

CONSULTANCY SERVICE FOR PREPARATION OF DPR, BID DOCUMENTS, MONITORING, ENGINEERING FOR OPRC ROAD WORKS FOR GUJARAT STATE HIGHWAY PROJECT - II

ENVIRONMENTAL SOCIAL MANAGEMENT FRAMEWORK
OPRC-GSHP-II

MARCH - 2017

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TABLE OF CONTENTS

1.	General.....	2
2.	Environmental and Social Management Framework.....	2
3.	Contract Applicable Policy and Regulatory Framework.....	3
4.	Environmental and Social Codes of Practice.....	6
5.	Generic Design Inputs Recommended for E&S Aspects.....	6
6.	Resettlement and Rehabilitation Planning.....	6
7.	Prior Information to the Community before any Intervention.....	7
8.	Grievance Management.....	8
9.	Environmental and Social Performance Compliance.....	8

1. General

An “Environmental and Social Management Framework (ESMF) for the OPRC - GSHP II Road Works of R& B Department, Government of Gujarat” has been prepared and finalized for this contract in December 2016. Part 2B: Specifications - Environmental and Social Management is to be read in conjunction with the full ESMF report, which shall be available at the Employer’s office on request.

The Contractor shall be required to take all necessary measures and precautions to ensure that the execution of the works and all associated operations on-site or off-site are carried out in conformity with the statutory and regulatory environmental requirements including those prescribed in the Environmental and Social Management Framework and elsewhere in this document.

The Contractor shall identify any critical or sensitive sections of the Contract’s roads and will ensure that the interests of the local community are not adversely affected by the Contractor’s activities. Where the Contractor becomes aware of any issues impacting upon his ability to complete the contract works, he shall communicate these concerns to the Monitoring Consultant as soon as possible. The Contractor shall work with the Monitoring Consultant and the Local Relationship Committee (LRC) to resolve these issues as efficiently as possible. The Contractor shall be proactive in reporting to the Monitoring Consultant on any issue like safety, social or environmental concerns relating to the management of the RoW that are observed or he is made aware of as part of his day to day activities.

The Contractor shall take all measures and precautions necessary to avoid any nuisance or disturbance arising from the execution of the works. This shall, wherever possible be achieved by suppression of the nuisance at source rather than abatement of the nuisance once generated. The provisions of this sub-clause shall however, be disregarded in respect of emergencies required for saving life.

2. Environmental and Social Management Framework

Goals and Objectives

This contract intends to achieve the following goals and objectives in a sustained manner throughout its duration:

- Achieve regulatory compliance with respect to environment, health, safety and social aspects;
- Formulate and implement a robust Environmental Management System in line with the recommended Environmental and Social Management Framework within the scope of the contract;
- Positively contribute to the environmental conservation of resources and sustainable development principles;
- Mitigate and manage adverse impacts arising out of contract interventions and activities;
- Deliver sustained Environmental and Social performance by adopting continual improvement principles and global best practices as part of the contract Environmental Management Systems within the scope of the contract; and
- Improve the road safety of the assigned network by adopting Indian Road Congress (IRC) traffic and geometric standards or similar approved standards.

Environmental and Social Management Process

In order to achieve the above goals and objectives, a model Environmental and Social Management Process is to be adopted. The Contractor shall review and replicate a similar site specific framework as part of his overall Project Management Framework and Systems.

The Environmental & Social Management Framework (ESMF) consists of nine (9) elements. A brief outline on the scope and purpose of various ESMF process elements and the responsibility for its implementation is provided in Annexure-1.

3. Contract Applicable Policy and Regulatory Framework

As the regulations are subject to change in the future, the OPRC Contractor is advised to undertake a thorough review of regulations applicable on the project as part of the Environmental and Social Management process recommended in the Contract.

Policy Framework

The international policies and treaties binding on Government of India and other related national environmental policies that are relevant to GSHP have been identified and highlighted below. All parties shall be aware of their objectives and comply with them throughout the contract duration.

International Policies binding on Government of India

- Ramsar Convention on Wetlands, 1971
- Convention on Biological Diversity, 1992
- UN Millennium Development Goals
- Convention on International Trade in Endangered Species of Wild Flora and Fauna
- Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972

National Policies binding on Government of India/R& B Dept., Govt. of Gujarat

- National Environment Policy – 2006 (Ref: <http://moef.gov.in/mef/policy.htm>)
- National Conservation Strategy and Policy Statement on Environment and Development, June 1992
- Policy Statement for Abatement of Pollution, 1992
- National Forest Policy, 1988
- Wildlife Conservation Strategy, 2002
- National Water Policy, 2002
- Resettlement and Rehabilitation (R&R) Policy Framework for the Gujarat State Highway Project

Regulatory Framework

The Contractor shall be aware of, and comply with, requirements of the following list of environmental, health, safety and labour related legislations. This list is indicative and not exhaustive. The Contractor shall undertake a thorough review of applicable regulations as part of the Environmental and Social Management process and comply with prevailing regulations that are in force through the contract duration.

Regulations that are applicable on the project include:

Environmental Regulations

- Environment (Protection) Act, 1986
- EIA Notification, 2006 and its amendments;
- Air (Prevention & Control of Pollution) Act, 1981
- Water (Prevention & Control of Pollution) Act, 1974
- National Ambient Air Quality Standards 2009 and its amendments;
- The Plastic Waste Management Rules, 2016
- The Hazardous and other Wastes (Management and Trans-boundary Movement) Rules, 2016
- The Batteries (Management and Handling) Rules, 2001
- Construction and Demolition Waste Management Rules, 2016
- The Solid Wastes Management Rules, 2016
- The Recycled Plastics Manufacture and Usage Rules, 1999 and Amendment Rules, 2003

- The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 and Amendment Rules, 2000
- The Bio-Medical Waste Management Rules, 2016

Fly Ash Notification 2009 and its amendment on 25th January 2016

Eco-sensitive zones specified in any of the Project or project related footprint areas

- Noise Pollution (Regulation & Control) Rules, 2000 and amended in 2010
- Forest (Conservation) Act, 1980 and its amendments
- Forest (Conservation) Rules, 2003 and its amendments
- The Biodiversity Act, 2002
- Wildlife (Protection) Act, 1972 and Amendment Act, 2002
- The Ancient Monuments and Archaeological Sites and Remains Act, 1958
- Ancient Monuments and Archeological Sites and Remains (Amendment and Validation) Act, 2010
- The Motor Vehicles Act, 1988 and Central Motor Vehicle Rules, 1989; and

Other Guidelines

- Environmental Impact Assessment Guidance Manual for HIGHWAYS, 2010
- EIA Manual published by Ministry of Environment & Forests, January 2010
- IRC: 104:1988, Guidelines for EIA of Highways Projects
- IS Codes and CPCB Guidelines for monitoring & analysis of air, water, soil etc
- The World Bank Operational Policies (<http://go.worldbank.org/4D2JSWFIW0>)
- Health and Safety Related Regulations
- The Factories Act, 1948
- Gujarat Factory Rules, 1963 and its amendments
- Explosives Act, 1884 and Rules, 1983
- The Petroleum Act, 1934 and Rules, 2002
- The Gas Cylinder Rules, 2004
- The Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and Central Rules, 1998

Labour Related Regulations

- The Trade Unions Act, 1926
- The Industrial Employment (Standing Orders) Act, 1946 and Rules, 1946
- The Industrial Disputes Act, 1947
- The Payment of Wages Act, 1936 and Rules, 1937
- The Minimum Wages Act, 1948 and (Central) Rules, 1950
- The Payment of Bonus Act, 1965 and Rules, 1975
- The Factories Act, 1948
- The Mines Act, 1952
- The Motor Transport Workers Act, 1961
- The Contract Labour (Regulation & Abolition) Act, 1970
- The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979
- The Building & Other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996
- The Maternity Benefit Act, 1961
- The Equal Remuneration Act, 1976
- The Bonded Labour System (Abolition) Act, 1976
- The Child Labour (Prohibition & Regulation) Act, 1986
- The Workmen's Compensation Act, 1923

- The Employees' State Insurance Act, 1948
- The Employees' Provident Fund & Miscellaneous Provisions Act, 1952
- The Payment of Gratuity Act, 1972
- The Employment of Manual Scavengers and Construction of Dry Latrines Prohibition Act, 1993
- The Fatal Accidents Act, 1855
- The Weekly Holiday Act, 1942
- The National and Festival Holidays Act
- The Personal Injuries (Emergency) Provisions Act, 1962
- The Personal Injuries (Compensation Insurance) Act, 1963
- The Labour Laws (Exemption from Furnishing Returns and Maintaining Register by Certain Establishments) Act, 1988
- The Public Liability Insurance Act, 1991

Social Related Regulations

- Land Acquisition Act, 1894 and its subsequent amendments
- Gujarat State Highway Project Resettlement and Rehabilitation Policy Framework

The Contractor shall be aware of the following clearances that are specific to the management of the Contract, including any subsequent amendments:

- Environmental Clearance requirements for State Highway projects as per EIA Notification, 2006 and its subsequent amendments;
- Forest Clearance for diversion of Forest Lands for non-forest purposes in the case of where diversion of forest land is required
- Forest Clearance for felling and branches trimming of trees from RoW of existing roads from the Gujarat State Forest Department
- Permission for withdrawal of groundwater for construction from Central/State Ground Water Board
- Permission for withdrawal of surface water from rivers and canals from Irrigation Department, Government of Gujarat
- Permission for locating and operating borrow area pits from Gujarat SEAC and Local Administration/ Panchayats
- Installation and operation of Hot Mix plants, Concrete batching plants and Crushers require Consent from Gujarat State Pollution Control Board under Water and Air Acts
- Authorization for storage, handling, transport and disposal of hazardous materials from Gujarat State Pollution Control Board under Hazardous and other Wastes (Management and Trans Boundary movement) Rules, 2016
- Consent for discharge of air / water pollutants from workers camp, DG set, HMP, WMP, WMM and Crusher Plant installations, equipment and storage yards from Gujarat State Pollution Control Board under Air, Water Acts and HWM Rules
- License for Quarries (in case of opening of new quarries) from Department of Mining, Govt. of Gujarat
- Permission for sand mining from river bed from Department of Mining, Govt. of Gujarat
- Authorization for disposal of bituminous wastes, if any from Gujarat State Pollution Control Board under Hazardous and other Wastes (Management and Trans Boundary movement) Rules, 2016
- All Construction vehicles and off-road equipment are to be registered with Regional Transport Office as required under Central Motor Vehicles Act and possess appropriate PUC certificate; and
- Traffic Police clearance to divert traffic or change traffic scheme within an urban area.

A regulatory matrix generically applicable to this contract is included under **Annexure 1**.

4. Environmental and Social Codes of Practice

To assist the Contractor to deliver sustained environmental and social (E&S) performance, this contract references a set of codes of practice covering social and environmental aspects. These also define a minimum level of E&S mitigation and performance. More details about the codes are presented in Annexure 1 and copies of these are available from the Employer. This will be issued to Contractor upon request.

5. Generic Design Inputs Recommended for E&S Aspects

In addition to the codes of practice, generic design inputs to enhance E&S performance of the project have been collated and presented in Annexure 1 for information and reference. The Contractor shall review the design inputs recommended against typical E&S features observed on the contract area links and apply similar or equivalent design interventions to improve E&S performance at the link and network level.

6. Resettlement and Rehabilitation Planning

It is anticipated that the majority of the required interventions will not require land acquisition. However, land acquisition may be required especially where the Contractor and Employer agree for geometric improvement proposals in the future.

The policy may be invoked when any road is required to be cleared of any encumbrance including private land acquisition before being considered for maintenance under this contract. This shall be the responsibility of the Employer who is required to provide the Corridor of Impact (CoI) required for actual construction free of all encumbrances to the Contractor.

Following any new encroachment or re-encroachment of cleared RoW that takes place post contract award, the responsibility of initiating the process of removing the encroachment shall remain with the Employer, including the payment of compensation as per the agreed R&R policy framework of Gujarat State Roads Project. However, the responsibility of monitoring and reporting re-encroachment to the Employer shall be the responsibility of the Contractor.

The following process is recommended to be followed by the Contractor every time there is an encroachment on the roads within this contract area (Refer Annexure 1 and Annexure 2). The encroachment shall be treated as per the applicable clauses of the R&R policy.

The Contractor will be responsible for assessing the width of the corridor which is required to be cleared, and remain clear, over the contract duration if the outcomes and objectives of this contract are to be achieved.

Identification of Critical Sites

The Contractor will identify sites critical from the point of view of encroachment and will monitor these. It is likely that all existing market places and previously encroached areas may again get encroached and hence these should be given a high priority in terms of monitoring. Other such areas would include those where any industry or dense residential areas are nearby or where temporary kiosks spring up to cater to the need of the industrial workforce and residents. The Contractor will monitor the entire length of the roads within the contract area giving special attention to the identified critical sites.
Coordination with the Local Relationship Committee (LRC)

All cases of re-encroachment should be reported by the Contractor to the Monitoring Consultant and Employer as soon as possible following their observation. The Employer and Monitoring Consultant shall liaise with the LRC in the first instance in an effort to have any re-encroachment removed.

