

Environment Impact Assessment Report (EIA)

**Construction of 1x43Mtr span Steel Decked Foot Bridge over Anji Nallah
at Sukhal Ghati including approach path on both sides (complete job)
Road in Reasi District under JTFRP Project.**

(Jhelum Tawi Flood Recovery Project)

(World Bank Funded)

Prepared for:

SGF Infra Private Limited

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Structure of the EIA Report

Executive Summary

CHAPTER 1: Introduction: Presents brief introduction of the project, need and objective of the study and structure of report.

CHAPTER 2: Methodology of EIA: The chapter describes the approach and methodology adopted for the EIA study.

CHAPTER 3: Project Description: This chapter describes salient features of the project, technical description and activities.

CHAPTER 4: Legal and Regulatory Framework: This chapter reviews applicable environmental regulatory framework and its relevance for Project;

CHAPTER 5: Environmental Baseline: Outlines Environmental(including Gender) Baseline in the study area of the project;

CHAPTER 6: Public Consultation and Participation: This chapter presents stakeholder mapping and analysis, overview of the stakeholder engagement activities undertaken during the EIA; and summary of consultations and the output

CHAPTER 7: Analysis of Alternatives: Reviews the alternatives with project and without project scenario

CHAPTER 8: Potential Environmental Impacts: Covering analysis of potential Environmental Impact due to the proposed project and mitigation measures;

CHAPTER 9: Environmental Management Plan: Presents detailed Environmental Management Plan (EMP) in accordance with WBG Policies and Procedures.

CHAPTER 10: Grievance Redressal Mechanism

CHAPTER 11: Institutional Arrangements

CHAPTER 12: Conclusions & recommendations

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EXECUTIVE SUMMARY

The devastating deluge of September 2014 had enormous negative impact on economic aspects of the state and massive infrastructure damages in which not only the major towns but far-flung areas were also affected. In response to this tragedy, a mission of the World Bank visited the state during February 1-6, 2015 in order to produce a rapid multi-sectoral assessment report of the damages and needs. The RDNA estimates the total damages and loss caused by floods at about INR 211,975 million (US\$ 3,550.45), most of it to housing, livelihoods, and roads and bridges, which combined represented more than 70% of the damages in terms of value. Public service infrastructure and equipment of hospitals and education centers were also severely damaged and are still not fully operational.

Based on the RDNA results, restoration works underway, and discussions with the Gol, J&K, "Jhelum and Tawi Flood Disaster Recovery Project (JTFRP)" will focus on restoring critical infrastructure using international best practice for creation of resilient infrastructure. The component 2 of JTFRP is 'to restore and improve the connectivity disrupted due to the disaster through the reconstruction of damaged roads and bridges. The project will finance the restoration and improvement of about 40 damaged bridges, designed to be seismic resilient (per the guidelines of the Bureau of Indian Standards) and with regard to topography and hydrology (per the guidelines of the Indian Roads Congress, the Ministry of Road Transport and Highways). One of the packages identified under this component is "Construction of 43Mtr span Steel Decked foot Bridge over Anji Nallah at Sukhal Ghati, Reasi, J&K". The site of Anji Foot bridge in Sukhal ghat was affected during 2014 floods and the existing foot bridge got washed away in the floods.

Sub-projects under "Jhelum and Tawi Flood Recovery Project" commonly known as JTFRP have a prior requirement of screening, which is based on three categories; viz., nature of the project, size of the project and location of the project that is sensitive area criteria. The objective of Environment and screening is to identify the potentially significant environmental/ social issues of the sub-project at an early stage for detailed Environmental and Social impacts.

Public consultation was conducted at the project location on 29-10-2020 with local people as part of environment and social screening study. During consultation process about the proposed sub-project, people have expressed keen interest about the proposed Sub- project. Local people

are aware about the upcoming work. People in general were very enthusiastic about the benefits of the Sub-project and have warmly welcome our representative of the firm.

The screening study reveals that there are no likely significant environmental impacts of the proposed sub project as the project do not significantly affect the local environment or involve any private land acquisition and have no negative impact on the livelihood of the local people.

Chapter 1: INTRODUCTION

1.1 Project Background

In September 2014, J&K experienced torrential monsoon rains in the region causing major flooding and landslides. The continuous spell of rains from September 2-6, 2014, caused Jhelum River in Kashmir and Chenab River in Jammu as well as many other streams/tributaries in the state to flow above the danger mark. Many districts of the Jammu Division received rainfall in the excess of the normal. The Jammu district received 467.3mm of rainfall in Sept 2014, which exceeds normal by 339%. Similarly, Reasi District received 681.7mm of rainfall which is 182% in excess of normal (Indian Meteorological department website). The Indian Meteorological Department (IMD) records precipitation above 244.4 mm as extremely heavy rainfall, and J&K received 558mm of rain in the June- September period, as against the normal 477.4 mm.

A Joint team led by the Department of Economic Affairs (DEA), GoI, with representation from the World Bank visited J&K on October 21, 2014. Subsequently, GoI has sent a request to the World Bank on January 5, 2015 to field a Joint Rapid Damage and Needs Assessment (RDNA) Mission within the State. In response, a mission of the World Bank visited the state during February 1 -6, 2015 in order to produce a rapid multi-sectoral assessment report of the damages and needs. The RDNA estimates the total damages and loss caused by floods at about INR 211,975 million (US\$ 3,550.45), most of it to housing, livelihoods, and roads and bridges, which combined represented more than 70% of the damages in terms of value. Public service infrastructure and equipment of hospitals and education centers were also severely damaged and are still not fully operational.

Based on the RDNA results, restoration works underway, and discussions with the Go J&K, the project will focus on restoring critical infrastructure using international best practice on resilient infrastructure. Given the state's vulnerability to both floods and earthquakes, the infrastructure will be designed with upgraded resilient features, and will include contingency planning for future disaster events. Therefore, the project aims at both restoring essential services disrupted by the floods and improving the design standard and practices in the state to increase resilience.

The project is comprised of the following seven components:

- I. Reconstruction and strengthening of critical infrastructure (US\$60million).
- II. Reconstruction of roads and bridges (US\$80 million).
- III. Restoration of urban flood management infrastructure (US\$50 million).
- IV. Strengthening and restoration of livelihoods (US\$15 million).
- V. Strengthening disaster risk management capacity (US\$25 million).
- VI. Contingent Emergency Response (US\$0 million).
- VII. Implementation Support (US\$20 million).

Out of seven components this project comes under reconstruction of roads & bridges.

1.2 Project Development Objective

The Project Development Objective (PDO) is to support the recovery and increase disaster resilience in targeted areas of the state, and increase the capacity of the State entities to respond promptly and effectively to an eligible crisis or emergency.

1.3 Sub-Project Background

The component 2 of "Jhelum and Tawi Flood Disaster Recovery Project" is 'to restore and improve the connectivity disrupted due to the disaster through the reconstruction of damaged roads and bridges'. The infrastructure will be designed to withstand earthquake and flood forces as per the latest official design guidelines. The affected areas will benefit by the restored access to the markets thereby increasing the economic growth in these areas and timely access to health and education services. Restoration of roads will also serve as supply/rescue lines in the event of disaster.

The component will finance support the reconstruction of about 300km of damaged roads and associated drainage works, retaining walls, breast walls and other structures to increase resilience. It will also finance the restoration and improvement of about 40 damaged bridges, designed to be seismic resilient (per the guidelines of the Bureau of Indian Standards) and with regard to topography and hydrology (per the guidelines of the Indian Roads Congress, the Ministry of Road Transport and Highways), and projected demographic changes.

One of the identified bridges is at Sukhal Ghati over Anji Nallah in District Reasi. The existing footbridge was destroyed completely during the flood in the Nallah in the aftermath of the heavy rainfall in the Sept 2014. This report covers the Environment and Impact Assessment study of this identified footbridge.

1.4 Sub-Project Description

The sub-project includes construction of 43Mtr span Steel Decked foot Bridge over Anji Nallah at Sukhal Ghati, Reasi. The Single foot suspension Bridge will rest on side abutments of open trench foundation resting on rock.

The site of Anji Foot bridge in Sukhal ghat was affected during 2014 floods and the existing foot bridge got washed away in the floods. The bridge was a major/vital connecting link between vast areas of the Tote, Ladda-A, Ladda-B, Sari, Sukhal Ghati villages having approximate population of 10,500. The new bridge with more resilient construction, in addition providing the vital link to these villages, will also serve indirectly thousands of souls of the other adjoining areas as it will provide useful link between these area and Districts headquarter Reasi. Moreover, the area being rich in Horticulture products like Anardana, Walnuts and local vegetables/fruits etc. will get enormous economic and social upliftment due to this proposed connectivity. The awarded cost of the contract is INR 12.2 million

1.5 Scope of EIA

Environmental study of the project road, identify and evaluate impacts on environment due to the various stage of project implementation and provide inputs to project road design team to incorporate necessary measures in design to minimise such impacts through suitable engineering interventions. Hence, an Environmental Management Framework has been designed for baseline environmental study, identifying impacts, mitigation measures to avoid, minimize and mitigate anticipated negative impacts within the project impact zone and project influence area. Accordingly, to minimize negative impacts during the entire project cycle, environmental management plan has been developed with roles and responsibilities for sound construction management during the project implementation. Furthermore, the report covers major finding of existing environmental, legal and administrative framework, monitoring programme.

The scope of this EIA was based upon four aspects:

- The Safeguard policy requirements of the WB and the Terms of Reference (ToR) for the EIA;
- The findings of initial consultations and focus group discussions (FGDs);
- The legal requirements of the GoI, including environmental standards and laws; and

- Other best practice guidelines, e.g. The World Bank Group (WBG) Environmental Health and Safety (EHS) Guidelines

Based on the above four aspects the following scope of work for the EIA was followed:

- A. Overview of the Legal and Institutional Framework Prepare an overview of the legal and institutional framework.
- B. Collection of Baseline Data Collect baseline data describing the existing biophysical environment in the area likely to be affected by the proposed project including:
 - Physical: geology; topography; soils; climate; air quality; noise; surface water; groundwater; seismicity and natural hazards.
 - Biological: flora and fauna; rare and/or endangered species (Red List species); critical and non-critical habitats and ecosystems; protected areas.
 - Human: population; communities; demographics; employment and socio-economics; land use; infrastructure (including local access roads); transport; public health; cultural heritage; archaeology; waste management.
 - Surveys conducted to address important gaps in the existing data and to collect up-to-date information on topics and areas where significant negative impacts are expected, specifically, flora, fauna, noise, air quality and water quality.
- C. Impacts and Mitigation Internationally accepted best practice will be used throughout the EIA study, including in the process of identifying impacts and assessing their significance. All of the key issues identified above in by stakeholders in the scoping phase will be assessed in detail. Ensure that the design team is informed in a timely manner of mitigation measures that need to be included in construction contracts. For each identified risk a set of mitigation measures explaining how these impacts will be mitigated or/and avoided will be provided. In the case of legal/institutional weaknesses, recommendations of ways for closing the gaps will be made.
- D. Analysis of Alternatives: The EIA will include a systematic comparison of the feasible project alternatives including the “no project” scenario.
- E. Environmental Management Plan: The EIA report will include an Environmental Management plan comprising of an Environmental Mitigation Plan and an Environmental Monitoring Plan.
 - The Environmental Management Plan will:

- Clearly identify what specific potential impacts various types of works may have on the sensitive receptors;
 - Provide concrete actions prescribed for managing these impacts, including location and timing of these actions;
 - Specify responsibility for the implementation of each mitigation activity;
 - Provide selected criteria of monitoring implementation of mitigation measures;
 - Identify location and timing/frequency of monitoring mitigation measures by the prescribed criteria; and
 - Specify responsibility for tracking each monitoring criterion.
 - The Environmental Monitoring Plan will:
 - Specify methods for instrumental monitoring;
 - Specify parameters, locations and schedule for monitoring;
 - Indicate responsibilities and costs for the monitoring activities.
- F. Grievance Redress Mechanism (GRM) A section describing the grievance redress framework (both informal and formal channels), setting out the time frame and mechanisms for resolving complaints about environmental and social performance.

1.6 Benefits of the Sub-Project

The prerequisite objective of this component is to restore and improve the connectivity disrupted due to the disaster through the reconstruction of damaged bridge. The infrastructure will be designed to withstand earthquake and flood forces as per the latest design guidelines. The bridge will ease commuting for the villagers and people to and from surrounding area.

The bridge would provide convenience in travelling and shorten the trip and strengthen transport system in affected area. This proposed bridge will improve rural connectivity. It will ease exchange of goods, capital and machineries. Nearby areas will be opened up for better trade opportunities and hence will be better integrated with the mainstream economy.

The bridge will be a lifeline connecting two villages for because currently there is no way for people to move between the bridges except for a 4-hour long detour.

1.7 Need of EIA

This Environmental Impact Assessment is part of the process of compliance with the World Bank Safeguard Policies in relation to the Project. The EIA provides a road map to the environmental measures needed to prevent and/or mitigate negative environmental effects associated with the project.

More specifically, the EIA:

- Describes the existing environmental conditions within the Project area;
- Describes the extent, duration and severity of potential impacts;
- Analyzes all significant impacts; and
- Formulates the mitigation actions and presents it all in the form of an Environmental Management Plan (EMP).

The main advantages of doing a systematic EIA include the following:

- **Free and Fair Information Sharing:** EIA ensure exchange of free and fair information among various stakeholders
- **Avoiding Adverse Impacts:** EIA provides the basis for preparing mitigation measures to avoid, reduce or manage adverse impacts.
- **Enhancing Positive Impacts:** EIA preparation also helps identify measures to maximize/share project benefits.
- **Reducing Costs:** Addressing impacts at an early stage helps to avoid costly errors in future.
- **Getting Approval Faster:** A well prepared EIA demonstrates that impacts are taken seriously and helps in getting project clearance faster

Chapter 2: METHODOLOGY OF EIA

In order to accomplish the above objectives, studies were organised in line with the guidelines stipulated by the World Bank and ESMF of JTFRP for environmental assessment.

a) Field Reconnaissance Survey

The approach to the entire study was formulated based on a detailed field reconnaissance survey and a thorough understanding of the proposed project. The reconnaissance survey was

carried out for the project site to understand the salient environmental features of the project area, sensitive areas with regards to the proposed project activities, and general understanding of the proposed subproject. Based on the above an environmental profile of the project area, primary and secondary data requirements for carrying out further activities of the study, environmental surveys necessary for assessing the project impacts, and the project influence area were identified.

b) Review and Assessment of Applicable Environmental Regulations

Discussions with different stakeholders and review of the various regulations and guidelines for EA were conducted to assess the sampling and analysis requirements for the project and the procedural requirements for conducting an Environment Assessment. This primarily comprised of reviewing all relevant documents available for the project area.

c) Delineation of Study Area for Assessment

The above tasks identified the survey and analysis requirements for baseline data collection required for assessing the anticipated impacts of the proposed subproject activities. Based on which, the study area that is critical for assessing the project impacts was identified and delineated. The project influence area also considered those areas that are directly or indirectly influenced by the project activities during preconstruction, construction or operation of the proposed bridge.

d) Base Line Environmental Conditions

This activity comprised of field surveys for assessing the baseline environmental conditions and collecting primary and secondary information regarding physical, biological and socio-economic conditions of the study area. In addition, existing environmental quality of the study area was assessed based on the field of environmental monitoring. For monitoring the air, noise, and water quality, monitoring was carried and samples were collected and analyzed for relevant parameters.

e) Prediction/Assessment of Potential Impacts

The activity identified the likely impacts through changes in the physical, biological environment based on the analysis of the baseline environmental data collected. The assessment considered both positive and negative impacts due to the subproject activities and also due to the construction, and operation of the project corridor.

f) Environment Management Plan

The major components of the environment management plan comprised preparation of mitigation plan for all the negative impacts identified during study and to avoid, minimize or compensate the impacts, and the post-project monitoring plan for the measures suggested in the management plan to ensure that the impacts of the project are within the regulatory standards

2.1 Study Area

The study area of the has been selected based on the location of the bridge, nature and spatial distribution of potential environmental impacts (based on similar type of projects). The study area includes the Project Footprint Area and Area of Influence described below:

2.2 Project Footprint Area

The Project Footprint is the area that may reasonably be expected to be physically touched by Project activities, across all phases. Physically, there is no demarcation of fencing for the Project Site boundaries and hence it is contiguous with the rest of the area.

2.3 Area of Influence (AoI)

The effects of the Project activities on a particular resource or receptor will have spatial (distance) and temporal (time) dimensions. Some activities would impact a larger radius than other identified impact sources. The spatial and temporal dimensions have therefore been taken into account to define a Project's Area of Influence. Table 1 shows the area of influence along with the justification for the same.

Table 1: Area of Influence for the project

| S. No. | Environmental Issues | Area of Influence | Justification |
|--------|----------------------|-------------------|--|
| 1 | Air Quality | 50 m | A minimum of 50m AoI has been taken to capture all sources of air quality emissions |
| 2 | Noise Pollution | 100 m | Noise can often be detected up to 100 m away from anticipated activities on site |
| 3 | Water Environment | 200 m | Water body located in the vicinity of the project area may get impacted due to activities at project footprint and allied sites. |

| | | | |
|---|------------------|-------|---|
| 4 | Land Environment | 100 m | Impacts on soil and land are often restricted to the Project footprint area. An AoI of 100m taken into account indirect effects usually occur due to activities on site |
| 5 | Ecology | 3 Km | An AoI of 3 km radius is considered for the ecological study. The 5 km radius provides an understanding use of forested habitat around the bridge |

2.4 Core and Buffer Zones

The AoI defined above has been divided into a core and buffer zone:

- **Core Zone:** the core zone is defined as the radius extending from the Project footprint area which would have majority of the impacts (during mobilization, construction, operation and decommissioning phase). The core zone area for the study is project footprint area and adjacent area within 100 m radius.
- **Buffer Zone:** the buffer zone of the study area is in general 3 Km radius from the proposed project

2.5 Screening Exercise

The screening exercise was done through reconnaissance survey. Public consultation meetings were arranged with the local community. Field survey and data collection were carried out as per the screening checklist provided in ESMF of the project. The information has been gathered through primary as well as secondary sources, with the support of PMU team members. The objective behind the environmental screening was to delineate affected environmental features and issue like water logging/ submergence, scheduled trees protection, sensitive receptors- schools/ religious places and residential area, human settlements, water, natural resources etc. in the project area, in order to define impacts and to minimize the adverse environmental impacts by suggesting best engineering solutions/options at optimal costs.

The positive actions not only to avoid adverse impacts, but to capitalize on opportunities to correct environmental degradation or improve environmental conditions were determined.

2.6 Collection of Data

Keeping in line with the proposed project, specific literature reviews and surveys were carried out referring publication & using internet and useful information about the project impact and

influence area was collected. This includes both published and unpublished environmental data. Literature searches were undertaken and relevant agencies were contacted and apprised of the proposed subproject. The following data were collected for the road projects during environmental assessment study:

- Geo reference maps.
- Socio-economic data from the Planning Department and Census records.
- Geological data from the Geological Survey of India.
- Meteorological data from India Meteorology Department, Govt. of India.
- District Profile from District Statistics Department.
- Forestry and Wildlife Data from the Forest Department.
- Flora and fauna from various sources, including the State Forests Department and Wildlife Department.

Readily available data were reviewed with the initial reconnaissance investigations, and the need for primary data collection in some instances was determined.

Chapter 3: PROJECT DESCRIPTION

3.1 Objective of Project

The objective of the project is to provide connectivity to the people of Sukhal ghat area in district Reasi by reconstructing the bridge which was devastated in the September 2014 floods and providing much needed relief to the surrounding population

3.2 Description of Project

The sub-project includes construction of 43Mtr span Steel Decked foot Bridge over Anji Nallah at Sukhal Ghati, Reasi. The Single foot suspension Bridge will rest on side abutments of open trench foundation.

The bridge is a major/vital connecting link between vast areas of the Tote, Ladda-A, Ladda-B, Sahri, Sukhal Ghati villages having approximate population of 10,000. The bridge will also serve indirectly thousands of souls of the other adjoining areas as it will provide useful link between these area and District's headquarter at Reasi. Moreover, the area being rich in Horticulture products like Anardana, Walnuts and local vegetables/fruits etc. will get enormous economic and social upliftment due to this proposed connectivity.

3.3 Project Location

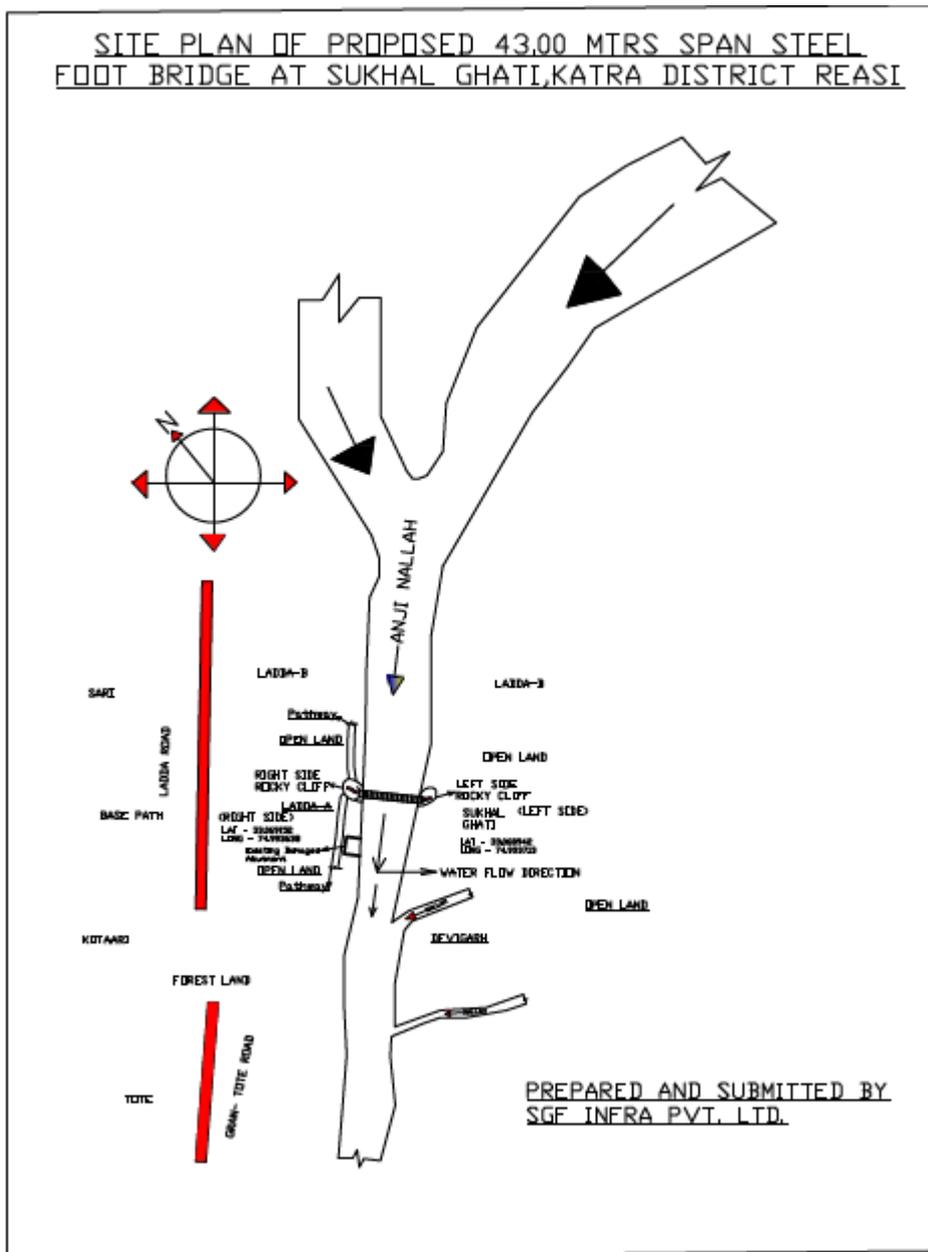


Figure 1: Site plan for proposed project at Anji Nallah

The Project is located in the Reasi Distt of Jammu and Kashmir in Sukhal Ghat over Anji Nallah. Longitude: 74°59' 37.108" E, Latitude: 33°4' 8.192" N. The site plan is shown in Figure 1. The location of project site is shown on the GIS map in Figure 2.

