during demolition of RCC work. Screens made up GI sheets shall be placed wherever necessary to prevent the flying pieces from injuring the workers</p> <p>Water should be sprayed to reduce the dust while removing concrete wearing course with jackhammer.</p> <p>No work shall be taken up under the span when dismantling work is progress.</p> <p>Contact numbers of Police, Fire Brigade, Ambulance, Police Station, Engineer, EO CSC Consultant and KSHIP should be displayed at every bridge Site.</p> <p>Engineering controls for Benzene fumes emitted from hot bituminous mix, such as chemical fume hoods, local exhaust ventilation with chimneys shall be provided to reduce exposures to benzene fumes at bituminous hot-mix plants. Local exhausts shall be used to capture and exhaust benzene fumes while paving the bituminous mix at the worksites, thereby preventing the accumulation of high exposure levels in the employee's breathing zone (Clause Number 111.5, MoRTH).</p> <p>In addition to engineering controls and provision of Personal Protective Equipments, administrative controls such as work practices involving rotation of crews shall be used to reduce exposures to benzene. This could include limiting the amount of time employees spend working in high exposure areas by rotating personnel with frequent breaks.</p> <p>Hot mix plant areas shall be designated as regulated areas and access to these areas will be limited to trained persons only. All entrances and access ways shall be posted with signs bearing the information such as 'DANGER', 'Authorized Personnel Only', etc.</p> <p>Every employee working with asphalt shall receive training on the health hazards associated with exposure, description of the operations in the work area, work practices to reduce exposure, including engineering and administrative controls and Personal Protective Equipment required, etc. (Annexure 'A' to Clause Number 501, 6.2, MoRTH)</p>	(Clause Number 111.5, MoRTH). (Annexure 'A' to Clause Number 501, 6.2, MoRTH) Appendix-9 and Appendix-20	ABL	CSC & Environmental Officer, CMU (KSHIP)



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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
C.3.3	Traffic Management and Safety	<p>Any skin contacts with epoxy materials; solvents and epoxy strippers should be avoided. Epoxy resin can cause irritation of skin particularly epoxy hardeners (B component) may cause a rash on skin in sensitive persons if incorrectly handled. The resin and hardener should not be allowed to come into direct contact with skin. The most effective protection is achieved by wearing polythene gloves, rubber gloves, with a cloth liner, and protective clothing. The official toxicity classification on container labels may be looked for before starting work. Barrier creams are recommended but are not substitutes for protective clothing. Eyes shall be protected where splashing could occur while spraying. Good ventilation shall be ensured and inhalation of vapors avoided. If materials are sprayed, a respirator shall be used. If skin contact occurs, it shall be immediately washed with a cleaner, followed by soap and water. Should eye contact occur, it shall be flushed immediately with plenty of water for 15 minutes and a doctor called for</p> <p>If contact occurs with the clothing, it shall be immediately changed to prevent further skin contact, and if the contact occurs with component A or B, the clothing shall be thrown away. Hardened epoxy is not harmful but shall break the clothing.</p> <p>All emptied used buckets; rags and containers shall be removed from site. These shall be stored in waste disposal bags and suitable disposed.</p> <p>The Contractor shall prepare a hazardous waste management and disposal plan and shall submit a copy of it to Environmental Officer (KSHIP) for review and supervision.</p> <p>The Contractor shall ensure that temporary bridges constructed for diversion of traffic are as per norms and safe and approved by Environmental Officer.</p> <p>Speed limits shall be set for movement of traffic on temporary bridges.</p> <p>The Contractor shall take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including sign, markings, flags, lights, warning boards and flagmen as proposed in the Traffic Control Plan/Drawings and as required by the Environmental Officer for the information and protection of traffic approaching or passing the bridge under construction or through the temporary diversion.</p> <p>The Contractor shall ensure that all signs, barricades markings are provided as per the MoRTH specifications. Before taking up of construction on any bridge site, a Traffic Control Plan shall</p>	Appendix-14	ABL	CSC & Environmental Officer, CMU (KSHIP)