Prevention of Re-encroachment of Cleared Sites and/or New Encroachments

Where, for any reason, the Employer needs to address the issue of RoW encroachment at any point over the duration of the contract, the following process, as well as the entitlement framework outlined within the R&R policy, shall be applied.

Consultation Process

Affected persons will be consulted and will have an opportunities to participate in planning and implementing resettlement programs during the course of the contract. The affected persons would normally be consulted at least twice: once while planning and then to explain the contents of plans when these are finalized. In addition, consultation would take place throughout the implementation of the Resettlement Action Plan. The methods of consultation would include group consultations with male as well female affected persons, individual consultations with PAFs, community leaders, elected representatives of Panchayats/Local Bodies and other stakeholders who may be deemed suitable for consultation.

Census and Socio-Economic Survey

In order to carry out resettlement planning, implementation and monitoring it is important to collect baseline socio-economic census data of Project Affected Person's (PAP's) (mainly non titleholders, tenants and broad information that would be collected during these surveys relate to details of family members, religion, caste, sources of income, occupation, ownership and type of structures, details of losses of assets to the project, etc. The extent of impact on Common Property Resources (CPR's) shall also be covered during these surveys. In addition, individuals and group consultations will be carried out to understand the needs and concerns of PAPs with regard to various issues such as compensation, assistance, resettlement options, alternative options, value addition to the project etc.

Based on the data collected from the primary surveys, Project Affected Families would be suitably identified as titleholders and non-titleholders. The socio-economic conditions of PAP and type and extent of impact would be worked out in order to prepare the Resettlement Action Plan.

- The RAP will broadly include-
- Project description
- Methodology adopted
- Applicable Legal and Regulatory Framework
- Socio-economic profile of the area
- Impact assessment; analysis of alternatives; Minimization of adverse impacts and categorization of PAPs as per the impact categories
- Census and Socio-economic survey of the PAPs and its results
- R&R policy provisions
- Land required for various purposes of the project
- Consultations during the implementation
- Institutional arrangements
- Implementation schedule; and
- Estimated budget for RAP as well as monitoring and evaluation arrangements
- Disclosure

7. Prior Information to the Community before any Intervention

There is no legal requirement for any prior information or disclosure to the local community about any activity under this contract, except for undertaking R&R activities and blasting operations. However, as a good practice and in long term interest of the contract and the Employer, the Contractor will undertake the following:

- Any work that will lead to temporary detouring of the traffic and is likely to cause inconvenience to general public and road users and;
- Activity/work with potential for damage to private property and CPR's.

The Contractor shall therefore, inform the local community about their entry and range of activities they propose to undertake. The Contractor shall also inform the local community about the measures to be adopted in order to reduce the inconvenience including traffic management. The information should be sufficient to permit the local community to assist the Contractor in avoiding any damage to private property or CPRs. The timing of this information dissemination shall be sufficient to allow individuals to relocate clear of the RoW.

Major interventions involving more than two (2) days of work on site, partial or complete road closure and the diversion of traffic, will require the Contractor to display information at prominent places and in such a manner to ensure that individuals within the local community are effectively informed.

Other than where emergency works are required, the Contractor shall inform the local community about the planned intervention/maintenance at least three (3) days in advance of the work commencing.

8. Grievance Management

The existing grievance redress mechanism is applicable which was established in the for the Gujarat State Roads Sector Project. For details refer Resettlement and Rehabilitation policy framework of Gujarat State Roads Sector Project.

9. Environmental and Social Performance Compliance

In line with the performance measurement system under Section VI – Specifications; Part 2A: Performance Specifications: Performance Specifications conformance with the required Environmental and Social requirements of this contract will be monitored and the results used to determine any non-conformance. Each individual breach of the CQAMP and/or its associated plans will be recorded as a non-conformance and will remain in place until resolved to the satisfaction of the Contract Provisions.

Compliance with Environmental and Social (E&S) requirements will be determined against the Social and Environmental Performance Indicators presented in Table 9.1. This table is indicative and not exhaustive.

Table 1 Environmental and Social Performance Indicators

Performance Indicator	Monitoring Parameters	Threshold of Non conformance	Frequency of Assessment
RoW Encroachment	Written notification to Monitoring Consultant and the Employer within five working days of observing any encroachment of RoW specifically providing the chainage and photo documentation.	No written notification within specified time period.	Monthly

Performance Indicator	Monitoring Parameters	Threshold of Non conformance	Frequency of Assessment
Borrow area management	Completeness of site-specific EA process adopted for borrow-area management; regulatory compliance; and adequacy of site-specific EMP implementation.	Inadequate or no EA process or its documentation; regulatory non-compliance; and unsatisfactory management of site-specific EHS issues	Monthly
Construction plants and Contractor's facilities management	Completeness of site-specific EA process adopted for plants/camp site facilities management; regulatory compliance; and implementation effectiveness of site-specific EMP.	Inadequate or no EA process or its documentation; regulatory non-compliance; and unsatisfactory management of site-specific EHS issues	Monthly
Construction waste (both hazardous and non-hazardous waste) management	Completeness of waste management process and plan; regulatory compliance; and integration and implementation of sustainable waste management principles.	Regulatory non-compliance; Inadequate no waste management process or plan both at individual links and network level; non-implementation of agreed waste management arrangements.	Monthly
Ambient Air Quality (AAQ) in construction stretches	AAQ levels	AAQ levels not to exceed baseline/routine operational AAQ levels	Monthly (during construction period)
Ambient Noise Levels (ANL) in construction stretches	ANL Levels	ANL Levels not to exceed baseline/routine operational ANL levels	Monthly (during construction period)
Regulatory compliance	Sourcing construction materials from legally compliant parties; Installing and operating Construction plants such as Hot-mix plants, Batching plants, Crushers, own mining leases etc after appropriate regulatory approvals; Compliance to fly ash notification; Tree felling after regulatory approval and all other regulations and related compliances as specified in the contract.	Absence of regulatory documents showing traceability; Inadequate documentation and record keeping practices; Failure to renew/ update the licenses/permits/consent s upon expiry; non-compliance with regulatory conditions/ requirements	Quarterly (during construction period) Half yearly during routine operational activities.

Performance Indicator	Monitoring Parameters	Threshold of Non conformance	Frequency of Assessment
Environmental Management Process	Environmental Management Process developed and implemented by the Contractor	Absence or unsatisfactory process and its documentation including baseline, impact identification and assessment and EMP documents; Inadequate training of senior personnel staff responsible for environmental process management.	Half yearly
Operational Management Processes including labour deployment during routine and maintenance work.	Compliance with labour laws of wages; Acceptable labour campsite conditions and facilities Valid licenses	Any breach of labour laws; Inadequate labour camp conditions; Any invalid license not being processed for replacement or renewal.	Monthly
Management of any chance discovery of archaeological remains at any site excavated under the contract.	Compliance with all protocols, procedures and legislation for reporting and managing archaeological discoveries. Chance find reports	Any breach of protocols, procedures or legislation for managing archaeological discoveries. Any legal action initiated by district administration due to non-reporting.	Quarterly (during construction period)
Prevention of communicable diseases spreading to new areas due to increased communications.	Acceptable number and frequency of HIV/AIDS awareness generation events carried out in a year; availability of contraceptive measures in the camp site/labour camps	Inadequate number or frequency of HIV/AIDS awareness generation events carried out in a year; non-availability of contraceptive measures in the camp site/labour camps.	Quarterly

Environmental and Social Management Framework [ANNEXURE 1]

1.1 Environmental and Social Compliance Objective

2. The over-riding objective is to foster an environmentally and socially responsible attitude on the part of the Contractor undertaking work for the Employer. It is to ensure compliance with all relevant environmental and social protection legislation and regulatory requirements.
3. Because of the nature of the work undertaken on behalf of the Employer, the Contractor may from time to time be exposed to environmentally sensitive situations, which could involve contamination of air, soil, and/or water systems. Situations will arise when there is a need to use appropriate environmental protection measures. In all cases/situations/activities, the provisions of the applicable Acts or Regulations must be strictly observed.
4. The Contractor needs to be aware of environmental laws, regulations and social policies along with the need to understand aspects such as:
 - a) The requirement to obtain permission before undertaking any work.
 - b) The hazards to which the environmental elements (natural, physical or social) may be exposed in the process of carrying out work.
 - c) The appropriate protective measures to be used.
 - d) Any standard practices for environmental risk mitigation.
 - e) Any emergency procedures for dealing with accidental pollution or imminent danger.
5. In undertaking work, which involves environmental risks, emphasis should be on the fundamentals such as how to avoid offences of:
 - a) Air and water pollution (by screening, filtering, channeling and washing at approved sites)
 - b) Unlawful hazardous waste disposal, by containment, storage and disposal by approved methods at approved sites
 - c) Chemical spills (by appropriate maintenance of suitable equipment)
 - d) Contamination (by cleaning equipment at an approved site after each job)

Reporting environmental incidents is important so that any environmental problem/s or its resultant adverse impact can be addressed quickly. It is a requirement that any pollution incident be advised promptly to the Monitoring Consultant.
6. Further environmental information is available from:
 - a) The Ministry of Environment, Forests & Climate Change
 - b) Gujarat State Pollution Control Board
 - c) The Employer

1.2 Environmental and Social Framework for OPRC

In order to achieve the goals and objectives envisaged for the Project (Refer to Part 2B – Environmental and Social Management Framework, Section VI – Specifications of the Main Tender Document and Section 1.1 above), an Environmental and Social Management process is provided in the Contract. The Contractor shall review and replicate a similar framework / management process as part of his overall Project Management Framework and Systems. The proposed Environmental & Social Management Framework is illustrated in **Figure 1**.

The proposed ESMF for the OPRC project is to be implemented by the Employer and Contractor as described in the following sections. The Environmental & Social Management Framework consists of following nine (9) steps and the responsibility for implementing the ESMF element is highlighted in the brackets:

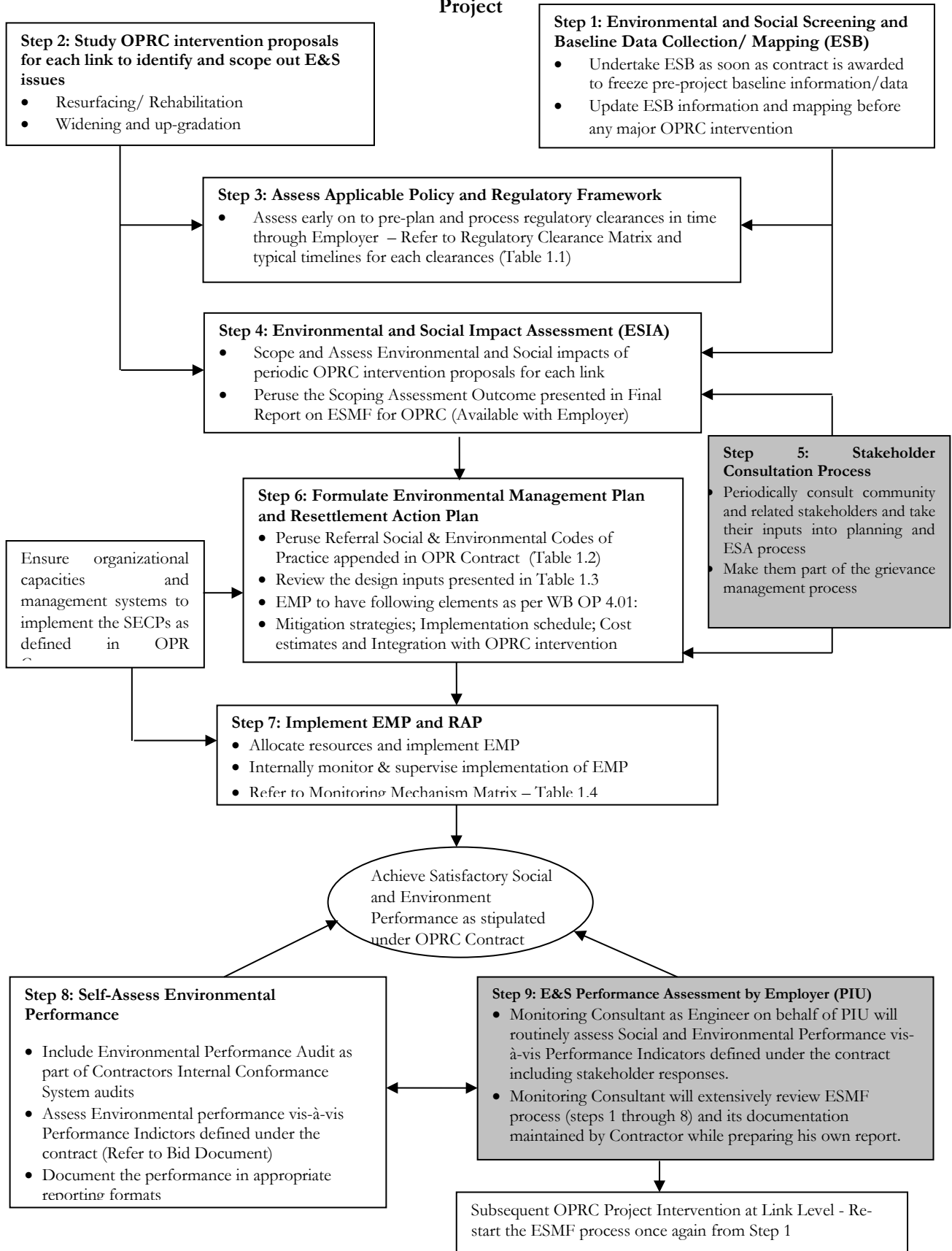
- Step 1 A: Environmental and Social Screening (Contractor)
(In case screening results show no encroachment/squatting/loss of CPRs/Cultural properties – baseline data and preparation of RAP are not required)
- Step 1 B: Environment and Social Baseline Data Collection and Mapping (Contractor)
- Step 2: Study OPRC intervention proposals for each link to identify and scope out environment and social issues (Contractor)
- Step 3: Assess Applicable Policy and Regulatory Framework (Contractor)
- Step 4: Environment and Social Impact Assessment (ESA) (Contractor)
- Step 5: Stakeholder Consultation Process (Monitoring Consultant on behalf of Employer)
- Step 6: Formulate Environmental Management Plan and Resettlement Action Plan (RAP) (Contractor)
- Step 7: Implement EMP and RAP (Contractor)
- Step 8: Self-Assess Environmental Performance (Contractor)
- Step 9: E&S Performance Assessment by Employer (Monitoring Consultant on behalf of Employer)

A brief outline on the scope and purpose of ESMF process elements are outlined in the following sections.