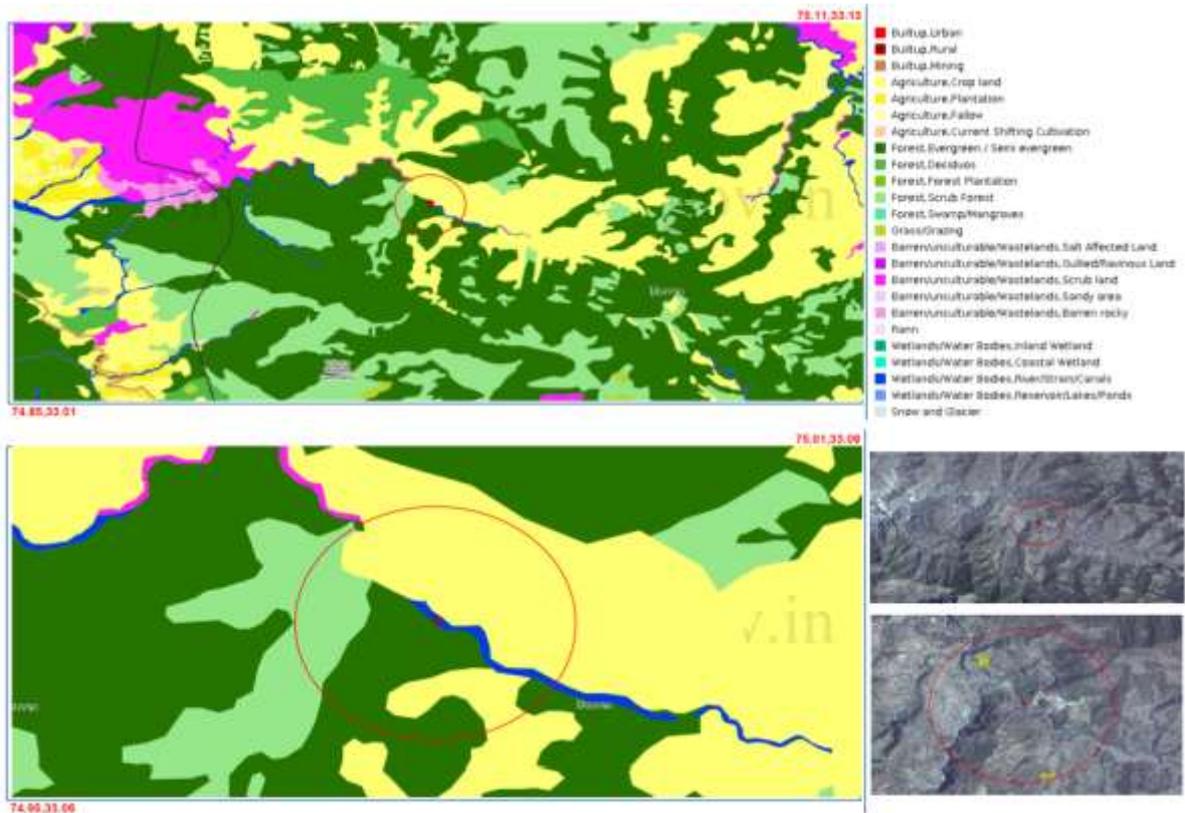


Figure 2: Location of proposed bridge site on GIS Map

The bridge connects the villages of Ladda A, Ladda B, Kothari, Devigarh and Tote with population of over 10,000 people.

The location of project on google maps is shown in Figure 3:

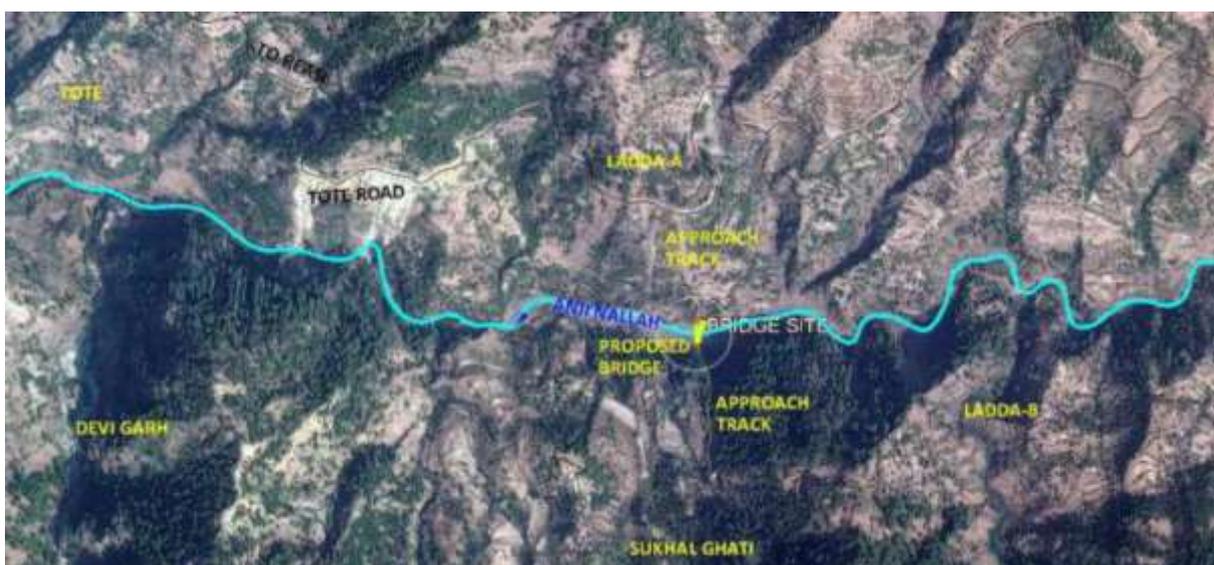
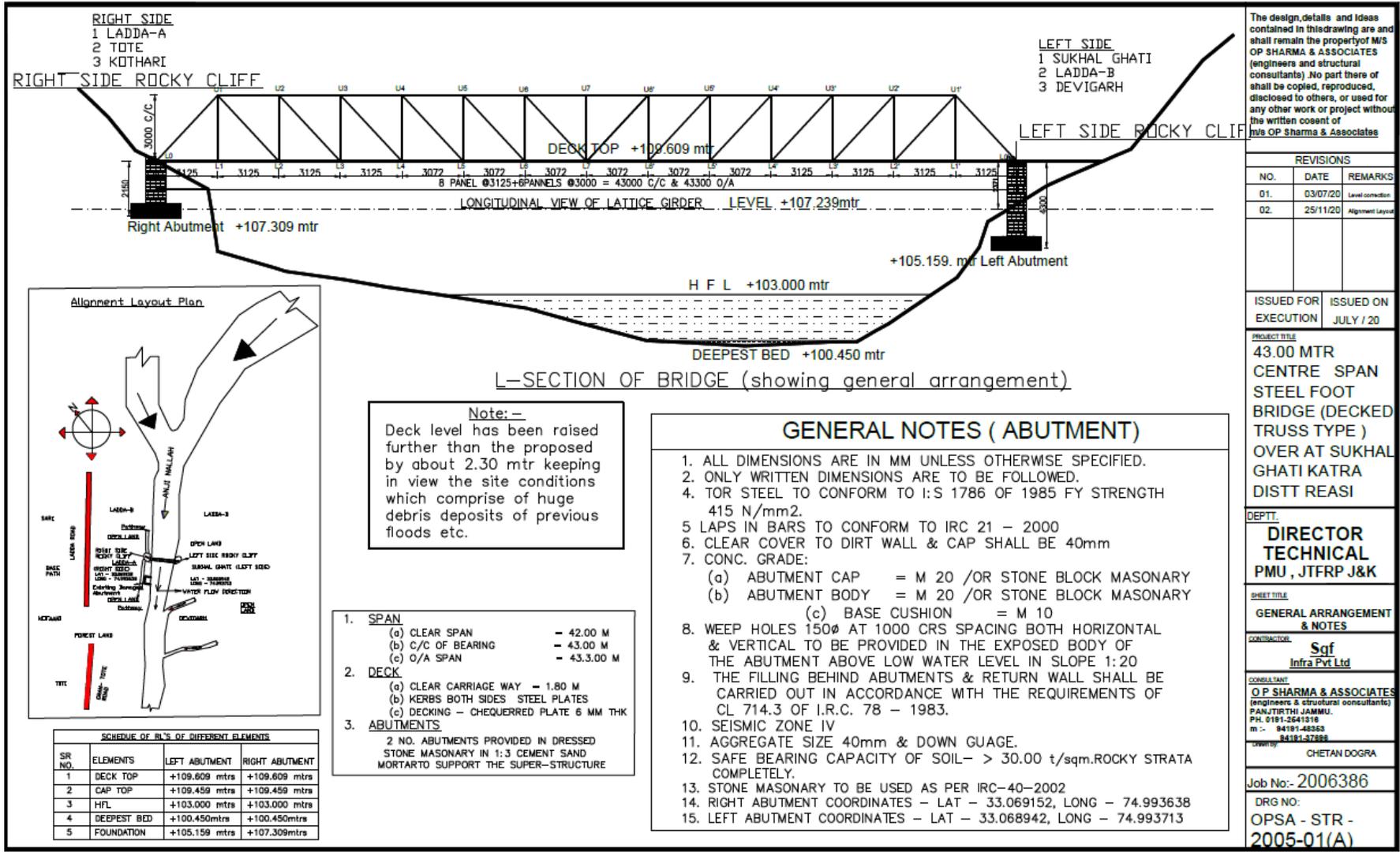


Figure 3: Location of the project in Google Maps

3.4 Proposed Bridge Details

The proposal for proposed bridge for a 43 m span single foot bridge has been adapted. The proposed bridge will be of single span and will rest on side abutments of open trench foundation. The substructure of the project consists of two abutments built with stone masonry. The elevation different between deck top level and the founding level of left abutment is 2.15 m whereas the elevation difference between deck top level and founding level of right abutment is 4.3 m. The grade of concrete used in foundation and abutment caps is M20. General arrangement drawing (GAD) for the proposed bridge over Anji Nallah is shown in Figure 4.

The design data for the bridge is shown in Table 2.



The design, details and ideas contained in this drawing are and shall remain the property of M/S O P SHARMA & ASSOCIATES (engineers and structural consultants) No part thereof shall be copied, reproduced, disclosed to others, or used for any other work or project without the written consent of M/s O P Sharma & Associates

| REVISIONS | | |
|-----------|----------|------------------|
| NO. | DATE | REMARKS |
| D1. | 03/07/20 | Level correction |
| D2. | 25/11/20 | Alignment Layout |

| | |
|----------------------|---------------------|
| ISSUED FOR EXECUTION | ISSUED ON JULY / 20 |
|----------------------|---------------------|

PROJECT TITLE
43.00 MTR CENTRE SPAN STEEL FOOT BRIDGE (DECKED TRUSS TYPE) OVER AT SUKHAL GHATI KATRA DISTT REASI

DEPTT.
DIRECTOR TECHNICAL PMU, JTFRP J&K

SHEET TITLE
GENERAL ARRANGEMENT & NOTES

CONTRACTOR.
Sgf Infra Pvt Ltd

CONSULTANT
O P SHARMA & ASSOCIATES (engineers & structural consultants) PANJITRITHI JAMMU. Ph: 0191-2641516 m:- 94191-48963 94191-37888

Job No:- 2006386

DRG NO:
OPSA - STR - 2005-01(A)

Figure 4: General Arrangement Drawing of the Proposed Bridge over Anji Nallah

Table 2: Design Details of the Bridge

| <u>SITE AND DESIGN DATA OF THE BRIDGE</u> | | |
|--|---|---|
| <u>BRIDGE DETAIL</u> | | |
| 1 | Site of bridge | Anji Nallah at Sukhal Ghat |
| 2 | Length of bridge | 43 mtr length single Span Footbridge Bridge (C/C of abutment bearing) |
| 3 | Span arrangement | Two Stone Masonary Abutments and Steel Decked Foot-bridge |
| <u>RIVER DETAILS</u> | | |
| 1 | Clear linear water way at HFL | 24.5 mtr |
| 2 | Highest flood level | RL 103 mtr |
| 3 | Lowest Bed level | RL 100.45 mtr |
| 4 | Nature of foundation strata | Rock on Both Sides |
| 5 | Max scour level for Abutments | NA since abutments are located on rocky non-scourable strata |
| 6 | Minimum vertical clearance required above HFL | 1.50 mtr |
| 7 | Decklevel | RL 109.609 Mtr |
| 8 | Discharge | 357.29 Cumes |
| 9 | Bed Slope | 1:20 |
| <u>SUB STRUCTURE</u> | | |
| 1 | Type of Foundation | Open foundation |
| 2 | Foundation Level of Abutments | Abutment RL 105.159. mtrs (Left Side) (Open on Non scour criteria). AbutmentRL 107.309mtrs(Right Side)(Openon Non scour criteria). |
| 3 | Foundation level of Piers | NA |
| 4 | Safe Bearing Capacity | 50 T/m ² for left abutment and 60 T/m ² for right abutment |
| <u>SUPERSTRUCTURE</u> | | |
| 1 | Type of superstructure | Steel Superstructure (Through Type) |
| 2 | Clear Footway width. | 1800 mm |
| 3 | Deck | 6 mm Thick Plate |
| 4 | Railings | 25 mm Dia MS Pipe |
| 5 | Overall Width of Superstructure | 2190 mm |

| | | |
|--------------------|---------------------|---|
| 6 | Bearings | Rocker and Roller Pin Bearings |
| DESIGN DATA | | |
| 1 | Footpath load | 500 kg per square meter of footpath load |
| 2 | Seismic coefficient | Seismic Zone IV Horizontal - 0.12 Vertical - 0.06 |
| 3 | Snow load | NA |
| 4 | Unit Weight of Soil | 1.8 T/cum |

3.5 Hydrology at Anji Nallah

Hydrological details of Anji Nallah are given below:

Discharge = 357.29 Cumes

Highest Flood level (HFL) = 103 m

Bed Slope = 1:20

3.6 Geotechnical Details

Subsoil investigations have been carried out by SMVDSR Lab. Open cutting of rock mass at abutment locations was done to understand the geological nature of the strata. Rock drilling was performed to get core samples and Unconfined Compressive test was done as per IS code to derive the bearing capacity for placing open foundations. The soil report recommends 50 T/sqm bearing Capacity for left abutment and 60 ton bearing capacity for right abutment. However, to keep additional factory of safety only SBC of 30 t/m² was adopted in the design of foundation.

3.7 Details of Existing Project Roads

The roads nearest to the project site are Ladda Road and Gran Tote Road. The roads are not motorable and are accessible only on foot. From the Ladda Road a track leads to the location of the bridge. There is no vehicular traffic on the roads and the project will not involve disruption of traffic.

On the Sukhal Ghat side, there is no permanent road but there is a track which leads to the villages.

3.8 Row Details of Sub-Project Roads

The project does not involve construction of any road and thus does not involve any acquisition of land. No land needs to be acquired for the construction of the bridge.

3.9 Major Utilities Along the Existing Roads

No utilities present on the existing approach tracks.

3.10 Proposed Activities

The Project involves the following activities:

- Survey of site and investigation of surrounding strata to assess the suitability of foundations
- Construction of abutments on both sides of Anji Nallah
- Erection of pre-fabricated steel members on the constructed abutments
- Construction of 50 m approach path on both sides of the bridge
- River protection works 40 m upstream site and 50 m downstream side.

Chapter 4: LEGAL AND REGULATORY FRAMEWORK

4.1 Introduction

This chapter deals with the laws, regulations and policies, of Government of India, the State Government and the World Bank, related to environment issues. Only the laws, regulations and policies relevant to the project are discussed here. This section needs to be updated as when new laws, regulations and policies are made and enforced or the existing ones are revised.

4.2 Operational Policies and Directive of the World Bank

The implementation of the World Bank Operational Policies seeks to avoid, minimize or mitigate the adverse environmental impacts, including protecting the rights of those likely to be affected or marginalized by the proposed project. Based on the literature review and

preliminary research, following OPs given in Table 3 might be triggered and would require adequate measures to address the safeguard concerns.

Table 3: Operational Policy and Directives of World Bank

| World Bank Safe Guard Policies | | | Objective | Applicability |
|--------------------------------|------|---|---|---------------|
| OP Environmental Assessment | 4.01 | The objective of this policy is to ensure that Bank financed projects are environmentally sound and sustainable. | The environmental issues will be addressed adequately in advance. However, no major impact is foreseen for the project | |
| OP Natural Habitats | 4.04 | The policy recognizes that the conservation of natural habitats is essential for long-term sustainable development. The Bank, therefore, supports the protection, maintenance and rehabilitation of natural habitats in its project financing, as well as policy dialogue and analytical work. The Bank supports and expects the borrowers to apply a precautionary approach to natural resources management to ensure environmentally sustainable development | Not application for the project | |
| OP Forests | 4.36 | This policy focuses on the management, conservation, and sustainable development of forest ecosystems and resources. It applies to project that may have impacts on health and quality of forests; Affect the rights and welfare of people and their level of dependence upon forests and projects that aim to bring about changes in the management, protection or utilization of natural forests or plantations, whether they are publicly, privately or community owned. The Bank does not support the significant conversion or degradation of critical forest areas or related critical natural habitats. | Impact of construction activities on Forest areas required to be taken care of. No impact is foreseen to the forests hence the policy is generally not applicable to the project. | |

4.3 Policy and Regulatory Framework of GoI and the State

This deals with various policies, acts, rules and regulations promulgated by the central and state government related to environment and relevant to present project. Scope of relevant environment regulations and implications for the EIA are furnished in the Table 4 below:

Table 4: Policy and Regulatory Framework GoI and State

| S. No | Relevant Act | Scope of the Act | Implication for the Sub-Project |
|-------|---|--|--|
| 1 | The Environment (Protection) Act No.29 of 1986 | Under this Act, the central government is empowered to take measures necessary to protect and improve the quality of the environment by setting standards for emissions and discharges; regulating the location of industries; management of hazardous wastes, and protection of public health and welfare. This encompasses all legislations providing for the protection of environment in the country. It includes the power to direct the closure, prohibition or regulation of any industry, operation or process by the government | Relevant to sub-projects to be taken up, viz., buildings, roads, bridges, etc. activities Preservation of air and water quality Control dust pollution |
| 2 | Water and Air (Prevention and Control of Pollution) Act, 1974 & 1981 (Central Act 6 of 1974) as amended in 1988 | This Act prohibits the discharge of pollutants into water bodies beyond a given standard and lays down penalties for noncompliance. Water act includes the maintenance or restoring the wholesomeness of the water Air act restricts the operation of any industrial plant in an air pollution control area without a valid consent | Generally, not relevant to project activities. |
| 3 | Forest (Conservation) Act No. 69 of 1980 and amended in 1988 | This Act restricts the powers of the state in respect of de-reservation of forests and use of forestland for non-forest purposes. All diversions of forestlands to any non-forest purpose, even if the area is privately owned, require approval of the central government Leases of forest land to any organization or individual require approval of the central government Proposals for diversion of forest land for construction of dwelling houses are not to be entertained | Generally, not relevant to project activities |
| 4 | National Forest Policy, 1988 | Protect and enhance the yields of non-timber forest products in order to generate employment and income for forest and village communities | Generally, not relevant to project activities. |
| 5 | Joint Forest Management, 1993 | Induces people participation in forest management sharing mechanism to distribute the benefits of interventions carried out on common resources property, government lands, wastelands, etc. Benefits are categorized into two – ecological benefits and economic benefits | Not relevant to project activities. |

| | | | |
|---|--|--|-------------------------------------|
| 6 | The Wildlife (Protection) Act 1972, Amendment 1991 | This Act provides for protection to listed species of Flora and Fauna in the declared network of ecologically important protected areas such as wild life sanctuaries and national parks. The wildlife protection act has allowed the government to establish a number of national Parks and Sanctuaries, over the past 25 years, to protect and conserve the flora and fauna of the state | Not relevant to project activities. |
| 7 | EIA Notification of MoEF 2006 | All projects listed under Schedule-I of the the Notification require environmental clearance from the MoEF. The list of project categories under Schedule I of the Environmental Impact assessment Notification is available on the MoEF Website. | Not Applicable |
| 9 | Biological Diversity Act 2002 Biological Diversity Rules 2004 | The Biological Diversity Act, which came into force in February 2003, aims to promote conservation, sustainable use and equitable sharing of benefits of India's biodiversity resources. It provides for establishment of a National Biodiversity Authority at national level, State Biodiversity Boards at state level and Biodiversity Management Committees at the level of Panchayats and Municipalities | Not relevant to project activities, |

This policy and regulatory analysis suggest that the proposed sub-project to be taken does not fall under any of the project categories listed in Schedule-I of the Environmental Impact Assessment Notification and hence does not require any formal environmental clearance of the Ministry of Environment and Forests, GoI. The project area has not been notified as ecologically sensitive or fragile under the Environment Protection Act, 1986. Though the State is dotted with a number of sites of religious, cultural and historical importance, wildlife sanctuaries and national parks, the proposed reconstruction of the bridge is expected to have no impact on these sites. The project will also ensure that the requirements of activities in the influence areas of any protected areas are also followed in the design and implementation of sub-projects.

