

SCHEDULE – W

**ENVIRONMENT
MANAGEMENT PLAN**

FOR

**LEBAD (SH-31) TO MANPUR
(NH-3) FOUR LANE ROAD
PROJECT**

1. Environmental Management Plan and Office

1.1 Introduction

The Monitoring and Evaluation are critical activities in implementation of the Project. Monitoring involves periodic checking to ascertain whether activities are going according to the plans. It provides the necessary feedback for project management to keep the program on schedule. The rationale for a reporting system is based on accountability to ensure that the measures proposed as part of the Environmental Management Plan get implemented in the project. Therefore, there is a need for building institutional capacity of the project authorities & Concessionaire including the organization structure and reporting structure and training needs.

- 1.2 The review of the preparation of the Environmental and Social impact assessments for the project and ensuring effective implementation of the Environmental Management Plan / Resettlement Action Plan will be carried out by the Deputy General Manager (Environment) at corporate office in due consultation with the manager (Environment) and manager (R&R) at MPRDC. The IE for project supervision will have an environmental specialist who will ensure compliances of EMP by the concessionaire.

1.3 Environmental Unit at the MPRDC Corporate

To assess advice and monitor the environmental performance of the various projects being planned, designed and implemented by the MPRDC, an Environmental and social development unit (ESDU) has been established at the Corporate Office of the MPRDC. The Environmental Unit is headed by the Deputy General Manager, and assisted by Manager (Environment).

The ESDU is responsible for the co-ordination of the environmental and social issues of the project and shall work in close interaction with the Independent Engineer. The IE will have a full time environmental engineer to monitor the implementation of the EMP by the Concessionaire and to ensure that the construction activities are carried out in an environmentally sound and sustainable basis.

1.4 Other Stakeholders

The other stakeholders, which assist MPRDC, include Feasibility Report consultants, Independent Engineers, NGO's and Concessionaires.

1.5 Independent Engineers

- 1.5.1 The project envisages the use of Independent Engineers for the implementation of project and assist the MPRDC during construction stage. The IE will assume the role of the Engineers. The Independent Engineer will be selected through Competitive Bidding and it is expected that they will have substantial capability to supervise the implementation of the environmental component of the project as part of their assignment. Implicitly during construction Independent Engineers

will have Environmental Engineer to advice and co-ordinate implementation of the measures developed as part of the Environmental Management Plans.

1.5.2 Independent Engineers (IE) Capacity

The independent engineer will assume the powers and responsibilities of the Engineer for Project Road and assist the MPRDC in implementation. The IE should have the following capabilities.

- The Independent Eengineer will have the necessary capability to supervise the implementation of the environmental measures proposed in the EMP
- The IE to be selected through Competitive Bidding and will have the in-house capacity to advise on and supervise the implementation of the EMP
- The IE will employ a full time Environmental Specialist.

1.5.2 Principal Duties of Independent Engineer

- The I.E. shall conduct quarterly monitoring of the implementation of the EMP by Concessionaire till the completion of the civil works.
- The I.E. will examine the provisions given in the EMP, along with the relevant drawing/ designs and monitoring parameters.
- The I.E. shall computerise the available data to monitor the progress of the environmental management activities against the targeted performance indicators.
- The quarterly monitoring of the implementation of the EMP for the project shall include but not limited to monitoring the following:
 - Appointment of the required staff by the Concessionaire including Environmental Engineer for implementation of EMP.
 - Results of the Environmental (air, water, noise, soil) monitoring done by the Concessionaire
 - Pollution control measures and follow up of the specifications listed in the EMPs
 - Road Safety and accessibility (Traffic diversions, Cautionary sign ages etc.)
 - Health and hygiene of the workers
 - Construction Camp and labour camp management
 - Borrow area and quarry site management
 - Top soil management
 - Solid and Hazardous waste management
 - Maintenance of haul roads;
 - Handling and use of fly-ash and disposal of pollutants like oils, grease, wastewater, exhausts, dust etc

- Construction scheduling with respect to environmental impacts
- Tree cutting and Plantation program
- Environmental enhancement measures
- The process of implementation of the EMP and any deviation from the EMP
- Transparency
- Training and workshops on environmental management of Concessionaire staff and institutional arrangement and capacity to implement the EMP

1.6 Concessionaires

The execution of the works will be responsibility of the Concessionaire, who will execute the road and bridgework and will also implement the environmental measures. It will be ensured that Concessionaire will have enough environmental/social expertise to incorporate environmentally sensitized construction practices. Though Concessionaire will have a set-up for executing works specified in the EMP, it is essential that separate staff including Environmental Engineer will be appointed to implement EMP for the successful completion of the works entrusted.

1.6.1 Qualifications and Experience of Environmental Engineer of Concessionaire

- Bachelors in Environmental Engineering or Civil engineer/Chemical Engineering with masters in Environmental Engineering
- 5 years of working experience in the field of Environmental Management in Highway projects or experience in construction management and operational maintenance of highways is preferred.

1.6.2 Concessionaires Role & Responsibility:-

The Concessionaire is the major implementing agency of EMP. The Concessionaire is recommended to employ Environmental Engineer/s. The roles and responsibilities of concessionaire are given in detailed Environment Management Plan in table 1.1 & 1.2. In addition Concessionaire ensure analysis and reporting of monitoring results.

1.7 Environmental Reporting System (ERS)

Environmental monitoring involves periodic checking to ascertain whether environmental activities are going according to the EMP. It provides the necessary feedback for project management to keep the program on schedule. The evaluation is essentially a summing up of the project assessment of whether those activities have actually achieved their outcomes. The important features of ERS are summarized below.

- The reporting system will operate linearly with the Concessionaire who is at the lowest rank of the implementation system. The Concessionaire will

report to the Independent Engineer, who in turn shall report to the MPRDC.

- All reporting by the Concessionaire and Independent Engineer shall be on a quarterly basis.
- The IE in association with MPRDC shall be responsible for preparing targets for each of the identified EMP activities.
- The compliance monitoring and the progress reports on environmental components may be clubbed together and submitted to the MPRDC, quarterly.
- The operation stage monitoring reports may be annual or biannual, provided the Project Environmental Completion Report shows that the implementation was satisfactory.
- Photographic records will also be established to provide useful environmental monitoring tools.
- A full record will be kept as part of normal Concession Agreement monitoring. Reporting and Monitoring Systems for various stages of construction and related activities have been proposed to ensure timely and effective implementation of the EMP. The format for Environmental Monitoring Status and Report Format is appended at Annexure I.

The reporting system has been prepared for each of the stage of road construction namely:

- Pre construction stage
- Construction Stage
- Operation Stage

This reporting shall be done through:

- Reporting by the Concessionaire to the IE
- Reporting by IE to MPRDC

1.8 Environmental Management Plan

Table - 1.1 & 1.2, given below summarizes the EMP of Lebad (SH-31) to Manpur (NH-3) four lane project roads after addressing all the relevant issues identified during EIA.