Step 1A - Screening

The screening would include a rapid assessment for encroachment and other encumbrances including sensitive receptors for the concerned link/corridor. In case screening result show no adverse social impacts, collection of baseline data and preparation of RAP will not be required.

Figure 1: Environmental and Social Management Process Applicable at Link Level for OPRC Project



Shaded boxes indicate the responsibility of implementing that Step lies with Employer through Monitoring Consultant

Step 1 B: Environmental and Social Baseline Data Collection and Mapping

The scope of the process element would be to generate baseline information for following parameters (but not limited to) at link level:

- Tree survey and mapping on road alignment map
- Utilities and other public services survey and mapping
- Representative Environment Quality Monitoring for ambient air, surface water and ambient noise levels
- Census and socio-economic survey of Project Affected Persons (PAP's) and impacted assets
- Identification of sensitive receptors (e.g. schools, hospitals, colleges, religious places, etc.) including community property resources (CPRs) and mapping
- Land use mapping along the study corridor; and
- All physical and other E&S features located within and along the road.

The strip plan maps prepared for individual OPRC links have been presented in the report titled 'ESMF for OPRC under Phase II of OPRC' available with Employer and can be used by the Contractor.

Step 2: Study OPRC Intervention Requirements

The scope of this process element would include reviewing the following intervention proposals to identify and scope out E&S issues for further assessment as part of Step 4 process:

- Rehabilitation requirements
- Improvement / Widening requirements
- Network Performance (Routine Maintenance) activities

Step 3: Assess Applicable Policy and Regulatory Framework

Scope of this process element is to assess and identify applicable E&S Policy and Regulatory framework for the identified OPRC intervention. Assessing and identifying the regulatory clearances that are required at an early stage of the project life cycle enables the Contractor to receive the clearances in time before starting the implementation of the civil works. If this is properly planned and pursued, the contract/proposed civil works will not be held up for lack or delay in obtaining regulatory clearances. Any delay in obtaining clearances will affect the overall performance of the Contractor, potentially leading to contractual penalties and other legal issues. In fact, the proposed interventions are to be planned/framed within the ambit of applicable regulatory norms and the over-all time that such processes usually take.

Hence, it is imperative on the part of Contractor to undertake Step 3 of ESMF process as early as possible before each OPRC intervention cycle and confirm these requirements with the Employer well in advance.

To assist the Contractor, a Regulatory Clearance Matrix along with typical time schedule for obtaining each clearance have been collated and presented in Table 1.1 which can be used for reference. Since regulations/rules are modified / updated from time to time, the Contractor will keep itself abreast with such changing norms and processes.

Step 4: Environment and Social Impact Assessment (ESIA)

The scope of this process element is to identify and assess likely/potential adverse environmental and social impacts due to implementation of proposed OPRC interventions.

Established environmental impact identification and assessment procedures such as the ones required/recommended by Ministry of Environment and Forests, Government of India in its EIA Manual

and The World Bank's OP 4.01 and Environment Assessment Handbook applicable for road sector projects shall be used.

The Terms of Reference for conducting Environmental and Social Impact Assessments has been provided in the Environmental and Social Management Framework Report. The Contractor shall refer to the said Terms of Reference that lists out all the components that are to be included in the Environment and Social Impact Assessment report. In addition, the Contractor will refer and use the latest guidelines/instructions of MoEF CC to carry out the said studies.

The scope of Environmental and Social Assessment to be undertaken by the Contractor has been highlighted in the Table 1.0. This has been provided to assist the Contractor to focus more on the link specific critical E&S issues apart from the generic issues and address them through formulation of location-specific avoidance, minimization, mitigation and management measures.

Table 1: Link-Wise ESMF Process Operational Summary Sheet – Minimum Requirements under the OPRC Contract

Sl. No	Link Name	Typical Interventions Envisaged		
		Resurfacing ⁷	Rehabilitation ⁸	Widening ⁹
1	Dhandhuka –Dholera SH-20 (Km 0+000 to Km 27+000)	<p>Preconstruction</p> <ul style="list-style-type: none"> • Getting of various clearances as listed in table 1.1 • Formulate link specific EMP/RAP (Step 6 of ESMF process) based on ESGPs and Generic design inputs (generic EMP report available with Employer) taking into account all issues related to construction stage and other, if any. • Operate ESMF process Steps 7 to 9 <p>Construction</p> <ul style="list-style-type: none"> • Getting of clearance from GSPCB for all plant and machineries under Water and Air Acts. • Clearance from labour department for employing un-skill labour. • Clearance from GSPCB for disposal of hazardous wastes. • Clearance from mining department for extraction of construction materials. • Compliance to mitigations measures in the environmental management plan approved by the employer. • Documentation of activities as part of achieving Performance Indicators identified under the contract. • Evaluation and Monitoring as per table 4.3 of Appendices Final Report. 	<p>Preconstruction</p> <ul style="list-style-type: none"> • Getting of various clearances as listed in table 1.1 • Entire ESMF process elements are applicable • Under Step 4 of ESMF process, undertake ESA by focusing on scoped out E&S issues identified chainage-wise for the links. • As per ESA report identified issues prepare environmental management plan taking into account also activities related to construction stage. <p>Construction</p> <ul style="list-style-type: none"> • Getting of clearance from GSPCB for all plant and machineries under Water and Air Acts. • Clearance from labour department for employing un-skill labour. • Clearance from GSPCB for disposal of hazardous wastes. • Clearance from mining department for extraction of construction materials. • Compliance to mitigations measures in the environmental management plan approved by the employer. • Documentation of activities as part of 	<p>Preconstruction</p> <ul style="list-style-type: none"> • Getting of various clearances as listed in table 7.1. • Entire ESMF process elements are applicable • Being a State Highway expansion project, the proposed interventions could not attract the provisions of EIA Notification, 2006 and its amendments warranting prior Environmental Clearance from State EIAA. Undertake Consultation with SEIAA/SEAC as part of ESMF step 3 process • Under Step 4 of ESMF process, undertake EA by focusing on scoped out E&S issues identified chainage-wise for the link along with generic issues. • Prior Environmental Clearance does not required, EA documentation prepared as part of ESMF step 4 has to meet the needs of regulatory authorities. • Permission for Tree Felling. • As per EA report identified issues prepare environmental management plan taking into account also activities related to construction stage. <p>Construction</p> <ul style="list-style-type: none"> • Getting of clearance from GSPCB for all

Sl. No	Link Name	Typical Interventions Envisaged		
		Resurfacing ⁷	Rehabilitation ⁸	Widening ⁹
		<ul style="list-style-type: none"> Capacity Building/Training. <p>Operation</p> <ul style="list-style-type: none"> Restoration of sites disturbed during contract period, e.g. Borrow Areas, Disposal sites, Camp & Plant Sites Right of Way, Waterway Rehabilitation of Quarry or Crushers sites newly opened under the project Documentation of all EMP implementation details as per format agreed by Employer 	<p>achieving Performance Indicators identified under the contract.</p> <ul style="list-style-type: none"> Evaluation and Monitoring as per table 4.3 of Appendices Final Report. Capacity Building/Training. <p>Operation</p> <ul style="list-style-type: none"> Restoration of sites disturbed during contract period, e.g. Borrow Areas, Disposal sites, Camp & Plant Sites Right of Way, Waterway Rehabilitation of Quarry or Crushers sites newly opened under the project. 	<p>plant and machineries under Water and Air Acts.</p> <ul style="list-style-type: none"> Clearance from labour department for employing un-skill labour. Clearance from GSPCB for disposal of hazardous wastes. Clearance from mining department for extraction of construction materials. Compliance to mitigations measures in the environmental management plan approved by the employer. Documentation of activities as part of achieving Performance Indicators identified under the contract. Evaluation and Monitoring as per table 4.3 of Appendices Final Report. Capacity Building/Training. <p>Operation</p> <ul style="list-style-type: none"> Restoration of sites disturbed during contract period, e.g. Borrow Areas, Disposal sites, Camp & Plant Sites Right of Way, Waterway Rehabilitation of Quarry or Crushers sites newly opened under the project
2	Dhandhuka – Paliyad SH-1 (Km 104.850 to Km	<ul style="list-style-type: none"> Formulate link specific EMP/RAP (Step 6 of ESMF) based on ESGPs and Generic design inputs Operate remaining ESMF Process Steps 7 	<ul style="list-style-type: none"> Entire ESMF process elements are applicable Under Step 4 of ESMF process, undertake EA by focusing on scoped 	<p>Preconstruction</p> <ul style="list-style-type: none"> Getting of various clearances as listed in table 7.1. Entire ESMF process elements are

Sl. No	Link Name	Typical Interventions Envisaged		
		Resurfacing ⁷	Rehabilitation ⁸	Widening ⁹
	151.200)	to 9	out E&S issues identified chainage-wise for the link along with generic issues.	<p>applicable</p> <ul style="list-style-type: none"> • Being a State Highway expansion project, the proposed interventions could attract the provisions of December 2009 amendment to EIA Notification, 2006 warranting prior Environmental Clearance from State EIAA. Undertake Consultation with SEIAA or CEIAA as part of ESMF Stage 3 process before undertaking Stage 4 of ESMF process. • Under Step 4 of ESMF process, undertake EA by focusing on scoped out E&S issues identified chainage-wise for the link along with generic issues. • Prior Environmental Clearance does not required, EA documentation prepared as part of ESMF step 4 has to meet the needs of regulatory authorities. • Forest diversion and Tree Felling permission. • As per EA report identified issues prepare environmental management plan taking into account also activities related to construction stage. <p>Construction</p> <ul style="list-style-type: none"> • Getting of clearance from GSPCB for all plant and machineries under Water and Air Acts. • Clearance from labour department for employing un-skill labour.

Sl. No	Link Name	Typical Interventions Envisaged		
		Resurfacing ⁷	Rehabilitation ⁸	Widening ⁹
				<ul style="list-style-type: none"> • Clearance from GSPCB for disposal of hazardous wastes. • Clearance from mining department for extraction of construction materials. • Compliance to mitigations measures in the environmental management plan approved by the employer. • Documentation of activities as part of achieving Performance Indicators identified under the contract. • Evaluation and Monitoring as per table 4.3 of Appendices Final Report. • Capacity Building/Training. <p>Operation</p> <ul style="list-style-type: none"> • Restoration of sites disturbed during contract period, e.g. • Borrow Areas, Disposal sites, Camp & Plant Sites • Right of Way, Waterway • Rehabilitation of Quarry or Crushers sites newly opened under the project
3	Dhandhuka –Limbdi SH-20 (Km 66.200 to 96+000)	<ul style="list-style-type: none"> • Formulate link specific EMP/RAP (Step 6 of ESMF) based on ESGPs and Generic design inputs • Operate remaining ESMF Process Steps 7 to 9 	<ul style="list-style-type: none"> • Entire ESMF process elements are applicable • Under Step 4 of ESMF process, undertake EA by focusing on scoped out E&S issues identified chainage-wise for the link along with generic issues. 	<ul style="list-style-type: none"> • Getting of various clearances as listed in table 7.1. • Entire ESMF process elements are applicable • Being a State Highway expansion project, the proposed interventions could attract the provisions of December 2009 amendment to EIA Notification, 2006

Sl. No	Link Name	Typical Interventions Envisaged		
		Resurfacing ⁷	Rehabilitation ⁸	Widening ⁹
				<p>warranting prior Environmental Clearance from State EIAA. Undertake Consultation with SEIAA /SEAC as part of ESMF Stage 3 process before undertaking Stage 4 of ESMF process.</p> <ul style="list-style-type: none"> • Under Step 4 of ESMF process, undertake EA by focusing on scoped out E&S issues identified chainage-wise for the link along with generic issues. • Prior Environmental Clearance does not required, EA documentation prepared as part of ESMF step 4 has to meet the needs of regulatory authorities. • Forest diversion and Tree Felling permission. • As per EA report identified issues prepare environmental management plan taking into account also activities related to construction stage. <p>Construction</p> <ul style="list-style-type: none"> • Getting of clearance from GSPCB for all plant and machineries under Water and Air Acts. • Clearance from labour department for employing un-skill labour. • Clearance from GSPCB for disposal of hazardous wastes. • Clearance from mining department for extraction of construction materials. • Compliance to mitigations measures in

