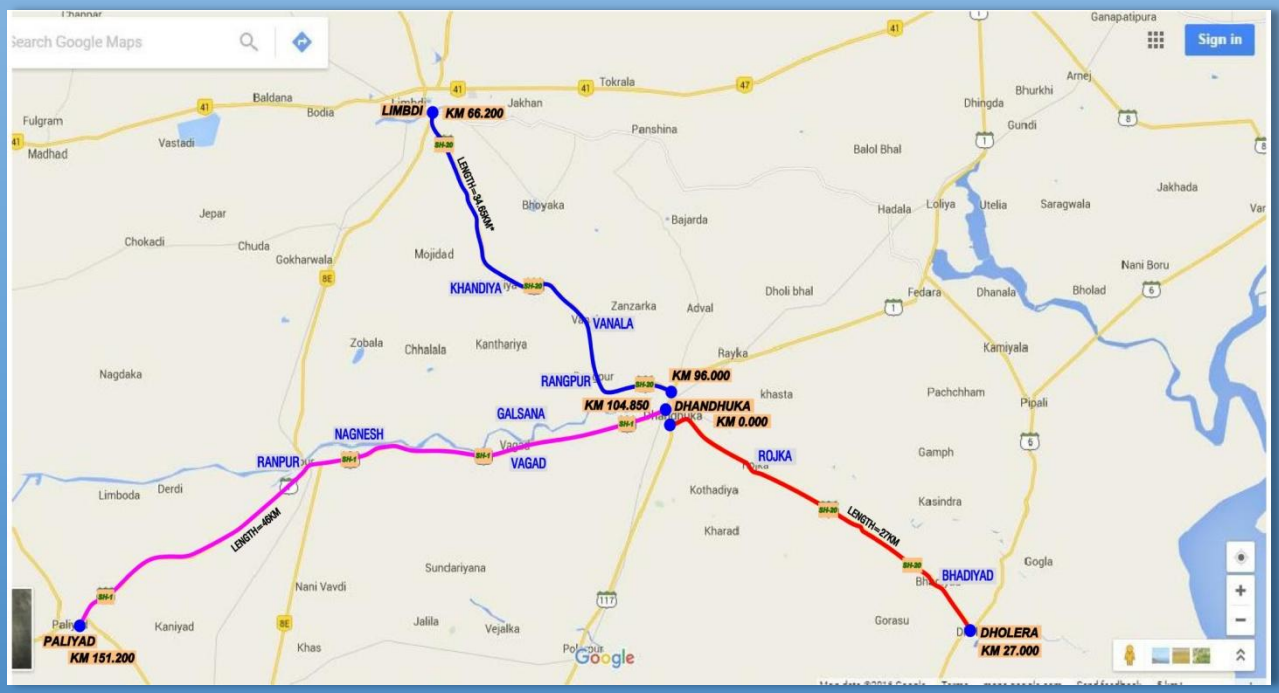
2017

# Environmental Management Plan

## Dhandhuka- Paliyad (SH-01)




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

Road & Building Department, Government of Gujarat

FEEDBACK INFRA
Making Infrastructure Happen

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DONG MYEONG
Engineering Consultants & Architecture

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# List of Abbreviations

| | |
|---|---|
| DIEAA | District Environmental Impact Assessment Authority |
| EIA | Environmental Impact Assessment |
| EMP | Environmental Management Plan |
| CoI | Corridor of Impact |
| CO | Carbon monoxide |
| CPR's | Common Property Resources |
| GPCB | Gujarat Pollution Control Board |
| GSHP-II | Gujarat State Highways Project – II |
| GoG | Government of Gujarat |
| LASA | LEA Associates South Asia Pvt. Ltd. |
| LHS | Left Hand Side |
| MoRT&H | Ministry of Road Transport and Highways |
| NOC | No Objection Certificate |
| $NO_X$ | Nitrates of Oxygen |
| $NH_3$ | Ammonia |
| NGO | Non-Government Organization |
| PIU | Project Implementation Unit |
| Pb | Lead |
| $O_3$ | Ozone |
| R&BD | Roads and Buildings Department |
| RPF | Resettlement Policy Framework |
| RoW | Right of Way |
| RAP | Resettlement Action Plan |
| RPM | Respiratory Particle Matter |
| RHS | Right Hand Side |
| MC | Monitoring consultant |
| $SO_2$ | Sulfur di oxide |
| SPM | Suspended Particle Matter |

# 1 INTRODUCTION

## 1.1 BACKGROUND

The Roads and Buildings Department (R&BD), Government of Gujarat (GoG) has taken up the preparation of the second Gujarat State Highway Project (GSHP-II), covering up- gradation, maintenance and improvement of identified core road network for loan appraisal with the World Bank. Towards project preparation, R&BD has retained M/s LEA Associates South Asia Pvt. Ltd. (LASA) as Project Preparatory Works Consultants to prepare plans for the widening and up gradation of highways as well as for carrying out the assessment of environment and social impacts. In the mean time R&B dept, GoG appointed M/s Feedback Infrastructure Pvt. Ltd JV with M/s Dong Myeong Engineering Consultants & Architecture as Monitoring Consultant for preparation of DPR, BID Documents, Monitoring, Engineering for Output Performance Road Contract (OPRC) Works. R&BD, GoG has selected three corridors under the OPRC mode at this stage, for preparation of conceptual designs. The details of the selected corridors are given in Table 1.1.

**TABLE 1-1: LIST OF OPRC CORRIDORS UNDER GSHP-II**

| Sr. No. | Link Name | Corridor No | Length km |
|---|---|---|---|
| 1. | Limbdi – Dhandhuka | SH-20 | 34.650 |
| 2. | Dhandhuka – Dholera | SH-20 | 27.000 |
| 3. | **Dhandhuka – Paliyad** | SH-01 | 46.400 |

*Source: R&BD*

## 1.2 CONTEXT FOR THE EMP

As part of the project preparation, an Environmental Impact Assessment (EIA) study has been carried out for the proposed roads during the year 2013. The EMP for the Dhandhuka – Paliyad (SH-01) corridor is based on the findings of EIA carried out, and it also provides the framework for effective implementation of the environmental management measures required for addressing the potential environmental impacts in the project. This Environmental Management Plan assists the contractor to update and implement the environmental management measures suggested as an outcome of the EIA.

## 1.3 BRIEF DESCRIPTION OF THE PROJECT ROAD

The project corridor starts at Dhandhuka (km 104+800) and ends at Dholera (km 151+200) covering a total length of 46.40 km (Figure 1.1). The corridor passes through plain terrain consisting clayey soil. The present road carriageway width measure to be 6.1 m between 104+800 and Km 131+000 while the same is 7.0m between the Km 131+000 and km 151+200. The average right of way is 30 m. Pavement condition of the corridor is fair to poor and most of the road sections are settled with cracks, pot holes, and raveling.

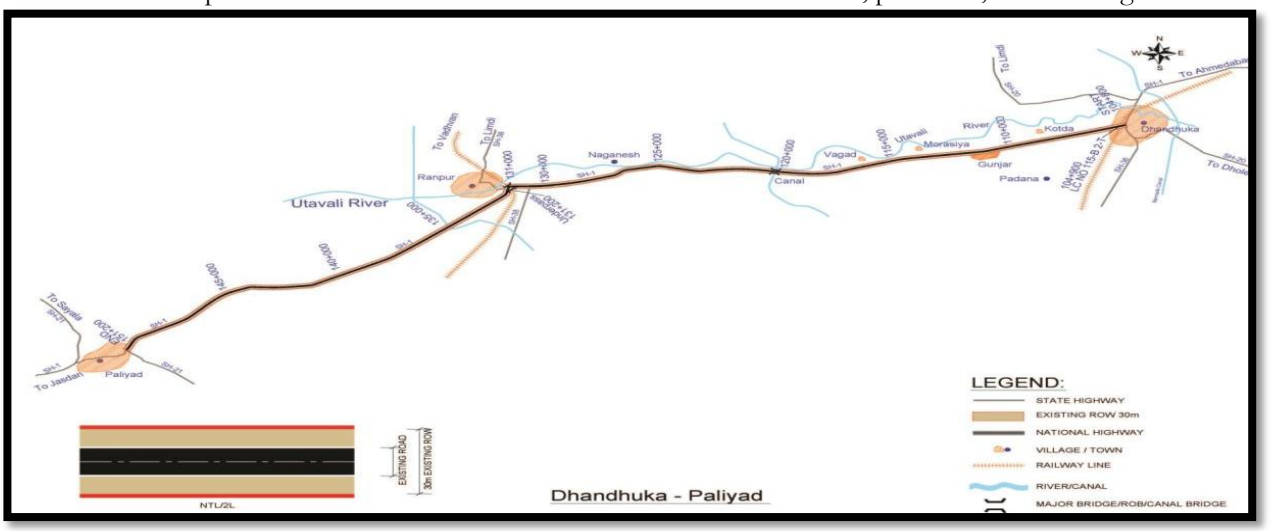


**Figure 1-1: Dhandhuka – Paliyad (SH-01) Corridor Map**

The project corridor traverses through 2 districts of Ahemadabd and Botad covering Dhandhuka, Ranpur Taluk. For the entire length of 46.4 km, 17 census village and one town Dhandhuka abuts the project corridor. The villages along the corridor are Sakardi, Gunjar, Paliyad, Ranpur and Umrad. A total number of 892 trees have to be felled for the proposed widening activity.

## 1.4 CLEARANCE REQUIREMENTS

***Environmental clearance***: As per the new amendment dated 1st December 2009 and 4th April, 2011 to EIA Notification 2006, environmental clearance has been made mandatory only for new state highway projects or state highway expansion projects in hilly terrain (above 1000 m AMSL) and or ecological sensitive area. Hence, the widening / strengthening and improvement works on existing corridors of the state highway are not covered under the ambit of the notification and are not categorized either as Category A or Category B. However, the project shall require obtaining consent from competent authorities such as the Gujarat Pollution Control Board (GPCB), for '***Consent to Establish***' by submitting an online Common Application (as per Schedule-I), under Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act, 1981) and authorization under Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016.