4.3.1 Environmental Permission Required for the Proposed Bridge

The proposed bridge is not scheduled activity under the EIA Notification 2006. Therefore, environmental clearance is not required for proposed bridge. As tree cutting and forest land are

also not involved in the proposed bridge, therefore, tree cutting permission and forest clearance are also not required. During construction phase, labour's safety, health and welfare measures will need to be taken by the contractor as per Building & other construction workers (Regulation of Employment and condition of service) Act 1996.

Chapter 5: ENVIRONMENTAL BASELINE

5.1 Introduction

The objective of conducting baseline survey of the existing environmental and status in the study area is to provide a data base for predicting the likely changes that are expected in implementation of the project. This chapter deals with the approach for data collection, environmental scoping / identification of environmental attributes and baseline survey details.

5.2 Data Collection

Baseline data were collected through sight visits and interaction with local people and discussion with project authority, stakeholder consultation, collection of data from relevant project records, collected data from secondary sources and analysis. The studied parameters include land, water, air, noise, soil, sediment and biological environment as well as the pre-project Socio-economic status of the people of study area.

5.3 Primary Baseline Data

The primary baseline information on different environmental components were collected through field survey. Field surveys were carried out to collect information on the major environmental features such as forest, trees within RoW of the embankment, waterbodies, sensitive locations, air, water, noise and soil quality etc. Further primary samples surveys for the environmental components, such as air, surface water, noise and soil characteristics that are critical in the context of the project were carried out during the study period.

Sampling stations are strategically located in and around the project sites. Soil & Water samples were collected as per recommended procedure. Suitable equipment was used to record Air quality and Noise level at site / near to site. Literature and authentic records were consulted to study the status concerning the study areas.

5.4 Physical Environment

Baseline environmental parameters for physical environment include survey for pre-project status of land, air, water and climatic conditions of the study area.

Reasi District is mostly hilly with deep gorges and ravine. The most important physiographic features of the district are Forests. Reasi Tehsil is located at a distance of 64 km from Jammu and is bounded by Gool-Gulab Garh in the north. Climatically a major part of this Sub-Division falls in subtropical zone and the rest in temperate zone. Summers are generally warm and winters cold with snowfall on the high ridges. One of the most beautiful things about Reasi is that in summer its temperature remains less than those of the districts in Jammu and in winter the temperature remains higher than those of other districts in Jammu. So, this makes Reasi favourable for all types of people visiting there.

5.5 Physiography

The study area is hilly terrain in forest. The area is surrounded by hills and the terrain is uneven. The project involves construction of a bridge which has rocky strata on both sides of the nallah. Rock is present on both the banks of the nallah.

Both sides of nallah has natural embankment. The debris of the bridge which got washed out in 2014 can also be seen. The sides of river are not approachable by vehicles. Entire land is very much fertile. No presence of wetland in the vicinity of the proposed site of the bridge

Educational features like school, college, etc. are not present near the site of the bridge. The socio-economic condition of villages is relatively poor. The villagers rely upon growing local crops to survive.

5.6 Agroclimatic Zone

The Planning Commission, as a result of the mid-term appraisal of the planning targets of the Seventh Plan, has divided the country into fifteen broad agro-climatic zones based on physiography, soils, geological formation, Climate, cropping patterns, and development of irrigation and mineral resources for broad agricultural planning and developing future strategies. Fourteen regions were in the main land and the remaining one in the islands of Bay of Bengal and the Arabian Sea. The area falls within western Himalayan agroclimatic zone.

The area consists of Hill soils, mountain, meadow skeletal, tarai. Agro-climatic Zone in which Reasi Falls according to different classifications is shown in Table 5

Table 5: Agro-Climatic Zone of Reasi according to different classifications

| Classifying Body | Classification Name | Applicable Zone(s) |
|---------------------|----------------------------|--|
| ICAR | Agro Ecological Sub Region | Western Himalayas, Warm Subhumid (To Humid with Inclusion of Prehumid) Eco-Region (14.1) |
| Planning Commission | Agro-Climatic Zone | Western Himalayan Region (I) |
| NARP | Agro Climatic Zone | Mid to High Altitude Intermediate Zone (JK-2) & Low Altitude Sub-Tropical Zone (JK-1) |

The project lies in the Reasi district where Maize, Wheat are the main crops grown. The District is also rich in its flora & has a tremendous potential of Horticulture fruits i.e., Citrus, Quince, Apple, mango, Guava, Apricot etc. produced in different climatic conditions in the District. The characteristics of various Agro-Climatic Zones in which the district falls have been explained in the Table 6

Table 6: Characteristics of various Agro-Climatic Zones of Reasi

| S. No | Agro-climatic Zone | Characteristics |
|-------|--------------------|---|
| 1 | Subtropical zone | This includes areas between 380-800m msl. The lower belt of Reasi where the KVK is located falls in this zone. This area experiences hot summers followed by cold winters and area also experiences autumn frost. The major chunk of precipitation is received during monsoons. The soils are mostly sandy loam and clay loam in some pockets with normal OM. Most of the area is rain fed with very little irrigation. The annual rainfall of the district is 1000 to 1100 mm. major chunk of it is received from May-September. The mean maximum and minimum temperature ranges between 35- 40 0C and 10-12 0C respectively. Agriculture in this area is diverse and is completely rain fed. The area has low productivity and low input usage. |
| 2 | Intermediate Zone | Situated between 800-1500m, msl, this area experiences definite winters and a hot spell of summer. The major chunk of precipitation is received in summer months. Most part of Udampur and Reasi falls in this zone. The annual rainfall of the district is about 1100 mm. The mean maximum and minimum temperature ranges between 35- 40 0C and 10-12 0C respectively. Agriculture in this area completely rain fed. |
| 3 | Temperate zone | It includes few areas falling above 1500m msl. This area experiences chilling winters and major cropping season is kharif, during which moisture is |

| | |
|--|---|
| | available for growing crops. These areas also experience snow in winter thus minimum temperatures falls below zero degrees during these months. |
|--|---|

5.7 Geology

The district has an elongated shape which extends from Udhampur Siwalik in the south-east to the PirPanjal in the north. It falls in the area which can be termed as Outer Hill Region, comprising the slopes and hills of Siwalik, Lesser Himalaya and PirPanjal. The areas within the jurisdiction of the district are hilly, comprising several off-shoots of great mountains interwoven closely. The hills are of moderate heights and are surmountable. In certain cases, the peaks rise as high as above 4,256 meters. In general, the plain areas have a normal height ranging between 456 meters and 608 meters. The areas in the north are very high, rising to heights of above 4256 meters. This region is on the southern side of the PirPanjal.

Geologically the area can be divided in the following four rock zones:

- The PirPanjal Zone
- Murree Zone
- The Reasi Limestone, and
- The Shivalik belt.

These four stratigraphic zones are distinct from one another in their constituent rock formation and in their tectonics and intensity of metamorphism. Here, we get rocks ranging in the age from Pre-Cambrian to Shivaliks of Miocene to Lower Pleistocene age.

5.8 Natural Hazards

The UT of J and K is a multi-hazard prone region with natural disasters like earthquakes, floods, landslides, avalanches, high velocity winds, snow storms, cloud bursts, besides manmade disasters including road accidents and fires etc. occurring in various parts of the state. The subproject roads/ project influence comes under flood hazard, heavy snowfall, earthquakes (under Zone-IV classification), and ma- made disasters including road accidents.

5.8.1 Floods

Although flooding is a major hazard to lives and infrastructure the world over, but mechanism and trends in flood hazards are poorly understood. Normally, the pro- longed and high intensity

rainfall is the trigger for floods, however, the geomorphic setup and nature of the socio-economic development in the river basin would either ameliorate or exacerbate the flooding under various scenarios. Recently, the frequency of extreme rainfall events and floods has increased worldwide including the NW Himalayas. The extreme rainfall event of 2014, turned into one of the worst disasters in the flood history of the state compounded by the existence of the injudicious socioeconomic structures and massive land system changes in the floodplains that interfered with the hydraulic and hydrological processes during the flooding. The scenario was further worsened due to the dilapidated flood control structures and the institutional failure on managing the enormity of the extreme flooding.

The 2014 flood was very devastating killing more than 100 people and causing colossal loss to the infrastructure to the tune of INR 1 Trillion (World Bank 2015). The Chenab waters, that used to be the provider of life and sustenance, suddenly became a monstrosly destructive force against the human life and the infrastructure that cohabit its backyards since millennia. The scene was frightening making the people fear for a high human loss and total destruction of the capital city, Srinagar. Even though there is tremendous advancement in the flood hazard prediction globally during the last few decades, but there is insignificant progress in translating the benefits of the scientific advancements for the flood risk reduction of the society as was evident from the high loss of life and property during the 2014 flooding. The site of Anji Foot bridge in Sukhal ghat was affected during 2014 floods as well. The existing foot bridge got washed away in the floods and the people in the surrounding villages were stripped of this important lifeline. Figure 5 shows the flood affected areas of J and K during 2014 floods with the blue dot showing the location of anji foot bridge.

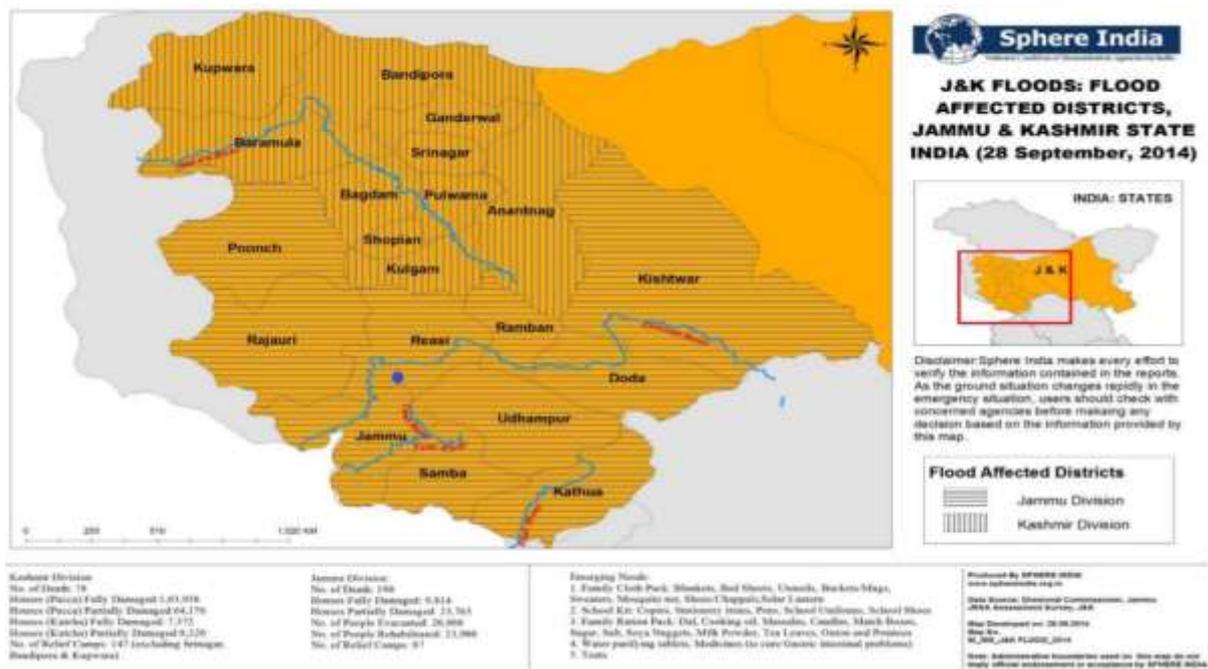


Figure 5: Flood Affected areas of J and K during September 2014, Sphere India

5.8.2 Earthquakes- History and Seismic Zonation

The Indian subcontinent has a history of devastating earthquakes. The major reason for the high frequency and intensity of the earthquakes is that India is driving into Asia at a rate of approximately 47 mm/year. Geographical statistics of India show that almost 54% of the land is vulnerable to earthquakes. The latest version of seismic zoning map of India given in the earthquake resistant design code of India [IS 1893 (Part 1) 2002] assigns four levels of seismicity for India in terms of zone factors. In other words, the earthquake zoning map of India divides India into 4 seismic zones (Zone 2, 3, 4 and 5) unlike its previous version which consisted of five or six zones for the country. According to the present zoning map, Zone 5 expects the highest level of seismicity whereas Zone 2 is associated with the lowest level of seismicity. The state of Jammu & Kashmir is the western most extension of the Himalayan mountain range in India. Here it comprises of the Pir Panjal, Zaskar, Karakoram and Ladakh ranges. The Main Boundary Thrust (MBT) underlies the Pir Panjal Range and is known as the Panjal Thrust in the region. The Zaskar ranges which are part of the Great Himalayan range are underlain by the Zaskar Thrust. The Kashmir Valley lies between the Pir Panjal and the Zaskar thrusts, making it very vulnerable to earthquakes. Other northern parts of Jammu & Kashmir are heavily faulted. Along the Zaskar and the Ladakh ranges runs a North West (NW) – South East (SE) trending strike-slip fault, the longest in the Jammu & Kashmir area. Apart from the routine small tremors, moderate to large earthquakes have hit nearly all parts of the

state. However, it must be stated that proximity to faults does not necessarily translate into a higher hazard as compared to areas located farther away, as damage from earthquakes depends on numerous factors such as subsurface geology as well as adherence to the building codes. There are atleast four regions of the Himalaya where earthquakes of magnitude 8 or above are likely to occur in near future. 2005 earthquake of MW 7.6 has released only 1/10th of the stress generated within the region and remaining has to go in future great earthquakes. The anji subproject is located in District Reasi which falls in a seismically active part (zone-IV) of Jammu Region. The design parameters for the proposed roads should conform with BIS code of Practice. Keeping in view the maximum credible earthquake magnitudes in the region, the site area is classified in Zone-IV as per the Bureau of Indian standards (BIS) code of Practice (IS-1893-2002). The earthquake zonation map of Jammu and Kashmir is given in Figure 6.

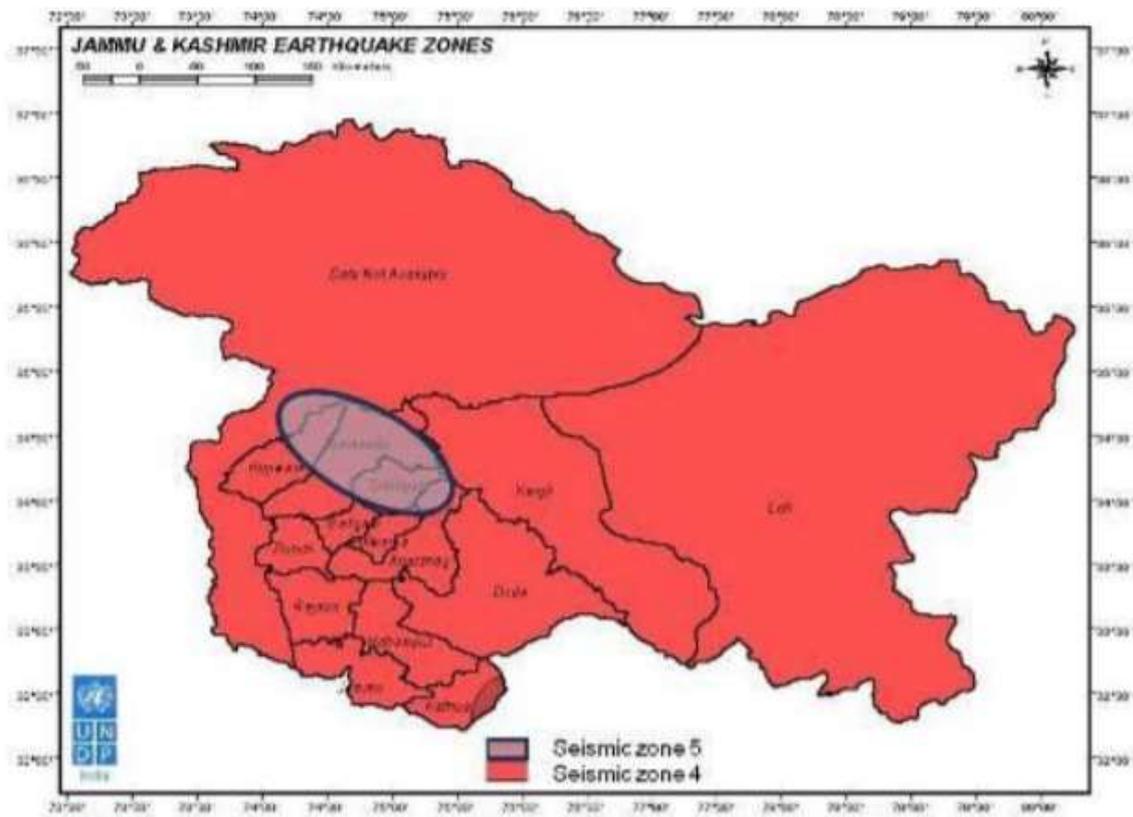


Figure 6: Seismic Zones of J and K and Ladakh, IS-1893-2002

5.9 Cropping Pattern

The main food crops of the district are maize and rice in Kharif and wheat in Rabi season. The most important crop is maize which is grown in the entire district, wheat ranks next. The area

under rice cultivation is small. The Table 7 shows the food crops grown in the district as per the Digest of Statistics 2017-2018, Jammu and Kashmir.

Table 7: Crops grown in the Reasi District, 2017-2018

| S. No | Crop | Area (hectare) |
|-------|---------------------|----------------|
| 1 | Maize | 22930 |
| 2 | Wheat | 13970 |
| 3 | Rice | 1122 |
| 4 | Condiments & Spices | 5 |
| 5 | Pulses | 93 |
| 6 | Barley | 87 |
| 7 | Bajra | 490 |
| 8 | Oilseeds | 983 |
| 9 | Fodder Crops | 76 |

Source: Digest of Statistics 2017-2018, Jammu and Kashmir

5.10 Meteorology

Reasi is mostly hilly district with the elevation up to 2480 meters above mean sea level. The district has some plains in southwest part and valleys of low elevation. The climatic conditions vary with ranging from sub-tropical to semi-temperate. Geographically the district can be divided into the hilly and low-lying hilly areas. The district receives abundant rain in the monsoon season and sometimes snow at high altitudinal areas during winter season. District headquarters is Reasi town situated in the Shivalik hills at altitude 517 meters on the bank of Chenab river. Summers are generally warm and winters are cold with snowfall on the high ridges. Winter starts by the middle of November and continues till early March. The period of March to end of June constitutes the pre-monsoon season, followed by southwest monsoon season till September. The period of October to mid-November is of post monsoon season.

5.10.1 Rainfall

According to the data presented in the Indian Meteorological Department report on “Observed Rainfall Variability and Changes over Jammu and Kashmir”, January 2020 it can be seen that the district Reasi receive the highest rainfall over other districts in the time period between 1989-2018 during all the months and season. Table 8 gives the rainfall statistics for the Reasi district of Jammu and Kashmir for the four monsoon months, southwest monsoon season and annual rainfall.

Table 8: Average Rainfall in Reasi District from 1989 to 2018

| JUNE | | JULY | | AUGUST | | SEPTEMBER | | MONSOON | | ANNUAL | |
|-------|------|-------|------|--------|------|-----------|------|---------|------|--------|------|
| MEAN | CV | MEAN | CV | MEAN | CV | MEAN | CV | MEAN | CV | MEAN | CV |
| 167.3 | 92.6 | 489.5 | 55.7 | 578.2 | 49.1 | 240.8 | 48.2 | 1475.7 | 48.9 | 2095.6 | 47.6 |

Source: “Observed Rainfall Variability and Changes over Jammu and Kashmir”, IMD, January 2020

The rainfall in southwest monsoon season (June to September) is about 70% of the annual normal rainfall. August is the month with the highest rainfall with an average of 578.2 mm.

In the period 1951 to 2000, the highest annual rainfall of 155% of the normal was recorded in year 1988, while the lowest was 50% of the normal recorded in 1951. Figure 7 shows the spatial pattern of these statistics over Jammu and Kashmir.