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
C.3.4	First Aid	A readily available first aid unit including an adequate supply of sterilized dressing materials and appliances as per the Factories Rules at every Bridge Construction site.	Appendix-9	ABL	CSC & Environmental Officer, CMU (KSHIP)
C.3.5	Informatory Signs and Hoardings	The Contractor shall provide, erect and maintain informatory/safety signs, hoardings written in English and Hindi, wherever required or as suggested by the Environmental Officer.	Appendix-4	ABL	CSC & Environmental Officer, CMU (KSHIP)
C.3.6	Pollution Monitoring	CMU shall monitor water quality both upstream and downstream of bridges thrice a year at the site of new bridges.	Appendix-7	CMU through approved Pollution Monitoring Laboratory	EO KSHIP
C.4	ABL's Demobilization	Contractor shall prepare site restoration plans, which shall be approved by the Environmental Officer. The clean-up and restoration operations are to be implemented by the Contractor prior to demobilization. All spaces excavated and not occupied by the foundation or other permanent works shall be refilled with earth up to surface of surrounding ground. The Contractor shall clear all temporary structures; dispose all surplus material laying in waterway or around bridge site as per Comprehensive Waste Management Plan and approved by Environmental Officer.	Appendix-21	ABL	CSC & Environmental Officer, CMU (KSHIP)
C.4.1	Cleanup Operations, Restoration and Rehabilitation				

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Sl. No.	Environmental Issue	Management Measures	Reference Document	Responsibility	
				Planning and Execution	Supervision /Monitoring
OPERATION STAGE					
Activities to be Carried Out by the CMU (Construction Management Unit)					
O.1	Monitoring Operation Performance	The KSHIP shall monitor the operational performance of the various mitigation measures carried out in the form of river training works as a part of the project The indicators selected for monitoring include the water quality status, Soil erosion etc.	Appendix-12	KSHIP	KSHIP
O.2	Pollution Monitoring	The periodic monitoring of the surface water quality at the selected locations as suggested in pollution monitoring plan shall be responsibility of KSHIP. These locations shall be monitored once during operation stage.	Appendix-12	Pollution Monitoring Agency through CMU	KSHIP
O.3	Safety Measures	Contractor shall submit Accident Safety and Hazardous Chemical Spill Management Plan and shall get it approved by the “EO KSHIP”. The plan should also have details of detours in case of emergency.	Appendix-20		

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WASTE MANAGEMENT PLAN

Objective: Minimise the generation of waste/ maximise the internal and external recycling of materials/ Minimise the volume of solid waste requiring disposal by landfill.

1. THE TYPES OF WASTE GENERATED AT SITE INCLUDE

- A** Hazardous waste (Used oil from DG Sets)
- B** Metal scraps
- C** Bio-degradable (Office and colony waste)
- D** Non- Bio-degradable (Plastic bag, thermocol)
- E** Construction debris
- F** Excavated soil
- G** Used electrical /wood/ plastic and other miscellaneous waste item
- H** Pb-Acid Batteries

PROJECT NAME : Engineering, Procurement and Construction of Rehabilitation and Upgrading to 2 lanes / 2 lane with paved shoulders configuration and strengthening of Madhugiri-Mulbagal Road Section (Km 343.800 to Km 483.151) of NH-234 in the State of Karnataka (Package No. NHIP-KA-234-10) for Lot-II Km 400.330 to Km 483.151” under Phase-I of National Highways Inter-connectivity Improvement Projects (NHIP)

Waste Classes	TYPE OF WASTE	DISPOSAL PLAN	STORAGE GUIDELINES	REMARKS
A	Hazardous waste (Used oil from DG Sets)	Concrete platform with sump/ collection tray, to be sent for recycle purpose, to be disposal by buy-back arrangement with suppliers. Storage of the oil drums should be in trip trays.	Sold to authorized recycler, Label Drum segregated areas, Applicable to DPCC for storage authorization, No Contamination of land storage to be done in concrete area.	Used Oil to be sold to CPCB authorized recycler only as per “ The hazardous waste (M & H) rules , 2003”
B	Metal scraps	Cutting in small pieces for barricade purpose	Scrap yards (TP-3)	Reused at the site
C	Biodegradable (Office and colony waste)	Shall be disposed off in coordination with the civic authorities. Segregation of waste (site, office and colony) should be done including colour coding of the different waste containers.	Dust bins	
D	Non-Biodegradable (Plastic bag, thermocol)	Sold to recycler if in large quantities	Storage area duly marked.(All sites)	
E	Construction debris	To be disposed only on municipal permitted land	Select/designated location only (waste yard)	

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F	Excavated soil	Collected and transferred through dumpers used for levelling.		
G	Used electrical /wood/ plastic and other miscellaneous waste item	Sold to recycler if in large quantities		
H	Pb-Acid Batteries	To be stored properly in identified area recycles as per batteries (Management & Handling) rules ,2006	To be sold to either manufactures /dealer / authorized	