Sl. No	Link Name	Typical Interventions Envisaged		
		Resurfacing ⁷	Rehabilitation ⁸	Widening ⁹
				<p>the environmental management plan approved by the employer.</p> <ul style="list-style-type: none"> • Documentation of activities as part of achieving Performance Indicators identified under the contract. • Evaluation and Monitoring as per table 4.3 of Appendices Final Report. • Capacity Building/Training. <p>Operation</p> <ul style="list-style-type: none"> • Restoration of sites disturbed during contract period, e.g. • Borrow Areas, Disposal sites, Camp & Plant Sites • Right of Way, Waterway • Rehabilitation of Quarry or Crushers sites newly opened under the project

Table 2: Regulatory Clearances Matrix

S. No	Regulatory Clearances	Corresponding Regulations	Approving Authority	Applicability to the Project	Typical Time Required	Responsibility for compliance	
						Execution	Supervision
Pre-Construction Stage							
01	Environmental Clearance	EIA Notification, 2006 and subsequent Amendments;	MoEF, GoI/ SEIAA	For Category B, Applicable for new State Highway projects and SH expansion projects in hilly terrain (above 1000 MSL) or ecologically sensitive areas as per EIA Notification 2006 & its subsequent amendments – Not Applicable Category B to be upgraded to Category A if project falling under general conditions - Not Applicable	-	-	-
02	Consent to Establish	Water (Prevention and Control of Pollution) Act 1974; Air (Prevention and Control of Pollution) Act 1981	Gujarat State Pollution Control Board	Subject to establishing Labour camps, Hot mix plants or any water/air pollution generating units.	3 Months	Contractor	Monitoring Consultant
03	Wild Life Clearance	Wild Life Act 1972	MoEF, GoI	Not applicable	-	-	-

S. No	Regulatory Clearances	Corresponding Regulations	Approving Authority	Applicability to the Project	Typical Time Required	Responsibility for compliance	
						Execution	Supervision
04	Diversion of forest land for non-forest purpose	Guidelines for diversion of forest lands for non-forest purpose under the Forest (Conservation) Act, 1980 and its amendments;	Western Zone Regional Office MoEF, Bhopal,	Forest diversion is applicable for Dhandhuka-Paliyad and Limdi – Dhandhuka project road. For Dhandhuka – Dhulera road is non Notified so diversion of Forest land does not required.	12 months	PIU/R&B Dept., Govt. of Gujarat Necessary supporting documents/applications are to be prepared and provided by Contractor	PIU/ R&B Dept., Govt. of Gujarat
05	Permission for felling & trimming of trees	Forest (Conservation) Act, 1980 and its amendments;	State Forest Dept., Gujarat	Permission is required from Divisional Forest Department	6 months	PIU/ R & B Dept., Govt. of Gujarat Necessary supporting documents to be prepared and provided by Contractor.	PIU/ R& B Dept., Govt. of Gujarat
Construction/Operation Stage							
06	Permission for locating and operating Borrow pits	EIA Notifications and Subsequent Amendments; Mines and Minerals (Development and Regulation) Act, 1957	District Environmental Impact Assessment Authority; (MOEFCC), Mining Department, Local Administration – Municipal Government/ Panchayat	Applicable	1 Month	Contractor	Monitoring Consultant
07	Permission for Withdrawal of Ground Water	Environment Protection Act 1986	Central Ground Water Board	Applicable, if withdrawal is proposed	1 month	Contractor	Monitoring Consultant

S. No	Regulatory Clearances	Corresponding Regulations	Approving Authority	Applicability to the Project	Typical Time Required	Responsibility for compliance	
						Execution	Supervision
08	Permission for withdrawal of Surface Water from River/ Irrigation Canals		Irrigation Authorities for use of water from Irrigation Canal. River Board / Authorities for withdrawal of water from Rivers	Applicable if withdrawal is proposed	1 month	Contractor	Monitoring Consultant
09	Authorization to generate, store, transport and dispose of Hazardous Waste	Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016	Gujarat State Pollution Control Board (GSPCB)	Applicable, if hazardous waste is generated in the project (disposal of bituminous wastes – verify with GSPCB)	2 months	Contractor	Monitoring Consultant
10	Consent to Operate	Water (Prevention and Control of Pollution) Act 1974; Air (Prevention and Control of Pollution) Act 1981	Gujarat State Pollution Control Board	Subject to establishing, Hot mix plants or any water/air pollution generating units, Labour camps	3 Months	Contractor	Monitoring Consultant
11	Traffic Police Clearance for diversion of routine traffic	Local Traffic Police Regulations and Bye-laws	Traffic Police Department	Applicable	1 Month	Contractor	Monitoring Consultant
12	NOC from Archaeological Survey of India	The Ancient Monument and Archaeological sites and Remains Act 1958.	Department of Archaeology Govt. of Gujarat	Not Applicable	2 Months	Contractor	Monitoring Consultant

S. No	Regulatory Clearances	Corresponding Regulations	Approving Authority	Applicability to the Project	Typical Time Required	Responsibility for compliance	
						Execution	Supervision
13	Permission for Sand Mining from river bed	Mines and Minerals (Development and Regulation) Act, 1957	River Board Authorities/ Department of Mining Govt. of Gujarat	Applicable, if river sand is mined	6 Months	Contractor	Monitoring Consultant
14	Permission for Opening of new Quarry sites	Mines and Minerals (Development and Regulation) Act, 1957; Water (Prevention and Control of Pollution) Act 1974; Air (Prevention and Control of Pollution) Act 1981	Department of Mining Govt. of Gujarat Gujarat Pollution Control Board	Applicable only if Contractor opens a new quarry site	6 Months	Contractor	Monitoring Consultant
					3 Months		
15	Registration of Vehicles and Off road equipments; Pollution Under Control Certificate for Contractor Vehicles and Equipments	The Motor Vehicles Act, 1988 and Central Motor Vehicle Rules, 1989	Department of Transport, Govt. of Gujarat	Applicable to all Contractor vehicles and off road equipments	1 Month 1 Week	Contractor	Monitoring Consultant

S. No	Regulatory Clearances	Corresponding Regulations	Approving Authority	Applicability to the Project	Typical Time Required	Responsibility for compliance	
						Execution	Supervision
16	Employing Labour	The Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and Central Rules, 1998	District Labour Commissioner	Applicable	1 week	Contractor	Monitoring Consultant
17	Registration of Workers	The Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and Central Rules, 1998	District Labour Commissioner	Applicable	1 week	Contractor	Monitoring Consultant
18	CRZ Clearance	CRZ Notification 2011	State CZMA/ MoEF&CC/SEIAA	Applicable if project road is going through CRZ area	120 days	Contractor	B&R Dept, GoG/ Monitoring Consultant

The scoping assessment outcome undertaken at a link level with chainage references have been collated and presented the report titled 'ESMF for OPRC under GSHP II' available with Employer and can be obtained for reference.

Step 5: Periodic Road-User (Stakeholder) Consultation Process

A consultation process with primary stakeholders of the project is considered essential for an effective ESA and accordingly is detailed out here. As Step 5 of the ESMF, the Monitoring Consultant on behalf of the Employer and in consultation/collaboration with Local Relationship Committee (LRC) shall formulate and operate a road-user committee at the network level through the contract period. The main purpose of operating such consultative process is to get critical and micro-level inputs for planned OPRC interventions, environmental management strategies and continual improvement proposals. The process can also be used to scope the EHS issues and obtain regular feedback on the performance of the Contractor in an objective manner.

The road-user or Stakeholder committee at network level should comprise of following major stakeholders:

- Transport Truck owners and operators Association
- Petroleum Truck owners and operators Association (oil tankers)
- Canter truck owners and operators Association
- State Forest Department (plantation and maintenance of roadside lands)
- Irrigation Department (operating and maintaining the canal network)
- Utility Service Departments/ Companies
- Government Bus Transport Corporation
- Private Bus/Tempo Operators Association or Groups
- Agricultural Board in the District
- Petrol pump owners association or group
- Local community members from network villages (farming community)
- Elected local government representatives (e.g. Sarpanch)
- Religious leaders/ Heads of Temple / Gurudwara / Mosque

The Monitoring Consultant shall endeavor to organize and conduct such Stakeholder committee meetings in a regular and formal manner.

Step 6: Formulate Generic and Specific EMP and Resettlement Action Plan

The scope of this process element would include formulating the following plans based on the outputs of preceding 1 to 5 step process elements:

- Generic EMP applicable for all links covering a wide range of Contractor activities and interventions
- Specific EMP for individual links or Contractor activities
- Environmental quality monitoring (as per conditions of Consent To Establish, whenever applicable) and its documentation
- The EMP is to have following elements:
 - Avoidance, Minimisation Mitigation and Management strategies for the identified generic and specific impacts
 - Implementation schedule in line with civil works programme
 - Appropriate resource allocation (including man-power)
 - Training
 - Integration with OPRC intervention proposals
- In addition to address adverse social impacts, a Resettlement Action Plan will be prepared in line with WB OP 4.10, 4.12 and the State of Gujarat Resettlement and Rehabilitation Policy adopted for the project. The contents of the RAP have been given in section 6.3.

The contractor's design proposal, Environmental Management Plan and Rehabilitation Action Plan must be authorised in writing by the Employer prior to the commencing of any physical work. Specific EMP/s applicable at link-level shall be prepared for major interventions such as improvement, widening proposals by using the process elements viz. **Steps 1 through 5.**

Environmental & Social Guidelines for Practice (ESGPs)

In order to enable the Contractor to deliver sustained social and environmental performance, the following set of referral codes of practice covering social and environmental aspects has been provided for reference. The codes recommended are appended in the report titled 'ESMF for OPRC under Phase II of OPRC' and the list is summarized at Table 1.2.

Table 3: List of Environmental & Social Guidelines for Practice (ESGP) recommended under the Contract

ESGP No.	Environmental and Social Guidelines for Practice (SEG)
Planning Phase ESGP	
ESGP 01	Felling of Trees
ESGP02	Setting up Labour Camps and labour deployment
ESGP03	Setting up Concrete Batching Plant and Casting Yard
ESGP04	Setting up Bituminous Hot Mix Plants
ESGP05	Setting up Site Offices
ESGP 06	Setting up Construction Yards
ESGP07	Sourcing Construction Materials such as Sand, Bricks, Stone, Ready Mix Concrete etc
ESGP08	Geotechnical Investigations
ESGP 09	EHS related Policy and Regulatory Compliance
ESGP10	R&R planning and RAP framework
Construction Phase ESGPs (Rehabilitation, Up-gradation and Routine Maintenance works)	
ESGP11	Prior information and disclosure to the public
ESGP 12	Clearing and grubbing
ESGP 13	Dismantling of Structures
ESGP14	Traffic Management during Construction
ESGP15	Deployment and Use of Construction Equipment's, Vehicles etc.
ESGP16	Project Road and other Network Roads used by Construction Traffic
ESGP17	Earthwork in Excavation for Roadway in all Strata Including Rock.
ESGP 18	Earthwork
ESGP 19	Utility Relocation
ESGP 20	Construction Waste Management
ESGP21	Soil Erosion and Sedimentation Control in Roadway
ESGP22	Bituminous Pavement Construction
ESGP23	Environmental Monitoring
ESGP24	Road Materials Testing Laboratory
ESGP25	General Workmanship
ESGP26	Onsite Concrete Preparation
Operation and Maintenance Phase SEG	
ESGP27	Grievance management
ESGP28	Traffic Management at specific areas and during specific periods
ESGP29	Road Safety Audit and Accident Prone Spot Management
ESGP 30	Streamlining Traffic flow at specific locations
ESGP31	Emergency Incident and Accidents Management

Where these codes are in conflict with any parts of the Specification or any other sections of this contract, then the sections of this contract shall take precedent.

Generic Design Inputs Recommended for E&S Aspects

Besides the ESGPs, generic design inputs to enhance E&S performance of the contract have been collated and presented in Table 1.3 for information and reference purpose. It is recommended that the Contractor reviews the design inputs recommended against typical E&S features observed in the contract area links and apply similar or equivalent interventions in their detailed designs to improve E&S performance at the link and network level.