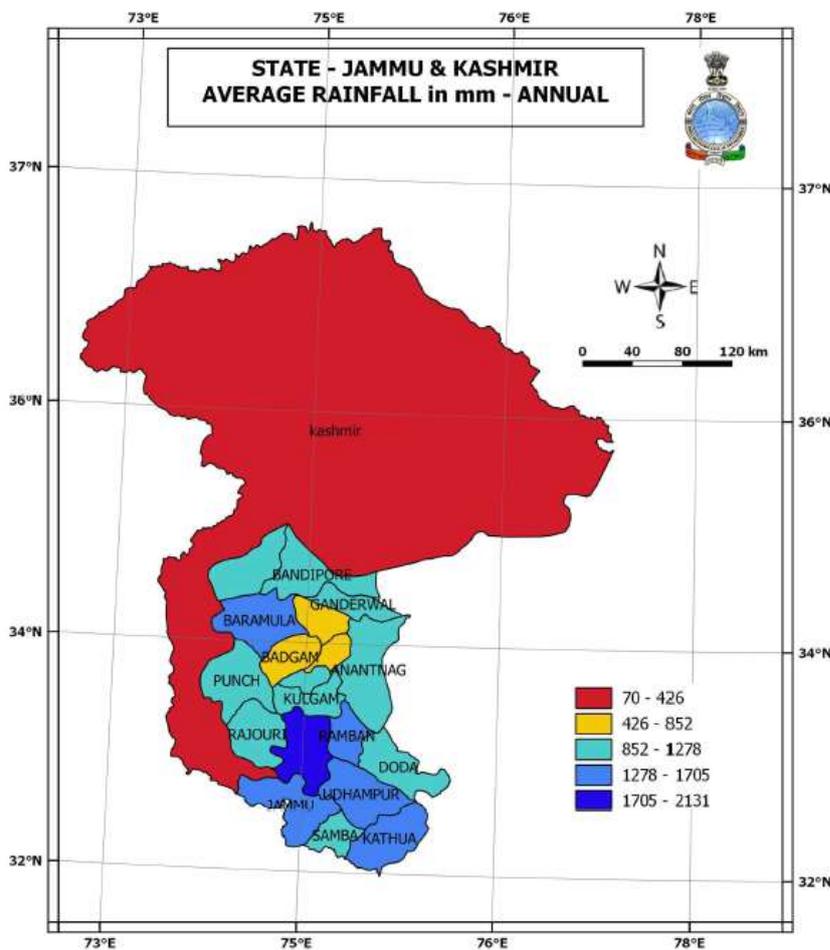


Figure 7: Spatial Pattern of Rainfall in J & K between 1989 and 2018, IMD Jan 2020

5.10.2 Temperature

For the years between 1951 and 2000, Indian Meteorological Department has prepared a report on the Climate of Jammu and Kashmir which has detailed information about the climate of Reasi District as well. As per the report, there is one meteorological observatory at Katra situated at an elevation of approximately 1170 meters in the district. The meteorological parameters recorded at this observatory may be taken to describe the climatic conditions for this district. The elevation of the district varies from 400 to 2480 meters and as temperature and other meteorological conditions depend on the topography it varies from place to place. The cold season is from the middle of November to mid-March. Temperatures begin to decrease from the middle of November till January. January is the coldest month with mean maximum temperature and mean minimum temperature at Katra are 17°C and 5.8°C respectively. Whereas mean maximum temperature of about 20°C and mean minimum temperature of about 8°C are experienced at district headquarters Reasi situated at about 517 meters. In association with cold waves, the minimum temperature may sometimes drop to below 0°C on individual days. The day and night temperatures both begin to rise from March and continue till July, while the day temperature reaches its maximum in June which is the hottest month with mean maximum temperature of about 39°C and mean minimum temperature of about 25°C at Reasi. Whereas at Katra mean maximum temperature and mean minimum temperatures are 35.6°C and 21.9°C respectively. Summers are hot while the temperatures only go down marginally in the monsoon months. On some days, during the period April to June the maximum temperature may sometimes reach 44°C. Both the temperatures are 3°C to 5°C lower at high altitudinal areas and 2°- 3°C high at low lying areas with reference to Katra. The period of summer and post monsoon season is of pleasant with fair weather. The temperature in the project area for the Months of 2020 is shown in:

Table 9: Maximum and Minimum Monthly Temperature at Reasi during 2020

| Jan | | Feb | | Mar | | Apr | | May | | Jun | | July | | August | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|--------|-----|
| Max | Min | Max | Min | Max | Min |
| 9 | -6 | 19 | -5 | 21 | 1 | 27 | 3 | 32 | 3 | 33 | 11 | 34 | 13 | 36 | 15 |

Source: Accuweather.com

The project location witnesses cold winters and hot summers. The maximum temperature goes till 36 degrees during the above-mentioned months and minimum temperature goes down to - 6 degrees.

5.10.3 HUMIDITY

The atmosphere over the district is generally humid during the period July to September when values of relative humidity are about 80%. The period from April to June is the driest part of the year especially in the afternoons when relative humidity is at about 40% to 50%. In the rest of the year values of the humidity are about 60 to 70%. The average relative humidity values recorded between 1951 and 2000 recorded at 8:30 IST and 17:30 IST are shown in the Table 10.

Table 10: Relative Humidity Recorded for Reasi at Katra Observatory between 1951 and 2000, Climate of Jammu and Kashmir, IMD, 2014

| MONTH | Relative Humidity % | |
|-----------|---------------------|----------|
| | 0830 IST | 1730 IST |
| January | 73 | 70 |
| February | 68 | 63 |
| March | 61 | 55 |
| April | 50 | 42 |
| May | 44 | 49 |
| June | 52 | 42 |
| July | 82 | 75 |
| August | 87 | 83 |
| September | 79 | 75 |
| October | 65 | 62 |
| November | 66 | 64 |
| December | 67 | 68 |
| Annual | 66 | 61 |

Source: Climate of Jammu and Kashmir, IMD, 2014

5.10.4 Cloudiness

During the monsoon months July and August skies are heavily clouded to overcast. Cloudiness decreases thereafter and skies are very lightly clouded in the rest of the year except in the period December to March when skies are moderately clouded to overcast when western disturbances affect the district. In the winter season, the skies are sometimes obscured in the morning due to lifted fog which clears with the advance of the day.

5.10.5 Winds

Winds are generally light throughout the year. Winds are mostly easterly throughout the year in the mornings. During latter part of pre-monsoon and southwest monsoon season, winds also blow from southeast direction in the mornings, while westerly wind is predominant in the afternoons throughout the year and southwesterly component is also noticed on some days during the period February to July in the afternoons. The Table 11 shows the average wind speed and predominant direction recorded between 1951 and 2000 at Katra Observatory. Thunderstorms occur throughout the year. Its frequency is more in the period March to September but subsequently reduces its activity being least in the winter months. Thunderstorms are sometimes accompanied with hails. Its frequency is more during the period March to May, while it is occasionally noticed in other months. Dust storms occur occasionally in pre-monsoon months. Fog is common during the winter and monsoon season.

Table 11: Wind Speed and Predominant Wind Direction for Reasi District between 1951 and 2000

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|----------------------|-----|---------|---------|----------|-------------|----------|----------|---------|----------|-----|-----|-----|--------|
| Wind Speed in km/hr | 1.6 | 2.0 | 2.4 | 2.2 | 2.3 | 1.9 | 1.6 | 1.4 | 1.2 | 1.2 | 1.0 | 1.3 | 1.7 |
| Direction in morning | C/E | C/E | C/E | C/E / SE | C/E / W/S E | C/E / SE | C/E / SE | C/E/S E | C/E / SE | C/E | C/E | C/E | C/E |
| Direction in evening | C/W | C/W/ SW | C/W/ SW | C/W/ SW | C/W | C/W | C/W/ SW | C/W | C/W | C/W | C/W | C/W | C/W |

Source: Climate of Jammu and Kashmir, IMD, 2014

5.11 Soil Quality

The soil of the district is made up of the Ochrepts, Orchrepts-Orthents and Ochrepts Orthents-Ustalfs sub-order associations. The soil viz., Ochrepts-Orthents is spread over the district in the shape of a huge linear belt extending from south-east to north-west followed in the north by another belt of soils of Ochrepts-Orthents-Ustalfs. The soil is of brown colour having coarse loamy texture which is suitable for crops like maize, millets etc.

5.12 Ambient Air Quality

The entire study area falls in rural area with limited human activities. There is no industrial establishment in and around the project area. The area is far away from the city and motorable areas because of which no pollutants are expected to be present in the study area. Continuous monitoring of air quality will be done in the study area during the whole of the project cycle.

5.13 Hydrological Environment

The main river of the Reasi district is Chenab or Chander Bhaga which enters the district from its eastern end extending up to the place where river Anas merges with Chenab. The Chenab then takes a southernly turn and enters Akhnoor tahsil of Jammu district. Underground water resources Perennial springs of good water are numerous in the whole terrain and form the principal resource of water supply. Murree sand stones, though porous are hard and steep dipping thus cannot retain water. The system of joints, cracks and faults etc. let out stored water in an even continuous flow through the channel of springs. The discharge obtained at the location of bridge is 357.29 cum and the bed slop is 1:20.

The catchment area of the location of the bridge is around 33 sq km. Figure 8 shows the catchment area from in 3D Terrain View.

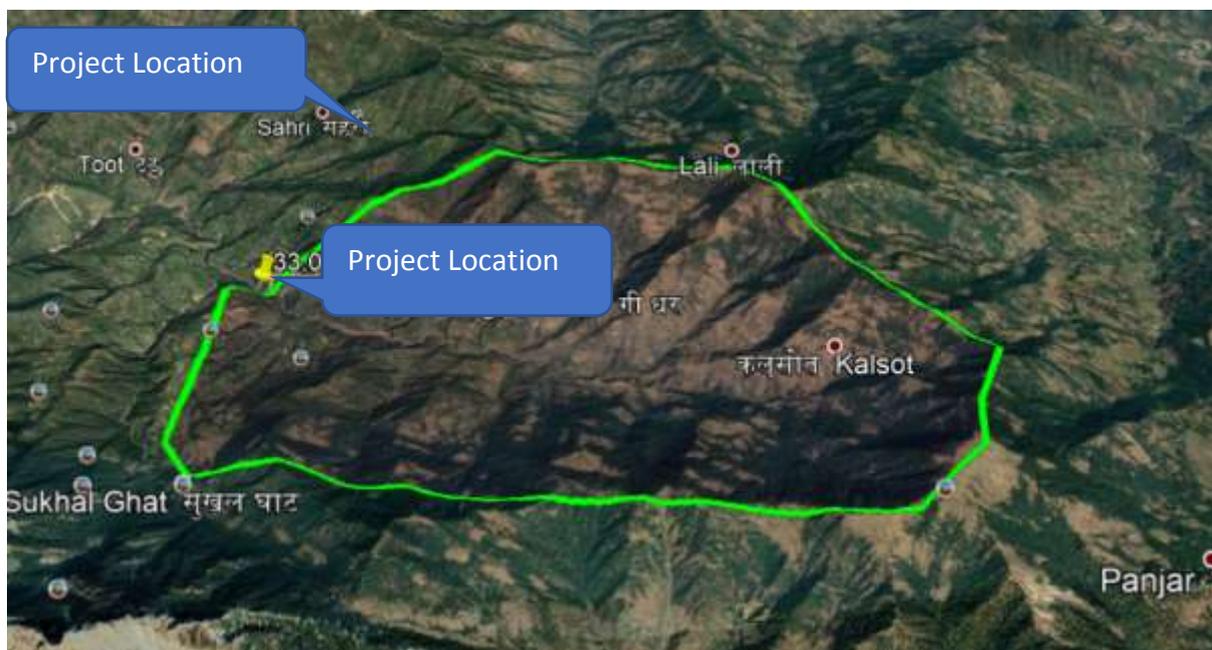


Figure 8: Catchment area in 3D Terrain View, Created Using Google Earth Pro

5.14 Ambient Noise Quality

There is not any significant noise generating activities recorded within the study area. The study area is mainly remote forest. There are few rural settlements around the proposed project area. However the noise levels are expected to be on the lower side.

5.15 Surface Water Quality

Due to the construction activities, there is no expected deterioration of water quality of the stream because the construction of bridge will not disturb the stream. The bridge foundations will be placed on firm rock on the sides of the bridge and the location of foundations is sufficiently away from the water stream.

5.16 Ecological Resources

A survey was carried out to have an overview of the ecological settings of the study area. The field visits were carried out during February and March 2019. The area exhibits a land use pattern that is mainly forest area.

The following sections describes the ecological settings of the study area:

5.16.1 Forests

The project area is located in area of significant natural vegetation. The major land use pattern is forest land. The district of Reasi is has moderately to very dense forest cover. Indian State forest report of 2019 found that the forest cover in J and K UT is 39.4% however the district of Reasi has much higher forest cover at 56.85%. Figure 9 shows the forest cover in the J and K state as per the Indian State of Forest Report, 2019. Table 12 shows the land under different types of forest for Reasi district and the UT of Jammu and Kashmir.

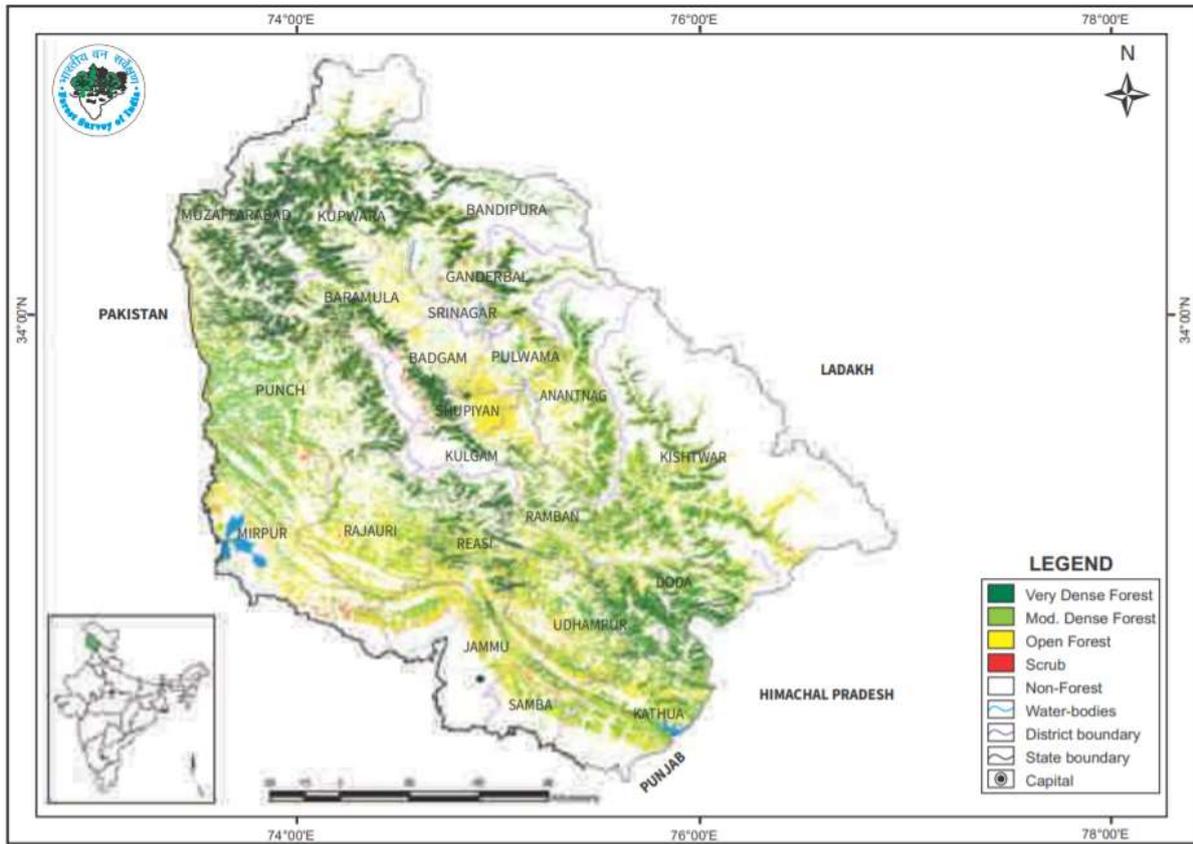


Figure 9: Forest Cover of the UT of Jammu and Kashmir, India State of Forest Report, 2019

Table 12: Area under different types of forest

| State/ District | Geographical Area | Very Dense Forest | Moderately Dense Forest | Open Forest | Total | Percent of Geographical area |
|-------------------|-------------------|-------------------|-------------------------|-------------|-----------|------------------------------|
| Reasi | 1932 | 234.54 | 393.58 | 470.29 | 1098.41 | 56.85 |
| Jammu and Kashmir | 53,258 | 4,202.86 | 7,952.47 | 8,967.26 | 21,122.59 | 39.66 |

Source: India State of Forest Report, 2019

The forests in the district of Reasi are dense and plenty. The forests exist on both sides of Anji Nallah. The proposed bridge is located over Anji nallah and the construction of bridges does not require any felling of trees as the abutments of the bridge will be constructed on the firm rocky strata. No tree is located in the alignment of the bridge. As per the District Handbook Reasi, 2011, the forest area in the study area was over 61% as shown in the Table 13.

Table 13: Forest Cover in the Study Area

| Name of Village | Village area in hectares | Forest area in hectares |
|----------------------|--------------------------|-------------------------|
| Sahri | 690.4 | 187 |
| Sukhal Ghat | 824 | 685.1 |
| Devi Garh | 632.1 | 488.1 |
| Toot | 587.2 | 310 |
| Total for Study Area | 2733.7 | 1670.2 (61.1%) |

Source: Census of 2011

5.16.2 Protected Areas

Although there are 3 National parks, 13 Wildlife Sanctuaries and 15 conservation reserves and 14 wetland reserves located in the state of Jammu and Kashmir, but there is no such ecologically protected area located in Reasi District. The nearest Wildlife Sanctuary is situated in Udhampur District which is more than 80 km away from the project location. A list of ecologically protected area in Jammu and Kashmir is presented in Table 14.

Table 14: List of Ecologically Protected Areas in J and K

| S. No. | Name of the Protected Area | District | Area (Sq.kms) |
|-----------------------|---------------------------------------|---------------------------|---------------|
| National Parks | | | |
| 1 | Dachigam National Park | Srinagar/ Pulwama | 141.00 |
| 2 | Kishtwar National Park | Kishtwar | 2191.50 |
| 3 | Kazinag National Park | Baramulla | 89.00 |
| | | TOTAL | 2421.50 |
| Wildlife Sanctuaries | | | |
| 1 | Overa - Aru Wildlife Sanctuary | Anantnag | 425.00 |
| 2 | Rajparian (Daksum) Wildlife Sanctuary | Anantnag | 20.00 |
| 3 | Gulmarg Wildlife Sanctuary | Baramulla | 180.00 |
| 4 | Limber Wildlife Sanctuary | Baramulla | 43.75 |
| 5 | Lachipora Wildlife Sanctuary | Baramulla | 93.50 |
| 6 | Hirpora Wildlife Sanctuary | Shopian | 341.25 |
| 7 | Thajwas (Baltal) Wildlife Sanctuary | Ganderbal | 203.00 |
| 8 | Tral Wildlife Sanctuary | Pulwama | 154.15 |
| 9 | Ramnagar Wildlife Sanctuary | Jammu | 31.50 |
| 10 | Nandni Wildlife Sanctuary | Jammu | 33.34 |
| 11 | Surinsar Mansar Sanctuary | Udhampur/ Samba/ Jammu | 97.82 |
| 12 | Jasrota Wildlife Sanctuary | Kathua | 10.04 |
| 13 | Tata Kutti Wildlife Sanctuary | Poonch | 66.27 |
| | | TOTAL | 1699.62 |
| Conservation Reserves | | | |
| 1 | Achhabal | Anantnag | 20.00 |

| | | | |
|---|----------------------------|-----------|--------|
| 2 | Khrew | Pulwama | 50.25 |
| 3 | Khonmoh | Pulwama | 67.00 |
| 4 | Brain Nishat | Srinagar | 15.75 |
| 5 | Khimber - Dara - Sharazbal | Srinagar | 34.00 |
| 6 | Wangat | Ganderbal | 12.00 |
| 7 | Ajas | Bandipora | 48.00 |
| 8 | Naganari | Baramulla | 22.25 |
| | | TOTAL | 269.25 |

Source: Department of Wildlife Protection, UT of J and K

5.16.3 Flora and Fauna

The project area falls in Himalayan biogeographic zone (2) biotic province (2B) of India. These areas are characterized by, dense subtropical and alpine forests. The area is an important representative of forest land in the region.

In Reasi District, Trees; namely; deodar, kail, fir and pine are existing in higher altitude, whereas in lower slopes and plain areas the trees of bamboo, tali, kher, tunu and thorny bushes are in abundance. Among fruit trees mango, apricot, guava, apple, walnut and citrus trees are found over a large area of the district. The vegetation consists of barberis, spirala, primsepia, qurrucus and flex including sub-alpine herbs.

5.16.3.1 Flora core and Buffer Zone

The proposed site for bridge crosses Anji Nallah and replaces a footbridge which got washed away in 2014 floods. The proposed area is devoid of any significant vegetation. The vegetation of the study area within core zone is mainly composed of open scrubs and grasses. Among grasses *Cymbopogon procerus* (Boda Grass) is predominantly present at which is commonly used for cattle fodder. The different flora was surveyed by walking in the core and buffer zones of the area. The list of flora recorded in the core zone during field survey are listed below in Table 15.

Table 15: List of Flora within Core Zone

| Name of Plant | Scientific Name |
|---------------|-------------------------------------|
| A. Trees | |
| Chir | <i>Pinus roxburghii</i> |
| Kambel | <i>Lannea Coramas delica merill</i> |
| Amli | <i>Phyllanthus emblica</i> |
| Tali | <i>Dalbergia sisoo roxb</i> |

| | |
|--------------------------|-------------------------------|
| Khair | Acacia catechu (L) willd oliv |
| Kikar | Acacia nilotica |
| Bamboo | Bambusa aurandinacea Retz |
| Pipal | Ficus religiosa Linn |
| B. Shrubs | |
| Bael | Aegle marmalos |
| Gumtree | Acacia arabica wild |
| Bamboo | Bambusa aurandinacea Retz |
| Amlaa/Indian Goose Berry | Phyllanthus emblica Linn |
| C. Herbs | |
| Indian Hemp | Cannabis Sativa |
| Tulsi/Sweet Basil | Ocimum Basillicum |
| Daarim | Punica grantatum Linn |
| Jujuba fruit | zizyphus jujuba lank |
| Indian Hemp | Cannabis Sativa |

5.16.3.2 Fauna

So far as the fauna of the district is concerned, wild animals include leopard, panther, fox, wild goat and wild cow. The pet animals, viz., cow, buffalo, goat, sheep, horse, camel and birds like parrot, dove, cock, sparrow, peacock, hen and duck are also found in the district. Animals like chetah, nilgai, sambar etc. are found

The project area is not rich in biodiversity. Both domesticated animals and wild animals constitute the faunal population around the study area. The data on fauna in the study area was collected from secondary data collected from local forest office, public consultation and observations made at site during field survey. The list of different animals found in the study area is presented below in Table 16.

Table 16: List of Fauna in the Study Area

| S. No. | Common Name | Scientific Name | Remarks |
|--------|----------------------|-----------------------|----------|
| 1. | Rabbit | Oryctolagus cuniculus | Observed |
| 2. | King cobra | Ophiophagus Hannah | Reported |
| 3. | Indian Fox | Vulpes bengalensis | Observed |
| 4. | Common Indian Toad | Bufo melanostictus | Reported |
| 5. | Common frog | Rana tigrina | Reported |
| 6. | Cobra | Naja | Reported |
| 7. | Indian Python | Python molurus | Reported |
| 8. | Forest Lizard | Calote rouxi | Reported |
| 9. | Indian Chameleon | Chamaeleon zeylanicus | Reported |
| 10. | Common garden Lizard | Calotes versicolor | Observed |

| | | | |
|-----|--------------|-----------------|----------|
| 11. | Common Skink | Mayuba carinata | Reported |
|-----|--------------|-----------------|----------|

5.16.3.3 Avifauna

In the study area numbers of birds are recorded during the time of field survey which are listed in the Table 17. The study also confirms that there is no route of migratory birds that comes under or overlaps with the study area.

Table 17: List of Avifauna in the Study Area

| Common Name | Scientific Name |
|-------------|-----------------------|
| Bulbul | Molpastes cafer |
| Pigion | Columba Livia |
| Koel | Eudynamis Scolopaccus |
| Parrot | Psittacula eupatria |
| Crow | Corvus Splendens |
| Sparrow | Passer domesticus |
| Peacock | Pavo cristatus |

During the stakeholder consultation with local public and forest department, it was confirmed that migratory birds were never spotted near the location of the project.