***Forest Clearance***: The project corridor is declared as "Notified Protected Forest" as per the ***Gujarat*** State Government Gazette. Hence obtaining forest clearance for proposed intervention is required and there is a need to felling the 892 numbers of avenue trees permission from the respective forest department.

***Other Project Clearances:*** Implementation of the project works would require clearances from the Gujarat Pollution Control Board (GPCB) as well as several other line agencies. These would have to be obtained by the contractor before commencement of civil works in the project area. The clearances to be obtained are presented in Table 1.2.

## TABLE 1-2: APPLICABLE LAWS AND REGULATIONS

| S. No | Regulatory Clearances | Corresponding Regulations | Approving Authority | Applicability to the Project | Typical[1] Time Required | Responsibility for compliance | |
|---|---|---|---|---|---|---|---|
| | | | | | | Execution | Monitoring |
| **Pre-Construction Stage** | | | | | | | |
| 01 | Environmental Clearance | EIA Notification, 2006 and subsequent Amendments; | MoEF&CC, 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**<br>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;<br>Air (Prevention and Control of Pollution) Act 1981 | Gujarat 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&CC, GoI | Not applicable | - | - | - |
| 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&CC, Bhopal | Forest diversion is applicable for Dhandhuka-Paliyad. | 12 months | R&B Dept., Govt. of Gujarat<br>Necessary assistance shall be provided by Contractor | 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 | R & B Dept., Govt. of Gujarat<br>Necessary assistance shall be provided by Contractor. | R& B Dept., Govt. of Gujarat |
| **Construction/Operation Stage** | | | | | | | |

| S. No | Regulatory Clearances | Corresponding Regulations | Approving Authority | Applicability to the Project | Typical[1] Time Required | Responsibility for compliance | |
|---|---|---|---|---|---|---|---|
| | | | | | | Execution | Monitoring |
| 06 | Permission for locating and operating Borrow pits | EIA Notifications and Subsequent Amendments;<br><br>Mines and Minerals (Development and Regulation) Act, 1957 | DIEAA;<br>(MoEF&CC), Commissioner of Geology and Mining, 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, West Central Region (WCR), Ahmedaabd | Applicable, if withdrawal is proposed | 1 month | Contractor | Monitoring Consultant |
| 08 | Permission for withdrawal of Surface Water from River/ Irrigation Canals | | Irrigation Authorities for use of water from Irrigation Canal.<br>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 Pollution Control Board (GPCB) | Applicable, if hazardous waste is generated in the project (disposal of bituminous wastes – verify with GPCB) | 2 months | Contractor | Monitoring Consultant |
| 10 | Consent to Operate | Water (Prevention and Control of Pollution) Act 1974;<br>Air (Prevention and Control of Pollution) Act 1981 | Gujarat 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 |

| S. No | Regulatory Clearances | Corresponding Regulations | Approving Authority | Applicability to the Project | Typical[1] Time Required | Responsibility for compliance | |
|---|---|---|---|---|---|---|---|
| | | | | | | Execution | Monitoring |
| 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 |
| 13 | Permission for Sand Mining from river bed | Mines and Minerals (Development and Regulation) Act, 1957 | Commissioner of Geology and 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 | Commissioner of Geology and Mining, Govt. of Gujarat<br><br>Gujarat Pollution Control Board | Applicable only if Contractor opens a new quarry site | 6 Months<br><br>3 Months | Contractor | Monitoring Consultant |
| 15 | Registration of Vehicles and Off road equipments;<br><br>Pollution Under Control Certificate for Contractor Vehicles and Equipments | The Motor Vehicles Act, 1988 and amended 2015, Central Motor Vehicle Rules, 1989 | Transport Department, Govt. of Gujarat | Applicable to all Contractor vehicles and off road equipments | 1 Month<br><br>1 Week | Contractor | Monitoring Consultant |
| 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 |

| S. No | Regulatory Clearances | Corresponding Regulations | Approving Authority | Applicability to the Project | Typical[1] Time Required | Responsibility for compliance | |
|---|---|---|---|---|---|---|---|
| | | | | | | Execution | Monitoring |
| 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 |

[1] The right of permission vests with the Competent Authority

*Source: Acts, Rules and Regulation from Central and State Government*

## 1.5 STRUCTURE OF THE REPORT

This report is structured to be a standalone document suitable for handing over to the contractor for enabling him to implement the environmental management measures suggested based on the outcome of the EIA. Further to the introduction provided in this chapter, the report provides a summary of the environmental impacts and mitigation measures in Chapter 2. Environmental Management Plan is presented in Chapter 3, while the implementation arrangements for implementing the EMP are presented in the Chapter 4. Chapter 5 provides the necessary budget for implementing the EMP.

# 2 ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

## 2.1 SUMMARY OF IMPACT

Environmental Impact Assessment was carried out for the project corridor during 2012 and the impacts that are likely to arise from the implementation of the project are detailed along with suitable design measures in the Table 2.1.

**TABLE 2-1: SUMMARY OF ENVIRONMENTAL IMPACTS AND DESIGN MEASURES**

| Sl. No | Environmental and Social Impact | Design Measures |
|---|---|---|
| **1.** | A total of 892 trees are getting impacted | As a management measure compensatory afforestation as directed by the forest department shall be carried out. |
| **2.** | Impact on cultural properties: 4 temples and 2 shrines | As a result of adopting design modification approach, the impact on cultural properties are avoided, however a temple boundary wall at Ch 110+963 is prone to impact since the RoW has been fixed based on the safety point of view. |
| **3.** | The presence of Nalsarovar Bird Sanctuary (about 35km aerial distance from Dhandhuka – Paliyad corridor) | The project corridor does not have any influence on the sanctuary as it is located at a distance of 30km from the project corridor (aerial distance). hence design measures are not required |
| **4.** | Impact on topography/ Soil | Disposal of the debris will have impact on the local topography, hence as a resource recovery approach, the excavated waste shall be tested for the CBR values and if found suitable will be used for sub-grade materials, for strengthening embankment (or) as an strengthening layer for village and approach roads. |
| **5.** | High TDS and chloride concentration in both surface and groundwater | Water quality in the project area has been found to be unfit for construction purpose. However, ground water can be used for drinking purposes after carrying out the necessary water quality analysis and installation of appropriate water purification devices as required |
| **6.** | Air quality impact at the habitations/ settlements<br>Dhandhulka (104+000)<br>Gunjar (110+800),<br>Ranpur (131+200),<br>Bodi (145+600) | Air pollution due to construction yard will be mainly ground -based with localised effect during the construction period. It is suggested that the construction yard shall be located away from the settlement; all construction plant (Crushers, Hot-mix Plants & Batching Plants) should be kept/stationed 1000m away from the settlements. |
| **7.** | Noise Pollution at Settlements and sensitive receptors<br>Dhandhulka (104+000), Gunjar (110+800), Ranpur (131+200), and Bodi (145+600)<br>Schools (Ch.105+200, Ch.111+000, 147+400)<br>3 Darga (Ch.110+800, Ch.120+400, 121+200)<br>Hospital (Ch.116+044) College (Ch.129+820)<br>Shivshakti Boys Hostel Ranpur (Ch.130+193) | Noisy construction activities (such as crushing, concrete mixing, batching etc.) within 150 m of the nearest habitation/ educational institutes/health centers (silence zones) shall be stopped during the night time between 7.00 pm to 6.00 am. Contractor shall provide noise barriers at the suggested locations of the identified schools/ Temples/health centers prior to commencement of work. |

*Source: LASA 2012*

## 2.2 SPECIFIC MEASURES

As part of the Environmental Assessment, consultations were held in the project corridor at various locations as given in Table 2.2. The outcome of the consultations was noted and for the discussed impacts, specific mitigation measures were suggested.

**TABLE 2-2: ENVIRONMENTAL AND SOCIAL SPECIFIC MEASURES INTEGRATED IN THE DESIGN**

| Sl. No | Impact | Mitigation Measures |
|---|---|---|
| **1.** | Impact on residential/ commercial structures and land acquisition Issues | • CoI approach has been adopted in minimizing the social impact associated with the residential/ commercial and land acquisition issues<br>• Public consultation has been done and the issues highlighted by the local communities like provision of safety aspects, drain issues are addressed and mitigated. |
| **2.** | Up-gradation of the existing drains (bridges and culverts) | • All the existing bridges, culverts and irrigation canals are proposed to be upgraded. The flood data collected from the irrigation department is kept as a source for designing the drain provisions. Additional drain facility is also suggested at locations experiencing water logging problems |
| **3.** | Safety issues need to be addressed in the proposed design | • Road safety audit has been performed for the corridor and the outcome of the report and the public consultation has been taken as a base to provide road safety measures in the design. The safety measures includes provision of footpath near settlements, Junction improvements, street lights etc. Due care has been taken at the social sensitive locations like schools and temples.<br>• Road design has been done as suggested by the local communities to reduce the curve. Illustration of the design is depicted in the flowing figures |
| **4.** | Pedestrian Safety | • To reduce the speed and subsequently to increase the pedestrian safety rumble strips are proposed at major intersections / junctions and at entry & exit of settlements. |
| **5.** | Crash barrier | • The guard rails are provided at sharp curves along with signage's to provide safety on such curves. |
| **6.** | Bus stop | • There are several bus stops existing along the project corridor. Generally these stops are associated with a settlement area or an intersection. |

*Source: LASA 2012*

## 2.3 ENHANCEMENT MEASURES

The cultural / community properties located at three shrine (Ch.110+963, Ch.120+400, 121+200) are falling within the RoW and are having direct impact due to the project activities. As per the proposed design it is identified that nearly two shrines are fully affected and two temples are partially impacted. Hence, in order to save the structure, design modifications like shifting of alignment have been adopted. After the design modification, 3 cultural/ community properties are protected. However, one shrine at Ch 110+963 boundary wall is prone to the impact.