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PRECAUTION GENERAL CONTROL

- Waste shall not be thrown in nallah causing public obstruction or private party & Government land.
- Construction debris shall be sold to contractor with instruction for disposal on municipal and sites only
- Use PPE while handling the waste
- No burning of waste at site shall be permitted.
- Allocate sufficient space and resources for effective and efficient waste management.
- Segregate different types of waste as they are generated.
- Use containers suitable for their contents. Consider using colour coding.
- Use containers suitable for their contents. Check that containers are not corroded or worn-out.
- Minimise the risk of accident spillage's or leaks. Provide covers and bunds to prevent evaporation and spillage of waste.
- Ensure that waste cannot blow away. Avoid mixing different types of wastes unless it is known that mixing is harmless and will have no adverse effects on the subsequent management of the waste.
- segregation of waste (Site, Office & Colony) shall be done including color coding of different waste contains.
- All work sites shall be declared as no smoking zones.
- Used oil from DG set is not permitted for shuttering purpose.

The general construction waste could be:

- Debris
- Mud
- Reinforcement pieces
- Cement
- Concrete blocks
- Wood
- Hazardous chemicals
- Oil
- Plastics
- Tiles, blocks, bricks, etc

Reduce Wastage of materials during:

Ordering:

Avoid:

- Over ordering
- Ordering for delivery from suppliers at wrong time

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Delivery:
Avoid:

- Damage during unloading
- Delivery of material to in appropriate areas of site
- Accepting incorrect deliveries, specifications or quantity.

Storage:
Avoid:

- Exceeding shelf lives
- Damage or contamination from incorrect storage
- Loss, theft and vandalism

Handling:
Avoid:

- Damage or spillage through incorrect or repetitive handling.

Minimise the disposal cost by reusing or recycling waste that is generated on sites. This can be done easily if the wastes are properly segregated.

Examples of materials arising as wastes on site that may be reused or recycled are given below:

TYPE OF WASTE	CAN BE REUSED OR RECYCLED
Concrete	Recycle for use as aggregate in new concrete
Excavated soil	Recycle for use as fill
	Reuse for landscaping
Top soil	Reuse for landscaping
Timber	Reuse e.g.: for shuttering/hoarding
	Recycle chipboard
Metals	Recycle
Architectural features	Reuse
Clay, concrete pipes,	Reuse
Plastics	Recycle in consultation with the suppliers

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MANAGEMENT ACTIONS:

- Construction site, construction camps and all other sites (access roads, storage areas...) shall be kept clean at all times;
- Littering shall be prevented by supply of adequate containers emptied on a regular basis;
- Re-use and recycling opportunities shall be systematically investigated;
- Separation at source shall be implemented, by designating a separate waste disposal area where different types of waste can be brought and separated;
- Temporary storage of waste on site shall be limited to designated weather proof and scavenger proof areas; waste sorting and temporary storage area shall be regularly controlled;
- Final disposal facilities (landfill, incinerators), if already existing, shall be compliant with local (licensed) and international environmental standards; Where new disposal areas are created, an environmental impact study of disposal commensurate to the size and importance of the infrastructure shall be carried out including alternative analysis, potential impacts and management regarding soil, ground and surface
- water contamination and closure and reclamation measures;
- On site burning, burying or dumping of any waste materials, vegetation, litter or refuse shall not be permitted, as a general rule;

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SITE MANAGEMENT PLAN

1 Site clearing Management Plans:

- Prior starting of construction activities, detailed plans and layout of the different sites (construction site, construction village, access roads, temporary or permanent disposal sites shall be produced;

Preservation:

- Avoid unnecessary removal of vegetation; areas to be left intact must be clearly demarcated;
- Large trees shall be preserved as far as possible; they are to be adequately marked and protected (fenced);
- If the construction site is close to sensitive ecological areas, it is recommended that buffer zones should be established to ensure survival of fauna and flora species; "No-go" areas shall be clearly marked on a site layout plan and demarcated through fencing or other measure;

Clearing methods

- Burning shall not be used in all sites.
- It is recommended that use of chemical clearing methods shall be prohibited in the vicinity of no go areas.
- have negligible adverse human health effect be shown to be effective against the target species

Erosion management

- Sensitive erosion areas should be identified, and location of works minimized in these areas;
- Where possible, and depending on local conditions, it is recommended that works in sensitive erosion areas to be restricted to the dry season ;
- Stabilize slopes that are disturbed during construction to prevent erosion through runoff;
- Traffic and movement over stabilised areas shall be controlled.