Table 1.1:
Environmental Management Plan for Lebad (SH-31) to Manpur (NH-3)

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
1.1 Land Acquisition, R&R (Throughout the Project Corridor)	The acquisition of land and private properties will be carried out in accordance with the land acquisition act of Govt. of M.P. It will be ensured that all R&R activities are to be completed before the construction activity starts, on any section of ROW of existing road and proposed new bypasses.	MPRDC	MPRDC
1.2 Clearance of Encroachment/ Squatters	Advance notice, shall be given to the encroachers and squatters which need relocation. All R & R activities will be undertaken. Entitlements as per Authority's entitlement framework for this project will be completed before construction starts.	MPRDC/ Concessionaire Revenue Authorities	MPRDC
1.3 Tree Cutting (Throughout the Project Corridor)	Trees will be removed from the ROW before commencement of Construction with the prior intimation to the Forest Department. For this project, total numbers of trees will be uprooted as per award passed by collector. All these trees are roadside trees except the trees present on proposed RoW of new bypass. The roadside trees are the property of Forest Department. Cutting of the trees (both Forests department as well as private trees) need NOC from forest department. Owners (both private and Forests department) will be compensated as per the rate fixed by Forest Department. Concessionaire will remove the roadside trees before the construction starts at the site and handed over to forest department. Disposal of the trees will be done as per the norm by forest department.	Concessionaire	Independent Engineers and MPRDC
1.4 Replacement of Cultural Property Resources	All cultural property resources such as temples, Shrine, Mazar will be affected. Sites for the relocation of these religious structures will be identified in accordance with the choice of the community and land allotted by collectors. The Concessionaire in consultation with local people will finalize design of these temples. The entire process (i.e., selection of relocation sites and designs)	Concessionaire	MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	will be under supervision of IE. The relocation will be completed during construction of project.		
2.0 Field Verification and Modification of the EMP			
2.1 Joint Field Verification	The Environmental Expert of IE and the Concessionaire will carry out joint field verification of the EMP. The efficacy of the mitigation/enhancement measures suggested in the EMP will be checked.	Concessionaire	IE / MPRDC
2.2 Crushers, Hot-mix Plants & Batching Plants	Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations.	Concessionaire	IE / MPRDC
2.3 Other Construction Vehicles, Equipment and Machinery	All vehicles, equipment and machinery to be procured for construction will confirm to the relevant Bureau of India Standard (BIS) norms. The discharge standards promulgated under the Environment Protection Act, 1986 will be strictly adhered to. Noise limits for construction equipments to be procured such as compactors, rollers, front loaders concrete mixers, cranes (moveable), vibrators and saws will not exceed 75 dB (A), measured at one meter from the edge of the equipment in free field, as specified in the Environment (Protection) Rules, 1986.	Concessionaire	IE / MPRDC
3. Identification and Selection of Material Sources			
3.1 Borrow Areas	Finalizing the borrow areas from the lists of the locations identified by FR consultants for borrowing earth, and all logistic arrangement as well as compliance to environmental requirements, as applicable, will be the sole responsibility of the Concessionaire. The Concessionaire will not start borrowing earth from selected borrow area until the formal agreement is signed between landowner and Concessionaire. Locations finalized by the Concessionaire shall be reported to the Environmental Expert of IE and who will in turn report to the MPRDC. Planning of haul roads for accessing borrow materials will be undertaken during this stage. The haul roads shall be routed to avoid	Concessionaire	IE / MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	agricultural areas as far as possible and will use the existing village roads wherever available. In addition to testing for the quality of borrow materials by the IE, the environmental personnel of the IE will be required to inspect every borrow areas location prior to approval.		
3.2 Quarry	<p>Concessionaire will finalize the quarry for procurement of construction materials from the list of quarries identified by FR consultants after assessment of the availability of sufficient materials and other logistic arrangement.</p> <p>In case the Concessionaire decides to use quarries other than recommended by FR consultants, then it will be selected based on the suitability of the materials. The Concessionaire will obtain necessary permission for procurement of materials from Madhya Pradesh Mining Department and State Pollution Control Board.</p> <p>Concessionaire will also work out haul road network and report to Environmental Expert of IE and IE will inspect and in turn report to MPRDC before approval.</p>	Concessionaire	Environmental Expert of IE, and MPRDC
3.3 Arrangement for Construction Water	<p>The Concessionaire will identify source for requirement of water preferentially from ground water but Concessionaire can use the ponds, which are not in use by community</p> <p>Concessionaire will set up the own bore well facility for construction work. The Concessionaire will not be allowed to pump from the surface water bodies used by community. In that case, before using any pond water Concessionaire will inform the owner or district administration as the case may be. To avoid disruption / disturbance to other water users, the Concessionaire will extract water from fixed locations and consult the Environmental Expert of IE before finalizing the locations.</p> <p>The Concessionaire need to comply with the requirements of the state Ground Water Department or concerned Govt. Deptt. and seek their approval for doing so.</p>	Concessionaire	Environmental Expert of IE and MPRDC
4. Labour Requirements	The Concessionaire will use unskilled labour drawn from local communities to avoid any additional stress on the existing facilities	Concessionaire	Environmental Expert of IE and MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	(medical services, power, water supply, etc.)		
5. Camp Stock yards & Sewage disposal	Construction camps will not be proposed within 1000 m from the nearest settlements to avoid conflicts and stress over the infrastructure facilities with the local community.	Concessionaire	Environmental Expert of IE and MPRDC
6. Stock Yard location	Location for stockyards for construction materials will be identified at least 1000 m from watercourses.	Concessionaire	Environmental Expert of IE and MPRDC
7. Hot Mix Plants and Batching Plant Locations	Hot mix plants and batching plants will be sited sufficiently away from settlements and agricultural operations or any commercial establishments. Such plants will be located at least 1000 m away from the nearest village settlements preferably in the downwind direction.	Concessionaire	Environmental Expert of IE and MPRDC
8. Arrangements for Temporary Land Requirement	The Concessionaire as per prevalent rules will carry out negotiations with the landowners for obtaining their consent for temporary use of lands for construction sites/hot mix plants/traffic detours/borrow areas etc. The Environmental Expert of IE will be required to ensure that the clearing up of the site prior to handing over to the owner (after construction or completion of the activity) is done by the Concessionaire	Concessionaire	Environmental Expert of IE and MPRDC
9. Site Clearance			
9.1 Clearing and Grubbing	Vegetation will be removed from the RoW before the commencement of construction. All works will be carried out such that the damage or disruption to flora other than those identified for cutting is minimized. Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works will be removed with prior approval from the Environmental Expert, of IE. The Concessionaire, under any circumstances will not damage trees (in addition to those already identified to be cut).	Concessionaire	Environmental Expert of IE and MPRDC
9.2 Accessibility	The Concessionaire will provide safe and convenient passage for vehicles, pedestrians and livestock to and from roadsides and property accesses connecting the project road. The Concessionaire will also ensure that the	Concessionaire	Environmental Expert of IE and MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	<p>existing accesses will not be undertaken without providing adequate provisions to the prior satisfaction of the Environmental Expert of IE.</p> <p>The Concessionaire will take care that the cross roads are constructed in such a sequence that construction work over the adjacent cross roads are taken up one after one so that traffic movement in any given area not get affected much.</p>		