As an enhancement measure, two temples are selected; the selection is based on the consultation held with the communities. The suggested amenities for enhancement are given in table 2.3.

**TABLE 2-3: SELECTED ENHANCEMENT MEASURES FOR PROPOSED PROJECT CORRIDOR**

| S.No. | Chainage | Name of Structure | Side | Distance from CL (m) | Age (in Years) | Size | Ownership | Building type |
|---|---|---|---|---|---|---|---|---|
| **1.** | 110+963 | Shrine | RHS | 6.2 | 200 | Small | Shrine | Pucca |

*Source: LASA 2012*

# 3 ENVIRONMENTAL MANAGEMENT PLAN

A description of the various management measures during various stages of the project are provided in Table 3.1.

## 3.1 PRE-CONSTRUCTION STAGE

### 3.1.1 Pre-Construction Activities by R&B Dept,

Prior to the contractor mobilization, the R&B Dept. will ensure that an encumbrance free CoI is handed over to enable the start of construction. The RoW clearance involves the following activities:

- Clearance of the RoW includes removal of trees, and
- Relocation of common property resources impacted, including cultural properties as temples and community assets as hand pumps and other utilities

### 3.1.2 By Contractor/Monitoring Consultant

The pre-construction stage involves mobilization of the contractor, the activities undertaken by the contractor pertaining to the planning of logistics and site preparation necessary for commencing construction activities. The activities include:

- Joint field verification of EMP by the Contractor along with Monitoring Consultant
- Modification (if any) of the EMP shall be modified by the contractor in concurrence with Monitoring Consultant
- Procurement of construction equipment / machinery such as crushers, hot mix plants, batching plants and other construction equipment and machinery
- Identification and selection of material sources (quarry and borrow material, water, sand etc.)
- Selection, design and layout of construction areas, hot mix and batching plants, labour camps etc.
- Planning traffic diversions and detours, including arrangements for temporary land acquisition

## 3.2 CONSTRUCTION STAGE

### 3.2.1 Construction stage activities by the contractor

Construction stage activities require careful management to avoid environmental impacts. Activities that trigger the need for environmental measures to be followed include:

- Imbibing environmental principles at all stages of construction as good engineering practices
- Implementation of site-specific mitigation/management measures suggested
- Monitoring the quality of environment along the construction sites (as air, noise, water and soil)

There are several other environmental issues that have been addressed as part of good engineering practices, the costs for which have been accounted for in the engineering costs. They include improvement of roadside drainage, provision of additional cross drainage structures or raising the road height in low-lying stretches and reconstruction and improvement of bunds of the affected water bodies.

### 3.2.2 Construction Stage Activities by the R&B dept,

The construction stage involves the following activities by R&B Dept.:

- Tree plantation along the project corridor by the State Forest Department.
- Monitoring of environmental conditions through approved monitoring agency

## 3.3 OPERATION STAGE

Operation stage actives are to be carried out by the Environmental Cell which includes mostly environmental monitoring of operational performance of the various mitigation/ enhancement measures which is carried out as a part of GSHP-II.

## TABLE 3-1: ENVIRONMENTAL MANAGEMENT PLAN

| ENVIRONMENTAL ISSUES | | | | Ref: CLAUSES | ADDITIONAL MEASURES TO BE ADOPTED BY THE CONTRACTOR | LOCATION[3] | RESPONSIBILITY |
|---|---|---|---|---|---|---|---|
| **1.** | **PRE-CONSTRUCTION STAGE** | | | | | | |
| | **1.1.** | **Pre-construction activities by PIU** | | | | | |
| | | **1.1.1.** | Utility Relocation and Common Property Resources (CPRs) | **Clause 110.1. and 110.7 of MoRT&H** | • R&B dept, and concerned line departments shall take necessary precautions, and shall provide barricades/delineation of such sites to prevent accidents including accidental fall into bore holes, pits, drains both during demolition and construction/ relocation of such facilities. Standard safety practices shall be adopted for all such works<br>• Contractor shall be inventoried and mapped all the utility services that need to be relocating or shifting from the CoI. | Corridor of Impact. | R&B Dept. |
| | **1.2.** | **Pre-construction activities by the Contractor/ Monitoring Consultant** | | | | | |
| | | **1.2.1.** | Joint Field Verification | | • The Monitoring Consultant and Contractor shall ascertain the feasibility of implementing the Environmental Management Plan (EMP) through Joint field verification.<br>• Any observations / modification required in updating EMP shall be done by the Contractor concurrence with monitoring consultant and a copy of the modified EMP shall be submitted to the R&B dept, for review and approval. | Along project corridor | Contractor under the supervision of the Monitoring Consultant |
| | | **1.2.2.** | **Procurement of Machinery** | | | | |
| | | 1.2.2.1 | Crushers, Hot-Mix Plants & Batching Plants | (i) Emission control legislations of CPCB/ GPCB for air, noise etc.<br><br>**(ii) Clause 111.5 of MoRT&H (**Pollution from Hot mix and Batching Plant**)** | • The contractor shall follow all stipulated conditions for pollution control as suggested by the GPCB in the consent/ NoC for establishing and operating the Hot-mix and Batching Plant.<br>• No such installation by the Contractor shall be allowed till all the required legal clearances are obtained from the competent authority and the same is submitted to the Monitoring Consultant/ R&B dept,.<br>• The location of the hot-mix and batching plant shall be at least (i) 1000m away from settlements and shall be placed in the downwind direction and (ii) 10 km aerial distance away from the protected areas (sanctuary, national parks etc.).<br>• All possible efforts shall be undertaken to identify land for establishment of Hot Mix and Batching Plant, where no major alteration will be required compelling a drastic change in landuse.<br>• The contractor shall submit the detailed layout plan for approval | All construction machineries (Crushers, Hot-mix Plants & Batching Plants) should be kept/stationed 1000m away from settlements:<br>Dhandhulka (104+000)<br>Gunjar (110+800),<br>Ranpur (131+200),<br>Bodi (145+600) | Contractor under the supervision of the Monitoring Consultant |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | to the Monitoring Consultant before getting into formal agreement with landowners for setting up of such site. Actions by Monitoring Consultant and R&B dept, against any non-compliance shall be borne by the Contractor at his own cost | | |
| | | 1.2.2.2. | Other Construction Vehicles, Equipment and Machinery | Discharge standards and Noise limits as per **Environment Protection Act, 1986 (EPA)** Emission standards as per **Bureau of Indian Standard (BIS)** preferably **Bharat IV emission norms** | • Equipment's conforming to the latest noise and emission control measures shall be used.<br>• Pollution under Control (PUC) certificates for all vehicles and machinery shall be made available to the Monitoring Consultant/ R&B dept for verification whenever required. | Along project corridor | Contractor under the supervision of the Monitoring Consultant |
| | | **1.2.3.** | **Identification & Selection of Material Sources** | | | | |
| | | 1.2.3.1. | Borrow Areas | **Clause 305.2.2. of MoRT&H**<br>**Clause 111.2** (borrow pits for embankment construction) | • The Monitoring Consultant shall inspect every borrow area location prior to issuing approval for use of such sites.<br>• Care shall be taken to avoid agriculture areas for planning haul roads for accessing borrow materials. In case of damage, the contractor shall be solely responsible and shall rehabilitate it, as approved by Monitoring Consultant/ R&B dept.<br>• All borrow areas shall be restored either to the original condition or as per the approved rehabilitation plan by the Monitoring Consultant, immediately upon completion of the use of such a source. | | Contractor under the supervision of the Monitoring Consultant |
| | | 1.2.3.2. | Quarries | **Clause 111.3. of MoRT&H (**procuring Quarry materials**)** | • No quarry and/or crusher units shall be established, which is within 1000m from the residential/ settlement locations, forest boundary, wildlife movement path, breeding and nesting habitats and national parks/sanctuaries.<br>• Contractor shall work out haul road network to be used for transport of quarry materials and report to Monitoring Consultant who shall inspect and approve the same. | For new quarry area, it should be located 1000m from the following locations:<br>Settlement locations: Dhandhulka (104+000)<br>Gunjar (110+800),<br>Ranpur (131+200),<br>Bodi (145+600)<br>(i) Surface water locations:<br>Surface water sources/ drains/ Nalahs/ Ponds etc. at<br>108+020, 108+850,<br>109+350, 111+850, | Contractor under the supervision of the Monitoring consultant |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | 115+300, 116+500, 117+200, 118+150, 119+700, 121+200, 125+550, 130+005, 131+100, 131+500, 132+600, 134+350, 134+600, 136+400, 138+500, 139+100, 139+600, 140+100, 140+500, 143+500, 146+500, 148+250, 149+800.<br>Pond at Ch115+600 | |
| | | 1.2.3.3. | Arrangement for Construction Water | | • The contractor shall source the requirement of water preferably from surface water bodies, rivers, canals and tanks in the project area with the necessary approval from the concern authority.<br>• To avoid disruption/disturbance to other water users, the contractor shall extract water from fixed locations. The contractor shall consult the local people before finalizing the locations.<br>• Only at locations where surface water sources are not available, the contractor can contemplate extraction of ground water, after intimation and consent from the Monitoring Consultant.<br>• The contractor shall comply with the requirements of Central Ground Water Board, West Central Region (WCR), Ahmadabad, Gujarat and seek their approval for extraction of ground water. | All rivers / surface water bodies that can be utilized within the project area | Contractor under the supervision of the Monitoring Consultant |
| | | 1.2.3.4. | Sand (all river and stream beds used directly or indirectly for the project) | **Clause 111.3. of MoRT&H** | • In case of selection of new sites for sand quarrying, the Contractor shall obtain prior approval and concurrence from Competent District Authority.<br>• To avoid accidents and caving in of sand banks at quarry sites, sand shall be removed layer by layer. Digging deeper than the permissible limit (0.9 metres) shall not be allowed. Such quarry shall be barricaded 10m away from the periphery on all sides except the entry point, so as to prevent accidental fall of domestic cattle, wildlife and human beings. | Nearest sand quarries locations:<br><br>Fadiya River (Nagnesar) | Contractor under the supervision of the Monitoring Consultant |
| | | **1.2.4.** | **Setting up construction sites** | | | | |
| | | 1.2.4.1 | Construction Camp Locations – | | Construction camps shall not be proposed:<br>(i) Within 1000m of ecologically sensitive areas (if any) | Nearest Habitations: Dhandhulka (104+000) | Contractor under the supervision of the |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Selection, Design & Layout | | (ii) Within 1000m from the nearest habitation to avoid conflicts and stress over the infrastructure facilities, with the local community | Gunjar (110+800), Ranpur (131+200), Bodi (145+600) | Monitoring Consultant |
| | | 1.2.4.2. | Arrangements for Temporary Land Requirement | **Clause 108.3. of MoRT&H** | • The Monitoring Consultant shall ensure that the temporary site is cleared prior to handing over to the owner (after construction or completion of the activity) and it is included in the contract | Areas temporarily acquired for construction sites / hot mix plants / borrow areas / diversions / detours | Contractor under the supervision of the Monitoring Consultant |
| | | 1.2.4.3. | Stock-yards | | • The contractor shall identify the location for stockyards for construction materials at least 1000m from water courses.<br>• Separate enclosures shall be planned for storing construction materials containing fine particles such that sediment-laden water does not drain into nearby storm water drains | Construction labor camps<br>Nearest water body locations: Narmada Canal at 119+711 and two ponds at at Ch115+600 | Contractor under the supervision of the Monitoring Consultant |
| | | 1.2.4.4. | Fuel storage and re-fuelling areas | **Clause 2.1.1.7. of EMP (**Stripping of Soil**) Clause 2.1.4.1.2 of EMP (**dispose the spent oil and grease**)** | • The contractor shall ensure that all construction vehicle parking locations, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance and refuelling sites are located at least 500 m from rivers and irrigation canal/ponds. | Construction labor camps<br>Canals and Ponds locations: Near Narmada Canal at Ch 119+711 and drains/ Nalahs/ Ponds etc. at 108+020, 108+850, 109+350, 111+850, 115+300, 116+500, 117+200, 118+150, 121+200,125+550, 130+005, 131+100, 131+500,132+600, 134+350, 134+600, 136+400, 138+500, 139+100, 139+600, 140+100, 140+500, 143+500, 146+500, 148+250, 149+800. Pond at Ch115+600 | Contractor under the supervision of the Monitoring Consultant |
| | | **1.2.5.** | **Labour Camp Management** | | | | |
| | | 1.2.5.1 | Location of Construction labour camps:<br>Accommodation | **Factories Act, 1948** and **Building & other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 (**construction & maintenance of labor camp**)** | • The contractor shall provide, if required, erect and maintain necessary (temporary) living accommodation and ancillary facilities for labourers, to standards approved by the Monitoring Consultant.<br>• Labour camps shall not be located within 1000m from the nearest habitation to avoid conflicts and stress over the infrastructure facilities, with the local community. The location, layout and basic facility provision of labour camps shall be submitted to Monitoring Consultant for approval prior to construction. | Along the project corridor at the location of construction labor camps | Contractor under the supervision of the Monitoring Consultant |
| | | 1.2.5.2 | Potable Water | **The Contract Labour (Regulation and** | • The contractor shall supply portable water through municipal/ panchayat sources. In case of groundwater it shall be treated prior | Construction labor camps | Contractor under the supervision of the Monitoring |