5.17 Socio-economic Environment

5.17.1 Demography

With a geographical area of 42241 sq. km, Jammu and Kashmir ranks as the second largest union territory in the country accounting for 1.28% of the country's area. The proposed project is located in Reasi district of Jammu. The district headquarters is located in Reasi Town. According to the 2011 census Reasi district has a population of 314,667, roughly equal to the nation of The Bahamas. This gives it a ranking of 570th in India (out of a total of 640). The district has a population density of 184 inhabitants per square kilometer (480/sq mi). Its population growth rate over the decade 2001-2011 was 27.06%. Reasi has a sex ratio of 890 females for every 1000 males (which varies with religion), and a literacy rate of 59.42%.

Reasi has a population which is a blend of almost equal percentage of Muslims and Hindus and has set an example for tolerant and peaceful religious co-existence. Reasi's population stands at 314,667 (2011) constituting 49.67% of Muslims and 48.90% of Hindus. The District is

divided into ten Tehsils and 22 Niabats. There are 12 Development Blocks with 147 Panchayat Halquas.

The demographic profile of Reasi is summarized in Table 18.

Table 18: General Demographic Profile of Reasi District

| Parameter | Total | Rural | Urban |
|-----------------------------------|----------|----------|--------|
| Area (sq. km) | 1719 | 1679.99 | 39.01 |
| No of Households | 56,689 | 51,659 | 5,030 |
| Total Population (lakh) | 3,14,667 | 2,87,671 | 26,996 |
| Male Population | 1,66,461 | 1,51,481 | 14,980 |
| Female population | 1,48,206 | 1,36,190 | 12,016 |
| SC population | 37,757 | 33,232 | 4,525 |
| ST Population | 88,365 | 86,608 | 1,757 |
| Population density (people/sq km) | 183 | 171 | 692 |
| Literacy Rate | 48% | 46% | 71% |
| Sex Ratio | 890 | 899 | 802 |

Source: Census of 2011

5.17.2 Land Use

The total geographical area of the district is 1.52 lakh ha. The land utilisation pattern as available in the district during the year 2017-18 is given in the Digest of Statistics 2017-2018 published by directorate of economics & statistics, Government of Jammu and Kashmir. The total cropped area is 0.39 lakh ha. Area sown more than once is 0.15 Lakh ha. The cultivated area of the District is 0.34 Lakh Hects. out of which 0.22 Lakh ha is under maize and 0.14 lakh ha is under wheat during the year 2017-18. For the study area, the land use pattern is similar to the Reasi district. The study area has no Barren and Uncultivable Land, Permanent Pastures and Grazing Lands, Land Under Misc. Tree Crops, and Fallows. Out of the total of 2733 hectares, more than 61% land is covered by forests and 19% is used in non-agricultural uses. Only 11% Area is Sown. Table 19 shows the land use pattern in the study area for greater detail.

Table 19: Land Use Pattern in the Study Area

| Name of Village | Area of village in hectares | of Forests in | Area Under Agricultural Uses | Non-Culturable Waste Land | Net Area Sown |
|-----------------|-----------------------------|---------------|------------------------------|---------------------------|---------------|
| Sahri | 690.4 | 27% | 47% | 11% | 15% |
| Sukhal Ghat | 824 | 83% | 1% | 8% | 7% |
| Devi Garh | 632.1 | 77% | 3% | 7% | 13% |
| Toot | 587.2 | 53% | 29% | 8% | 10% |

| | | | | | |
|----------------------|--------|-----|-----|----|-----|
| Total for Study Area | 2733.7 | 61% | 19% | 9% | 11% |
|----------------------|--------|-----|-----|----|-----|

Source: Digest of Statistics, 2017-2018

The District occupies lower position in respect of Irrigation facilities with only 5.8% of the net cropped area irrigated during 2017-2018. Out of the gross irrigated area of 1397 ha during 2017-18, canals accounted for 96.9%, and Tanks 3.1%. All the principal sources except canals are non-precarious.

Chapter 6: PUBLIC CONSULTATION AND PARTICIPATION

6.1 Introduction

Consultation during project preparation is an integral part of the social assessment process. It not only minimizes the risks but involves the public as stakeholders in project preparation process, promotes public understanding of the project and leads to timely completion of the project. The views and suggestions received during stakeholder's consultations also helps in better identification of social impacts and incorporation of mitigation measures in SMP to address these impacts. The specific objectives of the consultation process were to:

- Provide clear and accurate information about the project to the beneficiary community;
- Obtain the main concerns and perceptions of the public and affected families and their representatives regarding the project
- Improve project design and, thereby, minimize conflicts and delays in implementation
- Increase long term project sustainability and ownership

Consultation has been done in accordance with the World Bank's ESMF-JTFRP requirement which is the pre-requisite for the social and environmental safeguards. The purpose and objective of stakeholder's consultation is the identification and involvement of potential Project Affected people, nearby communities and other stakeholders in order to make them cognizant about the proposed bridge sub-project activities. Consultation has been followed in accordance with the World Bank's ESMF-JTFRP protocol which is the pre-requisite for the environmental screening process and environmental assessment. The purpose and objective of this

consultation is the involvement of residents/ stakeholders and to make them cognizant about the proposed bridge project activity of the subproject. Consultation with the stakeholders/ participants were conducted and participated based on the procedural guidelines of reaching public required for the preliminary baseline characteristics of environmental and social screening.

Public participation and community consultations is an integral part of environmental and social assessment. Public participation is a continuous two-way process, involving promotion of public understanding of the processes and mechanisms through which developmental problems and needs are identified and addressed. Consultations are a tool to inform stakeholders about the proposed project and seek their involvement and ownership at all stages of the project cycle. It assists in identification of the problems associated with the sub projects as well as the needs of the population likely to be impacted. This participatory process enables the participation of the local people in the decision-making process.

Public discussions were conducted at nearby villages. Panchayat members were contacted to inform the people. The Team also had informal meetings with village heads, panchayat members, patwaris, tehsil and DFO and forest officials, and the business community.

6.2 Consultation and Participation Mechanisms

People are properly informed and consulted about the project, their situation and preferences, and allowed to make meaningful choices. The project will therefore ensure that the stakeholders are informed, consulted, and participate actively in the development process. This will be an ongoing process, both during preparation, implementation, and monitoring of project results and impacts.

During the implementation and monitoring stage, information will be disseminated to project affected persons (if any) and other key stakeholders in appropriate ways. This information will describe the main project features. Consultation will be carried out taking into account the appropriate socio-cultural milieu, gender-considerations, and other differences among the stakeholders. Particular emphasis will be laid on the needs, concerns and priorities of vulnerable groups.

The EIA provides detailed information regarding the consultation process. It describes information disclosure at preparation stage. The consultation process established during preparation stage of the project uses different types of consultation such as in-depth interviews

with key informants, focus group discussions, seminars and meetings. The consultation program included the following:

- Heads of households;
- Household members;
- Villagers;
- Village panchayats
- Government Agencies and Departments; and

As part of the consultation process, women were given the opportunity to voice their views without the presence of men. The main objectives of the consultation program were to make people aware of the project & ensure people participation. During the process efforts were made to ascertain the views and priorities of the people. The aims of community consultation were:

- To understand views of the people affected w.r.t to the impacts of the Village
- To identify and assess all major economic and sociological characteristics of the village to enable effective planning and implementation

The consultation process was carried out at Village level and all the comments received have been incorporated in the EIA.

6.3 Local Level Consultations

More than two-group discussions were held in the villages. The size of group was restricted to 10-15 so that everybody gets the chance to express their views on the project. Separate group meetings were held for women. The objectives of local level consultations were to inform the affected persons about the project and to incorporate their views in the EIA and mitigation measures as suggested by them. The community level consultations included participation and discussion with different groups within the community regarding improvement and changes at the ground level to be addressed and included in the mitigation plans.

6.4 Issues Discussed During Consultation

The issues discussed during public consultation for the proposed bridge are given below:

- About proposed project, source of assistance and its implementation/ execution etc.

- Information on perceived benefits from the proposed bridge including travel time, fuel cost, noise and air pollution.
- COVID -19 Issues and Mitigation Measures
- Information of the impacts from the proposed bridge during construction stage in terms of inconvenience to public, air and noise pollution, etc.
- Occurrence of disaster like floods and cloud burst in past.
- Whether construction activities will cause any type of health hazard or not?, then and mitigation measures.
- Discussions among public for sharing of information related to the proposed bridge, environment policy of World Bank, direct and indirect impacts of improvement/construction work on environment.
- Any impact on trees in the close vicinity of the proposed bridge site.

Participants were urged to express their views freely without any reservation and have an open conversation/discussion about the issues.

6.5 Details of Community Consultations

Table 20: Details of public consultations conducted

| S.No | Date | Location of consultation | Number person attended in consultation as per records | Participants |
|------------|-----------|--------------------------|---|--|
| Study Area | | | | |
| 1 | 15.11.20 | Sukhal Ghat | 20 | Local villagers, farmers, women, Sarpanch, Local representatives |
| 2 | 14.11.20 | Tote | 20 | |
| 3 | 15.11.20 | Devigarh | 20 | |
| 4 | 14..11.20 | Sahri | 20 | |

6.6 Key findings of the local level consultations

The key findings of the local level consultations are as follows:

- The participants were concerned about the speedy completion of the project. Their daily routines were devastated after the floods of 2014 and after the existing footbridge was washed away.
- People wanted the new footbridge to withstand floods like that of 2014.
- Participations did not raise any concern of land acquisition as the bridge is not being constructed on private land but is just being constructed to replace an existing bridge.
- People in general were very enthusiastic about the benefits of the sub- project in terms of reduction in travel time and safe movement during rainy season.
- The participants were glad that they were being consulted for the preparation of EIA
- People are ready to extend all types of support during execution of the sub-project as their major difficulties will be overcome after completion of the sub-project.
- They were also interested in employment opportunities during the construction of the project.
- The participants were informed about the requisite environmental management measures which would be incorporated in EMP and public consultation shall be a regular process during all stages of the sub-project execution to solve any issues arising out of proposed works.

The Table 21 below provides detail of the consultations carried out during EIA.

Table 21: Output of Local Level Consultations conducted in the study area

| Participants | Issues raised | Response / Addressed in EIA |
|--|--|---|
| Local villagers, Farmers, Students, Sarpanch, Tehsildar, Local representatives | <p>The participants want employment in the project.</p> <p>The participants wanted timely completion of the project</p> <p>People wanted to know if private land will be acquired</p> <p>People raised concern over safety of the bridge in case of future floods.</p> | <p>Local workforce will be employed for transporting materials and other helping works for the project</p> <p>The project plan and milestones will be explained to them so that they are fully aware of when they can expect the bridge to be complete. The project to the extent possible will provide employment during construction as per the qualification.</p> <p>It was explained to the participants that no land needs to be acquired for the project</p> <p>It was communicated to the participants that the bridge is being designed as per IS codes and after incorporating all the safety norms. The span of the bridge is sufficiently large so that the foundations are not disturbing the stream.</p> |

The Attendance Sheet of Public Consultation is given in the Annexure II.

6.7 Photographs of Public Consultation

Few Photographs from Public Consultations from all villages are shown below:







Chapter 7: ANALYSIS OF ALTERNATIVES

7.1 Introduction

Analysis of alternatives involves a thorough study of the possible future conditions in the project study area in response to a set of alternatives without the project or status quo condition. Development of the project will provide new economic opportunities to people in the area as well as reduce the travel time from one side of Anji Nallah to the other.

To evaluate further, both the options of ‘Proposed Project’ and ‘No- Project’ Alternative have been assessed against potential environment impacts that are envisaged. Going forward with the proposed project alternative is considered the best possible option as opposed to ‘No Project’ since the proposed project is of vital importance to the area. The comparison of overall environmental impacts as a result of Proposed Project and No Project is given in Table 22.

Table 22: Comparison of overall environmental and social impacts as a result of Proposed Project and No Project

| S. No. | Environmental Impacts | Proposed Project | No Project |
|--------|-----------------------------------|---|---------------------------------|
| 1 | Land | No Change in existing situation | No Change in existing situation |
| 2 | Air Quality | Minor temporary change during construction, however no permanent change | No Change in existing situation |
| 3 | Noise | Temporary minor change during construction. No permanent change | No Change in existing situation |
| 4 | Waste water | Temporary minor change during construction. No permanent change | No Change in existing situation |
| 5 | Waste Generation and its disposal | Temporary minor change during construction. No permanent change | No Change in existing situation |
| 6 | Soil | No change in existing situation | No Change in existing situation |
| 7 | Groundwater | No change in existing situation | No Change in existing situation |
| 8 | Socio-economic | Significant Beneficial impact | Potential negative impact |
| 9 | Traffic | No impact | No Change in existing situation |
| 10 | Cultural Property | No Change in existing situation | No Change in existing situation |

| | | | |
|----|------------|-------------------------------------|---------------------------------|
| 11 | Employment | Positive impact during construction | No Change in existing situation |
|----|------------|-------------------------------------|---------------------------------|

The others are discussed as below:

7.2 Alternate methods of crossing Anji Nallah

Other possible options for providing a means for people to cross ani nallah were considered. For example, a boat system was considered wherein a designated boat could be used from transporting people from one side of the Anji Nallah to the other. However, this option was discarded because of unreliable water level in Anji Nallah, constant requirement of someone to drive the boat, non-suitability during monsoon due to high flood and non-permanent nature of the method.

Based on the analysis, the construction of foot bridge was found as the best possible alternative to achieve the required target to replace the existing bridge and provide a means for people to travel from one side of Anji Nallah to the other.

The proposed location of the bridge is ideal because is it just replacing the existing bridge which got washed away in the 2014 floods. The span has been fixed so as to place the foundation so firm rocky strata so that the bridge can withstand future floods.

7.3 Conclusion

From the above-mentioned alternatives: selection of location the project shows positive beneficial impact towards the society and economy. Hence, the project with all the chosen options is the appropriate alternative and is beneficial for the region.

Chapter 8: POTENTIAL ENVIRONMENTAL IMPACTS

This section presents identification and evaluation of anticipated impacts during pre-construction, construction and operation phases of the proposed construction of 43 m span footbridge over Anji Nallah, in Reasi District. The planning of proposed project intervention points towards the impacts in the pre-construction, the construction stages and the operation stages. The subsequent sections deal with the prediction of impacts due to the project on the physical, biological environment and socio & cultural environment Table 23 and Table 24 below present the general environmental impacts expected due to a construction site. Impacts have been assessed based on the information collected from the project activities as per design parameters/ drawings collected from the EPC contractor. Constructions, screening & scoping of environmental attributes, and baseline data collected during the EIA study. The quantum of all the impacts on physical & biological and socio-economic environment has been discussed in details in subsequent paragraphs.

The impact matrix for the project is given below in Table 23;

Table 23: Impact Matrix for the Project

| S. No. | Parameters | 43 m span footbridge over Anji Nallah, in Reasi District. |
|--------|---|---|
| | Negative Impacts | |
| 1. | Hand Pumps/Springs | Nil |
| 2. | Pond Area | Nil |
| 3. | Relocation Religious Properties | Nil |
| 4. | Transfer of Agriculture Land (ha) | Nil |
| 5. | Nos of trees to be felled | Nil |
| | Positive Impact | |
| 1. | Enhancement Sites (Nos.) | Accesibility of villlages to town |
| A. | Cultural/Religious Properties (Nos.) | 1 |
| B. | Silt and debris/waste traps at the outfall of drains | - |
| C. | Safe Access/traffic calming at Educational Institutes, hospitals etc (Nos.) | 1 |
| D. | Trees Saving (Nos) | - |
| E. | Wastes Reuse | - |
| F. | Proposed Plantation | Nil |
| G. | Proposed Compensatory Plantation (if tree cutting requirement arises) | Nil |
| 3. | Bridge/ Approach Road Safety Measures | |

| | | |
|-----------|------------------------------------|----------------------------|
| A. | Intersection/Access Improvement | 2 (Approaches) |
| B. | Signage Boards (Nos.) | As per IRC Guidelines |
| C. | Sidewalk | Available(1.5m both sides) |
| D. | Traffic Calming Measures Locations | - |

Table 24: Anticipated potential environmental impacts on the physical, biological and socio-economic environment

| Project Activity | Planning and Design Phase | Pre-construction Phase | | Construction Phase | | | | |
|---|---|---|--|---|---|---|---|---|
| | | Removal of Old Structures | Removal of trees and vegetation | Earth works including and borrow area | Laying of pavement | Vehicle & Machine operation & maintenance | Asphalt & crusher plants | Sanitation & Waste (labour campus) |
| Environmental component Affected | | | | | | | | |
| Air | | Not envisaged as removal of old structure is not involved | However the execution of project requires no tree cutting. | Excavation is limited to the construction of two abutment on the shores . The impact will be limited to the construction period only. | The foot bridge is of steel decked only. Asphalt or concrete pavement is not in the scope of the project. | The construction site is approached through non motarable road. The vehicle operation is limited to the hauling of construction material upto nearest roadhead. | The asphalt and chrusher plant will not be established. | Odour / Smoke from Cooking of food |
| Land | Impact on productive land if land acquisition required. | Generation of debris. Not envisaged. | Erosion and loss of topsoil. Not envisaged | Erosion and loss of topsoil. No Major impact anticipated. | Not envisaged | Not envisaged | Not envisaged | Contamination from Wastes and sewage |
| Water | Impact on Water Sources/ Surface Water Body | Siltation due to loose earth. Not envisaged | Siltation due to loose earth. Not envisaged | Not envisaged | Not envisaged | Not envisaged | Not envisaged | Contamination from wastes and untreated sewage disposal |
| Noise | | No impact anticipated. | Not envisaged | Noise Pollution. Limited to the construction period only. | Not envisaged | Not envisaged | Not envisaged | Not envisaged |
| Flora | No tree cutting is required for the execution of project. | | Not envisaged | Not envisaged | Not envisaged | Not envisaged | Not envisaged | Not envisaged |

8.1 Consideration of environmental impacts in design

The important environmental impacts for consideration during design of the proposed bridge are given below:

8.1.1 Hydrological Study

A bridge was there at the existing proposed site of, which was washed away during September 2014 catastrophic floods. This shows the high discharge with turbulent flow regime of the nallah which completely dislodged. Therefore, hydrological study and runoff calculations for extreme flood/rains under the climate change scenarios is carried out and considered for designing of the proposed 43 m span footbridge over Anji Nallah, in Reasi District. The height of the deck of the bridge was further kept 6.6 meters above the HFL for complete safety of the bridge.

8.2 Impact on Soil

Soil is one of the most important components of the physical environment. During construction of the proposed bridge, the potential impacts on soil are discussed below

8.2.1 Construction Phase

During construction of the proposed 43 m span footbridge over Anji Nallah, in Reasi District, the contamination of the soil is anticipated due to improper disposal of oily wastes, solid wastes, open defecation by construction workers, raw sewage disposal from the camp site, etc.

8.2.2 Operation Phase

No impact is anticipated on the soil during the operation phase of the proposed bridge.

8.3 Impact on Water Resources

8.3.1 Construction Phase

For the construction of the proposed 43 m span footbridge over Anji Nallah, in Reasi District, the foundation excavation debris and construction wastes on the course of nallah may also

affect surface water hydrology and flow. Proper management of excavation of foundation wells and disposal of the rock material will be required. However, the extent of such impact will be minor as nallah remain in lean flow most of the time.

8.3.2 Operation Phase

During the operation phase, drainage pattern or hydrology of the Nallah will not be affected. Therefore, no impact is anticipated during the operation phase.

8.4 Degradation of Water Quality

8.4.1 Construction Phase

The surface and groundwater quality due to the proposed 43 m span footbridge over Anji Nallah, in Reasi District may be degraded mainly in the following ways:

- I. by improper disposal of solid wastes, rock material during the excavation of foundation wells, etc.
- II. by raw sewage generated from camp and bridge construction site,
- III. open defecation by workers on the course of Nallah.

During the construction phase, debris and construction wastes, if not cleared, may deteriorate surface water quality of the Nallah.

8.4.2 Operation Phase

During the operation phase, there is no probability of degradation of water quality during normal operations of the proposed bridge at.

8.5 Impact on Ambient Air Quality

8.5.1 Construction Phase

During the construction phase, there are generally will be two main sources of air emissions i.e. mobile sources and fixed sources. Mobile sources include mostly vehicles involved in construction activities however no vehicles will be utilized in construction of the bridge so

Mobile sources will not contribute significantly to the air emissions. The emissions from fixed sources include excavation activities those produce dust emissions.

A certain amount of dust and gaseous emissions will also be generated when concrete is prepared due to cement particles. The quantity of concrete required for the project is miniscule and thus this might not contribute to air emissions significantly. The pollutants of primary concern include Fine Particulate Matter (PM2.5) and Respirable Particulate Matter (PM10). However, suspended dust particles may be coarse and will be settled within a short distance of the construction site. Therefore, the impact on ambient air quality will be temporary and restricted within the closed vicinity of the construction activities for the proposed bridge. Ambient air quality monitoring should be carried out during the construction phase. If monitored parameters are above the prescribed limited, suitable control measures must be taken.

8.5.2 Operation Phase

No adverse impact is anticipated on ambient air quality during the operation phase since the bridge is a foot bridge.

8.6 Impact on Noise

8.6.1 Construction Phase

The proposed construction of the bridge, in Reasi District will be confined to the Nallah. During the construction phase, the noise will be generated from the excavation activity and material stacking. During the construction phase, the noise levels are expected to be increased between 5 - 10 %. However, these noise levels will be temporary and intermittent mostly during works in day time only.

Table 25: Source of Noise Pollution and Impact Categorization

| S.No | Phase | Source of Noise pollution | Impact categorization |
|------|------------------|--|--|
| 1. | Pre-construction | <ul style="list-style-type: none"> Man, material & machinery movements establishment of labour camps, onsite offices, stockyards and construction plants | <ul style="list-style-type: none"> all activities will last for a short duration and also shall be localized in nature |

| | | | |
|----|----------------------------|---|--|
| 2. | Construct ion Phase | <ul style="list-style-type: none"> • Work zones • Community residing near to the work zones | <ul style="list-style-type: none"> • Such impacts again will be temporary as the construction site will go on changing with the progress of the works. |
|----|----------------------------|---|--|

All temporary noise-related impacts near the project will occur during the construction activities. This will occur along the construction zone as well as construction camps. Typical noise levels associated with the construction is given in Table 26. The magnitude of the impact will depend upon the specific types of equipment to be used, the construction methods employed and the scheduling of the work. In the proposed bridge, however, due to the unique location of the site, no heavy machinery will be utilized and hence the noise levels are not expected to increase to the levels shown in Table 26.