Table 4: Generic Design Inputs for Typical E&S Features/Issues

Typical E&S features	Design Inputs for E&S enhancements and performance
Road on embankment	Road edge markings and provision of hand rail/guard rail for embankment section with light reflectors
Private farm channel crossing	Regulated system (prior intimation, approval and penalty systems) of private farm channel construction across project roads
Water body (Ponds, Natural or Unlined Channels/canals) along road side	Provide silt arrestors, emergency oil/chemical spill arrestors, floatable trash screens etc. in the channel leading to outfall point into the Water body. In case of water body located close to road edge, provide retaining walls with anti-crash barrier fitted with light reflectors and road edge markings etc. along the road edge.
Rural settlements along road side	Rural settlement safety measures - Information boards displayed at entry/exit, rumble strips at 30m intervals, speed restrictions, road edge markings, and shrub plantations along shoulder edge if space is available, increase community awareness through consultations/road shows and periodic community consultations and design inputs over the contract period.
Earthen embankment	Slope stabilisation through vegetation; Prevent soil erosion by providing silt arrestors (hard or soft) or toe walls; Improve road side drainage.
Presence of educational institutions, religious places and hospitals along roadside	Design and provide entry/exit sections opposite sensitive receptors with clear visibility of road traffic; Provide rumble strips and speed restriction measures opposite sensitive receptors; Prohibit honking and place information boards; Collaborate with sensitive land use owners to increase vegetation cover between road and buildings and raise the compound wall height (not at project cost); Periodically monitor road safety aspects near the sensitive receptors
Truck parking on road side	Collaborate with truck drivers/owners to improve safety aspects of road side parking by: providing parking bays if space is available, self-regulation and management by truck drivers, use of temporary traffic alert equipment's such as safety cones/tapes/reflectors, improve truck driver/owner awareness on road safety aspects.

Typical E&S features	Design Inputs for E&S enhancements and performance
Seasonal traffic to grain market, godown and cattle market	Collaborate with godown owners/management to improve road safety aspects; provide parking bays if space is available; promote self-regulation and management by truck drivers; use of temporary traffic alert equipment's such as safety cones/tapes/reflectors; improve truck driver awareness on road safety aspects; design and provide location-specific entry/exit schemes for markets from the road; ensure proper visibility for drivers at the entry/exit point; Prohibit parking at the entry/exit point up to 30m distance to ensure clear visibility etc.
LT/ HT line crossing	Monitor incidents/accidents at LT/HT line crossing and accordingly take corrective actions with concerned utility department
Height restrictions and road safety aspects related to railway line crossing	Monitor incidents/accidents at railway crossing and accordingly take corrective action.
Road passing through urban areas and commercial stretches	Collaborate with and consult local community and administration including traffic police regarding safety measures that can be implemented at low cost; Through LRC and PIU, encourage local administration/traffic police to streamline traffic movements, parking facilities, bus stops, hawking zones, waste dumping, street lights, service road provision etc; Provide information boards at the entry/exit points of the stretch; speed restriction through rumble strips placed at 30m intervals.
Sharp horizontal curves on the alignment	Provide information boards at entry/exit of curve stretch; Speed restriction through rumble strip placed at 30m intervals; Ensure clear visibility through vegetation control; prohibit encroachments on the curves through LRC/PIU
Deep industrial drain, farm drains and other such features	Provide toe wall or other such road edge delineators with light reflectors to prevent driver overshooting the carriageway on the drain side.
Major and Minor road intersections	Provide information boards; Speed restriction through rumble strips; Ensure clear visibility through vegetation control; prohibit encroachments and parking on the intersection curves through LRC/PIU
Electrical utilities along roadside (LT poles, overhead wires, transformers)	Utility relocation in consultation and collaboration with concerned utility department
Culverts and Canal crossings	Road edge markings with reflectors; Provision of hand rail/guard rail section with light reflectors
Materials or waste storage on shoulder areas	Consultations with local community through LRC/PIU; Take corrective actions, including clearance of wastes and placement of appropriate boards; Improve community awareness on these aspects.
Wider carriageway sections of road passing through 1 lane bridge	Information boards; speed restriction using rumble strips on either side of the bridge; bridge wall delineation through light reflectors; other night driving related safety measures.
Good/ Dense Tree Cover	Attempt to protect as many trees as possible (without creating safety problems) from felling.
Poor/ Absence of tree/vegetation cover	Collaboration with Forest Department through LRC/PIU for plantation, if space is available

Step 7: Implementation of Environment Management Plan/s and Resettlement Action Plan (s)

The scope of this process element would include allocating appropriate manpower and material resources to implement the EMP/s and RAPs and institute internal monitoring and supervision mechanisms as part of the Contractor's overall management systems.

A sample Environmental and Social Management Plan (EMP) is also provided in Appendix 11, which shall be read in conjunction with the environmental specifications. The attached sample is the minimum level to be followed by the Contractor. This shall be further developed and submitted as a component of Contractor's CQAMP.

A matrix showing the monitoring mechanism delineating the roles and responsibilities of implementing various ESMF actions has been provided in **Table 5**.

Table 5: Monitoring Mechanism under OPRC Project

Sl. No	ESMF Actions (Refer to concerned ESGPs for list of Actions)	Responsibilities		
		Execution	Monitoring/ Cross Check	Approval
1	Environmental and Social Baseline data collection and mapping	Contractor	Monitoring Consultant	The Employer
2	Undertaking Environmental & Social Assessment	Contractor	Monitoring Consultant	The Employer
3	Undertaking Community Consultation process to feed into EA and EMP process	Contractor	Local Relationship Committee	The Employer
4	Preparation of Environmental Management Plan based on referral ESGPs	Contractor	Monitoring Consultant	The Employer
5	Self-Assessment of Environmental and Social Performance	Contractor	Monitoring Consultant	The Employer
6	Performance Assessment by Employer	Monitoring Consultant	PIU	The Employer
7	Setting up Labour Camps and labour deployment Setting up Concrete Batching Plant and Casting Yard Setting up Bituminous Hot Mix Plants Setting up Site Offices Setting up Construction Yards	Contractor	Monitoring Consultant	The Employer
8	Sourcing Construction Materials such as Sand, Bricks, Stone, Ready Mix Concrete etc.	Contractor	Monitoring Consultant	The Employer
9	Borrow area Management Identification of location Liaising with land owner Rehabilitation	Contractor	Monitoring Consultant	The Employer
10	EHS related Policy and Regulatory Compliance	Contractor	Monitoring Consultant	The Employer
11	Tree counting and documentation (forest Clearance)	Contractor	Monitoring Consultant	The Employer
12	Preparation of Ecology & Habitat Assessment	Contractor	Monitoring Consultant	The Employer
13	Occupational Health & Labour Safety Measures	Contractor	Monitoring Consultant	The Employer
14	Land Acquisition Locations & reasons for acquisition Details of land to be acquired	Contractor	Monitoring Consultant	The Employer

Sl. No	ESMF Actions (Refer to concerned ESGPs for list of Actions)	Responsibilities		
		Execution	Monitoring/ Cross Check	Approval
15	Land Acquisition Pursuing the process of LA	PIU	PIU	Government of Gujarat
16	R&R planning and RAP framework	Contractor	Monitoring Consultant	The Employer
17	Prior information and disclosure to the public	Monitoring Consultant	Local Relationship Committee	The Employer
18	Geotechnical Investigations	Contractor	Monitoring Consultant	Monitoring Consultant
19	Clearing and grubbing	Contractor	Monitoring Consultant	Monitoring Consultant
20	Dismantling of Structures	Contractor	Monitoring Consultant	Monitoring Consultant
21	Traffic Management during Construction	Contractor	Monitoring Consultant	Monitoring Consultant
22	Deployment and Use of Construction Equipments, Vehicles etc	Contractor	Monitoring Consultant	Monitoring Consultant
23	Project Road and other Network Roads used by Construction Traffic	Contractor	Monitoring Consultant	Monitoring Consultant
24	Earthwork in Excavation for Roadway in all Strata Including Rock.	Contractor	Monitoring Consultant	Monitoring Consultant
25	Earthwork in Embankment Using Material Obtained Within RoW and Using Material Obtained from Borrow Areas	Contractor	Monitoring Consultant	Monitoring Consultant
26	Utility Relocation	Contractor	Monitoring Consultant	The Employer
27	Construction Waste Management Identification of locations, recyclers Compliance to Hazardous waste rule Waste Disposal methods Quantifications of waste (all types) Rehabilitation of disposal site	Contractor	Monitoring Consultant	Monitoring Consultant
28	Soil Erosion and Sedimentation Control in Roadway	Contractor	Monitoring Consultant	Monitoring Consultant
29	Bituminous Pavement Construction	Contractor	Monitoring Consultant	Monitoring Consultant
30	Environmental Monitoring Air Pollution Noise Pollution Frequency for monitoring	Contractor	Monitoring Consultant	Monitoring Consultant

Sl. No	ESMF Actions (Refer to concerned ESGPs for list of Actions)	Responsibilities		
		Execution	Monitoring/ Cross Check	Approval
31	Road Materials Testing Laboratory	Contractor	Monitoring Consultant	Monitoring Consultant
32	General Workmanship	Contractor	Monitoring Consultant	Monitoring Consultant
33	Onsite Concrete Preparation	Contractor	Monitoring Consultant	Monitoring Consultant
34	Grievance management	Contractor	Monitoring Consultant/ LRC	The Employer
35	Traffic Management at specific areas and during specific periods	Contractor	Monitoring Consultant	Monitoring Consultant
36	Road Safety Audit and Accident Prone Spot Management	Contractor	Monitoring Consultant	Monitoring Consultant
37	Streamlining Traffic flow at specific locations	Contractor	Monitoring Consultant	Monitoring Consultant
38	Emergency Incident and Accidents Management	Contractor	Monitoring Consultant	Monitoring Consultant

Step 8: Self-Assess Environmental Performance

The scope of this process element would include:

- Undertaking Environmental Performance Audits as part of the Contractor's Conformance Management Unit's internal audits
- Assessing Environmental performance vis-à-vis Performance Indicators defined under the contract (Refer to Part D of Section VI – Specifications in the Main Bid Document)
- Documenting and reporting the performance in appropriate reporting formats to the Monitoring Consultant/Employer
- Implementing the audit outcomes/ findings.

The Social and Environmental Management Processes and system to be developed by the Contractor shall include the above elements.

Step 9: Environment and Social Performance Assessment by the Employer

As part of this process element, the Monitoring Consultant will routinely assess Social and Environmental Performance vis-à-vis Performance Indicators defined under the contract (Refer to Part 2B of Section VI – Specifications in main Bid document) including stakeholder responses. This assessment will form part of routine and other inspections as necessary.

**Environmental Management Plan
(Minimum Standard to be followed)**

[ANNEXURE 2]

Preamble

1. The Environmental Management Plan is an integral part of the contract and the Contractor has the responsibility to implement it under the supervision of the Monitoring Consultant.
2. All management measures of the Environmental Management Plan are deemed to be incidental to the specified work unless otherwise provided in the contract. No separate payments shall be made for implementing these measures.
3. The Monitoring Consultant shall issue substantial completion / works completion certificate only after verifying and certifying that corresponding EMP provisions and performance criteria, including clean-up operations and remediation works have been completed satisfactorily.
4. The Contractor will maintain a channel of communication with the communities (through the LRC and the Monitoring Consultant) to address any concern or grievances. The Monitoring Consultant or LRC will conduct meetings with the communities in the vicinity of the OPRC intervention works sites (minimum of one in each section) before two weeks of the construction commencement date, to inform them of the type of construction activity, traffic diversion plan/s, construction timing, likely impacts, setting up of construction camp site (share the plans), requirement of labour, plans for borrowing earth from nearby areas etc. The Contractor is expected to participate in such local community consultation and disclosure meetings to explain any issues. Periodic meetings will also be conducted during construction period to take feedback from communities or their representatives to ensure minimum disturbance.

Besides the issues covered in ESGP, the following issues should also be covered in the Environment Management Plan/s of the Contractor.

1. Transmission of Diseases

The project execution agency shall create awareness among his workforce to prevent transmission of diseases between the local inhabitants and the labourers engaged for the works, including sexually transmitted diseases.

2. Conservation of Religious Structures and Shrines

The Contractor must take necessary and adequate care to minimise impact on cultural properties which includes cultural sites and remains; places of worship including temples, mosques, churches and shrines; graveyards; archaeological monuments and any other important structures as identified during design, including all properties / sites / remains notified under the Ancient Sites and Remains Act). No work shall spill over to these properties, premises and precincts. Access to such properties from the road shall be maintained clear and clean.

3. New Road Encroachments

If the Contractor observes any illegal structure has been built or placed on the road reserve, he must report the infringement to the Monitoring Consultant.

4. Labour

The Contractor shall, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and transport as per the applicable labour law and rules.

Throughout the duration of the contract, the Contractor and his Subcontractor(s) shall abide at all times by all existing labour enactments and rules made there under, regulations, notifications and bye laws of the State or Central Government or local authority and any other labour law (including rules), regulations, bye laws that may be passed or notification that may be issued under any labour law in future either by the State or Central Government or the local authority. In case, there are sub-contractor(s) involved in some works, the main Contractor shall be responsible and shall ensure that the sub-contractors follow the same requirements as specified in this contract.

5. Health and Safety Compliance

Any construction works undertaken on behalf of the Employer, Contractor may frequently be exposed to hazardous situations, which could involve risk of various degrees of harm, to the contracting staff and/or motorists. Therefore, the over-riding principle will be to create/foster a responsible attitude towards occupational health and safety issues on the part of the Contractor, their sub-contractors and employees undertaking work for the Employer. It aims to ensure compliance with relevant work site safety laws and norms.

Situations will arise when it is not practical to eliminate or isolate significant hazards. In these situations the hazards must be minimised by ensuring planned protection systems (e.g. equipment, clothing) are actually used.

The Contractor needs to observe the provisions of the respective Indian Health and Safety in Employment legislation and in particular, to understand such aspects as the need to:

- a) Systematically identify existing and new hazards on the work site(s).
- b) Minimize significant hazards, where elimination and isolation are both impractical.
- c) Provide appropriate protective measures and ensure they are used
- d) Devise emergency procedures for dealing with accidental spillage, pollution or imminent danger
- e) Regularly assess each hazard identified and monitor employees' exposure to these hazards.
- f) These aspects are to be developed into a Health and Safety Management Plan, which is complementary to the Traffic Management Plan.

Reporting and recording of work site safety incidents is very important so health and safety problems can be addressed quickly and regularly. It is a requirement of this Contract that any such incident be advised promptly to the Employer's Monitoring Consultant. All injuries are to be reported to the Employer.

6. Safety of Children Entering or Exiting Schools

Where the Contractor is operating a work site within 500m of a school entrance, the Contractor shall provide a specific traffic management plan that clearly demonstrates the extra steps the Contractor will undertake to mitigate any risk to school children passing through the work site.

7. Assistance with Planned Events, Fairs and Festivals

The Employer may request the Contractor to provide assistance to the Police and other festival organisers and officials to ensure the safe operation or passage of those involved with any event or festival within or immediately adjacent to the RoW within the contract area.

The Employer shall give a minimum of five (5) days prior notification of this requirement to the Contractor along with an indication of the resources to be supplied and the duration for their deployment. Where necessary the Contractor shall liaise and coordinate with Police and other agencies.

The Contractor shall provide a price to the Employer for the assistance to be provided within two (2) days of receiving this notification. Any assistance provided shall be paid as a variation to this contract.

8. Land Acquisition Needs for Improvement Works

Improvements works involving pavement widening have been designed where ever possible to avoid the need for the Employer to purchase additional land outside of the current legal RoW. However, there may be instances where the need for additional land acquisition has been recognised at the conceptual design phase and as a consequence the planned improvement works on these sections of the Contract's roads have been programmed for completion later in the Contract thereby providing sufficient time for the Employer to complete the land acquisition process.

If at any stage, before or during the preparation of the final design (which includes the completion and submission of a legalisation survey of the existing Row) the Contractor becomes aware of the need for the acquisition of additional land outside of the current legal RoW to enable the completion of the works to the required specification or standard, he shall notify the Monitoring Consultant of this as soon as practicable. The Monitoring Consultant and the Contractor shall then determine the most appropriate approach for the works to proceed, inclusive of the time for the Employer to complete any required land acquisition process.

Note: As per the Environmental and Social Management process to be followed in the Contract (Refer Annexure 1 above), the Contractor will undertake the responsibility of preparing generic and link-specific EMPs for various project interventions such as resurfacing, pavement rehabilitation and widening during the OPRC contract period.

In line with OPRC philosophy, while the Contractor is free to adopt any similar or superior environment and social management process, the critical process outcome in the form of generic and link-specific EMPs should meet the basic minimum requirements of ESMF, including Social and Environmental Guidelines (SEG) and the sample generic EMP.

The sample generic EMP has been provided for ready reference (Appendix – 1).

Appendix 2 - Terms of Reference for Assisting in the Implementation of RAP and Conducting ESA in Gujarat State Road Sector Projects

The Contractor shall comply with the following terms of reference and associated checklist when conducting Environmental and Social Assessments and assisting the Employer with the implementation of any Resettlement Action Plan required under this contract.

1. Terms of reference for assisting GUJARAT-R&B in implementation of RAP in Gujarat State Highway Project (GSHP)

The Government of Gujarat has received a loan from the International Bank for Reconstruction and Development (IBRD) towards the cost of the Gujarat State Highway Project (GSHP) and it intends to apply the proceeds of this loan to payments for goods, works, related services and consulting services to be procured under this project. The project includes Road Improvement (Upgradation), Rehabilitation and Periodic Maintenance. In line with the GSHP objectives of strengthening the Government of Gujarat (GoG) capacity to plan and manage the road network and providing adequate road maintenance for network sustainability, R&B Dept. Gandhinagar is exploring the feasibility of implementing the OPRC model of road construction & maintenance contracting under the P component of GSHP. OPRC model of contracting is being attempted first time in the State of Gujarat.

The proposed OPRC interventions can be broadly classified into three (3) categories as below:

- Resurfacing and rehabilitation of road links – to relay the existing road surface whenever it deteriorates beyond the specified service levels without involving widening or other capacity expansion proposals. It will involve correcting soil erosions, road embankment structure, cleaning or clearing storm drainages etc.
- Improvement Works or Widening (Upgradation) – under this intervention, the OPRC Contractor is expected to widen the existing lane width to specified lane width at specified time period during the contract duration. This will involve removal of trees, earthwork for embankment, storm water drainage construction, removal of encroachments such as hawkers and squatters in urban stretches and commercial activities, removal of utilities, widening of bridges/culverts over canal crossings etc. The available RoW width is generally sufficient to undertake road widening and may not involve any land acquisition. The RoW is generally free of any major encumbrances such as buildings, sensitive receptors etc located within the proposed widening width except maybe at specific locations.
- Routine maintenance – this activity will involve day to day operational and maintenance activities along the road links to consistently maintain the network performance as specified in the contract. This will involve routine supervision; corrective actions including embankment strengthening, shoulder maintenance, erosion prevention, clearing & grubbing and storm drainage cleaning; removing stored materials along road side; pruning of tree branches; maintaining signs, road markings and other road furniture; inspecting bridge structures; and inspecting accident and safety hot spots and implement corrective actions etc.

1.1. Description of the Project

Under the OPRC model, a Contractor will be selected through bidding process to which the project road link will be awarded for providing services such as design, construction, operation and maintenance period.. The Contractor will be paid for the comprehensive services by the GSHP Project on a pre-agreed time schedule i.e. monthly, quarterly or annually. The payment will be linked to the Contractor maintaining the road link to specified service levels in the OPRC contract. Through this model, it is expected that service levels of the network roads, which form the backbone of farm based economy of Gujarat State, will be maintained at satisfactory level and at much lower cost to the State.

Through consultancy assignments, GUJARAT-R&B Dept., Gandhinagar has undertaken site assessment of the around 1300 kms of road networks between September 2008 and September 2009. The approach adopted to assess environmental and social features and identify critical stretches was to prepare strip plan maps which show the roadside environmental and social features. Using the approach, strip plans have been prepared for around 1300 kms of road links identified for analyzing OPRC feasibility.

Strip plan maps identified the following features and highlighted critical stretches within each link from environmental and social perspective:

- Squatters and hawkers along road side;
- Settlements along road side;
- Commercial activities along roadside;
- Dense urban stretches (having problems of mixed land use, dense commercial activities, haphazard parking, bus stops, hawkers, encroachments etc);
- Accident and safety hot spots;
- Sharp and incessant horizontal curves;
- Surface water bodies;
- Bottlenecks on road due to narrow bridges or other features;
- Tree cover along road side (classified as dense and sparse tree cover);
- Sensitive receptors such as schools, hospitals, religious places, other educational institutions etc.

1.2. Objective

While the Contractor will prepare a Resettlement Action Plan (RAP) adequate and commensurate to the scale of resettlement and rehabilitation involved in the project, it may require assistance of an external agency in implementing the RAP and shall make allowance for any such assistance within the Lump Sum Price. The RAP will be implemented only after approval of R&B Dept., Gandhinagar, and the overall supervision and monitoring will be undertaken by R&B Dept., Gandhinagar.

Where there is a need for an external agency adequately experienced in RAP planning and implementation to be engaged by the Contractor this agency will assist the CE/ R&B Dept., Gandhinagar in the implementation of RAP.

In addition, this agency will also undertake awareness generation among the local community, truckers and other target groups as identified by R&B Dept., Gandhinagar regarding HIV/AIDS. The agency will also be required to undertake awareness generation regarding road safety in general masses.

1.3. Scope of Work and Tasks (Resettlement Action Plan Preparation)

Specifically, the work will entail:

- i. Implementation of RAP (where required) in consultation with R&B Dept., Gandhinagar /CE and their monitoring Consultant.
- ii. Generating awareness among general masses regarding accidents and road safety; and
- iii. Generating awareness among identified target groups regarding HIV/AIDS.

1.4. Basic Content of a RAP to be prepared and implemented

The RAP should cover the following minimum elements:

- i. project description;
- ii. methodology adopted;
- iii. identification of adverse impacts; analysis of alternatives; and categorization of PAPs as per the impact type(s)

- iv. minimization of adverse impacts;
- v. census and socio-economic survey of the PAPs;
- vi. socio-economic profile of the project area and PAPs
- vii. R&R Policy provisions and other legal framework as applicable;
- viii. land required for various purposes of the project including acquisition of private land (if required);
- ix. consultations with various stakeholders during both the planning as well as implementation stage;
- x. institutional arrangements for implementation of RAP;
- xi. implementation schedule;
- xii. grievance redress mechanism and
- xiii. Estimated budget for RAP as well as monitoring and evaluation arrangements, and disclosure of draft RAP and its finalization after the receipt of comments. The RAP should be disclosed at the website of R&B Dept., Gandhinagar; office of the concerned district collector; gram panchayat; information kiosk at the contractor's project office and office of the concerned executive Monitoring Consultant.

2. Terms of Reference for Detailed Environmental Assessment of OPRC Links

2.1. General

OPRC link-specific ESA is the stage when more thorough assessments are done. It includes carrying out the detailed surveys, analysis of data, assessment of impacts and corresponding mitigation and/or enhancement measures and preparing various reports that include the detailed ESA report and environment management plans (EMPs). The work plans and methods employed shall be as per those described in the Inception Report and/or as agreed with the Client following the acceptance of the Scoping Report.

2.2. Scope of Work

2.2.1 Baseline Surveys

The Contractor will {a} collect information from secondary sources that are relevant to understanding the baseline, as well as the design of mitigation and enhancement measures, as pertaining to physical, biological and socio-cultural environments; {b} carry out site visits and investigations of all the environmentally sensitive locations (based on the inventory of valued eco-system components) and document them on the base maps to identify conflict points with preliminary designs (including verification of these from authentic sources of information, such as from the revenue and forest records); and {c} prepare detailed specific maps showing details of candidate sites for environmental enhancements.

2.2.2. Additional Baseline Surveys

The Contractor shall collect information on the existing environment scenario from secondary sources, and identify gaps to be filled, relevant to the environmental screening needs from primary surveys. The Contractor shall survey the environmentally sensitive locations on and along the OPRC link road, as well as within the OPRC link-specific road's influence area. The Contractor shall extensively use the video or other records of the project road (carried out as part of the Monitoring Consultanting surveys). All regionally or nationally recognized environmental resources and features within the OPRC link-specific road's influence area shall be clearly identified, and studied in relation to activities proposed under the OPRC link-specific proposals. Typically, these will include stretches with significant roadside trees; environmental and common property resources such as forests, large water bodies; and major physical cultural properties. All these may be depicted using a line diagram or a strip map.

All surveys shall be carried out in compliance with the Government of India (GoI) standards/ guidelines/ norms. Wherever such guidelines/norms are not available, the techniques, tools and samples employed for

the surveys shall conform to the international practices. Whenever directly relevant secondary data is available, these should be used, while indirectly relevant data should be verified through primary survey. Environmental quality (air, water and noise) monitoring shall include an adequate number of samples, as established on a sampling network, so as to provide a representative sample of the entire OPRC link-specific corridor. Additional sample data for sensitive environmental/ecological receptors, if any, shall be collected such as to analyze and predict the possible impacts to a degree and precision of acceptable professional standards. Further, additional specialized surveys, such as biodiversity assessment survey, and/or hydrological surveys shall be conducted, if and when recommended by environmental scoping. It is recommended that the environmental surveys be co-ordinated with the social and Monitoring Consulting surveys, as far as practical.

The Contractor shall also collect information on the various prevailing environmental and forest laws/regulations so as to carry out the OPRC link-specific EA in conformity to these.

2.2.3. Stakeholder Consultation

The Contractor shall undertake community consultation sessions at district, village and roadside community levels. The objective of the consultation sessions shall be to improve the OPRC link-specific interventions with regard to environmental management. At least, two rounds of consultations shall be carried out - the first to seek views from the stakeholders on the environmental issues and the ways these could be resolved, and the second to provide feedback to the stakeholders that their views have been taken care in the OPRC link-specific proposals (when the EMPs are nearly complete).

Following this, the final feedback received shall be analysed, and the Contractor shall determine how these can be addressed in the final EMP and in the OPRC link-specific designs. The Contractor shall co-ordinate the entire consultation programme with the social and the Monitoring Consulting teams of the Contractor.

2.2.4. Environmental Analysis of Alternatives

As the overall highway alignments are final at this stage, the environmental analysis of alternatives shall focus location-specific issues relating to cross-sections, materials and their sources from an environmental management perspective. This analysis shall also cover comparisons in relation to site location, design, technology selection, construction techniques and phasing, and operating and maintenance procedures.

2.2.5. Impact Prediction & Mitigation

The Contractor shall determine the potential impacts due to the OPRC link-specific intervention proposals through identification, analysis and evaluation on sensitive areas (natural habitats; sites of historic, cultural and conservation importance), urban settlements and villages/agricultural areas or any other identified VEC. These should be classified as significant positive and negative impacts, direct and indirect impacts, immediate and long-term impacts, and unavoidable or irreversible impacts.

For each impact predicted, feasible and cost effective mitigation measures shall be identified to reduce potentially significant adverse environmental impacts to acceptable levels. The capital and recurrent costs of the measures, and institutional, training and monitoring requirements to effectively implement these measures shall be determined. The Contractor shall explore and recommend environmental enhancements including roadside landscaping, separation of non-motorized lanes in an aesthetically appealing manner, provision of pilgrimage pathways, and development of cultural properties or improving access along the corridor. At this stage, it would be important to identify the need for further environmental studies for issues that cannot be dealt with during the OPRC link-specific proposal preparation stage, but should be undertaken during OPRC link-specific implementation phase.

2.2.6. Institutional Arrangements

The Contractor shall identify institutional/organizational needs to implement the recommendations of the OPRC link-specific EA and to propose steps to strengthen or expand, if required. This may extend to new agency functions, inter-Sectoral arrangements, management procedures and training, staffing, operation and maintenance, training and budgeting.

2.2.7. Training of Client's Staff

The Contractor shall develop and implement a plan for training its own and the client's staff. This plan should specify the types of training, the participants for each training type, the number of sessions, the duration of each session and when these should be conducted. At the end of the training, when draft EMPs are ready, brief reports shall be prepared on the training conducted and observations relevant for future training, if any.

2.2.8. Other Assistance to the Client

The Contractor shall support the client to furnish any relevant information required for obtaining clearance from various state and central government agencies. This may include {a) assisting the client in the submission of application for the Clearance of Reserved or Protected Forests to the Forest Departments; {b) completion of forms and submission of the same for obtaining Consent to Establish (CTE) and Consent to Operate (CTO) under the Water and Air Acts from the State Pollution Control Boards; {c) completion and submission of documents necessary for obtaining Environmental Clearance under EIA Notification, 2006; {d) assistance in presentation to the Wildlife Board of the MoEF in obtaining clearance for the section of the corridor passing through the Wildlife Reserves or Sanctuaries or other protected areas, if any; {e) assistance in submission for any other clearance requirements with respect to the environmental components relevant to the OPRC links.

The Contractor shall discuss and co-ordinate with the internal Monitoring Consultanting and social teams, the findings and recommendations of the OPRC link-specific EA in a continuous manner. The Contractor shall prepare an Environmental Assessment Report. The report will be revised in consideration of the comments of the Client and the Bank.

2.2.9. Environment Management Plans (EMPs)

Based on the environmental impacts predicted, separate EMPs, for each construction contract package, shall be prepared in such a manner that these can be incorporated in the bidding/contract documents. The EMP shall be prepared to fulfill all requirements of the GoI and at the minimum meet the requirements of World Bank OP 4.01- Annex C.

The EMP shall, among others, include a list of design modifications recommended by the OPRC link-specific EA, along with the road chainages. The report will be revised in consideration of the comments of the Client and the World Bank.

2.2.10. Environmental Mitigation & Enhancement Measures

The EMP shall describe feasible and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels. Apart from mitigation of the potential adverse impacts on the environmental components, the EMP shall identify opportunities that exist for the enhancement of the environmental quality along the corridor. This shall include mitigation measures for noise pollution at sensitive locations along the road, erosion control, slope stabilization/protection and the enhancement of specific locations such as water bodies, scenic areas along the corridor.

Residual impacts from the environmental measures shall also be clearly identified. The EMP shall include specific or sample plans for common road construction related activities, such as for management and redevelopment of quarries, borrow areas and construction camps; and good practice guides related to construction and upkeep of plant and machinery. The EMP shall include detailed specification, Payment Schedule, execution drawings and contracting procedures for execution of the environmental mitigation and enhancement measures suggested, separate for pre-construction, construction and operation periods. Responsibilities for execution and supervision of each of the mitigation and enhancement measures shall be specified in the EMP. A plan for continued consultation to be conducted during implementation stage of the OPRC link-specific shall also be appended.

2.2.11. Capacity Building & Training

The EMPs shall describe the implementation arrangement for the OPRC project at the contract package level and link-level, especially the capacity building proposals including the staffing of the environment unit (as and when recommended) to implement the environmental mitigation and enhancement measures. For each staff position recommended to be created, detailed job responsibilities shall be defined. Equipment and resources required for the environment unit shall be specified, and Payment Schedule prepared. A training plan and schedule shall be prepared specifying the target groups (Client including the environmental unit, supervision/monitoring consultants, Contractor staff and others) for individual training programmes, the content and mode of training.

2.2.12. Monitoring & Reporting

The EMP shall specify the environmental supervision, monitoring and auditing requirements. The monitoring programme shall specify parameters, reference standards, monitoring methods, frequency, duration, location, reporting responsibilities, and what other inputs (e.g., training) are necessary.

In addition, the program will specify what action should be taken and by whom in the event that the proposed mitigation measures fail, either partially or totally, to achieve the level of environmental protection expected. Customised formats for reporting on progress on EMP activities to different stakeholders shall be prepared and included in the EMP(s).

Each EMP shall list all mandatory government clearance conditions, and the status of procuring clearances. Additionally, the EMPs shall include as separate attachments, if applicable, Natural Habitat Plan and/or Cultural Properties Plan to satisfy the requirements of the World Bank safeguard policies.

Each EMP shall provide a summary description of where and how the recommendations of EA & EMP are made part of the OPRC link-specific s' designs, construction schedule, and all contract documents.

2.2.13. Further recommended reading

Sector Manuals published by Ministry of Environment and Forests, Government of India (Ref: http://moef.nic.in/Manuals/highways-10_may.pdf)

Corridor level checklist for the Contractor:

The following is a guidance checklist for the Contractor to be followed whenever any improvement work is to be done at the corridor level under the OPRC regime. The Environmental and Social Guidelines of Practices (ESGP) and the Environmental and Social Management Framework (ESMF) have been provided for further reference.

1. Review the OPRC proposal that is to be implemented- upgradation, widening, resurfacing etc;
2. Review the contract conditions, especially performance levels, penalty clauses, timelines, provisions for variation works etc;
3. Undertake a site reconnaissance survey to understand the encumbrances like squatters, encroachers, trees etc;
4. Collect environmental and social baseline data relevant to the type of intervention and undertake an impact assessment of the interventions. This information will also be helpful for preparing the RAP/EMP;
 - Process forest and environmental clearances, if required
 - Talk to local community to understand their perspective of impacts and also to understand the level of inconveniences that may arise out of intervention works;
 - Talk to all stakeholders of the corridor, including the truck owners, general public and shopkeepers;
5. Prepare the final proposal and submit to the Employer for approval, also informing about any encroachment on site and request for removal of the same;
6. In the meanwhile undertake a review of legal compliance that one needs to follow-
 - Check whether all licenses are in place;
 - Check whether all subcontractors have valid licences as well, including the requirements under the labour laws, pollution norms, etc
 - Review the Health & Safety requirements;
 - Locate areas to be accessed for material like water, soil etc;
 - Get guidance from the Employer in case of any difficulty;
7. Once approved by the Employer to start work, proceed to the site with machines and manpower;
8. Prepare the EMP and RAP in coordination with the Employer and its consultant;
9. Prepare terms of reference for implementation of RAP
10. Hire an external agency to implement the RAP and environmental consultant to implement the EMP, in case internal capacity if not present;
11. Self assess the performance as per the evaluation criteria under the project;
12. Document the entire process properly and submit reports to the Employer as desired under the contract, including environmental reporting as required under law.

Appendix 1 – Sample Environmental Management Plan

Sample Environmental and Social Management Plan

Sl. No.	Environmental Issue	Location/ sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
Pre-Construction Phase					
P.1	Ecologically sensitive areas (protected forests, reserve forests, wildlife sanctuary, national park etc.)	To Be Assessed (TBA)	Obtain prior permission for working at sections of the road pass through ecologically sensitive areas from the competent authorities as mentioned in the ESMF report for OPRC works. No tree felling shall be allowed. No diversion of forest land shall be carried out. While resurfacing, adequate precaution should be taken to avoid any damage to flora and fauna.	PIU, R& B Dept. Government of Gujarat	PIU, R& B Dept., Govt. of Gujarat, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant
P.2	Land Acquisition (if required)	To Be Assessed (TBA)	The acquisition of land and private properties will be carried out in accordance with the RAP and entitlement framework of the Project. PIU, R&B Dept. Government of Gujarat has to ascertain that acquisition of land in the post design phase are addressed and integrated into the relevant contract documents.	PIU, R& B Dept. Government of Gujarat, Revenue Dept, Collaborating Agencies	PIU, R& B Dept. Government of Gujarat
P.3	Clearance of Encroachment/ squatters (change in land use)	TBA	Advance notice, as per RAP shall be given to the encroachers & squatters present in the Corridor of Impact, who need to be relocated. All R&R activities will be completed prior to initiation of civil works.	PIU, R& B Dept. Government of Gujarat and Revenue Authority	PIU, R& B Dept. Government of Gujarat

Sl. No.	Environmental Issue	Location/sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
P.4	Tree Cutting	TBA	The Contractor is to confirm the number of trees that will need to be removed as part of his detailed design. Tree cutting is to proceed only after all the legal requirements including attaining of in-principle and formal clearances from the Forest Dept. /MoEF and subsequently a written order is issued to the Contractor. Stacking, transport and storage of the wood will be done as per the relevant regulatory norms.	Contractor and PIU, R& B Dept. Government of Gujarat	PIU, R& B Dept. Government of Gujarat / Monitoring Consultant
	Forest Clearance	TBA	Obtain prior permission for Diversion of Forest land at sections of the road pass through Protected Forest Area from the competent authorities (Forest Department) as mentioned in the ESMF report for OPRC works.	Contractor and PIU, R& B Dept. Government of Gujarat	PIU, R& B Dept. Government of Gujarat / Monitoring Consultant
P.5	Preservation of Trees	TBA	No tree will be cut beyond the proposed toe line. All efforts will be made to preserve trees including evaluation of minor design adjustments/alternatives to save trees (safety of road user needs to be properly considered while making such decisions). Specific attention will be given for protecting giant trees, green tunnels and locally important trees (religiously important etc.). Particular species declared as 'protected' by the State's Forest Dept. in the private land will be felled only after due clearance from the Forest Dept./ concerned agencies is obtained. In the event of design changes, additional assessments including the possibility to save trees shall be made.	PIU, R& B Dept. Government of Gujarat, Forest Department, Contractor	PIU/ Monitoring Consultant
P.6	Relocation of Community Utilities and Common Property Resources	TBA	All community utilities and properties i.e., hand pumps, open wells, water supply lines, sewer lines, telephone cables, buildings and health centres will be relocated before construction starts on the project road. All possible measures are to be taken to minimise inconvenience to public.	PIU, R& B Dept. Government of Gujarat, other Agencies and the Contractor	PIU/ Monitoring Consultant

Sl. No.	Environmental Issue	Location/sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
P.7	Relocation of affected Cultural and Religious Properties	TBA	Religious property resources such as shrines, temples and mosques will be preferably relocated beyond the RoW. If any relocation of the religious structures is required then it will be undertaken in consultation with the community. PIU, R& B Dept. Government of Gujarat /Contractor in consultation through the LRC will finalise the details of such relocation work.	PIU, R& B Dept. Government of Gujarat, other Agencies and the Contractor	PIU/ Monitoring Consultant
P.8	Implementation Information Meeting and Disclosure of Information	OPRC Environmental and Social	The Contractor will organise implementation information meeting in the vicinity of project site for general public to consult and inform people about his plans covering overall construction schedule, safety, use of local resources (such as earth, water), traffic safety and management plan of debris disposal, drainage protection, canal training during construction, pollution abatement and other plans, measures to minimise disruptions, damage and inconvenience to roadside users and people along the road. The mechanism and content for disclosure shall be approved by R& B Dept. Government of Gujarat prior to the meeting. The Contractor shall provide information kiosks at locations easily accessible to the stakeholders. The documents to be disclosed shall include of Executive Summary of EIA, EMP/s, Executive Summary of SIA, RAP, Resettlement and Rehabilitation Policy and Entitlement Matrix. In addition, locally relevant information such as Traffic Safety and Management Plan, Environment Management Measures proposed by contractor, Enhancement Details, Enhancement Drawing/s, Details of PAP, List of Common Property Resources, Complaints and Suggestion Book, Name & Address of the contact person, typical design cross-section/s, etc. shall also be disclosed by the Contractor.	Contractor	PIU/ Monitoring Consultant

Construction /Maintenance Phase					
Sl. No.	Environmental Issue	Location/sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
C.1	Air Pollution	Construction plants, equipment and vehicles	<p>All vehicles used by the Contractor must have copies of currently valid Pollution under Control Certificates displayed as per the requirement of the Motor Vehicles Department for the duration of the Contract. For Construction plant following will be maintained:</p> <ul style="list-style-type: none"> • 1.5 km away from settlement, school, hospital on downwind directions • 1.5 km from any archaeological site • 1.5 km from ecologically sensitive areas i.e. forest, national park, sanctuary • 1.5 rivers, streams and lakes • 500 m from ponds • 500 m from National Highway, 250 m from State Highway, 100 m from District roads and other roads • away from agricultural land • preference to barren land • Obtaining Consent-To-Establishment (CTE) and Obtaining Consent-To-Operation (CTO) under Air and Water Acts from the Gujarat State Pollution Control (GSPCB). • Ensure adequate stack height for HMP as stipulated in CFE, • Install emission control devices such as bag house filters, cyclone separators, water scrubbers etc. • Bag house filter / multi-cone cyclone for emission control. Pollution control measures for Diesel Generator (DG) set i.e. stack height, acoustic enclosure etc. • Greenbelt along the periphery of plant site. 	Contractor	R& B Dept. Government of Gujarat, PIU, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant
		Dust during earth works or from spoil dumps	<p>Maintaining adequate moisture at surface of any earthwork layer completed or non-completed to avoid dust emission. Stockpiling spoil at designated areas and at least 5 m away from traffic lane.</p>	Contractor	R& B Dept. Government of Gujarat, PIU, Appropriate

Construction /Maintenance Phase					
Sl. No.	Environmental Issue	Location/sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
					Regulatory Authorities and the Employer's Monitoring Consultant
		Storage of maintenance materials	Proper stockpiling and sprinkling of water as necessary.	Contractor	R& B Dept. Government of Gujarat, PIU, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant
C.2	Water Pollution	Clearing of waterways of cross drainage works including bridges and clearing of longitudinal side drains	Clearance of waterway will be undertaken before onset of monsoon i.e. early in the month of June. Debris generated due to clearing of longitudinal side drains and waterways of cross drainage will be stored above high flood level and away from waterway, and reused on embankment slope or disposed at designated areas ¹ .	Contractor	R& B Dept. Government of Gujarat, PIU, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant
		Construction vehicles	Avoiding cleaning / washing of construction vehicle in any water body	Contractor	

¹ Designated areas are to be identified and finalized by Contractor in consultation with the Engineer in accordance with relevant Environmental and Social Management Requirements

Construction /Maintenance Phase					
Sl. No.	Environmental Issue	Location/sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
		Construction camp and workers' camp	<p>Minimum distance of 1.5 km from river, stream and lake and 500 m from ponds</p> <p>Locate facilities in areas not affected by flooding and clear of any natural or storm water courses.</p> <p>The ground should have gentle slope to allow free drainage of the site.</p> <p>The Contractor will prepare, make widely available (especially to staff responsible for water and material management), and implement a Storm water Management Plan (SWMP) for (all) the site(s) after approval from the Monitoring Consultant.</p> <p>The camp must have impervious flooring to prevent seepage of any leaked oil & grease into the ground. The area should be covered with a roof to prevent the entry of rainwater.</p> <p>Degreasing can also be carried out using mechanical spray type degreaser, with complete recycle using an enclosure with nozzles and two sieves, coarse above and fine below, may be used.</p> <p>A separate vehicle washing ramp shall be constructed adjacent to the workshop for washing vehicles, including truck mounted concrete mixers, if any, after each day's construction is over, or as required.</p>	Contractor	R&B Dept. Government of Gujarat, PIU, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant

Construction /Maintenance Phase					
Sl. No.	Environmental Issue	Location/sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
C.3	Noise Pollution and Vibration	Vehicles and Construction machinery	<p>Site Controls: All vehicles and equipment will be fitted with silencers and/or mufflers which will be serviced regularly to maintain them in good working condition and conforming to the standard of 75dB (A) at 1m from surface of enclosure.</p> <p>Scheduling of Project Activities: Operations will be scheduled to coincide with period when people would least likely to be affected. Construction activities generating noise level more than 75 dB (A) will be avoided between 10 P.M. and 6 A.M. near residential areas.</p> <p>Protection devices (ear plugs or ear muffs) will be provided to the workers operating in the vicinity of high noise generating machines. Construction equipment and machinery will be fitted with silencers and maintained properly.</p> <p>Source-control through proper maintenance of all equipment. Use of properly designed engine enclosures and intake silencers. Vehicles and equipment used will conform to the prescribed noise pollution norms. Movements of heavy construction vehicles and equipment near public properties will be restricted. Comply with sitting criteria construction plants and installations and maintenance of pollution control devices</p>	Contractor	R& B Dept. Government of Gujarat, PIU, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant
C.4	Land Pollution	Spillage from plant and equipment at construction camps	<p>Providing impervious platform and oil and grease trap for collection of spillage from construction equipment vehicle maintenance platform Collection oil and lubes drips in container during repairing construction equipment vehicles Providing impervious platform and collection tank for spillage of liquid fuel and lubes at storage area Providing bulk bituminous storage tank instead of drums for storage of bitumen and bitumen emulsion Providing impervious base at bitumen and emulsion storage area and regular clearing of any bitumen spillage for controlled disposal</p>	Contractor	R& B Dept. Government of Gujarat, PIU, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant

Construction /Maintenance Phase					
Sl. No.	Environmental Issue	Location/sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
			<p>Reusing bitumen spillage</p> <p>Disposing non-usable bitumen spills in a deep trench providing clay lining of 300 mm at the bottom and filled with soil at the top (for at least 0.5 m) to encourage vegetation growth.</p> <p>All the waste oil collected, from skimming of the oil trap as well as from the drip pans, or the mechanical degreaser shall be stored in accordance with the Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016. For this purpose, metallic drums should be used.</p>		
		Domestic solid waste and liquid waste generated at camps	<p>Collecting kitchen waste at separate bins and disposing of in a pit at designated area/s</p> <p>Collecting plastics in separate bins and disposing in deep trench at designated area/s covering with soil</p> <p>Collecting cottons, clothes etc. at separate bins and burning in a pit (with sand bed)</p>	Contractor	R& B Dept. Government of Gujarat, PIU, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant
C.5	Borrow Areas	TBA	<p>Finalizing borrow areas for borrowing earth and all logistic arrangements as well as compliance to environmental requirements, as applicable, will be the sole responsibility of the Contractor.</p> <p>The Contractor will not start borrowing earth from select borrow area until the formal agreement is signed between landowner and the Contractor and a copy is submitted to the Monitoring Consultant.</p> <p>Planning of haul roads for accessing borrow areas will be undertaken during this stage. The haul roads shall be routed to avoid agricultural areas as far as possible and will use the existing village roads wherever available.</p>	Contractor	R& B Dept. Government of Gujarat, PIU, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant

Construction /Maintenance Phase					
Sl. No.	Environmental Issue	Location/sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
C.6	Quarry	TBA	<p>Contractor will finalise the quarry for procurement of construction materials after assessment of the availability of sufficient materials, quality and other logistic arrangements.</p> <p>The Contractor will procure all necessary permissions for procurement of material from the Mining Department, District Administration and State Pollution Control Board and shall submit a copy of the approval and the rehabilitation plan to R& B Dept. Govt. Of Gujarat through the Monitoring Consultant.</p> <p>Contractor will also work out haul road network and report these details to the Monitoring Consultant who will inspect and in turn report to R& B Dept. Govt. Of Gujarat before approval.</p>	Contractor	R& B Dept. Government of Gujarat, PIU, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant
C.7	Arrangement for Construction Water	TBA	<p>The Contractor will use ground /surface water as a source of water for the construction and where necessary set up own bore well facility for construction work.</p> <p>Contractor may use the ponds, which are not in use by the community or identified to fill up for the project, but in that case, before using any pond water the Contractor will obtain written consent from the owner and submit this to the Monitoring Consultant.</p> <p>To avoid disruption/disturbance to other water users, the Contractor will extract water from fixed locations and consult with the Monitoring Consultant before finalising the locations.</p> <p>The Contractor will provide a list of locations and type of sources from where water for construction will be extracted.</p> <p>The Contractor will 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 the Monitoring Consultant and the R& B Dept. Govt. of Gujarat.</p>	Contractor	R& B Dept. Govt. of Gujarat, PIU, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant

Construction /Maintenance Phase					
Sl. No.	Environmental Issue	Location/sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
C.8	Sand	Any riverbeds recommended for sand extraction within the contract area.	The sand will be procured from identified sand mines as far as possible. If the Contractor wants to obtain from other sources he shall provide reasons for doing so. The Contractor will obtain copy of the Lease agreement of the supplier and submit this to the Monitoring Consultant before procuring the sand.	Contractor	R& B Dept. Govt. of Gujarat, PIU, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant.
C.9	Clearing and Gribbing	TBA	Vegetation will be removed from any Improvement Works sections before commencement of construction. All works will be carried out such that the damage or disruption to flora other than those identified for cutting is minimised. Only ground cover/shrubs that impinge on the permanent work or necessary temporary work will be removed. The Contractor under any circumstances will not cut or damage trees outside of the construction zone. Trees identified for removal will be cut only after receiving clearance from the forest department/MoEF (as applicable) and after that the receipt of R& B Dept. Govt. of Gujarat's written confirmation in this regard. Vegetation only with girth of over 30 cm will be considered as trees.	Contractor	R& B Dept. Govt. of Gujarat, PIU, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant
C.10	Disposal of debris from dismantling structures and excavation of the existing road surface and pavements	TBA	Debris generated due to the excavation of the existing road will be suitably reused in the proposed construction, subjected to the suitability of the materials and approval from the Monitoring Consultant as follows: <ul style="list-style-type: none"> • The sub grade of the existing pavement may be used as embankment fill material. • The existing sub base material may be recycled as sub base of any haul road or access road. • The existing bitumen surface may be utilised for the paving of access roads and paving works in construction sites and campus, temporary traffic diversions, haulage routes etc. 	Contractor	R& B Dept. Govt. of Gujarat, PIU, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant

Construction /Maintenance Phase					
Sl. No.	Environmental Issue	Location/sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
			<ul style="list-style-type: none"> The Contractor shall identify disposal sites. The identified locations will be reported to the Monitoring Consultant. This location will be checked on site and accordingly approved prior to any disposal of waste materials. These sites shall also be reported to the Employer. At locations identified for disposal of residual bituminous wastes, disposal will be carried out over a 60 mm thick layer of rammed clay so as to eliminate the possibility of leaching of wastes into the ground water. The Contractor will ensure that the surface area of such a dumping pit is covered with a layer of soil and plantation is undertaken. All arrangement for transportation during construction including provision, maintenance, dismantling and clearing debris, will be considered incidental to the works and will be planned and implemented by the Contractor. Debris generated from other construction activities shall be disposed such that it does not flow into the surface water bodies or form mud puddles in the area. No debris will be staged on the road or culvert/bridges locations. 		
C.11	Drainage	TBA	<p>The Contractor shall ensure that no construction materials like earth, stone, or similar is disposed off in a manner that may block the flow of water of any water course and cross drainage channels.</p> <p>The Contractor will take all necessary measures to prevent any blockage to the water flow. In addition to the design requirements, the Contractor will take all required measures as directed by the Monitoring Consultant to prevent temporary or permanent flooding of any site or any adjacent area.</p>	Contractor	R& B Dept. Govt. of Gujarat, PIU, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant

Construction /Maintenance Phase					
Sl. No.	Environmental Issue	Location/sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
C.12	Siltation of Water Bodies and Degradation of Water Quality	TBA	<p>The Contractor will not excavate beds of any stream/canals/ any other water body for borrowing earth for embankment construction.</p> <p>The Contractor will construct silt fencing at the base of the embankment construction where these are adjacent to water bodies and around the stockpiles at the construction sites close to water bodies. The fencing will be provided prior to commencement of earthwork and maintained in an effective state until the stabilisation of the embankment slopes has occurred.</p> <p>The Contractor will ensure that construction materials containing fine particles are stored in a suitable enclosure such that sediment-laden water does not drain into any nearby watercourse.</p>	Contractor	R& B Dept. Govt. of Gujarat, PIU, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant
C.13	Planning for Traffic Diversions and Detours	TBA	<p>Specific temporary traffic diversion plan will be prepared by the Contractor and approved by the Monitoring Consultant.</p> <p>Any temporary diversions that will need to be constructed will only proceed following receipt of approval from the Employer and under the supervision of the Monitoring Consultant.</p> <p>Detailed Traffic Control Plans will be prepared by the Contractor and approved by the Monitoring Consultant seven days prior to commencement of works on any section of road. The traffic control plans shall contain details of temporary diversions, traffic safety arrangements for construction under traffic, details of traffic arrangement after cessation of work each day, safety measures for night time traffic and precaution for transportation of hazardous materials and arrangement of flagmen.</p> <p>The Contractor will provide specific measures for safety of pedestrians and workers at night as part of traffic control plans. The Contractor will ensure that the diversion/detours are always maintained in usable condition, particularly during the monsoon to avoid disruption to traffic flow.</p> <p>The Contractor will also inform local community of changes to traffic routes, conditions and pedestrian access arrangements with assistance</p>	Contractor	R& B Dept. Govt. of Gujarat, PIU, Appropriate Regulatory Authorities and the Employer's Monitoring Consultant

Construction /Maintenance Phase					
Sl. No.	Environmental Issue	Location/sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
			from the Monitoring Consultant, the LRC and R& B Dept. Govt. of Gujarat. The temporary traffic detours will be kept free of dust by sprinkling of water at a sufficient frequency and as required under specific conditions (depending on weather conditions, construction in the settlement areas and volume of traffic).		