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| | | | | **Abolition) Act, 1970** and **Factories Act, 1948** | to supply.<br>• | | Consultant |
| | | 1.2.5.3 | Sanitation facilities | **Factories Act, 1948** for sanitation | • The sanitation facilities for the camp shall be designed, built and operated in such a fashion that no health hazards occurs and no pollution to the air, ground water or adjacent water courses take place.<br>• No shared toilet facility shall be closer than 100 feet to any sleeping room, dining room, lunch area, or kitchen.<br>• Floor drains shall be provided in all bathrooms.<br>• Each toilet rooms, bathing rooms and washing area shall be lighted naturally or artificially by a safe type of lighting at all hours of the day and night. | Construction labor camps | Contractor under the supervision of the Monitoring Consultant |
| | | 1.2.5.4 | Waste Disposal | **Municipal Solid Waste Management Rules – 2016** for effective waste disposal | • The contractor shall provide garbage bins in the camps and ensure that these are regularly emptied and disposed off in a hygienic manner.<br>• Disposal shall be at designated disposal sites as advised by the local Panchayat body or the municipal corporation | Construction labor camps | Contractor under the supervision of the Monitoring Consultant |
| | | 1.2.5.5 | HIV/ AIDS Prevention Measures | | • The Contractor shall implement the following measures towards ensuring HIV/AIDS prevention during the entire contract period<br>• (i) conduct awareness campaign including dissemination of IEC materials on HIV/AIDS for all construction personnel (including labourers, supervisors, engineers and consultants) on HIV/AIDS/STDs within 3 months of mobilization and once a Quarter subsequently during the contract period;<br>• (ii) carry out screening of construction personnel for HIV/ AIDS, within the a quarter of mobilisation<br>• (iii) conduct er quarterly health check-up of all construction personnel including testing for STDs;<br>• (iv) erect and maintain hoardings/ information signages on HIV/AIDS prevention at the construction sites, labour camps and truck parking locations;<br>• (v) Install condom vending machines at the labour camps, including replenishment of supplies. | Construction & labor camps | Contractor under the supervision of the Monitoring Consultant |
| **2.** | **CONSTRUCTION STAGE** | | | | | | |
| | **2.1.** | **Construction Stage Activities by Contractor** | | | | | |
| | | **2.1.1.** | Site Clearance | | | | |
| | | 2.1.1.1. | Clearing and | **Clause 201. of** | • All works shall be carried out in a manner such that the damage or | Along project corridor at | |

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| | | | Grubbing | **MoRT&H** | disruption to flora is minimum. Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works shall be removed with prior approval fromMonitoring Consultant.<br>• In areas where grass or any form of vegetation is found, efforts to conserve topsoil shall be undertaken. | construction sites | |
| | | 2.1.1.2. | Dismantling of Bridgework/ Culverts | **Clause 202. Of MoRT&H**<br>**Construction and Demolition Waste Management Rules 2016** | • The contractor shall follow all necessary measures (including safety) especially while working close to cross drainage channels to prevent earthwork, stonework, materials and appendage from impeding cross drainage at rivers, streams, water canals and existing irrigation and drainage systems.<br>• All reusable materials can be stacked and treated separately. All possible efforts to reuse, recycle and reduce waste quantity shall be undertaken. | At locations where bridge works and culverts are proposed. | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.1.3. | Generation & disposal of Debris | **Clause 202.5 of MoRT&H**. For Disposal of materials<br>**Construction and Demolition Waste Management Rules 2016** | • Disposal of unutilized non-toxic debris shall be either through filling up of borrow areas or at pre-designated disposal sites, subject to the approval of the Monitoring Consultant.<br>• At locations identified for disposal of residual bituminous wastes, the disposal shall 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.<br>• Debris generated from pile driving or other construction activities along the rivers, streams and drainage channels shall be carefully disposed in such a manner that it does not flow into the surface water bodies or form puddles in the area.<br>• The pre-designated disposal locations shall be part of **Comprehensive Solid Waste Management Plan** to be prepared by Contractor in consultation and with approval of Monitoring Consultant. | Throughout Project Corridor | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.1.4. | Non-bituminous construction wastes disposal | **Clause 202. Of MoRT&H** | • The contractor shall finalise the location of disposal site based on the following.<br>o not located within designated forest area<br>o does not impact natural drainage courses<br>o No endangered/rare flora is impacted by such dumping.<br>o Settlements are located at least 1000m away from the site.<br>The Monitoring Consultant shall approve disposal sites after conformation | Disposal site locations | Contractor under the supervision of the Monitoring Consultant |

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| | | 2.1.1.5. | Bituminous wastes disposal | **Clause 202.5. of MoRT&H** | • The disposal of residual bituminous wastes shall be done by the contractor at secure land fill sites, with the requisite approvals for the same from the concerned government agencies. | Disposal site locations | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.1.6. | Stripping, stacking and preservation of top soil | **Clause 301.3.2** for stripping and preservation<br>**Clause 305.3.3** for construction and for embankments<br>**Clause 301.7**. for preservation of Top Soil | • Contractor shall strip the topsoil at all locations opened up for construction, including temporarily acquired land for traffic detours, storage, materials handling or any other construction related or incidental activities.<br>• Segregated topsoil shall be stored in stockpiles of 1 to 1.25-m height. The stockpiles shall be located such that disturbance to construction work is minimal.<br>• In dry weather conditions (between Feb - June), topsoil stacks shall be sprinkled with water on all sides to keep the moisture content of the stack. | At all construction sites | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.1.7. | Accessibility | | • The Contractor shall provide safe and convenient passage for vehicles; pedestrians and livestock to and from roadsides and property accesses by providing temporary connecting road, as necessary.<br>• Construction activities that shall affect the use of side roads and existing accesses to individual properties, whether public or private, shall not be undertaken without providing adequate provisions to ensure uninterrupted access, as approved by the Monitoring Consultant.<br>• The Contractor shall take care that the cross roads are constructed in such a sequence that construction work over the adjacent cross roads are taken up in a manner that traffic movement in any given area does not get affected. | Throughout Project Corridor | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.1.8. | Planning for Traffic Diversions and Detours | **Clause 112. of MoRT&H** | • Detailed traffic control plans shall be prepared by the contractor and the same shall be submitted to the Monitoring Consultant.<br>• The Contractor shall provide specific measures for safety of pedestrians and workers as a part of traffic control plans. The Contractor shall ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow.<br>• The Contractor shall inform local community of changes in traffic routes and pedestrian access arrangements with assistance from Monitoring Consultant and PIU. | All along the project corridor, all access roads.<br>Attention is required at:<br>Dhandhulka (104+000)<br>Gunjar (110+800),<br>Ranpur (131+200),<br>Bodi (145+600) | Contractor under the supervision of the Monitoring Consultant |
| | | **2.1.2.** | Construction Materials | | | | |

