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DRAFT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

For

Upgradation of Umsning - Jagi Road (Remaining Portion from 40.13 - 80.00 Km) for Meghalaya Logistics and Connectivity Improvement Project (MLCIP), funded by the World Bank

Submitted To



**Meghalaya Infrastructure Development Finance Corporation (MIDFC) Ltd.
House No. L/A-56, Lower Nongrim Hills, Top Floor,
Meghalaya Basin Development Authority (MBDA) Building,
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Document Information

This document includes ESIA Report of 37.481 km length of Upgradation of Umsning - Jagi Road (Remaining Portion from 40.13 - 80.00 Km) i/c Major bridge in Ri-Bhoi District.

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List of Abbreviations

ASI	:	Archaeological Survey of India
BIS	:	Bureau of Indian Standards
BMC	:	Biodiversity Management Committee
CESMP	:	Contractor's Environmental and Social Management Plan
CGWB	:	Central Ground Water Board
CoI	:	Corridor of Impact
CPR	:	Common Property Resources
CTE/CTO	:	Consent To Establish/Consent to Operate
CW	:	Carriageway
DG	:	Diesel Generator
DPR	:	Detailed Project Report
E&S	:	Environment and Social
EHS	:	Environment Health and Safety
EIA	:	Environmental Impact Assessment
ESF	:	Environmental and Social Framework
ESIA	:	Environmental and Social Impact Assessment
ESMP	:	Environmental and Social Management Plan
ESRS	:	Environmental and Social Review Summary
ESS	:	Environmental and Social Standards
ESZ	:	Eco-Sensitive Zone
FPIC	:	Free, Prior, and Informed Consent
GBV	:	Gender-Based Violence
GIS	:	Geographic Information System
GoM	:	Government of Meghalaya

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GRM	:	Grievance Redress Mechanism
HIV	:	Human Immunodeficiency Virus
IBA	:	Important Bird Area
IBAT	:	Integrated Biodiversity Assessment Tool
IDP	:	Internally Displaced Persons
IEC	:	Information, Education, and Communication
IFC	:	International Finance Corporation
IRC	:	Indian Road Congress
ISFR	:	India State of Forest Report
IUCN	:	The International Union for Conservation of Nature
KBA	:	Key Biodiversity Area
LHS	:	Left Hand Side
LULC	:	Land Use Land Cover
MDF	:	Moderately Dense Forest
MoEF&CC	:	Ministry of Environment, Forest and Climate Change
MLCIP	:	Meghalaya Logistics and Connectivity Improvement Project
MSPCB	:	Meghalaya State Pollution Control Board
MSDMA	:	Meghalaya State Disaster Management Authority
NABET	:	National Accreditation Board for Education and Training NABET
NATMO	:	National Atlas and Thematic Mapping Organization
NBSAP	:	National Biodiversity Strategy and Action Plan
NGO	:	Non-Governmental Organization
NH	:	National Highway
NOC	:	No Objection Certificate
NO _x	:	Oxides of Nitrogen

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NTFP	:	Non-timber forest product
OF	:	Open Forest
OHS	:	Occupational Health and Safety
OIP	:	Other Interested Parties
PAP	:	Project Affected Person
PBR	:	People's Biodiversity Register
PESO	:	Petroleum and Explosives Safety Organization
PIA	:	Project Influence Area
PID	:	Project Information Document
PM	:	Particulate Matter
POSH	:	Prevention of Sexual Harassment
PPE	:	Personal Protective Equipment
PROW	:	Proposed Right of Way
PUC	:	Pollution Under Control
PWD	:	Public Works Department
R&R	:	Resettlement and Rehabilitation
RAP	:	Resettlement Action Plans
RF	:	Reserve Forest
RFCTLARR	:	Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013
RHS	:	Right Hand Side
RoW	:	Right of Way
SBB	:	State Biodiversity Board
SEA	:	Sexual Exploitation and Abuse
SEIAA	:	State Environment Impact Assessment Authority

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SEP	:	Stakeholder Engagement Plan
SH	:	Sexual Harassment
SIA	:	Social Impact Assessment
SOP	:	Standard Operating Procedures
ST	:	Scheduled Tribes
SC	:	Scheduled Caste
OBC	:	Other Backward Caste
GC	:	General Caste
TSG	:	Technical Support Group
UJ Road	:	Umsning – Jagi Road
VDF	:	Very Dense Forest
WB	:	World Bank
WHO	:	World Health Organization
WPA, 1972	:	Wildlife Protection Act, 1972
WPA, 2022	:	Wild Life (Protection) Amendment Act, 2022

1. INTRODUCTION

1.1 Background

The Meghalaya Logistics and Connectivity Improvement Project (MLCIP), with a total investment of USD 300 million comprising USD 240 million from the World Bank and USD 60 million from the Government of Meghalaya (hereinafter refer to as the state government) aims to: a) enhance connectivity to key growth centers along identified road corridors; b) improved rural and district-level logistics infrastructure and services; c) provide greater market access and reduced average cost/time for select agriculture and horticulture products; and, d) strengthen institutional capacity for efficient, climate-resilient transport and logistics, West and East Meghalaya. The following are the key components of the project:

Table 1.1: Components of MLCIP

Components	Sub-components
Component 1: Climate-Resilient Roads and Road Safety	Sub-component 1.1: Rehabilitating Critical State Roads Sub-component 1.2: Promoting Road Safety Measures Sub-component 1.3: Implementing Policy and Regulatory Reforms
Component 2: Logistics Infrastructure and Services.	Sub-component 2.1: Developing key Logistics Infrastructure and Services for Selected Commodities Sub-component 2.2: Supporting Integrated Policy Reforms
Component 3: Institutional Strengthening and Capacity Building	Sub-component 3.1: Strengthening Road and Logistics Management Capacity in the State Sub-component 3.2: Leveraging and Promoting Private Sector Participation in the sector Sub-component 3.3: Promoting Employment Opportunities for Women and Local Communities
Component 4: Contingent Emergency Response Component (CERC).	Provision of immediate response to an Eligible Crisis or Emergency, as needed.

This ESIA, covers one of the critical state roads under Sub-component 1.1: Rehabilitating Critical State Roads which covers: (a) the construction/upgradation of about 600 kms of state roads (state highways, major district roads, feeder roads and bridges); and (b) incorporate climate-resilience and green road technologies in design and construction/upgradation of identified road corridors including improvement of drainage and slope protection works, and resurfacing of damaged road sections, preferably through locally available materials to improve all-weather connectivity between the hinterland and the 'Hashtag' corridors, national highways, and major markets. The selection of roads will be guided by an assessment of connectivity needs to economic and social infrastructure, significant production and consumption centers in the state, local markets, hinterland, and other key interstate and international road/rail/inland water transport networks, and potential social impacts, including the possibility and scale of land requirement. Performance-Based Maintenance Contracts (PBMC) will be introduced to incorporate climate resilience within contractors' specifications, ensuring sustainable maintenance. The planned civil works aim to improve all-weather accessibility, enhance the usage of alternative technologies and locally available materials, and increase resilience to climate change.

The rehabilitation of the state roads will be carried out in phases. The total of 672.499 km is divided into the East and West regions of 335.049 km and 337.45 km, respectively. In the first phase, a total of 172.87

kilometers (km) will be undertaken in East Meghalaya, followed by the remaining 162.179 km in the second and third phases. Details of proposed road corridors in East and West Meghalaya under MLCIP is given in Table 1.2.

Table 1.2: Details of Proposed Road Corridors in East and West Meghalaya under MLCIP

Sl. No.	Name of the Corridors and Proposed Upgradation/Improvement	Length (Km)	Districts	Start point Coordinate	End Point Coordinate
Phase I					
East Meghalaya					
1.	Upgradation of Dkhiah - Sutnga - Saipung - Pala upto Semmasi Road (Corridor 1)	64 Km	East Jaintia Hills	25° 21.818'N 92° 21.693'E	25° 22.638'N 92° 25.413'E
2.	Upgradation of Weiloi - Mawsynram Road upto Phlangwanbroi (Corridor 8)	27 Km	East Khasi Hills	25° 21.733'N 91° 36.781'E	25° 15.037'N 91° 29.637'E
3.	Upgradation of Umtyngar - Sohra Road upto 8th Km of Mawsmail-Shella (Corridor 3)	42 Km	East Khasi Hills	25° 27.668'N 91° 49.619'E	25° 10.173'N 91° 44.580'E
4.	Upgradation of Umsning – Jagi Road i/c Major bridge (Corridor 10)	39.87 Km	Ri Bhoi	25° 52.710'N 92° 7.267'E	26° 4.494'N 92° 9.971'E
West Meghalaya					
1.	Improvement and Widening of Rongrenggre-Simsanggre-Nengkhra (RSN) Road including Conversion of weak Bridges to Permanent RCC bridges. (Corridor 1)	22.00	East Garo Hill	25°33'14.741"N 90°33'40.282"E	25°29'59.132"N 90°41'24.083"E
2.	Improvement of Rongjeng – Mangsang Adokgre (RMA) road from 23 rd to 44 th Km including construction of a major Bridge at Eldek Akong and Bridge No. 1/6 (Corridor 2)	22.00	East Garo Hill & North Garo Hill	25°38'59.682"N 90°48'18.153"E	25°49'55.694"N 90°58'26.225"E

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Sl. No.	Name of the Corridors and Proposed Upgradation/Improvement	Length (Km)	Districts	Start point Coordinate	End Point Coordinate
3.	Upgradation of Rongsai Boijhora Bajengdoba (RBB) Road from single to intermediate lane. (Corridor 3)	18.27	North Garo Hill	25°53'29.623"N 90°31'1.151"E	25°59'55.422"N 90°27'9.353"E
4.	Strengthening and Improvement of Songsak- Mendipathar Road (MDR) including re-construction of weak CD Works and Bridges(Corridor 6)	36.00	East Garo Hill & North Garo Hill	25°39'22.25"N 90°36'55.292"E	25°55'15.35"N 90°38'1.223"E
5.	Improvement of Ampati to Purakhasia Road(Corridor 8)	8.00	South West Garo Hill	25°18'39.796"N 90° 0'24.283"E	25°28'21.622"N 89°55'55.496"E
6.	Improvement of Adugre to Purakhasia Road(Corridor 9)	20.00	South West Garo Hill & West Garo	25°26'23.546"N 90°12'30.772"E	25°18'5.031"N 90° 0'20.042"E

Next Phases

East Meghalaya

1.	Upgradation of Lakadong – Mooriap upto Semmasi Road (Corridor 2)	20 Km	East Jaintia Hills and West Jaintia Hills	25° 29.647'N 92° 33.091'E	25° 24.253'N 92° 32.662'E
2.	Conversion Of 17 Weak Bridges Under Pynursla Division To Permanent R.C.C. Bridges (Corridor 4)	--	East Khasi Hills	--	--
3.	Reconstruction of a weak bridge into permanent RCC Bridge on Nongstoin-Maweit Road at 10th Km (Corridor 5)	39 m	West Khasi Hills	--	--
4.	Construction of Umpling Bridge including approaches (Inside Shillong City) (Corridor 6)	80m & 60m	East Khasi Hills	--	--
5.	Upgradation of Weiloi Mawkyrwat upto Keniong including replacement of SPT Bridges into permanent RCC Bridge(Corridor 7)	50 Km	East Khasi Hills and South West Khasi Hills	25° 21.791'N 91° 36.792'E	25° 17.692'N 91° 21.889'E

Sl. No.	Name of the Corridors and Proposed Upgradation/Improvement	Length (Km)	Districts	Start point Coordinate	End Point Coordinate
6.	Upgradation including construction of road from Kongong (NH-06) to Shkentalang (NH-206) passing by the side of Phe and Rynji Falls (Corridor 9)	27 Km	East Jaintia Hills and West Jaintia Hills	--	--
7.	Construction of Umdang-Amarsang-Maheshkola Road (Corridor 11)	65 Km	West Khasi Hills and South West Khasi Hills	25° 33.231'N 90° 57.403'E	25° 11.265'N 90° 58.333'E
West Meghalaya					
1.	Improvement of Gasuapara Chokpot Road including construction of bridges (Corridor 7)	19.00	South Garo Hill	25°11'50.072"N 90°20'42.662"E	25°16'34.853"N 90°25'43.081"E
2.	Improvement and Upgradation of 12th Mile of TD Road to Chokpot including reconstruction of weak bridges (Corridor 4)	38.40	South Garo Hill	25°14'1.671"N 90°29'2.102"E	25°22'57.301"N 90°18'46.243"E
3.	Strengthening and Improvement of Resu- Dekachang - Anogre via Gabil Road (MDR) including conversion of weak bridges into RCC bridges (Corridor 5)	44.48	East Garo Hill, North Garo Hill & West Garo Hill	25°53'55.733"N 90°36'52.522"E	25°43'11.452"N 90°22'43.204"E
4.	Construction of road from Shallang to Siju including construction of a major Bridge over Simsang River (Corridor 10)	51.00	West Khasi Hill & South Garo Hill	25°31'46.513"N 90°51'41.363"E	25°21'33.755"N 90°39'32.895"E
5.	Construction of Baghmara Gittinggre Road to Chokpot C & RD Block via Mindikgre (Corridor 11)	20.30	South Garo Hill	25°15'18.402"N, 90°33'54.544"E	25°18'36.602"N, 90°26'25.763"E

Sl. No.	Name of the Corridors and Proposed Upgradation/Improvement	Length (Km)	Districts	Start point Coordinate	End Point Coordinate
6.	Construction of Mangsang to Mawshynrut (Riangdo) Road (Corridor 12)	38.00	West Khasi Hill	25°39'58.203"N 90°55'12.412"E	25°38'49.143"N 91° 3'14.026"E

1.2 Utility Details

A total of 31 nos. of electric poles and 06 nos. of Transformer are identified along the DSSPS road corridor for shifting. Of these, 20 poles are on the LHS and 11 on the RHS. Five transformers on the LHS and 1 on the RHS. Details of utilities are given in **Annexure 5.2**.

1.3 Scope for Conducting the ESIA Study

The Environmental and Social Impact Assessment (ESIA) study has been undertaken to integrate environmental and social considerations into the project planning and design process, thereby ensuring that the proposed road improvement options are environmentally sustainable and socially responsible. An Environmental and Social Screening of the Umsning – Jagi Road was conducted to define the broad scope of the ESIA.

Based on this assessment, the scope of the ESIA study was defined, and the following activities were undertaken for the detailed assessment.

- **Collection of project information:** Gather details on proposed project components, site visits and activities from the DPR for each stage of the project cycle (Design, Pre-construction, Construction, and Operation & Maintenance), including location, project design, processes and materials to be used, and expected waste generation.
- **Literature review and data compilation:** Review relevant literature and collect secondary data pertaining to the study area.
- **Baseline environmental and social assessment:** Conduct environmental monitoring and socio-economic surveys to establish the baseline conditions of the study area.
- **Identification of potential impacts:** Assess probable adverse environmental and social (E&S) risks and impacts arising from the construction and operation of the proposed improvement works.
- **Stakeholder identification and consultation:** Identify stakeholders, including affected parties, institutions, and groups with an interest or stake in the project corridors, with particular focus on disadvantaged and vulnerable groups. Conduct consultations to elicit concerns, suggestions, and support.
- **Preliminary climate and cumulative impact assessment:** Conduct an initial evaluation of potential climate change impacts and induced cumulative impacts associated with the project.

- **Environmental and Social Management Plan (ESMP) preparation:** Develop an ESMP outlining measures to improve environmental quality and social conditions, specifying responsibilities for mitigation, associated costs, and timelines for implementation across the project cycle.
- **Monitoring framework:** Identify critical environmental and social parameters to be monitored during and after the implementation of the sub-project.

The study commenced with screening and scoping, during which key environmental and social issues were identified through field surveys, stakeholder engagement, and preliminary impact analysis. This was followed by a detailed impact assessment, utilizing baseline data to evaluate potential environmental and social effects, propose appropriate mitigation measures, and develop management plans. Throughout the process, continuous public consultation ensured that stakeholder feedback informed the assessment, resulting in refined reports, regulatory approvals, and the establishment of a framework for ongoing monitoring during sub-project implementation.

1.3 Approach and Methodology

The approach and methodology included impact identification through surveys, baseline data collection, impact assessment, and mitigation planning. The following table summarizes the approach adopted for undertaking the ESIA study.

Sl. No.	Stages	Activities Done
1.	Screening and Scoping	Identified key issues through primary and secondary surveys, assessed stakeholders, and analyzed potential impacts considered in the Environmental and Social Impact Assessment, following the Free, Prior, and Informed Consent (FPIC) process to ensure meaningful participation and consent of Indigenous Peoples and affected communities.
2.	Public Consultation for Scoping Report	Identified key issues to understand stakeholder concerns and inform sub-project design and build awareness on the project including the Free, Prior, and Informed Consent (FPIC) process. This involved engaging with Indigenous Peoples and affected communities through meaningful consultations in a transparent and participatory manner in order to make them aware of the project activities.. An attendance sheet was maintained to record the presence of villagers who participated in the consultation meeting including geo tagged photographs as evidence of the same. These were the first rounds of consultations for FPIC.
3.	Baseline Data Collection	Gathered and reviewed primary and secondary data on environmental and social conditions in and around the sub-project area, including air quality, water resources, biodiversity, cultural heritage, and socio-economic factors.
4.	Impact Assessment	Using baseline data, the Umsning Jagi Project road potential impacts on the environment and local communities were assessed, including direct and indirect effects, as well as short-term and long-term impacts. A targeted assessment was carried as a part of ESIA since the sub-project area falls under a Schedule VI region with the presence of tribal communities. The Second round of FPIC consultations were undertaken as part of the impact assessment to ensure meaningful engagement with Indigenous Peoples (IP) to further discuss the project design, benefits and impacts, and to provide the communities' priorities and inputs to the drafting of the mitigation plans and measures. During this consultation, IPs' written consent to proceed with

Sl. No.	Stages	Activities Done
		the Project has been recorded through a resolution and countersigned by the participants, with attendance sheets, photos, etc. and attached as Annexure 7.3.
5.	Mitigation and Management Measures	Based on the impact assessment, measures were proposed to mitigate or minimize adverse environmental and social impacts while enhancing positive outcomes. These included exploring Project road design alternatives to reduce Involuntary resettlement and environmental degradation. These measures have been integrated in the draft Environmental and Social Management Plan, Resettlement Action Plan, Indigenous People's Development Plan, Labor Management Procedures, Stakeholder Engagement Plan, and SEA/SH Action Plan, among others.
6.	Draft ESIA Report	A draft report summarizing the findings of the Environmental and Social Impact Assessment (ESIA) has been prepared.
7.	Public Disclosure of ESIA	<p>Public Consultations informed each stage of the ESIA development. In accordance with both GoM and WB requirements, the draft ESIA report and mitigation plans (ESMPs, RAP, IPDP) has been prepared for disclosure and public consultation. Stakeholders, including local communities, NGOs, government agencies, and experts, will be invited to provide feedback, and the final report will be revised based on the feedback received.</p> <p>In addition, No Objection Certificates (NOCs) will be obtained from the village-level traditional institutions to ensure community consent and administrative approval before proceeding with the project in the proposed area.</p>
8.	Final ESIA Report	The draft ESIA report and mitigation plans (ESMPs, RAP, IPDP) will be finalized by incorporating feedback from the public consultation. Comments received will be addressed, and the assessment or proposed measures/plans will be revised as necessary.
9.	Approval and Implementation	The final ESIA report along with mitigation plans will be submitted to the MPWD and the World Bank.
10.	Monitoring	Monitoring of ESIA implementation and management of risks throughout the project implementation

Methodology adopted for the Environmental and Social Impact Assessment was in accordance with the requirements of the World Bank ESF (ESSs), EIA Notifications of Ministry of Environment, Forest and Climate Change (MOEFCC), Indian Roads Congress and MoRTH Guidelines, and other national guidelines. The methodology adopted for the ESIA is as follows.

- a. **Baseline Information:** Key attributes of the sub-project area, including socio-economic data, land, physiography, drainage, geology, hydrogeology, land use, flora, fauna, forest/ vegetation cover, climate, hazards, and vulnerability, were collected through both primary and secondary data sources. Primary data were gathered along the project corridor and within the direct impact area 500 m from the proposed RoW for sensitive environmental features and 10 m from the proposed RoW for social analysis. Secondary data were collected for a 10 km radius buffer surrounding the project road.
- b. To assess the baseline environment and social conditions, the data has been accessed from

authentic and verifiable sources as given in Table 1.3 for collecting the primary data through consultation, field survey and secondary data. A due attempt has been made to source and access only the latest available data from authentic and verifiable sources.

Table 1.3: Source and methodology for primary and secondary data collection

Parameters	Secondary Source
	Environment
Air	<p>Primary survey Primary monitoring</p> <p>Secondary Source Central pollution control Board (CPCB, https://cpcb.nic.in/) / Meghalaya State Pollution Control Board (MSPCB, https://megspcb.gov.in/)</p>
Water	<p>Primary survey Primary monitoring</p> <p>Secondary Source 1. District Survey Report, Ri Bhoi District, 2024 (https://ribhoi.gov.in/document-category/statistical_or_plan-report/) 2. CGWB Data 2024 (https://www.cgwb.gov.in/old_website/District_Profile/Meghalaya/Ri%20Bhoi.pdf)</p>
Noise	<p>Primary survey Primary monitoring</p> <p>Secondary Source CPCB (https://cpcb.nic.in/regulation-control/)</p>
Soil	<p>Primary survey Primary monitoring</p> <p>Secondary Source 1. District Irrigation Plan 2016-2020 (https://pmksy.gov.in/mis/Uploads/2017/20170331081041953-1.pdf) 2. Mapping India's Climate Vulnerability A District Level Assessment (2021) (https://www.ceew.in/sites/default/files/ceew-study-on-climate-change-vulnerability-index-and-district-level-risk-assessment.pdf)</p>

Parameters	Secondary Source
Biodiversity	<p>Primary survey</p> <ol style="list-style-type: none"> 1.Field observation 2.Vegetation assessment was conducted using Nested Quadrate method 3.Faunal assessment was conducted using Visual encounters, sign survey, line transect, and netting survey method 4.LULC analysis through ground truthing <p>Secondary Source</p> <ol style="list-style-type: none"> 1.Desktop study/secondary data collection - Govt. notified acts, peer review published scientific articles, Govt. reports, 2.Online open-source biodiversity databases such as Meghalaya Biodiversity Portal (https://megbiodiversity.nic.in/), PARIVESH Portal (MoEF&CC) (https://parivesh.nic.in/), Global Forest Watch (https://www.globalforestwatch.org/), IUCN Red List of Threatened Species (https://www.iucnredlist.org/) 3.Stakeholder consultation
Hazards and Vulnerability	<p>Primary survey</p> <p>Field observation and Consultation with concerned departments and local community</p> <p>Secondary Source</p> <ol style="list-style-type: none"> 1. District Disaster Management Plan for Ri-bhoi, 2024 (https://ribhoi.gov.in/document/district-disaster-management-plan-2024-25-volume-i/) 2. Meghalaya State Disaster Management Authority (MSDMA) (https://msdma.gov.in/)
Natural Environment	<p>Secondary Source</p> <ol style="list-style-type: none"> 1. Customized Rainfall Information System, Hydromet Division, IMD (https://hydro.imd.gov.in/) 2. District Census Handbook (Part A) – Ri Bhoi: https://censusindia.gov.in/nada/index.php/catalog/866/download/36332/DH_2011_1705_PART_A_DCHB_RIBHOI.pdf 3. Geological Survey of India (https://www.gsi.gov.in/webcenter/portal/OCBIS) 4. District Irrigation Plan 2016-2020 (https://pmksy.gov.in/mis/Uploads/2017/20170331081041953-1.pdf) 5. Consultant's Analysis, Source IMD Gridded Data (https://www.imdpune.gov.in/cmpg/Griddata/Rainfall_25_NetCDF.html) 6. State Action Plan on Climate Change (SAPCC), Meghalaya (https://moef.gov.in/uploads/2017/08/Meghalaya.pdf) 7. Statistical Handbook, Meghalaya 2023 (https://des.megplanning.gov.in/documents/SHB2023-as-on-02-05-24.pdf)

Parameters	Secondary Source
Climate	<p>Secondary Source</p> <p>India Meteorological Department – Shillong Climatological Normals, (1991–2020) https://dsp.imdpune.gov.in/home_normals.php#)</p>
	Land and Livelihood Impact
Land, Livelihood and Common Property Resources	<p>Primary survey</p> <p>1.Census/Household Survey (PAH: 14 2.Focus Group Discussions (3) 3.Key Informants Interviews (8) 4.Field Observations</p> <p>Secondary Source</p> <p>Census 2011 (https://www.census2011.co.in/)</p>
	Other Socio-Economic Parameters
Ethnicity	<p>Primary survey</p> <p>Consultation</p> <p>Secondary Source</p> <p>Census 2011 (https://www.census2011.co.in/)</p>
Gender	<p>Primary survey</p> <p>Focus Group Discussions Interviews</p> <p>Secondary Source</p> <p>Workforce Participation Rate as per Census 2011 (https://www.census2011.co.in/) National Family Health Survey- 5 (https://mohfw.gov.in/files/NFHS-5_Phase-II_0)</p>

Parameters	Secondary Source
Prevalence of GBV	<p>Primary survey Focus Group Discussions with women group</p> <p>Secondary Source Police records National Crime Records Bureau (NCRB) (https://ncrb.gov.in)</p>

1.4 Structure of the ESIA Report

This Environmental and Social Impact Assessment (ESIA) report has been structured into ten chapters including this introduction chapter as follows.

CHAPTER	DESCRIPTION
Chapter 1	INTRODUCTION, provides Background for the project, project roads, approach and methodology of the ESIA study
Chapter 2	LEGAL AND INSTITUTIONAL FRAMEWORK describes the state and central governments with their specific roles along with applicable acts and laws and comparison between the existing legislations and WB policy. As part of the targeted assessment for indigenous/tribal communities, this chapter includes the legal and institutional framework applicable to indigenous/tribal communities.
Chapter 3	PROJECT ROAD DESCRIPTION – In this chapter, project stretch details are described from an environmental and social perspective with salient features such as RoW, cross sections, traffic projections, corridor characteristics, settlements, and resource requirements etc.
Chapter 4	BASELINE ENVIRONMENT chapter describes the existing baseline environmental conditions and collection of secondary information regarding physical, biological and socio-economic conditions of the study area and environmental quality of the study area – monitoring of air, noise, soil, surface and ground water. As part of the targeted assessment, Baseline data focuses on the demographic, social, cultural, and political characteristics of the indigenous/tribal communities; the land and territories that they have traditionally owned or customarily used or occupied; and the natural resources on which they depend.
Chapter 5	ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS – Describes the potential risks and impacts on valued environmental and social components during various project phases including pre-construction, construction and operational phases. As part of targeted assessment for indigenous tribal communities, RAP, IPDP and ESMP includes the measures necessary to avoid adverse impacts, or if such measures are not feasible, measures to minimize, mitigate, or compensate for such impacts, and to ensure that the indigenous/tribal communities receive culturally appropriate benefits under the project, thus overall resulting in community-led development and decision-making in the project-affected tribal areas. This is based on meaningful consultation tailored to indigenous/tribal communities and, where relevant, on Free, Prior, and Informed Consent (FPIC).
Chapter 6	ANALYSIS OF ALTERNATIVES, with project and without project scenario. The mitigation hierarchy approach guided the impact assessment and analysis of alternatives— to explore alternative routes and designs to minimize adverse impacts. Additionally, potential mitigation measures were identified to reduce or eliminate negative effects and enhance positive outcome.
Chapter 7	STAKEHOLDER CONSULTATION AND INFORMATION DISCLOSURE describes the various stakeholders and outcome of the stakeholder consultation. As part of targeted assessment for indigenous/tribal communities, the chapter includes the identification of project-affected parties and the elaboration of a culturally appropriate process (FPIC) for involving and consulting with the indigenous/tribal communities in their vernacular medium at each stage of project preparation and implementation;

CHAPTER	DESCRIPTION
Chapter 8	ENVIRONMENTAL AND SOCIAL MONITORING & REPORTING PROGRAMME This chapter includes reporting, monitoring and institutional framework of the project.
Chapter 9	GRIEVANCE REDRESSAL MECHANISM
Chapter 10	CONCLUSION AND RECOMMENDATIONS

2. LEGAL AND INSTITUTIONAL FRAMEWORK

This chapter presents a review of all relevant acts, rules, and policies applicable to the proposed road development project.