Table 26: Typical Noise Levels Associated with Highway Construction

| S.N. | Activity Noise Levels | (d(B)A) |
|------|-----------------------|---------|
| 1. | Grading & Clearing | 84 |
| 2. | Excavation | 89 |
| 3. | Foundations | 88 |
| 4. | Finishing of Road | 84 |

8.6.2 Operation Phase

During the operation phase, the no noise will be generated as it is a foot bridge only.

8.7 Management of Spills and Wastes

During the construction of the proposed bridge at, demolition wastes excavated earth from the foundation, construction derbies, used oil from the maintenance of construction equipment, solid waste, etc will be generated. Such wastes may cause deterioration of soil quality and surface water/runoff flow in Nallah. These wastes must be collected and disposed of appropriately

8.8 Impact on Flora, Fauna and Ecosystem

During the construction and operation phases of the proposed bridge at, no adverse impact is anticipated on fauna. No cutting of trees is required during the construction and operational phases of the Bridge.

8.9 Impact on Socioeconomic Environment

As per the study the sub-project, “Design and Construction of 43 m Span Footbridge over Anji Nallah in Reasi District” can be categorized as Category S-2 as per ESMF. The project does not involve any land acquisition. The construction and operation phases of the proposed bridge will have a beneficial impact on the social environment. Increase in income of local people is expected as some of local unskilled, semiskilled and skilled persons may gain direct or indirect employment during the construction phase of the proposed bridge. Since the immigration of the workforce during the construction phase is likely to be very small, the social impacts on literacy, health care, transport facilities and cultural aspect are expected to be insignificant.

8.9.1 Construction stage

The influx of Construction Workers

Although the construction contractors are likely to use un-skilled labour drawn from local communities, use of specialized construction tools will require trained personnel not likely to be found locally. Sudden and relatively short-lived influxes of construction workers to communities in the project area will have the potential to ‘skew’ certain demographic variables and the traditional social coherence.

It is anticipated that the construction labour inputs for the construction of the 43 m footbridge, in Reasi District will be in the order of about 2-5 persons per day. However, this number will fluctuate and the number in any particular activities will be lower.

Economic Impacts

The relatively short-lived economic impacts of the construction phase are likely to be experienced in local communities for the duration of construction, as workers will make everyday purchases from local traders. Few shops exist at nearby villages, due to the construction activities these general stores will also get benefitted as well. This is likely to give a short-lived stimulus to these traders that will disappear as soon as the construction is complete.

8.9.2 Operation Stage

During the operation phase, the proposed bridge will provide safe movement of people across the sides of Anji Nallah and reduce the travel time. The agricultural produces in the and adjoining areas will be easily procured and delivered from one villages to other and also the town area. Therefore, a positive impact is anticipated on the socio-economic environment during the operation phase.

Impact on Religious Structures and Cultural Properties

No religious structures or cultural properties have been encountered on site.

Common Property Resources

No dismantling of common property resources is anticipated because the nearest village is more than 500 meters away from the bridge location.

Impacts Relating to Human Health & Safety

Poor sanitation arrangement and improper methods used for collection and disposal of solid wastes and effluent, accommodation without ventilation, unhygienic food, electrical safety, the risk from mosquito and reptile etc at the construction workers camp will impact human health and safety.

Safety Aspects

Safety for workers at the worksite and health problems at Labour camps

- Occupational health and safety risks to workers due to inadequate housekeeping and unsafe work practices at work sites.
- Health problems to workers due to inadequate sanitation and un-healthy environment at labour camps/plant sites.

Impact of Pandemic Disease Covid-19 (Coronavirus)

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus variant. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness. In the workplace of construction sites, labour campsites, site offices etc., the best way to prevent and slow down transmission is be well informed about the COVID-19 virus, the disease it causes and how it spreads. To protect workforce from infection the COVID-19 Standard Operational Procedures (SOP's) of the Government protocol and guidelines from World Health Organization (WHO), International Labour law (ILO) and other agencies to be strictly following.

Chapter 9: ENVIRONMENTAL MANAGEMENT PLAN

9.1 Introduction

Environmental Management Plan (EMP) has been prepared which mainly centered on the understanding of the interactions between the environmental and social setting and the project activities and the assessment of the likely impacts. Mitigation measures for anticipated environmental and social impacts have been elaborated as specific actions which would have to be implemented during the project implementation. The EMP would help the contractor and PIU to implement the project in an Environmentally sustainable manner and where contractor for this bridge project, understand the potential environmental and social impacts arising from the proposed bridge construction on Anji Nallah in Reasi District and to take appropriate actions/ mitigation measures to properly mitigate/manage such environmental and social impacts. EMP can thus be an overview document for contractor of this bridge project that will guide EMP of all anticipated impacts. This EMP may also be considered as flexible and will

be further developed by the Contractor in the Contractor's Environment Management Plan (EMP).

9.2 Environmental Management Measures for the Design stage

9.2.1 Hydrological Study for Design of Proposed Bridge

A foot bridge was there at the existing proposed site of, which was washed away during September 2014 catastrophic floods. This shows the high discharge with turbulent flow regime of the Nallah which completely dislodged. Therefore, hydrological study and runoff calculations for extreme flood/rains under the climate change scenarios are carried out and considered for designing of the proposed bridge with excess runoff flow/flood safeguard. No hydrological data were available for the Nallah and therefore the hydrological study was carried out and calculated based on the standard methodology of discharge based in the catchment area by Empirical & Rational Formula.

9.2.2 Seismic Factor in Design Bridge

The proposed bridge at is located in Seismic zone IV and prone to high-intensity earthquakes. Therefore, seismic load factor must be taken into consideration while designing of bridge components.

9.2.3 Safety Signage for Bridge

For the safety of road users and bridge, necessary road safety signage, hazard signage and warning signage with reflective tapes need to be provided before and at the proposed bridge as per IRC guidelines.

9.2.4 Environmental Management Plan (EMP)

The Environmental Management Plan (EMP) will guide the Environmentally-sound construction of the "43 m Footbridge in Reasi District" and ensure efficient lines of communication/ coordination between the PIU, Contractor, PMU and TAQAC. The EMP has been prepared for three stages of bridge project construction activities as (i) Pre-construction Stage; (ii) Construction Stage; and (iii) Demobilization Stage.

The purpose of the EMP is to ensure that the activities are undertaken in a responsible non-detrimental manner with the objectives of:

- i. provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on-site;
- ii. guide and control the implementation of findings and recommendations of the environmental assessment conducted for the subproject;
- iii. detail specific actions deemed necessary to assist in mitigating the environmental impacts of the subprojects; and
- iv. ensure that safety recommendations are complied with.

Budgetary provisions for the implementation of EMP shall be integrated with part of the construction contract in the form of technical specifications and environmental performance requirements. The costs to be incurred on implementation of EMP shall be incidental to the civil works and therefore, no separate environment budget/cost will be provided to the contractor for implementation of EMP. The contractor will ensure effective implementation of EMP during pre-construction, construction and demobilization/ operation stages. EMP for operation stage will be implemented by PIU/PMU.

The Contractor is deemed not to have complied with the EMP if; i), within the boundaries of the project site/ ancillary sites, site extensions and haul/ access roads there is evidence of a contravention of clauses, if environmental damage ensues due to negligence, the contractor fails to comply with corrective action measures or other instructions issued by the PIU / JTFRP-PMU within a specified timeframe and the Contractor fails to respond adequately to complaints from the public.

9.3 Outline of EMP and its Implementation Strategy

The EMP is a guiding tool which discusses the potential environmental impacts and specific mitigation/management measures for the proposed construction of bridge. It refers to the responsibilities ensuring commitment for implementation and means of verifying/ supervision whether the same has been implemented properly. The timing and frequency of monitoring along with the supervision responsibility and reporting requirements are also provided in the Environmental Management Plan. As a part of the EMP, the Contractor will commit to the identification of the environmental impacts at the project site. In case of any future changes in

the bridge project design, the EMP will need to be updated to reflect the new scope of the activities. Such revisions will be finalized in consultation with the World Bank.

The PIU will be responsible to ensure implementation of EMP for the performance of all by the Contractor of this bridge project. Whereas, the TAQAC will ensure periodic quality audit/guidance to the PIU and Contractor and by imparting regular training, monitoring, and ensuring that all EMP provisions and requirements are translated into contract document and that these requirements are implemented to their full intent and extent. Overall responsibility will be of Contractor for effective implementation of EMP and adherence to all the mitigation measures as outlined in this EMP associated with their respective activities. The Contractor will be required to comply with the provisions of the EMP.

9.4 Environment Management Plan (EMP)

The project is an E2 Category project. The EMP for the proposed bridge been covers all three phases design, pre-construction, construction and demobilisation phase of the proposed bridge. In proposed bridge, trees cutting, utility shifting or relocation of religious and cultural properties etc. are not required. The details of various environmental mitigation measures are presented in Table 27 below:

Table 27: Generic Environment Impact Mitigation Pan for 43 m Footbridge over Anji Nallah

| Environmental Component | Issue/ | Remedial Measures | Institutional Responsibility | |
|--|--------|--|------------------------------|-------------|
| | | | Implementation | Supervision |
| A. Design Stage | | | | |
| A.1 Hydrological Study for designing of Bridge | | <ul style="list-style-type: none"> Existing bridge could not with stand high floods in past. Therefore, it is essential that hydrological study should be carried out for designing of the proposed bridge with flood safeguard. | Contractor | PIU, TAQAC |
| A.2 Erosion at bridge abutments during flood | | <ul style="list-style-type: none"> Bridge abutments should be located in areas clear of water way and on non scourable strata | Contractor | PIU, TAQAC |
| A.3 Impact of earth quake on bridge | | <ul style="list-style-type: none"> The proposed bridge is located in Seismic zone IV and prone to high intensity earthquake. Therefore, it is imperative that seismic load factor must be taken in to consideration while designing of bridge components. | Contractor | PIU, TAQAC |
| A.5 Safety of proposed Bridge and its users | | <ul style="list-style-type: none"> For safety of bridge, necessary safety signage, hazard signage and warning signage with reflective tapes need to be provided before and at the proposed bridge as per IRC guidelines. | Contractor | PIU, TAQAC |
| B. Pre-Construction Stage | | | | |
| B.1 Pre-construction Activities By the Contractor | | | | |
| B.1.1 Appointment of Environment & Safety Officer | | <ul style="list-style-type: none"> The contractor will appoint qualified and experienced Environment& Safety Officer (ESO), who will dedicatedly work and ensure implementation of EMP including Occupational health and safety of workers issues at the camp, watching plant and bridge construction work site. | Contractor | PIU, TAQAC |
| B.1.2 Arrangements for temporary land requirement for camp (if required) | | <ul style="list-style-type: none"> The contractor as per prevalent rules will carry out negotiations with the land owner for obtaining their consent for temporary use of land for construction camp etc. | Contractor | PIU, TAQAC |
| B.1.3 Other Construction Vehicles, Equipment and Machinery (if required) | | <ul style="list-style-type: none"> All vehicles, equipment and machinery to be procured for construction of bridge will confirm to the relevant Bureau of Indian Standard(BIS)norms/ Central Pollution Control Board(CPCB) standards. The contractor will maintain records of Pollution Under Control (PUC) certificates for all vehicles used during the contract period, which will be produced to PIU for verification whenever required. It is expected that no machinery or motorized equipment which requires fuel will be used in the construction of the bridge because of lack of accessibility. | Contractor | PIU, TAQAC |
| B.1.4 Procurement of aggregate | | <ul style="list-style-type: none"> The contractor will finalize the approved quarry/crusher for procurement of aggregate for the proposed bridge construction after assessment of the availability of sufficient materials, quality and other logistic arrangements. The Contractor will also work-out road network and report to PIU, which will be inspected before approval. | Contractor | PIU, TAQAC |

| | | | |
|--|--|------------|------------|
| B.1.5 Labour Requirement | <ul style="list-style-type: none"> The contractor preferably will use unskilled/semiskilled labour from local area to give the maximum benefit to the local community. | Contractor | PIU, TAQAC |
| B.2 Pre-Construction Activities By the PIU | | | |
| B2.1 Tree cutting | <ul style="list-style-type: none"> As per site assessment, no cutting of tree is required at proposed site | PIU | PIU |
| B2.2 Environmental Monitoring- Baseline Data | <ul style="list-style-type: none"> Ambient air quality, noise levels and water quality monitoring on the six-monthly basis as per environmental monitoring plan and following the instruction of Environmental Specialist of PMU. | PIU | PMU, TAQAC |
| B2.3 Information Dissemination and Communication Activities | <ul style="list-style-type: none"> Before construction activity, information dissemination will be undertaken by the contractor at the project site. The wider dissemination of information to the public will be undertaken by PMU through the disclosure of EIA / EMP reports on the website of PMU-JTFRP. Project information Board showing the name of work, project cost, duration, date of commencement, date of completion, executing agency and contact details (including telephone numbers) shall be at Bridge Approach Side. Information boards will also be set up at the sites of construction camps and labour camps, plants and stockyard site. Details of Nodal officer with telephone numbers will be displayed for registering complaint/grievances by stakeholder/general public | Contractor | PIU, TAQAC |
| C. Construction Stage | | | |
| C.1 Site Clearance (Clearing and Grubbing) | | | |
| C.1 Site Clearance (Clearing, grubbing and Levelling) | <ul style="list-style-type: none"> If required vegetation will be removed from the construction zone (approaches) before the commencement of construction. All works will be carried out such that the damage or disruption to flora other than those identified for cutting is minimum. Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works will be removed with prior approval of PIU. The Contractor, under any circumstances, will not cut or damage trees. | Contractor | PIU, TAQAC |
| C.2 Protection of Trees | <ul style="list-style-type: none"> No scheduled trees (protective trees) of the J&K is observed around the construction site. No cutting of trees would be required during construction phase of the proposed bridge. No stockpiling of any construction will be allowed around or close to any trees. Any other trees within the area near the construction site will be marked with same horizontal reflective strips and green mesh as per the above measures. | Contractor | PIU, TAQAC |
| C.3 Water Pollution | | | |
| C.3.1 Impact on Water Resource during construction of bridge | <ul style="list-style-type: none"> The following mitigation measures are suggested during construction of the proposed bridge at Anji Bridge: Construction of bridge should be done during least flow or no flow area. Curtain should be provided over the flowing water to avoid the falling of construction material in water. Construction wastes should be collected and disposed in environmentally sound manner as soon as construction is over. | Contractor | PIU, TAQAC |

| | | | |
|--|--|------------|------------|
| | The construction of bridge should not affect existing flow pattern and drainage system around the proposed bridge at Anji. | | |
| C.3.2 Water Pollution from construction material | <ul style="list-style-type: none"> The contractor will take all precautionary measures to prevent entering of wastewater into streams, water bodies or the irrigation system during construction. The contractor will avoid construction works close to the streams or water bodies during monsoon. Any type of construction wastes will not be disposed of in rivers or water bodies. | | |
| C.3.3 Water Pollution from Wastes | <ul style="list-style-type: none"> The contractor will take all precautionary measures to collect and dispose construction wastes generated from the proposed bridge construction site (if any). No solid or hazardous wastes (oil contaminated waste) from camp site will be dumped on nallah or in open areas. Such wastes will be collected and disposed in environmentally sound manner as per environmental regulations | Contractor | PIU, TAQAC |
| C.3.4 Waste Water from site sanitary facilities (if present) | <ul style="list-style-type: none"> Waste water generated from the sanitary facilities of labour will be treated in septic tank followed by soak pit. Workers will not be allowed for open defecation. Proper toilets fitted with septic tank will be provided at camp, batching plant and bridge construction site. | Contractor | PIU, TAQAC |
| C.4 Air Pollution | | | |
| C.4.1 Dust and Gaseous Pollution | <ul style="list-style-type: none"> The contractor will take every precaution to reduce the level of dust and gaseous pollution from concrete mixing and bridge construction site. The excavated materials at the bridge construction site will be collected and disposed properly so that it does not generate fugitive dust emissions. Regular maintenance of machinery and equipment will be carried and vehicular pollution check will be made mandatory. LPG shall be used as fuel for cooking of food at construction labour camp instead of fuel wood. Personal Protective equipment(PPE) should be provided as a mandatory effort to the construction workers at the batching plant. | Contractor | PIU, TAQAC |
| C.4.2 Emissions from Construction Vehicles, Equipment & Machineries (like DG set) (only if such equipment is used) | <ul style="list-style-type: none"> The contractor will ensure that all vehicles, equipment and machinery used for construction works are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of CPCB and/Motor Vehicles Rules. The contractor will submit PUC certificates for all vehicles/ equipment/machinery used for the construction of bridge. | Contractor | PIU, TAQAC |
| C.5 Noise Pollution | | | |
| C.5.1 Noise Pollution: Noise Levels from Vehicles | <ul style="list-style-type: none"> No Vehicles are expected to be used for the construction of the bridge. | Contractor | PIU, TAQAC |
| C.6 Procurement of Construction Materials | | | |
| C.6.1 Procurement for Aggregate and other construction materials | <ul style="list-style-type: none"> No borrow area will be opened without permission of the Environmental Specialist and without obtaining necessary regulatory permission. The location, shape and size of the designated borrow areas will be as approved by the Environmental Specialist and in accordance to the IRC | | |

| | | | |
|--|---|------------|------------|
| | <p>recommended practice for borrow pits for road embankments (IRC 10: 1961). The borrowing operations will be carried out as specified in the guidelines for siting and operation of borrow areas.</p> <ul style="list-style-type: none"> • The unpaved surfaces used for the haulage of borrow materials, if passing through the settlement areas or habitations; will be maintained dust-free by the Contractor. A sprinkling of water will be carried out twice a day to control dust along such roads during their period of use. | | |
| C.6.2 Transporting Construction Materials | <ul style="list-style-type: none"> • No Vehicles can reach the site, hence materials will taken to the site manually. • | Contractor | PIU, TAQAC |
| C.6.3 Quarry Operations & Crushers | <ul style="list-style-type: none"> • The Contractor shall obtain materials for approved quarries. The crushers(if required) will be operated after obtaining consent to establish and consent to operate from J&KSPCB. | Contractor | PIU, TAQAC |
| C Construction Works | | | |
| C.7.1 Slope Protection and Control of Soil Erosion | <ul style="list-style-type: none"> • The Contractor will construct slope protection works as per design parameters, to control soil erosion(if any) at the abutment location. • All temporary sedimentation, pollution control works and the maintenance thereof will be deemed as incidental to the earthwork or other items of work and as such no separate payment will be made for them. • The foundations are founded on rocky strata therefore slope protection works are not required. | Contractor | PIU TAQAC |
| C.7.2 Handling of Cement Bags | <ul style="list-style-type: none"> • Cement bags will be stored and emptied in a covered area to control fugitive dust emissions. • While handling and emptying cement bags, workers will wear masks, hand gloves and protective goggles. | Contractor | PIU, TAQAC |
| C.7.3 Work-zone safety Management | <ul style="list-style-type: none"> • Both sides of the bridge to be barricaded and to delineate construction zone as well as material stacking areas. The bridge construction site shall be appropriately barricaded to prevent entry and accidental tress passing of workers, staff and others into the site. • Contractor to take necessary safety measures at the bridge construction work zone during events of torrential rains or in rainy season. • Public/ local entry to the construction will be highly restricted. • All operational areas shall be access controlled. Watch and ward facilities at all times shall be provided by the contractor. • All the retro safety signage as per IRC 55 will be erected at the construction site (especially during excavation/ well foundation works) for generating awareness among the local community | Contractor | PIU, TAQAC |
| C.7.4 Occupational Health and Safety of Workers | <ul style="list-style-type: none"> • The contractor will prepare and follow the OHS plan, including provisions for an emergency response plan. • All workers will be provided with required personal protective equipment • Emergency Telephone Numbers shall be displayed at site | Contractor | PIU, TAQAC |

| | | | |
|--|---|------------|-------------------|
| C.7.5 Archaeological Resources and Cultural properties | | | |
| C.7.5.1 Chance Found Archaeological Property | <ul style="list-style-type: none"> • All fossils, coins, articles of the value of antiquity, structures and other remains or things of geological or archaeological interest discovered on the site shall be the property of the Government and shall be dealt with as per provisions of the relevant legislation. • The contractor will take reasonable precautions to prevent his workmen or any other persons from removing and damaging any such article or thing. He will, immediately upon discovery thereof and before removal acquaints the PIU of such discovery and carry out the PIU instructions for dealing with the same, waiting which all work shall be stopped. • The PIU will seek direction from the Archaeological Survey of India (ASI) before instructing the Contractor to recommence the work in the site. | Contractor | PIU, PMU TAQAC |
| C.7.5.2 Impacts on Cultural Properties | <ul style="list-style-type: none"> • All necessary and adequate care shall be taken to minimize the impact on cultural properties which includes cultural sites and remains, places of worship including mosques, temples, shrines, etc., graveyards, monuments and any other important structures as identified during design stage. • Relocation and enhancement measures shall be taken up as per design and in consultation with the local community. Access to such properties from the road shall be maintained clear and clean. | Contractor | PIU, TAQAC |
| C.8 Personal Safety | | | |
| C.8.1 Personal Safety Measures for Labours and Staff | <ul style="list-style-type: none"> • The contractor will take necessary measures for personal safety during the bridge construction: | Contractor | PIU, TAQAC |
| | <ul style="list-style-type: none"> • Protective footwear, protective goggles and nose masks (as required) will be provided to the workers employed in concrete works at bridge construction site, painting etc. Welder's protective eye-shields will be provided to workers who are engaged in welding works (as required). Earplugs will be provided to the workers exposed to high noise levels. Safety vests will be used by workers when on bridge site. The contractor will comply with all the precautions as required for ensuring the safety of the workmen. | Contractor | PIU, TAQAC |
| | <ul style="list-style-type: none"> • The Contractor will make sure that during the construction work all relevant provisions of the Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996 are adhered to. The Contractor will not employ any person below the age of 14 years for any work. | Contractor | PIU, TAQAC |
| C.8.2 Emergency Management | <ul style="list-style-type: none"> • First aid boxes will be made available at construction site, | Contractor | PIU, TAQAC |
| C.8.3 Risk Force Measure | <ul style="list-style-type: none"> • The contractor will make required arrangements so that in case of any mishap on the bridge construction site, all necessary steps can be taken for prompt first aid treatment. | Contractor | PIU, TAQAC |