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| | | 2.1.2.1. | Earth from Borrow Areas for Construction | **IRC 010-1961 (**procurement of earth materials**)** | • The mitigation strategy in the form of Development and rehabilitation Plan shall be prepared by Contractor<br>• The borrow pits shall not be left in a condition likely to cause hazard to human and animal life.<br>• The contractor shall seek prior approval from the concern authorities for operating the borrow pit. | All along the project corridor, all access roads, temporarily acquired sites & all borrow areas | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.2.3. | Blasting | **Clause of 302. Of MoRT&H** | | All blasting and Pre-splitting Sites. | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.2.4. | Transporting Construction Materials | **Clause 111.9. of MoRT&H** | • All vehicles delivering materials to the site shall be covered to avoid spillage of materials.<br>• The unloading of materials at construction sites close to settlements shall be restricted to daytime only. | All along the Project corridor and all haul roads | Contractor under the supervision of the Monitoring Consultant |
| | | **2.1.3.** | **Construction work** | | | | |
| | | 2.1.3.1. | Disruption to other users of Water | **Annexure "A" Protection of the Environment of MoRT&H** and **Clause 2 Water Quality of MoRT&H** | • In case of diversion of water bodies, the Contractor shall take prior approval of the Irrigation Department and Monitoring Consultant for any such activity. The PIU shall ensure that Contractor has served the notice to the downstream users of water well in advance where such diversion of the flow is likely to affect the downstream population subject to the condition that under no circumstances the downstream flow shall be stopped. | | Contractor under the supervision of the PIU |
| | | 2.1.3.2. | Drainage and Flood Control | **Clause 202. Of MoRT&H** | • Contractor shall ensure that construction materials like earth, stone, ash or appendage disposed off does not block the flow of water of any water course and cross drainage channels.<br>• Where necessary, adequate mechanical devices to bailout accumulated water from construction sites, camp sites, storage yard, excavation areas are to be arranged well in advance before the rainy season besides providing temporary cross drainage systems.<br>• The contractor shall take all adequate precautions to ensure that construction materials and excavated materials are enclosed in such a manner that erosion or run-off of sediments is controlled. Silt fencing shall be installed prior to the onset of the monsoon at all the required locations, as directed by Monitoring Consultant and PIU.<br>• The contractor shall ensure that no material blocks the natural flow of water in any water course or cross drainage channel. Prior to monsoon, the contractor shall provide either permanent or | Surface water sources/ drains/ Nalahs/ Ponds etc.<br><br>Silt fencing should be given near at:<br>Ponds at Ch 115+538 and Ch16+000 | Contractor under the supervision of the Monitoring Consultant |

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| | | | | | temporary drains to prevent water | | |
| | | 2.1.3.3. | Siltation of Water Bodies and Degradation of Water Quality | **Clause 306. of MoRT&H** for soil erosion and sedimentation control | | Surface water sources/ drains/ Nalahs/ Ponds etc.<br>Silt fencing at: Water body location: Ponds at Ch 115+638 | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.3.4. | Slope Protection and Control of Soil Erosion | **Clause 306. of MoRT&H** for soil erosion and sedimentation control **Clause 307. of MoRT&H** for Turfing works **Clause 308. of M MoRT&H** for other measures of Slope Protection | • The contractor shall construct slope protection works as per design, or as directed by the Monitoring Consultant | High raise embankment and surface water bodies locations<br><br>Stone Pitching method at Canal crossings:<br>Ponds at Ch 115+638 | Contractor under the supervision of the Monitoring Consultant |
| | | **2.1.4.** | **Pollution Control** | | | | |
| | | 2.1.4.1.1. | Water Pollution from Construction Wastes | **Schedule VI - General Standards for Discharge of Environmental Pollutants** (Liquid Waste Disposal) - **CPCB**<br>**The Environment (Protection) Rules, 1986** and **Water Act, 1974** | • The Contractor shall take all precautionary measures to prevent the wastewater generated during construction from entering into streams, water bodies or the irrigation channels.<br>• Contractor shall avoid construction works close to the streams or water bodies during monsoon. | Surface water sources/ drains/ Nalahs/ Ponds etc.<br>At locations:<br>Ponds at Ch 115+638 | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.4.1.2. | Water Pollution from Fuel, Lubricants and Chemicals | **Petroleum Act and Rules** and **Environment (Protection) Rules, 1986** (**Standards for Emission or Discharge of Environmental Pollutants Schedule – I**) for Liquid Waste Disposal<br>**Clause 111.** (Precaution and Safeguarding the Environment)<br>**Annexure 'A'** to **Clause 501** (Protection of Environment) - **Section 2 water quality** | • Oil interceptors shall be provided for vehicle parking, wash down and refuelling areas.<br>• In all, fuel storage and refuelling areas, if located on agricultural land or areas supporting vegetation, the top soil shall be stripped, stockpiled and returned after cessation of such storage. | Surface water sources/ drains/ Nalahs/ Ponds etc.<br>At locations:<br>Ponds at Ch 115+638 | Contractor under the supervision of the Monitoring Consultant |

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| | | | | **Clause 301.3.2 of MoRT&H. (**Stripping and preservation of top soil) | | | |
| | | 2.1.4.2. | **Air Pollution** | | | | |
| | | 2.1.4.2.1. | Dust Pollution | **Annexure 'A' to Clause 501** (Protection of Environment) - **Section 3 Air Quality**<br>**Clause 111.5.** of **MoRT&H. (**Hot mix plant and batch mix plant**)** | • The conditions for pollution control given in the **NoC (consent for establish and operate)** by the GPCB shall be strictly followed.<br>• Air pollution monitoring shall be conducted as per the Environmental Monitoring Plan and results shall be used to identify any additional pollution control measures required to be adopted. | Construction area/ site, Construction camps, Materials Loading / unloading facilities | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.4.2.2. | Emission from Constructio n Vehicles, Equipment and Machineries | **Schedule-I: Standards for Emission** suggested by **CPCB/ GPCB** | • Certification issued for such contrivances obtained from designated/approved authority shall be submitted along with the specified reporting format to the Monitoring Consultant.<br>• The contractor shall maintain a separate file and submit PUC certificates for all vehicles/equipment/machinery used for the project. Monitoring results shall be submitted to Monitoring Consultant and PIU. | Construction camps, Materials Loading / unloading facilities | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.4.3. | **Noise Pollution** | | | | |
| | | 2.1.4.3.1. | Noise Pollution: Noise from Vehicles, Plants and Equipments | **Noise Limits for vehicles (Environment (Protection) Amendment Rules, 2000)** and **Part 'E', Schedule – VI of Environment (Protection) Rules, 1986.**<br>**Clause 5A The Noise Pollution (Regulation and Control) Rules, 2000 (**sound emitting construction equipments**)**<br>**Clause 201.2 of MoRT&H** for Idling of temporary trucks | • All plants and equipment used in construction shall strictly conform to the MoEF/ CPCB noise standards.<br>• Noisy construction activities (such as crushing, concrete mixing, batching etc.) within 150m of the nearest habitation/ educational institutes/health centers (silence zones) shall be stopped during the night time between 9.00 pm to 6.00 am.<br>• Contractor shall provide noise barriers to the suggested locations of select schools/ Temples/health centers prior to commencement of work.<br>• Monitoring shall be carried out at the construction sites as per the monitoring schedule and results shall be submitted to Monitoring Consultant. Based on the monitoring results, the Monitoring Consultant, if required, shall recommend any additional noise mitigation measures required to be implemented by the Contractor. | Sensitive receptors:<br>Dhandhulka (104+000), Gunjar (110+800), Ranpur (131+200), and Bodi (145+600)<br>Schools (105+200, 111+000, 147+400)<br>3 Darga (110+800, 120+400, 121+200)<br>Hospital (116+044) College (129+820)<br>Shivshakti Boys Hostel Ranpur (130+193) | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.4.4. | **Safety** | | | | |
| | | 2.1.4.4.1 | Safety Procedures | | The Contractor shall:<br>Comply with all applicable safety regulations, | All construction sites | Contractor under the supervision of the |

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| | | | | | ▯ Take care for the safety of all persons entitled to be on the Site,<br>▯ Use reasonable efforts to keep the site and works clear of unnecessary obstruction so as to avoid danger to these persons,<br>• Provide fencing, lighting, guarding and watching of the works until completion and taking over and provide any temporary works (including roadways, footways, guards and fences) which may be necessary, because of the execution of the works, for the use and protection of the public and of owners and occupiers of adjacent land. | | Monitoring Consultant |
| | | 2.1.4.4.2 | Care and supply of Documents | | • The contractor shall prepare, submit and obtain approval of the Monitoring Consultant for construction Safety Management Plan 14 days prior to commencement of construction works at site. | | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.4.4.3 | Contractors general obligations | | • All design calculations and fabrication drawings for temporary works (such as form-work, staging, centring, scaffolding, specialized construction, handling and launching equipment and the like)material lists for structural fabrication as well as detailed drawings for templates, and anchorage and temporary support details for prestressing cables as well as bar bending and cutting schedules for reinforcement, etc. shall be prepared by the contractor at his own cost and forwarded to the Monitoring Consultant at least six weeks in advance of actual constructional requirements. The Monitoring Consultant will check the same for the contractor's use with amendments. | | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.4.4.4 | Personal Safety Measures for Labour, Material handling , Painting etc. | **Factory Act, 1948, Factories (Amendment) Act, 1987 (Chapter -5 Safety)**<br><br>**Building and Other Construction Workers (Regulation of Employment and Conditions of Services) Act, 1996** | Construction Safety Plan shall be prepared by the Contractor during mobilization and approved by Monitoring Consultant shall be adhered to by the Contractor throughout the construction period, and shall include provision of.<br>• Protective footwear and protective goggles to all workers employed in mixing asphalt materials, cement, lime mortars, concrete etc.<br>• Welders protective eye-shields to workers engaged in welding works<br>▯ Protective goggles and clothing to workers engaged in stone breaking activities and workers shall be seated at sufficiently safe intervals<br>▯ The contractor shall comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress. | All construction sites | Contractor under the supervision of the Monitoring Consultant |

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| | | | | | ▯ The contractor shall ensure that no paint containing lead or lead products is used except in the form of paste or readymade paint.<br>▯ Contractor shall provide facemasks to the workers when paint is applied in the form of spray or a surface having dry lead paint is rubbed and scrapped.<br>• The Contractor shall mark 'hard hat' and 'no smoking' and other 'high risk' areas and enforce non-compliance of use of PPE with zero tolerance. | | |
| | | 2.1.4.4.5 | Health and Safety | | • The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the contractor's personnel. In collaboration with local health authorities, the contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the site.<br>• The contractor shall appoint an accident prevention officer at the site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the execution of the works, the contractor shall provide whatever is required by this person to exercise this responsibility and authority.<br>• The contractor shall send, to the Monitoring Consultant, details of any accident as soon as practicable after its occurrence.<br>• The contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Monitoring Consultant may reasonably require. | All construction sites and labour camps | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.4.4.6 | Traffic Safety & Pedestrian Safety | **Clause 112. of MoRT&H (**Arrangement for traffic during construction**)** | • Pedestrian Safety shall be ensured. Pedestrian circulation shall be demarcated prior to start & unsafe areas shall be cordoned off. | All along the project corridor | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.4.4.7 | Risk from Electrical Equipment(s) | **Factory Act, 1948 – Chapter -5 (Safety**) and **Factories (Amendment) Act, 1987** | • No material shall be so stacked or placed as to cause danger or inconvenience to any person or the public.<br>• All machines to be used in the construction shall conform to the relevant Indian Standards (IS) codes, shall be free from patent defect, shall be kept in good working order, shall be regularly inspected and properly maintained as per IS provision and to the satisfaction of the Monitoring Consultant | All construction equipment | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.4.4.8 | Safety during Road Works | **Clause 112.4. of MoRT&H (**Traffic | • The contractor shall provide adequate signage and markings as per the instruction of the Monitoring Consultant in the construction | All along the project corridor and all haul roads | Contractor under the supervision of the Monitoring |

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| | | | | safety**)**<br>**Clause 112.5. of MoRT&H (**Maintenance and Diversions**)**<br>**IRC:SP:55 (**Road signage and markings **)** | zones. | | Consultant |
| | | 2.1.4.4.9 | First Aid | **Section 36 (First Aid) of Building and the other Construction Workers(Regulation of Employment and Conditions of Service) Act, 1996** | • First aid measure shall be provided in the construction zones and labour camps. | All construction sites and labour camps | Contractor under the supervision of the Monitoring Consultant |
| | | 2.1.4.5. | **Cultural Property** | | | | |
| | | 2.1.4.5.1. | Chance Found Archaeologic al Property | **Ancient Monuments and Archaeological Sites and Remains Rules 1959**<br>**Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act 2010** | • All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or archaeological interest discovered on the site are the property of the Government and shall be dealt with as per provisions of the relevant legislation.<br>• The contractor shall take reasonable precautions to prevent his workmen or any other persons from removing and damaging any such article or thing. | Along the project corridor | Contractor under the supervision of the Monitoring Consultant |
| | | **2.2.** | **Environmental enhancement and special issues** | | | | |
| | | **2.2.1.** | Enhancement measures | | • Landscaping at junctions to improve aesthetics etc.<br>• Rehabilitation of cultural and community properties | At suitable locations along the project road | Contractor under the supervision of the Monitoring Consultant |
| | | **2.2.2.** | Rehabilitation/ enhancement of Cultural and Religious Properties | **Physical Cultural Resources (WB OP/BP 4.11)** | • The architectural elements of the structure shall be conserved/reflected/translated into the design of new structures/ enhancements in accordance with wishes of the community. | | |
| | | **2.2.3.** | Flora and Chance found Fauna | | • The contractor shall take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body and hunting of any animal.<br>• If any wild animal is found near the construction site at any point of time, the contractor shall acquaint the Monitoring Consultant and execute the Monitoring Consultant's instructions for dealing | Along the project road / forest | Contractor under the supervision of the Monitoring Consultant |

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| | | | | | with the same.<br>• The Monitoring Consultant shall report to the nearby forest office (range office) and shall take appropriate steps/ measures in consultation with the forest officials. | | |
| | | **2.2.4.** | Sensitive receptors | | • Sensitive receptors like schools, hospitals are provided with permanent noise barriers prior to the start of work in order to minimize the dust and noise impacts due to vehicle movement (during / post construction). Their effectiveness to be checked during operation phase.<br>• Construction activities shall be confined within the present available CoI, regularly strict monitoring/supervision shall be done to minimize/control air-noise pollution and abatement of dust particles at minimum level possible using well maintained modern machineries. | Dhandhulka (104+000), Gunjar (110+800), Ranpur (131+200), and Bodi (145+600)<br>Schools (105+200, 111+000, 147+400)<br>3 Darga (110+800, 120+400, 121+200)<br>Hospital (116+044) College (129+820)<br>Shivshakti Boys Hostel Ranpur (130+193) | Contractor under the supervision of the Monitoring Consultant |
| | | **2.3.** | **Contractor Demobilization** | | | | |
| | | **2.3.1.** | Clearing of Construction of Camps & Restoration | | • Contractor to prepare site restoration plans for approval by the Monitoring Consultant. The plan shall be implemented by the contractor prior to demobilization.<br>• On completion of the works, all temporary structures shall be cleared, all rubbish burnt, excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the Contractor's expense, to the entire satisfaction of the Monitoring Consultant.<br>• The topsoil removed and conserved earlier shall be spread over the restoration area as per the direction of the Monitoring Consultant to facilitate the growth of vegetation.<br>• Residual topsoil shall be distributed on adjoining/proximate barren/rocky areas as identified by the Monitoring Consultant in a layer of thickness of 75mm – 150mm. | All Construction Workers' Camps | Contractor under the supervision of the Monitoring Consultant |
| | | **2.3.2.** | Redevelopment of Borrow Areas | | • Redevelopment of borrow areas shall be taken up in accordance with the plans approved by the Monitoring Consultant | All borrow area locations used for the project. | Contractor under the supervision of the Monitoring Consultant |
| **3.** | **OPERATION STAGE (Activities to be Carried Out by the Contractor/R&BD/PIU)** | | | | | | |
| | **3.1** | | Monitoring and Evaluation of Operational | | • The PIU shall monitor the operational performance of the various mitigation/ enhancement measures carried out as a part of the project. Monitoring and performance indicators have been | All along the project corridor | Contractor under the supervision of the Monitoring |

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| | | | Performance of Environmental Mitigation Measures | | indicated in **Environmental Monitoring Plan (Table 4.2).** | | Consultant |
| | **3.2** | | Maintenance of Drainage | | • PIU shall ensure that all drains (side drains and all cross drainages) are periodically cleared especially before monsoon season to facilitate the quick passage of rainwater and avoid flooding without damaging the spurs and check dams erected to stabilize the course and flow of all such drainage channels.<br>• PIU shall ensure that all the sediment/oil and grease traps set up at the water bodies are cleared once in every three months. | At locations were bridge works and culverts are proposed. | Contractor under the supervision of the Monitoring Consultant |
| | **3.3** | | Pollution Monitoring | | • The periodic monitoring of the ambient air quality, noise level, water (both ground and surface water) quality, soil pollution/contamination are to be continued at pre-designated locations as identified in the **Environmental Monitoring Plan (Table 4.2)** and if necessary, at additional locations for comparative study of pre and post operation data in order to ensure further improvement/modification in similar future works. | All along the project corridor | Contractor under the supervision of the Monitoring Consultant |
| | **3.4** | | Atmospheric Pollution | | • Ambient air concentrations of various pollutants shall be monitored as envisaged in the Environmental Monitoring Plan at pre designated locations to compare the levels with the pre-construction data.<br>• Additional data at other location may be collected as per any site specific requirement. | All along the project corridor | Contractor under the supervision of the Monitoring Consultant |
| | **3.5** | | Noise Pollution | | • Noise pollution shall be monitored as per **Environmental Monitoring Plan** at sensitive locations where pre-construction noise data was collected. The functioning of the noise barriers shall be supervised and monitored for further improvement/replication at other affected points if necessary.<br>• Signage near sensitive locations shall be maintained and kept clean. Monitoring the effectiveness of the pollution attenuation measures shall be taken up as per **Environmental Monitoring Plan (Table 4.2).** | All along the project corridor | Contractor under the supervision of the Monitoring Consultant |
| | **3.6** | | Soil Erosion and Monitoring of Borrow Areas | | • Visual monitoring and inspection of soil erosion at borrow areas, quarries (if closed and rehabilitated), embankments and other places expected to be affected, shall be carried to record and monitor the effectiveness of such structures after the completion of project, so as to evaluate the beneficial effects of each type of | | Contractor under the supervision of the Monitoring Consultant |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | activity together with the cost involved. | | |
| | **3.7** | | Road Safety and Maintenance of Assets | | • No advertisement/hoardings shall be allowed within the Right of Way limits of the project road.<br>• Regular maintenance and cleaning of assets such as sign boards, bus stops, drains etc. shall be undertaken. | All along the project corridor | Contractor under the supervision of the Monitoring Consultant |

[3] All locations are referred to design chainages

# 4 IMPLEMENTATION ARRANGEMENTS

### 4.1.1 ENVIRONMENTAL MONITORING PLAN

To ensure the effective implementation of the EMP, it is essential that an effective monitoring programme be designed and carried out. The contractor shall perform Environmental quality monitoring through NABL aggregated laboratory. Broad objectives of the monitoring programme are:

- To evaluate the performance of mitigation measures proposed in the EMP
- To suggest improvements in the management plans, if required
- To satisfy the statutory and community obligations
- To provide feedback on adequacy of Environmental Impact Assessment

### 4.1.2 Monitoring Indicators

The monitoring programme contains monitoring plan for all performance indicators, reporting formats and necessary budgetary provisions. Physical, biological and environmental management components identified as of particular significance in affecting the environment at critical locations have been suggested as Performance Indicators (PIs). The Performance Indicators shall be evaluated under three heads as:

- Environmental condition indicators to determine efficacy of environmental management measures in control of air, noise, water and soil pollution;
- Environmental management indicators to determine compliance with the suggested environmental management measures.
- Operational performance indicators have also been devised to determine efficacy and utility of the mitigation/enhancement designs proposed.

**TABLE 4-1: ENVIRONMENTAL MONITORING INDICATORS**

| Sr. No. | Indicator | Details | Stage | Responsibility |
|---|---|---|---|---|
| **A** | **Environmental Condition Indicators and Monitoring Plan** | | | |
| **1** | Air Quality | The parameters to be monitored, frequency and duration of monitoring as well as the locations to be monitored will be as per the Monitoring Plan prepared **(Refer Table 4.2)** | Pre- Construction | Contractor |
| | | | Construction | Contractor |
| | | | Operation (DL Period) | Contractor |
| **2** | Noise Levels | | Pre- Construction | Contractor |
| | | | Construction | Contractor |
| | | | Operation (DL Period) | Contractor |
| **3** | Water Quality | | Pre- Construction | Contractor |
| | | | Construction | Contractor |
| **4** | Soil Quality | | Pre-Construction | Contractor |
| | | | Construction | Contractor |
| **B** | **Environmental Management Indicators and Monitoring Plan** | | | |
| **1** | Tree Cutting | Progress of tree removal marked for cutting is to be reported. | Pre-construction | Forest Dept, /PIU |
| **2** | Construction Camps | Location of construction camps have to be identified and parameters indicative of environment in the area has to be reported. | Pre- construction | Contractor |
| **3** | Borrow Areas | Location of borrow areas have to be identified and parameters indicative of environment in the area has to be reported. | Pre- construction | Contractor |
| **4** | Rehabilitation | Monitoring Consultant will undertake site visits to verify that all borrow areas have been rehabilitated in line with the landowner's request and to their full satisfaction. | Construction | Contractor |

For each of the environmental condition indicator, the monitoring plan specifies the parameters to be monitored; frequency and duration of monitoring. The monitoring plan also specifies the applicable standards, implementation and supervising responsibilities. The monitoring plan for environmental condition indicators of the project in construction and operation stages is presented in Table 4.2.

## TABLE 4-2: ENVIRONMENTAL MONITORING PLAN

| Attribute | Project Stage | Parameter | Special Guidance | Standards | Frequency | Duration | Location | Implementation |
|---|---|---|---|---|---|---|---|---|
| **Air** | Construction | $SO_2$, $NO_x$, $PM_{10}$, PM2.5, CO | High volume sampler to be located 50m from the plant in the Downwind direction. Use method specified by CPCB for analysis. Environmental monitoring shall be conducted by NABL approved laboratory. | National Ambient Air Quality Standard , CPCB, 2009 | One time in a seasons and three seasons per year | 24 hours Sampling | Three location along the road (preferable construction site or sensitive receptor and settlement area) Hot Mix / Batching Plant And labour camp site (Covered in Dhandhuka Dholera Section) | Contractor under the supervision of the Monitoring Consultant |
| | Operation[4] | | | | One time in a year | | Three location along the road (sensitive receptor / settlement area) | |
| **Noise** | Construction | **Leq Day, Leq Night, $L_{DN}$** | Equivalent noise levels using an integrated noise level meter kept at a distance of 15 from edge of pavement Equivalent noise levels using an integrated noise level meter kept at a distance of 15 from edge of pavement. Environmental monitoring shall be conducted by NABL aggregated laboratory. | MoEF&CC Noise Rules, 2000 | One time in a seasons and three seasons per year | 24 hr sampling | Three location along the road (preferable construction site or sensitive receptor and settlement area), Hot Mix / Batching Plant And labour camp site (Covered in Dhandhuka Dholera Section) | Contractor under the supervision of the Monitoring Consultant |
| | Operation | | | | One time in a year | | Three location along the road (sensitive receptor / settlement area) | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Water** | Construction | All essential characteristics and some of desirable characteristics as decided by the Environmental Specialist of the MC and PIU | Grab sample collected from source and Analyse as per Standard Methods for Examination of Water and Wastewater. Environmental monitoring shall be conducted by NABL Approved laboratory. | Indian Standards for Inland Surface Waters (IS: 2296, 1982 | Twice in a year (pre and post monsoon season) | Grab Sampling | Two Surface water and one ground water sources along the road | Contractor under the supervision of the Monitoring Consultant |
| **Soil** | Construction | Monitoring of Pb, SAR and Oil & Grease | Sample of soil collected to acidified and analysed using absorption Spectrophotometer. Environmental monitoring shall be conducted by NABL Approved laboratory. | Threshold for each contaminant set by IRIS database of USEPA until national standards are promulgated | Once in a year | Grab Sampling | Two locations along the road | Contractor under the supervision of the Monitoring Consultant |
| **Borrow area** | Pre-construction | Suitability of the material as per IS 2720 | - | IS 2720 | Once | Once | Borrow area location | Contractor under the supervision of the Monitoring Consultant |
| **Rehabilitation of Borrow Areas** | Construction | As per Guidelines | Visual Observation | - | Once in a month | - | | |
| **HIV/ AIDS Prevention Measures** | Construction | Awareness campaign | - | - | Quarterly | - | Construction and Labour Camp sites | Contractor under the supervision of the Monitoring Consultant / R&BD/PIU |
| | | HIV/ AIDS Screening of construction personnel's | | | Within 3 months of mobilization and every quarter during construction | | | |
| | | IEC materials distribution | | | Quarterly | | | |
| | | Condom Distribution | | | Once a month | | | |

[4] Parameters to be monitored for Operation stage is same as Construction stage

## 4.2 REPORTING SYSTEM

Reporting system for the suggested monitoring program operates at two levels as:

- Reporting for environmental condition indicators and environmental management indicators
- Reporting for operational performance indicators at the PIU level

Contractor and Monitoring Consultant operate the reporting system for environmental condition and environmental management indicators.

Contractor will report to the Monitoring Consultant on the progress of the implementation of environmental conditions and management measures as per the monitoring plans. The Monitoring Consultant will in turn report to the PIU on a quarterly basis which will be reviewed. Reporting formats shall be prepared, which will form the basis of monitoring, by the Monitoring Consultant and/or the PIU as required.

**TABLE 4-3: SUMMARY DETAILS OF REPORTING**

| Format No. | Item | Stage | Contractor | MC | PIU |
|---|---|---|---|---|---|
| | | | Implementation & Reporting to MC | Review and Reporting to PIU, | Oversee/ Field Compliance Monitoring |
| **EM 1** | Identification of Disposal Locations | Pre- Construction | One Time | One Time | One Time |
| **EM 2** | Setting up of Construction Camp | Pre- Construction | One Time | One Time | One Time |
| **EM 3** | Borrow Area Identification | Pre- Construction | One Time | One Time | One Time |
| | Borrow area management | Construction | Monthly | Quarterly | |
| **EM 6** | Status Regarding Rehabilitation of Borrow Areas | Construction | - | - | Half Yearly |
| **EM 4** | Tree Cutting status | Pre- Construction | - | - | Monthly |
| **EM 5** | Top Soil Monitoring | Construction | Monthly | Quarterly | Quarterly |
| **EM 7** | Construction Safety | Construction | Monthly | Quarterly | Quarterly |
| **EC 1** | Pollution Monitoring | Construction | As Per Monitoring Plan | Quarterly | Quarterly |
| **EC 2** | Pollution Monitoring | Post Construction (DL Period) | As Per Monitoring Plan | Quarterly | Quarterly |

In addition to these formats, to ensure that the environmental provisions are included at every activity of the implementation by the contractor, it is suggested that the approval of the environmental personnel of the contractor is required in the request for application to proceed or other similar reporting formats used by the contractor. These will not only ensure that the environmental provisions are addressed but also link the satisfactory compliance to environmental procedures prior to approval of the Interim Payment Certificate (IPC) by the Monitoring Consultant. The activities by the contractor that can impact the environment will be identified based on discussions between the PIU, team leader of the Monitoring Consultant and the Environmental personnel of the Monitoring Consultant. The decisions will be communicated to the contractor prior to the start of the construction activities.

The contractor shall take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.

## 4.3 CLAUSE FOR NONCONFORMITY TO EMP - PROTECTION OF THE ENVIRONMENT

The Contractor shall implement all mitigation measures for which responsibility is assigned to him as stipulated in the EMP Report. Any lapse in implementing the same will attract the damage clause as detailed below:

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.

## 4.4 INSTITUTIONAL SETUP

During implementation, the Contractor, Monitoring Consultant and PIU will be collectively responsible for ensuring effective implementation of the provisions of the EMP and to comply with all statutory and legal requirements and procedures applicable for the project. The institutional responsibilities for EMP implementation are presented in Table 4.4.

## TABLE 4-4: INSTITUTIONAL RESPONSIBILITIES

| 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 | R&BD |
| 2 | Undertaking Environmental & Social Assessment | Contractor | Monitoring Consultant | R&BD |
| 3 | Undertaking Community Consultation process to feed into EA and EMP process | Contractor | Local Relationship Committee | R&BD |
| 4 | Preparation of Environmental Management Plan based on referral ESGPs | Contractor | Monitoring Consultant | R&BD |
| 5 | Self-Assessment of Environmental and Social Performance | Contractor | Monitoring Consultant | R&BD |
| 6 | Performance Assessment by Employer | Monitoring Consultant | PIU | R&BD |
| 7 | Setting up Labour Camps and labour deployment<br>Setting up Concrete Batching Plant and Casting Yard<br>Setting up Bituminous Hot Mix Plants<br>Setting up Site Offices<br>Setting up Construction Yards | Contractor | Monitoring Consultant | R&BD |
| 8 | Sourcing Construction Materials such as Sand, Bricks, Stone, Ready Mix Concrete etc. | Contractor | Monitoring Consultant | R&BD |
| 9 | Borrow area Management<br>Identification of location<br>Liaising with land owner<br>Rehabilitation | Contractor | Monitoring Consultant | R&BD |
| 10 | EHS related Policy and Regulatory Compliance | Contractor | Monitoring Consultant | R&BD |
| 11 | Tree counting and documentation along with forest department | Contractor | Monitoring Consultant | R&BD |
| 12 | Occupational Health & Labour Safety Measures | Contractor | Monitoring Consultant | R&BD |
| 13 | Land Acquisition<br>Pursuing the process of LA | PIU | PIU | Government of Gujarat |
| 14 | R&R planning and RAP if any | Contractor | Monitoring Consultant | R&BD |
| 15 | Prior information and disclosure to the public | Monitoring Consultant | Local Relationship Committee | R&BD |
| 16 | Geotechnical Investigations | Contractor | Monitoring Consultant | Monitoring Consultant |
| 17 | Clearing and grubbing | Contractor | Monitoring Consultant | Monitoring Consultant |
| 18 | Dismantling of Structures | Contractor | Monitoring Consultant | Monitoring Consultant |
| 19 | Traffic Management during Construction | Contractor | Monitoring Consultant | R&B D, with Traffic Police |
| 20 | Deployment and Use of Construction Equipments, Vehicles etc | Contractor | Monitoring Consultant | Monitoring Consultant |
| 21 | Project Road and other Network Roads used by Construction Traffic | Contractor | Monitoring Consultant | Monitoring Consultant |

| Sl. No | ESMF Actions (Refer to concerned ESGPs for list of Actions) | Responsibilities | | |
|---|---|---|---|---|
| | | Execution | Monitoring/Cross Check | Approval |
| 22 | Earthwork in Excavation for Roadway in all Strata Including Rock. | Contractor | Monitoring Consultant | Monitoring Consultant |
| 23 | Earthwork in Embankment Using Material Obtained Within RoW and Using Material Obtained from Borrow Areas | Contractor | Monitoring Consultant | Monitoring Consultant |
| 24 | Utility Relocation | Concern Department | Monitoring Consultant | Govt. Of Gujarat |
| 25 | Construction Waste Management Identification of locations, recyclers.<br>Compliance to Hazardous waste rule Waste Disposal methods<br>Quantifications of waste (all types)<br>Rehabilitation of disposal site | Contractor | Monitoring Consultant | Monitoring Consultant |
| 26 | Soil Erosion and Sedimentation Control in Roadway | Contractor | Monitoring Consultant | Monitoring Consultant |
| 27 | Bituminous Pavement Construction | Contractor | Monitoring Consultant | Monitoring Consultant |
| 28 | Environmental Monitoring<br>Air Pollution<br>Noise Pollution<br>Frequency for monitoring | Contractor | Monitoring Consultant | Monitoring Consultant |
| 29 | Road Materials Testing Laboratory | Contractor | Monitoring Consultant | Monitoring Consultant |
| 30 | General Workmanship | Contractor | Monitoring Consultant | Monitoring Consultant |
| 31 | Onsite Concrete Preparation | Contractor | Monitoring Consultant | Monitoring Consultant |
| 32 | Grievance management | Contractor | Monitoring Consultant/ LRC | The Employer |
| 33 | Traffic Management at specific areas and during specific periods | Contractor | Monitoring Consultant | R&B Dept, with traffic Police |
| 34 | Road Safety Audit and Accident Prone Spot Management | Contractor | Monitoring Consultant | Monitoring Consultant |
| 35 | Streamlining Traffic flow at specific locations | Contractor | Monitoring Consultant | R&B Dept, with Traffic Police |
| 36 | Emergency Incident and Accidents Management | Contractor | Monitoring Consultant | Monitoring Consultant |

## 4.5 ENVIRONMENTAL CONSTRUCTION GUIDELINES

To assist the Contractor to deliver sustained environmental and social (E&S) performance, this contract references a set of guidelines for practice covering social and environmental aspects. These also define a minimum level of EHS&S mitigation and performance. Copies of these are available from the Employer. This will be issued to Contractor upon request.

The following set of referral Guidelines of practice covering social and environmental aspects has been provided for reference.

**TABLE 4-5: GUIDELINE FOR GOOD ENVIRONMENTAL AND SOCIAL PRACTICES**

| ESGP No. | Environmental and Social Guidelines for Practice (ESGP) |
|---|---|
| **Planning Phase ESGP** | |
| ESGP01 | 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 |
| ESGP06 | Setting up Construction Yards |
| ESGP07 | Sourcing Construction Materials such as Sand, Bricks, Stone, Ready Mix Concrete etc |
| ESGP08 | Geotechnical Investigations |
| ESGP09 | 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 |
| ESGP12 | Clearing and Grubbing |
| ESGP13 | 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. |
| ESGP18 | Earthwork |
| ESGP19 | Utility Relocation |
| ESGP20 | 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 SEGPs** | |
| ESGP27 | Grievance management |

# 5 ENVIRONMENTAL MANAGEMENT BUDGET

Budgetary estimates for environmental management in the project include all items envisaged as part of the EMP. The environment budget includes provisions for various environmental management measures (other than measures considered under good engineering practices) and the environmental monitoring costs. Budgetary provisions for the project are presented in Table 5.1.

**TABLE 5-1: BUDGETARY PROVISIONS FOR ENVIRONMENTAL MANAGEMENT MEASURES**

| S. No. | Item | Unit | Rate (INR) | Quantity | Cost (in INR) |
|---|---|---|---|---|---|
| **A** | **CONSTRUCTION PHASE** | | | | |
| **1** | ***Site Clearance*** | | | | |
| 1.1 | Disposal of unserviceable as well serviceable material with all leads and lifts beyond the ROW | Cum | Covered in Engineering cost | | |
| 1.2 | The 30 cm top layer of disposal pit shall be provided with good earth, suitable for development of vegetation/plantation. All work shall be carried out as per specifications 301.3.2 of MoRT&H and approval of the Monitoring Consultant in Charge | Cum | | | |
| 1.3 | Regular water sprinkling (at least 4 times) per day at all construction sites for dust suppression. *Note:* This item is to be operated after the completion of earthwork to suppress the visible dust levels. Cost of watering during compaction of earthwork is deemed to be already covered under civil works. | Km | | | |
| **2** | ***Construction near water bodies*** | | | | |
| 2.1 | Construction of silt traps at the discharge points of channels into to fresh water bodies across the project road as indicated in the Clause 111.4 and 111.18 | m | | | |
| **3** | ***Worker Safety*** | | | | |
| 3.1 | Providing Personal Protective Equipment to the labours during the construction phase of the project | Nos | | | |
| **4** | ***Enhancement Measures*** | | | | |
| | Shrine @ 110+963 | | | | 1,50,000.00 |
| **5** | ***Monitoring of Environmental Attributes during Construction Activity*** | | | | |
| 5.1 | AAQ sampling during construction period | Nos | 7,500 | 18.0 | 1,35,000.00 |
| 5.2 | Ambient Noise Levels during construction period | Nos | 3,000 | 18.0 | 54,000.00 |
| 5.3 | Water Quality | Nos | 6,000 | 6.0 | 36,000.00 |
| 5.4 | Soil Quality | Nos | 5,000 | 4.0 | 20,000.00 |
| **6** | ***HIV/ AIDS Prevention measures*** | | Covered in Dhandhuka Dholera corridor | | |
| | **Environmental Budget During Construction Phase** | | | | 3,95,000.00 |
| **B** | **OPERATION PHASE** | | | | |
| **1** | AAQ sampling during operation period | Nos | 7,500 | 16.0 | 1,20,000.00 |
| **2** | Monitoring of Noise Level during operation period | Nos | 3,000 | 16.0 | 48,000.00 |
| | **Environmental Budget During Operation Phase** | | | | **1,68,000.00** |
| | Sub Total (A+B) | | | | **4,43,000.00** |
| | **Grand Total INR. (Environmental Budget +3% contingency)** | | | | **4,56,290.00** |