2.1 Applicable Environmental and Social Regulations/ Acts/ Policies at National and State Level

To define the scope of the environmental and social assessment for the proposed road improvement works, relevant laws, legislation, and policies at both national and state levels were reviewed. The findings are summarized in Table 2.1, which also includes a review of the legal and institutional framework applicable to indigenous and tribal communities as part of a targeted assessment

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
ENVIRONMENTAL REGULATIONS					
1	Environment Protection Act/ Rules 1986	The Environment Protection Act, 1986 (the "Environment Act") provides for the protection and improvement of the environment. Under the Environment Act, the Central Government issues notifications for the protection of ecologically sensitive areas or issues guidelines for matters under the Environment Act	The various environmental quality standards notified under this act apply to MPWD works.	--	Meghalaya State Pollution Control Board (MSPCB)
2	EIA Notification 14th Sep 2006 and 17 March 2025	Borrowing of minerals (earth, sand, aggregates, etc.) will require prior environment clearance under mining category	Borrowing of minerals (earth, sand, aggregates, etc.) for embankment, bridge, approach road construction	Environmental Clearance through Contractor	SEIAA Meghalaya
3	Air (Prevention and Control of Pollution) Act, 1981, 1987	To provide for the prevention, control and abatement of air pollution, and for the establishment of Boards to carry out these purposes.	Air pollution from proposed Batching Plant or Hot mix plants and DG set during construction stage	Consent to Establish and Consent to Operate through Contractor	Meghalaya State Pollution Control Board (MSPCB)

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
4.	Water Prevention and Control of Pollution) Act, 1974, 1988	To provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water.	Water pollution during the construction stage from labour camp	Consent to Establish and Consent to Operate through Contractor	Meghalaya State Pollution Control Board (MSPCB)
5.	Noise Pollution (Regulation and Control Act) 2000 and amendment till date	The ambient noise standards for day and night across various land use categories were notified by the MoEF&CC under the Noise Pollution (Regulation and Control) Rules, 2000, based on recommendations of the CPCB	Noise emission from proposed activities during construction stage like operation of DG sets, equipment and concrete mixers should be within applicable standards	No regulatory clearance required but noise monitoring results should be below applicable standard as per CPCB .	MSPCB
6	Hazardous & Other Wastes (Management and Trans-boundary Movement) Rules, 2016 and March, 2024	Protection against improper handling, storage and disposal of hazardous waste. The rules prescribe the management requirement of hazardous wastes from its generation to final disposal.	Hazardous waste generation from proposed activities like generation of paints waste, used oil/waste oil, bitumen waste, etc.	Contractor to obtain authorization for storage, transport, and disposal of hazardous and other wastes. Disposal through authorized collectors/recyclers	MSPCB

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
7	Construction and Demolition Waste Management Rules, 2016	To manage the demolition and construction waste and prevent environmental degradation	Construction and demolition waste will be generated from proposed activities	Permission will be required by Contractor.	Village Council, Municipal Boards
8	Solid Waste management Rules, 2016 and amended thereof	To manage solid waste or semi-solid domestic waste, sanitary waste	Solid Waste will be generated from proposed activities due to influx of labour	Permission will be required. Contractor needs to submit plan for reuse or safe disposal	Village Council, Municipal Boards
9	Vehicle Act 1988 Central Motor Vehicle Rules 1989	To minimize the road accidents, penalizing the guilty, provision of compensation to victim and family and check vehicular air and noise pollution.	Transportation of manpower and material will involve vehicular movement. Vehicles must have valid Pollution Under Control (PUC) certificates, Insurance, Fitness Certificate. Driver should have valid Driving License.	PUC and fitness certificates, Insurance. Driving License, Fitness Certificate	State Transport Authorities approved PUC certificate providers
10	The Gas Cylinder Rules 2016	To regulate the storage of gas / possession of gas cylinder more than the exempted quantity.	Gas cylinders may be used during welding and other electromechanical work. Storage within threshold quantity and as per capability analysis. Handling with defined safe practices	Yes, Permission will be required by the Contractor if the storage of gas / possession of gas cylinder is more than the exempted quantity(i.e more than 25 cylinders of total weight	Petroleum and Explosives Safety Organization (PESO)

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
				exceeding 200 kg for flammable non-toxic gases).	
11	The Mines and Minerals (Development and Regulation) Act, 1957	For development and regulation of mines and minerals in a sustainable manner. The rules regulate the mining of mineral and dealerships for mining and trading.	The construction of works will require stones, aggregates, sand, earth, etc.	Mining Permit from regional mine office. The EC is also required for some minor minerals.	Mines and Mineral Department
12	The Forest (Conservation) Act, 1980 and Amendments and The Forest (conservation) Rules 1981 and Amendments	To help conserve the country's forests. It strictly restricts and regulates the de-reservation of forests or use of forest land for non-forest purposes without the prior approval of the Government. To this end the Act lays down the pre-requisites for the diversion of forest land for non-forest purposes	No forest area diversion involved in the project	No	State Forest Department, MoEF&CC

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
13	National Forest Policy 1988	It articulates the twin objectives of ecological stability and social justice; recognizes people's dependence and their symbiotic relation with forest, emphasizes protection of people's rights over forest resource and offers space for participation of forest dependent communities in the conservation, protection and management of state-owned forests.	Provisions of this act will not be applicable since road will not adversely affect any forest.	No	State Forest Department, MoEF&CC
14	Meghalaya Forest Regulation (Application and Amendment) Act, 1973	The Act provides a comprehensive legal framework for conservation and sustainable use of bio-resources, reflects a strict regime for access, control and benefit sharing. It restricts access and use of biological resources by outsiders and creates decentralized institutional structures (State Biodiversity Boards -SBB and GP	Provisions of this act will not be applicable since road will not adversely affect any biological diversity	No	Meghalaya State Biodiversity Board

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
		level Biodiversity Management Committees) for conservation of biological diversity.			
15	Meghalaya Forest Regulation (Application and Amendment) Act, 1973	Conservation of forest and controlled felling of trees and forest produce	Provisions of this act will not be applicable since the road does not have communities dependent on forest produce.	No	State Forest Department
16	Meghalaya Biodiversity Rules, 2010	Conservation of biological diversity, sustainable use of its components and fair and equitable sharing of benefits arising out of the use of biological resources	Provisions of this act will not be applicable since road will not adversely affect any biological diversity	No	Meghalaya State Biodiversity Board
17	Wildlife protection Act 1972, 2022	Protection of wildlife in the state of Meghalaya	Wildlife impact is not anticipated in this project.	No	State Forest Department
18	Eco-sensitive Zone Notifications 2015	The activities in areas around Wildlife Sanctuaries and National Parks are regulated from the	No ESZ falls within 10 km of the project road as per the Map provided by Forest Department.	No	MoEF&CC

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
		perspective of conservation of wildlife			
19	State Compensatory Afforestation Fund Management and Planning Authority Forest (Conservation) Amendment Rules, 2014	It seeks to establish the National Compensatory Afforestation Fund under the Public Account of India, and a State Compensatory Afforestation Fund under the Public Account of each state. The collected funds will be utilized for afforestation, regeneration of forest ecosystem, wildlife protection and infrastructure development.	No forest area diversion involved in the project	No	State Forest Department
20	Meghalaya State Compensatory Afforestation Fund Management and Planning Authority (MSCAFMPA). This body was constituted in	To constitute a Fund for the purpose of Compensatory Afforestation to be raised against the Forest Area diverted for non-forest use under the provisions of Section 4(1) of the Forest (Conservation) Act, 1980	No forest area diversion involved in the project	No	State Forest Department

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
	alignment with the Compensatory Afforestation Fund Act, 2016				
21	Meghalaya Tree (Preservation) Act, 1976, and the Meghalaya Tree Felling (Non-Forest Areas) Rules, 2006	Conservation of forest and controlled felling of trees	Approx. 35 nos of tree are falling within the ROW.	Permission for felling of trees	State Forest Department
22	Disaster Management Act, 2005	The purpose is to have an effective management of disasters and for matters connected therewith or incidental thereto	The project area falls under the seismic (earthquake prone) zone V and hence construction activities/ interventions will be under purview of this act	No. Contractor should be aware of Guidelines/SOPs/Advisory of MSDMA	Meghalaya State Disaster Management Authority (MSDMA)/MPWD
23	Meghalaya Disaster Management Rules, 2008	The rule is to provide measures' to be adopted for prevention and mitigation of disaster; mitigation measure to be integrated with development plans and projects; build capacity and preparedness	During implementation, setting of labour camps and capacity building of contractor staff	No Contractor should be aware of Guidelines/SOPs/Advisory of MSDMA	Meghalaya State Disaster Management Authority (MSDMA)/MPWD

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
		measure; and specify roles and responsibilities to each dept. in relation to adopted measure			
24	Energy Conservation Act, 2001	The objective is for efficient use of energy and its conservation and for matters connected therewith or incidental thereto	Project activities involves use of energy efficient equipment, energy conservation buildings, etc.	No	Bureau of Energy Efficiency (BEE)/ Meghalaya State Designated Agency (MSDA)
25	Plastic waste management Rules, 2016	The Plastic Waste Management Rules, 2016 provide a framework for the effective management of plastic waste. They aim to minimize the adverse environmental impact of plastic waste and promote sustainable practices for its handling and disposal.	Plastic waste generation from proposed activities. Safe disposal as per Rules	No. Properly segregate plastic waste at source and hand it over to authorized waste collectors, local bodies, or MSPCB authorized agencies/Recyclers	Village Council/ Municipal Authority/MSPCB
26	E-Waste Management Rules, 2016 and amended thereof	Protection of environment against improper handling storage and disposal of hazardous waste.	E-waste generation from replacement of instrumentation. Safe disposal as per Rules	No. Proper segregation and handing over of e-waste to the MSPCB authorized agencies/Recyclers	MSPCB

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
27	Petroleum Act, 1934, Petroleum Rules, 2002 (under the Petroleum Act, 1934)	Regulates the storage, transport, handling, and use of petroleum and diesel. Requires licenses for storage of petroleum products beyond prescribed limits.	Storage of High Speed Diesel (HSD) at construction sites (above threshold limits of 2,500 liters in multiple containers/drums and 1,000 liters single container) requires license/approval.	License for storage from PESO (Petroleum and Explosives Safety Organization); NOC from District Authority/Fire Department.	PESO, Nagpur (through Regional Office) & District Magistrate/Chief Controller of Explosives.
28	Ground Water Regulation (Central Ground Water Authority – CGWA Guidelines, 2017, adopted by States)	Governs the extraction of groundwater for industrial, infrastructure, or commercial use. Requires NOC/permission prior to abstraction.	Applicable (if groundwater extraction proposed) Groundwater extraction for construction, camp use, or dust suppression requires prior permission.	NOC for groundwater abstraction.	CGWA or State Ground Water Authority (if notified).
29	The Meghalaya Water Act, 2011	State-level mandate for use of surface water from rivers, streams, ponds, lakes, etc. for non-domestic/commercial purposes.	Construction water requirements may involve use of surface water from nearby streams/rivers with state approval.	Permission/Allocation order for surface water abstraction.	Water Resources Department, Government of Meghalaya.
SOCIAL REGULATIONS					
1	The Right to Fair Compensation	The Act ensures transparent land acquisition with fair	Yes, as the area falls under 6th schedule,	No	Revenue Department,

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
	and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013	compensation, rehabilitation, and resettlement. It sets minimum compensation norms, R&R entitlements, and facilities for the displaced, allowing states to enhance benefits. The Act also includes special provisions to protect the interests of Scheduled Castes and Scheduled Tribes.	A review of the legal and institutional framework applicable to indigenous/tribal communities.		Government of Meghalaya, Khasi Hills Autonomous District Council The Sixth Schedule establishes the ADC or VC as institutional mechanisms for governing these areas.
2	Meghalaya Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules, 2017	Aim to provide a fair, transparent, and participatory process for land acquisition while ensuring adequate compensation and rehabilitation for affected families. These rules align with the broader objectives of the RFCTLARR Act to minimize the adverse impact of land acquisition and promote the welfare of those affected by it.	Impact on private Assets and properties	Ensure fair compensation and Guarantee transparency in the acquisition process.	Revenue Department/ District Administration, Village Council

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
3	Notification Land Acquisition through Direct Purchase by way of negotiated settlements for all departments in the state of Meghalaya, March,2022	It recommends land purchase through negotiation (and mutual consent) as the best approach by paying the landowners an incentive of 25%, inclusive of R&R benefits on the compensation calculated as per the provisions of Section 26 to 30 and First Schedule of the RFCTLARR Act.	Direct Negotiated settlement can be faster method of land acquisition	No	MPWD, Revenue Department/ District Administration, Village Council
4	Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014 & Meghalaya Street Vendors (Protection of Livelihood and Regulation of Street Vending) Rules, 2016	It regulates street vending and protects the rights of street vendors by legalizing their right; protects them from sudden eviction or relocation; spells their rights and obligations.	Applicable to all Project road corridors in case of economic displacement and relocation of street vendors.	No	District Administration/ District Municipal Authority, Village Councils under the Autonomous District Councils

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
5	Rights of Persons with Disabilities Act, 2016	Ensures that the Persons with Disability (PWD) enjoy the right to equality, life with dignity, and respect for his or her own integrity equally with others.	For the entire project road corridor where PWD are present and affected, and for designing the project in an inclusive manner.	No	Department of Social Welfare, Government of Meghalaya
6	Right to Information Act, 2005	The Act provides for setting out the practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, the constitution of a Central Information Commission and State Information Commissions and for matters connected therewith or incidental thereto.	All documents pertaining to the project would be disclosed to public.	No	Public Information Officer (PIO)
7	Article 244(2) & 275(1) of the Constitution of	Article 244(2) establishes Autonomous District Councils (ADCs) in tribal areas, granting them legislative and	Applicable in designated tribal areas under the Sixth Schedule	No	Government of India, Autonomous District Councils

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
	India - The Sixth Schedule	administrative powers, empowering them to legislate on land, resources, and local governance. Article 275(1) provides financial grants for the welfare and development of Scheduled Tribes and Scheduled Areas			
LABOUR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTION WORK					
1	Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996	It regulates the employment and conditions of service of building and other construction workers and provides for their safety, health and welfare.	Applicable for all building or other constructions works under the project that employs 10 or more workers.	Establishment Registration is required	Labour Commissioner, Meghalaya
2	Workmen Compensation Act, 1923	It provides for payment of compensation by employers to their employees for injury by accident i.e., personal	Construction workers will be involved in the Project road corridors	Workmen compensation Insurance Policy	Commissioner for Workmen's Compensation

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
		injury or occupational disease.			
3	ESI Act, 1948 (Employees State Insurance Act, 1948)	Employees State Insurance Act provides for health care and hospitalization benefits for construction work force	Construction workers will be involved in the Project Road corridors	Insurance Policy.	Commissioner for Workmen's Compensation
4	Inter-state Migrant Workers Act, 1979	It protects workers whose services are requisitioned outside their native states in India. A contractor who employs or who employed five or more Inter-State migrant workmen need to obtain registration under this act	Construction workers will be involved in the Project Road corridors	Registration/Labour license	Labour Commissioner, Meghalaya
5	The Child Labour (Prohibition & Regulation) Amendment Act, 2016	It prohibits employment of children in specified hazardous occupations and processes and regulates the working conditions in others.	There should not be any child labour (less than 14 years) in any project activity and adolescents (above 14 and less than 18 years) in any hazardous activity.	No	Labour Commissioner, Meghalaya/ Department of Social Welfare, Government of Meghalaya

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
6	Sexual Harassment of Women at the Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act)	It mandates every organization having more than ten employees to constitute an Internal Complaints Committee (ICC) in the prescribed manner to receive and address the complaints of any sort of sexual harassment from women in a time-bound and extremely confidential manner	Applicable to all implementing agencies	No	District Officer (District Magistrate or Additional District Magistrate)
7	Contract Labour (Regulation & Abolition) Act 1970	To provide proper and habitable working conditions. To regulate the functioning of the advisory boards. To lay down the rules and regulations regarding the registration procedure of the	Applicable to all implementing agencies	Labour License Required	Labour Commissioner, Meghalaya

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
		establishments employing contract labour			
8	Payment of Wages Act, 1936 and the Minimum Wages Act, 1948	Lays down as to by what date, wages are to be paid, when it will be paid and what deductions be made from the wages of the workers, if any.	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya
9	Payment of Gratuity Act, 1972 The payment of gratuity rules Meghalaya 1972	Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation, if an employee has completed 5 years of service with employer	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya
10	Employees Provident Fund and Miscellaneous Provision Act, 1952	Provides for monthly contributions by the employer and as well as by workers with a provision as return of pension of a lump sum (principal and interest	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
		accrued) at the end of his/her service term).			
11	Maternity Benefit Act, 1951 Meghalaya Maternity benefit Rules 1965	Provides for maternity leave for women, during pregnancy and after giving birth and some other benefits to women employees, in case of medical recommendation of bed rest or miscarriage etc.	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya
12	Payment of Bonus Act, 1965 The Payment of Bonus Rules Meghalaya 1975	Provides payments of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages.	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya
13	The Bonded Labour (Abolition) Act 1976 Bonded Labour System (Abolition) Rules 1976	An Act to provide for the abolition of bonded labour system, with a view to prevent economic and physical exploitation of the weaker sections of the	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
		people and for all matters connected there with or incidental thereto			
14	The Trade Union Act, 1926	Lays down the procedure for registration of trade union of workers and employers. The trade unions registered under the Act have been given certain immunities for civil and criminal liabilities.	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya
15	Schedule Caste and Schedule Tribe (Prevention of Atrocities Act 1989)	Atrocity with SC and ST community is defined as an offense punishable under Section 3 of the Act	Project Area is protected under Sixth Schedule of the Constitution	No	Social Welfare Department, Meghalaya
16	The Meghalaya Highways Act, 1972	Regulates road development and transport services in Meghalaya to ensure planned infrastructure, maintenance, and efficient	Applicable to all road development and transport projects in Meghalaya	No	Government of Meghalaya, Public Works Department (PWD)

Table 2.1: Applicable Environmental and Social Regulations/ACTs/Policies

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
		transport operations while promoting safety.			
17	Meghalaya Right to Public Services Act, 2020	Ensures timely delivery of notified public services to citizens by government departments, enhancing transparency, accountability, and efficiency in governance.	Applicable to all government departments and public service providers in Meghalaya	No	Meghalaya State Public Services Delivery Commission (MSPSDC)

2.2 IRC AND MORTH CODES APPLICABLE TO THE PROJECT

All road works in India must comply with the IRC, MoRTH guidelines and BIS Codes. Key relevant IRC codes that may directly or indirectly influence the environmental and social management during the design, construction and operational phases are given in **Annexure 2.1**.

Relevance of WB E&S Standards Applicability of ESS1 to 10 is given in Table 2.2.

Table 2.2: Relevance of ESS 1 to 10

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
ESS 1 – Assessment and Management of Environmental and Social Risks and Impacts	<i>ESS1 outlines the Borrower's duties for evaluating, handling, and tracking environmental and social risks and impacts at each phase of a project</i> <i>Involves Preparation of ESA, ESIA, ESMF, RAP.</i>	Project may involve potential environmental and social risks due to construction activities under the project.	Yes	ESIA/DPR/MPWD
ESS 2 – Labour and Working Conditions	<i>ESS2 highlights the vital role of job creation and income generation in reducing poverty and fostering inclusive economic growth. Borrowers can improve project outcomes by ensuring fair treatment of workers and providing safe, healthy working conditions.</i>	All project construction activities must guarantee the elimination of child labor and forced labor, while ensuring the implementation of operational health and safety standards, as well as a grievance redressal mechanism for the welfare of workers.	Yes	ESIA/MPWD/Contractor/CSC

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	Objectives include promotion of health, safety, equal opportunity at work and to protect vulnerable workers. Aims to prevent forced and child labour and to provide workers with accessible means to raise workplace concerns.			
ESS 3 – Resource Efficiency, Pollution Prevention and Management	<p>ESS3 acknowledges that economic activity and urbanization contribute to pollution and resource depletion, which can harm people, ecosystems, and the environment locally, regionally, and globally.</p> <p>Objectives include promotion of sustainable use of resources, minimize project-related pollution and emissions, minimize</p>	Construction and Demolition activities and provision of support facilities require waste and pollution management during construction and operations; prevention of risks due to chemicals and hazardous material use. Efficient use of raw material resources Energy, Air, Water, reuse of wastes and ensuring circularity etc. are important for overall sustainability.	Yes	ESIA/MPWD/Contractor/CSC

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	<i>generation of hazardous and non-hazardous waste and manage the risks and impacts associated with pesticide use</i>			
ESS 4 – Community Health and Safety	<p><i>ESS4 acknowledges that project activities, equipment, and infrastructure can heighten community exposure to risks and impacts.</i></p> <p><i>The major objective is to anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle.</i></p>	<p>It is of paramount importance to prioritize community health and safety through the careful design of infrastructure, products, and associated services in road construction projects involving extensive civil works.</p>	Yes	ESIA/DPR/MPWD/Contractor/CS C
ESS 5 – Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement	<p><i>ESS5 acknowledges that land acquisition and land use restrictions for projects can negatively affect communities, causing physical and economic</i></p>	<p>Land acquisition might be required as part of the project for road expansion and it is necessary to prioritize the protection of people's rights, ensuring a fair and transparent procedure.</p>	Yes	ESIA/DPR/MPWD /RP Implementation Agency

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	<p><i>displacement. "Involuntary resettlement" occurs when affected individuals or communities cannot refuse these actions.</i></p> <p><i>Major objective is to avoid or minimize involuntary resettlement. Other objectives include avoiding forced evictions, mitigate unavoidable adverse social and economic impacts from land acquisition and improve the living conditions of vulnerable persons.</i></p>	<p>Respecting landowners' rights fosters community trust, reduces conflicts, and supports social equity. A rights-based approach guarantees that affected individuals are treated justly and project proceeds smoothly.</p>		
ESS 6 – Biodiversity Conservation, and Sustainable Management of Living Natural Resources	<p><i>ESS6 acknowledges that safeguarding and conserving biodiversity, along with the sustainable management of living natural resources, are essential for achieving sustainable development.</i></p>	<p>The assessment and mitigation of impacts and risks to biodiversity and living natural resources, arising from both the implementation and operation phases, are crucial for linear projects that traverse extensive and</p>	Yes	ESIA/DPR/MPWD/Contractor/CS C

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	<i>The objectives include protection and conservation of biodiversity and habitats, ensure cautionary approach in project design and implementation which impact biodiversity and promote the sustainable management of living natural resources.</i>	diverse land areas.		
ESS 7 – Indigenous Peoples	<i>ESS7 recognizes that Indigenous Peoples are often disadvantaged by traditional models of development and supports poverty reduction and sustainable development by ensuring that projects enable Indigenous Peoples and communities to participate in and benefit from development, while safeguarding their cultural</i>	The socio-economic assessment and the integration of a management plan for the affected Indigenous communities are essential, given the context through which the project road passes.	Yes	ESIA/DPR/MPWD/CSC/Contractor

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	<p><i>identities and well-being</i></p> <p><i>The major objectives include ensuring that the development process fully respects the human rights, dignity, aspirations, identity, culture, and natural resource-based livelihoods of Indigenous Peoples, while avoiding any adverse impacts on them.</i></p>			
ESS 8 – Cultural Heritage	<p><i>ESS8 acknowledges that cultural heritage serves as a link between the past, present, and future, encompassing both tangible and intangible forms. ESS8 outlines measures aimed at protecting cultural heritage throughout the entire project lifecycle.</i></p>	<p>Impacts and risks on cultural heritage during the construction and operation periods should be considered to preserve and protect valuable historical, cultural, and archaeological sites. These elements are vital for maintaining cultural identity, community values, and social cohesion. Neglecting to address</p>	Yes	ESIA/DPR/MPWD/Contractor/CS C

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	<i>Its objectives are to protect cultural heritage from adverse impacts of project activities and to address cultural heritage as an integral aspect of sustainable development.</i>	potential risks can lead to irreversible damage, loss of heritage, and conflicts with local communities, thereby undermining the sustainability and social acceptance of the project.		
ESS 9 – Financial Intermediaries	<p><i>ESS9 highlights the importance of strong domestic capital markets and access to finance for economic development, growth, and poverty reduction. The Bank is committed to supporting sustainable financial sector development and strengthening the role of domestic markets.</i></p> <p><i>The major objective is to outline how the FI will assess and manage the environmental and social risks</i></p>	ESS9 would not be specifically required because there are no third-party financial intermediaries involved.	No	

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	<i>and impacts linked to the subprojects it finances.</i>			
ESS 10 – Stakeholder Engagement and Information Disclosure	<p><i>ESS10 emphasizes the importance of open, transparent engagement between the borrower and project stakeholders as a key element of good practice.</i></p> <p><i>Objectives include creating a systematic approach for identifying stakeholders and fostering constructive relationships with them, to assess the level of stakeholder interest and support and to ensure the timely, clear, accessible, and appropriate disclosure of relevant project information on environmental and social risks and impacts to stakeholders.</i></p>	<p>Effective stakeholder engagement enhances environmental and social sustainability, improves project acceptance, and contributes to successful project design and implementation.</p>	Yes	ESIA/DPR/MPWD/Contractor/CS C

2.5 Land Revenue Governance and Administration In Khadc

The Khasi Hills Autonomous District Council (KHADC), constituted under the Sixth Schedule of the

Constitution of India, is empowered under Paragraph 8 of the Sixth Schedule to assess and collect land revenue and levy taxes within its jurisdiction. Under Paragraph 3 of the Sixth Schedule, the Council also holds legislative authority over specified matters, including land allotment and land use. The jurisdiction of KHADC encompasses the entire Ri Bhoi District. Traditional Systems of land management in Ri Bhoi is presented in Table 2.3.

Table 2:3: Traditional Systems of land management in Ri Bhoi District

Khasi Classification of Land	
▪ RI KYNTI, OR PRIVATE LANDS	▪ RI RAID OR COMMUNAL LANDS
Property of the individual or the <i>kur</i> that owns it	Community entrusts Durbar Raid to manage on its behalf
<ol style="list-style-type: none"> 1. Ri Nongtymmen: Inherited from generations to generations. 2. Ri Dakhol: Obtained by the right of occupation. 3. Ri Bitor: Acquired on receipt of a ceremonial bottle of liquor. 4. Ri Khurid: Purchased or bought. 5. Ri Seng and Ri Khain: Undivided family owned land. 6. Ri Maw: Acquired through purchase or through the right of apportionment. 	<ol style="list-style-type: none"> 1. Ri Samla: Land acquired by an unmarried person. 2. Ri Shnong: Land villagers can use for cultivation. 3. Ri Lyngdoh: Land set aside for religious leaders. 4. Ri Bam Syiem: Land set aside for ruling chiefs. 5. Ri Bamlang: Land set aside for community use. 6. Ri Leh Mokutduma: Land acquired through litigation. 7. Ri Aiti Mon or Ri Nongmei Nongpa: Land donated or gifted for public use. 8. Ri Raphlang-Ri Bamduh: Barren land which anyone can use. 9. Ri Diengsai-Diengin: Forests area between the uplands and low lying areas.

Source: EIS

Autonomous District Councils and their role in land tenure management is presented in Table 2-4.

Table 2-4: Autonomous District Councils and their role in land tenure management

Sixth Schedule Established Autonomous District Councils

Unit	Governing Unit	Head	Broad Roles
Executive unit of ADC	Executive Committee	Chief Executive Member	Implement the policies and schemes of the ADC including development works; give consent for land acquisition; sanction land records (where relevant)
Legislative unit of ADC	Legislative Body	Chairman	Enact laws relating to the subjects listed in the sixth schedule, including land revenue and inheritance.
Judicial unit of ADC	Courts, including Village Courts, Subordinate District Council Courts	(Respective) Judges	Settle disputes involving one or more parties who are tribals.

Source: mbma.org.in/project_doc/

The sub-project falls in Khasi Hills Autonomous District Council (KHADC). Their role in Land tenure management is given in **Table 2.5**.

Table 2-5: Customary Institutions and role in land tenure management

Traditional/ Customary Institutions of governance in Meghalaya			
Unit	Governing Unit	Head	Broad Roles
<i>Khasis (Syiemship)</i>			
Hima (Province or a Princely state)	Dorbar Syiem (Council of the Syiem)	Syiem (Chief)	Administration of Hima, including markets and their taxation; Issuance of pattas, where available; settlement of disputes
Raid (Group of Shnongs)	Dorbar Raid (Council of the Raid)	Lyngdoh (Priest) or Basan	Administration of <i>raid</i> lands, mostly religious in nature
Shnong (Village)	Dorbar Shnong (Village Council)	Rangbah Shnong (Village Headman)	Administration of the village; witness to land transactions; mediation of disputes; aiding organisation of social and religious functions

Source: mbma.org.in/project_doc/

The traditional land tenure management systems practiced by the Khasis are summarized in **Table 2.6**.

Table 2-6: Traditional systems for Land Tenure Management amongst Khasis

Category	Khasis
Basis of classification	Purpose or ownership of land
Type of land	2 types of ownership (Ri Kynti or private land ; Ri Raid or communal lands) 15 sub- categories of ownership or use (Refer to Table 2.3)
Control and Management	Ri Kynti = Family-managed private land (individual or kur ownership). Ri Raid = Clan- or community-managed communal land (under Durbar Raid authority)

Category	Khasis
Inheritance	Women inherit and own property ¹ : The ancestral property and other inheritable forms of property like self-acquired (if not alienated), are inherited by the daughters. Khatduh (youngest daughter) gets a major share of the property, though it is incumbent upon her to maintain other members of the family if they so need ²
Records	The Khasis do not have any formal land records. There could be boundary marks for demarcating villages or parcels of land holdings. Hima Myllem (in case of Shillong) has pattas which they issue to the landowners on request as evidence ownership of land. The Hima also maintains a record of such pattas. Sometimes, documents could be issued by the village dorbar (<i>dulir</i>) which is also recognised by people as a form of land record as is the practice in this project area. Nature and form of <i>dulir</i> varies as it is not standardised by any authority
Systems for sale/purchase/ mortgage	The decision to sell land is made by the family. The village headman stands as the witness to such transactions. The parties are at liberty to register the transaction with formal authorities. Conveyance of land is a practice when there is a need to mortgage land.
Managing private property	The authority to manage the property is vested in the <i>kni</i> (maternal uncle) ³ .
Managing community property	For Clan lands or the community lands, it is the <i>Durbar</i> that oversees taking decisions for such lands. It is the <i>Durbar kur</i> or the <i>Durbar raid</i> in charge of such decisions (Male dominant or only male group)

¹ There do exist certain variances to this principle, like among the Wars, wherein sons have a share onto the property (Khongpai, 1974, p. 13)

² Bareh, 2016, pp. 326–330

³ Thus, it has been opined that amongst traditional Khasi societies, descent follows through the female while authority vests in the maternal uncles (Passah, 2017; Syiem, 2017).

3. PROJECT DESCRIPTION

3.1 UJ Road

The proposed road existed before the formation of Meghalaya State and ROW is limited only up to the existing Drain. The proposed UJ project road has a total length of 37.481 km, starting from Sonidan at chainage 40+130 and extending up to Umsiang at chainage 77+611, where the project road concludes.

3.2 Location Details of the UJ Road

The project road traverses a diverse landscape, encompassing hilly terrains, agricultural fields, scrublands, and built-up areas, while passing through thirteen villages along its alignment. This UJ road plays a vital role in enhancing regional connectivity by linking economic hubs and facilitating access to industrial centers as well as tourism destinations. **Table 3.1** presents the chainage-wise details of the corridor and the alignment of the road is shown in **Figure 3.1**.

Table 3.1: Chainage wise UJ Road stretches details

Sl. No.	Starting Chainage	End Chainage	Corridor No.	Project length
1	40+130	77+611	10	37.481

Source: DPR

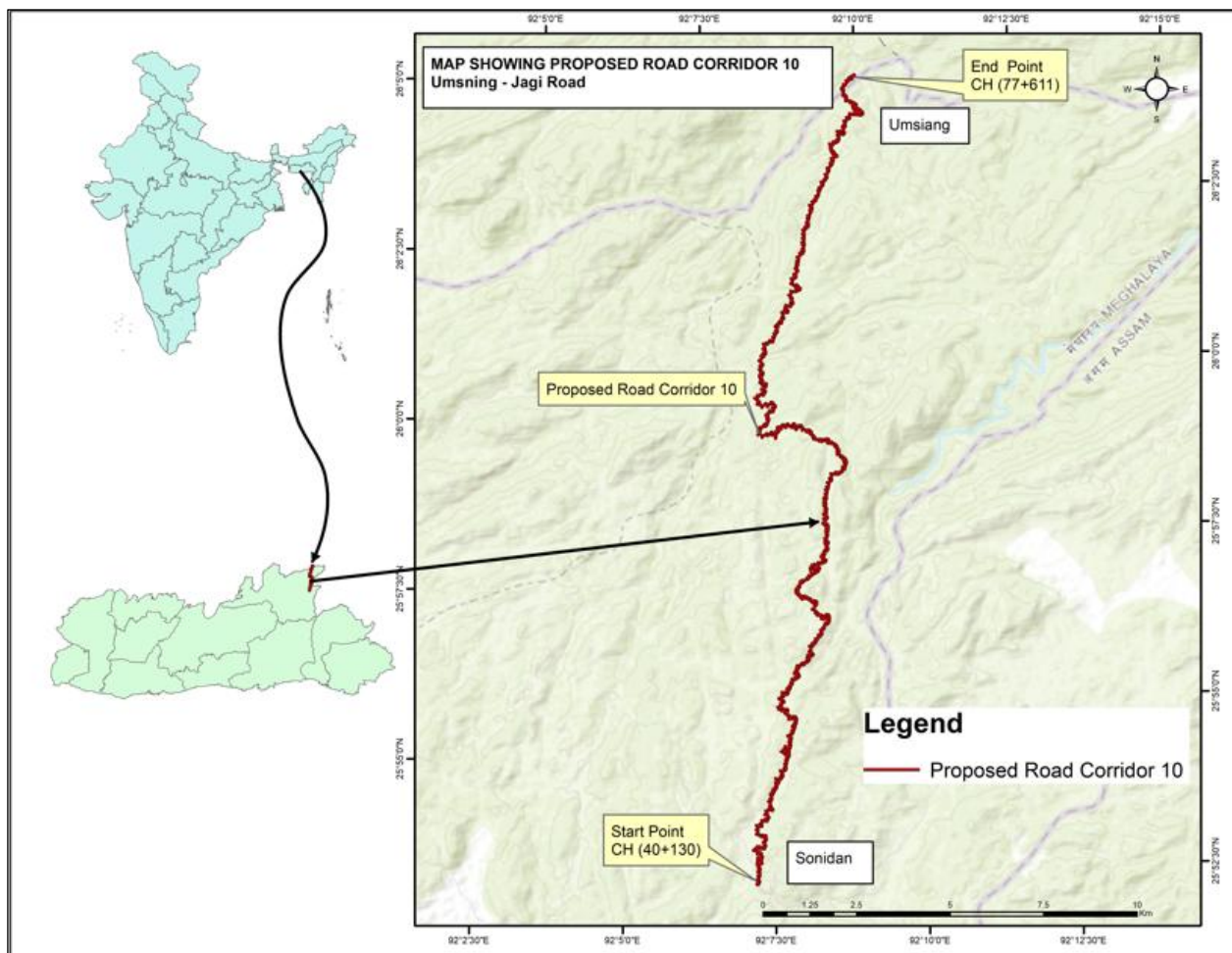


Figure 3.1: Road alignment map for UJ Road

3.3 Project Study Area (Project Influence Area)

For the purpose of this study, the Project Influence Area has been categorized in three tiers to facilitate a holistic environmental and social impact of the road stretch and to minimize potential environmental and social risks. Three tiers are given below

1. 12 m of ROW for Direct Impact (6m from Centre line)
2. 500 m buffer for indirect impact area ⁴
3. 10 km of study area (Project Influence Area)

The existing Right of Way (12 m) of the corridor has been considered adequate for characterizing baseline conditions and for assessing direct socio-economic impacts, including the profile of affected persons, religious structures, and common property resources. In stretches where the proposed RoW extends beyond the existing RoW to accommodate hill cutting or slope stabilization measures, the socio-economic assessment has been undertaken based on the actual proposed RoW.

⁴ Based on Earlier experiences it was observed that dust, noise and other environmental parameters would get attenuated/diluted to meet existing baseline conditions within 500 m from the source.

The indirect impact area has been delineated as 0.5 km on either side of the proposed RoW from the Centre Line. This buffer has been considered adequate to cover drainage channels, biodiversity-rich zones, natural habitats, protected areas, agricultural land, landslide- and landslip-prone stretches, marshy areas, surface water bodies, physical features, and settlements, among others. The LULC map of the direct impact area is presented in **Figure 3.2**.

The project influence area has been delineated with a buffer of up to 10 km from the periphery of the proposed RoW to identify environmentally sensitive features such as protected areas, wildlife sanctuaries, national parks, wetlands, and wildlife corridors. 10 km Buffer area for project road is presented in **Figure 3.3**. Map showing distance from Ecosensitive Zones w.r.t Project Road is presented in **Figure 3.4**.