| | | | |
|--|---|------------|---------------|
| | Construction Safety Plan prepared by the Contractor will identify necessary actions in the event of an emergency. | | |
| C.8.4 First Aid | <ul style="list-style-type: none"> • The contractor will arrange for : • A readily available first aid unit including an adequate supply of sterilized dressing materials, burn ointment and appliances as per the Factories Rules will be maintained all the time by the contractor. • Availability of first aid trained persons will be ensured at the project site during the construction phase. • Availability of suitable transport will be ensured at all times to take an injured or sick person(s) to the hospital. | Contractor | PIU, TAQAC |
| C.8.5. Informatory Signs and Hoardings | <ul style="list-style-type: none"> • The Contractor will provide, erect and maintain informatory/safety signs, hoardings written in English and local language, wherever required or as suggested by the Environmental Specialist of PIU. | Contractor | PIU TAQAC |
| C.9 Labour Camp and Project Site Management | | | |
| C.9.1 Accommodation for workers | <ul style="list-style-type: none"> • The contractor will follow all relevant provisions of the Building and the other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 for construction and maintenance of labour camp. • Regular cleaning and sweeping will be ensured at the labour site. • Systematic waste collection management at labour camp to be managed as per SWM Rules 2016. • Standard First Aid Kits/units including an adequate of sterilized dressing materials. | Contractor | PIU, TAQAC |
| C.9.2 HIV/AIDS Prevention Measures | <ul style="list-style-type: none"> • Necessary HIV/AIDS prevention measures will be taken at the labour camp • HIV/AIDS awareness program will be organized by the contractor's Environment & Safety Officer. | Contractor | PIU, TAQAC |
| C.9.3 Potable Water for Workers | <ul style="list-style-type: none"> • The contractor will construct and maintain labour accommodation in such a fashion that uncontaminated clean water is available for drinking, cooking, bathing and washing. The contractor will also provide potable water facilities within the precincts of workplace/pump stations in an accessible place, as per standards set by the Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996. • The contractor will also provide the following: • Supply of sufficient quantity of potable water (as per IS) at construction site/labour camp (site at suitable and easily accessible places and regular maintenance of such facilities). • If any water storage tank is provided that will be kept such that the bottom of the tank at least 1 meter above the surrounding ground level. • If water is drawn from any existing well/ hand pump, which is within 30 meters proximity of any toilet, drain or other sources of pollution, the well will be disinfected before water is used for the drinking. | Contractor | PIU, TAQAC |

| | | | |
|---|--|------------|------------|
| | <ul style="list-style-type: none"> PIU will be required to inspect the labour camp once in a week to ensure the compliance of the EMP. | | |
| C.9.4 Sanitation and Sewage System at Labour Camp | <ul style="list-style-type: none"> The contractor will ensure that : The sewage system for the camp will be designed, built and operated in such a fashion that no health hazard occurs and no pollution to the air, groundwater or adjacent watercourses take place, Separate toilets/bathrooms, as required, will be provided for men and women, marked in vernacular language, Toilets will be provided with septic tank followed by soak pit. Adequate water supply will be provided in all toilets and urinals, Night soil can be disposed of with the help of municipality or disposed of by putting a layer of it at the bottom of a permanent pit prepared for the purpose and covered with 15 cm layer of waste or refuse and then covered with a layer of earth for a fortnight. | Contractor | PIU, TAQAC |
| C.9.5 Waste Disposal | <ul style="list-style-type: none"> The contractor will provide garbage bins in the camp & construction site and ensure that these are regularly emptied and disposed off hygienically according to Solid Waste Management Plan as per Solid Waste Management Rule 2016. Burning of wastes at the construction site, labour camp and bridge/roadside will not be allowed. The solid waste generated at the construction site & labour camp will be collected in covered waste bins and segregated as biodegradable (food waste, paper, etc) and non-biodegradable (plastic, polyethene bag, etc) wastes. Polyethene/plastic wastes will be stored in empty cement bags and to be sent for recycling through scrap dealer. Biodegradable (food waste, paper, etc) solid waste will be disposed of in the compost pit. | Contractor | PIU, TAQAC |
| C.10 Environmental Monitoring | | | |
| C.10.1 Environmental Monitoring- Construction Stage | <ul style="list-style-type: none"> The PIU will carry out environmental monitoring for Ambient Air Quality, Noise levels and Water Quality on the six-monthly basis as per environmental monitoring plan and in accordance with the instruction of Environmental Specialist of PMU. | PIU | PMU, TAQAC |
| C.10.2 Compensatory Plantation | <ul style="list-style-type: none"> No compensatory plantation needs to be done as no tree would be cut during the construction and operation phase of the proposed bridge. | | |
| D Contractor's Demobilization | | | |
| D.1 Clean-up Operations, Restoration and Rehabilitation | <ul style="list-style-type: none"> The contractor will prepare the project and labour campsite restoration plan in case labour camp is set up. The clean-up and restoration operations are to be implemented by the contractor before demobilization from the construction site and labour camp. The contractor will clear all temporary structures, debris, construction wastes, garbage, night soils, etc in an Environmentally sound manner. All disposal pits or trenches will be filled in and effectively sealed off. | Contractor | PIU, TAQAC |

| | | | |
|---|---|------------|---------------|
| | <ul style="list-style-type: none"> • Construction places including camp and any other area used/affected due to the project operations will be left clean and tidy at the contractor's expense to the entire satisfaction to the PIU. | | |
| D.2 Land Rehabilitation | <ul style="list-style-type: none"> • All surfaces hardened due to construction activities will be ripped & imported materials thereon removed. • All rubbles to be removed from the site to an approved disposal site. Burying of rubble on-site is prohibited. • Surfaces are to be checked for waste products from activities such as concreting and cleared in a manner approved by the Engineer.. • Borrow pits are to be closed and rehabilitated following the pre-approved management plan for each borrow pit. The Contractor shall liaise with the PIU regarding these requirements. | Contractor | PIU, TAQAC |
| E Post Construction (Operation) Stage | | | |
| Activities to be Carried out by the PIU | | | |
| E.1 Environmental Monitoring- Post Construction Stage | <ul style="list-style-type: none"> • The environmental monitoring Laboratory of JTFRP-PMU will carry out environmental monitoring for Ambient Air Quality, Noise levels and Water Quality on the six-monthly basis as per environmental monitoring plan | PIU | PMU |
| E.2 Slope/ Protection Monitoring | <ul style="list-style-type: none"> • During rains regular monitoring will be carried for bridge & nallah protection works and scour protection work/ slope management. In case any indication of erosion, deformation and collapse of protection, necessary measures will be taken to control such issues. | PIU | PMU |

9.4.1 Environmental Management Plan (EMP) - Protection of Clause for Non-conformity to EMP

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

- Any complaints of public, within the scope of the Contractor, formally registered with the PIU and communicated to the Contractor, which is not properly addressed within the time-period intimated by the PIU shall be treated as a major lapse.
- Non-conformity to any of the mitigation measures like unsafe conditions, non-collection of excavated material (during the laying of drainage pipes) regularly and other unattended Health, Safety & Environment (HSE) issues, as stipulated in the EMP Report (other than stated above) shall be considered as a minor lapse.
- On observing any lapses, PIU shall issue a notice to the Contractor, to rectify the same.
- Any minor lapse for which notice was issued and not rectified, first and second reminders shall be given after ten days from the original notice date and first reminder date respectively. Any minor lapse, which is not rectified, shall be treated as a major lapse from the date of issuing the second reminder.
- If a major lapse is not rectified upon receiving the notice PIU shall invoke reduction, in the subsequent interim payment certificate to a maximum of 0.1% of the contract value

9.4.2 Environmental Monitoring Plan

The monitoring programme consists of performance indicators, reporting formats and necessary budgetary provisions. The Contractor's monitoring plan should be following the baseline environmental monitoring, locations provided in the Environmental impact assessment report.

The monitoring plan has the following objectives:

- To ensure effective implementation of EMP
- To evaluate the performance of mitigation measures proposed in the EMP
- To comply with all applicable environmental, safety, labour and local legislation
- To ensure that public opinions and obligations are taken into account and respected to the required satisfaction level
- To modify the mitigation measures or implementing additional measures, if required

The environmental monitoring plan is discussed below:

Ambient Air Quality Monitoring (AAQM)

The ambient air quality parameters viz: Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂), Particulate Matter (PM₁₀ and PM_{2.5}), shall be monitored six monthly at identified locations from the start of the construction activity. The ambient air quality parameters shall be monitored following the National Ambient Air Quality Standards. The duration and the pollution parameters to be monitored and the responsible institutional arrangements are detailed out in the Environmental Monitoring Plan.

Noise Quality Monitoring

The noise levels shall be monitored at designated locations following the Ambient Noise Quality standards. The duration and the noise pollution parameters to be monitored and the responsible institutional arrangements are detailed in the Environmental Monitoring Plan.

Surface Water Quality Monitoring

Surface Water quality parameters such as pH, BOD, COD, DO coliform count, total suspended solids, total dissolved solids, Hardness, Conductivity etc. shall be monitored at all identified locations during the construction stage as per standards prescribed by Central Pollution Control Board. The duration and the pollution parameters to be monitored and the responsible institutional arrangements are detailed out in the Environmental Monitoring Plan

The monitoring requirement for the different environmental components have been prepared is presented in the Table 28 below:

Table 28: Environment Monitoring Plan

| Attribute | Project Stage | Parameter | Special Guidance | Standards | Frequency | Duration | Location | Implementation |
|----------------------|--|--|--|--|--|--|----------------------|---|
| Air | Pre-Consuction, Construction & Operation Stage | PM ₁₀ , PM _{2.5} , SO ₂ ,NO ₂ ,CO | Use method specified in National Ambient Air Quality Standards (NAAQM). | National Ambient Air Quality Standards (NAAQM). | Six Monthly (Summer and Post Monsoon Seasons) | 24 hours of Sampling | Bridge site | PIU through Environmental Monitoring Laboratory |
| Surface Water | Pre-Construction, Construction & Operation Stage | pH, BOD, COD, Oil & Grease, Total Suspended Solid (TSS), Total Dissolved Solid (TDS) | Grab sample collected from source and Analyses as per standard Methods for Examination of Water and Wastewater | Indian Standards: for Inland Surface Water (IS: 2296, 1962 | Six Monthly (Summer and Post Monsoon Seasons) | Grab Sampling | Bridge site | PIU through Environmental Monitoring Laboratory |
| Noise | Pre-Consuction, Construction & Operation Stage | Hourly Level Equivalent (Leq) on dB (A) scale | Equivalent noise levels using an integrated noise level meter kept at it a distance of 1 m from the edge of the pavement | MoEF Noise Rules. 2000 | Quarterly (Summer and Post Monsoon Seasons) | Leq in dB(A) of daytime and night time | Bridge site | PIU through Environmental Monitoring Laboratory |
| Borrow Area | Construction Phase | As per Guidelines | Visual Observations | - | Before opening at least once in a month during operation, Post Rehabilitation. | - | Borrow area Location | Contractor/PIU, TAQAC |

9.4.3 Performance Monitoring Indicators

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 the efficacy of environmental management measures in the 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 the efficacy
- and utility of the proposed mitigation measures

The performance indicators of the proposed bridge is provided in Table 29 below:

Table 29: The performance indicators for project implementation

| S.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 six monthly summer and post-monsoon seasons | Baseline (pre-construction) Construction Post-construction | PMU, PIU Environmental Monitoring Laboratory of PMU through TAQAC |
| 2 | Noise Levels | Quarterly, Hourly Level equivalent (Leq). | Baseline (pre-construction) Construction Post Construction | PMU, PIU Environmental Monitoring Laboratory of PMU through TAQAC |
| 3 | Water Quality | Nearby rivers, surface water body, six-monthly summer and post-monsoon seasons | Baseline (pre-construction) Construction | PMU, PIU Environmental Monitoring Laboratory of PMU |

| | | | | |
|-----------|--|--|-----------------------------------|---|
| | | | Post Construction | through TAQAC agency |
| B | Environmental Management Indicators and Monitoring Plan | | | |
| 1 | Construction Camp | Locations of construction camps have to be identified and parameters indicative of the environment in the area has to be reported. | Pre-Construction | PIU/Contractor |
| 2 | Borrow Areas | Locations of borrow areas have to be identified and parameters indicative of the environment in the area has to be reported | Pre-Construction | PIU/Contractor |
| 3 | Tree Protection | Protective Measures of Trees | Pre-Construction/ Construction | Contractor/PIU |
| 4. | Occupational Health & Safety Measures | Occupational, Health & Safety of workers engaged in construction activities | Daily | Environment & Safety Officer of the Contractor. |
| 5 | Bridge Protection Work and Scour Protection | Monitoring of Bridge Protection and Scour Protection | During rains | PIU/ TAQAC |

9.4.4 Monitoring Plans for Environment Conditions

For each of the environmental components, the environmental monitoring plan specifies the parameters to be monitored, location of the monitoring sites and duration of monitoring. The monitoring plan also specifies the applicable standards, implementation, and supervising responsibilities. The monitoring plan for the various environmental condition indicators of the project in construction stages is already presented in Table below. Monitoring plan does not include the requirement of arising out of regulation provision such as obtaining NOC/Consent for plant site operation.

Furthermore, periodical site monitoring should be carried out by the Environmental Expert of PIU for surveillance & monitoring of safety of the construction site. The brief description of measures has been given in Table 30 below:

Table 30: Brief Description of Measures

| S. No. | Locations of Work Site | Bridge Site Safety Measures |
|--------|------------------------------|---|
| 1 | Construction Sites | Caution boards, Safety Cones, Delineators |
| 2 | Deep Cutting | The construction zone should be barricaded with applicable safe G.I Sheet or arrangement to be made as per the plan approved by the PIU / PMU. [Provide Safety Sign Boards and Safety Barriers marked with reflective tapes] |
| 3 | Temporary Diversion (if any) | Diversion Board, Barricading Diversion with reflective tape for illumination at night at the all diverted locations |
| 4 | Safety for the Workers | Helmets, Safety-Shoes, Goggles, Dusk mask. etc |

9.4.5 Reporting System

The contractor will follow the reporting system (shown in Table 31) for the implementation of the environmental management plan and its indicators. The Contractor will report the PIU on corrective measures and implementation status of mitigation measures as per the environmental management plan. The EMP compliance report will comprise the photographic evidence (with date, time and geo-reference) for implemented mitigation measures in the monitoring reports.

Table 31: The Reporting System and Requirements

| S.No | Item | Stage | Contractor | PIU/ TAQAC |
|------|--|------------------|-----------------------------------|--|
| | | | Implementation & Reporting to PIU | Supervise/ Field Compliance Monitoring |
| 1. | Setting up of construction Camp | Pre-Construction | One Time | |
| 2. | Identification of disposal locations for constructional & other wastes from Bridge Project | Pre-Construction | One Time | One Time |
| 3. | Tree cutting | Pre-Construction | One Time | One Time |
| 4. | Topsoil Preservations | Pre-Construction | One Time | |
| 5. | EMP Implementation Report | Construction | Monthly | Monthly |

| | | | | |
|-----------|--|---|-------------|-------------|
| 7. | Pollution Monitoring | Construction | Six Monthly | Six Monthly |
| 8 | Cleaning and Restoration on Demobilization | On completion of construction of Bridge | One Time | One Time |

The contractor will take all reasonable steps to protect the environment on & off the project site and to avoid, minimize and mitigate impacts due to the bridge construction work activities creating pollution to environment and other causes as a consequence of methods of operations.

9.4.6 Budgetary Provision for EMP

Mitigation measures proposed in the EMP will be implemented by the Contractor and under the supervision/ monitoring by the PIU/TAQAC. The construction works to be undertaken by the contractor have been quantified and the quantities included in the respective BOQ items. The essentials of environmental health and safety and effective implementation of COVID-19 Standard Operating Procedures (SOP) as per Govt. guidelines/ measures to be followed by the contractor have been included in the annexures of this EIA report.

The indicative split up of capital and recurring cost for the environmental management plan for the project is presented in following Table 32:

Table 32: Budgetary Allocation- Indicative Cost for EMP Implementation

| S. No. | Component | Item | Unit | Unit Cost (INR) | Quantity | Total Cost | Responsibility |
|---------------------------------|--|---|----------|-----------------|---|------------|-----------------|
| A Pre-Construction Stage | | | | | | | |
| 1 | Air | Baseline Monitoring Ambient Air Quality at 1 location especially near sensitive receptors | No. | 10000/ | 24 hr sample, One time monitoring Location (PM _{2.5} , PM ₁₀ , SO ₂ and NO ₂) | 10000 | PMU |
| 2 | Water | Surface Water Quality sample from Nallah location | No. | 7000/- | Grab Sample from Nallah Location (pH, TSS, TDS, BOD, COD, Oil & Grease, Turbidity) | 7000 | PMU |
| 3 | Noise | Noise Measurements at 1 location near sensitive receptors | No. | 5000 | Hourly measurements for 24 hours | 5000 | PMU |
| B. Construction Stage | | | | | | | |
| 4 | COVID-19 “Standard Operating Procedure” as per Govt. Guidelines for Construction site/ Workplace/ Campsite | Masks, Sanitizer Equipments (sensor-based/ dispenser based), appointment of Covid -19 “Marshal for SOP implementation” | Lump Sum | | | 100000 | PIU/ Contractor |
| 5 | Tree Cutting | Nil | No. | | | | PIU/Contractor |
| 6 | Air | Ambient Air Quality at 1 bridge location within the construction zone and operational plant sites. (3 times in a year except for monsoon) | No. | 10000/- | 24 hr sample, One-time monitoring 3 Locations (Six monthly) (PM _{2.5} , PM ₁₀ , SO ₂ and NO ₂) | 30000 | PMU |
| 8 | Water | Surface Water Quality at 1 location (six monthly) | No. | 7000/- | Grab Samples at 1 Location at Nallah (pH, TSS, TDS, BOD, COD, Oil & Grease, Turbidity) | 21000 | PMU |
| | | 1 Ground Water/ Public Water Source (six monthly) | | 7000/- | Parameters as per IS 10500:2012 | 21000 | PMU |

| | | | | | | | |
|--|--|---|------------------------------------|---------|---|-----------------|-----|
| 9 | Noise | Noise measurements at 1 location near sensitive receptors/ Settlements within the construction zone (Quarterly) | No. | 5000/- | Hourly measurements for 24 hours. | 30000 | PMU |
| 10 | Air | Dust Suppression Measures | Cost part of civil works | | | | |
| 11 | Labour camp and Ancillary Facilities | Labour Camp and all associated facilities as per EMP | Cost part of the civil works. | | | | |
| 12 | First Aid Kits | First Aid Kits at the construction site, camp and ancillary sites | Cost part of the civil works. - | | | | |
| Project Enhancement by PMU-JTFRP | | | | | | | |
| 14 | Embankment Protection/ Slope Stability | Plantation/ Grass engraining with indigenous shrubs | Lump Sum | | | 50000 | PMU |
| 15 | Median Plantation | | | | | | PMU |
| C. Operation Stage (Post Construction Monitoring) | | | | | | | |
| 16 | Air | Ambient Air Quality at 1 location near the sensitive receptor | No. | 10000/- | 24 hourly sample, one-time monitoring (Post Construction) | 30000 | PMU |
| 17 | Noise | Noise Levels at 4 locations near sensitive receptors | No. | 5000/- | One time monitoring (Post Evaluation) 4 Samples | 20000 | PMU |
| 18 | Water | Surface Water Quality at 1 location | No. | 7000/- | One time monitoring (Post Evaluation) 4 Samples | 21000 | PMU |
| Total Budget | | | | | | 3,47,000 | |

Chapter 10: CONCLUSIONS & RECOMMENDATIONS

The project specific EIA study has been carried out to assess the overall impacts on Environmental components as a result of construction of 43 m Span Footbridge over Anji Nallah in Reasi District of Jammu and Kashmir. Overall, the project will have positive impacts in terms of reduction travel time for villagers, creating employment opportunities for locals, and preventing accidents which might take place if people try to cross Anji Nallah by swimming across the stream. In general, the project will lead to an improvement in socio-economic condition of the area.

The project area does not come under protected areas and is devoid of any endangered species. The project will not require and acquisition of land from private individuals and the project will also not require acquisition of forest land.

The assessment of anticipated environmental and impacts due to the project is mainly confined to construction stage and are minimal, site specific and have reversible impacts on the micro environment. All the construction related impacts can be managed by following good construction practices. The proposed Environmental Management Plan describes implementation mechanism for recommended mitigation measures together with monitoring to verify the overall project performance. Mitigation measures for potential impacts on physical and biological aspects of the environment have been specified through:

- Adequate arrangements for construction safety, stakeholder engagement and grievance redress mechanism;
- Stringent adherence to Health and Safety requirements; and
- Obtaining requisite permits for the proposed project.

There are no indigenous communities being affected in the project area; The project area does not fall in bird area or bird migratory route.

Although the project will have overall positive socio economic and environmental impacts, few activities are likely to cause potential temporary impacts. To manage those impacts following measures are recommended:

- The environmental mitigation measures should be part project plan

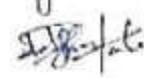
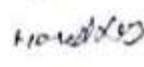
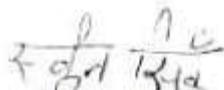
- Monitoring of performance indicators is required as per environmental monitoring plan for ensuring effectiveness of mitigation measures.
- Labour standards and occupational health and safety deserve special attention during construction and maintenance
- The Contractor shall ensure that all the safeguards requirements of World Bank Group standards are complied by them.