9.3 Planning for Traffic Diversions and Detours in the Existing State Highways, District and Village Roads	<p>Temporary diversions will be constructed with the approval of the Environmental Expert of IE. Detailed Traffic Control Plans will be prepared and submitted to the Environmental Expert of IE for approval, 5 days prior to commencement of works on any section of road. The traffic control plans shall contain details of temporary diversions, details of arrangements for construction under traffic, details of traffic arrangement after cessation of work each day, safety measures for transport of hazardous materials and arrangement of flagmen.</p> <p>The Environmental Expert of IE will assess the environmental impacts associated as the loss of vegetation, productive lands and the arrangement for temporary diversion of the land prior to the finalization of diversions and detours.</p> <p>Special consideration will be given to the preparation of the traffic control plans for safety of pedestrians and workers at night.</p> <p>The Concessionaire will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. The Concessionaire will also inform local community of changes to traffic routes, conditions and pedestrian access arrangements. The temporary traffic detours will be kept free of dust by frequent sprinkling of water.</p>	Concessionaire	Environmental Expert of IE and MPRDC
9.4 Earth from Borrow Areas for Embankment Construction	<p>No borrow area will be opened without permission of the Environmental Expert of IE. Borrow pits will not be dug continuously in a stretch. The location, shape and size of the designated borrow areas will be as approved by the Environmental Expert of IE and in</p>	Concessionaire	Environmental Expert of IE and MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	<p>accordance to the IRC recommended practice for borrow pits for road embankments (IRC 10: 1961).</p> <p>The unpaved surfaces used for the haulage of borrow materials will be maintained dust free by the Concessionaire. Sprinkling of water will be carried out twice a day to control dust along such roads during their period of use. During dry seasons (winter and summer) frequency of water sprinkling will be increased and Environmental Expert of IE will decide the numbers of sprinkling depending on the local requirements.</p>		
9.5 Quarry Operations	<p>The Concessionaire shall obtain materials for quarries only after consent of the department of Mining.</p> <p>The Concessionaire will develop a comprehensive quarry redevelopment plan, as per the Madhya Pradesh Mining Rules.</p> <p>The quarry operations will be undertaken within the rules and regulations in force.</p>	Concessionaire	Environmental Expert of IE and MPRDC
9.6 Construction Water	<p>Concessionaire will arrange adequate supply and storage of water for the whole construction period at his own costs.</p> <p>Concessionaire will not open new bore well or extract groundwater without permission from the MP Ground Water Board. The Concessionaire will take all precaution to minimize the wastage of water in the construction process/ operation.</p> <p>Concessionaire will not take water from any irrigation canal or any other surface water bodies.</p> <p>If Concessionaire uses any existing source of water, (subject to the provision that any claim arising out of conflicts with other users of the said water body shall be dealt with entirely by the Concessionaire) (s) he will seek permission from the owner and environmental expert of IE. IE will ensure that such activity will not deprive the original user of the concern water source (s).</p> <p>Environmental Expert of IE will also keep a strict vigil on this aspect.</p>	Concessionaire.	Environmental Expert of IE and MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
9.7 River Training and Disruption to other Users of Water	<p>Construction over and close to the non-perennial streams shall be undertaken in the dry season. If Construction work is expected to disrupt users of community water bodies, notice shall be served well in advance to the affected community.</p> <p>While working across or close to any perennial water bodies, Concessionaire will not obstruct/ prevent the flow of water.</p> <p>The Concessionaire will serve notice to the down stream users well in advance to divert the flow of water of any surface water body. Wherever excavation for diverting water flow will take place, Concessionaire will ensure that the slopes are not steeper than 1:2 (vertical: horizontal) otherwise proper slope protection measures will be taken as approved by the Environmental Expert of IE.</p> <p>The Concessionaire will take prior approval of the Environmental Expert of IE for such activity. The IE will ensure that Concessionaire has served the notice to the downstream users of water well in advance.</p>	Concessionaire	Environmental Expert of IE and MPRDC
9.8 Siltation of Water Bodies and Degradation of Water Quality	<p>The Concessionaire will not excavate beds of any stream/ canals/ any other water body.</p> <p>Concessionaire will construct silt fencing at the base of the embankment construction for the entire perimeter of any water body (including wells) adjacent to the RoW and around the stockpiles at the construction sites close to water bodies. The fencing will be provided prior to commencement of earthworks and continue till the stabilization of the embankment slopes, on the particular sub-section of the road. (refer Annexure II).</p> <p>The Concessionaire will also put up sedimentation cum grease traps at the outer mouth of the drains located in truck lay bays and bus bays which are ultimately entering into any surface water bodies / water channels with a fall exceeding 1.5 m.</p>	Concessionaire	Environmental Expert of IE and MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	Concessionaire will ensure that construction materials containing fine particles stored in an enclosure such that sediment-laden water does not drain into nearby watercourse.		
9.9 Slope Protection and Control of Soil Erosion	<p>The Concessionaire will take slope protection measures as per design, or as directed by the Environmental Expert of IE to control soil erosion, sedimentation through use of dykes, sedimentation chambers, basins, fibber mats, mulches, grasses, slope, drains and other devices. All temporary sedimentation, pollution control works and maintenance thereof will be deemed as incidental to the earth work or other items of work and as such as no separate payment will be made for them.</p> <p>Concessionaire will ensure the following aspects:</p> <p>During construction activities on road embankment, the side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications.</p> <p>Turfing works will be taken up as soon as possible provided the season is favourable for the establishment of grass sods. Other measures of slope stabilization will include mulching netting and seeding of batters and drains immediately on completion of earthworks.</p> <p>In borrow pits, the depth of the pits shall be so regulated that the sides of the excavation will have a slope not steeper than 1 vertical to 2 horizontal, from the edge of the final section of the bank.</p> <p>Along sections abutting water bodies, stone pitching as per design specification will protect slopes.</p>	Concessionaire	Environmental Expert of IE and MPRDC
10. Safety Measures			
10.1 Personal Safety Measures for Labours	Concessionaire will provide: Protective footwear and protective goggles and helmets to all workers employed on mixing asphalt materials, cement, lime mortars,	Concessionaire	Environmental Expert of IE and MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	<p>concrete etc.</p> <p>Welder's protective eye-shields to workers who are engaged in welding works.</p> <p>Protective goggles and clothing to workers engaged in stone breaking activities and workers will be seated at sufficiently safe intervals</p> <p>Earplugs to workers exposed to loud noise, and workers working in crushing, compaction, or concrete mixing operation.</p> <p>The Concessionaire will not employ any person below the age of 14 years for any work and no woman will be employed on the work of painting with products containing lead in any form.</p> <p>The Concessionaire will also ensure that no paint containing lead or lead products is used except in the form of paste or readymade paint. Concessionaire will provide facemasks for use to the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.</p>		
10.2 Traffic and Safety	<p>The Concessionaire will take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, marking, flags, lights and flagmen as may be required by the Environmental Expert of IE for the information and protection of traffic approaching or passing through the section of any existing cross roads.</p> <p>The Concessionaire will ensure that all signs, barricades, pavement markings are provided as per the MoRTH specification. Before taking up of construction on any section of the existing lanes of the highway, a traffic control plan will be devised to the satisfaction of the Environmental Expert of IE.</p> <p>The Concessionaire shall take all the precautions at the time of construction of bypass.</p>	Concessionaire	Environmental Expert of IE and MPRDC
10.3 Precautionary/Safety Measures during Construction	<p>The Concessionaire will comply with all the precautions as required for the safety of the workmen as per the International Labor Organization (ILO) Convention No. 62 as far as those are applicable to this Concession</p>	Concessionaire	Environmental Expert of IE and MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	<p>Agreement.</p> <p>The Concessionaire will make sure that during the construction work:</p> <p>All relevant provisions of the Factories Act, 1948 and the Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996 will be adhered to.</p> <p>Adequate safety measures for workers during handling of materials at site will be taken up.</p> <p>The Concessionaire will comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress.</p>		
10.4 Risk from Electrical Equipment (s)	<p>The Concessionaire will take adequate precautions to prevent danger from electrical equipment i.e. no material will be so stacked or placed as to cause danger or inconvenience to any person or the public.</p> <p>All necessary fencing and lights will be provided to protect the public.</p> <p>All machines to be used in the construction will conform to the relevant Indian Standards (IS) codes, will be free from patent defect, will be kept in good working order, will be regularly inspected and properly maintained as per IS provision and to the satisfaction of the Environmental Expert of IE.</p>	Concessionaire	Environmental Expert of IE and MPRDC
10.5 Risk Force Measure	<p>The Concessionaire will take all reasonable precaution to prevent danger of the workers and public from fire, flood, etc.</p> <p>The Concessionaire will keep emergency arrangement so that in case of any mishap all necessary steps can be taken for prompt first aid treatment.</p>	Concessionaire	Environmental Expert of IE and MPRDC
10.6 First Aid	<p>The Concessionaire will arrange for a readily available first aid unit including an adequate supply of sterilized dressing materials and appliances as per the Factories Rules of Madhya Pradesh at every workplace.</p>	Concessionaire	Environmental Expert of IE and MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	<p>Suitable transport to take injured or sick person(s) to the nearest hospital.</p> <p>Equipment and trained nursing staff at every workplace and construction camp.</p>		
10.7 Informatory Signs and Hoardings	The Concessionaire will provide, erect and maintain informatory/ safety signs, hoardings written in English and Hindi, wherever required or as suggested by the Environmental Expert of IE.	Concessionaire	Environmental Expert of IE and MPRDC
11. Flora/ Fauna	<p>The Concessionaire will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body and hunting of any animal.</p> <p>If any wild animal is found near the construction site at any point of time, the Concessionaire will immediately upon discovery thereof acquaint the Environmental Expert of IE and carry out the IE's instructions for dealing with the same.</p> <p>The Environmental Expert of IE will report to the near by forest office (forest range office or divisional forest office) and will take appropriate steps/ measures, if required in consultation with the forest officials.</p>	Concessionaire	Environmental Expert of IE and MPRDC
12. Chance Found Archaeological Property	<p>All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or 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.</p> <p>The Concessionaire will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any such article or thing.</p> <p>He will, immediately upon discovery thereof and before removal acquaint the Environmental Expert of IE of such discovery and carry out the IE's instructions for dealing with the same, awaiting which all work shall be stopped.</p>	Concessionaire	Environmental Expert of IE and MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	The IE will seek direction from the Archaeological Survey of India (ASI) before instructing the Concessionaire to recommence the work in the site.		
13. Sanitation and Sewage System (Refer guidelines at Annexure V)	<p>The Concessionaire will ensure that:</p> <p>The sewage system for the camp are designed, built and operated in such a fashion that no health hazards occurs and no pollution to the air, ground water or adjacent water courses take place.</p> <p>Separate latrine and urinals, screened from those from men (and marked in the vernacular) are provided for women.</p> <p>Adequate water supply is there to all latrines and urinals.</p> <p>All latrines in workplaces are with dry-earth system (receptacles) which are cleaned at least four times daily and at least twice during working hours and kept in a strict sanitary condition.</p> <p>Night soil is disposed off by putting layer of it at the bottom of a permanent tank prepared for the purpose and covering it with 15 cm. layer of waste or refuse and then covering it with a layer of earth for a fortnight.</p> <p>The Environmental Expert of IE will ensure the compliance of EMP.</p>	Contactor	Environmental Expert of IE and MPRDC
14. Monitoring of Environmental Conditions	The Concessionaire will undertake seasonal monitoring of air, water, noise, and soil quality through SPCB's approved monitoring agency. The parameters to be monitored, frequency and duration of monitoring as well as the locations to be monitored will be as per the monitoring plan presented with the package specific EMP.	Concessionaire	Environmental Expert of IE and MPRDC
15. Continuous Community Participation	The environmental Expert of IE will 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	Environmental Expert of IE	MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	vicinity of project site under construction due to noise, dust or disposal of debris etc.		
16. Redevelopment of Borrow Areas (Refer guidelines at Annexure VI)	Concessionaire will rehabilitate the borrow areas in accordance with the Guidelines for redevelopment of borrow areas or as suggested by Environmental Expert of IE.	Concessionaire	Environmental Expert of IE and MPRDC
17. Cleaning of Construction of Camps and Restoration	<p>Concessionaire will prepare site restoration plans, which will be approved by the Environmental Expert of IE.</p> <p>The plan is to be implemented by the Concessionaire prior to demobilization. On completion of the works, the site will be left clean and tidy, at the Concessionaire's expense, to the satisfaction of the environmental expert of IE.</p> <p>The Concessionaire will clear all temporary structures, remove or burn all rubbish, and night soils. All disposal pits or trenches will be filled in and effectively sealed off.</p> <p>Residual topsoil, if any will be distributed on adjoining/ proximate barren land or areas identified by Environmental Expert of IE in a layer of thickness of 75 mm-150 mm.</p>	Concessionaire	Environmental Expert of IE and MPRDC
18. Monitoring Operation Performance	<p>The MPRDC will monitor the operational performance of the various mitigation / enhancement measures carried out as a part of this project.</p> <p>The indicators selected for monitoring include the survival rate of trees, utility of enhancement provision for relocated temples and other important structures, status of rehabilitation of borrow areas and utility of double glazing for noise sensitive receptors.</p>	Concessionaire	MPRDC
19. Maintenance of Drainage	<p>MPRDC will ensure that all drains (side drains, median drain and all cross drainages) are periodically cleared especially before monsoon season to facilitate the quick passage of rainwater and avoid flooding.</p> <p>MPRDC will ensure that all the sediment and oil & grease trap set up at the water bodies</p>	Concessionaire	MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	along the bypass are cleared quarterly every year.		
20. Soil Erosion and Monitoring of Borrow Areas	Visual monitoring and inspection of soil erosion at borrow areas, quarries, embankments and other places expected to be affected, will be carried out quarterly every year as suggested in monitoring plan.	Concessionaire	MPRDC
21. Changes in Land Use Pattern	<p>MPRDC shall take initiative and act as facilitator to prepare an action plan for balanced regional development in consultation with Local Development Authority and State Government to control the ribbon development along the project road including new bypasses. A land use regulation control, if applicable need to be adopted.</p> <p>A land use-zoning map may be developed, under which up to a particular distance from the RoW of the alignment especially in new bypass stretches, no development will be allowed.</p> <p>A separate governing body may be formed with the representation of MPRDC, Revenue Department and Local Civic Body (Municipal Corporation/ Gram Panchayat) with the power of taking necessary action, if required to remove un-authorized development along the road.</p> <p>This special body will meet periodically and monitor the development along the road. Necessary hoarding will be erected indicating the availability of RoW and legal charges for encroachment of RoW.</p>	MPRDC & Local Authorities (Revenue Department and Local Civic Bodies)	MPRDC
22. Orientation of Implementing Agency and Concessionaires	<p>The MPRDC shall organize orientation sessions during all stages of the project.</p> <p>The orientation session shall involve all staff of Environmental Cell, field level implementation staff of MPRDC, Environmental Expert of IE and Concessionaire.</p>	Concessionaire	MPRDC

In addition to above Environment Management Plan (EMP), State Level Appraisal Committee of Environment and Impact Assessment Authority of MP has recommended certain issues to be included in EMP vide their letter no. 1089/PS-MS/MPPCB/SEAC/TOR(41)/2009, Bhopal dated 05.12.2009. These additional Environmental issues and mitigation measures are tabulated below:-

Table:-1.2

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
1. Impact of Transportation of the construction material and its impact management	<p>Concessionaire will maintain all roads (existing or built for the project), which are used for transporting construction materials, equipment and machineries.</p> <p>All vehicles delivering materials to the site will be covered to avoid spillage of materials.</p> <p>All existing highways and roads used by vehicles of the Concessionaire, or any of his sub-Concessionaire or suppliers of materials and similarly roads, which are part of the works, will be kept clean and clear of all dust/mud or other extraneous materials dropped by such vehicles.</p> <p>Concessionaire will arrange for regular water sprinkling at least thrice a day (i.e., morning, noon and evening) for dust suppression of such roads particularly the earthen roads.</p> <p>The unloading of materials at construction sites close to settlements will be restricted to daytime only.</p>	Concessionaire	Environmental Expert of IE and MPRDC
2. Details of waste generation and its management			
2.1 Generation of Waste, Debris from Dismantling of Structures and existing road Surface	<p>Waste & Debris generated due to the dismantling of the existing road will be suitably reused in the proposed construction, subject to the suitability of the materials and approval of the Environmental Expert of IE as follows:-</p> <p>The sub grade of the existing pavement shall be used as embankment fill materials if found suitable for construction by I.E.</p> <p>The existing base and sub-base material shall be recycled and may be used as sub-base of</p>	Concessionaire	Environmental Expert of IE and MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	<p>the haul road or access roads if found suitable for construction by I.E.</p> <p>The existing bitumen surface may be utilized for the paving of access roads, and paving works in construction sites and campus, temporary traffic diversions, haulage routes etc.</p> <p>The Concessionaire will suitably dispose off un utilized waste & debris materials; either through filling up of borrows areas located in wasteland or at pre-designated dump locations, subject to the approval of the Environmental Expert of IE.</p> <p>At locations identified for dumping of residual bituminous wastes, the dumping will be carried out over a 60 mm thick layer of rammed clay so as to eliminate the possibility of leaching of wastes into the ground water. The Concessionaire will ensure that the surface area of such dumping pits is covered with a layer of preserved topsoil.</p> <p>All arrangement for transportation during construction including provision, maintenance, dismantling and clearing debris, where necessary will be considered incidental to the work and will be planned and implemented by the Concessionaire as approved and directed by the Environmental Expert of IE.</p> <p>The pre-designed dump locations will be a part of comprehensive solid waste management plan to be prepared by Concessionaire in consultation with Environmental Expert of IE.</p> <p>Debris generated from pile driving or other construction activities shall be disposed such that it does not flow into the surface water bodies or form mud puddles in the area. The Concessionaire shall identify dumping sites. The identified locations will be reported to</p>		

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	the Environmental Expert of IE.		
2.2 Details of dumping sites for waste & its management	<p>The pre-identified dump locations will be a part of comprehensive solid waste management plan to be prepared by the Concessionaire in consultation with Environmental Expert of IE.</p> <p>Location of disposal sites will be finalized prior to completion of the earthworks on any particular section of the road. The Environmental Expert of IE will approve these disposal sites.</p> <p>Concessionaire will ensure that any spoils of material unsuitable for embankment fill will not be disposed off near any water course, agricultural land, and natural habitat like grass lands or pastures. Such spoils from excavation can be used to reclaim borrow pits and quarries, low-lying area in barren lands along the project corridors.</p>	Concessionaire	Environmental Expert of IE and MPRDC
2.3 Non Bituminous Waste	<p>Non-bituminous wastes other than fly ash may be dumped in borrow pits covered with a layer of the conserved topsoil. No new disposal site shall be created as part of the project, except with prior approval of the Environmental Expert of IE.</p> <p>All waste materials will be completely disposed and the site will be fully cleaned before handing over.</p> <p>The Environmental Expert of IE will certify the site after approval.</p> <p>The Concessionaire at its cost shall resolve any claim, arising out of waste disposal.</p>	Concessionaire	Environmental Expert of IE and MPRDC
2.4 Water Pollution from Fuel and Lubricants	<p>The Concessionaire will ensure that all construction vehicle parking location, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance and refueling sites will be located at least 1000 m from rivers and irrigation canal/ponds or as directed by the Environmental Expert of IE.</p> <p>Concessionaire will ensure that all vehicle/machinery and equipment operation,</p>	Concessionaire	Environmental Expert of IE and MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	<p>maintenance and refueling will be carried out in such a fashion that spillage of fuels and lubricants will be minimised and does not contaminate the ground. Oil interceptor will be provided for vehicle parking, wash down and refueling areas. Field storage will be in proper bunded areas.</p> <p>In all fuel storage and refueling areas, if located on agricultural land or areas supporting vegetation, the topsoil will be stripped, stockpiled and returned after cessation of such storage.</p> <p>Concessionaire will arrange for collection, storing and disposal of oily wastes to the approved disposal sites. All spills and collected petroleum products will be disposed off in accordance with MoEF and MPPCB guidelines.</p> <p>Environmental Expert of IE will confirm that all arrangement comply the guidelines of MPPCB/MoEF or any other relevant laws.</p>		
2.5 Waste Disposal	<p>The Concessionaire will provide garbage bins in the camps and regularly emptied and disposed off in a hygienic manner as per the comprehensive Solid Waste Management plan for the labour/ Concessionaire's camp approved by the Environmental Expert of IE.</p> <p>Concessionaire will follow all relevant provisions of the Factories Act, 1948 and the Building and the other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 for construction and maintenance of labour camp.</p> <p>The Concessionaire will make arrangement for disposal of night soil by composting at the workplace unless otherwise arranged by the local sanitary authority. The composting of night soil will be done as per direction of Environmental Expert of IE.</p> <p>The Concessionaire will also ensure that on</p>	Concessionaire	Environmental Expert of IE and MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	<p>completion of the work, all temporary structures are cleared, all rubbish are burnt, night soil or other disposal pits or trenches filled in and effectively sealed off.</p> <p>The site will be left clean and tidy, at the Concessionaire's expense, to the entire satisfaction to the Environmental expert of IE.</p>		
3. Air Water Quality			
3.1 Dust pollution from crushers & hot mix plants	<p>The Concessionaire will take every precaution to reduce the level of dust along construction sites involving earthwork, by frequent sprinkling of water.</p> <p>The Concessionaire will confirm that all crushers used in construction shall conform to relevant dust emission control legislation.</p> <p>All the plants will be sited at least 1 km in the downwind direction from the nearest human settlement. Clearance for siting shall be obtained from the MPPCB. Alternatively, only crushers licensed by the MPPCB shall be used.</p> <p>Dust screening vegetation will be planted on the edge of the RoW for all existing roadside crushers.</p> <p>Hot mix plant will be fitted with dust extraction units.</p> <p>The suspended particulate matter value at a distance of 40m from a unit located in a cluster should be less than 500 $\mu\text{g}/\text{m}^3$. The monitoring is to be conducted as per the monitoring plan.</p>	Concessionaire	Environmental Expert of IE and MPRDC
3.2 Emission from Construction Vehicles, Equipment and Machineries	<p>Concessionaire will ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of MPPCB. The Environmental Expert of IE will be required to inspect regularly to ensure the compliance of EMP.</p>	Concessionaire	Environmental Expert of IE and MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
3.3 Atmospheric Pollution	Ambient Air concentrations of various pollutants shall be monitored regularly. Roadside tree plantation will be maintained.	Concessionaire	MPRDC
3.4 Pollution Monitoring	The periodic monitoring of the ambient air quality, noise level, water (both ground and surface water) quality, soil pollution/contamination in the select location will be responsibility of IE. MPRDC will appoint CPCB approved pollution monitoring agency for this purpose.	Concessionaire	IE
3.5 Water Pollution from Construction Wastewater	The Concessionaire will take all precautionary measures to prevent the wastewater during construction from entering directly into streams, water bodies or the irrigation system. Concessionaire will avoid construction works close to the streams or water bodies during monsoon. The Concessionaire will strictly follow the discharge standards promulgated under the Environmental Protection Act, 1986. All waste arising from the project is to be disposed off in the manner that is acceptable to the Madhya Pradesh State Pollution Control Board (MPPCB). The Environmental Expert of IE will certify that all liquid wastes disposed off from the sites meet the discharge standards.	Concessionaire	Environmental Expert of IE and MPRDC
4. Ground-water recharging and water-shed management	Concessionaire will ensure that no construction materials like earth, stone, ash or appendage disposed off so as not to block the flow of water of any water course, and cross drainage channels. Concessionaire will take all necessary measures to prevent the blockage of water flow. Concessionaire will make a scheme for recharging of ground water and water shed management in the project area at suitable sites in consultation with environmental expert of I.E. and will take approval of	Concessionaire	Environmental Expert of IE and MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	<p>MPRDC for such scheme.</p> <p>In addition to the design requirements, the Concessionaire will take all required measures as directed by the Environmental Expert of IE to prevent temporary or permanent flooding of the site or any adjacent area.</p>		
5. Impact of change of land use particularly grazing/agriculture land and Alternate arrangements	<p>The topsoil from all areas of cutting and all areas to be permanently covered will be stripped to a specified depth of 150 mm and stored in stockpiles. At least 10% of the temporarily acquired area will be earmarked for storing topsoil and following precautionary measures will be taken to preserve them till they are used in alternate barren land to be developed for grazing an agricultural land.</p> <p>Stockpile will be designed such that the slope does not exceed 1:2 (vertical to horizontal), and height of the pile is restricted to 2 m. To retain soil and to allow percolation of water, the edges of the pile will be protected by silt fencing.</p> <p>Stockpiles will not be surcharged or otherwise loaded and multiple handling will be kept to a minimum to ensure that no compaction will occur. The stockpiles shall be covered with gunny bags or tarpaulin sheets.</p> <p>It will be ensured by the Concessionaire that the topsoil will not be unnecessarily trafficked either before stripping or when in stockpiles.</p> <p>Such stockpiled topsoil will be utilized for covering all disturbed areas including borrow areas, top dressing of the road embankments and fill slopes filling up of tree pits, in the median, and in the agricultural fields of farmers, acquired temporarily.</p> <p>Residual topsoil, if there is any will be utilized for the plantation at median and side of the main carriageway and reclamation of barren land.</p>	Concessionaire	Environmental Expert of IE and MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	The management of topsoil shall be reported regularly to the Environmental Expert of IE.		
6. R&R Activities			
6.1. Details of R&R/compensation and the related social issues.	<p>The acquisition of private properties will be carried out in accordance with the land acquisition act of Govt. of M.P.</p> <p>It will be ensured that all R&R activities are to be completed before the construction activity starts, on any section of ROW of existing road and proposed new bypasses. Suitable provisions for compensation of rehabilitation and resettlement of project affected persons, government building and religious structures has been made in the total project cost and EMP estimate. This cost will be born by MPRDC, but concessionaire shall provide necessary support in R & R activities.</p>		
6.2 Relocation of Community utilities (Throughout the Project Corridor)	<p>All community utilities i.e., educational institutes, Temples, Mazar, Bus stands will be affected due to this project.</p> <p>All these structures will be relocated with prior approval of the concerned agencies before construction starts, on any section of the project corridor.</p> <p>The Concessionaire will relocate these properties in consultation and agreement with the owner under the supervision of IE.</p> <p>All other community and Govt. property resources such as schools, hospitals (if any) etc; which will be demolished will also be relocated.</p> <p>The relocation sites for these schools will be identified in accordance with the decision of the district collectors.</p> <p>The relocation will be completed during construction of project.</p>	Concessionaire	MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
7. Tree cutting & Greenbelt Afforestation			
7.1. Greenbelt afforestation, Species of plant proposed in the green belt development as per standard guidelines of CPCB/State Forest Department should be listed. Additional species should also be considered for plantation on need based survey of the local population.	<p>Trees will be removed from the ROW before commencement of Construction with the prior intimation to the Forest Department. For this project, total numbers of trees will be uprooted as per award passed by collector.</p> <p>All these trees are roadside trees except the trees present on proposed RoW of new bypass. The roadside trees are the property of MPRDC. Cutting of the trees need NOC from forest department.</p> <p>Owners (both private and Forests department) will be compensated as per the rate fixed by Forest Department.</p> <p>Concessionaire will remove the roadside trees before the construction starts at the site and handed over to forest department. Disposal of the trees will be auctioned as per the norm by forest department. This amount will be deposited to MPRDC after deduction of handling and auction charges by forest department.</p>	Concessionaire	Independent Engineers and MPRDC
7.2 Road side Plantation	<p>The Concessionaire will do the plantation at median, and turfing at embankment slopes and at median as per the tree plantation strategy prepared for this project.</p> <p>The Concessionaire will maintain the plantation till they handover the project site to the client.</p> <p>The Environmental Expert of IE will inspect regularly the survivability of the plants and compliance of tree plantation guidelines.</p>	Concessionaire	Environmental Expert of IE and MPRDC
7.3 Tree Plantation	<p>Roadside avenue plantation (wherever space is available) will be implemented by concessionaire.</p> <p>The plantation will be done as per the plantation scheme prepared for this project. The plantation will be carried by concessionaire.</p> <p>All the trees felled from the RoW will be</p>	Concessionaire	ESDU, MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	replaced in accordance to the prevailing Standards.		
8. Water and shelter for the workers			
8.1. Shelter and accommodation for the workers at the site	<p>Construction camps will not be proposed within 1000 m from the nearest settlements to avoid conflicts and stress over the infrastructure facilities with the local community. The Concessionaire will provide, erect and maintain necessary (temporary) living accommodation and ancillary facilities for labour up to standards and scales approved by the IE at the location identified for such facilities in pre-construction phase.</p> <p>The Concessionaire will provide these facilities within the sites of every workplace, latrines and urinals in an accessible place, and the accommodation, as per standards set by the Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996.</p>	Concessionaire	Environmental Expert of IE and MPRDC
8.2 Water for the workers at the site	<p>The Concessionaire will construct and maintain all temporary accommodation in such a fashion that uncontaminated water is available for drinking, cooking and washing.</p> <p>The Concessionaire will also guarantee the followings: Supply of sufficient quantity of potable water (as per IS) in every workplace/labour campsite at suitable and easily accessible places and regular maintenance of such facilities.</p> <p>If any water storage tank is provided that will be kept at a distance of not less than 15 m. from any latrine, drain or other source of pollution.</p> <p>If water is drawn from any existing well, which is within close proximity of any latrine, drain or other source of pollution, the well will be disinfected before water is used for drinking.</p>		

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	<p>All such wells will be entirely covered and provided with a trap door, which will be dust proof and waterproof.</p> <p>A reliable pump will be fitted to each covered well. The trap door will be kept locked and opened only for cleaning or inspection, which will be done at least once in a month.</p> <p>Testing of water will be done every month as per parameters prescribed in IS 10500:1991.</p> <p>Environmental Expert of IE will be required to inspect the labour camp once in a week to ensure the compliance of the EMP.</p>		
8.3 Sewage & Waste water disposal	<p>The waste disposal and sewage system for the camp will be designed, built and operated such that no foul odour is generated.</p> <p>Unless otherwise arranged by the local sanitary authority, arrangements for disposal of night soils (human excreta) suitably approved by the local medical health or municipal authorities or as directed by Environmental Expert of IE will need to be provided by the Concessionaire.</p>	Concessionaire	Environmental Expert of IE and MPRDC
9. Utilization of fly-ash in the project.	<p>Concessionaire shall use Fly ash available in 100 km reach from project corridor for various construction works. Further concessionaire will take care if any residual fly ash remains after construction work either this will be returned to the source or used in construction of embankment elsewhere with proper construction measures. IE will keep strict vigil on this aspect.</p>	Concessionaire	Environmental Expert of IE and MPRDC
10. Noise Pollution			
10.1. Measures to mitigate the expected increased noise pollution	<p>The Concessionaire will confirm the following:</p> <p>All plants and equipment used in construction (including the aggregate crushing plant) shall strictly conform to the MoEF/CPCB noise standards.</p> <p>All vehicles and equipment used in construction will be fitted with exhaust silencers.</p> <p>Servicing of all construction vehicles and machinery will be done regularly and during</p>	Concessionaire	Environmental Expert of IE and MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	<p>routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective will be replaced.</p> <p>Limits for construction equipment used in the project such as compactors, rollers, front loaders, concrete mixers, cranes (moveable), vibrators and saws shall not exceed 75 dB (A) (measured at one meter from the edge of equipment in the free field), as specified in the Environment (Protection) rules, 1986.</p> <p>Maintenance of vehicles, equipment and machinery shall be regular and up to the satisfaction of the Environmental Expert of IE 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, concrete mixing, batching will be stopped during the nighttimes between 10.00 pm to 6.00 am.</p> <p>No noisy construction activities will be permitted around educational institutes / health centres (silence zones) up to a distance of 100 m from the sensitive receptors i.e., school between 9.00 am to 6.00 pm.</p> <p>Concessionaire will provide appropriate noise barriers to the suggested locations of select schools/ health centres at his/her own costs. In addition of the listed locations, if Environmental Expert of IE suggests any other locations, the Concessionaire will provide the device at those locations also at his/her own costs.</p> <p>Noise barrier may be of 2 to 3 m high wall separating the sensitive building from noise or it may a green barrier of vegetation having density of minimum 5 m between sensitive location and the highway</p> <p>Monitoring shall be carried out near construction site as per monitoring schedule.</p> <p>Environmental Expert of IE will be required to inspect regularly to ensure the compliance of EMP.</p>		

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
10.2 Noise Pollution	Noise pollution will be monitored as per monitoring plan at sensitive locations. Noise control programs to be enforced strictly. Monitoring of the effectiveness of the pollution attenuation barriers, if there is any will be taken up thrice in the operation period.	Concessionaire	Environmental Expert of IE and MPRDC
11. Plantation in atleast 7.5 meters broad strips on either side of the proposed road	The Concessionaire will do the plantation in open median and road side plantation and turfing at embankment slopes and at median as per the tree plantation strategy prepared for this project. Plantation to be taken up in such a manner that grown trees are not removed from sides during future expansion. Schemes for plantation shall be prepared in consultation with Environmental Expert of I.E. and approval shall be taken from MPRDC. The Concessionaire will maintain the plantation till they handover the project site to the client. The Environmental Expert of IE will inspect regularly the survivability of the plants and compliance of tree plantation guidelines.	Concessionaire	Environmental Expert of IE and MPRDC
12. Mines, stone-crusher and hot-mix plants shall take the mandatory consents from M.P. Pollution Control Board prior to establishment			
12.1 Borrow Areas	Finalizing the borrow areas for borrowing earth, and all logistic arrangement as well as compliance to environmental requirements, as applicable, will be the sole responsibility of the Concessionaire. The Concessionaire will not start borrowing earth from selected borrow area until the formal agreement is signed between landowner and Concessionaire. Locations finalized by the Concessionaire shall be reported to the Environmental Expert of IE and who will in turn report to the MPRDC. Planning of haul roads for accessing borrow materials will be undertaken during this stage. The haul roads shall be routed to avoid agricultural areas as far as possible and will use the existing village roads wherever available. In addition to testing for the quality of borrow materials by the IE, the environmental	Concessionaire	IE / MPRDC

Environmental Issue	Mitigation Measures	Responsibility	
		Implementation	Supervision
	personnel of the IE will be required to inspect every borrow areas location prior to approval.		
12.2 Quarry, Stone Crusher, Hot Mix Plant, Batching plants	<p>Concessionaire will finalize the quarry for procurement of construction materials after assessment of the availability of sufficient materials and other logistic arrangement. Hot mix plant, batching plant, crusher will be sufficiently sited away from settlements and agricultural operations or any commercial establishments.</p> <p>Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations & norms fixed by MP Pollution Control Board.</p> <p>The quarries will be selected based on the suitability of the materials. The Concessionaire will obtain necessary permission for procurement of materials from Madhya Pradesh Mining Department and State Pollution Control Board.</p> <p>Concessionaire will also work out haul road network and report to Environmental Expert of IE and IE will inspect and in turn report to MPRDC before approval.</p>	Concessionaire	Environmental Expert of IE, and MPRDC
13. Compliance to Notifications, Rules and Guidelines issued by MoEF and CPCB norms during execution of project.	Concessionaire shall comply the notifications, rules, guidelines, standards and norms fixed by MOEF and MP Pollution Control Board with latest amendments. Concessionaire should submit a compliance report of such activity to I.E. and MP Pollution Control Board on regular intervals.	Concessionaire	Environmental Expert of IE, and MPRDC

Annexure-I**ENVIRONMENTAL MONITORING STATUS**

Achievement of the Objectives till Date

1. Mobilization Status – (Concessionaire)

Sr. No.	Package	Stretch Chainage	Name of the Concessionaire	Date of Mobilization	Name of Environmental Engineer

Issues:

Action Taken:

ENVIRONMENT MANAGEMENT AT THE CONSTRUCTION WORK SITES

Earthwork

Package	Estimates of excavated soil	Estimates of topsoil to be re-used	Preservation measures? Arrangement of stockpiling the top soil	Debris and soil disposal plan, if soil is not be re-used

Issues/Action

Machinery

- a) Condition of the machineries
- b) Pollution control equipment for machinery

Issues/Action

Monitoring of Air Quality/Water Quality/ Soil/Noise during Construction

Sr. No.	Agencies deployed for monitoring	Location of Monitoring Chainage	Pollution levels	Within CPCB Permissible limits Yes/No	If exceeding limits – action taken

Issues/Action

ENVIRONMENT MANAGEMENT AT THE CONTRACT AND LABOUR CAMPS

Establishment of Contract Camps and Labour Camps

The locations of the construction / labour camps are as follows:

Sr. No.	Location Chainage	Date of Establishment	Present Land use	Area of Camp

Management Measures:

Issues	Yes/No	Action required	Responsibility
Area sufficient for labour camps			
Accommodation for staff and labours sufficient			
Safety measures like fencing/ boundary wall etc.			

Issues/Action Taken

General Facilities at Campsite

Facilities provided/other features	
Labour nos. 1.Transient 2.Permanent 3.Women	
Medical care	
Drinking water/Tank capacity 1.No. of tube wells 2.No. of hand pumps 3.Tank capacity 4. Overhead Storage Tank	
Separate drinking water facility	
Security	
Creche facility	
1.No. of Quarters	
2.size of dwelling unit	
Location from construction work site	
Availability of doctor	
Location from settlement	
Cooking facilities	
1.No. of WCs	
2.WCs for women	
3.No. of bathroom for women	
HIV Posters provided	

Labour / Manpower Resources

Management Measures:

Issues	Yes/No	Action required	Responsibility
Separate drinking water facility			
Adequacy of WCs			
Separate WCs for women			
Adequacy of medical facilities			

Issues/Action Taken
Machinery / Materials and Other Physical Aspects

Indicators	
Solid waste mgmt/garbage disposal etc	
Sanitation No. of septic tanks/soak pits	
Drainage to collect any waste water Treatment of water from fuel use areas	
Oil and grease traps : 1.Solid platform provided 2.Fuel storage 3.Fueling equipment	
Stockyard planning 1.Solid platforms 2.Material covered 3.Segregation of materials 4.Layout of yard 5. Routing of heavy vehicles 6.Ground levelling 7.Lorry covers for fine material	
Dust suppression 1.Haul roads 2.Stockyard	
Safety equipment in use	
Camps fenced	

Management Measures:

Issues	Actions	Responsibility
Drainage to collect any waste water		
Dust suppression 1.Haul roads 2.Stockyard		
Stockyard planning 1.Solid platforms 2.Material covered 3.Segregation of materials 4.Layout of yard		

5.Routing of heavy vehicles		
Oil and grease traps: 1.Solid platform provided 2.Fuel storage 3.Fueling equipment		
Sanitation/ adequacy of septic tanks/soak pits		
Safety equipments like helmets, ear plugs etc.		

Borrow Areas: The details of the borrow areas are as follows.

Sr. No.	No. of Borrow Areas identified in the EA	No. of Borrow Areas Approved by RE	Current land use	Distance from settlement/ Water source	Distance from construction work site	Proposed rehabilitation plan

Management Measures:

Issues	Actions	Responsibility
Consultations with landowners w.r.t. Rehabilitation plans		
Preparation of rehabilitation plans		
Haul roads maintenance		

Issues

Location of Batch Mix and Hot Mix Plants:

Sr. No.	Pkg.	Type of Plant	Location Chainage	Distance from nearest settlement	Distance from const. Work site

Management Measures:

Issues	Actions	Responsibility
Pollution levels as per CPCB permissible limits 1.Air 2.Noise 3.Soil		
Dust suppression		
Regular maintenance to comply with CPCB standards on above parameters		

Construction of Noise Barrier Walls: **The noise barrier walls are to be constructed near the sensitive locations like schools, hospitals etc.**

Sr. No.	No. of sensitive locations identified	Type of sensitive receptors	Chainage	Proposed noise barrier wall(concrete wall, vegetation etc.)	Work started Yes/No

Environmental Enhancement of Cultural/Religious/Archaeological Properties:

Sr. No.	How many sites identified		Category of site / religious /water source/cult. Prop./ any other	Site specific plans prepared - (link with micro plans)	No. of sites where work started
	Enhancement	Shifting			

Management Measures:

Issues	Actions	Responsibility
Consultations with people / local bodies on planning and maintenance		
Time schedule for re-location and enhancement		

The common property resources, which require enhancements and relocations, have been identified by the NGOs. Such properties have been identified which are close to the highway, and can improve the aesthetic quality of the corridor. Accordingly, ***Site-specific plans for all the Common property resources are now in place.*** The common property and religious structures have not only been relocated but some enhancement measures have also been adopted like providing drinking water facilities, paved access, cemented platforms etc. The proposals have been worked out in consultation with the local people.

Road Safety during Construction

Sr. No.	Traffic diversion and Management Plan	Use of Signage

Tree Felling Status:

Sr. No.	Priority stretches(chainage)	Actual no. of Trees to be cut	Tree cutting status	% of trees cut

Management measures:

Issues	Action	Responsibility
Road safety during cutting		
Transport of logs without delay		
Ensuring the sites clear of logs and trees in stipulated time		

Tree Plantation:

Sr. No.	No. of Trees proposed for compensatory plantation	No. of Trees/Shrubs proposed to be planted in median	No. of plants required for junctions/ site specific locations

Issues	Action	Responsibility
Inventory of nurseries that will supply saplings (2 to 3 year old)		
Coordination with the Forest Department to develop an activity plan		
Landscaping plans on enhancement sites		

Reporting Format

Consolidated - Compliance Status on Environmental Management Plans for
Concessionaire

Sl. No.	Issues	Package	Status and other Remarks
1	Site clearance - Tree Felling % of trees cut		
2	Tree Plantation :		
3	Borrow area management 1.No. of borrow areas approved 2.No. Rehabilitated		
4	Top-soil management 1. Estimates of excavated soil 2. Estimates of top soil re-used		

Sl. No.	Issues	Package	Status and other Remarks
5	<u>Site Management</u> <u>Construction/Labour camps</u> <u>Facilities at camp sites:</u> Accommodation Fencing Medical care Drinking water Creche facility W.C. for men/women HIV posters Soakpits Septic tanks		
6	Site Management Debris/Soil disposal plans		

Sl. No.	Issues	Package	Status and other Remarks
7	<p><u>Pollution control</u></p> <p>Noise Noise control devices on equipments Ear plugs provided / used</p> <p><u>Dust</u> Dust control devices Sprinkling of water Cover on the vehicles Cover on stocked material</p> <p><u>Oil spillage</u> Grease traps Solid platforms</p> <p><u>Waste water</u> Drainage Soak pits Maintenance of equipment</p>		
8	<p><u>Pollution monitoring during construction</u></p> <p>Air Water Noise Soil</p>		
Sl. No.	Issues	Package	Status and other Remarks
9	<p><u>Workshop on Environmental management practices</u></p>		
10	<p><u>Enhancement of Common Properties</u></p> <p>Site specific plans prepared Work started Work completed Noise barriers for sensitive receptors.</p>		
11	<p><u>Road safety</u></p> <p>Traffic diversion Signals and signage</p>		