Demolition

- In case of a brown field site, liabilities shall be addressed in the contractual documentation;
-Demolition waste shall be adequately sorted and disposed of to minimize their volume (potential reuse) and contamination by hazardous waste.

Materials Management Plans:

Hazardous Materials (HazMat)

- All hazardous materials must be stored in clearly labelled containers;
- All chemicals and waste considered as potentially hazardous materials shall be registered in order to follow-up type, quantities stored, quantities used or generated;
- It is recommended that lead-free and asbestos free materials should be used;
- Transformers or equipment containing polychlorinated biphenyls (PCBs) shall not be used on the building site;

Materials handling

- Concerned workers shall be trained to safety procedures applicable to the handling and use of hazardous materials;
- Explosives storage facilities shall be kept locked and access limited to authorized staff;
- Transportation schedule for transfer of significant quantities of hazardous materials must be specified. It is recommended to limit such transfers to off-peak periods;
- Concrete shall not be mixed directly on the ground; care shall be taken to prevent cement to enter water bodies;

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- It is recommended that, where possible, loading and unloading of materials occur in bounded areas to contain any potential spillage;
- Surfaces of refuelling areas shall be protected to prevent any soil contamination;
- During transportation, materials shall be appropriately secured. Loads including but not limited to sand, stone chip, fine vegetation, refuse, paper and cement shall have appropriate cover to prevent materials spilling from the vehicles;

Materials storage management Plan:

- All materials storage areas and stockpiles shall be designed and managed so as to reduce the risk of spillages, contamination of soils, groundwater, surface water and storm water;
- As far as possible, material storage areas should be positioned away from ecologically sensitive areas and outside the 1:50 flood line of watercourses;
- Appropriate secondary containment shall be installed around storage tanks and materials stores;
- Fuel stores shall be placed on a bunded area, with the bund accommodating 110% at least of the volume of the largest tank. Tanks containing fuels shall have lids and remain firmly shut. When necessary, tanks and bunded areas shall be covered by a roof to prevent the bunded area from filling with rainwater;
- Used oil shall be stored at a central location on site prior to removal off site for disposal in an approved place;
- Bulk storage tanks and drums integrity should be regularly tested.
- Storage of oil drums shall be in drip trays.

Leak and spillage Management Plans (Housekeeping):

Objective: When leaks and spillages occur despite efforts to prevent them, minimise negative environmental impacts through rapid and effective containment and clean up actions

Response hierarchy to be implemented in case of a spill of any HazMat:

- seek medical attention for any injured person
- prevent further injury
- prevent environmental damage (eg. by use of containment barriers, absorbent materials or others)
- report the spill
- clean up spill
- remedied area of spill
- final report

Management Actions:

- Any workshop shall have an impermeable floor, bunded or sloped towards an oil trap to prevent any spillages;
- Pumps, compressors and other stationary machinery requiring hydrocarbons shall be placed on drip trays to be emptied and cleaned regularly;
- All vehicles and equipment shall be serviced regularly.
- Oil and lubricants change, or refueling activities, shall only take place on designated, bunded and covered areas, except for emergency repairs;

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- Absorbent materials designed to soak up minor hydrocarbon spillages (spill response kits) shall be available in sufficient quantities at all times;
- Any spilled fuel, fuel soaked sand or other contaminated material shall be immediately disposed of as hazardous waste.

Water supply and water use

Objective: Minimize the amount of water used

Management actions:

- Implement water conservation measures (including recycling of gray waters, eg. recycling of wastewater generated from washing down mixer trucks);
- Where water is scarce, ensure that consumption for the construction site will not be detrimental to other users, or that any loss attributable directly to the project be fairly compensated.

Wastewater and storm water management Plans

Definition: Wastewater discharged from construction activities may include:

- Domestic wastewater
- Water from groundwater pumping systems, water used in construction processes (may have a high suspended solids content), water from tunnel dewatering
- Runoff from material depots/workshops/vehicles washing areas and concrete Swills
- Storm water runoff

Objective: Limit degradation of landscape through erosion/ Minimize risk of storm water being contaminated/ Minimize deterioration of groundwater and surface water quality/ Ensure that contaminated water, contaminated run off or effluent discharged from the site in surface waters.

Management actions:

- On construction site, and in the construction site, toilet facilities with adequate waste water treatment must be provided;
- Facilities for workmen shall be provided as per relevant labour laws.
- All domestic wastewater shall be treated on site, or discharged into a conservancy tank for removal from the site and appropriate treatment or directly into the municipal sewerage system, if its performance is acceptable;
- Depots/workshops/vehicles washing areas and concrete swills must be placed and constructed in such a way to limit pollution of groundwater and surrounding areas; the runoff shall be collected (channels) and treated adequately (silt/oil separator, sediment basins...);
- Natural run off shall be diverted away from the construction site and towards storm-water drains where these are available. Appropriate measures to prevent silt and sand entering the drainage system or water courses must be taken (silt screens, straw bale);

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- Wastewater and storm water discharges (including water from groundwater pumping systems) shall be monitored regularly to ensure that the World Bank limits are not exceeded; the parameters to be monitored will depend on the characteristics of the site, but always include pH, TSS, oil and grease, and coliform bacteria..

Air Quality Monitoring & management Plans:

Objective: Minimise the impacts of dust generation on surrounding communities, and local ecosystems/ Ensure air emissions by construction equipment are compliant with local and international standards through adequate maintenance and servicing

Control of Dust & Air Emissions:

- Air Emissions shall be controlled by using proper Equipments and machines. Equipments maintenance should be carried out at regular intervals.
- Every day morning before the Site operation starts, water spraying should be done to the entire site.
- If possible landscaping should be carried out with minimum cost, since grass can prevent dust. This can be practised looking into the soil conditions of site.
- While transferring the fine aggregate /sand/metal in dumpers make it sure that the material should not spill out of the dumpers.
- The point where the cement is transferred to batching plant or mixer shall be covered with Gunny bags or plastic sheet in order to prevent the accumulation of cement dust particles.

MANAGEMENT ACTIONS:

- Each construction vehicle in the fleet shall be inspected on a regular basis (at least every 6 months);
- Limit vehicle-entrained dust from unpaved roads through traffic control measures (eg limit vehicle speeds, restrict traffic volume);
- Covering of materials likely to result in dust emission during transportation and storage;
- Covering of scaffoldings and use of air extraction equipment, wherever relevant are recommended practices;
- Routine hosing down of unpaved roads and cleaning of vehicles, if necessary and relevant regarding water availability;
- If the location is prone to high winds conditions, specific measures should be implemented depending on weather conditions (Eg. limitation of certain activities such as cement stabilization);
- Workers should not allowed emissions of fugitive dust from any transport, handling, construction or storage activity to remain visible in atmosphere beyond the property line of emission source.
- Do not block or shut vents or construction returns.
- Prohibits smoking inside the construction
- Do not dispose of food waste or food wrappers in work area.
- Dispose of contaminated waste in receptacles that are emptied daily.
- Do not over water plants. Remove dead leaves. Break up dirt around the plant to avoid mold overgrowth in the dirt.

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- Clean-up water spills immediately.
- Minimize accumulations of paper, cardboard, and other cellulose-based materials.
- Clean work area routinely.
- Do not burn candles or have other scent-producing materials in the work area.
- Avoid portable humidifiers.
- The workers shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from work sites such as construction depots and batching plants. At such facility, high-pressure water jets will be directed at the wheels of vehicles to remove all spoil and dirt.
- The workers shall cover loads of dust generating materials like debris and soil being transported from construction sites. All trucks carrying loose material should be covered and loaded with sufficient free-board to avoid spills through the tail board or side boards.

Noise and vibration Monitoring & Management Plans:

Management actions:

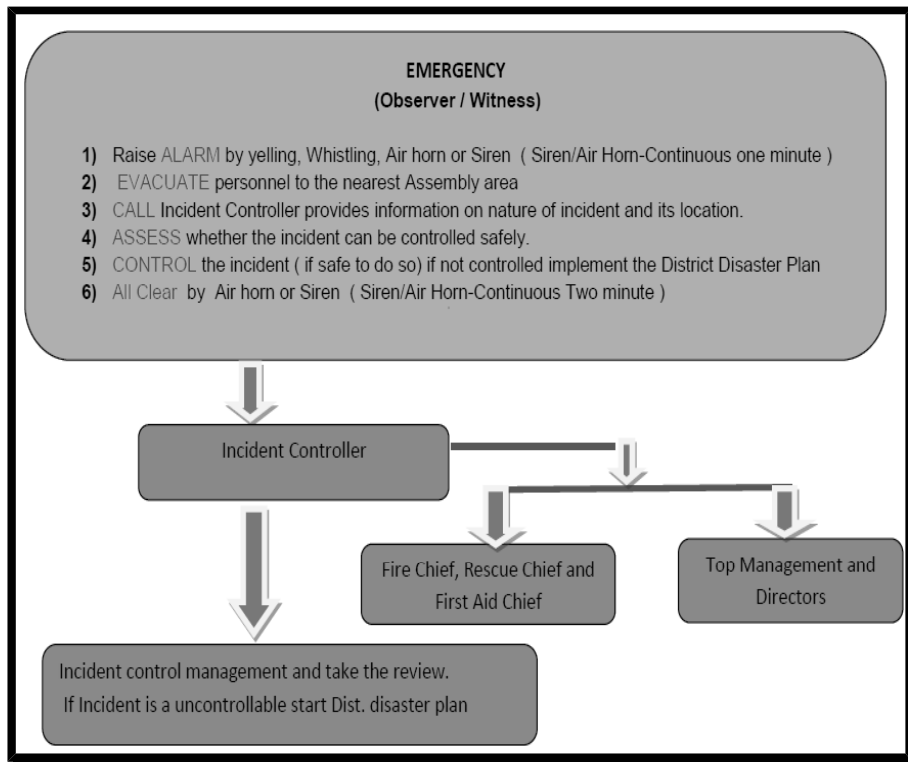
- If possible, maintenance or establishment of a vegetated buffer zone is considered as best practice;
- Regular maintenance of equipment (lubrication); - Appropriate noise abatement accessories (silencers, mufflers, acoustic linings, shields) shall be put in place;
- Noisy stationary equipment like generators and compressors shall be provided with acoustic enclosures to reduce noise levels.
- topographic features to provide shielding;
- Periods when the environment is least sensitive (Eg during normal working days in a residential area) shall be selected for noisy activities; it is recommended to systematically avoid noisy activities at night time;
- A schedule of noisy activities (eg use of pile drivers, jack hammers, rock drills or for blasting activities) shall be drawn up when construction takes place in close proximity of particularly sensitive environments including schools, hospitals, residential area, sensitive ecosystems.

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Emergency Response Plan

The Emergency Response plan is necessary as a moral and legal obligation of management to protect the safety people, property and environment. The objective of this “Emergency Response Plan” is to provide the organizational guidelines and directions to ensure fast and effective response in any emergency situation in order to save life, property and environment. At any time, it may be necessary to minimize harm to personal, the environment and business operations. Please remember that saving life and property is only possible if the emergency response procedure is effectively followed. This plan shall be followed in all cases of emergency. Therefore, it is imperative that every employee must be familiar and knowledgeable of what to do in case of emergency.

We have formed our Emergency Response Team in each Base Camp to combat with the Emergency situations. The Flowchart and the Team Details are displayed in the following pages:



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Incident Controller
(Mr.Neelmani Katdare | Project Manager)
Mob. No: 09015469107

Fire Fighting Team Leader Mr. Sudip Sharma Mob. No: .09108369135	Rescue Team Leader Mr..Shivakumar Reddy Mob. No: .9481076779	First Aid Team Leader Mr. .Kiran Reddy Mob. No: .9448653655
Mr. Partha Saradhi	Mr. K.Ramchandra Reddy	Mr. Narayana .P
Mr. Nannan Chinna	Mr. B. Janardhana Rao	Mr. P. Anil Kumar
Mr. B. Penchal Reddy	Mr. UMA Shekar Reddy	Mr. Ravi Kumar

Emergency response plans will be developed specifically for the project that will cover:

- Fire
- General medical / first aid
- Major accident event
- Crane collapse

The following key roles will be assigned with identified responsibilities:

- First Aiders
- Emergency Rescue Personnel's

The following key facilities will be provided:

- Alarm systems
- Lighting Equipment
- First aid Kit
- Communication equipment

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EMP Reporting Formats And Frequency

Sr.No	Format Number	Details of Formats	Frequency of Reporting
1	MMRP/NH234/EMP/FR/01	Statutory summary	Quarterly
2	MMRP/NH234/EMP/FR/02	Construction Camp Establishment	Six Month
3	MMRP/NH234/EMP/FR/03	Soil Management	Quarterly
4	MMRP/NH234/EMP/FR/04	Earth Barrow Area Management	Quarterly
5	MMRP/NH234/EMP/FR/05	Stone Quarry Management	Quarterly
6	MMRP/NH234/EMP/FR/06	Scarified Bitumen Storage Sites	Every Month
7	MMRP/NH234/EMP/FR/07	Accident Data	Every Month
8	MMRP/NH234/EMP/FR/08	Consolidated Environmental Compliance	Every Month