ANNEXURE I - IMPACT MATRIX

| S. No. | Project Activities | Land use | Topography and Drainage | Soil/Land Environment | Ambient Air Quality | Ambient Noise Quality | Water Environment | Terrestrial Ecology | Aquatic Flora/Fauna | Birds Movement | Occupational Health and Safety |
|--------|------------------------------------|----------|-------------------------|-----------------------|---------------------|-----------------------|-------------------|---------------------|---------------------|----------------|--------------------------------|
| 1 | Site clearance | | | | | | | | | | |
| 2 | Excavation of Rock till foundation | | | | | | | | | | |
| 3 | Construction of Abutment | | | | | | | | | | |
| 4 | Launching of Superstructure | | | | | | | | | | |
| 5 | Construction of Approach Roads | | | | | | | | | | |
| 6 | Embankment Protection | | | | | | | | | | |
| 7 | Finishing of Bridge with Deck Slab | | | | | | | | | | |

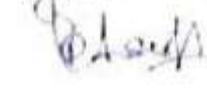
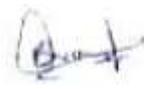
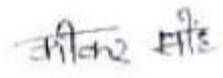
| | |
|---------------------------------------|--|
| Positive Impact | |
| Interaction possible but no impact | |
| Interaction possible but minor impact | |

ANNEXURE II – ATTENDANCE SHEETS

| S.No. | Name | Village : Tote Occupations | Signature |
|-------|------------------------------|-------------------------------|--|
| 1. | Laldeep Singh. (Sarpanch) | Private business |  |
| 2. | Rajeev Singh | Farmer/labour | Rajeev Singh |
| 3. | Pooran Singh | Farmer/labour |  |
| 4. | Mohd. Yunus | Farmer/labour |  |
| 5. | Bawarn Singh | Farmer |  |
| 6. | Brun Singh. | Farmer | Signature Hoshyari Singh |
| 7. | Hoshyari Singh | Farmer | Hoshyari Singh |
| 8. | Sanjeer Singh | Farmer/labour | Sanjeer Singh |
| 9. | Gardeer Singh | Farmer/labour |  |
| 10. | Deep Singh. | Farmer/labour |  |

| S.No | Name | Occupation | Signature |
|------|----------------|------------|-----------------|
| 1. | Koushlaya Devi | Household | Vaishno Devi |
| 2. | Vashano Devi | | मि.शिवराम शर्मा |
| 3. | Lakshmi Devi | | Lakshmi Devi |
| 4. | Tamama Devi | | Tamama Devi |
| 5. | Sushma Devi | | Sushma Devi |
| 6. | Shelto Devi | | Shelto |
| 7. | Pooja Devi | | Pooja Devi |
| 8. | Rajkumari | | Rajkumari |
| 9. | Geeta Devi | | Geeta |
| 10. | Pooji Devi | | Pooji |

Village - Sahri

| S.No | Name | Occupation | Signature |
|------|-----------------|---------------|---|
| 1. | Harbhajal Singh | shopkeeper |  |
| 2. | Baldev | shopkeeper |  |
| 3. | Balwant kumar | labour | Balwant |
| 4. | Suram Singh | labour | Suram |
| 5. | Abinder kumar | labour |  |
| 6. | Vijay Singh | labour | Vijay Singh |
| 7. | Romail Singh | farmer/labour | Romail Singh |
| 8. | Balbir Singh | farmer/labour | Balbir Singh |
| 9. | Ketan Singh | farmer/labour |  |
| 10. | Mohd. Latif | labour | Latif |

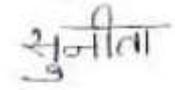
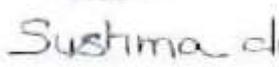
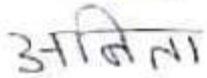
| No. | Name | Village - Sahri Occupation | Signature. |
|-----|----------------|-------------------------------|---|
| 1 | Kirna Devi | Household | Kirna |
| 2 | Smitashikunari | | स्मिता |
| 3 | Rajni Devi | | Rajni Devi |
| 4 | Kalo Rani | | |
| 5 | Sushenari | |  सुशेनारी |
| 6 | Sukaintharani | | |
| 7 | Chanchlo devi | |  |
| 8 | Rubina | |  Rubina |
| 9 | Namita Rani | | नमिता |
| 10 | Kalasho Devi | |  |

Village : Kudohalhatti

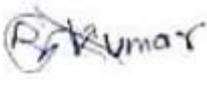
| Sr. No. | Name | Occupation | Signature |
|---------|----------------|------------|---|
| 1. | Asha Devi | Household. | Asha |
| 2. | Usha Rani | " | Usha |
| 3. | Shivani Devi | " | Shivani Devi |
| 4. | Vashanti Devi | " | वैष्णो |
| 5. | Tripta Rani | " | तरीपता रानी |
| 6. | Sushma. | " | सुषमा |
| 7. | Rajni | " | राजनि |
| 8. | Swarna Devi | " | सवर्ना देवी |
| 9. | Pashhōlma Devi | " |  |
| 10. | Rampayari Rani | " |  |

| | Village - "Lalohal (Bhat)" | | |
|---------|----------------------------|---------------|---------------------------|
| Sr. No. | Name | Occupation | Signature |
| 1 | Babbar Singh | Farmer/Labour | Babbar Singh |
| 2 | Bukhtdar Singh | Farmer | Abu |
| 3 | Pandav Kumar | Labour | Pandav |
| 4 | Sumit Kumar | Labour | Sumit Ankur |
| 5 | Ankur Singh | Labour | Ankur |
| 6 | Bansinder Singh | Farmer | Bansinder |
| 7 | Chamul Singh | Farmer | Chamul Singh |
| 8 | Rakesh Singh | Shopkeeper | Rakesh |
| 9 | Gobind | Labour | (Gobind) |
| 10 | Kulbir | Labour | Kulbir |

Village - Dongarkh.

| S.No. | Name | Occupation | Signature |
|-------|----------------|------------|---|
| 1. | Sunanda kumari | Household |  सुनंदा |
| 2. | Vimla Devi | " |  |
| 3. | Sushma Devi | " |  Sushma d |
| 4. | Santosh kumari | " | Santosh |
| 5. | Kamla Devi | " | कमला |
| 6. | Parikasho Devi | " |  |
| 7. | Neelima | " | नीलिमा |
| 8. | Raj kumari | " |  |
| 9. | Shanti Devi | " |  |
| 10. | Anita | " |  अनिता |

Village - Davigarh

| S.No. | Name | Occupation | Signature. |
|-------|---------------------------|---------------|---|
| 1 | Rohan Kumar (Sarpanch) | Business |  |
| 2. | Mohd. Yousuf | labour | Yousuf Latif |
| 3. | Latif | labour | |
| 4. | Romesh Kumar | labour |  |
| 5. | Utam Singh | farmer/labour | Utam |
| 6. | Arjun Kumar | farmer/labour |  |
| 7 | Suneel Singh | farmer/labour | Suneel |
| 8. | Anuj | student | Anuj |
| 9. | Omparkash Kumar | farmer | Omparkash |
| 10. | Rajesh Thakur | student |  |

ANNEXURE III – ENVIRONMENTAL AND SOCIAL SCREENING DATASHEET

Part A: General Information

| | | |
|--|--|---------------------------------------|
| 1. Name of the sub-project | Construction of 43Mtr span Steel Decked Foot Bridge over Anji Nallah at Sukhal Ghati Reasi | |
| 2. Type of proposed activity (tick the applicable option and provide details) | | |
| • Road | <input type="checkbox"/> | - |
| • Bridge | <input checked="" type="checkbox"/> | 43Mtr Steel Decked foot Bridge |
| • Fire Station | <input type="checkbox"/> | - |
| • Hospital/Health Facility | <input type="checkbox"/> | - |
| • Educational Institute | <input type="checkbox"/> | - |
| • Building for Livelihoods | <input type="checkbox"/> | - |
| • Flood Infrastructure Related | <input type="checkbox"/> | - |
| • Other Public Building | <input type="checkbox"/> | - |
| • Any Other (Please Specify) | <input type="checkbox"/> | - |
| 3. Location of the proposed sub-project | | |
| • Name of the Region | Jammu(J&K State) | |
| • Name of the District | Reasi | |
| • Name of the Block | Reasi | |
| • Name of the Settlement | Sukhal Ghat | |
| • Longitude | 74°59'37.108"E | |
| • Latitude | 33°4'8.192" N | |

| | |
|--|---|
| 4a. Proposed Nature of Work (tick the applicable options) | |
| ▪ Minor Repairs | - |
| ▪ Major Repairs/Rehabilitation | - |
| ▪ Upgrading/Major Improvement | - |
| ▪ Expansion of the facility | - |
| ▪ New Construction | √ |
| ▪ Any Other | - |
| 4b. Size of the sub-project (approx. area in sq. mt/hac or length in mt/km, as relevant) | 1x 43.00m span Steel Decked Foot Bridge over Anji Nallah at Sukhal Ghati Reasi. |
| 5. Land Requirement (in hac./sq.mt.) | |
| ▪ Total Requirement | Nil |
| ▪ Private Land | Nil |
| ▪ Govt. Land | Nil |
| ▪ Forest Land | Nil |
| 6. Implementing Agency Details (sub-project level) | |
| ▪ Name of the Department/Agency | PWD (R&B) Division Reasi |
| ▪ Name of the contact person | Er. Raj Kumar Kapahi |
| ▪ Designation | Executive Engineer |
| ▪ Contact Number | +91-9419651938 |
| ▪ E-mail Id | xenpwdranbreasi@gmail.com |
| 7. Screening Exercise Details | |
| ▪ Date on which it was carried out | 29/09/2018 |
| ▪ Name of the Person | Tejinder Gupta |
| ▪ Contact Number | +91 9419134347 |
| ▪ E-mail Id | tejindergupta41@gmail.com |

Part B (1): Environment Screening

| Question | Yes | No | Details |
|---|-----|----|--|
| 1. Is the sub-project located in whole or part within 1 km of the following environmentally sensitive areas? | | | |
| a. Biosphere Reserve | | No | |
| b. National Park | | No | |
| c. Wildlife/Bird Sanctuary | | No | |
| d. Wildlife/Bird Reserve | | No | |
| e. Important Bird Areas (IBAs) | | No | |
| f. Habitat of migratory birds (outside protected areas) | | No | |
| g. Breeding/Foraging/Migratory route of Wild Animals (outside protected areas) | | No | |
| h. Area with threatened/rare/endangered fauna (outside protected areas) | | No | |
| i. Area with threatened/rare/endangered flora (outside protected areas) | | No | |
| j. Reserved/Protected Forest | | No | |
| k. Other category of Forest | Yes | | No impact on the nearby forest area is envisaged. No tree cutting is required. |
| l. Wetland | | No | |
| m. Natural Lakes | | No | |
| n. Rivers/Streams | Yes | | Bridge is proposed to be constructed over Anji Nallah which is perennial stream. |
| Question | Yes | No | Details |

| | | | |
|---|-----------------------------------|----|--|
| o. Swamps/Mudflats | | No | |
| p. Zoological Park | | No | |
| q. Botanical Garden | | No | |
| 4. Is the sub-project located in whole or part within 500m of any of the following sensitive features? | | | |
| a. World Heritage Sites | | No | |
| b. Archaeological monuments/sites (under ASI's central/state list) | | No | |
| c. Historic Places/Monuments/Buildings/Other Assets (not listed under ASI list but considered locally important or carry a sentimental value) | | No | |
| d. Religious Places (regionally or locally important) | | No | |
| e. Reservoirs/Dams | | No | |
| f. Canals | | No | |
| g. Public Water Supply Areas from Rivers/Surface Water Bodies/Ground Water Sources | | No | |
| 4. What is the High Flood Level in the sub-project area? | 2.0 mtrs from lowest water level. | | |
| 5. Is any scheduled/protected tree like Chinar, Mulberry or Deodar likely to be affected/ cut due to the project? | | No | |

| | | | |
|--|--|--|----|
| 6. Is the sub-project located in a landslide/heavy erosion prone area or affected by such a problem? | | No | |
| 7. Is sub-project located in an area that faces water paucity or water quality issues? | | No | |
| Part B (2) : Result/Outcome of Environmental Screening Exercise | | | |
| 1. | Environment Impact Assessment | | No |
| 2. | Environment Clearance Required | | No |
| 3. | Forest land Clearance/Diversion | | No |
| 4. | Tree Cutting Permission Required | | No |
| 5. | ASI (Centre/State) Permission Required | | No |
| 6. | Permission from ULB/Local Body/Department Required | | No |
| | | | - |
| 7 | Any other clearance/permission required | Only Statutory clearances and NOC's / PUC's for establishment or operation of stone crushers, generators, vehicles etc shall be required to be obtained by the Contractor during execution stage if established. | |
| | | | |

Part C (1): Social Screening

| | | | |
|--|---------------------------|----|---|
| 1. Does the sub-project activity require acquisition of land? | | | |
| Yes | | No | ✓ |
| Give the following details: | Private Land (sqmts/hac.) | | - |
| | Govt. Land (sqmts/hac.) | | - |
| | Forest Land (sqmts/hac.) | | - |
| | | | |

| | | | |
|--|---|----|---|
| 2. Does the proposed sub-project activity result in demolition/removal of existing structures? | | | |
| Yes | | No | ✓ |
| If so, give the following details: | | | |
| Number of public structures/buildings | - | | |
| Number of common property resources (such as religious/cultural/drinking water/wells/etc.) | - | | |
| Number of private structures (located on private or public land) | - | | |
| 3. Does the proposed project activity result in loss of crops/trees? | | | |
| Yes | | No | ✓ |
| 4. Does the proposed project activity result in loss of direct livelihood/employment? | | | |
| Yes | | No | ✓ |
| 5. Does the proposed activity result in loss of community forest/pastures on which nearby residents/local population are dependent? | | | |
| Yes | | No | ✓ |
| If yes, give the details of the extent of area to be lost (in acres/hac) | | | |
| 6. Does the proposed project activity affect scheduled tribe/caste communities? | | | |
| Yes | | No | ✓ |

Part C (2): Result/Outcome of Social Screening Exercise

| S. No. | Result/Outcome | Outcome |
|--------|---|--------------------------------|
| 1. | Answer to all the questions is 'No' and only forest land is being acquired | No SIA/RAP required |
| 2. | Answer to any question is 'Yes' and the sub-project does not affect more than 200 people (i.e. either complete or partial loss of assets and/or livelihood) | No Abbreviated RAP is required |
| 3. | Answer to any question is 'Yes' and the sub-project affects more than 200 people (i.e. either complete or partial loss of assets and/or livelihood) | No SIA/RAP required |

Overall Screening Outcome:

23. The proposed sub-project will not have any significant environmental & social impact because the project will not involve destruction of ecological resources, displacement of people, acquisition of private land, demolition/removal of existing structures and major Environmental threat/risk. There are no significant social impacts as land involved is government land; therefore, no further special study or detailed / social impact assessment needs to be undertaken.
24. There may be some short term inconvenience to the local citizens due to construction of the bridge but it will completely be for very short period if compare with its long term benefits to the local citizens.

No EIA and SIA required for the Sub-project site.

Statutory Clearances/ No Objection Certificate:

25. The proposed work involves only the Construction of bridge in place of damaged Steel Decked footbridge, which had been under use for long time. The site is also under possession of R&B Department for a long time. Only Statutory clearances and NOC's / PUC's for establishment or operation of stone crushers, generators, vehicles etc shall be required to be obtained by the Contractor during execution stage if established.

ANNEXURE IV – EMP REPORTING FORMATS

SGF INFRA PRIVATE LIMITED
MONTHLY ENVIRONMENT REPORTING FORMAT

REPORTING OF OCCUPATIONAL HEALTH AND SAFETY MEASURES

Project Name:

Site Supervisor Name:

Site Location:

Reporting Month:

| Sl. No | Health and Safety Measures | Implementation Status (Yes / No/NA) | Remarks |
|--------|--|--|---------|
| 1 | Appointment of qualified Environment and Safety Officer | | |
| 2 | Approval for Construction Safety Management Plan by the Environmental Expert of PIU. | | |
| 3 | Provision for flags and warning lights for potential hazards | | |
| 4 | Provision of adequate staging, form work and access (ladders with handrail) for works at a height of more than 3.0 m | | |
| 5 | Provision of adequate shoring / bracing / barricading / lighting for all deep excavations of more than 3.0 m depth. | | |
| 6 | Provision for sufficient lighting especially for night time work | | |
| 7 | Construction Workers safety–Provision of personnel protective equipment's | | |
| | A.Helmets | | |
| | B.Safety Shoe | | |
| | C.Gumboot | | |
| | D.Dust masks | | |
| | E.Hand Gloves | | |
| | F.Safety Belts | | |
| | G.Reflective Jackets | | |
| | H. Earplugs for labour | | |
| 8 | Workers engaged in welding work shall be provided with welder protective shields | | |
| 9 | All vehicles are provided with reverse horns. | | |
| 10 | All scaffolds, ladders and other safety devices shall be maintained in as safe and sound condition | | |
| 11 | Regular health checkup for labour/ Contractor's personnel | | |
| 12 | Ensuring the sanitary conditions and all waste disposal procedures & methods in the camp. | | |
| 13 | Provision for insurance coverage to the workers | | |

Supervised and Checked by (Name and Signature with Date)

Approved By:

SGF INFRA PRIVATE LIMITED
MONTHLY ENVIRONMENT REPORTING FORMAT

REPORTING OF ACCIDENTS ON SITE (Page 1)

Project Name:
 Site Supervisor Name:
 Site Location:
 Reporting Month:

| Details of Accident and People Involved in Accident | | | |
|--|--|---|--|
| Name and address of people involved in the accident | | | |
| Whether Contractor's General personnel or public | | | |
| Details of Injury | | | |
| Details of treatment given | | | |
| Type of Accident (√) | | | |
| Fall of person from a height | | Explosion | |
| Slip, trip or fall on same level | | Fire | |
| Struck against fixed objects | | Contact with hot or corrosive substance | |
| Struck by flying or falling objects | | Contact with poisonous gas or toxic substances. | |
| Struck by moving objects | | Contact with poisonous gas or toxic substances | |
| Struck / caught by cable | | Hand tool accident | |
| Stepping on nail etc. | | Vehicle / Mobile plant accident | |
| Handling without machinery | | Machinery operation accident | |
| Crushing / burying | | Other (please specify) | |
| Drowning or asphyxiation | | | |
| Agent Involved in Accident (√) | | | |
| Machinery | | Stair edge | |
| Portable power appliance | | Excavation | |
| Vehicle or associated equipment/machinery | | Ladder | |
| Material being handled, used or stored | | Scaffolding | |
| Gas, vapor, dust, fume or oxygen | | Construction formwork, shuttering and false work. | |
| Hand tools | | Electricity supply cable, wiring switchboard and associated equipment | |
| Floor edge | | Nail or chipping | |
| Floor opening | | Other (Please specify) | |
| Left shaft | | | |

SGF INFRA PRIVATE LIMITED
MONTHLY ENVIRONMENT REPORTING FORMAT

REPORTING OF ACCIDENTS ON SITE (Page 2)

| | | |
|---|--|--|
| Unsafe Action Relevant to the Accident (√) | | |
| Operating without authority | | Failure to use proper footwear |
| Working on moving or dangerous equipment | | Failure to use proper clothing |
| Using un-safety equipment | | Failure to use warn others or given proper signals |
| Adopting unsafe position or posture | | Horseplay |
| Operating or working at unsafe speed | | No unsafe action |
| Unsafe loading, Placing, mixing etc | | Others (please specify) |
| Failure to use helmet | | |
| Lack of Safety Measures Relevant to the Accident (√) | | |
| No protective gear | | Unsafe layout of job, etc. |
| Defective protective gear | | Unsafe process of job methods |
| Improper dress / footwear | | Poor housekeeping |
| Improper guarding | | Lack of warning system |
| Improper ventilation | | Defective tool, machinery or materials |
| Improper illumination | | No unsafe condition |
| Improper procedure | | Others (please specify) |
| Personal Factor Relevant to the Accident (√) | | |
| Incorrect attitude /motive | | No unsafe personal factor. |
| Unsafe act by another person | | Other (please specify) |
| Details of Corrective and Preventive action taken | | |
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |

Supervised and Checked by (Name and Signature with Date)

Approved By:

SGF INFRA PRIVATE LIMITED
MONTHLY ENVIRONMENT REPORTING FORMAT

CONSTRUCTION AREA DETAILS

Project Name:

Site Supervisor Name:

Site Location:

Reporting Month:

| Mitigation Measures | Mitigation Implemented (Yes/No/NA) | Mitigation Effective (1 to 5) | Corrective Action including Deadline for Corrective Action | Resolution status of previous corrective action |
|-----------------------------------|------------------------------------|-------------------------------|--|---|
| Dust Control Measures employed | | | | |
| Traffic Management | | | | |
| Storage Site | | | | |
| Maintenance Shed and service area | | | | |

Supervised and Checked by (Name and Signature with Date)

Approved By:

SGF INFRA PRIVATE LIMITED
MONTHLY ENVIRONMENT REPORTING FORMAT

PREVENTION AND CONTROL OF WATER POLLUTION

Project Name:

Site Supervisor Name:

Site Location:

Reporting Month:

| Site Location | Drainage details at site | Measures adopted to prevent runoff and contamination of nearby water bodies. |
|---------------|--------------------------|--|
| | | |
| | | |
| | | |
| | | |

Supervised and Checked by (Name and Signature with Date)

Approved By:

SGF INFRA PRIVATE LIMITED
MONTHLY ENVIRONMENT REPORTING FORMAT

EROSION AND SEDIMENT CONTROL MEASURES AT SITE

Project Name:

Site Supervisor Name:

Site Location:

Reporting Month:

| Location | Control Measures implemented as suggested in Contract | Extent of other Protection measures completed at site |
|----------|---|---|
| | | |
| | | |

Supervised and Checked by (Name and Signature with Date)

Approved By:

SGF INFRA PRIVATE LIMITED
MONTHLY ENVIRONMENT REPORTING FORMAT

PREVENTION AND CONTROL OF OIL AND CHEMICAL SPILLS

Project Name:

Site Supervisor Name:

Site Location:

Reporting Month:

| Construction Site Location | Precaution Measures adopted in Field | Method employed for storage, disbursal and disposal of oily wastes | Storage and Disposal of used hazardous material and other solid wastes |
|----------------------------|--------------------------------------|--|--|
| | | | |
| | | | |
| | | | |

Supervised and Checked by (Name and Signature with Date)

Approved By:

SGF INFRA PRIVATE LIMITED
MONTHLY ENVIRONMENT REPORTING FORMAT

COMMUNITY GRIEVANCES/PROBLEMS DURING CONSTRUCTION

Project Name:

Site Supervisor Name:

Site Location:

Reporting Month:

- If any grievance/ problems expressed by the community during construction? Yes/No. If Yes give details
- Has there been any post construction erosion or damage to the roadway? Ys/No. If yes, state mitigation measures employed
- Was there any spillage of chemicals/bitumen? Yes/No
- Status of reclamation and restoration of Borrow pits / roadsides.
- Status of Debris clearance from site
- Status of the construction camp sites dismantling and restoration of the original state of land after clearance of the debris and construction material
- Photographs of Post Construction Compliance

Supervised and Checked by (Name and Signature with Date)

Approved By:

SGF INFRA PRIVATE LIMITED
MONTHLY ENVIRONMENT REPORTING FORMAT

GRIEVANCE (COMPLAINTS) REGISTER

Project Name:

Site Supervisor Name:

Site Location:

Reporting Month:

| Sl. No. | Date of Complaint | Name and address of person with contact details | Complaint | Action taken with date Signature of ESO of Contractor |
|----------------|--------------------------|--|------------------|--|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |

Supervised and Checked by (Name and Signature with Date)

Approved By: