

ASHOKA BUILDCON LIMITED

Karnataka State Highway Improvement Project (KSHIP)

Upgradation of Road from Badami Bypass junction (Km2+870) to Pattadakallu (Km 21+530) in link 21E and Pattadakallu (Km 0+000) to Kamatagi (Km 22+280) link 21F including additional length for Badami bypass (2.190 kms) in link 21E

Environment Management Plan (EMP)

Rev.02	Prepared by	Reviewed and Recommended By	Approved by
Date 03 February 2016	P. Narasimhulu Dy. Manager	Anil Shimpi Head-HSE	Prem Sankar Rai D.G.M. Projects

INDEX

NO.	CHAPTER	PAGE NO.
1	BRIEF INTRODUCTION OF PROJECT	03 - 13
3	STATUTORY AND REGULATORY REQUIREMENTS	14 - 15
3	INSTITUTIONAL ARRANGEMENT AND ENVIRONMENT MANAGEMENT SYSTEM	16 - 30
4	ENVIRONMENTAL MANAGEMENT PLANS AND REVIEW FRAMEWORK	31 - 50
5	ENVIRONMENTAL STIPULATION FROM THE COMPETENT AUTHORITY SEIAA, MOEF, SPCB, FOREST DEPARTMENT AND CHECK LISTS OF ENVIRONMENTAL REMEDIAL MEASURES	51
6	ENVIRONMENT MONITORING PLAN	52 - 53
7	HEALTH AND SAFETY	54 - 56
8	ENVIRONMENTAL REPORTING AND FREQUENCY	57 - 76
	Appendix	
	<ol style="list-style-type: none"> 1. Scarified Bitumen Disposal -CA Schedule C and Appendix C-III. (Page 12) 2. Typical drawings of Enhancement of Water Body- CA Schedule C Appendix C-V (page 13) 3. Ground Water Recharge Pits and Silt Fencing/ Traps- CA Schedule C Appendix: C-IV (Page 11) 4. Environmental Monitoring Plan- Schedule-B, Appendix B-XI (Page 55) 	

Chapter – 1

BRIEF INTRODUCTION OF PROJECT

Introduction

1. The project road KSHIP/ADB/NCB/AEP-9C

Upgradation of Road from Badami Bypass junction (Km 2+870) to Pattadakallu (Km 21+530) in link 21E and Pattadakallu (Km 0+000) to Kamatagi (Km 22+280) link 21F including additional length for Badami bypass (2.190 kms) in link 21E.

Part-1 General Technical Specification shall comprise the “Specifications for Road and Bridge Works (Fourth Revision 2001) published by the Indian Roads Congress on behalf of the Government of India, Ministry of Road Transport and Highways (the “MoRT&H specification”).

Certain provisions of the MoRT&H Specification are amended by Section B Part 2 – Particular Technical Specification of this Specification. In the event of conflict or discrepancies between the MoRT&H Specification and the Particular Technical Specification, the provisions of the Particular Technical Specification shall prevail.

Words like ‘Contract’, ‘Contractor’, ‘Drawings’, ‘Works’, ‘Site’, and ‘Provisional Sum’ used in the MoRT&H Specification shall have and shall be deemed to have the same meaning as understood from the definition of these terms in and as included in the Conditions of Contract.

Words like ‘Specification’, ‘Technical Specification’, ‘General Technical Specification’, ‘Particular Technical Specification’ and ‘Additional Technical Specification’ shall have and shall be deemed to have the same meaning as per Specification Section B Part1 and Part 2 of Volume II.

The above project consists a length of 43.13 Kms to be constructed on BOQ basis.

Project Overview

Upgradation of Road from Badami Bypass junction (Km2+870) to Pattadakallu (Km 21+530) in link 21E and Pattadakallu (Km 0+000) to Kamatagi (Km 22+280) link 21F including additional length for Badami bypass (2.190 kms) in link 21E

Links	From	To	Length (km)
21E	Badami Bypass junction	Pattadakallu	18.66
21F	Pattadakallu	Kamatagi	22.280
21E	Badami bypass	Additional Length	02.190

Total = 43.130

1.3 Environmental Clearance

The Package – Upgradation of Road from Badami Bypass junction (Km2+870) to Pattadakallu (Km 21+530) in link 21E and Pattadakallu (Km 0+000) to Kamatagi (Km 22+280) link 21F including additional length for Badami bypass (2.190 kms) in link 21E.

To overcome the impacts during up-gradation of project highways, the Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India stipulated the General Conditions and Specific Conditions on the evaluation of environmental sensitivity of project links to take appropriate planning and management during the project implementation in order to safeguard the environment that shall be implemented in the sustainable environmental friendly manner. Moreover, the detail environmental management plan has been developed to minimize and mitigate the impact to environment so as the project meet the requirements of Operational Policy- 4.01 of World Bank. Therefore, interpretation and applicability of the EIA Notification dated 14th September 2006, for KSHIP-II, Annuity AEP 9C road vide letter No. SEIAA: 7: IN D: 2009 Dated 1st Oct-2009 and No. SEIAA: 80: IND: 2008 dated 18th November 2008 from State Level Environment Impact Assessment Authority, Karnataka

1.4 Key Environmental Features

The entire link roads under this package AEP 9C, KSHIP-II are passing through the flat rolling terrain to gently undulating terrain with residual hills.

The identified significant impacts due to project are summarized in following significant negative and positive impacts due to project are summarized in the impacts matrix given in Table - 1.4

Table 1.4 : Environmental Impact Matrix for Road Project

Environmental Attributes	Physical Environment			Biological Environment		Geology	
	Air	Water	Noise	Flora	Fauna	Natural Drainage	Soil
I. Construction Phase							
Labour Camp Activities	-ve/t	-ve/t	-ve/t				
Quarrying	-ve/t		-ve/t	-ve/t	-ve/t	-ve/t	-ve/p
Material Transport Storage	-ve/t	-ve/t	-ve/t	-ve/t		-ve/t	-ve/t
Drilling & Blasting	-ve/t		-ve/t	-ve/t			
Pavement Works	-ve/t	-ve/t	-ve/t	-ve/t	-ve/t	-ve/p	-ve/t
Use of Construction Equipments	-ve/t	-ve/t	-ve/t				
Felling of Trees				-ve/p			
Plantation	+ve/p		+ve/p	+ve/p	+ve/p		+ve/p
Culvert and Bridge Construction		-ve/t	-ve/t			-ve/t	
Stripping of Soil				-ve/t		-ve/t	-ve/t
Debris Generation	-ve/t	-ve/t				-ve/t	-ve/t
Oil and Grease		-ve/t					-ve/t
Agricultural land	-ve/t	-ve/t		-ve/t			-ve/t
Waterways (rivers and major streams crossing the link roads)		-ve/t		-ve/t	-ve/t	-ve/t	
Forest area				-ve/t	-ve/t		-ve/t
Major water reservoirs, ponds		-ve/t		-ve/t	-ve/t	-ve/t	
community properties	-ve/t	-ve/t	-ve/t	-ve/t	-ve/t		
II. Operation Phase							
Vehicular Movements	-ve/p		-ve/p				

Note- t-temporary, permanent, - negative, + positive

1.4.1 Environmental Impacts on Schools

The summary of environmental impacts schools and colleges for the proposed project roads are given in the following *Table – 1.4.1*

Table 1.4.1. Summary of Environmental Impacts

Sl. No.	PROJECT ROAD LINK ID	21E	21F	Remarks
1	High School (Nos.)	-	2	
2	Primary School (Nos.)	3	5	
3	Residential School Hostel (Nos.)	-	-	
4	College	-	-	

Above educational institutes has been relocated out of ROW. Presently ROW is free from institutes. KSHIP has provided noise barrier wall to schools to avoid the noise impact.

1.4.2 Impact over the Temples, heritage monuments and Tourism

During construction of road work very low impact over the sites of temples or heritage monuments are envisaged since these are the obligatory locations which will have significant impact over the road alignment. In this project stretch, there is one protohistoric monument (Dolmen) at Ch. Km 19+750 Badami- Pattadakallu. The other common impact from development of road includes disturbances to bus shelters, diversion of parking areas, increased noise and air pollution, fading of walls in temple and corrosion of metal surface like towers, pillars and gates, loss of platforms or beautiful large trees and drinking water resources like well, ponds, temples and there will be temporary impact over the scenic beauty along the project corridor by covering the places with sheets during construction this will prevail till the construction is completed .The list of the religious structures, cultural and heritage monuments are as below.

The summary of environmental impacts on religious structure for the proposed project roads are given in the following *Table – 1.4.2*

Table1.4.2: The Religious structure under impact in the project area

Link ID	Location	Temple	Mosque	church	Samadhi	Graveyard	Community Hall	Arali katte	Shrine	Remarks
21E	Badami Bypass junction to Pattadakallu	3	0	0	0	0	0	0	0	
21F	Pattadakallu to Kamatagi	18	1	0	0	0	0	0	0	
21E	Badami bypass to Additional Length	0	0	0	0	0	0	0	0	

1.4.3 Impact on regional utilities

A variety of utilities serving the regional needs like Electric poles (EP), Electric Transformer (ET), Telephone pole (TP), Telephone Junction Box (TJ), Optical fibre cable post (OC), are currently placed within RoW. The categories of such utilities, which are impacted from the proposed project road construction, are given in **Table 1.4.3**

Table 1.4.3: List of utilities being affected by the proposed roads

Link ID	Link Description	Electric poles (EP) (in ROW)	Electric Transformer (ET)	Telephone pole (TP)	Telephone Junction Box (TJ)
21E	Badami Bypass junction to Pattadakallu	4	2	1	0
21F	Pattadakallu to Kamatagi	5	2	2	0
21E	Badami bypass to Additional Length	0	0	0	0
	Total	9	4	3	0

These utilities shifted by KSHIP from ROW to avoid disruption

1.4.4 Impact on silent receptors:

There are many silent receptors like Schools, Colleges, Hospitals and Courts are located in Impact zone of the project area due proposed widening of the roads these silent receptors will come closer to road edge. During construction activity and movement of heavy construction machinery considerable increase in noise levels and increased suspended particulate matter will be envisaged. Due to progressive of work sometimes there is a chance of school children can meet with the accidents it is necessary to employ the skilled drivers who are operating at these sites.

1.4.5 Impact on Socio Environment:

1.4.5.1 Land use Impact

The major land use in the project area is extensive agricultural land and also existence of settlement at locations of village and small towns having active commercial and economic activity along the roadside. Any additional land available must be put to use for productive purposes. Mitigation related to land acquisition and resettlement will be undertaken as specified by the Resettlement Action Plan (RAP) developed by KSHIP and by Government Authority.

1.4.5.2 Land use Impact at Construction phase:

During construction phase contractor activity will go beyond building line. Even in secondary construction sites like borrow area, quarry sites and water resource points the contractor activity will cross the border line out side the limit depending upon the demand for material availability. These will create demand and disturbances to the near by agricultural area, built up area etc. In case of any such issues it should be cleared within shortest period. Potential community impact related to economy growth are closely related to land acquisition, aesthetic and landscape considerations; noise, air quality etc., Other than the mitigation in these area no additional measures are warranted.

1.4.5.3 Impact on Agriculture and horticulture Activity

There will be loss of topsoil from productive agricultural regions. Sometimes there is chance of scarified waste or other construction waste may take an entry into agriculture land and have negative impact over the crop production or horticulture produce of the region. However, after the completion of project, there is positive impact on agricultural and horticultural activities by better roads and connectivity.

1.4.6 Impact on Human Health and safety

During construction of roads there will be major or minor accidents envisaged by lack of knowledge on handling new equipments, workers functioning without proper personal protective equipment not possessing first aid facilities at work sites. Fire hazard due to absence of fire protective equipment at site of storage of oils, bitumen,

diesel and any other form of chemicals storage may impose safety concerns. Other impacts on human beings due to pollution have been elaborately discussed in the respective sections of impact on air, water, and noise quality.

1.4.7 Impact over water resources during pre-construction and construction stage:

The major impacts on the water bodies along the proposed project roads include the disturbance to the flow of minor rivers, streams and canals due to construction of roads, cross drainage structures and bridges across these water bodies. Alteration of drainage can lead to soil erosion and flooding in the adjacent areas. If the period of construction is long, there are chances of local ecology being impaired. The silt by the construction activities will alter the aquatic habitat of fishes, benthic organisms and phytoplankton leading to an imbalance in the ecology of water bodies. However, as the bridge construction work has been planned to be constructed during the lean flow periods in summer, the impacts on drainage can be minimized. The waterways will be constricted during the construction these structures. Increase in the velocity of water & sediment load downstream of the bridge. This reduces the growth of micro flora (algae) and other photosynthetic plants. The impacts shall be direct but short term in nature. The impacts will last till the construction activity continue. Adequate mitigation measures and pre planned construction schedules also help in reducing the impact on the water bodies.

It is proposed to raise the embankments from the existing levels to ensure that the finished pavement is above the High flood level so as to prevent any impacts due to any water seepage in the pavement. No significant impact on the drainage pattern of the area due to raising of the road profile likely occurs as sufficient numbers of cross drainage structures have been proposed.

During construction phase the vehicles and heavy needs oils, lubricants and fuels for their operation. The spills of these oils & lubricants from the construction camps either during repair & maintenance or accidents will directly lead their way into soils (underground water) and nearest water bodies and affect the terrestrial and aquatic ecosystems of the project area respectively.

1.4.7.1 Impact over water resources at the time of operations stage

Proposed widening also contributes to consolidation of embankment decreasing the permeability of the paved and unpaved shoulder area and increase in run off aftermaths of road construction. Surface runoff also increases due to paved impervious surface of main carriageway. The hard paved surface and the consolidation of embankments decrease the ground water recharge in surrounding region. This affects many water supply units such as hand pumps, wells and agricultural bore wells within RoW which needs to be relocated. The accidental spills of oils, fuels and other hazardous chemicals on the roads during operational phase will pollute and the harmful effects over the near by areas and the water courses of the area.

1.4.8 Monitoring of water quality

During preparation of EIA report, surface and ground water are planned to be monitored as per proposed monitoring plan. The concentration of all parameters are well within the prescribed limit of drinking water standard .It is an indicator that canal and river water is still unpolluted and whatever variation is observed is due to natural causes and seasonal changes ingresses of irrigation water. People in the vicinity use the water for irrigation, drinking and other domestic activities.

1.4.9 Protected Forest, National Park and Sanctuaries

There are no any protected areas such as National Parks and Sanctuaries within road sections.

Table: 1.4.9: National Park, Sanctuaries and Protected Forest

Link Road	Protected forest	National Park	Sanctuaries
21E	Badami Bypass junction to Pattadakallu	0	0
21F	Pattadakallu to Kamatagi	0	0
21E	Badami bypass to Additional Length	0	0

1.4.10 Impact on Biodiversity and Cultural Heritage

1.4.10.1 Biodiversity

The project road alignment does not traverse through rich biodiversity area. The presence of any endanger species is very unlikely.

However, In case any wildlife found having taken up a refugee in any space in project territory, all construction labours have been instructed to leave that place immediately, trained personnel from Department of Forests and Wildlife Warden's office and approved experts shall be intimated for rescue of such wildlife. Any construction activities to be taken up only after any trapped wildlife find its safe escape.

We strictly adhere to the rules and regulations of the Wildlife (Protection) Act (1972), Biological Diversity Act (2002), Forest (Conservation) Act (1980), Environment (Protection) Act (1986) and guidelines of State Biodiversity Conservation Strategy Action Plans for the preservation of habitats and protection of wild animals.

1.4.10.2 Cultural Heritage

In Protohistoric monument (Dolmen) is present at ch Km 19+750, Badami, Pattadakallu. Protective measures will be taken in the stretch so that construction activity will not harm the structures.

1.5 MITIGATION AND ENHANCEMENT MEASURES

1.5.1 Description of Project Facilities

In the process of environmental management measures, including the measures considered for good engineering practices and environmental monitoring for air, water, noise and soil quality for the sound construction management, the ABL shall construct the project facilities in the subsequent paragraph.

The Project Facilities include the following :

1. *Ground Water Recharge Pits*
2. *Locations of Silt traps*
3. *Solid Noise Barriers*
4. *Scarified Bitumen Disposal Pits*
5. *Bitumen Disposal Pits*
6. *Oil Interceptors*
7. *Enhancement of Water Bodies*
8. *Landscape and tree plantation*
9. *Disposal of debris*
10. *Environmental Monitoring*

1.5.2 Ground Water Recharge Pits

As per Guidelines of Ministry of Environment, Forest and Climatic Change (MoEF&CC), New Delhi and Central ground water board of India, the construction of ground water recharge pits are to be provided all along the project corridor. The recharge pits shall be constructed in and around water deficient area along the project road. The location identified for recharging pits are given below and the typical drawing of groundwater recharge pits has been given as per CA Schedule C Appendix: C-IV in this report. The final locations shall be confirmed in consultation with the Construction Supervision Consultant (CSC) or Authority.

1.5.3 Silt Fencing/ Traps

The constructions of Silt fencing are to be provided all along the project corridor. The locations identified for Silt fencing are given below. These locations shall be confirmed as per site requirements in consultation with the CSC or Authority .The typical drawing of Silt Traps has been given as per CA Schedule C Appendix C-IV in this report

1.5.4 Solid Noise Barriers

Some of the noise barriers has been constructed by Authority. The ABL shall repair the damages caused by his construction activities to Noise barriers and other noise barriers identified shall be constructed as per the concession agreement (CA).

1.5.5 Scarified Bitumen Disposal Pits

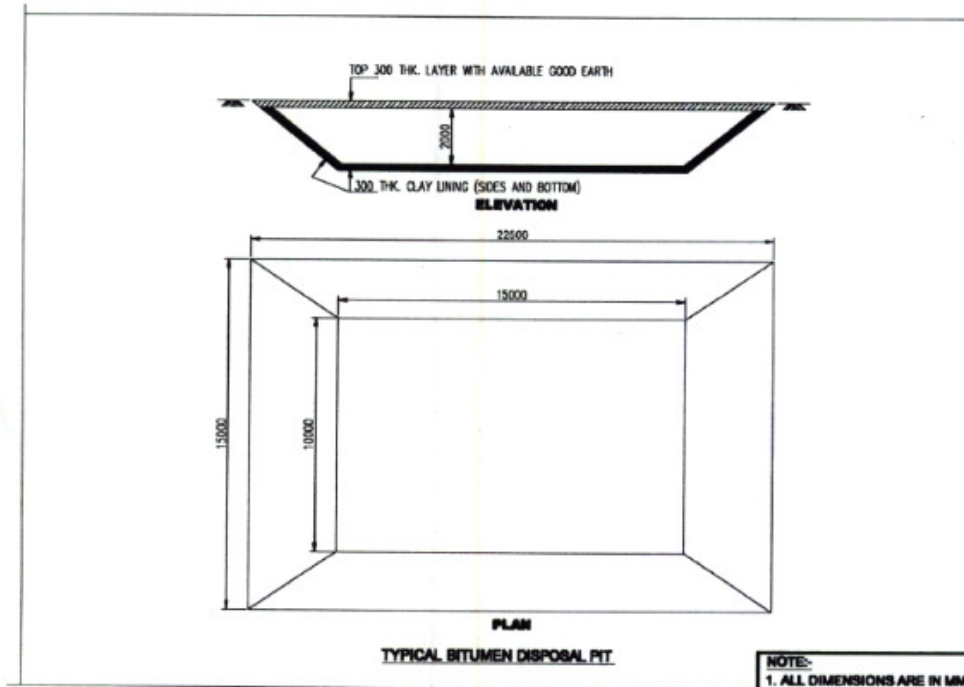
The project involved dismantling large quantity of bituminous layers which are hazardous. Such excavated materials needs to be disposed of in scarified bitumen Disposal Pits. The locations shall be finalized in consultation with CSC. The ABL will take measures for the disposal of scarified bituminous wastes as per the details of typical section of as per CA Schedule C and Appendix C-III of this report.

Appendix C-III

Scarified Bitumen Disposal Pits

The locations for scarified bitumen disposal pits shall be finalized in consultation with Independent Engineer.

Typical Scarified Bitumen Disposal Pit



1.5.6 Oil Interceptors

The ABL shall provide the oil interceptors at construction camps/Workshop area as per the specifications and standards or as directed by the CSC or Authority.

1.5.7 Enhancement of Water Body

The ABL shall provide enhancement measures for water body as per the specifications and standards or as directed by the CSC or Authority.

1.5.8 Landscape and Tree Plantation

Tree saplings shall be planted against each tree removed from ROW for the construction of project road. The number of trees to be planted against trees removed from ROW shall be based on terms and conditions stipulated Environmental clearance (EC). As per the plan and profile of concession agreement shrubs shall be planted in median. The landscaping shall be carried out as per the extent policy of Authority as is being done on Authority public funded projects as referred in Schedule D. **Responsibility of tree plantation**

1.5.9. Disposal of debris

The ABL will suitably dispose off un-utilized 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 will be carried out over a 300 mm thick layer of rammed clay so as to eliminate the possibility of scarified percolation of leachate into the ground water. Mainly to deal with surplus debris materials that would be available after adjusting for all in-situ applications. The ABL will identify dumping sites as per the guidelines prepared; The identified locations will be reported to the Environmental Expert of CSC.

1.5.10. Environmental Monitoring

The ABL 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.

1.6 Borrow Area Management and Rehabilitation Plan:

1.6.1 Borrow Area Management

The sources for borrow materials shall identified and samples should be tested to determine their suitability. Location of source of supply of materials for embankment of sub-grade and the procedure for excavation or transport of material shall be in compliance with the environmental requirements of the MoRTH and as specified in IRC:10-1961.

Precautions for Borrow Area Management

- Environment clearance from SEIAA for borrow area prior to carried out any work on borrow area.
- To restrict unauthorized borrowing by the contractor No borrow area shall be opened without permission of the supervision Consultant.
- The borrowing shall not be carried out from cultivable lands, unless and until, it shall be agreed upon by the supervision consultant that there is no suitable non-cultivable land in the vicinity for borrowing or private landowners are willing to allow borrowing on their fields.
- To avoid any embankment slippage, the borrow areas Will not be dug continuously, and the size and shape of borrow pits will be decided by the Supervision Consultant.
- Redevelopment of the borrow areas to mitigate the impacts will be the responsibility of ABL and Sub Contractor.
- Precautionary measures as the covering of vehicles will be taken to avoid spillage
- During transport of borrow materials. The unpaved surfaces used for the haulage of borrow material will be maintained properly.
- The haul roads and borrows areas will be managed and maintained. Since dust rising is the only impact along the haul roads sprinkling of water will be carried out thrice a day along such roads during their period of use.

1.6.2 Rehabilitation plan for borrow earth area

Non-Cultivable Lands: Borrowing of earth will be carried out up to a depth of 2.0 m from the existing ground level. Borrowing of earth shall not be done continuously. Ridges of not less than 8m width shall be left at intervals not exceeding 300 m. Small drains shall be cut through the ridges, if necessary, to facilitate drainage. Borrow pits shall have slopes not steeper than 1 vertical in 4 horizontal.

Productive Lands: Borrowing of earth shall be avoided on productive lands. However, in the event of borrowing from productive lands, under circumstances as described above, topsoil shall be pressed in stockpiles. The conservation of topsoil shall be carried out. At such locations, the depth of borrow pits shall not exceed 45 cm and it may be dug out to a depth of not more than 30 cm after stripping the 15 cm top soil. Elevated lands: at locations where private owners desire their fields to be leveled, the borrowing shall be done to a depth of not more than 2 m or up to the level of surrounding fields.

Rehabilitation Plan: - The objective of the rehabilitation is to return the borrow pit sites to a safe and secure area, which the general public should be able to safely enter and enjoy. Securing borrow pits in a stable condition is a fundamental requirement of the rehabilitation process.

Rehabilitation plan shall be prepared by the Contractor before the start of work in line with the owner's will and to the satisfaction of the owner keeping in the view of *IRC:10:1961* guidelines, geographical condition and sound engineering practice of borrow area management. Each and every Borrow Area Rehabilitation will be site specific and as per agreed document of owner.

The Borrow Areas shall be rehabilitated as follows;

- Borrow pits shall be backfilled with rejected construction wastes (unserviceable materials) compacted and shall be given a turfing or vegetative cover on the surface. If this is not possible, then excavation slope should be smoothed and depression is filled in such a way that it looks more or less like the original ground surface. In all cases preserved top soil will be reutilized on same ground.
- Borrow areas might be used for aquaculture in case landowner wants such development. In that case, such borrow area shall be photographed after their post-use restoration and Environment Expert of Supervision Consultant shall certify the post-use redevelopment.

The Contractor shall keep record of photographs of various stages i.e. before using materials from the location (pre-project), for the period borrowing activities (Construction Phase) and after rehabilitation (post development), to ascertain the pre and post borrowing status of the area.

Borrow Pits Along Roadside: Borrow pits shall be located 5m away from the toe of the embankment.

Depth of the pit should be such that the bottom of the pit shall not fall within an imaginary line of slope 1 vertical to 4 horizontal projected for the edge of the final section of the bank. Borrow pits should not be dug continuously. Ridges of not less than 8 m width should be left at intervals not exceeding 300 m. Small drains should be cut through the ridges to facilitate drainage.

Community/Private Ponds: Borrowing can be carried out at locations, where the private owners (or in some cases, the community) desire to develop lands (mostly low-lying areas) for pisciculture purposes and for use as fishponds.

Borrow Areas Near Settlements: Borrow pit location shall be located at least 1 km from villages and settlements. If unavoidable, they should not be dug for more than 30 cm and should be drained.

Chapter – 2

STATUTORY AND REGULATORY REQUIREMENTS

2.1 Legal Compliance

The M/s. Ashoka Buildcon Limited, commits to attend all the environmental stipulated conditions over which obtained permission, NOC and license for compliance of legal and statutory requirements from the concerned authority for the execution of project, Package AEP 9C, KSHIP-II. We shall conduct our operations in such a manner so that we protect the property, health of public and prevent damage to natural ecosystem and environment at the entire location on and off the project sites.

This will be achieved by the incorporation of following:

1. Organization set-up for responsibility of EHS management System
2. Sound Management Planning in execution of works
3. Strong Commitment for remedial actions on Environmental Management Plan
4. High degree Commitments on Pollution Prevention and Abatement
5. Prompt actions for the safeguards of natural ecosystem and environment
6. Commitment for continuous monitoring and reporting on environmental aspects
7. Occupational, Health and Safety for staffs and workers
8. Prompt actions on the safety for road –users and Personnel safety for workers
9. Addressing grievances redress and approach
10. Training and participation

Further, M/s. **Ashoka Buildcon Limited** commits that not contravene any legislation and obtain all licenses, NOC, Permits as per legal and statutory requirements under the laws and acts governed in India for this Contract package, AEP 9C, KSHIP –II, on or before the appointed date.

The details are given in the following head

2.2 NOC/ Permit/ License

1. NOC for new quarries from Department of Mines and Geology, State Pollution Control Board, land conversion from State Revenue Department and District Administration. If mining area comes under forest land, permission from State Forest Department;
2. NOC from Pollution Control Board and the Village Panchayat for the installation of crushers plant (as per the recent guidelines from Supreme Court) and **CFE & CFO from Karnataka state pollution control board (KSPCB) for stone crusher.**
3. License for use of explosive from the office of Explosives controller;
4. Permission for withdrawal of ground water from the Central Ground Water Authority and pond / river from Village Panchayath / Irrigation Department as applicable;
5. NOC from State pollution Control boards for consent of establishment (CFE) and consent of operation (CFO) for setting up Batching Plant;
6. NOC from State Pollution Control Board for Establishment and Operation of Drum Mix Asphalt Plant, WMM Plant.
7. Borrow Earth: i) Permission required from Village Panchayat and owner of the land in case of private land ; ii) Permission from Local Municipalities and Development Authorities;
8. Permission of State Forest Department for cutting of trees, if any ;i) Ministry of Finance / RBI: i)Approval for foreign investment and foreign loans, if required; ii) Approval for import of equipment and machinery for construction and operation, if required; iii) Exemption of Excise Duty on construction materials, if required;
9. Department of Telecommunication: i)Permission / clearance for setting up of wireless system, if required; ii) Clearance / permission for the use of optical fiber cables from the Department of Telecommunication, if required;
10. Electricity :i) **Consent to Establishment & Operate from State Pollution Control Board for installation of Diesel**

Generator (DG); ii) Permission required from State Electricity Board (SEB) for electrical connection, if power source is available;

11. Sewage Lines and Water Mains :i)Permission from local Municipalities and Development Authorities; and
12. Environmental Clearance from SEIAA for borrow earth (MoEF OM Dated 24th June, 2013)
13. Consent from KSPCB for storage, Handling and Transport of Hazardous Materials.
14. Consent from KSPCB & District Management / Administration for Storage and Handling of Fuels & Explosive (Hazardous Chemicals)
15. Labour License from Labour Commissioner for Engagement of Labour from Labour Commissioner.
16. Permission from KSPCB for location / layout of workers camp, equipments and storage yards
17. CFE & CFO from labour camp for Discharges from labour camp.
18. Permission from Local Civic Body for Disposal of Bituminous Wastes.
19. Any other permits or clearances required under Applicable Laws.

2.3 Applicable Law and Acts

Apart the above, the ABL shall obtain all applicable Permits and NOC required for environmental protection and conservation from the Competent Authority as provision under the acts and rules governed in India and applicable for this project.

The following Rules and Regulation are applicable for ABL :-

- MOEF&CC Requirement Road construction -- EIA Report & Environment clearance from MOEF--Applicable
- Environment safeguard policy of ADB.
- 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 Centre if required) -- Applicable
- Local authority or *Grampanchayat* permission (NOC) for establishment of plant - -- Applicable
- District Industry Centre permission for industry - -- Applicable
- Factory Act: 1948 (Crusher VSI & HMP) Plant Establishment - -- Applicable
- State Factory Rule (Director of Industrial Safety and Health requirement) - -- Applicable
- Building and Other Construction worker Act, 1996 Applicable
- The Mines & Minerals Act, 1957 -- Applicable
- Land acquisition Rule-1998 --Applicable
- Petroleum Rules, 1976 (Petroleum & Explosive Department) - -- Applicable
- The Indian Electricity Rules, 1956 - -- Applicable
- Batteries Act, 1989 - -- Applicable
- Minimum Wages Act, 1948 - -- Applicable
- National Environmental Tribunal Act, 1995
- National Environment Appellate Authority Act, 1997
- Notification on Fly Ash – IRC : SP 56:2001
- Motor Vehicle Rules (1989) and Amendments of 1994, 2000 & 2002
- Environmental (Protection) Amendments Rules, 2003
- Forest (Conservation) Act, 1980
- The Karnataka Preservation of Trees Act, 1976
- The Ancient Monuments and Archaeological Sites And Remains Act, 1958
- The Karnataka Ancient and Historical Monuments and Archaeological Sites and Remains Act, 1961
- Public Liability Insurance Act, 1991
- Labour (Regulation & Abolition) Act, 1970

CHAPTER – 03

INSTITUTIONAL ARRANGEMENT AND ENVIRONMENT MANAGEMENT SYSTEM

3.1 Health, Safety and Environment Policy

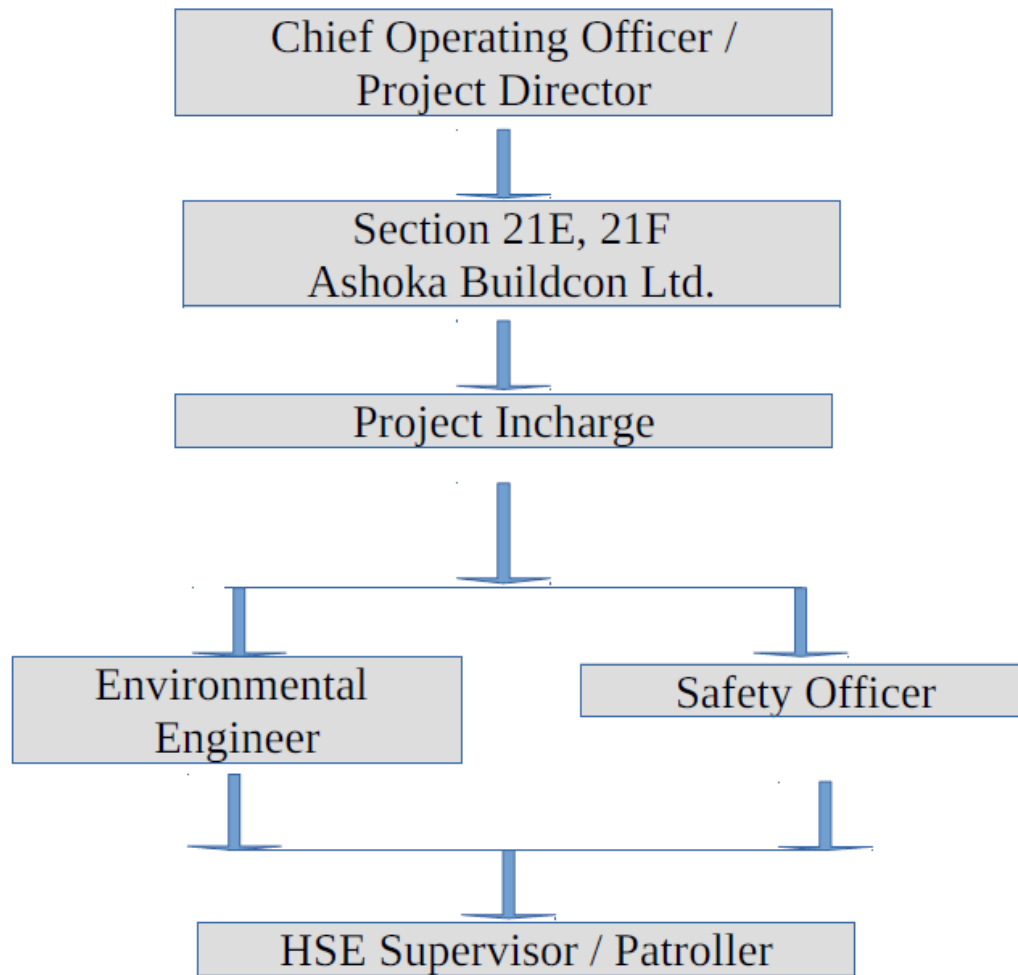
We, at **Ashoka Buildcon Limited** are committed to become an icon in infrastructure development, through innovation, professionalism, active leadership in product quality and sustained growth by delivering value to our Clients (KSHIP).

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, injury 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.

3.2 Project Site HSE Organization Chart:



3.2.1 ROLES & RESPONSIBILITIES

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

CHIEF OPERATING OFFICER (COO) /PROJECT DIRECTOR

The COO/ Project Director is responsible for the overall implementation of the project. In the present case, the ABL contractors are also members of the ABL, VHPL, and hence the 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 are 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, HSE-Work Instructions
- Provide the Safety & Environmental awareness /Induction training to employee (ABL and subcontract employees)
- Prepare the HSE Training program as per the site specific requirement and Train the workers & employee as per the training programs ;
- 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;
- Implementation of Road Work Safety measures for road work. Ensure implementation of warning signs and boards, barricading system, diversion boards etc as per traffic safety devices as per IRC SP:55.
- Ensure the use of Personal protective equipments by all employees.
- To conduct Road Safety Audit.
- Conducting Safety Committee Meeting including preparation of agenda, near miss & accidents reports & forward to Corporate Office before 3rd of every month;
- Monthly HSE Report to be sent to HSE- Corporate Manager before 3rd day of every month;
- Emergency preparedness plan and its effectiveness report (i.e. Mock-drill Report) on quarterly basis;
- Visit the labour camp, Workers canteen to do the audit on welfare provided and required.
- Accident reporting per as Govt. Authority norms.

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.

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 ABL who will establish and maintain an organisational 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 ABL 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.

3.3. Various Committees and Working

Project site management has formed various committees to implement the EMP smoothly. To address and resolve the issues related to Safety, Health, Environment, mess, labour camp, Employees grievances and public grievances. These committees will meet on following schedules.

Sr. No.	Name of Committee	Committee Head/Chairman	Functional Responsibility	Frequency
01.	HSE Committee	Project In-Charge	HSE Officer	Monthly
02.	Canteen Committee	Project In-Charge	Base Camp HR In-Charge	Quarterly
03.	Grievance Committee (Local Community & Employee)	Project In-Charge	Site HR Office/ Liasoning Officer	Monthly
04.	Emergency Response Team	Camp In-Charge/Project Manager	HSE Officer/ HSE Supervisor	Quarterly

All the Committees do meet as per the Frequency stipulated and necessary decisions & implementations are monitored strictly by the Committee members. Also the grievances are resolved on priority.

3.4 ENVIRONMENT MANAGEMENT SYSTEM

The ABL shall identify and evaluate the consequences of Health, Safety and the Environment during the project implementation process by making good environmental management practices, making changes to organizational structure, addition of suitable personnel for HSE, equipment, processes and procedures. Accordingly, the ABL shall adopt the environmental construction management practices.

This Environmental Management Plan has been prepared in the line with proposed Environmental Mitigation measures as suggested in EIA report, keeping consistency with applicable law and national/International good construction practice.

Management Plan has been finalized and is as below

- (i) Documentation of Management Plan
- (ii) Implementation, Recording and Monitoring
- (iii) Risk Evaluation and Management
- (iv) Audit and Review

The detail lists related with the sound environmental management practices which stipulate the specific environmental code of conduct for the environmental management for the project AEP 9C of KSHIP –II are given in Table -5.1.

3.4.1: ENVIRONMENTAL MANAGEMENT SYSTEM PLAN

In addition to the suggested mitigation measures mentioned in this EMP, the ABL and/or Sub-contractor will develop and implement following management Programs and plans under the EMP:

Management Plans:-

- 3.4.1.1) Construction Labour Management Plan;
- 3.4.1.2) Pollution Prevention Management Plan;
- 3.4.1.3) Traffic Management Plan;
- 3.4.1.4) Training Programs and plan;
- 3.4.1.5) Resettlement Action Plan (RAP);
- 3.4.1.6) Indigenous People Development Plan (IPDP);
- 3.4.1.7) Public Consultation and Disclosure Plan;
- 3.4.1.8) Grievance Redressal mechanism;
- 3.4.1.9) Biodiversity & Wildlife Management Plan.

Company will work upon the above mentioned management action plans for necessary changes, where required while being practiced.

A brief description of the above mentioned plans is given as following:

3.4.1.1) Construction Labour Management Plan :-

The Company, ABL will base the employment relationship on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, and promotion, termination of employment or retirement, and disciplinary practices.

The Company will take measures to prevent and address harassment, intimidation, and/or exploitation, especially in regard to women.

The Company will ensure that all workers receive notice of dismissal and severance payments mandated by Indian labour law and collective agreements in a timely manner. All outstanding back pay and social security benefits and pension contributions and benefits will be paid

- (i) on or before termination of the working relationship to the workers,
- (ii) where appropriate, for the benefit of the workers, or
- (iii) Payment will be made in accordance with a timeline agreed through a collective agreement. Where payments are made for the benefit of workers, workers will be provided with evidence of such payments.

The Company will provide a grievance mechanism for worker to raise workplace concerns. The company will inform the workers of the grievance mechanism at the time of recruitment and make it easily accessible to them. In Project office and Camp area grievance box for easy and immediate communication.

The Company will provide a safe and healthy work environment, taking into account inherent risks in its particular sector and specific classes of hazards in the project work areas, including physical, chemical, biological, and radiological hazards, and specific threats to women. The client (KSHIP) will take steps to prevent accidents, injury, and disease arising from, associated with, or occurring in the course of work by minimizing, as far as reasonably practicable, the causes of hazards.

Child Labour

The Company & its ABL, Sub-contractor will not employ children in any manner that is economically exploitative, or is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development.

Forced Labour

The Company & its ABL, Sub-contractor will not employ forced labour, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty.

Worker

During the construction peak work labour strength of approximately 250-300 persons is expected. A brief of the measures that have been suggested for the construction labour under the construction labour management action plan include the following:-

- ❖ Provisions of labour camps provided with individual/share dwelling units supported with piped water supply,
- ❖ Provision of proper accommodation, food and sanitation etc.
- ❖ Monthly inspection of labour camps and mess-hall to focus on the following
 - General observations on cleanliness;
 - Drinking water availability with respect to source, cleanliness of storage tanks and quality fit to be consumed;
 - Provision of first aid facility, sanitation facilities to water availability in the toilets their cleanliness and drainage;
 - Provision of garbage collection, segregation and disposal facilities.

❖ **Workers' participation in safety & environment management.**

Company/ ABL Contractor shall, in every factory and/or project site where a hazardous process takes place, or where hazardous substances are used or handled, set up of a Safety Committee to promote co-operation between the workers and the management in maintaining proper safety, health and environment at work and to review periodically the measures taken for the improvement of Safety and Environment management system and shall be documented.

❖ **Creches**

(1) In every factory / Construction site wherein more than [thirty women workers] are ordinarily employed there shall be provided and maintained a suitable room or rooms for the use of children under the age of six years of such women.

(2) Such rooms

- shall provide adequate accommodation,
- shall be adequately lighted and ventilated,
- shall be maintained in a clean and sanitary condition and
- shall be under the charge of women trained in the care of children and infants.

❖ **Canteen :**

Company / ABL Contractor shall provide and maintain in every place wherein not less than two hundred and fifty building workers are ordinarily employed, a canteen for the use of the workers.

❖ **Workers Management Relationship :-**

Company has a formal and documented human resource policy which are communicated in local language, And has a policy of making workers organization wherein workers representative and management representatives discuss any issue and resolved suitably and same is documented.

❖ **Worker engaged by Third party & Supply Chain**

Enough care is taken by the company while selecting and appointing third party & supply chain that they have the competency and infrastructure for effective implementation ESSMS.

❖ **Security Management Strategy:-**

Company has a well define security management system and it is monitored and reviews time to time for its effectiveness.

3.4.1.2) Pollution Prevention Management Plan

During the project life-cycle, Company will consider ambient conditions and apply technically and financially feasible resource efficiency and pollution prevention principles and techniques that are best suited to avoid, or where avoidance is not possible, minimize adverse impacts on human health and the environment. The principles and techniques applied during the project life-cycle will be tailored to the hazards and risks associated with the nature of the project.

Resource and efficiency :-

Company has a policy to use latest technology and machines for construction work to avoid environmental pollution problem and to encourages innovative ways of conservations of natural resources like water and energy.

Pollution Prevention :-

Company will avoid the release of pollutants or, where avoidance is not feasible, minimize and/or control the intensity and mass flow of their release. This applies to the release of pollutants to air, water, and land due to routine, non-routine, and accidental circumstances with the potential for local and regional.

Environmental issues specific to construction and operation of roads include the following:

- Eco-system and Habitat alteration;
- Storm water;
- Waste;

- Noise;
- Air emissions;
- Wastewater,
- Chemical Spill Management Plan

Detailed environmental mitigation measures are described in Environmental Management Plan (EMP)

3.4.1.3) Traffic Management Plan :-

It is expected that there will be increase of traffic for construction related activities of the Project. This may disturb local people in the area and also increase chances of road accidents requiring a traffic management plan to minimize adverse impacts. The traffic management action plan includes the following elements.

- 1.Transport management planning;
- 2.Driver training;
- 3.Access road maintenance;
- 4.Vehicle management and maintenance;
- 5.Community liaison and safety, and
- 6.Traffic diversion during the road construction.

The traffic management action plan covers the following aspects:

1. Sourcing or recruitment of drivers and number of qualified drivers needed;
2. Drivers' training and drivers commitment;
3. Driver communication with control point and vehicle equipment;
4. Source of suitable vehicles, Vehicle quality and specification;
5. Vehicle management and preventative maintenance programme;
6. Vehicle routes, route planning and alternative routes;
7. Overall vehicle movements - access route selection and management;
8. Strategic vehicle parking locations - to minimize impact of vehicles on local community, villages, roads, and
9. Inspection and audit of the project traffic.

The traffic management is to be monitored on daily basis to evenly spread traffic flow during a day so as to avoid congestion and minimize chances of road accidents. The plan also describes roles and responsibilities of ABL, ABL –O&M, and Sub-contractors. The Traffic management & diversion is available at road project site. The project site HSE Officer is responsible for preparation of diversion plan and its effective implementation.

In order to make an accident free zone at road construction chainage, ABL / subcontractor will ensure an elaborate traffic management plan and procedures which will be inline with IRC: SP-55 standard and tie up with local administration. The required and mandatory road signage shall be posted at working zone.

3.4.1.4) Training Programs:-

HSE induction training and job specific training needs will identified by Ashoka Buildcon Ltd project personnel, sub-contractor engaged for the project activities. Specific training will be imparted to undertake the required ESMP management actions and monitoring activities. The project will ensure that all concerned team members assigned for implementation of EMP and project specific ESMP understand the following aspects through the training programme :-

- Purpose and Importance of EMP & ESMP for Various project activities ;
- Requirements of the mitigation measures under the management plan and specific action plans ;
- Understanding of the sensitive environmental and social features within and surrounding the project area ;
- Aware of the potential risks from the project activities.

Suggested training module matrix for Ashoka Buildcon Ltd and Sub-contractor for better implementing are as below

Sr. no	Training Topic	Designation						Frequency
		Project Management (GM, DGM, Sr. Manager and Manager)	Engineers / Departmental Heads	Supervisor	Operators	Driver	Labour /Workers	
1	E S & S Induction		√	√	√	√	√	Six Monthly
2	Emergency Preparedness and Response Plan	√	√	√	√	√		Quarterly
3	Environment & Social Management Plan	√	√	√	√			Quarterly
4	General Safety Rule		√	√	√	√	√	Six Monthly
5	Hazard Identification and Risk Assessment and Risk Control	√	√	√	√			Quarterly
6	Environment Aspect and Impact Assessment and control measures	√	√	√	√			Quarterly
8	Fire Fighting			√	√		√	Six Monthly
9	Hazardous Material (MSDS)		√	√	√		√	Six Monthly
10	Road Safety & Road Barricading			√	√	√	√	Quarterly
11	First Aid Box & its use	√	√	√	√	√	√	Six Monthly
12	Accident prevention at road project site and HMP,WMM,RMC Plant	√	√	√	√		√	Six Monthly
13	Working at Height		√	√	√		√	Six Monthly
14	Material Handling		√	√	√		√	Six Monthly
15	Electrical Safety	√	√	√	√		√	Quarterly
16	Defensive Driving	√	√	√	√	√	√	Six Monthly

3.4.1.5) Resettlement Action Plan (RAP):-

The required land for construction of project road has already been acquired by KSHIP. However, in case of any modification in project road alignment the land acquisition shall be undertaken as per Concession Agreement.

3.4.1.6) Public Consultation and Disclosure Plan (PCDP) :-

PCDP responsibility lies with Client (KSHIP). Company will monitor Ashoka Buildcon Ltd & Sub-contractor activities and ensure the following:-

1. ABL Project Incharge will attend the meeting if there is announcement, information, invitation from local authority, KSHIP and MoEF&CC etc ;
2. As and when there is grievance from local public will be recorded and project incharge will forward it to the concern department to resolve. If grievance is under the scope of Project in charge will be resolve on priority;
3. Project information board will be displayed at appropriate location;
4. During Construction phase, Proper sing ages such as informative, warning and guiding signage's will be display;
5. During Operation phase, Information required by the Client will be displayed at appropriate location;
6. During Operation phase, Informative, warning, hazard marking and mandatory signage's will be posted at appropriate location;
7. Company project site office will keep public complaint register and /or grievance box. Project Manager

will be responsible for the follow-up and close-out of complaint and/or grievance

3.4.1.7) GRIEVANCE REDRESSAL MECHANISM:-

A Grievance Redressal Cell (GRC) to be established at the project office. The cell has representation from company, ABL, Sub-contractor, local administration and concerned stockholders. The company facilitator will look into complaints and concerns about ownership disputes, historic structures, religious structures, public utilities, distribution of compensation among heirs, missing affected assets and persons in the census etc. The procedure will not replace existing legal processes. Company will forward the grievance to the concerned Client (KSHIP) and authorities for necessary action.

Ongoing reporting to the PAC (Project affected Communities)

Company / ABL Facilitator will play pro-active role in mitigation measures mentioned in feasibility report and suggested by Client and same will be reported to the Client.

3.4.1.8) Eco System, Biodiversity & Wildlife Management Plan:-

Company will implement the directives and guidelines stipulated in environment clearness issued by ministry of forest and environment and state pollution control board.

During the construction phase, various adverse impacts on the ecosystem and wildlife are anticipated in the surrounding areas of the proposed project in terms of increased noise levels, land vibrations during tunnelling and blasting, release of air and water pollutants, etc. Mammals are the most vulnerable group affected by these negative impacts, which affect their movement, behavior and breeding habit. To avoid and minimize the negative impacts of these activities, project authorities are advised to prepare strict guidelines as suggested below:

1. Strict instructions (warnings) shall be imposed on the workers at project sites to ensure that they do not harvest any species and/ or produce from the forests and cause any danger or harm to the animals and birds at project territory and forest section.
2. Minimum levels of noise during construction activities will be maintained.
3. The fuel wood to the labourers shall not be provided from tree cutting meant for the purpose and/or the provision made for the supply of the free/subsidized kerosene/LPG from the depots being set up for this purpose to avoid forest degradation and destruction of animal habitats.
4. To avoid the deterioration of water quality and release of pollutants into the river, project authorities would provide proper sanitation facilities and garbage disposal bins to the workers camp areas.
5. The interference of human population would be kept to a minimum in the adjacent forested areas and it would be ensured that the ABL /Sub-contractors do not set up labour camps in the vicinity of forests and wilderness areas.
6. The project authorities will be bound by the rules and regulations of the Wildlife (Protection) Act (1972), Biological Diversity Act (2002), Forest (Conservation) Act (1980), Environment (Protection) Act (1986) and guidelines of State Biodiversity Conservation Strategy Action Plans for the preservation of habitats and protection of wild animals

7. In case any wildlife found having taken up a refuge in any such tunnels or any space in project territory, all construction labour to leave that place immediately, trained personnel from Department of Forests and Wildlife Warden's office and approved experts should be intimated for rescue of such wildlife. Any

construction activities to be taken up only after any trapped wildlife finds its safe escape;

8. It would be ensured that the noise levels would be kept as minimum as possible in the project area, particularly where human and wildlife habitats are located. For the strict blasting regime, i.e. controlled blasting under constant and strict surveillance should be followed. Some of the suggested methodologies for reduction and mitigation of noise so as to cause as little disturbance to the animals as possible are given below:

- ❖ Only well maintained/new equipment that produces lesser noise would be installed at the work sites.
- ❖ The best way to control the noise is at source. Certain equipment that needs to be placed permanently at one place like generators, etc. would be housed in enclosed structures to cut off the noise.
- ❖ The heavy equipment like rotating or impacting machines will be mounted on anti-vibration mountings
- ❖ Wherever combustion engines are required, they will be fitted with silencers.
- ❖ There should be provision of wind barrier around three sides of storage piles. All storage piles should be wetted and covered with plastic sheets. The grading operation should be suspended when speed of wind is very high.

3.4.2 Implementation, Recording and Monitoring

The ABL shall adopt the methodology for the construction in accordance with defined guidelines for the mitigation of environmental impacts and monitored through active employee participation for continuous improvement of environmental quality at the project site. The ABL shall develop and use systematic monitoring systems for both proactive and reactive performance measures to measure and support HSE objectives. Further, the ABL is made strong commitment to follow the documents to which are the part of the Concession Agreement to meet the environmental quality and health and safety for the workers and staffs. The ABL also commit to keep all records, information of incidents which actually, or have the potential to, affect Health, Safety and the Environment. The ABL will take all corrective actions to prevent recurrence of incidents after the investigation of any mishaps and incidents.

The lists of documents to be followed to meet the objective of HSE policy are given in Table : 3.4.2.1

Sr. No	Particulars	Reference Document	Objective and Responsibility

3.4.3 Risk Evaluation and Management

The ABL commits for continuous evaluation of processes and activities for specific hazards – assessment, records and controls the subsequent risks to tolerable level. For this, the methodology shall be established to identify both acute and chronic hazards and their associated impacts. The entire infrastructure site shall be verified, periodically, to overcome the construction risks. Hazard assessments shall be conducted at all accidental and construction sites including the structural section , deep excavation, bridges, narrow carriageways, faulty

equipment's, machinery yards, storage yards, explosive sites etc.

3.4.4 Audit and Review

The ABL shall conduct audits and reviews to verify the implementation and effectiveness of the HSE Management System and its conformation to this specification. To come this into the affect, the ABL shall set audit exercises to which will be initiated by the management at least once in three months. The MR shall prepare the site audit plan on the basis of the status and importance of the activity to be audited. Based on these plans, the MR prepares a schedule indicating the names of internal auditors, the site/department to be audited and the dates.

Also maintain document and distribute the audit report for corrective action and future for reference. It will be reviewed with all affected employees. For effective actions, the infrastructure site shall be monitored for corrective actions at the regular intervals. Also, schedule periodic management system reviews shall be developed to include, but not be limited to the followings :

- *Summarizing of Audit finding*
- *Analysis of incidents, regulatory citations and non-compliance*
- *Current and future requirements at the project sites*
- *Feedback from other stakeholders*
- *Feedback from employees*
- *Analysis of risks management processes*
- *Create review team with the authority to change the system and update the system requirements.*

3.4.5 Integration of EMP within the Project

The ABL commits to maintain the environmental quality and take mitigation measures as per result of monitoring programme of Air, Noise, Water and Soil that shall be conducted on quarterly basis except the monsoon. Moreover, all the construction activities shall be carried – out following the environmental management plan and remedies shall be taken for the minimal impacts so that the work should be carried –out in environmental friendly manner.

3.4.6 Enforcement

The HSE Personnel of the ABL will monitor all works and inspect facilities to ensure all compliance with this plan. The General Manager will ensure that all employees under their control comply with this environmental, health and safety norms. The Codes of Conduct as detailed above explains the responsibility of each and every person for the project AEP 9C of KSHIP -II.

The Chief Project Manager shall have overall responsibility of ensuring that the Codes of Conduct is followed during Project implementation.

Chapter-4

ENVIRONMENTAL MANAGEMENT PLANS AND REVIEW FRAMEWORK

4.1 Environmental Management Measures

Environmental Management Measures deals with the management measures and implementation procedure of the guidelines along with enhancement measures recommended to avoid, minimize and mitigate foreseen environmental impacts of the project.

The ABL will extend their resource and support for environmental management and provide all inputs of manpower for environmental benefits so that work should be carried –out in the sincerity of environmental concern to up- keep the health , safety and environment at standard and acceptable level. Proposed preventive measures which are required for mitigation and minimization of impacts during the project implementation are listed in below table. The ABL commits to acts for sound management construction during the all stages of project covers as details in the preceding sections of environmental management plan.

Table -4.1 ENVIRONMENTAL MANAGEMENT MEASURES

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
P 1	Environmental Management Measures — Road Construction (Part-A) Pre- Construction Stage			
P 1.1	Tree Cutting resulted due to alignment change proposed by	Trees required to remove due to alignment change proposed by ABL be intimated to the Authority which in turn will submit application with Forest Department (Tree Officer) of the area for removal. Compensation towards removal of trees as assessed by the Forest Department shall be paid by the ABL	-Client -Divisional Forest Officer -Project In-charge	Legal Matrix
P 1.2	Relocation of Utilities resulted due to alignment change proposed by C ABL	Utilities and properties i.e., hand pumps, open wells, water supply lines, sewer lines, telephone cables, buildings and health centers etc. resulting from the change in alignment proposed by ABL shall be relocated by the ABL at his own cost.	-Project In-charge	legal Compliance Report
P 1.3	Assessment of Impacts due to Changes proposed by ABL	The ABL in consultation with Environmental Specialist of CSC shall identify and assess potential adverse environmental impacts due to changes proposed by him, and prepare the Environmental management measures and submit to the authority for review before implementing the same.	-Environmental Specialist -Project In-charge	Legal matrix
P 1.4	Crushers, Hot-mix plants and Batching Plants Location	All construction plants shall be sited sufficiently away from settlements and agricultural operations or any commercial establishments. Such plants shall be located at least 500m away from the nearest dwelling preferably in the downwind direction. The ABL shall submit a detailed layout plan for all such sites and approval of Environmental Specialist of CSC shall be necessary prior to the establishment. Arrangements to control dust pollution through provision of windscreens, water sprinklers, and dust extraction systems shall have to be provided by ABL at all such sites. Specifications for crushers, hot mix plants and batching plants shall comply with the requirements of the	-Project In-charge - CSC -Plant and machinery In-charge	Legal Matrix

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
		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. Wherever there is extreme 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 1.5	Other Construction Vehicles, Equipment and Machinery	All vehicles, equipment and machinery to be procured for construction shall confirm 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. The ABL shall maintain a record of Pollution Under Control (PUC) for all vehicles and machinery used during the Concession Period which shall be produced to CSC for verification whenever required.	- Plant and Machinery In-charge -Project In-charge	Legal Compliance Report
P 1.6	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 ABL. The ABL shall not start borrowing earth from selected borrow area until the formal agreement is signed between landowner and ABL and approved by the CSC. Locations finalized by the ABL shall be reported to the Environmental Specialist of CSC. 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 may use the existing village roads wherever by taking consent from local village <i>panchayat</i> . The environmental personnel of the CSC shall be required to inspect every borrow area location prior to approval.	-Project In-charge -Land Owner - Environmental Specialist	Borrow Area Management
P 1.7	Quarry	ABL shall finalize the quarry for procurement of construction materials after assessment of the availability of sufficient quantity of materials, quality and other logistic arrangements. ABL shall also work out haul road network and report to Environmental Specialist of CSC and CSC shall inspect before giving consent.	- Project In-charge - CSC	Legal Matrix
P 1.8	Arrangement for Construction Water	In view of the special situation in Karnataka, ABL shall prepare and implement the approved Water Management Plan. The ABL shall use ground/surface water as a source of water for the construction and may set up own bore well facility for construction work. ABL may take surface water from the Irrigation Canal with the written consent from the Irrigation Department. The ABL shall provide a list of locations and type of sources to the CSC from where water for construction shall be used. The ABL 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.	- Project In-charge	Legal Matrix
P 1.9	Sand	The Sand shall be procured from identified/approved sand mines as far as possible. If the ABL wants to obtain from source other than approved ones, substitution shall be provided with the details of the source and lead distance. The ABL shall obtain copy of the Lease Agreement of the supplier and submit to CSC	- Project In-charge	Legal Compliance Report

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
		before procuring the sand.		
P 1.10	Labour Requirements	The ABL shall preferably use unskilled labour drawn from local communities to give maximum benefits to the local community.	- Project In-charge	Legal Matrix
P 1.11	Construction Camp Locations — Selection, Design and Layout	Siting of the construction camps shall be as per the guidelines below and details of layout to be approved by environment specialist, CSC. Construction camps shall not be proposed within 500m from the nearest settlements to avoid conflicts and stress over the infrastructure facilities with the local community. Location for stockyards for construction materials shall be identified at least 300m away from watercourses. The Sewage Treatment Plant and solid waste treatment for the camp shall be designed, built and operated. Concessionaire's camps shall be identified at least 2km away from the Forest Reserves.	- Structural Engineer	Legal Matrix Solid Waste Management
P 1.12	Arrangements for Temporary Land requirement	The ABL 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 without special permission where it is un avoidable due to the vast forest reserves along the Project corridor.	- Project In-charge -Land Owner	Legal Compliance Report
P 1.13	Orientation of Implementing Agency and concessionaire's	The ABL 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 his staff involved in the implementation of Environment Management Measures, Environmental Specialists of CSC and Concessionaire.	-Project In-charge	Training Record
P2	CONSTRUCTION STAGE			
	Site Clearance			
P 2.1	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 Concessionaire, under any circumstances shall not cut or damage trees and forest reserves. Trees identified for cutting under the project shall be cut only after receiving clearance from the Forest Dept./DoEF/MoEF (as applicable) and after the receipt of Clients' 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 Clients' instruction to undertake tree cutting.	-Client - Divisional Forest Officer -Project In-charge	Legal Matrix
P 2.2	Disposal of Debris from dismantling structures and road surface	Preparation of the Concessionaires Debris disposal plan. This is mainly to deal with surplus debris materials that would be available after adjusting for all in-situ 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: For filling and leveling of School grounds and proposed parking areas after getting permission from owner of establishment.	- Structural Engineer/ Environmental engineer - Project In-charge	Legal matrix

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
		<p>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. The ABL 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 300 mm thick layer of rammed clay so as to eliminate the possibility of scarified percolation of leachate into the ground water. The ABL shall ensure that the surface area of such disposal pits is covered with a layer of soil & subsequent turfing. 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 ABL as approved and directed by the Environmental Expert of CSC. The pre-designed disposal locations shall be a part of Waste Disposal Plan in consultation and with approval of Environmental Expert of CSC. 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. The ABL shall identify dumping sites as per the Debris Disposal Plan prepared; 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 2.3	Other Construction Wastes Disposal	<p>The pre-identified disposal location shall be part of Comprehensive Waste Disposal Plan Solid Waste Management Plan to be prepared by the ABL in consultation and with approval of Environmental Specialist of CSC. Location of disposal sites shall be finalized prior to initiation of the works on any particular section of the road. The Environmental Specialist of CSC shall approve these disposal sites after conducting a joint inspection on the site with the Concessionaire. ABL 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). 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. 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 ABL 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>	- Environmental Engineer of CSC -Project In-charge	Legal Matrix
P 2.4	Stripping, stocking and	The topsoil from all areas of cutting and all areas to be permanently covered shall be stripped off to a	- Environmental	Legal matrix

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
	preservation of top soil	<p>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> <p>(a) 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.</p> <p>(b) 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.</p> <p>(c) It shall be ensured by the ABL that the topsoil shall not be unnecessarily trafficked either before stripping or when in stockpiles.</p> <p>Such stockpiled topsoil shall be utilized for —</p> <ul style="list-style-type: none"> • Covering all disturbed areas including borrow areas, only in case where they are to be rehabilitated. • Dressing of slopes of road embankment/agricultural fields of farmers acquired temporarily land. 	Specialist	
P 2.5	Accessibility	<p>The ABL 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. The ABL shall also ensure that the existing accesses shall not be used without providing adequate provisions.</p> <p>The ABL 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>	-Project In-charge	
P 2.6	Planning for traffic diversions and detours	<p>Temporary diversions shall be constructed with the approval of the Environmental Specialist of CSC. Detailed Traffic Control Plans shall be prepared by the ABL and submitted to the Environmental Specialist 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 ABL 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 ABL shall also inform local community of changes to traffic routes, conditions and pedestrian access arrangements with assistance from CSC and Client. 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>	<p>-Operation and Maintenance In-charge</p> <p>- Project In-charge</p>	Traffic Management And safety plan
Procurement of construction material				
P 2.7	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 as approved by the Environmental Specialist of CSC and in accordance to the IRC recommended practice for borrow pits for road embankments (IRC: 10:	<p>- Project In-charge</p> <p>-Environmental Specialist</p>	Borrow Area Management

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
		<p>1961). The borrowing operations shall be carried out as specified in the guidelines for siting and operation of borrow areas.</p> <p>The unpaved surfaces used for the haulage of borrow materials, if passing through the settlement areas or habitations; shall be maintained dust free by the Concessionaire. 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>ABL 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 2.8	Quarry Operations Crushers	<p>The ABL 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, ABL 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 Policy guidelines for installation of stone Crushers.</p>	<p>- Project In-charge - Plant and Machineries In-charge</p>	Legal Matrix
P 2.9	Blasting	<p>Except as may be provided in the Agreement or ordered or authorized by the CSC, the ABL shall not use explosives.</p> <p>Where the use of explosives is so provided or ordered or authorized, the ABL shall comply with the requirements of the standards & specifications besides the law of the land as applicable.</p> <p>The ABL 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 ABL shall at all times when engaged in blasting operations, post sufficient warning flagmen. The ABL 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 concerned or affected by blasting operations.</p> <p>Blasting shall be carried out only after inspection and with the consent of CSC. All the statutory laws, regulations, rules etc., pertaining to acquisition, transport, storage, handling and use of explosives shall be strictly followed.</p> <p>Blasting shall be carried out during fixed hours (preferably during mid-day) or as permitted by the law of land as applicable. The timing should be made known to all the people within 1000m (200m for pre-splitting) from the blasting site in all directions.</p>	<p>- Project In-charge - Environment Specialist</p>	Legal Matrix
P 2.10	Transporting Constructing Materials and Haul Road Management	<p>ABL 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.</p> <p>All existing roads used by vehicles of the ABL or any of his sub contractor 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.</p>	<p>- Transportation In-charge - Operation and maintenance In-charge</p>	
P 2.11	Construction Water	<p>ABL need to implement the finally approved Construction Water Management Plan. This is linked to the Concessionaire's work plan.</p>	<p>- Environment Specialist</p>	

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
		<p>ABL shall arrange adequate supply and storage of water for the whole construction period at his own cost. The ABL shall submit a list of source/s from where water shall be used for the project to CSC.</p> <p>The ABL 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 prior to initiation of construction.</p> <p>The ABL shall take all precaution to minimize the wastage of water in the construction process/operation.</p>		
Construction work				
P 2.12	River training and disruption to other users of water	<p>While working across or close to any perennial water bodies, ABL shall not obstruct/prevent the flow of water.</p> <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>	- Environment Specialist	
P 2.13	Drainage and flood control	<p>ABL 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.</p> <p>ABL shall take all necessary measures to prevent any blockage to the water flow. In addition to the design requirements, the ABL 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.</p>	- Environment Specialist	
P 2.14	Siltation of water bodies and degradation of water quality	<p>The ABL shall not excavate beds of any stream/canals/any other water body for borrowing earth for embankment construction.</p> <p>ABL 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.</p> <p>ABL shall ensure that construction materials containing fine particles are stored in an enclosure such that sediment-laden water does not drain into nearby watercourse.</p>	- Environment Specialist	
P 2.15	Slope protection and control of soil erosion	<p>All temporary sedimentation 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.</p> <p>ABL shall ensure the following aspects:</p> <ul style="list-style-type: none"> • After construction of road embankment, the side slopes shall be covered with grass and shrubs as per design specifications. • Turfing works shall be taken up as soon as possible provided the season is favorable 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. • 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. • Along sections abutting water bodies, pitching as per design specification shall protect slopes. 	- Environment Specialist - Structural In-Charge	
Pollution				
Water Pollution				

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
P 2.16	Water Pollution from Construction Wastes	<p>The ABL shall take all precautionary measures to prevent entering of wastewater into streams, water bodies or the irrigation system during construction. ABL shall avoid construction works close to the streams or water bodies during monsoon.</p> <p>ABL shall not wash his vehicles in river water and shall not enter riverbed for that purpose.</p>	<p>- Environment Specialist - Plant In-Charge</p>	
P 2.17	Water Pollution from Fuel and Lubricants	<p>The ABL 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 ABL 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>ABL 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.</p> <p>Wastewater 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>ABL shall arrange for collection, storing and disposal of oily wastes to the pre-identified disposal sites (list to be submitted to CSC and Client) and approved by the Environmental Specialist of CSC. All spills and collected petroleum wastes shall be disposed off in accordance with Petroleum Rules and Pollution Control Board guidelines.</p>	<p>- Environment Specialist - Plant In-Charge</p>	
Air Pollution				
P 2.18	Dust Pollution	<p>The ABL 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, ABL should limit water sprinkling once in the early morning hours. ABL should erect warning boards on dust nuisance to the road users.</p> <p>The ABL 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 near the premises of construction plant or a controlled isolated as well as from a unit located in a cluster should be less than 600 µg. The environmental monitoring is to be conducted as per the approved monitoring plan.</p> <p>Alternatively, only crushers licensed by the KSPCB shall be used. The ABL shall submit required certificates and consents.</p> <p>The suspended particulate matter measured between 3 metres and 10 metres from any process equipment of a stone crushing unit shall not exceed 600 microgrammes per cubic metre.</p>	<p>- Environment Specialist - Plant In-Charge</p>	
P 2.19	Emission from Construction Vehicles, Equipment and Machineries	<p>ABL 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.</p> <p>The ABL shall submit PUC certificates for all vehicles/ equipment/ machinery used for the Project.</p>	<p>- Environment Specialist - Plant In-Charge - Plant and Machineries In-Charge</p>	
Noise Pollution				

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
P 2.20	Noise Pollution: Noise from Vehicles, Plants and Equipments	<p>The ABL shall conform the following:</p> <ul style="list-style-type: none"> All Construction plants and equipment used in construction shall strictly conform to the MoEF/CPCB noise standards. All Vehicles and equipment used in construction shall be fitted with exhaust silencers. 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. The equipment available in the market should be procured, if the ABL 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. 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>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. Working hours of the construction activities shall be restricted around educational institutions/Health Centers (silent zones) up to a distance of 100 m from the sensitive receptors i.e., School, Health Centers and Hospitals etc.</p> <p>Noise monitoring shall be carried out at the locations approved by CSC through the approved monitoring agency.</p>	<p>- Environment Specialist - Plant In-Charge - Plant and Machineries In-Charge</p>	<p>Noise level Monitoring Legal Matrix</p>
P 3				
Plantation/preservation/Conservation Measures				
Flora and Fauna:				
P 3.1	Road side Plantation Strategy	<p>The ABL shall do turfing on embankment slopes, plantation of trees & shrubs as specified in the Agreement. Minimum 80 percent survival rate of the saplings shall be acceptable otherwise the ABL 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 ABL in accordance with the plantation strategy suggested.</p>	<p>-Client -Divisional Forest Officer -Project In-Charge -Environmental Specialist of CSC</p>	
P 3.2	Flora and chance found Fauna	<p>The ABL 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 ABL 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.</p>	<p>-Client -Divisional Forest Officer -Project In-Charge -Environmental Specialist of CSC</p>	
P 3.3	Chance Found Archaeological Property	<p>All fossils, coins, articles of value of antiquity, structures and other remains of 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 ABL 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</p>	<p>- Project In-Charge -CSC</p>	

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
		dealing with the same, waiting which all work shall be stopped. The CSC shall assist the authority to seek direction from the Archaeological Survey of India (ASI) before instructing the ABL 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.		
P 3.4	Accommodation	ABL 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 prior to their construction. The Construction shall commence only upon the written approval of the Environmental Specialist of CSC. The ABL shall maintain necessary living accommodation and ancillary facilities in functional and hygienic manner and as approved by the CSC.	-project In-charge	
P 3.5	Potable Water	The ABL shall construct and maintain all labour accommodation in such a fashion that uncontaminated water is available for drinking, cooking and washing. The ABL 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 ABL shall also guarantee the following: a) Supply of sufficient quantity of Potable Water (as per BIS) in every workplace/labour camp Site at suitable and easily accessible places and regular maintenance of such facilities. b) If any water storage tank is provided that shall be kept such that the bottom of the tank is at least 1 m above the surrounding ground level. c) 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. d) All such wells shall be entirely covered and provided with a trap door, which shall be dust proof and water proof. e) 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. f) Analysis of water shall be done every month as per parameters prescribed in IS 10500-1991. Environmental Specialist of CSC shall be required to inspect the labour camp to ensure the compliance of the Environment Management measures.	-project In-charge	
P 3.6	Sanitation and Sewage System	The ABL shall ensure that — <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 those from men (marked in vernacular) are to be provided for women. • Adequate water supply is to be provided in all toilets and urinals. 	- Environment Specialist - Safety Officer	
P 3.7	Waste Disposal	The ABL 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.	- Environment Specialist - Safety Officer	
P 4	Concessionaire's Demobilization			

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
P 4.1	Environmental Conditions	The ABL 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.	- Environment Specialist - Safety Officer	Environmental Monitoring Reports as per Monitoring Plan
P 4.2	Continuous Community Participation	The Concessionaire/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.	- Environment Specialist/Project In-Charge	Community Grievances register
P 4.3	Clean-up Operations, Restoration and Rehabilitation	ABL 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 ABL prior to demobilization. The ABL 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 ABL 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 Concessionaire's expense, to the entire satisfaction to the Environmental Specialist of CSC.	- Environment Specialist/Project In-Charge	Rehabilitation of borrow Areas plan
C. 9	Construction Activity by Authority			
C.9.1	Tree Plantation	The plantation at the following locations shall be implemented by the Authority/Other agencies appointed by Authority. Cost for tree plantation will be borne by the Authority. 1. Road side 2. Enhancement sites 3. Forest land 4. Community Forestation ABL shall deploy one of his employees to identify & report any damages caused to Road works during tree plantation by carried out by Authority/ Agency deployed by authority.	-Client - Divisional Forest Officer - Project In-charge	ABL/KSHIP/ EMP-FR 01 (Legal Matrix)
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 such as space within RoW; oxbow lands and other leftover portions along the project road..	-- Environment Specialist/Project In-Charge	Rehabilitation of borrow Areas plan
B 1	Environmental Management Measures — Bridges (Part-B) PRE-CONSTRUCTION STAGE			
B 1.1	Permission from Irrigation Department	Permission from Irrigation Department shall be taken prior to start of construction work on bridges on irrigation canals.		Legal matrix
B 1.2	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.	- Environment Specialist/Structural Engineer	
B 1.3	Arrangements for	The ABL as per prevalent rules shall carry out negotiations with the landowners for obtaining their consent for	- Landowner	

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
	Temporary Land Requirement	temporary use of lands for traffic detours, material storage, construction machinery & equipment, vehicle parking etc. ABL shall enter into a written agreements with land owners for all such sites and Environmental Engineer 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.	- Environment Specialist	
B 2	CONSTRUCTION STAGE			
B 2.1	Dismantling of Structures/Components and Debris Disposal	The ABL shall identify disposal sites and shall report the same to the Environmental Engineer, CSC. These locations shall be checked on site and accordingly approved by Environmental Engineer prior to any disposal of waste materials. ABL shall prepare Comprehensive Solid Waste Management Plan in consultation with Environmental Engineer and after approval of plan by Environmental Engineer 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 make the area congenial for working. 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 Engineer of CSC. Dismantled material shall not be stored in canal bed, embankment slopes. All debris requiring disposal shall be directly taken to the Pre identified disposal site and deposited as per approved Comprehensive Waste Disposal Locations. 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 CSC. All arrangements for dismantling, clearing debris and its transportation shall be considered incidental to the work and shall be planned and implemented by the ABL as approved and directed by the Environmental Engineer.	- Structural Engineer	
B 2.2	Construction of temporary traffic diversions	Construction of temporary traffic diversions shall be carried out in accordance with the plans prepared and approved during pre-construction stage. Temporary diversions shall be constructed after receipt of approval from concerned authorities and under supervision of Environmental Engineer. 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. Flashlights are provided at least 200 m before the construction site on either side giving warning to drivers before reaching construction sites. 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 CSC. ABL 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). ABL shall prepare a Detailed Traffic Control Plans and shall submit it to the Environmental Engineer for approval, five days prior to commencement of works on any bridge. The traffic control plans shall contain details of temporary diversions, traffic safety arrangements i.e. lighting arrangement, signages, arrangement of flagmen etc. The ABL shall provide specific measures for safety of pedestrians and workers as a part of traffic control plans. The ABL shall ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption of traffic flow. The ABL shall also inform local community of changes to traffic routes, conditions and pedestrian access arrangements with assistance from local bodies, local police, CSC and Client.	- Structural Engineer	

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
B 2.3	Handling and storing of materials	<p>ABL 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 Engineer of CSC/. This area shall not be at a distance of less than 50 m. from bank of the water course.</p> <p>The access road should be free from water logging.</p> <p>Storage area should be on 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 IS: 7293 & IS: 7969 dealing with handling & storage of building materials and safe working with construction machinery should be followed..</p> <p>ABL shall prepare a plan for handling & storing of material at bridge construction site and shall submit it for approval from Environmental Engineer, CSC.</p>	- Store In-charge	
B 2.4	Water training and disruption to other users of water	<p>ABL shall not obstruct the flow of water while constructing/rehabilitating bridges. ABL 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>ABL 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> <p>ABL 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>ABL 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 ABL 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/ ABL shall ensure that ABL has served the notice to the downstream users of water well in advance.</p>	- Environment Specialist Structural Engineer	
B 2.5	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.	-Project In-charge	
B 2.6	Labour	Minimum' required labour should stay at night at bridge site and ABL shall make necessary arrangement of toilets, sanitation, and Drinking Water requirement at site.	- Project In-charge	
Pollution				
Water Pollution				
B 2.7	Water Pollution from Construction Wastes	<p>The ABL 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 Norms.</p> <p>Cofferdams or formwork shall be such as to ensure still water conditions. All waste arising from the bridge 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 Plan.</p> <p>Wastes must be collected, stored and reused in the construction/taken to approved disposal sites.</p>	-Project In-charge	ABL/KSHIP/ EMP-FR 11 (Prevention and control of Water pollution)

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
		The Environmental Engineer shall certify that all wastes generated at bridge site have been disposed off as per norms or in environment friendly manner.		
B 2.8	Contamination of water from fuel and lubricants	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.	- Plant and machineries In-Charge	
B 2.9	Drainage and runoff	ABL 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 ABL shall take all required measures as directed by the Environmental Engineer to prevent temporary or permanent flooding of the site or any adjacent area.	- Plant In-Charge - Environment Engineer	
B 2.10	Siltation of Water Bodies and Degradation of Water Quality	The ABL 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 schedules to avoid siltation of water bodies.	- Plant In-Charge - Environment Engineer	
Air Pollution				
B 2.11	Dust Pollution	The ABL shall follow good engineering practices during demolishing of bridges or part thereof and during Construction and rehabilitation of bridges. The ABL should provide Screen around the demolition sites as far as possible and where ever feasible. The ABL 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 approved monitoring and reporting programme.	- Environment Incharge	Ambient Air Quality report
Noise Pollution				
	Noise Pollution: Noise from Vehicles, Plants and Equipments	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.	- Environment engineer	Noise Level Monitoring report
B 2.12	Safety			
	Tool Box Meetings	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.	-Safety Officer -Project In-charge	Tool Box Talk record

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
B 2.13	Personal Safety Measures for Labour	<p>ABL shall provide:</p> <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. • The ABL 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 waterborne/water related/water based diseases to ensure the health and hygiene of workers. • ABL 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 ABL 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 Agreement. The ABL 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 ABL 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 ABL shall also ensure that no paint containing lead or lead products is used to except in the form of paste or readymade paint.</p> <p>ABL shall provide facemasks 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 ABL 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 ABL during mobilization and shall be approved by CSC</p> <p>ABL shall install a warning device in the area to be used to warn the workers in case of mishap/emergency.</p> <p>ABL shall provide Safety Helmets conforming to IS 2925 to all the workmen engaged in dismantling work. 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 form 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, CSC, Environment Engineer and Client should be displayed at every bridge Site.</p>	<p>-Safety Officer -Project In-charge</p>	
B 2.14	Handling of Hazardous Materials / Chemicals	<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</p>	<p>- Environment Engineer of CSC -Project In-Charge</p>	

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
		<p>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. 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. All emptied used buckets; rags and containers shall be removed from site. These shall be stored in waste disposal bags and suitably disposed. The ABL shall prepare a hazardous waste management and disposal plan and shall submit a copy of it to Environmental Engineer of CSC for review and supervision. Disposal shall be as per Hazardous Waste (Management & Handling) rules 1989.</p>		
B 2.15	Traffic Management and Safety	<p>The ABL shall ensure that temporary bridges constructed for diversion of traffic are as per norms and safe and approved by Environmental Engineer. Speed limits shall be set for movement of traffic on temporary bridges. The ABL 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 Engineer for the information and protection of traffic approaching or passing the bridge under construction or through the temporary diversion. The ABL shall ensure that all signs, barricades markings are provided as per the standards & specifications. Before taking up of construction on any bridge site, a Traffic Control Plan shall be devised and implemented to the satisfaction of the Environmental Expert. The ABL shall take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricading, including signs, markings lights and flagmen etc. For the information and protection of traffic.</p>	- Environment Engineer -plant In-charge	Traffic Management and Safety plan
B 2.16	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.	-Safety Officer	Tool Box talks
B 2.17	Informatory Signs and Hoardings	The ABL shall provide, erect and maintain informatory/safety signs, hoardings written in English and Kannada wherever required or as suggested by the Environmental Engineer.	-Safety Officer	Tool Box talk
B 2.18	Pollution Monitoring	ABL shall monitor water quality both upstream and downstream of bridges thrice a year at the site of new bridges.	- Environment Specialist/Structural Engineer	Environmental Monitoring Reports
B 3	Concessionaire's Demobilization			
B 3.1	Cleanup Operations, Restoration and Rehabilitation	ABL shall prepare site restoration plans, which shall be approved by the Environmental Engineer of CSC. The cleanup and restoration operations are to be implemented by the ABL prior to demobilization. All spaces excavated and not occupied by the foundation or other permanent works shall be refilled with earth up to	- Environment Specialist/Project In-Charge	Rehabilitation of borrow

Sr. No.	Environmental Issue	Mitigation Measures	Responsibility	Reference Document
		<p>surface of surrounding ground. The ABL 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 Engineer.</p> <p>The bridge construction site shall be left clean and tidy, at the Concessionaire's expense, to the satisfaction to the Environmental Engineer</p>		Area plan

OPERATION STAGE (Activities to be Carried Out by the ABL or through concerned agency)

SL		Mitigation Measures	Responsibility	Reference Document
O.1	Monitoring Operation Performance	<p>The CSC/Supervision Consultant till period of their engagement will monitor the operational performance of the various mitigation/ enhancement measures carried out as a part of the project. Further the monitoring shall be carried out by ABL and KSHIP.</p> <p>The monitoring indicators include the survival rate of trees; utility of enhancement provision for relocated structures; enhancement provision for Schools, Hospital, Water bodies, temple spur roads, bus stand and sheds at bus stop, wells, resin king of setting up of bore wells and stand post, noise and dust filter structures at sensitive receptors, status of rehabilitation of borrows areas; and utility of noise barriers.</p> <p>The rehabilitation of degraded sites along with development and functioning of nalas, streams and gullies after soil and water conservation measures shall be inspected, recorded and timely damages repaired for effective functioning and maintenance of such effort in the field.</p>	<p>-IE" Env. Expert. (for initial 6 month only Monitoring)</p> <p>-Project in charge of Concessionaire</p>	
O.1.1	Maintenance of Groundwater Recharge Pits, Silt Traps	<p>Recharge Pits require minimal maintenance if the ridges are properly constructed initially. Maintenance involves reconstruction of any lines and ridges that might have collapsed. There is limited, ongoing repair required as the stones are not vulnerable to erosion. However, silting behind the stone bunds (if there) requires that the stones to be relaid from time to time. Care will be taken that overtopping of the bunds does not lead to erosion on the downstream face, with subsequent gully formation and undercutting of the bund. Regular maintenance will done to maintain and repair the bunds, remove and replace the top sand layer periodically (generally every year after rainy season) to prevent blockage.</p>	<p>-IE" Env. Expert. (for initial 6 month only Monitoring)</p> <p>-Project in charge of Concessionaire</p>	
O.2	Maintenance of Drainage	<p>The ABL 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>The contractor will ensure that all the sediment and oil and grease traps set up at the water bodies are cleared once in every three months.</p>	<p>-IE" Env. Expert. (for initial 6 month only Monitoring)</p> <p>-Project in charge of Concessionaire</p>	
O.3	Pollution Monitoring	<p>The monitoring of the ambient air quality, noise level, water (both ground and surface water) quality, soil pollution/contamination in the selected locations for initial six months of Operation Phase pollution monitoring plan as elaborated in Concession Agreement and if</p>	<p>-IE" Env. Expert. (for initial 6 month only Monitoring)</p>	Environmental Monitoring Report

		necessary at additional locations for comparative study of pre and post operative data in order to ensure further improvement/ modification in design/methodology. The ABL will appoint NABL/MoEF&CC approved pollution monitoring agency for this purpose.	-Project in charge of Concessionaire	
O.3.1	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, will be carried out. The frequency will be (a) before monsoon (b) During Monsoon and (c) after winter rains to regularly record and monitor the effectiveness of such structures at quarterly intervals for the 1 st three years during and after completion of project.	-IE” Env. Expert. (for initial 6 month only Monitoring) -Project in charge of Concessionaire	
O.4	Safety Measures for road users	ABL will submit Accident, Safety and Hazardous Chemical Spill Management Plan and will get it approved by KSHIP. The Plan should also have details of detours in case of emergency.	-IE” Env. Expert. (for initial 6 month only Monitoring) -Project in charge of Concessionaire	Record /Register
O.4.1	Provision of Ambulance	As per schedule C, Sub-Clause 2.9, there will be Medical Aid Post with facility of Ambulance. Environmental Officer/Concerned Staff will periodically check effectiveness of response time and it must not exceed 20 minutes. Environmental Officer/Concerned staff will also inspect and monitor the effectiveness of First Aid Facilities, life saving medical service and support system implementation for transporting the victims to the nearest hospital and providing medical aid during transportation of victims from accident site to nearest hospital.	-IE” Env. Expert. (for initial 6 month only Monitoring) -Project in charge of Concessionaire	
O.4.2	Informatory Board, Signage ,	ABL will maintain all informatory boards, and signages to keep road user aware for direction and other instructions. In case , the growth of plant’s shoot hiding the signage/boards , it will be periodically removed/cut down the plant’s shoot in such a way the signage/ board should be visible to road users.	-IE” Env. Expert. (for initial 6 month only Monitoring) -Project in charge of Concessionaire	Record /Register
O.4.3	Removal of dead animals.	Concessionaire’s Operation & Maintenance staff will remove Dead Animal lying on the project road and buried away from the nearby residences.	-IE” Env. Expert. (for initial 6 month only Monitoring)	Record /Register
O.4.4	Public awareness	Public awareness program on the issues of Environment, Health and Safety by ABL on different occasion atleast thrice in a year.	-IE” Env. Expert. (for initial 6 month only Monitoring)	
O.4.5	Orientation of Implementation Agency , ABL and Contractor	The ABL shall organize orientation session prior to start of operation of project road. The orientation session shall involve all staff of Environmental Cell, field level implementation staff, Environmental Expert of CSC (in 1 st six month) and KSHIP officials.	-IE” Env. Expert. (for initial 6 month only Monitoring)	Record /Register

4.2 Common Property Resources (CPRs) and other Utilities

Problems	Mitigation measures	Applicability	Responsibility
Avoidance of CPRs	<ul style="list-style-type: none"> • Realignment near all CPRs wherever it is technically feasible. 	Near CPRs	Project In-charge, Site Engineer/ Site Supervisor, Subcontractor
Shifting of community properties	<ul style="list-style-type: none"> • Geometric adjustment while finalizing the alignment to minimize the loss to any such facilities. • Relocation of wells, hand pumps at suitable locations in consultation with community 	Throughout the corridor	Project In-charge, Site Engineer/ Site Supervisor, Subcontractor
Utilities	<ul style="list-style-type: none"> • All telephone and electrical poles/wires and underground cables should be shifted to avoid any such hazard 	Throughout the corridor	Project In-charge, Site Engineer/ Site Supervisor, Subcontractor
Environmental enhancement along the corridor	<ul style="list-style-type: none"> • Enhancement of Ponds, tree plantations near likely to be relocated community structures/ landscaping etc. • Enhancement/rehabilitation of borrow areas etc. • Construction of check dams/other water harvesting structures 		Project In-charge, Site Engineer/ Site Supervisor, Subcontractor

Chapter-05
**ENVIRONMENTAL STIPULATION FROM THE COMPETENT AUTHORITY SEIAA,
MoEF&CC, SPCB, FOREST DEPARTMENT AND CHECK LISTS OF ENVIRONMENTAL
REMIDIAL MEASURES**

The Project Highway during design, engineering, construction, operation and maintenance shall conform to the environmental rules and regulations in force and the relevant specific, general conditions mentioned in the Environmental clearance for the Project by SEIAA, EAC, Forest Division, State Pollution Control Board and other Environment Regulatory Authorities.

The ABL shall take all measures defined under the head of specific conditions, general conditions and other conditions stipulated by the authority. The NOC and grant for the establishment of project AEP 9C of KSHIP –II, obtained from the SEIAA, MoEF, Karnataka State Forest Department and KSPCB as per CA from BKRP Schedule L-1 Appendix L-I as per Concession Agreement.

The ABL commits to abide by all conditions and submit the compliances on the schedule time to the CSC for observation and verifications at project site. Any lapses and shortcoming if notified shall be attended with the full satisfaction of the CSC.

The check- lists of compliance for Environment, Health & Safety Management are attached in the Annexure-2. The ABL will report the compliance in that format along with the environmental report latest by the first week of the preceding month for an observation and inspection of the CSC. Notwithstanding, the ABL shall take appropriate actions for the compliances of environmental aspects all the times during the project implementation.

Chapter-06

ENVIRONMENT MONITORING PLAN

Environmental monitoring of Air, Noise, Water and Soil shall be conducted during Pre-construction, construction and operational phase in conformity to the Environmental Protection Act, 1986. The ABL will appoint the Environmental Testing Laboratory approved from Ministry of Environment, Forest and Climate Change (MoEF&CC).

Environmental monitoring will be conducted for Ambient Air, ambient noise, drinking water and soil as per the National Ambient Air Quality Standard, water quality standard (IS 10500:1991), Ambient Noise Quality Standard and Soil Quality Monitoring. Standard.

Chapter 07

HEALTH AND SAFETY













ABL will take care of Construction workers and management staff by providing training and personnel protective equipment as per work criteria.

7.1 The Summary of safety concerns during Road and Bridge construction is as follows:

S N	Safety Concerns	Safety Measures	Responsibility
1	Personal Safety	<ul style="list-style-type: none"> Protective footwear, protective goggles and nose masks to the workers employed in asphalt works, concrete works, crusher etc. 	HSE Officer / Site Supervisor
2		<ul style="list-style-type: none"> Welder's protective eye-shields to workers who are engaged in welding works. 	HSE Officer / Site Supervisor
3		<ul style="list-style-type: none"> Earplugs to workers exposed to loud noise, and workers working in crushing or compaction. 	HSE Officer / Site Supervisor
4		<ul style="list-style-type: none"> Comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress. 	HSE Officer / Site Supervisor
5		<ul style="list-style-type: none"> 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 Agreement. 	HSE Officer / Site Supervisor
6		<ul style="list-style-type: none"> Comply with all relevant provisions of Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996 are adhered to. 	HSE Officer / Site Supervisor
7		<ul style="list-style-type: none"> Each structure made available for occupancy shall be of sound construction, shall assure adequate protection against weather, and shall include essential facilities to permit maintenance in a clean and operable condition. Adequate heating, lighting, ventilation or insulation when necessary to reduce excessive heat shall provide for comfort and safety of occupants. 	HSE Officer / Site Supervisor
8		<ul style="list-style-type: none"> Each structure made available for occupancy shall comply with the requirements of the Uniform Building Code. This shall not apply to tent campus 	HSE Officer / Site Supervisor
9		<ul style="list-style-type: none"> 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. 	HSE Officer / Site Supervisor
10		<ul style="list-style-type: none"> Ensure that paint containing lead or lead products is used except in the form of paste or readymade paint 	HSE Officer / Site Supervisor
11		<ul style="list-style-type: none"> All buildings, rooms and equipment and the grounds surrounding them shall be maintained in a clean and operable condition and be protected from rubbish accumulation. 	HSE Officer / Site Supervisor
12	Road User Safety	<ul style="list-style-type: none"> Before taking up of construction on any section of the existing lanes of the highway, a Work Zone Safety Checklist shall be devised by the ABL and approved by the CSC. 	HSE Officer / Site Supervisor
13		<ul style="list-style-type: none"> During construction, the ABL shall ensure that all aspects of the Traffic Management Plan prepared by the Authority are well implemented and maintained throughout the construction period. 	HSE Officer / Site Supervisor
14	Risk from electrical equipments	<ul style="list-style-type: none"> ABL shall take all reasonable precautions to prevent danger to the workers and public from fire, flood etc. resulting due to construction activities. ABL 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 ABL shall identify necessary actions in the event of an emergency. 	HSE Officer / Site Supervisor
15	First Aid	<ul style="list-style-type: none"> 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. 	HSE Officer / Site Supervisor
16		<ul style="list-style-type: none"> Availability of suitable transport at all times to take injured or sick person(s) to the nearest hospital. 	HSE Officer / Site Supervisor
17		<ul style="list-style-type: none"> Equipment and trained nursing staff at construction camp. 	HSE Officer / Site Supervisor
18	Informatory Signs and Hoardings	<ul style="list-style-type: none"> 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. 	HSE Officer / Site Supervisor

7.2 PPE Matrix

PPE Matrix for Road & Bridge Construction Worker

Personal Protective Equipment	Working Location details	Life of PPE	IS Code	Approx Prices in Rs
Safety Helmet 	Is compulsory for all working activities	One & half year	IS:2925-1984	200- 350
Safety Shoes 	Is compulsory for all working activities	One & half year	IS 1989 –1 986 (Pt.2)	350- 750
Reflective Vest 	Is compulsory for all working activities	Three Months		150- 300
Dust Mask 	Is compulsory for Crusher, WMM, HMP, CRMB and RMC Workers and employees	Ten Days	IS 9473 – 2002	15- 65
Ear Plug 	Is compulsory for Crusher, WMM, and HMP, CRMB, RMC and DG Set Workers and employees	Ten Days	IS 9167 – 1979	10-70
Ear Muff 	is compulsory if Noise Level is high greater than 85 dB	Two Year	IS 9167 – 1979	350- 1250
Safety goggle 	Is compulsory for Crusher, WMM, and HMP, CRMB, RMC and DG Set Workers and employees	Six Months	IS 8940 – 1978 / IS 1179 – 1967	150 - 350
Cotton Coverall / Dungaree 	Petrol pump operator and fuelling operator	One year	IS 8519 – 1977	350 - 500
Hand Gloves 	Store Person- Cotton Hand Gloves for Bitumen & Concrete laying – Rubber Hand gloves For Electrical work – Shock proof Hand gloves For Welding Work – Heat proof	Ten Days Six Months One Year One Year	IS 4770 – 1968 / IS 2573 – 1986/ IS 6994 – 1973 part I	10 – 25 30 – 60 150- 450 100- 200
Gumboot (Thermal Proof) 	Is compulsory for Bitumen & Concrete laying (Gumboot -Heat proof activity and Concreting activity Rubber-gumboot)	Six Months		300 - 500
Welding Glass 	Is compulsory for all welding and cutting activity	One year	IS 8940 – 1978 / IS 1179 – 1967	150- 300
Full Body Harness 	Is compulsory for working at height above 1.8 M Should be compulsory for Bridge workers who are working at height.	Two Years	IS 3521 – 1999	750 – 1250

Note: - After Issuing the PPE to worker/staff , Self declaration letter should taken from worker/Staff. If Employee/staff/worker found without PPE'S at work zone area or during the working, He will be penalised and warning letter will be issued immediately. Warning letter format is enclosed herewith.

7.3 Emergency Preparedness 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 Base Camp to combat with the Emergency situations.

Emergency Response Plan

Mr K V Raju (CPM) 7090785434		
First Aid Team	Fire Rescue Team	Fire Fighting Team
Mr Nitin Hallur (7090785438)	Mr Appagi (7090785421)	Mr B C Ramanjuneyle (7090788503)
1) Harsh (7090785438)	1) Rajesh D (7090785437)	1) Nagababu K (7090785430)
2) P Vasudeva Rao (7090785429)	2) D Upandar (7090785427)	2) Shive Hiremath (8197530269)
3) Prashant Madivalar (9964646717)	3) Santosh chapalki (7026440008)	3) Santosh chapalki(7026440008)
4) Govind Pillekar (8105370615)	4) Ravi (9701790655)	4) Shive Hiremath(8197530269)
5) Padiyapp Relligangi	5) Mahammad Azaruddini	5) Kishor S Shambekar
6) Prahlad Sharma	6) Ratan Singh	6) K Jitendar Reddy
7) G Shrinivas	7) Narendra	7) Prashant

Emergency Contact Number Badami Project	
P&M SUPERVISOR-	7090785425
HR and Admin In-charge-	7090785437
Emergency Crane -	7090785422
HSE Officer-	8884413162
FIRE-	101
AMBULANCE-	108
POLICE -	100
Police Toll free Helpline:	1800-4250-100
POLICE STATION BADAMI	08357220133
HOSPITAL PATTALKALLU	09481420911
HOSPITAL - BADAMI	08357250222

Emergency Response Plan EMERGENCY PROCEDURES	
REMOVE Anyone in immediate danger	ONLY IF SAFE TO DO SO!
ALERT Others in immediate area Fire Wardens Activate Whistle, Air Horn, Bell, Siren etc. 3 times for 30 sec. Other Tenants and Adjacent Neighbours	 
	 
RING THE EMERGENCY SERVICES ☛ Fire Brigade, Police or Ambulance. ▪ Advise Site: ▪ Advise address: ▪ Advise nearest cross street: ▪ Name & phone number. ▪ Provide details of incident DO NOT HANG UP UNTIL THE ADDRESS HAS BEEN REPEATED	  
CONTAIN THE FIRE Use correct Fire Extinguisher or Fire Hose Reel Turn OFF Electricity, Air Conditioning Close doors and windows to contain fire ALL IF ONLY IF SAFE TO DO SO!	 
	 
EVACUATE Proceed to the nearest exit. Gather together at Exit, if safe to do so, then Evacuate via exit and proceed to the Assembly Area	  
ASSEMBLY AREA Conduct Head count, Roll call. Report to the Emergency Services -Advise missing, provide details of incident. Do not leave the Emergency Assembly Area or attempt to re-enter the building until given the "All Clear" by the Emergency Services. Long siren of 1 minute.	