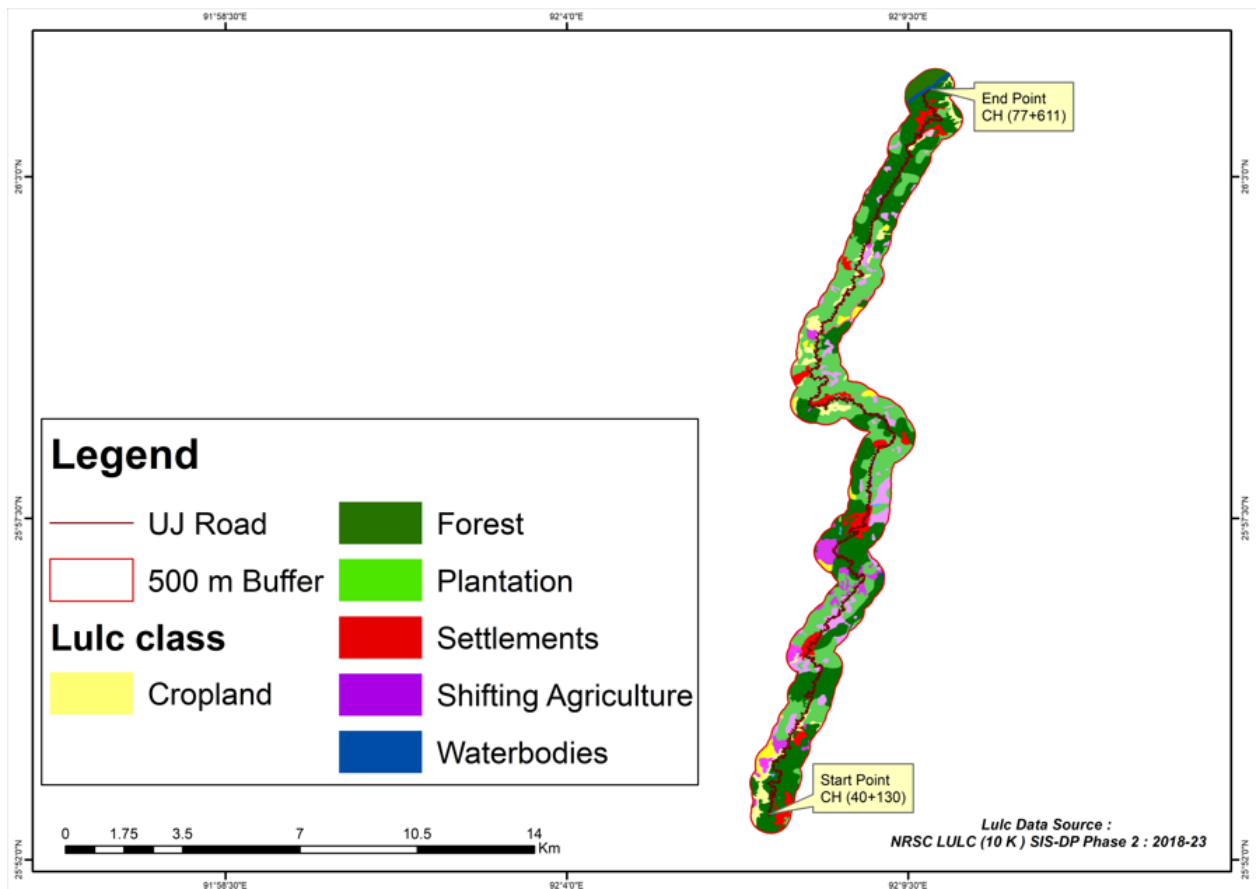


Figure 3.2: The LULC map of the direct impact area

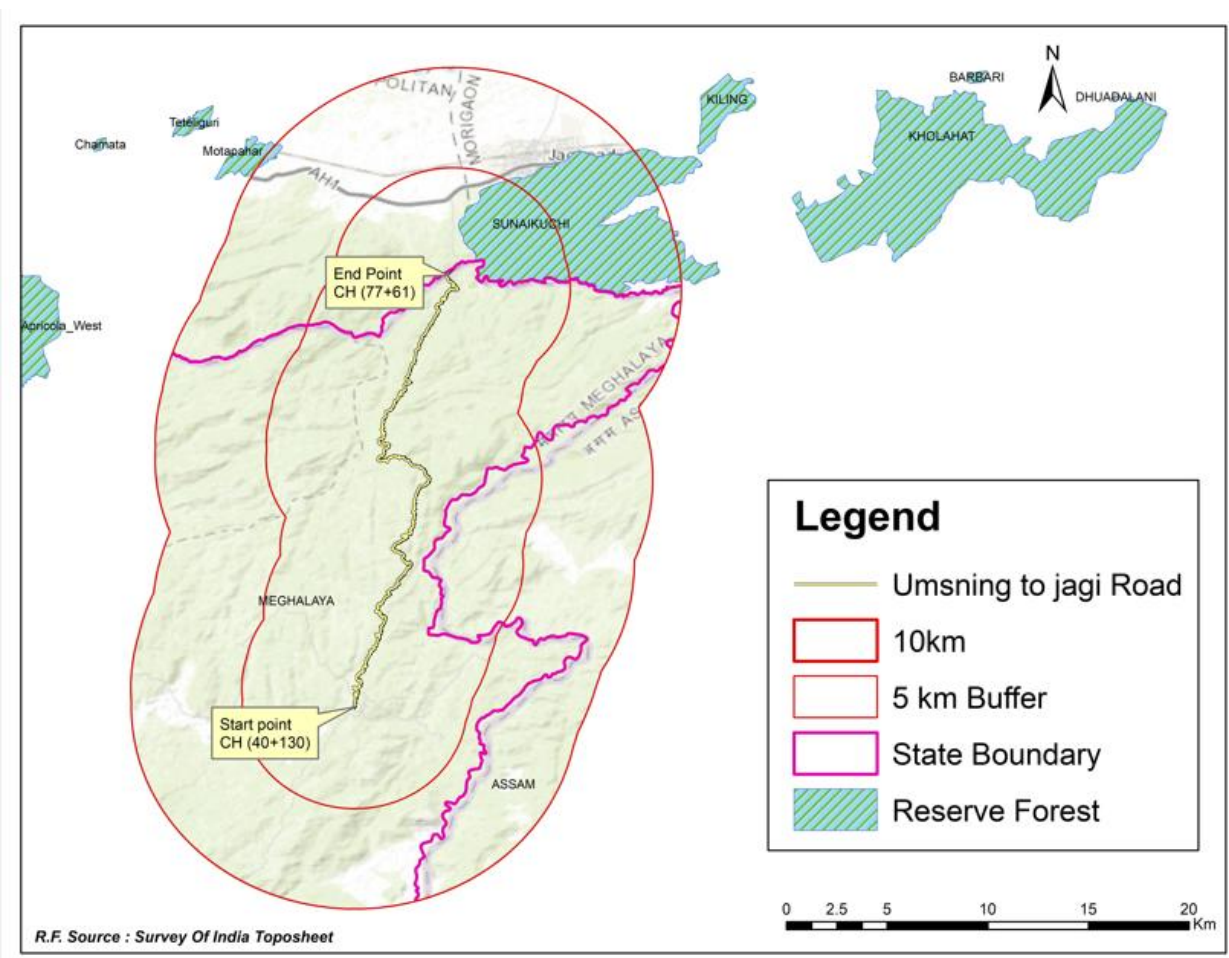


Figure 3.3: 10km Buffer area for project road

The following sections of this chapter provide details of the existing road characteristics, key project components, resource requirements and proposed improvements.

3.4 Key Existing Conditions and Proposed Improvements of the UJ Road

The key existing conditions along the UJ project road, together with the proposed improvements, are outlined in the following sub-sections. These have been described based on findings from the primary field surveys as well as details provided in the Detailed Project Report (DPR).

3.4.1 Right of Way, Carriage Width, Pavement Conditions and Junctions

The existing Right of Way (RoW) for the project road is 10 m, while the existing road width is 3.75 m. It is presently a single-lane roadway with a bituminous pavement surface. Details of the existing and proposed carriageway (CW) are summarized in Table 3.2. The pavement along the project stretch is bituminous, with its overall condition ranging from fair to poor, and most sections being in poor condition. Earthen shoulders of about 1.0 m width are provided on both sides; however, their condition has also been observed to be poor.

Table 3.2: Details of Existing Carriage way

S. No.	Chainage in Km		Length in km	Existing Carriageway width in (m)
	From	To		
1	40.130	77.611	37.481	3.75
Total Length			37.481	

Source: DPR

Pavement Details:

The existing pavement along the project stretch is bituminous. Its general condition ranges from fair to poor, with most sections observed to be in poor condition as per finding from the DPR and field observations. Earthen shoulders are provided on both sides, with a width of about 1.0 m; however, their condition is also assessed as poor.

For the MLCIP project, the pavement design adopts a multi-layered approach, utilizing materials of specified thicknesses to ensure durability and performance. The pavement layers consist of:

- Bituminous Concrete (BC): 40 mm
- Aggregate Interlayer pavement (AIP): 100 mm
- Cement-Treated Base (CTB): 100 mm
- Cement Treated Sub-Base (CTBS): 200 mm

This results in a total pavement thickness of 440 mm, providing a robust structure capable of withstanding diverse traffic loads and environmental conditions.

Junctions Details:

Along the project stretch, there are 8 minor intersections. The details of these junctions are provided in **Table 3.3**.

Table 3.3: List of Junctions Umsning - Jagi Road

Sr. No	Chainage	No.of Arm	Side	Direction	Type of Junction
1	48.550	4	Both	Surok-Umtyrkhang	Minor
2	53.890	3	LHS	Korhadem	Minor
3	56.490	3	LHS	Korhadem	Minor
4	61.200	3	RHS	Umlamphlang	Minor
5	62.950	4	RHS	Umlaper	Minor
6	64.900	3	LHS	Umtraï	Minor
7	66.860	3	RHS	Mawshang	Minor
8	75.420	4	Both	Umsiang	Minor

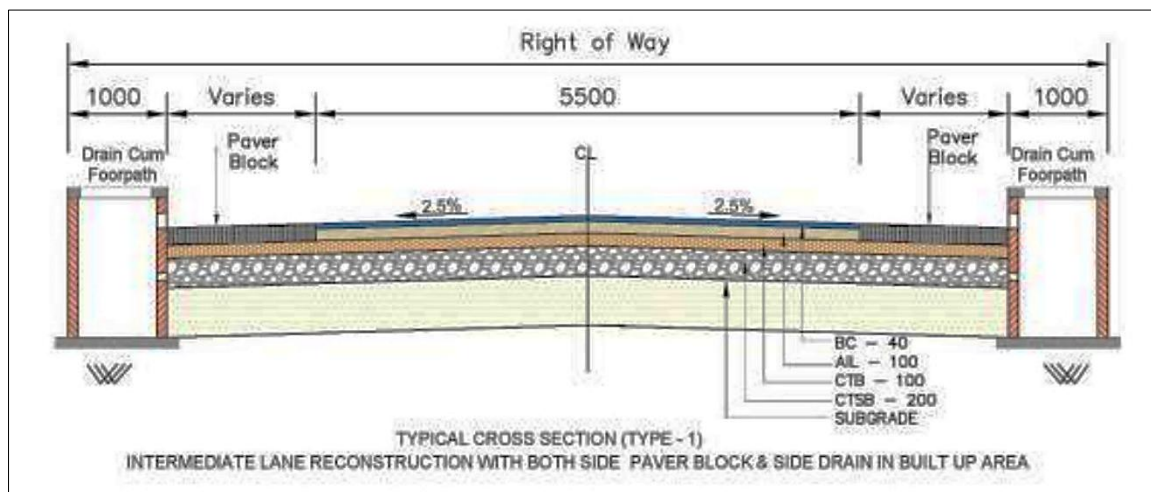
3.4.2 Proposed Road Cross Sections

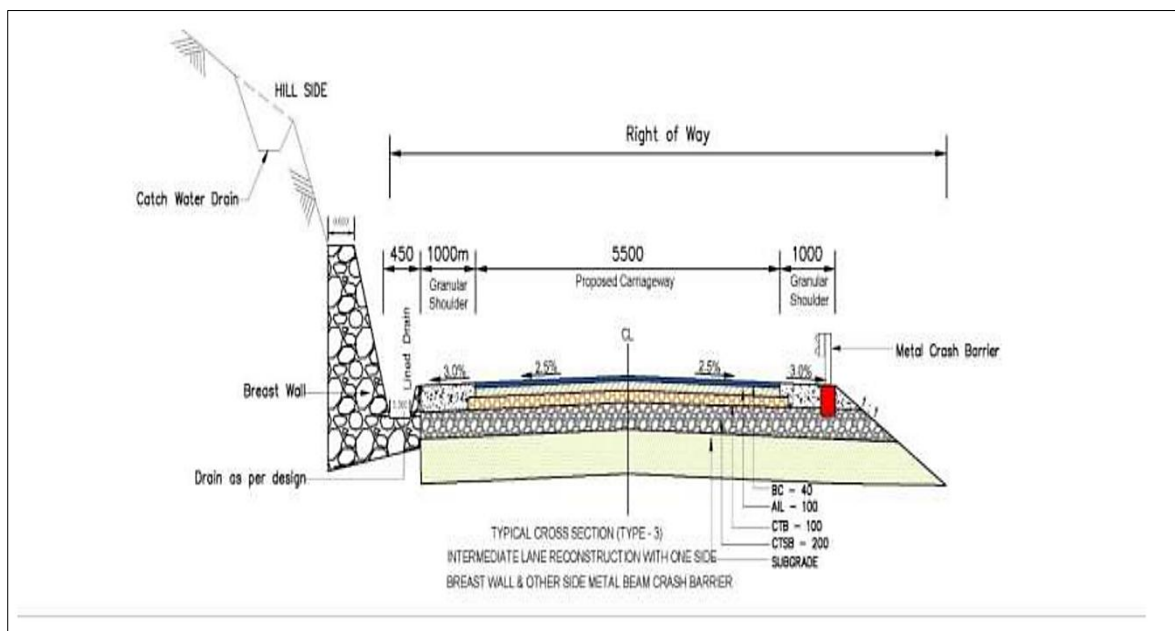
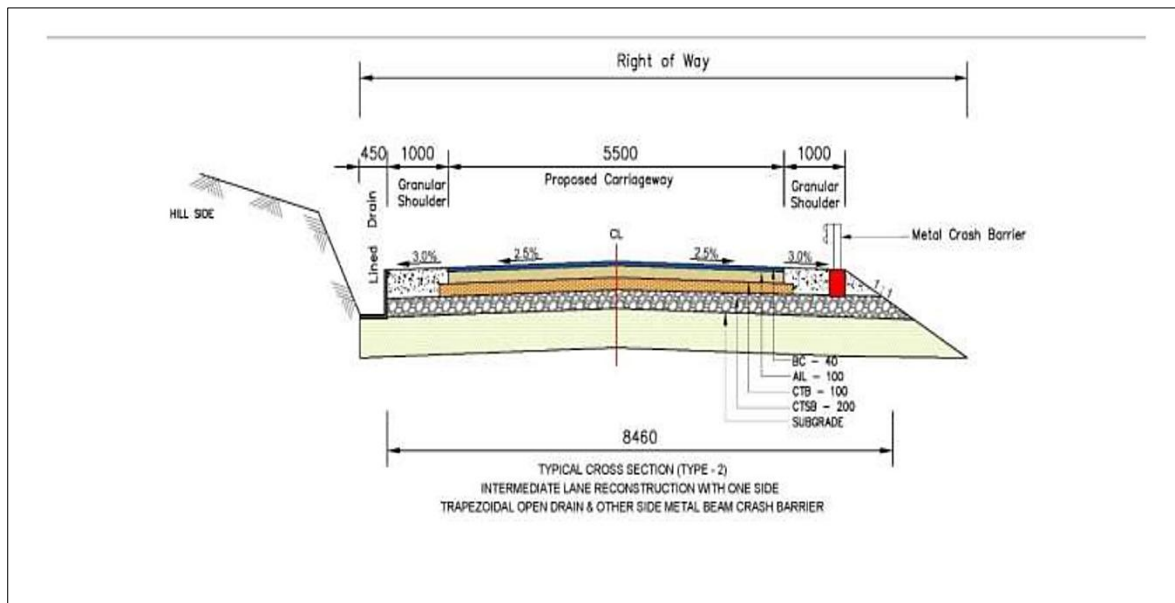
The Umsning-Jagi Road traverses terrain ranging from 95 m to 932 m above mean sea level. Based on the earthwork analysis as presented in Table 5.2 in Chapter 5, the total quantity of material to be excavated (cut) along the project corridor is 14,6587.150 m³, while the total fill requirement is 10,7844.900 m³. After balancing the cut and fill volumes, there remains a surplus of approximately 38,742.25 m³ of excavated material that will need to be safely disposed of at designated muck disposal sites. This approach ensures

effective earthwork management while minimizing environmental impacts and maintaining slope stability along the project corridor.

A total of four Typical Cross-Sections (TCS) has been proposed in the DPR for the 37.481 km project road. These TCSs vary across the alignment, with certain sections incorporating intermediate lanes. Each cross-section has been designed to address the specific terrain and infrastructure requirements, including provisions for road widening, slope stabilization, drainage, and utility corridors. Implementation of these cross-sections may also lead to environmental and social impacts, such as tree cutting, alteration of natural landscapes, potential biodiversity loss, and disruption of local ecosystems.

The details of chainage-wise cross-section designs adopted, are provided in **Annexure 3.1**. A total of four Typical Cross-Sections (TCS) have been presented in **Figure 3.4**.





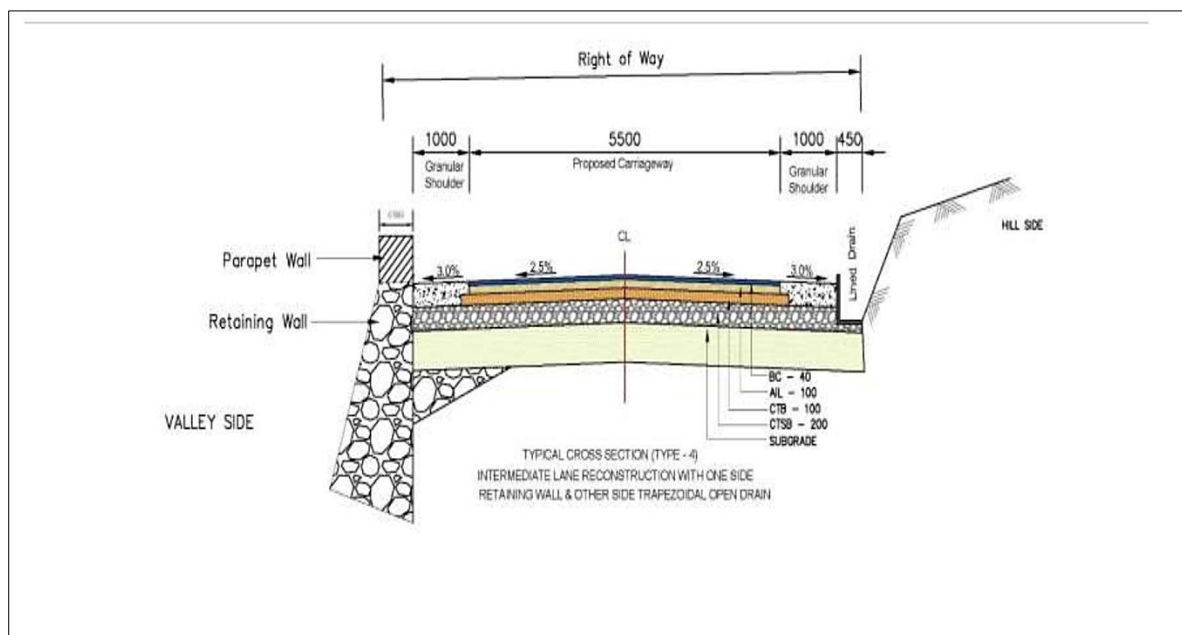


Figure 3.4: Typical Cross Sections

3.4.3 Settlements and Corridor Characteristics

3.4.3.1 Settlements:

The UJ Road passes through hilly terrain, rural settlements and towns. The details of the settlements along the stretch are presented in **Table 3.4**.

Table 3.4: Chainage wise List of villages & towns along project road

S. No.	Village Name	Chainages in KM
1	Sonidan	40.130
2	Mawpat (LHS)	45.000
3	Mawshunam (RHS)	45.000
4	Mawalaho	49.000
5	Kohradem	55.000
6	Sngahtyrkhang	59.000
7	Umlamphlang	61.000
8	Umlaper	62.000
9	Umtraí	65.000
10	Mawshang Mawksiew (RHS)	67.900
11	Umsiang Maiong	76.000
12	Kraikajam	76.500

13	Umsiang Mawpdeng	77.700
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3.4.3.2 Corridor Characteristics

The salient features of the UJ road are presented in **Table 3.5**.

Table 3.5: Salient features of the Existing UJ Road

Sl. No.	Characteristics	Details
1	Name of Road	Umsning -jagi Road
2	Project road corridor road Length	37.481 Km
3	District	Ri-bhoi District
4	Villages/settlements enroute	13 villages
5	Terrain	Hilly
	Existing	3.75 m
6	Proposed treatment	Brownfield, Improvement of sharp curves within the RoW, reconstruction of weak and damaged/ new culverts and bridges, rehabilitation and strengthening of existing pavement to intermediate lane and protection works.
7	Bridges	No. of Major Bridge – 0 No. of Minor Bridges – 1
8	Culverts	256
9	Forests / environmentally sensitive areas	Within 0.5 km of the project road, habitats include a mix of natural and modified ecosystems influenced by hilly terrain and human activities. Natural habitats feature with bamboo and degraded grasslands.
10	Religious Structures Affected	No religious structure is affected
11	Fifth/Sixth Scheduled Areas	Sixth Schedule Area
12	River crossings	Umsiang river at end point
13	Water bodies / ponds	1 River and 1 Community fish pond at Ch 43+450 RHS
14	Sensitive receptors	Church, school, hostel building, 2 nos of health centres, a community stockyard, a community fish pond and , Mawlaho Market. One parking shed (Ch 44+500) and five waiting stand (Ch 60+945, Ch 61+000, Ch 61+825, Ch 66+588 and Ch 75+610) along with one compound wall of church (Ch 69+776) will be affected. Refer Table 4.24 for chainage wise details of CPR.
15	Transshipment areas/truck parking locations	Nil
16	Other features / issues if any	Nil

3.4.4 Trees

Approximately 22 trees are situated within the existing Right of Way (RoW) on both sides of the road. To mitigate the ecological impact of tree felling, compensatory afforestation should be carried out, in accordance with applicable environmental regulations and guidelines. These measures, along with their implementation strategies, are comprehensively detailed in the Environmental and Social Management Plan (ESMP). The ESMP is attached as **Annexure 3.2**. The chainage wise details of trees are presented in Table 3.6.

Table 3.6: Chainage wise list of Trees

Sl. No.	Chainage (km)	LHS/RHS	Common Name	Scientific Name	Girth at Breast Height (cm)
1	40.406	RHS	Sal	Shorea robusta	210
2	43.262	RHS	Bamboo	Bambusa spp.	160
3	43.501	LHS	Jackfruit	Artocarpus heterophyllus	140
4	43.481	LHS	Nonsal (Mixed hardwood)	<i>Castanopsis, Schima wallichii</i>	180
5	45.990	LHS	Banana	Musa paradisiaca	55
6	45.994	LHS	Betel nut	Areca catechu	90
7	47.059	RHS	Jackfruit	Artocarpus heterophyllus	115
8	47.084	RHS	Broom stick	Thysanolaena maxima	90
9	49.416	LHS	Sal	Shorea robusta	230
10	51.816	RHS	Jackfruit	Artocarpus heterophyllus	120
11	51.843	RHS	Nonsal	Mixed Broadleaf Species	170
12	53.366	RHS	Bamboo	Bambusa spp.	190
13	56.533	RHS	Sal	Shorea robusta	220
14	56.574	RHS	Betel nut	Areca catechu	120
15	56.707	RHS	Betel nut	Areca catechu	85
16	56.829	LHS	Banana	Musa paradisiaca	60

17	57.263	RHS	Jackfruit	Artocarpus heterophyllus	160
18	57.417	LHS	Nonsal	Mixed Broadleaf Species	150
19	57.424	LHS	Bamboo	Bambusa spp	210
20	57.445	LHS	Broom stick	Thysanolaena maxima	60
21	57.766	RHS	Betel nut	Areca catechu	100
22	57.959	RHS	Broom stick	Thysanolaena maxima	130

3.5 Components & Activities of the Proposed Project

The development of the road would necessarily entail the following three stages. Each of the stages would have several activities and sub-activities. The three stages are

3.5.1 Detailed Design and Pre-Construction Stage

- Carrying out ESIA studies & preparation of ESMP and other Environmental and Social management instruments such as RAP, IPDP, LMP, SEA/SH plan and OHS plan
- Finalization of alignment with incorporation of environmental, social and community concerns in addition to the design and safety aspects
- Relocation of utilities and private & community structures
- Community consultation for land identification for borrow areas, disposal site, water availability, siting of camps, tree felling permission
- Identification of sources of material
- Contractor mobilization
- Setting of Construction Camp

3.5.2 Construction Stage

- Site clearing & construction camp establishment
- Material procurement & transportation
- Earthwork, hillside cutting, if required, embankment construction, GSB, WBM, operation of equipment, plant and machinery
- Structure demolition & construction work, if required
- Surfacing and shoulder protection & road furniture

3.5.3 Post-Construction, Operations & Maintenance Stage

- Decommissioning and restoration of camp area, removal of Construction & demolition waste, Restoration of borrow area, disposal sites.
- Operation of vehicles and safety of road users

3.6 Resource Requirements

For the proposed road project, assessing the availability of suitable construction materials in the vicinity of the project road is essential. The major materials required include soil, sand, aggregates, bitumen, steel, and cement. Surface water will be utilized for construction purposes, subject to prior permission from the Irrigation/Water Resources Department. Details of the construction materials, their sources, and corresponding lead distances are provided in **Table 3.7**.

Table 3.7: Details of construction material, sources along with the lead

Material	Source	Lead (in km)	Surfaced Road	Unsurfaced Gravelled Road	Kutch Road
Building Stone/ Boulders	7th Km of BB road	59.00	58.000	1.00	0.00
Stone Metal/ Aggregates/ GSB/ Stone Chip/ Filter Material/	11 th Km of Shillong Jowai Road (N.H. 44)	81.00	80.000	1.00	0.00
Sand/ Blindage/ Binding Materials	Korbalu	50.00	49.000	1.00	0.00
Cement	Umsning	40.00	39.000	1.00	0.00
HYSD bar	Umsning	40.00	39.000	1.00	0.00

3.6.1 VOLUME OF CIVIL WORKS

The volume of civil works for MLCIP will depend on the construction methods employed, the typical cross-sections, and the specific materials used within the sub-project area. These civil works are critical to ensuring the highway's stability, safety, and environmental sustainability, thereby contributing to the long-term success of the road project. Details of the materials used including Bituminous Concrete (BC), Dense Bituminous Macadam (DBM), Prime Coat (PC), Tack Coat (TC), Granular Sub Base (GSB), and Wet Mix Macadam (WMM) treatments are provided in **Annexure 3.3**. The use of this comprehensive range of materials ensures the road's strength, durability, and overall performance.

The total quantity of material to be excavated (cut) along the project corridor is 14,6587.150 m³, while the total fill requirement is 10,7844.900 m³. After balancing the cut and fill volumes, there remains a surplus of approximately 38,742.25 m³ of excavated material. This excess earthwork shall be disposed of or utilized by the contractor only at designated and pre-approved disposal sites identified by the Meghalaya Public Works Department (MPWD), in accordance with environmental management and safety norms.

Further, recycling and reuse of existing pavement materials shall be carried out as per MoRTH Specifications for Road Works (latest revision) and IRC: 120 guidelines. This approach promotes cut-and-fill optimization, reduces the requirement for fresh borrow materials, minimizes construction waste, and ensures compliance with the Solid Waste Management Rules, 2016 and Environmental (Protection) Act, 1986.

3.7 Land Requirements

Approximately 0.38 hectare of land will be acquired for road improvement works. Critical locations where geometric improvement required on Umsning -jagi Road (37.481 Km) is presented in Table 3.8.

Table 3.8: Critical Locations where Geometric Improvement Required

Sr. no.	Location		Area Required in Sqm	Reason
	From	To		
1	41.1	41.3	1241.583	Curve Improvement
2	45.9	46.2	937.74	Curve Improvement
3	47.17	47.3	397.81	Curve Improvement
4	48.00	48.30	1100.00	Curve Improvement
5	57.1	57.3	151.049	Curve Improvement

3.8 Water Requirements

The overall water requirement of the project is 93.5 KLD, of which 92.7 KLD will be used for construction activities and 8 KLD is required for domestic purposes.

Details of the water requirement assessed for the project road are presented in **Table 3.9**.

Table 3.9: Details of the water requirement

A ctivity	Daily Demand (Liters/km)	Total for 40 km (Liters/day)	Remarks
Permanent Works	800 – 1000	32000	Concrete mixing, compaction, culverts, drains.
Dust Suppression at Work Zone	300 – 500	13800	Reduced due to frequent rain; use only on dry days.
Curing	300 – 500	14000	Rainfall may assist, but controlled curing still needed.
Laboratory	Fixed	1,000	Centralized testing facility.
Haul Roads	300 –5600	12000	Frequent spraying due to erosion-prone slopes.
Crusher	Fixed	8700	For aggregate washing and dust control.
Plant Cleaning & Workshop Washing	Fixed	4000	Includes batching plant and machinery.
Domestic Purpose	Fixed	8000	For 50–100 workers (drinking, cooking, sanitation).
Total		93500	

3.9 Project Cost

The total estimated cost of the project as per the DPR is approximately INR 124.53 crore and the project is planned for a period of 36 months.

3.10 Project Implementation Schedule

Based on the stipulated criteria and conditions, MPWD will award the civil works contract to an eligible contractor. The contractor will be responsible for procuring quality materials in sufficient quantities from the nearest authorized sources and approved manufacturers. Equipment meeting the prescribed standards must be used throughout the construction process.

The manpower requirement will vary over the construction period depending on the scope and type of work. The peak manpower is estimated to be approximately 50 personnel. Skilled manpower, primarily machine operators and the concrete casting crew, will generally be migrant workers accommodated in the construction camp. It is estimated that about 65–70% of the workforce will be sourced locally, while the remaining skilled workers, operators, supervisors, and engineers may be recruited from outside the area. The contractor will mobilize the required manpower according to the construction schedule. The construction period for the 37.48 km project stretch is planned for 36 months.

4. BASELINE ENVIRONMENT

4.1 General

This chapter provides an overview of the existing environmental and social conditions of the project area, covering natural, physical, biological, cultural, and socio-economic components. Based on this baseline scenario, the potential impacts of the proposed sub-project have been identified. The approach and methodology adopted for baseline data collection are outlined in Section 1.3 of Chapter 1.

4.2 Natural Environment (Meteorology)

This section describes the present meteorological conditions of the area like climate, temperature, rainfall and relative humidity.

4.2.1 Climatic Conditions

The climate of Ri-Bhoi district is characterized by moderate temperatures and high humidity throughout the year. The district experiences three distinct seasons: summer, monsoon, and winter. Summer typically lasts from March to May, followed by the Southwest (SW) monsoon season, which extends until September. Winter begins in November and continues through the end of February.

4.2.2 Temperature

In Ri-Bhoi District, winter generally begins in November, with January being the coldest month. During this period, minimum temperatures can drop to around 5-7 °C in the higher elevations, while daytime conditions remain mild and sunny though exact average maximums are not consistently recorded. Summer sets in from March onwards, with July and August being the warmest months, especially during the monsoon season. Although specific temperature ranges are limited in official records, the warmest periods are typically marked by moderate daytime temperatures averaging between 25–30 °C, while nights remain relatively cool.

Table 4.1 below presents the monthly mean maximum and minimum temperatures recorded at Shillong (IMD data), which has been considered as the nearest representative location for the project area.

Table 4.1: Monthly Mean Maximum and Minimum Temperature

Month	Maximum Temperature (°C)	Minimum Temperature (°C)
January	18.6	2.2
February	21.2	3.7
March	25.6	6.8
April	27.1	10.1
May	27.0	11.8
June	27.1	14.7
July	27.4	16.3

August	27.3	16.2
September	26.9	14.8
October	25.2	10.9
November	22.8	7.1
December	20.1	4.0

Source: India Meteorological Department – Shillong Climatological Normals, (1991–2020)

Temperature projection and implications for project road

According to the Meghalaya State Climate Action Plan, Ri Bhoi District is projected to experience an increase in average annual temperature of about 1.6°C to 1.7°C by 2050 (relative to the 1970s baseline), along with greater variability in monsoon rainfall, more intense downpours, and a higher frequency of extreme weather events. Such climate trends heighten the risk of slope slips, localized flooding, drainage congestion, and premature pavement deterioration, particularly along road sections passing through the district’s rolling terrain and high-rainfall zones.

To improve climate resilience, the project design includes enhanced cross- and longitudinal-drainage capacity, strengthened retaining and breast walls, the use of climate-resilient pavement materials, and targeted slope stabilization and bioengineering measures suitable for Ri Bhoi’s geomorphological setting. These measures collectively aim to minimize vulnerability to heat- and rain-induced stresses, protect the structural stability of the roadway, and ensure reliable long-term serviceability under evolving climatic conditions.

Source: Meghalaya State Climate Action Plan

4.2.3 Rainfall and Humidity

Ri-Bhoi district experiences a humid subtropical to temperate monsoon climate, influenced by its elevation and geographical features. Pre-monsoon showers typically occur in April and May, often accompanied by thunderstorms and occasional hailstorms, followed by a short dry period. The southwest monsoon usually arrives by late May or early June, bringing heavy rainfall, with the peak occurring between June and August. While Ri-Bhoi does not receive as much rainfall as the southern parts of Meghalaya, such as Mawsynram and Cherrapunji, it still faces challenges like localized flooding, waterlogging, and increased risk of landslides, particularly along major transportation routes during the peak monsoon months.

The average annual rainfall as recorded at the Shillong IMD station (Nearest IMD station), is presented in **Table 4.2**, which provides the year-wise rainfall distribution.

Table 4-2: Monthly Rainfall Data

Month	Average rainfall (mm)
January	12.6
February	15.4

March	42.7
April	131.4
May	244.5
June	423.7
July	402.0
August	328.4
September	270.1
October	197.2
November	24.7
December	7.2
Annual total	2,099.9

Source: India Meteorological Department – Shillong Climatological Normals, (1991–2020)

Rainfall projection and implications for project road

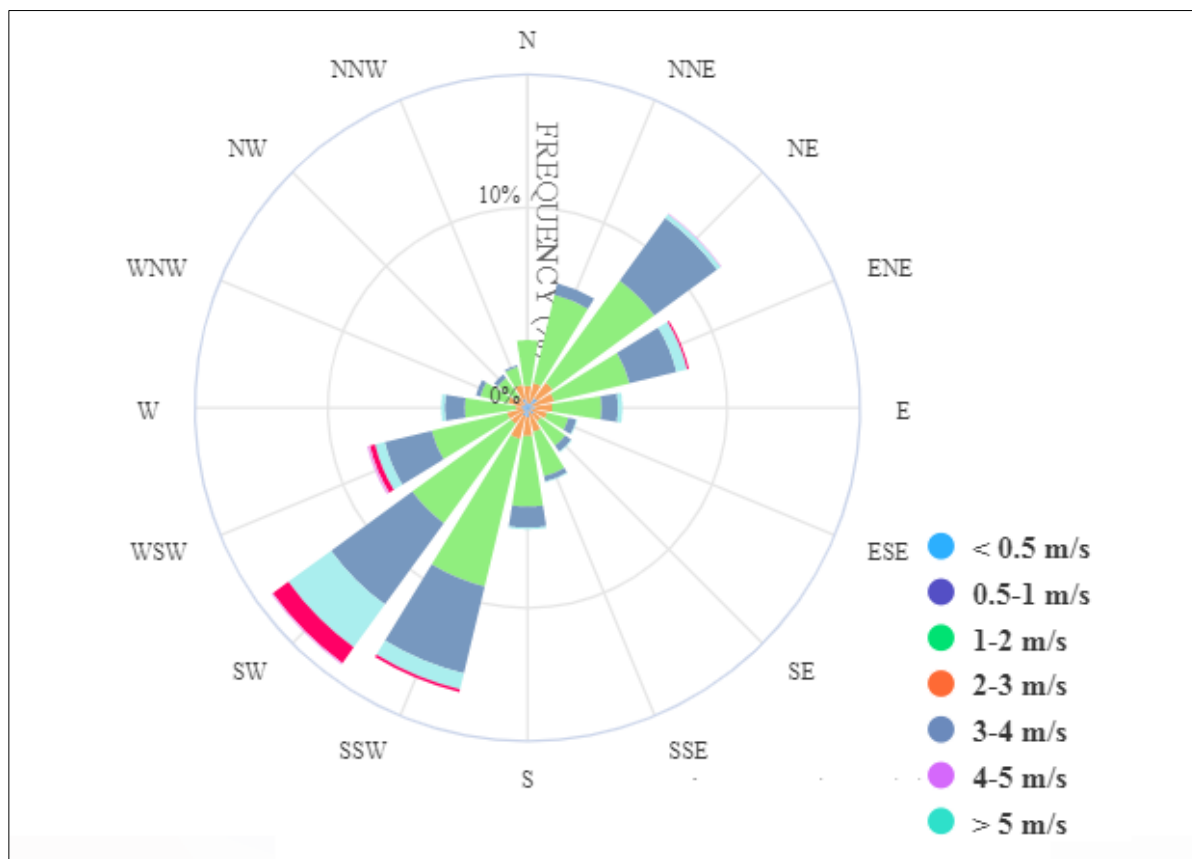
According to the Meghalaya State Climate Action Plan (2022), Ri Bhoi District is expected to experience increasingly erratic rainfall patterns by 2050, characterized by a rise in extreme precipitation events and short-duration, high-intensity rainfall. In the project area, which already receives high monsoon rainfall due to its undulating terrain and proximity to the central plateau, these projected changes may further intensify surface runoff, soil erosion, slope instability, and localized flooding along the project corridor. Such conditions can place additional pressure on existing drainage systems, accelerate pavement deterioration, and pose risks of traffic disruption, especially during the peak monsoon period.

To mitigate these climate-related risks, the project design incorporates expanded cross-drainage structures, improved longitudinal side drains with adequate outfall arrangements, properly engineered muck disposal sites, and bio-engineering techniques for slope protection. These interventions aim to strengthen stormwater management, minimize erosion and slope failures, and ensure road stability, safety, and year-round connectivity under the projected rainfall variability and increasing extreme weather events in the Umsning–Jagi region.

The Ri-Bhoi district in Meghalaya experiences consistently high humidity levels, typical of its subtropical highland climate. The average relative humidity remains around 83% throughout the year, reflecting persistently high moisture content in the atmosphere.

4.2.4 Wind Speed and Direction

The annual windrose diagram for Shillong (nearest IMD station) is presented in **Figure 4.1**. The average wind speed is about 4.9 km/hr, predominantly blowing from the southwest direction.



Source: IMD Climatological Tables for 1991–2020

Figure 4.1: Wind rose Diagram for Shillong (IMD)

4.3 Land Environment

This section describes the key characteristics of the project area including its Physiography, Elevation, Geology, Geomorphology and soils, land use pattern, agriculture and soil.

4.3.1 PHYSIOGRAPHY AND ELEVATION

Ri-Bhoi district in Meghalaya is characterized by rugged, forested hills with deep valleys and numerous perennial rivers, including the Umkhrach, Umshyrpi, and Umiam, which support agriculture and local water supply. The general elevation ranges from about 100 metres above mean sea level (amsl) in the northern plains to nearly 1,000 metres amsl in the southern hilly areas. The terrain gradually rises towards the south, with hill ranges and ridges interspersed with river valleys and flat patches of cultivable land.

Source: CGWB District Ri Bhoi District

Baseline Scenario for Road

As per the elevation map, the Umsning - Jagi road passes through terrain ranging from 95 to 932 meters above mean sea level, which will require careful alignment and slope stabilization measures during road construction. The elevation profile of the project stretch is shown in **Figure 4.2**.

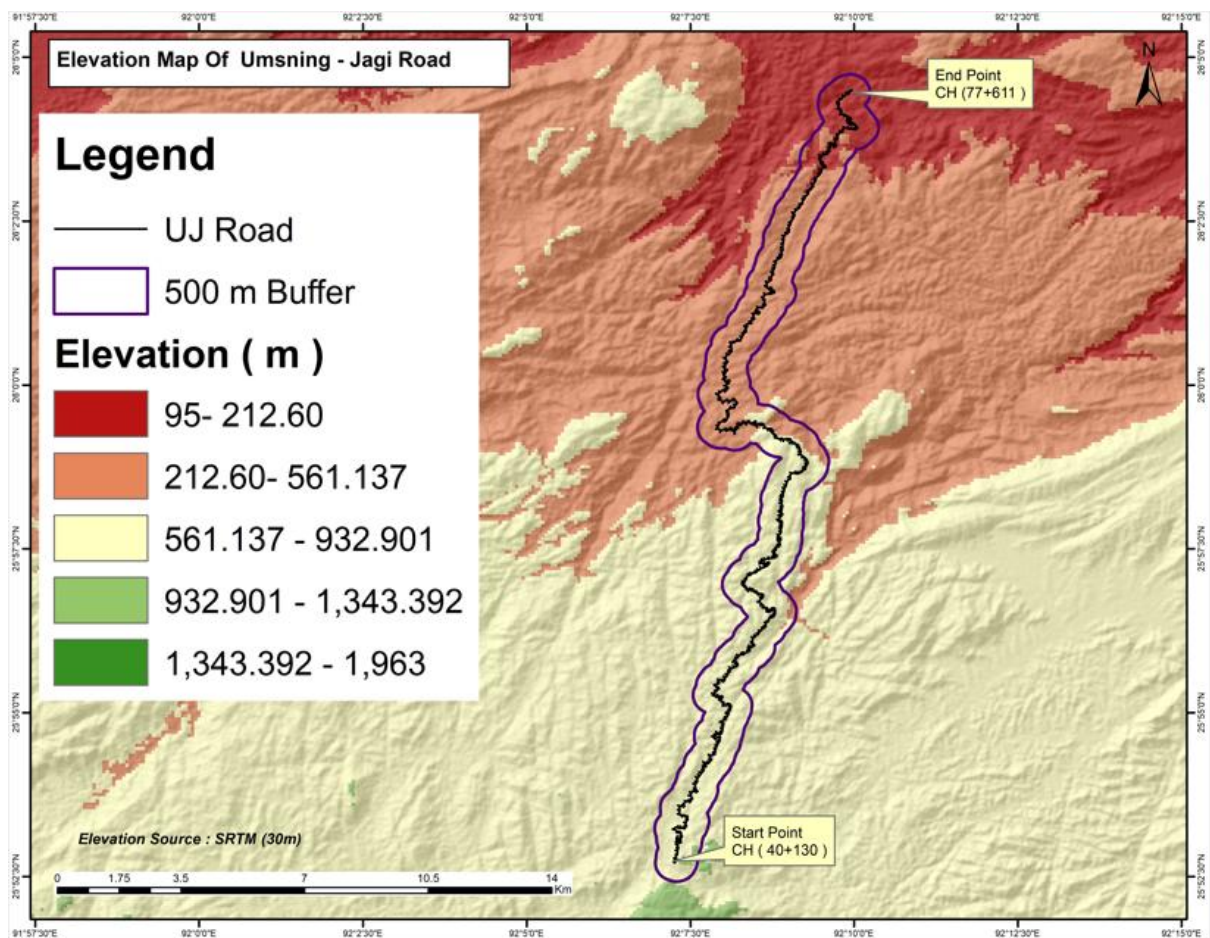


Figure 4-2: Elevation map of the project road (Elevation Source: SRTM (30m))

4.3.2 Geology

Baseline Scenario for Project Road

The Umsning–Jagi corridor in East Meghalaya predominantly traverses terrain underlain by Proterozoic crystalline rocks belonging to the Assam–Meghalaya Gneissic Complex. The initial section of the alignment exposes grey to pink porphyritic granite and coarse-grained pink and grey granite, representing intrusive phases of the Precambrian basement. These rocks are hard, massive, and form a rugged and stable foundation, which largely controls the surface morphology and provides a firm substratum for construction activities.

Further along the corridor, the lithological sequence includes mica (biotite) gneiss, pegmatite and quartz veins, and localized occurrences of quartzite with thin phyllite interbands. These rocks signify multiple episodes of metamorphism and late-stage hydrothermal activity, typical of the eastern Shillong Plateau region.

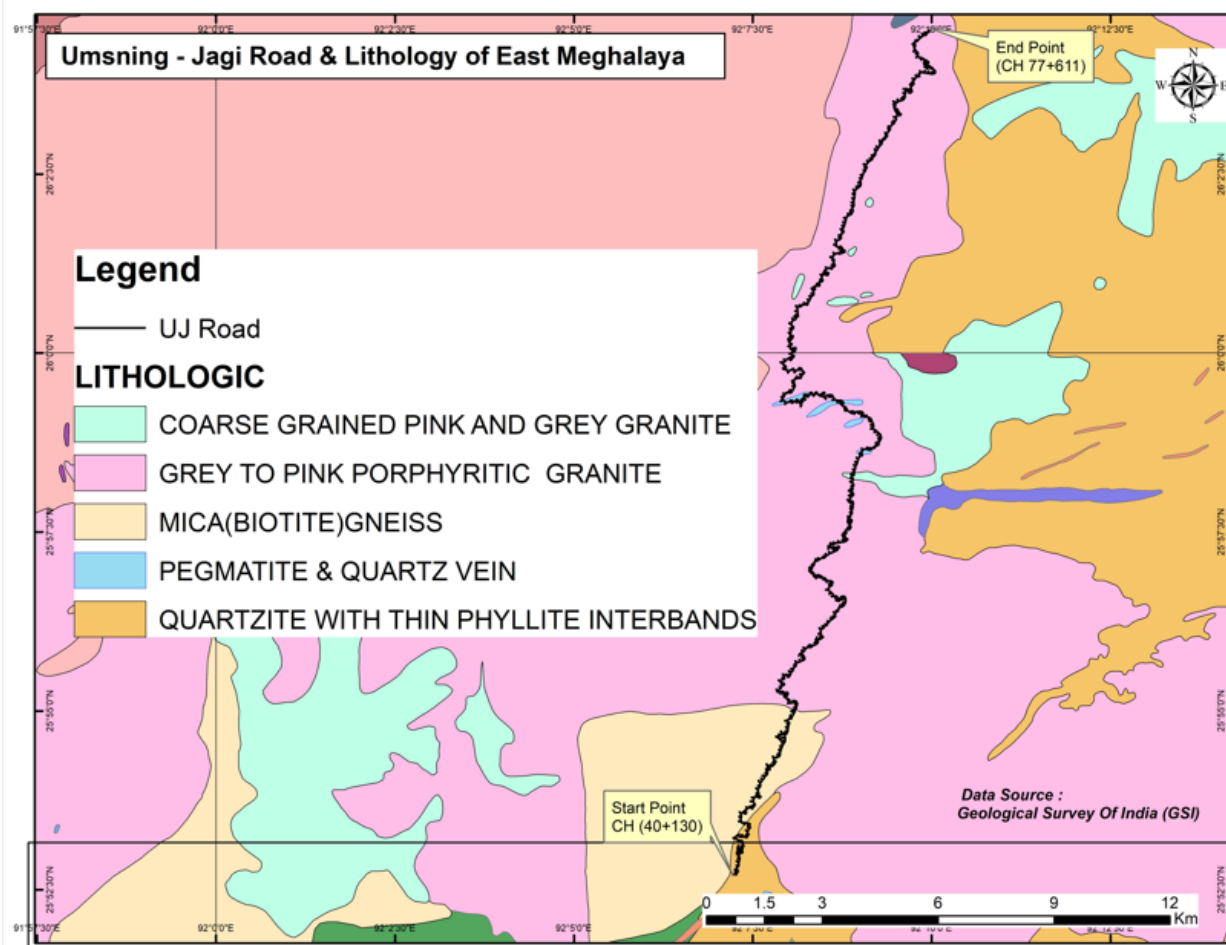


Figure 4-3 Local geology of the project road

4.3.3 GEO-MORPHOLOGY AND SOILS

Geomorphologically, Ri-Bhoi district is characterized by rugged hills, undulating plateaus, valleys, and riverine floodplains. The terrain is predominantly hilly, with steep slopes in upland areas gradually transitioning into plateau regions and low-lying valleys in certain stretches.

Soils in the district are mainly lateritic and acidic, formed from the weathering of Shillong Group rocks under high rainfall. In the hilly sections, soils are highly acidic, with textures ranging from sandy loam to clay loam, and patches of lateritic red soil. These soils are rich in organic matter and nitrogen but are prone to erosion and leaching during heavy monsoon rains, which can lead to slope instability. The block-wise soil type and land slope is given in below **Table 4-3**.

Table 4-3: Block wise major soil area and Land Slope for Umsning C & RD

Block	Major Soil Type	Area (Ha)	0–3% Slope	3–8% Slope	8–25% Slope	>25% Slope
Umsning C & RD	Loamy to clay loam soils	72,500	5,000	11,800	21,700	34,000

Source: District Irrigation Plan 2016–2020, Ri Bhoi, Government of Meghalaya

Baseline Scenario for Sub- Project Road

The Umsning - Jagi Road section in Ri-Bhoi District soils are predominantly acidic, consisting mainly of red and yellow loams with sandy to sandy loam textures—derived from weathered gneissic, schistose, and quartzitic bedrock typical of the Meghalaya Plateau. The soils are generally well-drained but moderately leached due to high rainfall. The southern portion of the road traverses a moderately dissected plateau, representing a relatively stable terrain with gentle slopes. Moving northward, the alignment passes through areas of highly dissected plateau and moderately dissected hills and valleys, characterized by rugged terrain, steeper slopes, and narrow valleys shaped by fluvial erosion. The northernmost stretch approaches low-lying areas near water bodies and river channels, indicating a gradual transition from plateau to plains. Overall, the corridor covers a mix of plateau and dissected hill terrain, requiring appropriate drainage and slope stabilization measures along the steeper stretches. Geomorphological map of the project road is depicted in the **Figure 4.4**.

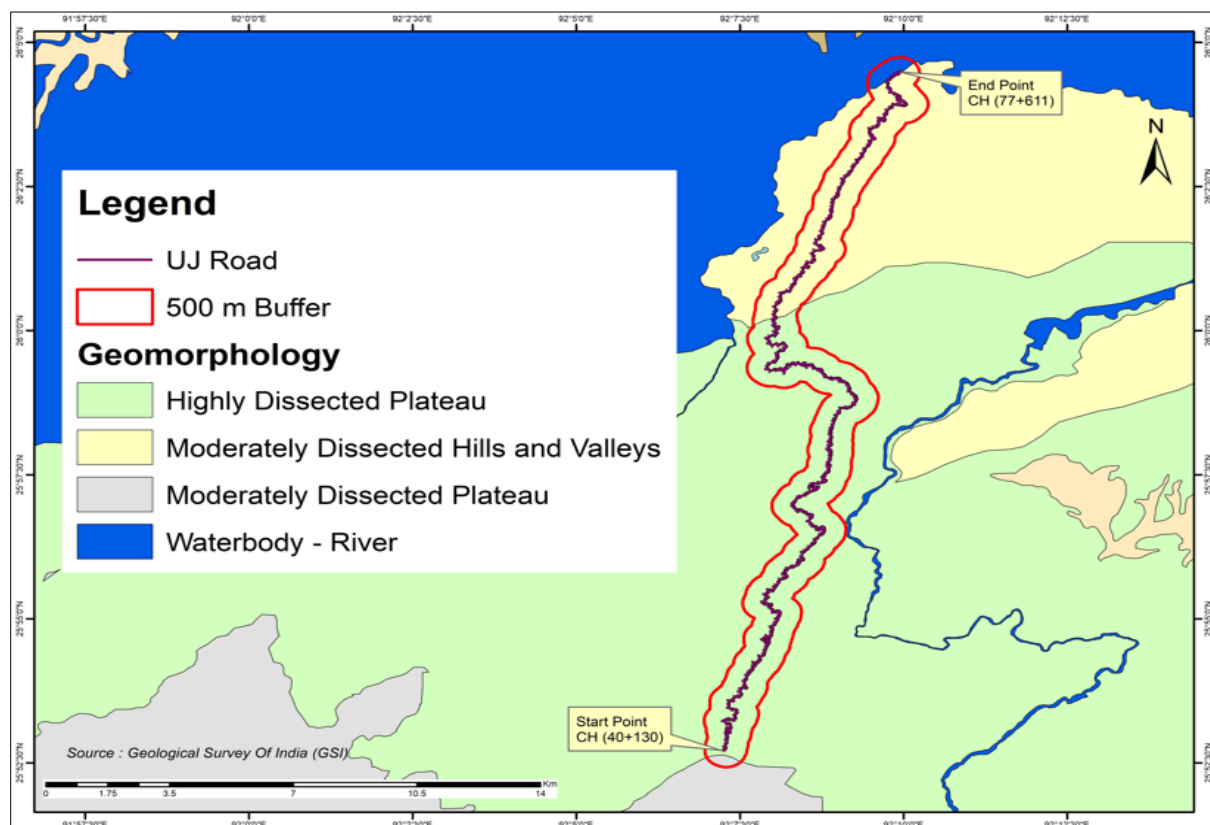


Figure 4-4: Geomorphological map of Ri-Bhoi

4.3.4 Land Use Pattern

Baseline Scenario of the UJ Road

The Land Use and Land Cover (LULC) within 500 m of the Umsning–Jagi Road up to Phlangwanbroi Road, the land cover is dominated by plantation (36%), followed by forest (27%), shifting agriculture (17%), built-up area (13%), cropland (6%), and water bodies (2%). The alignment does not pass through any Forest area, Protected Area, National Park, Wildlife Sanctuary or Wetland. Landscapes are divided into hills plain and rural landscapes. Among them, a number of landscape types and subtypes are distinguished. Three landscape types were identified within the project influence area - 1,000 m wide corridor along the alignment (within 500 m of the centerline of the alignments). The Land Use/Land Cover map of the project road corridor is presented in **Figure 4.5**.

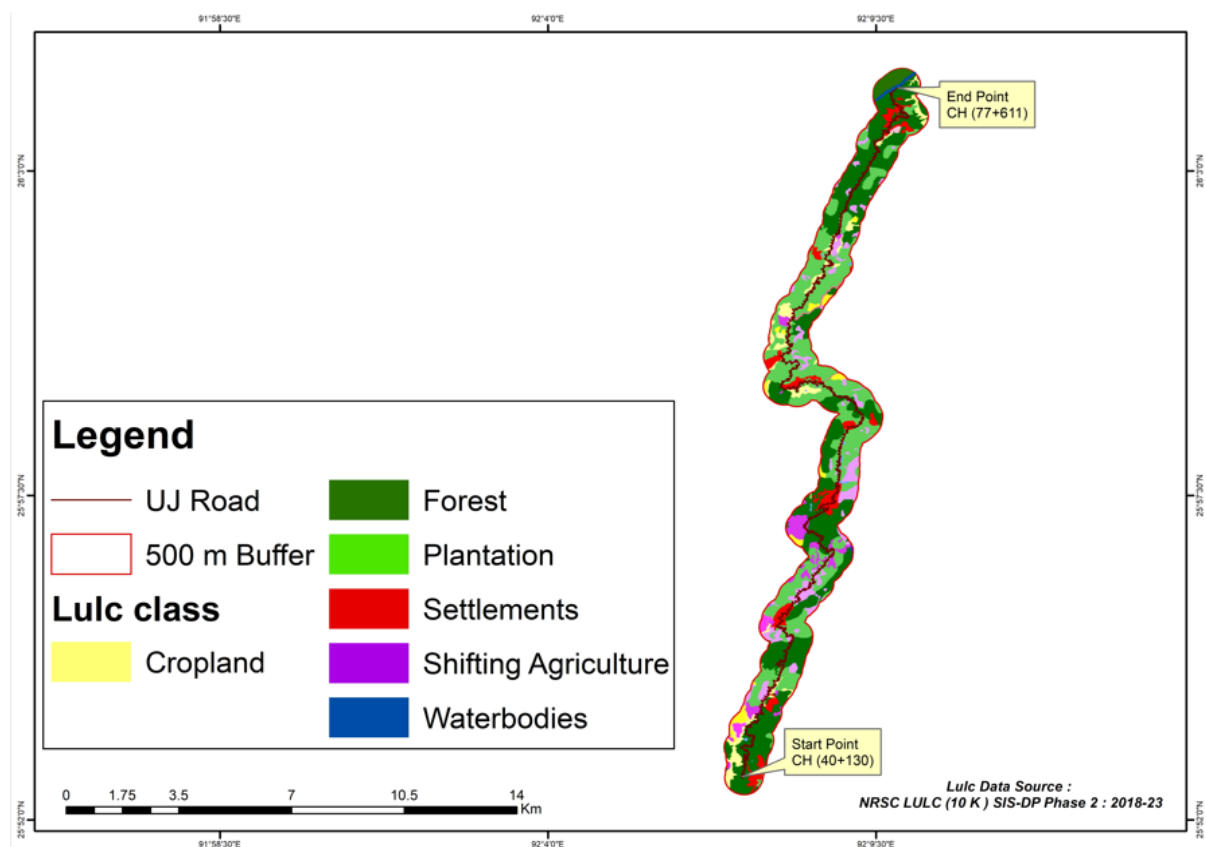


Figure 4.5: Land Use/Land Cover map of project road corridor

4.3.5 Agriculture

While agriculture remains the backbone of rural livelihoods in Meghalaya, the traditional practice of shifting cultivation (locally known as “jhum”) occupies a significantly larger share in Ri Bhoi District. In 2001, roughly 12.11% of the rural population in Ri Bhoi were reported to be dependent on jhum, and about 1.53% of the district’s geographical area was under active jhum cultivation.⁵ This cultivation is done in the Autumn season either as a single crop or sometimes as mixed crop along with Maize, Ginger, Turmeric, Chilies and Vegetables etc. Some horticultural crops cultivation, viz. pineapple,

⁵ <https://megsoil.gov.in>

orange, papaya and banana play a vital role in the agricultural economy of the district.

Baseline Scenario in Project Corridor Area

According to the consultations that was organized with the Indigenous communities, it was found that agriculture remains the main livelihood practice. The traditional practice of shifting cultivation (jhum) is still present among local households, particularly on steeper slopes and marginal lands, though it is not the dominant or primary form of farming for the majority of households in the area. Key crops grown in the UJ road area include paddy, maize, sesame, millet, jowar, cauliflower, cabbage, chilli, bitter gourd, tomatoes, lettuce, pumpkin, betel nut, betel leaf, pineapple, and banana. Farmers primarily sell their products in local markets, while surplus yields are supplied to other districts or states through vendors.

4.3.6 SOIL QUALITY

The soils of Ri-Bhoi District are primarily red loamy and lateritic, and are acidic in nature. These soils are commonly found in the hilly and sloped regions of the district and are highly susceptible to erosion, particularly during the monsoon season. In contrast, the valley bottoms and river plains in Ri-Bhoi contain more fertile alluvial soils, which support higher-intensity agricultural activities.

These soils are generally moderately fertile, supporting crops like paddy, maize, and a variety of horticultural crops, including pineapple, orange, and banana. However, the acidic nature of the soils means they often require liming to balance their pH levels. Additionally, the district faces significant challenges from soil erosion, particularly in areas with shifting cultivation practices, which makes soil conservation and water management critical for maintaining long-term agricultural productivity.⁶

4.3.6.1 Summary of Soil Results

Soil sampling has been conducted in four locations all along the sub project road. Soils along the corridor are sandy loam, well-drained and moderately acidic (pH 5.2–5.6), which is typical for the region's high rainfall conditions. Organic matter levels are moderately high, reflecting good natural leaf-litter enrichment. Major nutrients (N & P) are moderate, whereas Potassium is slightly low due to natural leaching. The results for soil analysis is presented in Annexure 4.1.

4.4 Water Environment

This section describes the Hydrogeology of Ri-Bhoi district, Surface and Ground water conditions and relevant water quality standards in the sub-project area.

4.4.1 Hydrogeology

Impacts on water quality, including both surface water and groundwater, as well as flood risks, are expected to occur primarily during the construction phase. These impacts are typically linked to ground disturbance, dewatering activities, accidental release of pollutants, or works near or within watercourses. Such effects are common in road construction projects, and well-established mitigation measures are available. It is proposed that avoidance strategies, good international practices, and project-specific mitigation measures will be incorporated into the ESMP. These measures are considered effective in mitigating impacts on sensitive receptors, ensuring that no significant adverse

⁶DYNAMIC GROUND WATER RESOURCES OF MEGHALAYA, 2024

effects arise from the project. Additionally, key hydrological features, such as river crossings and open streams, will be mapped and described in the ESIA report to identify potential issues and inform appropriate mitigation strategies.

Water bodies along the project road corridor are primarily represented by Umsiang River, as observed during field studies. Surface water quality testing will be conducted in the river and other key sensitive ponds and streams to ensure water safety and identify any potential contamination. If required, the contractor will be instructed to implement appropriate mitigation measures to maintain water quality during construction.

Road construction projects are water-intensive, requiring a substantial volume of water throughout the construction period. As discussed with the DPR team, surface water is proposed as the primary source for construction purposes, subject to prior permission from the competent authority. In exceptional cases where surface water is unavailable, groundwater resources may be utilized. The project area has been classified as 'safe' by the CGWB; therefore, no further detailed groundwater assessment is required within the scope of this ESIA study.

4.4.2 Water Quality

Ground Water

Groundwater samples (GW-1, GW-2, and GW-3) were tested against the IS 10500:2012 drinking water standards. All three samples were clear, colourless, and had agreeable odour and taste. The pH ranged from 6.5 to 7.1, falling within the acceptable range. Total hardness (112–138 mg/l), calcium (22.8–25.4 mg/l), magnesium (13.9–19.2 mg/l), chlorides (18.7–22.5 mg/l), sulphates (10.6–15.2 mg/l), and alkalinity (130.5–133.7 mg/l) were all well below the desirable limits. Iron levels (0.11–0.27 mg/l) also remained within permissible limits. TDS values were low (179–192 mg/l), indicating good mineral quality. Toxic metals such as chromium, arsenic, lead, cadmium, mercury, nickel, and aluminium were all below detectable limits, ensuring safety. Fluoride was below detection in all samples. Other parameters including ammonia, detergents, boron, mineral oil, phenolic compounds, and residual chlorine were either below detection or within limits. Nitrate levels (8.7–12.8 mg/l) were also significantly lower than the standard. Sodium and potassium levels were within normal ranges. Microbiological analysis confirmed that total coliforms and E. coli were absent, indicating no faecal contamination. Overall, the groundwater quality at all three locations is well within drinking water standards and safe for consumption. The results for water quality is presented in Annexure 4.1.

Surface Water

The water quality analysis of the Umsiang River indicates that most physico-chemical parameters are well within the IS:2296-1992 Class-C criteria for surface water. The river water is slightly alkaline (pH 7.20) with a cool temperature of 18.2°C. Dissolved Oxygen (7.2 mg/L) is high, and BOD (5.8 mg/L) is significantly below the permissible limit of 30 mg/L, indicating good oxygenation and low organic pollution.

TDS (150.4 mg/L), TSS (14.8 mg/L), nitrates (2.0 mg/L), chlorides (23.4 mg/L), sulphates (26.7 mg/L), and hardness-related ions are all low, reflecting clean, soft, low-mineral water typical of upland rivers.

Heavy metals such as arsenic, mercury, cadmium, chromium, copper, zinc, selenium, and manganese are present in trace to non-detectable levels, all within acceptable limits. Oil & grease, phenolic compounds, cyanide, and detergents are also below detectable or permissible levels.

Nutrient parameters show moderate phosphate (3.4 mg/L) but very low ammonia (<0.1 mg/L) and TKN (2.2 mg/L), suggesting minimal nutrient loading. COD is low (14.2 mg/L), indicating limited chemical pollution. Total coliform count (756 MPN/100 mL) is within Class-C criteria (limit: 5000 MPN/100 mL), signifying moderate microbiological quality.

Overall, the Umsiang River at SW-1 exhibits good surface water quality suitable for Class-C uses (drinking water source with conventional treatment, propagation of fisheries). The results for water quality is presented in Annexure 4.1.

4.5 Air Environment

4.5.1 Air Quality

There are no major industries along the project road, and vehicular movement is the primary source of emissions. Based on site observations and public consultations, no noticeable deterioration in ambient air quality was observed.

4.5.2 Summary of Air Results

Air quality monitoring was carried out at four locations—Sonidan, Korhadem, Umtraï, and Umsiang. PM₁₀ levels ranged from 51.6 to 60.3 µg/m³, with the highest concentration observed at Umsiang and the lowest at Korhadem. PM_{2.5} concentrations varied between 24.9 and 32.8 µg/m³, again showing a slightly elevated level at Umsiang. Sulphur Dioxide (SO₂) levels remained low across all sites, ranging from 6.1 to 6.9 µg/m³, while Nitrogen Dioxide (NO₂) varied from 7.0 to 8.2 µg/m³, both well within permissible limits. Carbon Monoxide (CO) concentrations were also low, ranging from 0.230 to 0.320 µg/m³. Overall, the monitored parameters indicate that the ambient air quality in all four locations remains within acceptable standards, with Umsiang showing marginally higher particulate concentrations compared to the other sites. The results for ambient air quality is presented in Annexure 4.1.

4.6 Noise Environment

There are no major industries along the project road, and the primary source of noise is vehicular traffic. Based on site observations and public consultations, no significant noise levels were observed.

The Central Pollution Control Board (CPCB) has published Ambient Noise Standard with respect to air for different Category Area/Zone and has given limit in dB(A) for Day and Night time with respective categories. The Noise standards issued by CPCB are given in **Table 4.4** below.

Table 4.4: CPCB Ambient Noise Level Standards for different Zone/Category Area

Area Code	Category of Area/Zone	Limits in dB(A) Leq	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silent Zone	50	40

4.6.1 Summary of Noise Results

Ambient noise quality monitoring has been conducted at four locations along the sub project road. Noise monitoring along shows that daytime and nighttime noise levels are within the prescribed CPCB standards for both residential and commercial areas. In the residential locations of Sonidan, Korhadem, and Umtra, daytime noise levels ranged from 51.2 to 53.7 dB(A), all remaining below the 55 dB(A) limit, while nighttime levels were between 35.6 and 37.7 dB(A), also well within the 45 dB(A) standard. At Umsiang, which falls under the commercial category, the recorded daytime level of 58.3 dB(A) stayed below the 65 dB(A) limit and the nighttime level of 38.6 dB(A) was comfortably within the permissible 55 dB(A) limit. Overall, the monitored noise environment complies with regulatory norms and does not indicate any exceedance across the surveyed locations. The results for noise analysis is presented in Annexure 4.1.

4.7 Biological Environment

4.7.1 Biodiversity

Ri-Bhoi District in Meghalaya is a biodiversity-rich region, home to a mix of tropical and subtropical forests, including subtropical pine forests, bamboo-dominated areas, and montane forests. As of the latest Forest Survey of India (FSI) report (2023), approximately **72.4%** of the district's total geographical area is under forest cover. This includes moderately dense forests (**51%**), open forests (**19%**), and very dense forests (**2.4%**). The region supports a high level of species endemism and has a diverse ecological landscape. However, the district has witnessed forest cover loss, with a reduction of approximately **28 km²** in forest area between 2019 and 2023. This loss is primarily attributed to shifting cultivation, agricultural expansion, and urbanization.

4.7.2 Biodiversity and Critical Habitat In Project Road

The biodiversity within 10 km radius of the UJ Roads were studied based on the secondary sources followed by primary data collection in the direct impact area. Project Influence Area with 10 km buffer area is presented in **Figure 4.6**. The methodology adopted for biodiversity assessment is attached as **Annexure 4.2**.

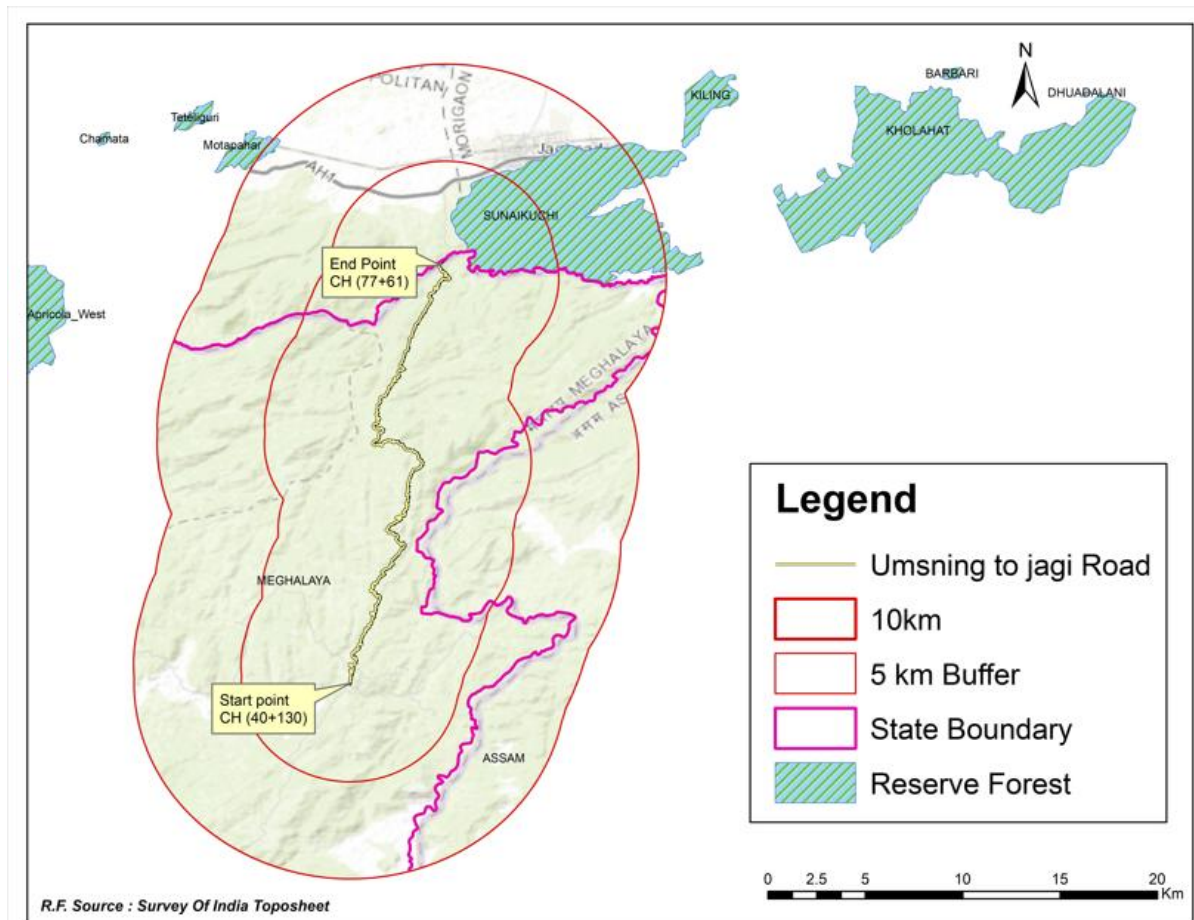


Figure 4.6: Project Influence Area with 10km buffer area for UJ road

Indirect Impact Area (Within 0.5 km):

Critical habitat assessment was conducted based on the “Critical Habitat” criteria outlined by World Bank’s ESF (ESS 1 & 6). The details of the presence of critical habitat within PIA are summarized in Table 4.5.

Table 4.5: Biodiversity and critical habitat assessment-based on field survey and GIS analysis for the (500 m buffer)

Sl. No.	Habitat (includes natural or modified)	Observation	Remarks
I.	(a) Habitats protected by national and state legal regulations		
	(i) PAs - Wildlife Sanctuary, National Park, conservation reserve or community reserve, Tiger reserve and corridor and Eco-sensitive zone (As notified under the Wildlife Protection Act, 1972)	Not present	No such area within 500 m buffer for the project road.
	(ii) Reserve Forest (As notified under	Not	No such area within 500 m

Sl. No.	Habitat (includes natural or modified)	Observation	Remarks
	India Forest Act, 1927)	Present	buffer for the project road.
	(iii) Protected wetland of Meghalaya	Not Present	No such area within 500 m buffer for the project road.
II.	b) Habitat of significant importance to Critically Endangered or Endangered species		
	(i) Species listed under Schedule I of the Wildlife (Protection) Act, 2022	Not Present	Schedule I species are not observed during the field survey.
	(ii) Species listed under Schedule III of the Wildlife (Protection) Act, 2022	Not present	Schedule III species are not observed during the field survey
	(ii) Species notified as “threatened species” by the Govt. of Meghalaya under the Meghalaya Biodiversity Rules 2010	Not Present	“Threatened species” are not observed during the field survey.
	(iii) Critically Endangered/Endangered species as listed by the IUCN Red List of Threatened species	Not Present	Critically Endangered/Endangered species are not observed during the field survey.
III.	c) Habitats of significant importance to endemic or restricted-range species d) Habitats that support globally or nationally significant concentrations of migratory or congregatory species e) Highly threatened or unique ecosystems		
	(i) Biosphere Reserve (Core Area)	Not present	No Govt. notified Biosphere Reserve
	(ii) Ramsar Site	Not present	No such area within 500 m buffer for the project road.
	(iii) Important fish & Key Biodiversity Area	No	No such area within 500 m buffer for the project road.
	(iv) Habitat of Appendix I – Endangered migratory species as per the Convention on the Conservation of Migratory Species (CMS)	Not present	No such species were observed during the field survey.
	(v) Notified Elephant Reserve and Corridor	Not present	No Govt. notified Elephant reserve and corridor present
	(vi) Natural habitats	Not Present	The habitats in the project area are modified for agricultural purposes, and the degraded forest is primarily dominated by bamboo species, Banana, Betel nut, Jackfruit.

4.7.3 Summary of Biodiversity Assessment and Risks

A total of 40 species of flora (10 Tree species, 3 Shrubs, 5 Herbs, 18 Fern, and 4 Grass species), 11

mammal species, 16 bird species, 6 reptile species, 4 amphibians and 11 butterfly species were recorded during the field survey. The detailed list of flora and fauna is attached as **Annexure 4.3**. A total of 05 species are listed under Schedule I of the Wildlife Protection Act, 2022. Although none of these species were recorded during the field surveys conducted in the study area, their presence has been indicated through secondary information sourced from the IBAT Tool.

4.8 Socio Economic Environment

The baseline study assessed the socio- economic profile of households and families within the Project Influence Area that may be affected by the project. The assessment covered various parameters including education levels, ethnicity, religion, source of livelihood and income levels of affected families.

The project corridor is predominantly inhabited by Scheduled Tribe communities, who constitute the majority of the population across all districts. The Khasi tribe along with the Bhoi, Maram and Pnar Sub tribes, each with a distinct dialect reside along the project corridor.

These communities maintain rich cultural traditions, including matrilineal social structures among the Khasis, indigenous festivals, and belief systems that often coexist with Christianity. This ethnic and cultural diversity underpins Ri Bhoi District's societal identity and strongly influences local governance, land use practices, and community-based natural resource management.

As per the 2011 census, the demographic profile, literacy rates, and tribal population of the project district are presented below, with detailed demographic data provided in **Table 4.6**.

Table 4-6: Demographic profile of Ri Bhoi district as Per 2011 Census

District	Total Pop	Male Pop	Female Pop	Rural Pop	Urban Pop	Literacy Rate Overall	Male	Female
Ri-Bhoi	258,840	132,531	126,309	233,587	25,253	75.67 %	76.79	74.49

Source: Census 2011

Socio-Economic baseline of the project roads

The project road provides a vital link for numerous settlements, supporting communities that depend on the corridor for daily mobility, economic activities, and access to essential services. The region's socio-economic activities are closely intertwined with the natural and cultural landscape, making the road a critical component of local livelihoods and overall development.

Population:

The project corridor passes through thirteen villages, namely Sonidan, Kohradem, Sngahtyrkhang, Mawshunam, Mawpat, Mawshang Mawksiew, Umsiang Maiong, and other nearby settlements. Based on the population size, it may be mentioned that the project corridor encompasses smaller rural settlements such as Sngahtyrkhang (64) and Mawshunam (94), which have relatively low populations. Gender distribution is generally balanced, though some areas such as Mawpat and Mawshang Mawksiew have a higher proportion of females. Larger settlements, including Sonidan (1,206) and Kohradem (839), significantly influence the region's demographics, reflecting the variation in

population density along the corridor. The population distribution of the sub-project affected villages is presented in **Table 4.7**.

Table 4-7: Population Distribution in Villages along the UJ Road

Village Name	Total Population		
	Male	Female	Total
Sonidan	603	603	1206
Mawpat	60	70	130
Mawshunam	45	49	94
Mawalaho	218	218	436
Kohradem	435	404	839
Sngahtyrkhang	36	28	64
Umlamphlang	113	110	223
Umlaper	485	447	932
Umtraï	693	332	1025
Mawshang Mawksiew	127	155	282
Umsiang Maiong	193	145	338
Kraikajam	124	129	253
Umsiang Mawpdeng	198	205	403

Source: Census 2011

SEX RATIO

The sex ratio along the project road varies from 751 to 1,220. Most villages, including Mawpat (1,167), Mawshunam (1,089), and Mawshang Mawksiew (1,220), Kraikajam (1040), Umsiang Mawpdeng (1035) have more females than males, while Kohradem (929) and Sngahtyrkhang (778), Umlamphlang (973), Umlaper (922), Umtraï (1087), Umsiang Maiong (751) have a male-biased population. Overall, the corridor shows a predominantly female-biased demographic with notable inter-village variation. Detailed sex ratio data for the project-affected villages and two towns are presented in **Table 4.8**.

Table 4-8: Sex Ratio in the villages along the UJ road

Village Name	Sex Ratio
Sonidan	1000
Mawpat	1167
Mawshunam	1089
Mawalaho	1000
Kohradem	929
Sngahtyrkhang	778
Umlamphlang	973
Umlaper	922
Umtraï	1087
Mawshang Mawksiew	1220
Umsiang Maiong	751
Kraikajam	1040
Umsiang Mawpdeng	1035

Source: Census 2011

Scheduled Tribe population:

The project corridor covers thirteen rural settlements with varied population sizes. Larger villages such as Sonidan (1,206) and Kohradem (839) are the key demographic centres, while smaller settlements like Sngahtyrkhang (64) and Mawshunam (94) reflect the low-density habitation pattern typical of remote areas. A detailed distribution of the ST population along the project corridor is provided in **Table 4.9**.

Table 4-9: ST Population in the Villages along the sub project road

ST Population				
Village Name	Male	Female	Total	Percentage
Sonidan	593	600	1193	98.92
Mawpat	60	70	130	100
Mawshunam	44	49	93	98.94
Mawalaho	217	218	435	99.77
Kohradem	435	403	838	99.88
Sngahtyrkhang	33	27	60	93.75
Umlamphlang	111	110	221	99.10
Umlaper	928	483	445	47.75
Umtraï	332	361	693	67.60
Mawshang Mawksiew	126	154	280	99.29
Umsiang Maiong	68	55	123	36.39
Kraikajam	12	10	22	8.70
Umsiang Mawpdeng	191	202	393	97.52

Source: Census 2011

Education:

The educational scenario in the project corridor reveals notable variations in literacy levels across rural areas. Sonidan and Kohradem lead in literacy rates, while villages like Sngahtyrkhang and Mawshunam show minimal literacy levels. Gender imbalances persist, with females generally exhibiting higher literacy rates; however, some villages such as Mawpat and Mawshang Mawksiew demonstrate more balanced gender participation.

The detailed distribution of literate in the sub-project affected villages is provided in **Table 4.10**.

Table 4-10: Literate Population in Villages along the sub project road

Literate Population				Percentage
Village Name	Male	Female	Total	
Sonidan	262	275	537	44.53
Mawpat	37	43	80	61.54
Mawshunam	31	27	58	61.70
Mawalaho	81	88	169	38.76
Kohradem	204	192	396	47.20
Sngahtyrkhang	19	16	35	54.69
Umlamphlang	57	59	116	52.02
Umlaper	283	215	498	53.43
Umtraí	217	247	464	45.27
Mawshang Mawksiew	78	80	158	56.03
Umsiang Maiong	112	68	180	66.27
Kraikajam	63	62	125	49.41
Umsiang Mawpdeng	103	111	214	53.10

Source: Census 2011

Total workforce:

The workforce data shows a total of 2,542 employees, consisting of 1,438 males and 1,104 females. While male employees slightly outnumber females overall, the gender distribution varies across different groups. The detailed workforce of the project affected villages is given in **Table 4.11**.

Table 4-11: Workforce Population of Village along the sub Project road

Area	Main Workers (No.)			Marginal Workers (No.)			Total Workforce (No.)			Percentage
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
Sonidan	296	91	387	1	1	2	297	92	389	32.26
Mawpat	33	30	63	0	0	0	33	30	63	48.46

Area	Main Workers (No.)			Marginal Workers (No.)			Total Workforce (No.)			Percentage
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
Mawshunam	15	17	32	0	3	3	15	20	35	37.23
Mawalaho	90	70	160	1	17	18	91	87	178	40.83
Kohradem	167	131	298	40	45	85	207	176	383	45.65
Sngahtyrkhang	12	11	23	1	1	2	13	12	25	39.06
Umlamphlang	50	48	98	4	2	6	54	50	104	46.64
Umlaper	200	179	379	1	0	1	201	179	380	40.77
Umtraï	184	190	374	27	50	77	211	240	451	44.00
Mawshang Mawksiew	52	29	81	1	0	1	53	29	82	29.08
Umsiang Maiong	97	52	149	3	4	7	100	56	156	46.15
Kraikajam	74	40	114	0	0	0	74	40	114	45.06
Umsiang Mawpdeng	81	86	167	8	7	15	89	93	182	45.16

Source: Census 2011

Disturbance to the Community:

Local communities, especially those in close proximity to construction sites, are likely to experience disturbances from noise, dust, and increased traffic. Construction activities, the operation of heavy machinery, and the movement of large transport vehicles will affect normal traffic flow along the project corridor. Considering the existing road network and the need for flexibility in transporting machinery and materials, road transport is expected to be the primary mode for supporting the project's construction activities. Chainage wise details of affected structures are presented in Table 4.16.

PUBLIC AWARENESS AND KNOWLEDGE

Health Concerns:

There is a prevalent concern about the potential health risks of water borne diseases like acute diarrhoea, typhoid etc. These concerns were reported during consultations with the community at Umsing.

Community Disharmony concerns

Concerns were raised during public consultation meetings at Umsing regarding potential conflicts between local communities and migrant labor due to the influx of the workforce during construction.

However, no incidents of such conflicts were reported during the consultations. These concerns were raised as precautionary in nature, reflecting community apprehensions about maintaining social harmony.

4.9 Socio-Economic Profile of Project Affected Households

Socio-economic data of project-affected households were collected through census and socio-economic surveys, systematically tabulated, and analyzed to assess the extent of adverse impacts on structures and livelihoods. A structured, pre-tested questionnaire served as the primary tool for these surveys, which were conducted in September 2025.

4.9.1 DEMOGRAPHY

The total number of project-affected households in terms of structures are 14. Among these, 11 households (79%) are male-headed, while 3 households (21%) are female-headed. **Table 4.12** below summarizes the gender distribution of the heads of households.

Table 4.12: Gender Distribution of PAHs

Gender	PAH	Percentage
Male	11	79.0
Female	3	21.0
Total	14	100.0

Source: EIS primary survey – 2025

4.9.1.1 GENDER DISTRIBUTION OF PROJECT-AFFECTED PERSONS

The gender distribution of Project-Affected Persons (PAPs) of 14 project-affected households shows a nearly balanced composition, with a slightly higher proportion of males. Out of a total of 82 PAPs, 42 individuals (52%) are male, while 40 individuals (48%) are female. The gender distribution of PAPs is presented in **Table 4.13**.

Table 4.13: Gender Distribution of Project-Affected Persons (PAPs)

Gender	Project Road	
	Project Affected Persons	Percentage
Male	42	52.0
Female	40	48.0
Total	82	100.0

Source: EIS primary survey – 2025

4.9.1.2 ETHNICITY

Along the project road, the Bhoi community constitutes the majority, representing 85% of settlements, followed by the Pnar community and the Maram community at 5%. The detailed distribution of ethnic groups along the project road is provided in **Table 4.14**.

Table 4.14: Community Wise Distribution of PAHs

Communities	PAH	Percentage
Bhoi	12	85%

Communities	PAH	Percentage
Maram	1	5%
Pnar	1	5%

4.9.2 IMPACT TO VULNERABLE HOUSEHOLDS

Census and socio-economic surveys identified vulnerable groups among the households, including women-headed households, below-poverty-line families, and the elderly population (60+ years).

Table 4.15 presents the distribution of these vulnerable groups within the study area.

Table 4.15: Distribution of Vulnerable Group

Vulnerable Category	PAH	Percentage
Schedule Tribes	14	100
Aged persons above 60 years	3	23
Below Poverty Line	0	0
Woman Headed Household	3	15
Scheduled Caste	0	0
Physically Challenged	0	0

4.9.3 ECONOMIC PROFILE

EMPLOYMENT PATTERNS

4.9.3.1 AGRICULTURAL DOMINANCE

Along the project road, the majority of people are engaged in agriculture (6), business (4), service sector (2) and other (2) play a smaller role, reflecting a predominantly agrarian and informal local economy. The occupational pattern of project-affected households (PAHs) in the area is presented in **Table 4.16**.

Table 4.16: Occupation pattern of PAHs in project area

Sl. No.	Occupation	PAH
1	Agriculture	6
2	Business	4
3	Service Sector	2
4	Others (Labours)	2
Total		14

4.9.3.2 INCOME

Along the project road, 30% of households earn less than ₹25,000 per month, while 23% earn between ₹25,000–50,000, and another 47% earn between ₹50,000–1,00,000. The monthly income range of project-affected households (PAHs) is presented in **Table 4.17**.

Table 4-17: Monthly Income Range of PAHs

Sl. No.	Monthly Income Range of HH	Project Road	
		No. of PAHs	Percentage
1	less than 25000	4	30.0

Sl. No.	Monthly Income Range of HH	Project Road	
		No. of PAHs	Percentage
2	25000- 50000	4	23.0
3	50000-100000	6	47.0
4	More than 100000	0	0
Total		14	100.0

4.9.4 EDUCATION

Along the project road, out of 82 individuals, most have attained primary (33) or high school education (26). Fewer individuals have completed higher secondary (9) or graduate and above levels (8), while 6 individuals are illiterate. This indicates a moderate overall educational attainment, with particular scope for improvement among women. The education levels of Project-Affected Persons (PAPs) are presented in **Table 4.18**.

Table 4.18: Education Level of PAPs

Sl. No	Education	Project Road		
		Male	Female	Total
1	Primary (Class 1 to 4)	20	13	33
2	High School (Class 5-10)	11	15	26
3	Higher Secondary (Class 11-12)	4	5	9
4	Graduate and Above	5	3	8
5	Illiterate	2	4	6
	Total	42	40	82

4.9.5 HEALTH STATUS

The health status of Ri Bhoi District has improved over the years due to targeted government initiatives; however, significant challenges remain. Rural-urban disparities, limited healthcare infrastructure, and the increasing prevalence of lifestyle-related diseases are major concerns. The district continues to face a dual burden of communicable diseases, such as malaria, dengue, and diarrheal illnesses, alongside a rising incidence of non-communicable diseases (NCDs), including hypertension, diabetes, and cardiovascular conditions. Improving overall health outcomes requires a multi-pronged approach that emphasizes healthcare accessibility, nutritional support, health education, disease prevention, and early diagnosis across both rural and urban areas.

The Bhoi Rymbong Community Health Centre (CHC) serves as the main hub, acting as a referral point for Primary Health Centres (PHCs) and sub-centres. Outreach efforts are also made via Mobile clinics and weekly outreach sessions deliver routine care, vaccinations, and maternal services. The National Health Mission (NHM) Meghalaya supports these via the 108 ambulance helpline and 14410 health query line.

4.9.7 Type of Loss

Approximately twelve structures are expected to be affected by the project (7 NTH shops and 5 residential compound walls).

4.9.8 Impact to Structures

The proposed improvements along the project corridor are expected to impact approximately twelve structures are expected to be affected by the project (7 NTH shops and 5 residential compound walls). Details of the impacted structures by project corridor are presented in **Table 4.19**.

Table 4.19: Type of Impact on Structures

Type of Impacts	Project road	%
Commercial (Major) (Non-Title Holder)	6	50.00
Other Minor Structures (Residential compound walls)	6	50.00
Total	12	100.00

4.9.9 Loss Of Trees

Approximately 22 trees are situated within the existing Right of Way (RoW) on both sides of the road. To mitigate the ecological impact of tree felling, compensatory afforestation should be carried out, in accordance with applicable environmental regulations and guidelines. These measures, along with their implementation strategies, are comprehensively detailed in the Environmental and Social Management Plan (ESMP).

4.9.9 Common Property Resources

The Common Property Resources (CPRs) assessment classifies structures into government and community/public facilities. One parking shed (Ch 44+500) and five waiting stand (Ch 60+945, Ch 61+000, Ch 61+825, Ch 66+588 and Ch 75+610) along with one compound wall of church (Ch 69+776) will be affected. Details of the CPRs along the project road are presented in **Table 4.21**.

Table 4.20: Common Property Resources

CPR Structures	Number
Church	1 (Ch 69+755 LHS)
School	1 (Ch 55+200 RHS)
Memorial ground	0
TOTAL	2
Community Stock yard	1 (Ch 44+400 LHS)
Community Fish pond	1 (Ch 43+450 RHS)
Health Center	2 (Ch 62+136 RHS and Ch 66+324 LHS)
Parking shed/Waiting stand	6
TOTAL	10
Grand Total	12

CPR Structures	Number
Church	1 (Ch 69+755 LHS)
School	1 (Ch 55+200 RHS)
Memorial ground	0
TOTAL	2
Community Stock yard	1 (Ch 44+400 LHS)
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Health Center	2 (Ch 62+136 RHS and Ch 66+324 LHS)
Parking shed/Waiting stand	6
TOTAL	10
Grand Total	12

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Memorial ground	0
TOTAL	2
Community Stock yard	1 (Ch 44+400 LHS)
Community Fish pond	1 (Ch 43+450 RHS)
Health Center	2 (Ch 62+136 RHS and Ch 66+324 LHS)
Parking shed/Waiting stand	6
TOTAL	10
Grand Total	12

4.10 Archaeological and Historical Monuments

No ASI Protected monuments found within 0.5 km from the project site. Therefore, no baseline archaeological sites of direct significance are associated with the proposed UJ road corridor.

4.11 Hazard and Vulnerability Profile

The hazard and vulnerability profile of the UJ road area and Ri-Bhoi district includes landslides, flash floods, earthquakes, among others. Other hazards such as droughts, group clashes, and fire incidents also occur in the district. A seasonal hazard analysis of Ri-Bhoi district is presented in **Table 4.21**.

Table 4.21: Hazard analysis

Type of Hazards	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Landslide			←							→		
Earthquake	←											→
Flashflood		←								→		
Storm			←			→						
Fire Accident	←											→
River Erosion				←					→			
Industrial Hazard	←											→
Road Accident	←											→

4.11.1 Landslide Prone Areas

The list of landslide-prone areas in Ri-Bhoi district is provided in **Table 4.22**. The Umsning-Jagi road does not have any weak spots zone as well as most acting sliding zone. Other areas where hill slopes are made of soft and highly weathered rocks, earthen boulders etc. and the cut slopes fail by slumping, sliding and toe failures due to erosion such as at 44.355–44.460 km, 44.550–44.700 km, 45.920–45.960 km, 46.080–46.145 km, 46.740–46.785 km, 48.090–48.300 km, 75.550–75.650 km, 76.510–76.550 km, and 77.440–77.515 km. Such spots are identified and toe protection of slopes is proposed by constructing the breast walls.

Table 4.22: List of landslide prone areas in Ri-Bhoi District

S.No.	Name of Block/Subdivision	Name of the Locations
1	Nongpoh Subdivision	Umling, Pahamsyiem, Nongpoh, Mawdiangum
2	Umsning Block	Umsning, Umroi, Mawlyngkhung, Mawbri
3	Umling Block	15 th Mile, Byrnihat, Killing, Umiam
4	Jirang Block	Patharkmah, Jirang, Nongkyndang, Amphreng

Source: District Disaster Management Plan Ri-Bhoi district

According to the landslide density map of Ri-Bhoi district, the UJ road passes through areas of high to moderate landslide density, except for the initial stretches,

4.11.2 Flood Zones

The list of flash flood-prone areas in Ri-Bhoi district is provided in **Table 4.23**. Notably, no flood-prone areas have been identified along the project road.

Table 4.23: List of flash flood prone areas in Ri Bhoi Hills District

Name of Block/Sub-Division	Flash Flood Prone Locations
Umsning	Sumer Latara, Umran Dairy, Umran Niangbyrnai, Sumer Umran, Umsolait Umlaper, Umsamlem, Umtham, Umlew River area
Bhoirymbong	Umroi, Mawtneng, Nongthymmai Kyndem, Mawlein, Mawkhan, Umwangthem
Umling	Nongpoh, Patharkhmah, areas along National Highway 6
Jirang	Pahamduma, Nartap

Source: District Disaster Management Plan Ri-Bhoi district

4.11.3 Earthquake Zones

Earthquakes

- **High Seismic Risk:** The region falls under **Seismic Zone V**, the most severe category in India.
- Caused by the region's location near the Himalayan tectonic plate boundary and Shillong Plateau faults.

The project road stretches fall under Zone – V, which is at Very High risk and intensity is IX. Seismic Zone details of Ri-Bhoi is presented in **Table 4.24**.

Table 4.24: Seismic Zone details of Ri-Bhoi District

District	Seismic Zone	Notable Faults	Recent Earthquakes
Ri-Bhoi	Zone V (Very High Damage Risk Zone)	Barapani Fault, Oldham Fault, and Kopili Fault system	Ri Bhoi district lies in a seismically active zone influenced by the Kopili and Barapani faults and has experienced several low to moderate earthquakes (Mw 3.5–5.0) in recent years, including notable tremors near Umsning and Nongpoh in 2018 and 2022, indicating ongoing tectonic activity in the region.

Source: Meghalaya State Disaster Management Authority

5. ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

5.1 Introduction

The project is expected to generate both positive and adverse environmental and social impacts along the road corridor. This chapter presents an analysis of the potential impacts arising from the implementation of project activities. These impacts vary in type, nature, magnitude, extent, timing, duration, certainty, and reversibility. The assessment takes into account the nature of the project, the types of activities involved, and the scale of potential impacts across various environmental and social components, including:

- Physical Environment: Air quality, water resources, noise levels, and soil
- Biological Environment: Flora, Fauna and
- Socio-economic components: Property removal, Land Acquisition, ASI sites, Influx of labour

5.2 Impacts Identification And Evaluation

The potential impacts were identified through a three-step process:

1. Identification of project activities/aspects that could generate impacts;
2. Establishing the affected environmental and social components (valued receptors), which include vegetation, water bodies, soil, land stability, water quality and quantity, ambient air quality, employment and livelihoods, vulnerable groups, infrastructure, public safety, and occupational health and safety;
3. Determination of potential impacts through the preparation of an Impact Identification Matrix.

Based on the project information presented in Chapter 3 and the baseline environmental conditions described in Chapter 4, the anticipated impacts of the MLCIP project were identified and analyzed. The potential environmental and social impacts—both adverse and positive—arising from project activities during the Design, Construction, and Operational Phases were evaluated using the Leopold Matrix. This approach considered the interactions between project activities and both natural/physical environmental components and social components to determine whether such interactions could result in potential impacts.

5.3 Impact Analysis Using Leopold Matrix (Magnitude/Importance Classification)

The Leopold Matrix is a comprehensive checklist designed for the identification, evaluation, assessment and analysis of environmental impacts on the development project following the interaction matrix analysis approach by Leopold. The Leopold Matrix developed for the road upgradation project is provided as **Table 5.1**. The checklist interaction matrix for environmental impact assessment was obtained by placing identified existing environmental components in the columns and the proposed project activities in the rows of the matrix. The process is summarized as follow:

5.3.1 Impact Evaluation Matrix

In order to assess the impacts of the proposed project, the impacts analysis across the project phases was done as follows.

1. Pre-Construction Phase
2. Construction Phase
3. Operational Phase

The description of the project activities and magnitude of the impacts for the various environments and social components for this project are presented in the below table. These impacts further have been categorized as per the World Bank's Environmental and Social Standards (ESSs) applicable to the project.

As per the impact evaluation matrix the environmental and social screening indicates that during the pre-construction phase, potential impacts are expected to be low to moderate, mainly due to site clearance, vegetation removal, and establishment of labour camps or material storage areas. These may temporarily affect air quality, noise levels, and local soil stability, but impacts will remain localized and reversible if proper site selection, vegetation management, and waste disposal measures are followed.

During the construction phase, impacts may intensify, particularly concerning air and noise pollution, waste generation. Activities such as excavation, grading, and drainage could also temporarily affect water resources and slope stability. However, these impacts are temporary and manageable through effective implementation of the Environmental and Social Management Plan (ESMP), including dust suppression, proper waste and fuel handling, and strong occupational health and safety (OHS) protocols.

In the operational phase, environmental and social risks are expected to be low to moderate, mainly linked to traffic movement, community safety, and road drainage maintenance. The project will also yield positive benefits, including improved road safety, slope stability, drainage efficiency, and local accessibility, along with biodiversity gains through Compensatory.

Table 5.1: Impact Evaluation Matrix

Project Activity	Relevant WB ESS	Air Quality	Noise	Water Resources	Soil Stability	Flora & Fauna	Public Health	Community Safety	Cultural Heritage	Hazardous Material Risk	Drainage	Road Safety
Pre-Construction Phase												
Site Clearance (Tree Felling, Vegetation removal, utility relocation)	ESS1, ESS6, ESS8	MN	MN	N	MN	MN	LN	LN	MN	N	N	LN
Labour Camp Siting & Mobilization	ESS1, ESS2, ESS4	MN	MN	MN	N	Low	MN	N	MN	MN	LN	N
Site identification for construction plants, quarrying, material storage	ESS2, ESS3, ESS4, ESS6	HN	HN	HN	MN	HN	HN	N	HN	HN	HN	HN
Construction Phase												
Earthworks (Excavation, Filling)	ESS1, ESS3, ESS4	MN	HN	MN	HN	MN	MN	LN	MN	MN	MN	MN
Grading, Levelling and Surface laying	ESS2, ESS3, ESS4	HN	HN	MN	MP (Improved Stability)	MN	MN	LN	MN	MN	MN	MN
Drainage &	ESS3,	N	LN	MP	MP	LP	LP	LP	HN	N	MP	LP

Culvert Installation	ESS4			(Improve d Drainage)	(Improve d Stability)							
Slope Stabilization & Bioengineering	ESS3, ESS4, ESS6	N	N	LN	N	MP	LP	LP	N	N	MP	LP
Construction Water Usage	ESS3, ESS4	LN	N	MN	LN	LN	LN	LN	N	N	LN	LN
Operation of Construction Plants	ESS2, ESS3	HN	HN	HN	N	MN	MN	MN	N	HN	MN	MN
Waste Generation and Disposal	ESS3, ESS4	MN	N	MN	MN	MN	HN	MN	N	HN	HN	MN
Fuel and Hazardous Material Handling	ESS2, ESS3, ESS4	MN	N	MN	N	LN	HN	MN	N	HN	N	N
Construction Traffic & Machinery	ESS2, ESS4	HN	HN	LN	LN	LN	MN	MN	N	MN	N	HN
Health & Safety Training and OHS Implementation	ESS2, ESS4	HP	HP	HP	N	N	HP	MP	N	MP	N	MP
Decommissioning of Construction Sites, Plants,	ESS2, ESS3	MN	MN	MN	MN	LN	MN	LN	N	MN	LN	LN

Labour Camps												
Operational Phase												
Operational Traffic Flow	ESS4, ESS10	LN	LN	LN	LN	LN	MP	MP	LN	LN	MP	MP
Transportation of Hazardous Materials	ESS4	MN	LN	LN	LN	MN	HN	HN	MN	HN	MN	HN
Compensatory Plantation	ESS6	HP	N	MP	MP	HP	MP	MP	LP	MP	MP	HP
Monitoring & Community Engagement	ESS10	-	—	—	—	—	MP	MP	N	MP	N	LP

Below is an explanation of the rating undertaken for the Leopold compliance matrix.

Short Form	Full Form
HN	High Negative Impact
MN	Moderate Negative Impact
LN	Low Negative Impact
N	Neutral Impact
LP	Low Positive Impact
MP	Moderate Positive Impact

HP	High Positive Impact
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5.4 Environmental Impacts (ESS1, ESS2, ESS3, ESS4, ESS6, ESS8)

The assessment of potential environmental impact consists of comparing the expected changes in the environment with or without the project. The analysis predicts the nature and significance of the expected impacts. The following sections provide a detailed analysis of the project's environmental and social impacts across its various phases in detail. Corresponding mitigation measures have been incorporated into the sub-project ESMP and sub-project RAP, IPDP, including project-level plans (LMP, Work Site safety Plan (OHS plan), SEP, and SEA/SH Prevention and Response Plan). Based on this indicative ESMP, contractor will prepare contractor's environment and social management plan (C-ESMP) and get it approved by MPWD before starting the pre-construction work.

5.4.1 IMPACTS DURING PRE-CONSTRUCTION PHASE

The project envisages upgrading the existing single-lane carriageway to an intermediate lane configuration to enhance the capacity and extend the service life of the UJ Road. While all the construction activities are proposed within the existing Right of Way (RoW).

Pre-construction activities will primarily include:

- Site clearance and reconstruction/improvement of approach roads for movement of plant and machinery,
- Establishment of contractor's camp, material storage, and construction yard, and
- planning for material sourcing and finalization of work methodology.

The work methodology will define activity sequencing and associated occupational and community health and safety (OHS/CHS) risks. It will be reviewed by the Project Management Unit (PMU) and CSMP prior to mobilization.

During the pre-construction phase, potential impacts are anticipated from site clearance, vegetation removal, tree felling, material sourcing, labour camp establishment, and utility relocation. A total of 22 trees will be felled along the corridor, leading to localized loss of vegetation and minor habitat disturbance (ESS6). These impacts will be mitigated through compensatory plantation at a minimum ratio of 1:10, greenbelt development, and adoption of native species tolerant to local climatic and pollution conditions.

Significant utility shifting is required prior to the commencement of construction works. A total of 31 nos. of electric poles and 06 nos. of Transformer are identified along the DSSPS road corridor for shifting. Of these, 20 poles are on the LHS and 11 on the RHS. Five transformers on the LHS and 1 on the RHS. Utility relocation activities may temporarily disrupt local services and traffic movement, and therefore must be planned and executed in coordination with respective line departments, ensuring safety and minimal community inconvenience (ESS4).

The sourcing of materials such as aggregates, sand, and stone may cause short-term adverse impacts on land, air, and water quality if not properly managed. Hence, materials shall be procured only from authorized borrow areas, licensed quarries, and SPCB-approved crushers following CPCB guidelines (ESS3). The establishment of labour camps and construction support facilities may exert localized pressure on water availability, sanitation systems, and waste management infrastructure. Appropriate provisions for safe drinking water, adequate sanitation, drainage arrangements, and solid waste disposal must be made to prevent health and hygiene issues in compliance with ESS2 and ESS4.

Early-stage stakeholder engagement (ESS10) and preparation of a Contractor's Environmental and Social Management Plan (C-ESMP) will be essential. The C-ESMP shall apply the mitigation hierarchy—prioritizing avoidance, then minimization, and finally offsetting and restoration through design improvements, slope stabilization, compensatory plantation, and safety training. Implementation of these measures during the pre-construction stage will ensure environmentally responsible preparation and minimize potential social disruptions before commencement of construction works.

Ecological and Environmental Impacts

Although the UJ corridor passes mostly through agricultural areas, that may be disturbed by construction activities. Site-specific **Environmental Management Plans (EMP)** will be developed by the contractor in consultation with the Environment Officer of PMU to minimize biodiversity loss.

Mitigation Measures:

- Avoid construction camps and material storage near sensitive area such as schools or PHC.
- Restrict vegetation clearing to the minimum area required for works.
- Maintain a buffer of at least 100 m from natural drainage channels or water bodies.
- Implement soil erosion control measures (silt fencing, sediment traps, and slope turbing).
- Prohibit hunting, fishing, or collection of forest produce by workers.
- Awareness and sensitization of labourers on local wildlife and biodiversity conservation.
- Schedule noisy operations (rock breaking, heavy equipment use) away from bird nesting seasons (March–July).

Occupational Health and Safety (OHS)

To ensure safe working conditions, a **Hazard Identification and Risk Assessment (HIRA)** will be conducted for each task.

Mitigation Measures:

- Develop and implement a site-specific OHS Plan conforming to World Bank Environmental, Health and Safety (EHS) Guidelines.
- Provide PPE (helmets, safety shoes, high-visibility vests, gloves) to all workers.
- Conduct regular health check-ups for labourers.
- Ensure proper sanitation, potable water (minimum 5 litres per person per day), and waste disposal facilities in camps.
- Regular inspection and certification of lifting and construction equipment.
- Engage trained personnel for operating machinery and working at height or confined spaces.

Community Health and Safety

Construction works along existing habitations and roadside markets can pose safety risks to pedestrians and road users.

Mitigation Measures:

- Prepare and implement a Traffic Management Plan to regulate vehicle movement, material haulage, and diversions.

- Install barricades, signage, and warning lamps at work sites.
- Prepare a Community Health and Safety Plan ensuring public segregation from work zones.
- Schedule high-risk activities during off-peak hours to minimize traffic congestion.
- Conduct community awareness campaigns before any temporary road closure or service disruption.

The OHS Plan, CHS Plan, and Traffic Safety Plan must be reviewed and approved by PMU/PMTC before initiation of construction.

Construction Camp and Site Selection

Contractor's camps, stockpile, and equipment yards will be located at least 500 m from settlements and 100 m from water bodies or forest areas. Camps should follow IFC/World Bank Labour Accommodation Guidelines and local environmental norms. The layout of camps will be reviewed and cleared by the Environment Officer, PMTC prior to establishment.

Disposal of Construction Debris and Waste

Limited C&D waste (excavated material, asphalt fragments, scrap metal) will be generated.

Mitigation Measures:

- Segregate reusable and non-reusable debris.
- Reuse topsoil for slope stabilization and landscaping.
- Dispose of debris only at approved low-lying barren areas located at least 1 km downwind of settlements and away from drainage lines.
- Avoid dumping in water bodies, wetlands, or near agricultural fields.
- Regularly monitor disposal sites to prevent contamination and visual pollution.

Shifting of Utilities

Minor relocation of electrical poles, telephone lines, and water pipelines may be required.

Mitigation Measures:

- Coordinate with line departments (MePDCL, PHE, Telecom) for planned relocation prior to construction.
- Provide prior notice to local communities about any temporary service disruption.
- Restrict utility shifting to daytime hours to avoid safety risks at night.

Plant, Machinery, and Vehicle Selection

All construction equipment and vehicles shall comply with **CPCB emission standards** and have valid **Pollution Under Control (PUC)** certificates. The contractor shall maintain equipment in good working condition to minimize noise and air pollution.

Sourcing of Construction Materials

All aggregates, sand, and stone shall be sourced only from **approved quarries** having valid environmental

clearance and consent to operate. Borrow areas, if required, shall comply with **MoEF&CC Standard Operating Procedures (SOP 2022)** for rehabilitation and closure.

Mitigation Measures:

- Contractor to submit quarry permits, EC copies, and compliance reports before material use.
- No borrowing shall be allowed within forest areas or near habitations.
- Borrow area restoration to be certified by the Environmental Officer, PMU before final payment.

Water Requirement

Construction water will be required for concrete mixing, dust suppression, and domestic use.

Mitigation Measures:

- Obtain permission for groundwater abstraction from the State Water Resources Department.
- Prefer use of surface water from local streams or treated water from nearby sources.
- Avoid over-extraction from community wells.
- Maintain drainage around storage and batching areas to prevent stagnation.

5.4.1.1 Impacts On Physiography (ESS3)

The sub-project area comprises an existing road traversing hilly terrain. Land use along the road stretches includes agricultural areas, dense vegetation, and shifting cultivation. The same alignment will generally be followed for upgrading the road from existing single/intermediate lanes to an intermediate configuration with paved shoulders and geometric corrections at selected locations. The existing ground profile will be maintained, with minor profile adjustments at certain locations. Rehabilitation and upgradation, will generally be restricted to the existing right-of-way (ROW) in settlement areas.

The Umsning-Jagi Road traverses terrain ranging from 95 m to 932 m above mean sea level. The total quantity of material to be excavated (cut) along the project corridor is 14,6587.150 m³, while the total fill requirement is 10,7844.900 m³. After balancing the cut and fill volumes, there remains a surplus of approximately 38,742.25 m³ of excavated material that will need to be safely disposed of at designated muck disposal sites. This approach ensures effective earthwork management while minimizing environmental impacts and maintaining slope stability along the project corridor.

5.4.2 Impacts During Construction Phase

Most of the adverse environmental impacts are related to construction works which are inevitable but are manageable through certain tested and known environment friendly practices. The negative environmental effects can be taken care of at an early stage through proper engineering designs and through the contract during construction practices.

Construction Phase

The construction phase involves earthworks, grading, drainage works, slope protection, and culvert installation, which are expected to cause significant short-term adverse impacts on air quality, noise, water resources, and soil stability (ESS2, ESS3, ESS4). Occupational health and safety (OHS) risks including

accidents, exposure to dust and noise, handling of heavy machinery, and potential landslides require robust safety protocols.

Mitigation measures under the C-ESMP include:

- Provision of utility ducts for underground pipelines and GI (Galvanized Iron) pipe crossovers shall be incorporated into the design to ensure safe and organized routing of essential services, minimize future excavation, and facilitate maintenance without disrupting road infrastructure
- Safety measures should be taken at Ch 62+136 (Umlaper Sub centre) and Ch 66+324 (Umtraí PHC) during the construction phase such as barricading, signages etc.
- Safety measures shall be implemented to avoid any damage to the school infrastructure and to ensure the safety of students, staff, and the surrounding community during all phases of construction at (55+200).
- At cultural and religious features like Church (69+755),: Access roads should not be damaged or obstructed during construction activities; necessary precautions must be taken to maintain uninterrupted access for local residents and emergency services. Solar blinker and Junction development work is proposed.

Additionally, the Contractor must ensure provision of PPE, emergency preparedness plans, spill prevention measures, and OHS training and monitoring to reduce worker and community risks.

Labour Camp and Community Health & Safety

Labour camps and site operations pose community health and safety risks (ESS2, ESS4), including sanitation, water access, and increased traffic hazards. Labour influx may exacerbate these risks if not well managed. Hence, the C-ESMP must ensure adequate water supply, waste management, health facilities, and grievance mechanisms, as well as community liaison programs to maintain good relations between workers and local residents.

The standard road construction works involved are site clearance, excavation, filling of earth materials and subgrade materials, laying of bituminous mixtures, handling of hazardous materials like bitumen, diesel, etc., dumping of unusable debris materials, transportation of materials from production site to construction site, and other constructional activities and associated works like mobilization of construction equipment, setting up of construction plants, setting up of workforce camps, quarrying, material storage etc. These activities have certain impacts of various magnitudes on different components of the environment.

Environment screening of the proposed road alignment has identified several community assets and sensitive receptors along the corridor. These include educational institutions such as Synod Secondary School (55+200), health facilities like Umlaper Sub Centre (62+136) and Umtraí PHC (66+324), cultural and religious features including a church wall (69+755), and other community facilities like markets, hostels, and stock yards. Mitigation measures have been proposed to minimize impacts, such as provision of retaining walls for valley-side structures, improvement of junctions, regulated access to community facilities, and installation of speed management devices near schools and religious sites. Safety precautions during construction have also been recommended around hostels, health centres, and other sensitive areas. Overall, the screening emphasizes the importance of incorporating protective measures and community safeguards into the project design and construction stages.

The anticipated impacts due to all these activities have been described below:

5.4.2.1 Impacts On Geology (ESS3)

The construction of project road will require different materials such as earth, aggregate, boulders, and sand that occur naturally and whose formation process is slow and takes years. Minimizing the construction footprint on natural resources is a fundamental design principle for pavement and structures.

As per the engineering design, the estimated quantities of other construction materials that are required for construction of the sub-project area are attached as **Annexure 3.3**.

With an estimated surplus of approximately 38,742.25 m³ of excavated material after balancing cut and fill, the DPR emphasizes reuse of suitable cut and excavated earth for embankment formation, slope dressing, and construction of protection works such as toe walls, gabion retaining walls. In addition, stone and granular materials recovered from dismantling of existing pavement and drainage structures will be recycled and reused for sub-base layers, shoulder construction, and filter media where technically feasible, thereby reducing dependence on new quarry material. These practices not only conserve natural resources but also minimize environmental impacts from material extraction, transportation, and waste disposal. Only unsuitable or non-recyclable materials will be disposed of at MPWD-designated disposal sites in accordance with environmental management guidelines.

5.4.2.2 Compaction And Contamination Of Soil (ESS3)

Contamination of soil during the construction stage may happen primarily due to construction and allied activities. The sites where construction vehicles are parked and serviced are likely to be contaminated because of leakage or spillage of fuel and lubricants. Contamination of soil during construction might be a major long-term residual negative impact. Unwarranted disposal of construction spoil and debris will add to soil contamination. This contamination is likely to be carried over to water bodies in case of dumping near water bodies.

5.4.2.3 Increased Erosion And Loss Of Top Soil (ESS3)

Loss of topsoil: The topsoil on the land parcels, which is either used for short term (e.g., borrow areas, construction camps etc.) or permanent use (expansion of the road alignment), would be lost unless the same is preserved. Project activity involves tree cutting and vegetation removal from the PRow followed by construction, widening and strengthening of the present carriageway.

Since the project involves upgrading an existing road alignment rather than developing a Greenfield corridor, substantial removal of topsoil is not anticipated. However, localized topsoil disturbance may occur during shoulder widening, drainage improvement, and embankment raising activities. To mitigate this, the ESIA prescribes specific topsoil management measures to be implemented during construction. These include: (i) stripping and preserving topsoil up to a depth of 150 mm from all areas of cutting, filling, and temporary construction zones; (ii) storing topsoil separately in designated stockpiles with proper slope protection and sediment barriers to prevent erosion; (iii) reuse of stored topsoil for median greening, roadside plantation, and slope turfing after construction; and (iv) prohibition of topsoil disposal at dumping sites. These measures shall form part of the Environmental Management Plan (EMP) and be monitored through the supervision consultant to ensure effective implementation during the construction phase.

The alignment passes through areas which have sandy loam with varying amounts of clay, typically exhibiting low to medium plasticity. These soils are light textured and are thus prone to erosion by winds and during rain and consequent slides can occur due to hilly slopes of the area.

Additionally, the movement and operation of vehicles, construction equipment, and material transport during project execution may cause soil compaction, particularly in borrow areas, temporary storage sites, and parking zones if not properly managed. Soil compaction reduces permeability and soil fertility, affecting natural drainage and vegetation growth. To minimize this impact, all construction activities and machinery movement will be strictly confined within the designated Right of Way (RoW) and approved working areas. Parking and servicing of vehicles and equipment will be allowed only in designated hard-surfaced zones, while borrow areas will be managed to prevent soil degradation through controlled excavation, use of light equipment, and post-extraction rehabilitation as per the approved Borrow Area Management Plan. These measures will ensure that soil structure and fertility in adjacent agricultural and community lands remain unaffected.

5.4.2.4 BORROW AREAS AND QUARRIES (ESS3)

Opening of a new borrow pit creates the following impact

- The borrowing of earth in an unregulated manner may lead to unstable slopes, erosion, loss of fertility, inundation of water, breeding areas for mosquitos and an unhygienic environment. Fertile topsoil may be wasted if not preserved for backfilling.
- The transportation of earth from borrows and quarry areas in open/uncovered trucks can increase the dust levels and overloaded borrow transportation material may cause spillage of material on road causing dust, high emission, vehicle wear and tear, road surface damage due to overloading.
- Haul roads may develop surface damage due to plying of trucks and if left unattended may cause problems to other pedestrians and commuters on the road.
- Unauthorized borrowing without requisite approval/permissions from local self-government bodies may create social conflict in the area.
- Open borrow pits abandoned without proper restoration may lead to accidents and risks of social nuisance.

As given below in the table, earthwork quantity from cutting comes out more than the required for filling. The earthwork detail in the project area is listed in **Table 5.2**.

Table 5.2: Earthwork details in the project area

Corridor	Fill (m ³)	Cut (m ³)
Corridor-8	107844.900	146587.150

From the above table it is calculated that after balancing cut and fill, the remaining quantity of 38742.250 cum earthwork will be dumped/disposed by the contractor. The details for the muck disposal site are presented in **Table 5.3**. Average height should be 6 m to 7 m.

Table 5.3: Details for the muck disposal site

S.No.	Location	Distance from UJ	Area of	Quantity of Muck to be disposed	Environment Sensitivity (If any)

		road (m)	disposal site (ha)	(cu.m)	
1	Mawpat village at Ch 42+400 km	5	0.04	2900	To minimize environmental impacts, all efforts will be made to avoid cutting trees, and the site will be managed to preserve existing vegetation.
2	Mawlaho at Ch 48+200 km	5	0.07	5036	No specific environmental sensitivity noted
3	Sngahtyrkhang at Ch 59+700	5	0.14	10072	To minimize environmental impacts, all efforts will be made to avoid cutting trees, and the site will be managed to preserve existing vegetation.
4	Umtraï at Ch 67+000	10	0.28	20734.25	To minimize environmental impacts, all efforts will be made to avoid cutting trees, and the site will be managed to preserve existing vegetation.

Mitigation Measures

- For sitting location of a muck disposal site include selecting a location with stable topography, away from water bodies and agricultural land, to prevent environmental contamination.
- Muck disposal sites shall be located on stable, non-erodible terrain away from water bodies and agricultural land.
- Dumping will be done in compacted layers (≤ 1 m thick) with retaining walls, drainage channels, and slopes maintained within the natural angle of repose (30° – 35°).

- Each site will be protected with toe walls, sediment traps, and vegetative cover for stabilization.
- The contractor shall operate only at approved locations under supervision and maintain the site until full rehabilitation is achieved.
- The site should incorporate proper retaining structures, such as toe walls and catch drains, to prevent sliding and erosion.
- Adequate drainage must be provided through surface and subsurface channels to control runoff.
- Muck should be deposited in layers, compacted, and stabilized using vegetation or geo-textiles to minimize dust and erosion.
- Access roads should be provided to ensure safe transport of muck, and the site should be fenced and clearly demarcated.
- Environmental safeguards, including periodic monitoring and rehabilitation plans, must be integrated into the design to ensure long-term stability and ecological compliance.

The typical design of the muck disposal site will be incorporated into the DPR. Dumpsite Stabilization Plan is attached as **Annexure 5.1**.

5.4.2.5 AMBIENT AIR QUALITY (ESS3)

Construction-stage activities are likely to have adverse impacts on both workers and settlements adjacent to the road, particularly those located downwind. The main types of pollution anticipated are dust pollution and emissions from harmful gases from the construction plant and equipment.

Impacts from Generation of dust

- Transportation and tipping of cut material - while the former will occur over the entire stretch between the cutting location and disposal site, the latter is more location specific and more intense;
- Transportation of raw materials from quarries and borrow sites
- Site levelling, clearing of trees
- Construction of structures and allied activities

Impacts from Generation of polluting gases including SO₂, NO_x and CO

- Hot mix plants
- Large construction equipment, trucks and asphalt producing and paving equipment
- The movement of heavy machinery, oil tankers etc.
- Inadequate vehicle maintenance and the use of adulterated fuel in vehicles.

The impacts are expected to be temporary (limited to construction period) and confined within construction areas. Mitigation Measures for Ambient Air Quality is presented in Table 5.4.

Table 5.4: Mitigation Measures for Ambient Air Quality (ESS3)

Impact Source	Mitigation Measures
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Transportation and tipping of cut material; site levelling and excavation	Regular water sprinkling (at least 3 times in a dry season) on haul roads, excavation areas, and disposal sites to suppress dust. Limit vehicle speeds to 25 km/h on unpaved roads.
Transportation of raw materials from quarries and borrow sites	Cover all vehicles carrying loose materials with tarpaulin; avoid overloading and ensure proper loading/unloading to prevent spillage.
Stone crushing, batching, and asphalt plants	Locate plants at least 500 m from settlements and sensitive receptors; install dust extraction, bag filters, and stack emission controls. Regularly maintain equipment to minimize emissions.
Site clearing, vegetation removal, and handling of topsoil	Restrict vegetation clearance to the required RoW; immediately stabilize exposed soil using mulching, water spraying, or temporary turfing.
Concrete and asphalt mixing operations	Use pre-mixed bitumen and maintain mixing temperature within permissible limits to reduce hydrocarbon release. Avoid fuel adulteration.
Operation of heavy machinery and transport vehicles	Maintain all equipment and vehicles regularly; prohibit use of old or poorly maintained machinery; use low-sulphur fuel.
Generation of gaseous pollutants (SO₂, NO_x, CO)	Ensure all machinery meets CPCB emission norms; prohibit idling of vehicles; schedule material transport to avoid congestion.
Worker and community exposure to dust and fumes	Provide PPE (dust masks, goggles) to workers; display warning and awareness signs; avoid high-emission activities near schools or dense settlements.
Monitoring and compliance	Conduct periodic ambient air quality monitoring (PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , CO) at identified locations and ensure compliance with CPCB National Ambient Air Quality Standards.

5.4.2.6 Noise (ESS3)

During construction, particularly in residential and commercial areas, ambient noise levels may temporarily exceed statutory limits within about 50 m of active work zones due to operation of heavy machinery, material transport, and equipment use. The main noise sources will include excavators, graders, vibratory rollers, and transport vehicles, which typically generate levels above 70 dB(A). Vibration from rollers may also affect nearby structures depending on soil type, structural age, and construction quality.

These impacts will be intermittent, short-term, and localized, as all construction activities will not occur simultaneously along the corridor. Sensitive receptors such as schools, hospitals, and religious places located near the project road may experience temporary disturbance during high-noise activities. However, impacts will attenuate with distance and can be effectively mitigated through equipment maintenance, use of temporary noise barriers, scheduling of high-noise works during daytime, and strict adherence to CPCB

noise standards.

The scale of construction required for upgrading the UJ Road is moderate and within the existing Right of Way (RoW) with curve improvement at few stretch which required community land. The primary sources of noise emissions include construction equipment, material transport vehicles, stone crushers, and asphalt plants. These activities are temporary, localized, and limited to the construction period. Noise levels are expected to rise intermittently during operations such as excavation, compaction, and pavement laying, especially near settlements and sensitive receptors like schools and health centers. However, with proper scheduling of high-noise activities during daytime, maintenance of equipment, use of noise barriers or temporary screens near sensitive locations, and adherence to CPCB noise standards, the impacts will remain within acceptable limits. Consequently, the overall scale of works and the expected marginal increase in post-construction traffic are not anticipated to result in any significant or lasting adverse impacts on ambient air quality or noise levels.

Ambient noise level may increase temporarily in the close vicinity of various construction activities, maintenance workshops, and vehicles and earthmoving equipment. These construction activities are expected to generate noise levels in the range of 80 – 95 dB(A) at about 1m from the source.

Mitigation Measures

- Staging of construction equipment and unnecessary idling of machinery within noise-sensitive areas shall be avoided wherever possible.
- All plants and equipment used in construction (including third-party units) must conform to MoEF&CC/CPCB noise standards.
- All vehicles and equipment used in construction shall be fitted with effective exhaust silencers.
- Servicing of all construction vehicles and machinery shall be done regularly; during routine servicing, the effectiveness of exhaust silencers shall be checked and replaced if defective.
- Construction activities shall be restricted to daytime hours (6 AM–10 PM). Night-time work may be carried out only in emergencies, following all prescribed mitigation measures for night operations.
- Unnecessary honking at construction sites shall be strictly prohibited.
- Temporary barricading or noise barriers shall be installed around active construction zones, especially near settlements, schools, or hospitals, to minimize noise propagation.
- Noise monitoring shall be carried out at construction sites as per the approved monitoring schedule, and results shall be submitted to the Project Management Consultant (PMC) and Project Management Unit (PMU) for review and compliance verification.

○ DG Set Noise Control Standards

To minimize noise from generator operations during construction, the following measures shall be implemented:

- The contractor must use silent DG sets as prescribed by the Central Pollution Control Board (CPCB).
- If a silent DG set is not available, noise shall be controlled by providing an acoustic enclosure or acoustically treated housing.
- The acoustic enclosure shall be constructed with suitable materials of adequate thickness, supported by a structural or sheet-metal base, and insulated with fire-retardant acoustic foam.

- The acoustic enclosure/acoustic treatment shall be designed to provide a minimum 25 dB(A) insertion loss or to meet ambient noise standards, whichever is higher.
- Each DG set shall be provided with a proper exhaust muffler to further reduce noise emissions.
- The DG set shall be properly sited to minimize its noise impact beyond the premises, ensuring compliance with ambient noise standards at the nearest receptor.
- A routine and preventive maintenance schedule shall be prepared and followed in consultation with the DG set manufacturer to ensure that noise levels do not deteriorate with use.

▪ Surface Water Quality And Siltation (ESS3)

Construction activities such as earthworks, material storage, and operation of construction camps may temporarily affect surface water quality along the UJ Road corridor. Proposed sub project road cross Umsiang river at Chainage 78+400. Earth Runoff from exposed soil surfaces, stockpiles, and construction zones can carry suspended solids, oils, and debris into nearby streams or drainage channels, leading to increased turbidity and siltation. Additionally, improper disposal of construction wastewater or accidental spills of fuels and lubricants may also contribute to localized water pollution. Construction activities such as bridge works, river training, and slope protection may temporarily increase turbidity and sediment load in the river, potentially affecting local fish habitats and water quality. These effects are expected to be localized and short-term, primarily during active construction near the river crossing.

Labour camps and site facilities will generate domestic wastewater and sewage, which, if discharged untreated, may degrade nearby water bodies.

Mitigation measures

- To prevent this, sewage treatment through septic tanks and soak pits or mobile bio-toilets shall be provided at all camps.
- Construction runoff shall be managed through temporary drainage channels, sediment traps, and silt fencing, ensuring that no untreated discharge enters natural watercourses.
- With proper implementation of drainage control, containment of oil and grease near equipment yards, and treatment of domestic wastewater, no significant or long-term impact on surface water quality or aquatic habitats is anticipated during the project construction and operation phases.
- Proper implementation of erosion and sediment control measures including silt fencing, and controlled work scheduling will minimize such impacts.

Mitigation Measures for Groundwater Protection (Pile/Material Storage Areas)

- **Site Selection:** Locate material and pile storage yards at least 100 m away from water bodies, wells, or natural drainage channels. Avoid low-lying or flood-prone areas.
- **Impervious Flooring:** Provide impermeable flooring (e.g., compacted clay or concrete base with HDPE lining) in storage areas for materials such as bitumen, fuel, cement, and chemicals to prevent seepage into soil and groundwater.
- **Storm water Management:** Construct peripheral drains around storage yards to collect and divert runoff to sedimentation pits before discharge. Prevent mixing of clean storm water with contaminated runoff.
- **Spill Prevention and Control:** Store fuel and lubricants in bunded areas (110% capacity of the largest

container) with proper spill kits (sand, absorbents). Immediately clean up any spills or leaks.

- **Topsoil and Excavated Material:** Store topsoil separately on raised and covered platforms to prevent erosion and sediment-laden runoff into groundwater recharge zones.
- **Waste and Debris Management:** Prohibit dumping of construction waste, oils, or concrete slurry on bare ground. Dispose of waste only at approved sites.
- **Regular Inspection:** Conduct routine checks for leakages, cracks, or improper containment in fuel and chemical storage zones.

▪ Impacts On Natural Drainage And Watershed Management (Flooding) (ESS3)

Along the rivers and streams crossed by the road, bank protection measures are required to prevent accelerated sedimentation that could alter drainage patterns and affect riverine habitats. The road alignment generally follows the existing topography, except at locations of cross-drainage structures. The project road stretch includes a total of 1 minor bridge and 256 culverts. Many of the existing culverts, if not adequately strengthened during the proposed road widening, rehabilitation, and upgradation, could fail structurally, leading to disruptions in water flow, increased flood risk, and potential damage to the road. Such failures may also pose safety hazards to road users and nearby communities.

▪ Ground Water Quality (ESS3)

The road construction projects are water intensive and demand a large volume of water during the entire project's construction period. Project road stretch will require approx. 93.5 KLD. The demand for construction is proposed to be met from surface water sources. However, in extreme cases, where surface water is not available, it is proposed to use groundwater resources. The project area is not classified as critical, semi-critical or overexploited by CGWB. It is "safe" area for ground water abstraction.

Untreated discharge from the labour camp may lead to contamination of ground water sources in the vicinity of the camp.

▪ Construction and Demolition Waste (ESS3)

Construction and demolition (C&D) waste from major demolitions is not expected along the proposed sub project road because no permanent structures will be removed. Only temporary structures with masonry or light walls (e.g., temporary kiosks, sheds, compound walls) will be dismantled where absolutely necessary to establish the right-of-way. Even these limited removals, if not handled correctly, can obstruct natural drainage, cause siltation of nearby water bodies, generate dust, and create temporary traffic inconveniences or health nuisances. To avoid such impacts, all temporary-structure debris will be managed through a contractor-led waste handling plan that emphasizes source segregation, timely removal, reuse/recycling where feasible, controlled transport, and disposal at authorized sites.

Key mitigation measures

- **Avoidance & minimization:** limit removals to only those temporary walls/structures that are unavoidable for construction; explore minor realignments or temporary protection works to retain structures where possible.

- **Segregation on site:** separate inert masonry/brick, concrete, metal, wood and mixed waste at designated temporary collection points to maximize reuse/recycling.
- **Reuse & recycling:** priorities reuse of intact masonry/brick and concrete as backfill or for temporary access tracks; recover metal and timber for reuse.
- **Designated storage & timely removal:** store debris in covered areas away from drains and surface water; remove to authorized disposal/recycling facilities within agreed short timeframes to prevent runoff and scavenging.
- **Dust control:** dampen stockpiles and vehicle loads, cover trucks during transport, and restrict demolition/dismantling operations during high-wind conditions.
- **Drainage protection:** install silt traps/sediment control (e.g., sandbags, temporary settling pits) at nearby drains and around stockpiles to prevent siltation of water bodies.
- **Traffic & public safety:** schedule dismantling works off-peak where possible, use flaggers and signage, and maintain clear pedestrian/vehicular passage around work areas.
- **Permits & authorised disposal:** ensure waste is transported only to licensed C&D disposal or recycling facilities and that manifests/receipts are retained.
- **Contractor responsibilities & training:** the contractor shall prepare the C&D waste handling plan, train workers on segregation and pollution prevention, and maintain daily records of waste quantities and destinations.
- **Monitoring & reporting:** include C&D waste management in construction supervision checklists; undertake fortnightly inspections and submit waste disposal receipts as part of monthly compliance reports.

▪ Municipal Solid And Hazardous Waste (ESS4)

The project corridor is expected to generate approximately 20 to 25 kg of municipal solid waste per day during the construction stage, based on an estimated 50 workers at the project site, assuming an average waste generation of 0.4 to 0.5 kg per person per day. This waste if not disposed of properly, may lead to littering in the immediate vicinity of the camp sites and contamination of ground water as well as air pollution due to unauthorized burning.

Mitigation measures

- Disposal of sanitary wastes and excreta shall be into septic tanks. If bio-toilets will be used the excreta could be converted to manure.
- Kitchen wastewater shall be disposed into soak pits/kitchen sump located preferably at least 15 m from any water body. Sump capacity should be at least 1.3 times the maximum volume of wastewater discharged per day. The bottom of the pit should be filled with coarse gravel and the sides shored up with board, etc. to prevent erosion and collapse of the pit. New soak pits shall be made ready as soon as the earlier one is filled.
- Solid wastes generated in the kitchen shall be reused if recyclable or disposed of in landfill sites.

- Provide segregated garbage bins in the camps and ensure that these are regularly emptied and disposed of hygienically as per the Comprehensive Solid Waste Management Plan approved by the Environmental Expert of Project Authority.

The camping area should be periodically sprayed with Bleaching powder and other disinfectants.

Approximately 260 m³ of scarified bituminous material will be generated from the project road during pavement rehabilitation. Improper disposal may cause localized soil and water contamination due to leaching of hydrocarbons; therefore, its reuse and handling shall follow MoRTH (5th Revision) guidelines.

As per MoRTH Clause 517 and Clause 305.2.2.2, the scarified bituminous material shall be recycled and reused in Granular Sub-Base (GSB), Wet Mix Macadam (WMM) layers, or for pavement shoulders, after appropriate screening and blending to achieve the required gradation. The reclaimed mix can also be incorporated in hot or cold recycling processes depending on site conditions and equipment availability.

Any quantity of scarified bitumen found unsuitable for reuse shall be disposed of at designated locations approved by the Engineer-in-Charge, with proper base lining and containment to prevent leachate migration and protect soil and water quality. This approach promotes resource recovery, cost efficiency, and environmental compliance in line with MoRTH and CPCB sustainability principles.

The corridor-wise details of existing bituminous surface to be scarified in the project area are presented in **Table 5.5**.

Table 5.5: Amount of Bituminous Waste

Sl. No.	Description	Unit	Quantity
1.	Scarifying existing bituminous waste	cum	260

A small quantity of hazardous substances, such as diesel, petroleum products, and other chemicals, will be used or stored during construction. If these substances are not stored properly, leakage or spillage may occur, potentially causing contamination of soil and water.

During the construction phase, used batteries are expected to be discarded and must be disposed of in accordance with the Battery Waste Management Rules, 2022. Lead-based batteries, if not properly managed, may contaminate soil and water through the leakage of lead.

▪ Disruption Of Community Services (ESS4)

Local services, including water supply lines, irrigation channels, drainage systems, ditches, and streets, are often disrupted during road earthworks. These services are essential for crop production, drinking water supply, and local access, and their damage can also affect road construction activities. Details of utilities, such as electric poles, are provided in **Annexure 5.2**.

▪ Diversion of Traffic (ESS4)

Since the road upgradation works will be carried out on the existing alignment, there will be a direct interface with road traffic. Short-term impacts during construction will include traffic diversions and management challenges, potentially causing hindrance to the existing traffic flow. There is also a risk of accident hazards during this phase. Although such diversions do not directly impact the natural

environment, poorly planned diversions can lead to adverse effects. Rapid restoration of diverted services can help minimize the severity of impacts resulting from the disruption of existing services.

▪ **Impacts on Occupational Health & Safety (ESS2)**

During the construction phase of the road project, workers are continuously exposed to various occupational and environmental hazards. These include prolonged exposure to dust and gaseous emissions from equipment, vehicles, and material handling. In addition, there are significant safety risks associated with activities such as hill-side cutting, benching, excavation, embankment formation, operation of heavy machinery, and protection works along eroded riverbanks. Specific risks also arise from working near waterlogged or submerged sections, culvert and bridge construction, and sharp curves or junction improvements, where vehicular movement poses added danger. Electrocutation, work at heights, slips, trips, and falls, as well as tree cutting and vegetation clearance, further contribute to potential safety concerns. Proper use of personal protective equipment (PPE), adherence to standard operating procedures (SOPs), traffic and work-zone safety management, and regular safety training will be critical to prevent accidents and ensure worker well-being throughout the construction period. Table 5.6 presents Hazard analysis as per DPR.

Table 5.6: Hazard analysis as per DPR

Activity / Task	Potential Hazards	Associated Risks / Impacts	Proposed Mitigation & Control Measures	Responsible Agency
Site clearance and earthwork (excavation, grading)	Cave-ins, slope failure, dust inhalation, contact with sharp objects	Injury from collapsing sides, respiratory issues, cuts and bruises	<ul style="list-style-type: none"> • Use proper shoring and benching of excavations • Restrict unauthorized entry- Provide dust masks and PPE • Regular inspection of slopes and trenches 	Contractor / Site Engineer
Operation of heavy machinery (excavator, roller, grader, paver)	Machine entanglement, collision, vibration, noise	Physical injury, hearing loss, fatigue	<ul style="list-style-type: none"> • Only trained operators • Maintain equipment regularly • Use reverse alarms, lights, and mirrors • Use ear protection and seat belts 	Contractor / Safety Officer
Material handling and lifting (manual or crane use)	Dropped loads, back injuries, entanglement	Fractures, strains, crushing injury	<ul style="list-style-type: none"> • Inspect lifting equipment and slings • Train workers on safe lifting techniques 	Contractor / Safety Supervisor

			<ul style="list-style-type: none"> • Use tag lines and certified riggers- Prohibit standing under suspended loads 	
Asphalt and hot mix plant operation	Burns, inhalation of fumes, fire hazard	Thermal burns, respiratory irritation	<ul style="list-style-type: none"> • Use heat-resistant gloves, long sleeves • Maintain fire extinguishers near site • Ensure good ventilation- Prohibit smoking near bitumen storage 	Plant Operator / Safety Officer
Working near traffic / along existing road	Collision with moving vehicles, poor visibility	Fatal accidents, severe injuries	<ul style="list-style-type: none"> • Implement Traffic Management Plan- Install warning signs, cones, and barricades • Assign flagmen with high-visibility vests- Restrict work to off-peak hours 	Contractor / Traffic Marshal
Construction at height (culverts, retaining walls, bridges)	Fall from height, falling tools or materials	Fractures, head injuries, fatalities	<ul style="list-style-type: none"> • Use full-body harnesses and guardrails- Provide safety nets and helmets • Secure tools with lanyards- Supervise work at height 	Contractor / Safety Officer
Welding, cutting, and concreting works	Electric shock, eye injury from sparks, burns	Eye irritation, electrocution, burns	<ul style="list-style-type: none"> • Provide face shields and gloves • Ensure proper earthing of welding sets • Keep fire extinguishers nearby- Maintain distance from flammable material 	Contractor / Electrical Supervisor

Fuel and chemical storage / handling	Fire, explosion, spillage	Groundwater contamination, burns, inhalation	<ul style="list-style-type: none"> • Store in bunded area with 110% capacity- Provide spill kits and firefighting equipment • Train staff on spill response- Maintain MSDS at site 	Contractor / Store In-charge
Labour camp and sanitation facilities	Poor hygiene, contaminated water, waste mismanagement	Disease outbreak, worker illness	<ul style="list-style-type: none"> • Provide potable water (≥5 L/person/day)- Maintain toilets and waste bins • Regular disinfection and waste removal- Conduct health check-ups 	Contractor / Camp Supervisor
Noise and vibration from machinery / DG sets	Prolonged exposure to high noise levels	Hearing loss, stress, fatigue	<ul style="list-style-type: none"> • Use silencers and acoustic enclosures- Restrict operation to daytime • Rotate workers and provide ear protection- Monitor noise levels regularly 	Contractor / Environmental Officer
Electrical works (temporary wiring, lighting)	Short-circuit, electrocution	Shock, burns, fire	<ul style="list-style-type: none"> • Use insulated tools and cables- Regular inspection of wiring • Provide ELCB protection- Only certified electricians to handle work 	Contractor / Electrical Supervisor
Extreme weather conditions (rain, heat)	Slippery surfaces, heat stress, dehydration	Falls, injuries, fatigue	<ul style="list-style-type: none"> • Schedule work during cooler hours- Provide shaded rest areas • Supply drinking water and electrolyte drinks- Stop work during heavy rainfall 	Site Engineer / Safety Officer

Waste and debris disposal	Sharp objects, dust, unstable mounds	Cuts, respiratory irritation	<ul style="list-style-type: none"> • Segregate and reuse materials- Dispose at approved sites • Cover trucks during transport- Provide gloves and masks 	Contractor / Site Engineer
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▪ Work Site Safety (ESS2)

Construction site safety is one of the most overlooked things during a construction project. In most workplaces accidents are common due to lack of work site safety. Accidents have the potential to be life-threatening and can be avoided through proper Work site Safety. The likely hazardous materials to be transported or stored on-site which includes diesel, petrol, oils for machinery, explosives for blasting in rocky terrains (if required), cement and lime (which can cause respiratory issues if inhaled), bitumen (flammable and can cause burns), solvents and paints (volatile and toxic). Accidental leaks or exposure of hazardous materials can harm local flora and fauna. Lack of PPE and safety training increases the likelihood of accidents and health issues for workers handling hazardous materials. A project level Worksite Safety Plan (OHS plan) has been prepared as a separate document which outlines the various impacts and strategies to manage them.

▪ Road Safety Measures (ESS4)

Road Construction activity will impact safety on the road for commuters, pedestrians, students, women and elderly people. In addition to this, sub project stretch being in landslide prone areas, there will be chances of landslide/rock fall on the road from time to time. Animal crossings, although not reported in the current stretch, can yet be a possibility during the construction stage and mitigation measures may have to be incorporated in the Contractor's C-ESMP.

▪ Anticipated Impacts on Biological Environment (ESS6)

Since the proposed Umsning - Jagi Road involves no widening beyond the existing Right of Way (RoW) except at few sections for curve improvement, and no diversion of forest land or habitat alteration, none of the identified species meet the threshold for Critical Habitat criteria under IFC PS6 or World Bank ESS6. Hence, all species have been screened out from further critical habitat assessment.

Critical Habitat Screening for the Umsning - Jagi Road Project is presented in **Table 5-7**.

Table 5.7: Critical Habitat Screening for the Umsning - Jagi Road

Scientific Name	IUCN Status	Restricted Range	Migratory / Congregatory	Habitat & Distribution (Ri Bhoi)	Likelihood of Occurrence in Project Area	Rationale for Critical Habitat Screening	Screened In / Out
Hoolock hoolock (Western Hoolock Gibbon)	Endangered (EN)	NE India & Bangladesh	No	Occurs in semi-evergreen forests of Ri Bhoi, especially in intact canopy areas	Low	Project along existing RoW with no forest canopy removal; unsuitable for gibbon movement	Screened Out
Nycticebus bengalensis (Bengal Slow Loris)	Endangered (EN)	NE India, SE Asia	No	Found in forest fringes of Ri Bhoi; nocturnal, uses dense vegetation	Low	No new forest clearance; roadside habitat does not support core loris requirements	Screened Out
Elephas maximus	Endangered (EN)	Widespread but fragmente	Yes – seasonal	Elephants occur in parts of Ri	Low–Moderate regional	Road entirely within	Screened Out

(Asian Elephant)		d	movement	Bhoi, mainly deeper forests and known corridors	ly but Low at project site	existing RoW; Umsning– Jagi is not an elephant corridor	ut
Macaca assamensis (Assam Macaque)	Near Threatened (NT)	No	No	Common in Ri Bhoi forest edges, agricultural fringes	Moderate	Species may be locally present but not dependent on habitats impacted within RoW	Screened Out
Macaca mulatta (Rhesus Macaque)	Least Concern (LC)	No	No	Frequently observed along settlements and roadside areas	High	Common generalist with no critical habitat features in project area	Screened Out
Manis pentadactyla (Chinese Pangolin)	Critically Endangered	NE India, SE Asia	No	Occasional in Ri Bhoi	Low	Habitat (forest floor) lies	Screened Out

Pangolin)	ed (CR)			forest patches; uses burrows in moist soils		outside the RoW; no new land-take	ut
Manis crassicaudata (Indian Pangolin)	Endangered (EN)	Indian Subcontinent	No	Occurs in mixed agricultural-forest landscapes	Low	No burrow habitat disturbance due to restricted work in existing RoW	Screened Out
Gallus gallus (Red Junglefowl)	Least Concern (LC)	No	Locally congregatory	Occurs in scrub and agricultural edges	Moderate	No critical habitat features; species widely distributed	Screened Out
Anthraceros albirostris (Oriental Pied Hornbill)	Near Threatened (NT)	No	Occasional local congregation	Found in forest edges of Ri Bhoi; nests in tree cavities	Low	No large nesting trees being removed; work restricted to existing alignment	Screened Out

Arborophila chloropus (Green-legged Partridge)	Least Concern (LC)	No	No	Found in lowland forests and scrub of Ri Bhoi	Low	No significant habitat modification	Screened Out
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▪ Impacts on Aquatic Ecology

Impacts on aquatic ecology during construction include increased silt inflow into surface water bodies and the potential discharge of liquid wastes and untreated sewage from construction and labour camps.

Mitigation Measures:

- Silt traps and sedimentation ponds will be installed to control runoff.
- Proper drainage channels and waste management systems will be established at construction sites.
- Labour camps will be equipped with septic tanks or mobile toilets to prevent direct sewage discharge into nearby water bodies.
- Disposal of construction material or debris into rivers or streams will be strictly prohibited.
- Regular monitoring of water quality will be conducted to ensure compliance with environmental standards

During the operational phase, significant impacts on aquatic ecology are not anticipated; although the alignment crosses a river, appropriate mitigation measures such as sediment control, construction of temporary diversion structures, and proper wastewater management will minimize potential adverse effects.

To address the potential impacts on biodiversity, a comprehensive set of mitigation measures have been developed and incorporated into the ESMP.

▪ IMPACTS ON ARCHAEOLOGICAL, HISTORICAL AND CULTURAL SITES (ESS8)

No ASI-protected monuments are located within 0.5 km of the project site.

Another key potential impact during project construction is the risk of partial or total destruction of previously unknown heritage assets, such as undiscovered archaeological sites, due to ground excavation. This highlights the need for a defined mitigation approach.

During the construction works, as part of the Contractor's project CESMP, a "chance-find" procedure will be developed and implemented. A guidance note for the protocol on the "chance find procedure" is to be incorporated in the indicative ESMP as part of this ESIA. Workers need to be trained in the use of this procedure.

5.4.3 IMPACTS DURING OPERATIONAL PHASE

During the operation stage, the main sources of environmental impacts are the increased traffic volume and speed. The increase in traffic volume and speed may enhance the safety risk especially in the rural area. No sudden change in the volume of traffic is expected due to this road as the road is already existing and opened for public traffic. The project also provides opportunities for the restoration of vegetation around the vicinity of the worksite and roads by implementing the compensatory plantation programme, which will not only enhance the aesthetic view but can also help in reclamation of soil.

During the operation phase, moderate increases in air and noise pollution may occur due to higher vehicular movement (ESS4). Nevertheless, the overall impacts are largely positive, with enhanced road

safety, reduced travel time, and improved connectivity supporting local economic development. Landscaping, replantation, and slope bioengineering measures (ESS6) will improve local biodiversity, stabilize embankments, and enhance the corridor's visual aesthetics.

Various impacts during operation phase are discussed below:

5.4.3.1 Impacts on Water Quality and Resources

During the operation phase, the possibility of degradation of water quality is very remote. The impact on the surface water quality during operation can be expected due to accidental spillage. However, the probability of such accidents is minimal since enhancement of road safety measures such as improvement of curves and widening of the roads and other pedestrian facilities are taken care of in the design stage.

5.4.3.2 Impact on Air Quality

Vehicular emissions are the principal source of pollution during the operation stage. The project road being mostly located adjacent to open agricultural land, adequate dispersion of gaseous pollutants is expected.

5.4.3.3 Impact on Noise Quality

Impact due to increased noise level and vibration is anticipated due to increased vehicular movement upon improvement of existing road condition. Road side plantation will act as a noise barrier and is likely to reduce the noise quality during the operational phase and any further mitigation is beyond the control of the project authority.

5.4.3.4 Accidents Involving Hazardous Materials

Accidents involving hazardous chemicals may generally be catastrophic to the environment, though the probability of occurrence is low. Prevention of an accident involving hazardous material is a better way of minimizing the impacts. The provisions mandated by 'The Hazardous Wastes (Management and Handling) rules, 1989 and "Manufacture Storage and import of Hazardous Chemicals Rules" 1989 under the Environmental (Protection) Act, 1986 will be complied with. Vehicles delivering hazardous substances will be expected to have printed warning signs on the vehicles and measures to contain any hazardous spillage on the road.

In case of spillage, the report to relevant departments will be made and instructions will be followed in taking up the contingency measures immediately as per the Emergency Management Plan of the contractor's OHS plan.

5.5 Social Risks & Impacts (ESS2,ESS4,ESS5 ,ESS7 and ESS10)

The construction of the road is expected to intersect various areas of significant social and economic value, which necessitates careful consideration and management. Key areas of concern include impacts on agricultural lands, residential communities, and culturally significant sites. The route traverses along agricultural land, community ponds etc. that are important for local food production, livelihoods and eco system services in general. Disruption to these areas could result in economic losses for farmers and reduced agricultural output. Mitigation measures, including re-alignment, compensation, and access to community benefit programs have been considered to minimize adverse effects and ensure that the project contributes positively to the socio-economic landscape. This has been outlined in the Resettlement

Action Plan.

Approximately 0.38 hectare of land will be acquired for road improvement works.

The social screening of the project corridor identified few structures, including shops, compound walls, waiting stands, a church, and a kiosk, located within 2.5–4.5 meters of the centerline. Most structures are likely to be partially impacted, particularly in Umtraí where four structures are affected. The social risks primarily involve loss of assets, and restricted access to residences or livelihoods. In accordance with ESS5, mitigation measures will include careful alignment design, avoidance of displacement where feasible. Given that these communities include indigenous and vulnerable groups, as per ESS7, additional measures such as meaningful consultation, culturally appropriate mitigation, and support to maintain community cohesion will be implemented to minimize adverse impacts during construction. FPIC was carried out as the project will result in loss of assets and cause relocation of IPs who are Non-Title Holders.

Furthermore, the easement zones around the construction areas will potentially cause hindrance on land use, limiting some of the activities such as building construction, tree planting, and certain agricultural practices. These restrictions can disrupt community development plans, hinder local businesses, and affect the overall quality of life for residents.

To mitigate these social impacts, household surveys and extensive meaningful stakeholder consultations were carried out to understand the concerns and needs of affected communities. The **Free, Prior, and Informed Consent (FPIC)** process was followed in culturally appropriate manner to ensure meaningful engagement with Indigenous Peoples, securing their consent through transparent and participatory consultations. Additionally, community engagement programs have been conducted to provide clear information about the project, address misconceptions, and explore opportunities for local benefits, such as job creation and infrastructure improvements.

By ensuring that the road construction remains within the existing Right of Way (RoW) and does not require additional land or impose new easement restrictions, the project aims to minimize social impacts and maintain positive relationships with local communities. Contractors will be required to ensure that existing access ways to public and private amenities are maintained throughout the construction period.

The Project recognizes the critical importance of addressing Sexual Exploitation, Abuse, and Harassment (SEA/SH) both within the workplace and in interactions between workers and the local community. To address these concerns, SEA/SH Prevention and Response Action Plan has been prepared for the project.

Given below are the impacts on various social components from the project:

5.5.1 SOCIAL COMPONENT ISSUES: IMPACT ON LAND, STRUCTURES AND LIVELIHOOD

Potential Risks & Impacts

The social screening of the project corridor identified few structures, including shops, compound walls, waiting stands, a church, and a kiosk, located within 2.5–4.5 meters of the centerline. Most structures are likely to be partially impacted, particularly in Umtraí where four structures are affected.

Social impacts from the project will be mitigated as per the sub-project RAP, IPDP and ESMP.

5.5.2 Social Component Issues: Temporary Restriction to Access

Potential Risks & Impacts

Construction activities, such as road improvement works, may temporarily restrict access for residents and business owners. These disruptions can affect daily movement to and from homes, limit customer access to shops, and cause inconvenience to the local community. Such temporary access constraints may lead to frustration among residents and business owners, potentially straining community relations and generating dissatisfaction with the project if not properly managed.

To mitigate these risks, the Contractor will implement the following measures:

- Maintain alternative access routes to residences and shops wherever feasible.
- Schedule construction works in a phased manner to minimize disruption.
- Install clear signage and provide advance notice to affected persons about construction schedules and access changes.
- Ensure safe pedestrian pathways and temporary crossings in congested areas.
- Coordinate closely with local communities and shop owners through the Grievance Redressal Mechanism (GRM) to promptly address access-related complaints.

These mitigation measures will be detailed in the Environmental and Social Management Plan (ESMP).

5.5.3 Social Component Issues: Disruption to Access Ecosystem Services

Potential Risks & Impacts

The commencement of construction may intensify pressure on community resources, potentially leading to resource depletion. Managing this impact requires sustainable resource management practices to ensure villagers continue to have access to essential materials like fuel, food, and building supplies while preserving the forest and other resources for future use.

5.5.4 Social Component Issues: Impact on Vulnerable People

Potential Risks & Impacts

Construction projects can disproportionately affect vulnerable and disadvantaged populations such as women-headed households, below-poverty-line families, and the elderly population (60+ years). This has been discussed in Section 4.9.2. These groups may face increased difficulties related to mobility, access to essential services, and overall safety during construction activities. Failure to adequately address their unique needs can exacerbate existing inequalities and lead to additional social and economic challenges. There can be difficulty for the community to reach the nearby hospital when road construction is on-going.

To address these risks, the following measures will be implemented:

- Ensure continuous access to essential services, particularly healthcare and educational institutions, through alternate routes or temporary walkways.
- Provide advance information to communities regarding construction schedules, traffic diversions, and safety measures through local notice boards and community meetings.
- Establish priority crossing points and temporary access for elderly persons, school children, and differently abled individuals.
- Engage local women's groups, self-help groups, and village councils in monitoring safety and access conditions during construction.

- Maintain a functional Grievance Redress Mechanism (GRM) to ensure that concerns from vulnerable groups are addressed promptly and effectively.

Amenities for Indigenous Peoples (IPs) residing in the road project such as toilets, beautification work around the monoliths etc have been incorporated under the Indigenous Peoples Development Plan (IPDP), which builds upon the outcomes of the consultations and Free, Prior, and Informed Consent (FPIC) process conducted with the affected communities. Furthermore, continuous engagement with IP and other vulnerable groups will be maintained throughout the project implementation phase through the Stakeholder Engagement Plan (SEP), which provides for inclusive communication, regular disclosure of project information, and responsive community feedback mechanisms.

5.5.5 Social Component Issues: Influx of Migrant Labor

Impact of Labor Influx

Poor behavior by workers from outside, in sub-project areas can lead to disruption of local community cohesion, especially smaller communities. This can occur through unaccustomed or violent behavior, including gender-based violence, and/or an increase in communicable diseases.

There is potential for an increased risk of the spread of communicable diseases and increased rates of illicit behaviour and crime resulting from the worker influx, however, the volume and skilled nature of the incoming workforce reduce this likelihood.

Gender Based Violence

Despite being a predominantly matrilineal society, Meghalaya has recorded a worrying upward trend in reported crimes against women. According to the Government of Meghalaya's Gender Statistics 2023 publication, total registered cases of crimes against women rose from 237 in 2020 to 287 in 2021.

In Ri Bhoi District, a total of 14 cases were reported in 2021, reflecting a lower incidence compared to more urbanized districts but still highlighting growing concerns regarding women's safety and gender-based violence in the region.

GBV Action Plan has been prepared and attached as **Annexure 5.3**.

Consultations were held with communities residing along the project road, utilizing the Free, Prior, and Informed Consent (FPIC) process to understand their needs and challenges & to seek their consent. These consultations highlighted critical issues in basic accessibility, including education, healthcare, and markets, emphasizing the need for improved road infrastructure. While most villages have sanitation facilities, some lack adequate toilet facilities. Education access is limited in certain areas due to the absence of high schools and public transportation, making travel to schools difficult. Similarly, medical facilities exist but are often inaccessible due to transportation constraints, underscoring that essential services, though available, remain out of reach for many community members without improved transport options.

The risk associated with labour influx for the project is expected to be moderate, as workers from outside may be required and will stay on-site during the construction phase. This could potentially cause some discomfort for the local community, particularly for women and children living in the surrounding areas.

Although the road spans over hilly terrain, regular supervision can be done during the construction phase which reflects a positive perspective of the project. Also, during the construction phase, access to the schools would be provided. The project would be equipped with monitoring indicators for GBV and SEA/SH

risks along with the avoidance of proximity of female workers with the male workers mandated to be implemented by the contractors. This is outlined in the site specific ESMP and the SEA/SH Action Plan.

5.5.6 Social Component Issues: Labor and Working Conditions

Challenges may arise in finding workers while balancing community expectations for local employment opportunities. Local communities may oppose hiring external workers, preferring that job opportunities remain within the local population. Further, there may be risks related to working conditions, terms and conditions of employment, occupational health and safety, discrimination and equal opportunity of all employees. The project level Labour Management Plan (LMP) and Work site safety plan (OHS Plan) outlines strategies for managing these risks. Labour Management Plan is attached as attached as **Annexure 5.4**. Occupational Health and Safety plan is attached as **Annexure 5.5**.

5.5.7 SEA/SH IMPACTS

The Project recognizes the importance of addressing Sexual Exploitation, Abuse, and Harassment (SEA/SH) both within the workplace and in interactions between workers and the local community. Measures to address these risks are outlined in the ESMP and the SEA/SH Prevention and Response Action Plan.

5.5.8 Positive Social/Community Impacts

For the most part the impact of the proposed road project on the socio-economic environment will be significantly beneficial. The project will strengthen the existing road by widening or new construction, paved shoulder and drainage improvement. Improved access to connecting roads with uninterrupted movement on wider roads will be a major stimulus to economic growth, particularly in rural areas of the sub-project areas. During construction, benefits to local people can be maximized if the contractor recruit's construction workers locally. Wherever possible, the contractors should also not discriminate in the employment of women. The long-term effects of the proposed project in poverty reduction are expected to be largely positive.

5.7 Climate-Related Impact

Climate change poses a significant challenge to the State of Meghalaya, with its diverse ecosystems, high biodiversity, and socio-economic dependence on agriculture, forestry, and natural resources. The state is highly vulnerable to the impacts of climate change due to its unique geographic and climatic conditions.

Rising temperatures have further contributed to ecological imbalances, affecting agricultural productivity, forest health, and water resources. Additionally, the district lies in Seismic Zone V, and the interplay of climate-induced hazards and geophysical risks adds further complexity to its vulnerability.

Due to the uneven climatic behavior, it is essential that climate mitigation and adaptation plans to combat the impacts of climate change are factored in the development process to avoid economic burden of adaptation in the long run, and gain from new opportunities that will be thrown up along the way. The Potential impacts of Climate Change trend on road transport infrastructure are provided in **Table 5.8**. A detailed preliminary assessment has been undertaken to assess climate disaster risks, details of which are available in **Annexure 5.6**.

Table 5.8: Potential impacts of Climate Change trend on road transport infrastructure

Climate Trend / Parameter	Observed Pattern	Impact on Road Infrastructure
High Rainfall	High Rainfall 2,100–2,500 mm (Umroi)	<ul style="list-style-type: none"> - Erosion of road embankments and landslides in hilly terrains. - Structural damage to culverts and bridges.
Low Rainfall	<ul style="list-style-type: none"> - Significant drop in annual rainfall - Reduced annual rainfall correlates with reduced soil moisture and vegetation 	<ul style="list-style-type: none"> - Dry soil conditions may cause cracks in asphalt roads. - Lower soil stability, leading to uneven settling of road foundations. - Loss of vegetation can weaken slopes and lead to landslides in hilly areas like Ri Bhoi Hills. - Roads may face increased dust and reduced traction due to dry conditions.
Rising Temperatures	- Maximum temperature rising from 24.5°C to 28.0°C	<ul style="list-style-type: none"> - Higher temperatures cause thermal expansion of road materials, leading to surface cracks. - Softening of asphalt during hot days can cause deformation and rutting.
Landslide Risk	- Frequent rainfall and runoff events increase landslide susceptibility in the district's terrain	<ul style="list-style-type: none"> - Roads in hilly areas may face closures due to landslides. - Increased repair costs for damaged road sections and disrupted connectivity to remote areas.

6. ANALYSIS OF ALTERNATIVES

6.1 Introduction

In line with best practices for managing environmental and social impacts, several alternative approaches have been considered for the proposed road widening and upgrade project. The design is being refined to enhance safety, improve the road structure, and accommodate both current and future traffic demands. This chapter presents an analysis of the potential impacts under the “With Project” and “Without Project” scenarios.

6.2 With and Without Project Alternatives

An alternative analysis was conducted for the project stretch, considering various design scenarios as well as a “Without Project” scenario. These are described in the following sections.

6.2.1 Without Project Scenario

The road traverses’ areas with high population densities, particularly in sonidan, Kohradem, Umlaper as well as hilly and rural stretches where traffic is frequently disrupted due to poor road conditions and the demand for efficient through-traffic movement. This situation is further exacerbated by land-use conflicts, including uncontrolled development along the route and encroachments within the designated right-of-way.

The continued growth in population, rising traffic volumes, and expanding economic activity along the corridor are likely to exacerbate the existing challenges. Without the proposed upgrades, current road safety hazards and adverse environmental impacts along the route are expected to persist and worsen. Additionally, the limited socioeconomic development of these remote and underdeveloped areas would remain constrained. Therefore, halting the project would not be practical or justified, as it would impede essential improvements and limit the potential for economic growth in the region.

6.2.2 With Project Scenario

The “With Project” scenario is expected to generate positive long-term impacts across social, environmental, economic, and financial dimensions. Key interventions include widening the existing roadway to intermediate lanes, in line with the project’s objectives.

From an economic perspective, the project is viable and is anticipated to substantially improve current conditions, supporting the development goals set by the Government of Meghalaya and enhancing the region’s growth potential.

While the project promises multiple developmental benefits, it is important to recognize that, like all infrastructure initiatives, it may also result in certain impacts on the environment and local communities.

Potential environmental and social impacts can be mitigated through the adoption of best environmental management and social development practices. Where impacts cannot be fully avoided, suitable mitigation measures will be implemented to minimize and offset adverse effects. A detailed comparison of the “With Project” and “Without Project” scenarios, along with the anticipated benefits of the proposed project, is presented in **Table 6-1** below.

Table 6.1: "With and Without" Project Scenarios – A Comparative Assessment

Component	"With" Project Scenario	"Without" Project Scenario
Highway Geometry	Intermediate lane with shoulder and paved surface is being developed with geometric improvements	Existing Single/Intermediate lane carriageway with poor geometry
Design Speed	(30-50 kmph for Intermediate lane)	30-40 kmph entire project section.
Congestion in Settlements	Improved carriageway with good surface and separated footpath with railing in built-up area reduces interaction of pedestrians with through traffic resulting in reduction of vehicular emissions, reducing travel time and vehicle operating cost. This in turn contributes to lowering of GHG emission; and may improve people/public health due to no or low exposure period.	Lack of road or lack of good road surface with shoulder and foot path, congestion and frequent vehicle stoppage due to mixing of local, pedestrian and through traffic will increase localized accumulation of vehicular emission with potential impacts on human health and contribute to generation of GHG emission.
Felling of roadside trees	Felling of both old and young trees. Old and weak trees near the road edge shall be a road hazard and shall be felled. Ten times of felled trees, the number of new young and healthy saplings to be planted as compensatory afforestation..	No Felling of trees hence maintaining the healthy local ecology.
Pedestrian safety	Pedestrian facilities in the form of footpath, street lights, etc. are to be provided in built-up area locations.	Lack of dedicated pedestrian facilities such as footpaths and adequate lighting making it unsafe for pedestrians.
Road Safety Measures	Provision of proper road markings, zebra crossings, crash barriers and improvement of geometry to reduce accidents.	Accident incidents will rise with an increased traffic volume.
Environmental Quality	Development of roads in hilly and urban settlements improves environmental quality within the urban areas due to lowered pollution levels and relieving of congestion. Besides, an aggressive tree plantation and provision of enhancement features shall not only provide aesthetics but also improve the quality of air.	Poor in settlement areas due to non-motorable road conditions, congestion and high emission levels because of slow movement of traffic. A further deterioration is expected due to Increase in traffic volumes and further congestion.
Drainage	Will be improved due to reconstruction of culverts / bridges/ side drains with adequate hydraulics.	These issues remain un-addressed without the project

Component	"With" Project Scenario	"Without" Project Scenario
Roadside Amenities	Appropriate roadside amenities to be provided at various locations along the corridor.	Not adequate in the present scenario.
Wayside Facilities	Wayside facilities are proposed at several locations, where necessary like rest areas, with appropriate facilities for recreation, road public toilets, street lights etc.	Not of adequate standards, quality and number in present scenario.
Environmental Enhancement	Enhancement of landslides/water bodies, community and cultural properties	No enhancement measures involved.
Social Development	Higher potential for social development due to improvement in access and consequent increase in connectivity.	Social development activities are likely to be significantly constrained due to the severe inadequacy of infrastructure.
Financial and Economic Analysis	Project financially viable for upgrading from existing lane configuration to intermediate lane configuration.	The cost of maintenance while catering to the projected higher traffic, accident cost, Vehicle operating cost & travel time cost shall be higher.

6.3 Environmental and Social Alternatives (To Specific Once) Considered for the Proposed Stretch

Various avoidance measures have been developed to minimize environmental and social impacts and to protect sensitive features along the proposed sub-project road. **Table 6.2** summarizes the measures adopted to offset these impacts, and a detailed description of each measure is presented in the following sections.

Table 6.2: Alternative considerations for Minimization of Environmental Impacts

CH No.	Type of Structure	Proposed Mitigation Measures	Purpose / Environmental Consideration
44+400 (LHS)	Community Stock Yard	During construction, the access point should not be disturbed. Safety measures should be taken during the construction phase such as barricading, signages etc.	To ensure uninterrupted community use and avoid temporary livelihood disruption
43+450 (RHS)	Community Fish Pond	Valley-side retaining wall to be proposed	To prevent soil erosion, slope failure, and contamination of the pond
48+320	Mawlaho Market	Junction improvement required	To reduce traffic congestion and enhance pedestrian and vendor safety
55+200 (RHS)	Synod Secondary School	Speed reduction measures; retaining wall and access realigned to avoid blind curve	To improve student safety and avoid accidents near school premises

62+136 (RHS)	Umlaper Sub Centre	Safety measures such as barricading and signage during construction	To ensure safe access for patients and prevent construction-related hazards
66+324 (LHS)	Umtraí PHC	Safety measures during the construction phase	To avoid disruption of healthcare services and protect emergency movement
69+755 (LHS)	Church Wall	Solar blinker and junction development proposed	To enhance visibility, prevent collisions, and protect nearby structures
76+200 (LHS)	Hostel Building	Safety measures such as barricading and signage during construction	To ensure safety of hostel residents, especially children, during construction activities

The Environmental and Social Impact Assessment conducted during the pre-design stage helped identify and mitigate potential negative impacts of the project. While the project is expected to provide numerous benefits, the assessment highlighted potential adverse effects associated with widening the road within the proposed 10 m right-of-way. Along these stretches, roadside communities are likely to be directly and immediately affected by construction activities, potentially experiencing losses of land, assets, and livelihoods. In line with the mitigation hierarchy for managing environmental and social risks, alternative analyses were conducted to minimize direct negative impacts. Based on these analyses, the design team was advised to limit road widening to within the existing right-of-way.

Mitigation measures primarily focus on settlements along the project road, particularly villages and towns or areas with the highest potential impacts. Stakeholder recommendations have been incorporated into the designs wherever feasible.

The following is a summary of the considerations incorporated into the road design to mitigate environmental and social impacts:

- The design will incorporate utility ducts for underground pipelines and GI (Galvanized Iron) pipe crossovers to ensure safe and organized routing of essential services, minimize future excavation, and enable maintenance without disrupting the road infrastructure.
- Curves and bends will be smoothed to improve geometric design; where adjustments may affect local settlements, road realignment has been proposed.
- Paved shoulders will be provided wherever possible to accommodate non-motorized traffic.
- Unnecessary displacement will be avoided by adjusting the alignment, narrowing the impact zone, or tailoring designs to meet both rural and urban cross-section requirements.
- Design speed will be reduced in densely populated areas to enhance safety.
- Impacts on existing shrines and places of worship will be minimized.
- Safety features, including speed control measures near schools and healthcare facilities, will be incorporated.
- Road elevation in settlement areas will be minimized to prevent water seepage into adjacent

properties.

- Ensure continuous access to businesses and residential properties throughout the construction period.
- Minimize land clearance to reduce the loss of public and private assets, including wells, tree plantations, and other community resources within the project area.

7. Stakeholder Consultation and Information Disclosure

This chapter presents an overview of the stakeholder consultations conducted as part of the Environmental and Social Impact Assessment (ESIA) for the proposed MLCIP. These consultations were intended to ensure a participatory approach in identifying and addressing potential environmental and social impacts of the project.

Relevant stakeholders were mapped and can be categorized under three broad categories as shown in below **Table 7.1**.

Table 7.1: List of relevant stakeholders

Category of stakeholder	Project Stakeholder
Project-Affected Parties	<ul style="list-style-type: none"> ▪ Village community ▪ Street side Shop Owners ▪ Shop owners (NTH) ▪ Residential structure owners ▪ Dorbar Shnong
Interested Parties	<p>Government agencies</p> <ul style="list-style-type: none"> • Public Works Department Meghalaya • Khasi Hills Autonomous District Council (KHADC) • Meghalaya Forests & Environment Department • Meghalaya State Pollution Control Board (MSPCB) • Meghalaya State Biodiversity Board (MSBB) • Land Records & Revenue Department, Meghalaya • Meghalaya State Disaster Management Authority (MSDMA) • Meghalaya Energy Corporation Limited (MeECL) (for electricity & power supply) • Public Health Engineering (PHE) Department (Water supply & sanitation) • Agriculture Department, Meghalaya • Irrigation Department, Meghalaya • Transport Department, Meghalaya • Department of Health Services, Meghalaya (including AIDS Control Society functions) • Department of Arts & Culture, Meghalaya (instead of Directorate of Archaeology, Meghalaya) • District Social Welfare Office (RI-Bhoi) • District Legal Services Authority • District Child Protection Unit • Office of the Child Development Project Officer • Educational Institute <p>Civil society organizations</p>

	<ul style="list-style-type: none"> • District Rural Development Agency (DRDA) Administration – livelihood & rural development initiatives • Ri-Bhoi Women’s Self-Help Group Federations – grassroots women’s collectives focused on livelihood generation, microfinance, and social empowerment. • Bethany Society – NGO based in Shillong working on disability inclusion, rural development, and sustainable livelihoods in the region. • Church-based Organisations (Presbyterian / Catholic Missions) – significant role in education, health, and social services across villages <p>Community Based Organization</p> <p>Bio-Diversity Management Committee</p>
Vulnerable groups	<ul style="list-style-type: none"> ▪ Women Headed Household (WHH), ▪ PAPs falling under Below Poverty Line (BPL), ▪ Scheduled Tribe (ST) categories, ▪ Persons with disabilities

During the ESIA, consultations were carried out with representatives from all three stakeholder categories, including government agencies, communities, and other organizations, with particular attention to vulnerable groups. Special focus was given to communities located in sub-project areas likely to experience significant impacts, such as effects on residential and commercial structures or on common property resources. Key common property resources identified include religious structures, public utilities, and other community assets critical to local livelihoods and cultural heritage.

Representatives from relevant stakeholders were consulted to incorporate their concerns and expertise, ensuring that the project aligns with broader developmental, economic, and environmental objectives. Key discussions focused on potential displacement, loss of livelihoods, environmental degradation, law and order issues, forest land concerns, irrigation impacts, structural matters such as cross-drainage structures, and corresponding mitigation measures. These consultations helped document and integrate the priorities and concerns of affected communities, providing valuable input to shape strategies for minimizing adverse impacts.

Through public consultations, stakeholders’ viewpoints and suggestions were captured and considered as inputs to the technical design. All suggestions were incorporated into the project design to the extent feasible and warranted.

Additionally, **Annexure 7.1** provides a summary of consultations with project-affected parties from local communities and institutional stakeholders from government agencies.

The project has prepared a project-level Stakeholder Engagement Plan (SEP), which outlines the procedures for stakeholder engagement throughout the project cycle. The SEP details the process, methods, and frequency of engagement with various stakeholders and will be implemented accordingly during the project period. Stakeholder Engagement Plan is attached as **Annexure 7.2**.


7.1 Public Consultation


Public consultations were a key component of the Environmental and Social Impact Assessment (ESIA) process. These consultations were conducted to ensure that the views, concerns, and suggestions of local communities and other stakeholders were effectively considered in project planning and decision-making. The process was guided by the principles of transparency, inclusiveness, and participation, in line with the requirements of the World Bank's Environmental and Social Standard 10 (ESS10) on Stakeholder Engagement and Information Disclosure. Consultations were organized at different stages of the project to inform stakeholders about the project objectives, potential environmental and social impacts, and proposed mitigation measures, while also providing an opportunity for them to share feedback and local insights. The outcomes of these consultations were incorporated into the project design and environmental and social management plans to enhance the project's sustainability and community acceptance.




7.1.1 Stakeholder Consultations



Stakeholder consultations formed an integral part of the Environmental and Social Impact Assessment (ESIA) process. These consultations were carried out to ensure that the perspectives, concerns, and expectations of all relevant stakeholders particularly the project-affected persons, IPs, and vulnerable groups were effectively captured and integrated into project planning and decision-making. A total of six consultations were conducted as part of the Environmental and Social Impact Assessment (ESIA) process for the proposed road project. These included two preliminary public consultations, one Focus Group Discussions (FGDs) with youth, two Focus Group Discussions (FGDs) with women and one with DPR consultant. Key Informant Interviews were also conducted with PAH. The details of consultations along the project road is presented in **Table 7.2**.



Table 7.2: Summary of consultations

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1.	Mawlaho	22-08-2025	Men (6)	<ul style="list-style-type: none"> • Participants appreciated the project and acknowledged its positive impact on the community. • Highlighted concerns about non-functional streetlights • Requested fair compensation and support in case of any demolitions affecting their properties or livelihoods. • Strong support from the local community for the project • Hill cutting in many road stretches. 	<ul style="list-style-type: none"> • Construct smoother roads to enhance accessibility and improve transportation. • Prioritize immediate repairs to address safety and mobility concerns in the community. • Ensure fair compensation and support for individuals affected • Hill cutting required 	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
2.	Umtraí	22-08-2025	Men (8)	<ul style="list-style-type: none"> • Suggestions were made to include speed breakers and signage in residential zones to ensure traffic safety. • Several attendees emphasized the importance of regular maintenance after project completion • Requested fair compensation and support in case of any demolitions affecting their properties or livelihoods. • Appreciation was expressed for efforts taken to engage the community and consider their feedback. 	<ul style="list-style-type: none"> • Construct smoother roads to enhance accessibility and improve transportation. • Prioritize immediate repairs to address safety and mobility concerns in the community. • Integrate pedestrian footpaths, ramps for differently-abled individuals, and tactile paving for visually impaired pedestrians in the design. 	
Key Informant Interview						

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1.	Umtraí	30.09.2025	PAH	<ul style="list-style-type: none"> Participants appreciated the project and acknowledged its positive impact on the community. 	<ul style="list-style-type: none"> Construct smoother roads to enhance accessibility and improve transportation. 	 <p>Time: 30-09-2025 14:04 Note: 58x476 Powered by NoteCam</p>
2.	Sonidan	30.09.2025	PAH	<ul style="list-style-type: none"> Minimum cutting of trees 	<ul style="list-style-type: none"> Construction is restricted to existing RoW 	 <p>Latitude: 25.922762 Longitude: 92.13218 Elevation: 762.339416 m Accuracy: 3.0 m Time: 30-09-2025 12:40 Note: 48x340 Powered by NoteCam</p>  <p>Latitude: 25.922837 Longitude: 92.132185 Altitude: 718.114600 m Accuracy: 11.1 m Time: 30-09-2025 12:33 Note: 48x340 Powered by NoteCam</p>

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
FGD with Youth						
1.	19.09.2025	Umlaper	Youth (8 nos.)	<ul style="list-style-type: none"> • Limited local opportunities, inadequate skill development platforms, and lack of structured guidance • Migration remains a major coping strategy, but often comes with social and economic risks 	<ul style="list-style-type: none"> • Integrate capacity-building and skill development components • Encourage microenterprise development by promoting small-scale livelihood opportunities • 	
FGD with Women						
1.	19.09.2025	Sonidan	Women (4 nos.)	<ul style="list-style-type: none"> • Women are eager to contribute economically but are constrained by limited opportunities, social barriers, and lack of structured support 	<ul style="list-style-type: none"> • Integrate women-focused skill development initiatives 	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
2.	19.09.2025	Umsiang	Women 2 nos.)	<ul style="list-style-type: none"> There is a pressing need for inclusive, women-centric interventions that promote local entrepreneurship, skills, and connectivity 	<ul style="list-style-type: none"> Strengthen participation of women's Self-Help Groups (SHGs) in project-related awareness, monitoring, and plantation maintenance programs. 	
Consultation with DPR consultant						
1.	DPR Consultant	25-08-2025	DPR Consultants	<ul style="list-style-type: none"> Preliminary observations from an 37.481 km site visit were presented, along with information requirements. Current data for Existing Right of Way (ERoW) and Proposed Right of Way (PRoW) is unavailable. PRoW will be considered as 10 meters, in accordance with 	<ul style="list-style-type: none"> Incorporate the 10-meter Proposed Right of Way (PRoW) into the design to ensure compliance with relevant codes for state highways. Utilize the data from the topographic survey conducted within a 60-meter width to inform the design process and address any topographical challenges. Develop flexible design options that can accommodate variations in the PRoW, ensuring 	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
				<p>relevant codes for state highways.</p> <ul style="list-style-type: none"> • A topographic survey has been conducted within a 60-meter width. 	<p>that any potential adjustments can be made without significant delays.</p> <ul style="list-style-type: none"> ▪ Integrate drainage solutions into the design to manage water runoff effectively, particularly in areas prone to landslides or flooding. ▪ Consider the inclusion of safety features such as guardrails and proper signage to enhance road safety along the newly proposed road alignment. ▪ Plan for ecological assessments to ensure that the road design minimizes environmental impacts, especially in sensitive areas identified during the site visit. ▪ Allow for future expansion possibilities in the design to accommodate potential increases in traffic volume and road usage over time. 	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					<ul style="list-style-type: none"> Engage with local communities to gather input and address concerns regarding the design, particularly in relation to access and land. 	

7.1.2 FPIC Process

As per the requirements of the World Bank's Environmental and Social Standard 7 (ESS7), the Free, Prior, and Informed Consent (FPIC) process is required for the following circumstances:

(i) have adverse impacts on lands and natural resources traditionally owned or used by Indigenous Peoples, including situations where such ownership is not legally recognized; (ii) result in the relocation or physical displacement of Indigenous households or communities from their customary or ancestral lands; or (iii) have significant impacts on Indigenous Peoples' cultural heritage, including their cultural, spiritual, or sacred sites and practices that hold collective significance for their identity and well-being.

In the case of the proposed road project, the FPIC process was triggered under the first condition, as the project activities involve the use of land and natural resources traditionally owned and utilized by Indigenous communities. The process was therefore undertaken to ensure that affected communities were fully informed, consulted in a culturally appropriate manner, and provided their collective consent prior to implementation.

The FPIC process was carried out in a phased and participatory manner, beginning with preliminary stakeholder mapping and engagement with the local Dorbar Shnongs (village councils).

The scope of the Borrower's Free, Prior, and Informed Consent (FPIC) process encompassed comprehensive engagement with Indigenous Peoples (IPs) and traditional institutions to ensure culturally appropriate participation throughout project preparation. The FPIC process included discussions on key aspects of the project, such as the proposed road design, alignment options, construction methodology, and implementation arrangements, as well as the anticipated environmental and social impacts and proposed mitigation measures. Consultations were conducted with representatives of the Dorbar Shnong (village councils), village elders traditional leaders (Rangbah Shnong), women's groups, youth representatives, and other community members residing within the project's area of influence.

The discussions also focused on the potential risks associated with the project—such as impacts on land, access to livelihoods, and cultural resources—and on measures proposed to avoid, minimize, or mitigate these impacts. Community members were informed about the project's benefits, including improved road connectivity, economic opportunities, and enhanced access to essential services. The FPIC process thus ensured that Indigenous communities were not only consulted but also actively involved in shaping project decisions, implementation arrangements, and benefit-sharing mechanisms, reflecting their collective consent and ownership over the development process.

The FPIC process was conducted in a transparent and participatory manner, ensuring that community participation was entirely voluntary and free from any form of external manipulation, interference, or coercion. All consultations were facilitated by the ESIA team in collaboration with the Public Works Department (PWD) and information disclosed well in advance in the local Khasi language. Meetings were held in accessible community spaces and scheduled in consultation with local leaders to maximize participation. Written consent from community representatives and participants was obtained through attendance sheets and minutes of meetings (MoM), which were duly reviewed and counter-signed by the Rangbah Shnong (village headmen), council members, and representatives of the participating villages. Photographic and video documentation further corroborates that participants were engaged freely, and expressed their views without any undue pressure or influence. The signed records and documentation of the FPIC proceedings are enclosed in Annexure 7.3 of this report.

Information related to the proposed road project was disseminated in a culturally appropriate and accessible manner to ensure full understanding and participation of Indigenous communities. Project

details including road alignment maps, typical cross-sections, and environmental and social management measures were presented using simple visual aids such as diagrams, maps, and posters. These materials were translated into the local Khasi language and explained verbally during meetings to accommodate all literacy levels. The consultation sessions were facilitated by local interpreters and community mobilizers familiar with local customs and communication practices, ensuring clarity and mutual understanding. Frequently Asked Questions (FAQs) like project objectives, timelines, expected benefits, and potential risks were addressed during each session. Meetings were conducted in familiar community spaces, allowing both men and women, including elders and youth, to freely participate and express their views. This culturally sensitive approach ensured that the FPIC process was inclusive, transparent, and fully aligned with the traditional decision-making systems of the Khasi community.

- Process of good faith negotiation (sufficient time for IP Communities' decision-making, willingness to compromise,) and agreements reached that documents the process of GFN

The FPIC process was conducted through good faith negotiations between project authorities and Indigenous Peoples' communities, allowing adequate time for traditional institutions and affected households to review project information, discuss internally, and make collective decisions. The project team incorporated community feedback—such as alignment adjustments and provision of stand shed—reflecting genuine efforts at consensus-building. All meetings were held transparently and respectfully, enabling free expression of views, particularly from women and elders, without coercion or interference. Agreements reached were documented through signed minutes and countersigned by the Rangbah Shnong and KHADC representatives, serving as evidence that the FPIC process was participatory, voluntary, and conducted in good faith.

Free, Prior, and Informed Consent (FPIC) Process adopted for the project road.

The ESIA consultant, comprising of four experts (Social, community, Tribal and Gender) and two community mobilizers, initiated the Free, Prior, and Informed Consent (FPIC) process by identifying affected communities within the project's area of influence, in accordance with the requirements of World Bank ESS7.

One-on-one interactions were conducted with Village council members, the secretary, and other key representatives between 25th and 30th August 2025 to discuss the project and assess the communities' willingness to participate in the process.

Official Invitations to Stakeholders – The Village Council (Dorbar Shnong) agreed to call a meeting with village heads, traditional leaders, elders, women's groups, affected persons, and youth representatives to facilitate the consultation process. A mutually agreed-upon schedule was developed to ensure that community members had ample time to participate in discussions. The schedule outlined the sequence and timing of pre-consultation meetings, FPIC rounds, and focus group discussions—covering initial one-on-one meetings (25–30 August 2025), the first FPIC consultations (04 September 2025), and the second FPIC consultation (19 September 2025). This schedule, agreed upon collectively by community representatives and project officials, provided sufficient time for advance notice, internal deliberations within each village, and informed participation during meetings.

Conducting consultations and obtaining consent - Comprehensive efforts were made to ensure Free, Prior, and Informed Consent (FPIC) from Project Affected Persons (PAPs), stakeholders, community members, and the village Council. Three rounds of Free, Prior, and Informed Consent (FPIC) consultations were

conducted with the Indigenous communities along the project corridor. These included an initial round to introduce the project and explain the FPIC process, a second round to present the detailed project design and discuss potential environmental and social impacts, and a third round (planned as part of the ESIA disclosure phase) to confirm community consent and agreement on mitigation measures.

FPIC consultations undertaken for the project stretch are explained below:

- The first round of consultations for FPIC was conducted by the ESIA team on **04.09.2025** at three different locations. The consultations were held at **Sonidan Community Hall, Sonidan at 10:00 AM, Umlaper Community Hall, Umlaper at 12:00 PM, and Umsiang Community Hall, Umsiang at 03:00 PM** with a **total of 61 participants**. The participants included project-affected persons (PAPs), village headmen (Rangbah Shnong), government officials, civil society organizations and representatives from the Khasi Hill Autonomous District Council (KHADC). The discussions focused on key concerns such as displacement, livelihood loss, minimizing project impacts and the protection of common property resources. As part of this process, participants were also sensitized about the project and introduced to the principles of **Free, Prior, and Informed Consent (FPIC)**, thereby marking the initiation of the FPIC process. The signed mom of the FPIC proceedings are enclosed in Annexure 7.3 of this report.
- The second round of consultations for **FPIC** for the project road was conducted on **19.09.2025** at three different locations. The meetings were held at **10:00 AM in Sonidan village, 1:00 PM in Umlaper village, and 4:00 PM in Umsiang village**. This meeting provided an important platform for stakeholders to deliberate on project details, address community concerns, and ensure transparent and inclusive communication. The proceedings were presided over by the Assistant Executive Engineer (AEE), Sub-Divisional Officer (SDO), and representatives of key consultancy firms including *Enviro Infra Solutions (ESIA Consultants)*, *KOBA Engineering Services Pvt. Ltd. (DPR Consultants)*, and *Satra Consultancy (ESMF Consultants)*. Local stakeholders, including village headmen, women, and youth representatives, also took part, ensuring broad-based and inclusive participation. In total, **75 local stakeholders participants** engaged actively in the discussions, reflecting the community's genuine interest in the proposed infrastructure development.
- The meeting was organized in a structured manner to cover all key aspects. It commenced with the chairperson reading out the minutes of the first FPIC meeting to maintain continuity and transparency. This was followed by a detailed presentation of the Detailed Project Report (DPR), a comprehensive session on the Environmental and Social Impact Assessment (ESIA), and an informative discussion on the Grievance Redress Mechanism (GRM). To encourage active and inclusive participation, two parallel group discussions were held: one dedicated to women participants to capture their specific perspectives, and another with the youth group to gather their insights and suggestions. This structured approach ensured that diverse viewpoints were acknowledged and documented, thereby strengthening the participatory nature of the FPIC process. Local stakeholders, including village headmen, women, and youth representatives, also took part, ensuring broad-based and inclusive participation. The signed mom of the FPIC proceedings are enclosed in Annexure 7.3 of this report.

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The third round of consultations for **FPIC** for the project road was conducted on **10.10.2025 in Sonidan**. This meeting provided an important platform for stakeholders to deliberate on project details, address community concerns, and ensure transparent and inclusive communication. The proceedings were presided over by the Assistant Executive Engineer (AEE), Sub-Divisional Officer (SDO), and representatives of key consultancy firms including *Enviro Infra Solutions (ESIA Consultants)*, *KOBA Engineering Services Pvt. Ltd. (DPR Consultants)*, and *Satra Consultancy (ESMF Consultants)*. Local

stakeholders, including village headmen, women, and youth representatives, also took part, ensuring broad-based and inclusive participation. In total, **34 local stakeholders' participants** engaged actively in the discussions, reflecting the community's genuine interest in the proposed infrastructure development.

- The meeting was organized in a structured manner to cover all key aspects. It commenced with the chairperson reading out the minutes of the first FPIC meeting to maintain continuity and transparency. This was followed by a detailed presentation of the Detailed Project Report (DPR), a comprehensive session on the Environmental and Social Impact Assessment (ESIA), and an informative discussion on the Grievance Redress Mechanism (GRM). To encourage active and inclusive participation, two parallel group discussions were held: one dedicated to women participants to capture their specific perspectives, and another with the youth group to gather their insights and suggestions. This structured approach ensured that diverse viewpoints were acknowledged and documented, thereby strengthening the participatory nature of the FPIC process. The signed mom of the FPIC proceedings are enclosed in Annexure 7.3 of this report.

Sufficient time and Information to enable Informed Consent – Consultations were conducted in Khasi, the local language, to ensure informed participation. A one week prior notice was issued to inform communities about the meeting schedules. During the FPIC meeting, the project team provided detailed information on project impacts, benefits, mitigation measures, and grievance mechanisms through presentation.. The indigenous communities were given adequate time to discuss, ask questions, and deliberate before providing or withholding consent for the project. The details regarding the agreements which were reached with the communities as conditions of FPIC are summarized as a part of FPIC mom and attached as Annexure 7.3.

Documentation of FPIC Proceedings – The discussions, concerns, inputs, and decisions made during the FPIC meetings were recorded, analyzed, and formally documented. All meetings were documented through minutes, photographs, and videography to maintain a transparent record and ensure that Project-Affected Persons (PAPs) participated freely and voluntarily, without coercion. Attendance was recorded at each consultation to confirm the presence of key stakeholders and community members. The Minutes of Meeting (MoM), including photographs and attendance sheets for FPIC 1 and FPIC 2, are presented in **Annexure 7.3**. The outcomes of the 1st, 2nd and 3rd FPIC are summarized in **Tables 7.3 to 7.5**, respectively, while photographs of the FPIC sessions are presented in **Figures 7.1 to 7.3**.

Table 7.3: Summary of the FPIC 1 Meeting


Si.No	Issue discussed
1.	Representatives expressed enthusiasm for the project, noting it as a long-awaited initiative for regional development.
2.	Key concerns raised included transparency in land requirements; stakeholders requested advance notification to affected landowners.
3.	Regarding land acquisition, the Chairman clarified that all processes will be followed if land is to be acquired.
4.	Requests were made for additional amenities such as street lights, footpaths, proper drainage




	systems, bus sheds, and safety features in inhabited areas.
5.	The member presents also suggest that, in case the road alignment passes near the buildings, Retaining Wall/ breast wall or any similar structure may be provided to bring stability to the exposed soil strata.
6.	It is also suggested junction improvement maybe provided wherever necessary.
7.	The meeting resolved to extend full cooperation for timely execution and urged prompt resolution of any issues during implementation by relevant authorities.



Figure 7.1: Photographs during 1st FPIC

Table 7.4: Transact Walk with the Village Representatives after the 2nd FPIC Meeting

CH No	Descriptions	Pictures
40+600	To LHS there are settlement where the community identify the junction to be feasible for a stand shed to the RHS	

41+100	To LHS from Sonidan, there are settlement where the community identify the junction to be feasible for a stand shed to the RHS	
45+000	A proper subway needs to be constructed as adjacent there is agricultural land and it's a perennial land. Also the community would give the land free of any encumbrance for making the subway.	
47+100	For the proposed realignment of this road section, it is estimated that more than eight trees will need to be cut down. (The request purpose for realignment of the road is because the community wanted to develop the existing pond and also for other community projects).	

The table above presents in detail the key concerns raised by village representatives during the transact walk after the end of the DPR presentation. These issues were carefully recorded and further examined during the subsequent site visit, which played an important role in validating the concerns and identifying practical solutions.

It is essential that the identified sites receive due attention from the DPR team, particularly where they have not yet been incorporated into the existing Detailed Project Report. Special caution must be exercised in relation to water sources to avoid any risk of contamination or disruption during construction activities.





Figure 7.2: Photographs during 2nd FPIC

Table 7.5: Summary of the FPIC 3 Meeting

Agenda Item	Key Points Discussed
Welcome & Opening	<ul style="list-style-type: none"> - Meeting opened with a welcome address by the Headman of Sonidan Village. - Minutes of the previous meeting were read by the AEE, PWD (Roads), Mawhati Sub-Division.
Session on Draft DPR	<ul style="list-style-type: none"> - KOBA Consultant presented the draft DPR, explaining existing road conditions and proposed geometric design. - Consultant highlighted that additional facilities (drainage, footpath, bus shed) require extra land. - AEE emphasized the necessity of these facilities, especially in habitation areas.
Economic & Social Impact Discussion	<ul style="list-style-type: none"> - ESIA representative presented likely economic and social impacts along the corridor. - Chainage-wise impacts were explained to the participants. - Need for additional land for curve correction was reiterated. - ESIA team to identify landowners and expedite follow-up actions.
Closing Remarks	<ul style="list-style-type: none"> - Headman thanked participants for attending and contributing. - Emphasized collective commitment and cooperation for successful project implementation.





Figure 7.3: Photographs during 3rd FPIC

The FPIC process resulted in community consent for the project, conditional upon:

- Inclusion of slope protection and breast walls,
- Provision of stand shed,
- Ensuring safety of nearby public structures,
- Environmentally sound muck disposal practices, and
- Continuous coordination with the *Dorbar Shnong* and PWD for implementation and grievance handling.

No dissenting opinions were recorded, and the participants unanimously agreed to support the project following these commitments. All the agreements and commitments outlined above were formally documented in the Minutes of Meeting (MoM) of the FPIC–III consultation and counter-signed by the participants, including representatives from the *Dorbar Shnong*, local communities, and project officials. The signed MoM, along with attendance sheets and photographic evidence, is attached as Annexure 7.3.

Summary of FGD with Youths (Under FPIC Process)

As part of the FPIC consultation process, a Focus Group Discussion (FGD) was conducted on **19.09.2025** with local youth representatives to understand their perspectives on livelihood challenges, employment opportunities, and migration trends in the project area. Many participants shared that migration to urban centers like Shillong and Guwahati is often a coping mechanism driven by better income prospects, though it exposes them to social and economic risks. The youths emphasized the need for skill training, entrepreneurship promotion, financial support mechanisms, and local job creation through government and private sector engagement. They also recognized that improved road connectivity under the proposed project would enhance market access, tourism potential, and livelihood diversification. These insights have been incorporated into the project's livelihood enhancement and community engagement strategy, ensuring that youth-related priorities are addressed during implementation.

Summary of FGD with Women (Under FPIC Process)

As part of the FPIC consultation process, a Focus Group Discussion (FGD) was held with local women participants to understand their livelihood challenges, access to opportunities, and perspectives on the proposed project. Most women are engaged in agriculture, weaving, poultry, and small-scale enterprises, while some migrate to nearby cities like Shillong and Guwahati for domestic or factory work due to limited local opportunities. Participants emphasized the need for women-focused skill training centres, microfinance access, awareness on welfare schemes, and support for women-led cooperatives in agro-

processing and handicrafts. Improved road connectivity under the project was seen as a key enabler for better market access and mobility. The insights and recommendations gathered during this FGD have been incorporated into the project's Gender Action Plan and Livelihood Development Strategy to ensure inclusive benefits for women and other vulnerable groups.

Public Disclosure: Draft Environment and Social Impact Assessment (ESIA), Draft Environment and Social Management Plan (ESMP), Draft Resettlement Action Plan, Draft Indigenous People Development Plan (IPDP) for project road will be uploaded at MPWD website for public disclosure along with the Executive Summary in local language i.e. Khasi.

8. Environmental and Social Management, Monitoring & Reporting Programme

8.1 General

Monitoring and reporting are critical components in the implementation of the project. Monitoring involves periodic checks to determine whether activities are being carried out in accordance with the proposed mitigation plans. It provides essential feedback to project management, helping ensure that project objectives are achieved on schedule. The reporting system ensures that environmental and social mitigation measures are implemented as planned. Together, monitoring and reporting support the proper implementation of the Environmental and Social Management Plan (ESMP).

The broad objectives of monitoring and reporting on E&S management are:

- To evaluate the performance of mitigation measures proposed in the ESMP and in other mitigation plans.
- To evaluate the adequacy of environmental and social assessment.
- To suggest improvements in ESMP and other mitigation plans based on the monitoring and to devise fresh monitoring based on the improved ESMP.
- To enhance environmental quality and social development through proper implementation of suggested mitigation measures.
- To meet the requirements of the existing environmental and social regulatory framework and community obligations.

8.2 Environment and Social Management Plan

The Environmental and Social Management Plan (ESMP) has been prepared in accordance with the World Bank's Environmental and Social Framework (ESF) to ensure that the potential environmental and social impacts identified during the assessment are effectively managed during the design, construction, and operation phases of the project. The ESMP outlines specific mitigation, enhancement, and monitoring measures; defines institutional responsibilities; and provides a framework for capacity building and reporting. It serves as a practical tool to guide the implementation of mitigation measures, ensuring compliance with applicable national regulations and the World Bank's Environmental and Social Standards (ESSs), while promoting sustainable and inclusive project outcomes. Environment and Social Management Plan is presented in Table 8.1.

Table 8.1: Environmental and Social Management Plan

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
PRE-CONSTRUCTION						
1	Consents/ Permits/ Approvals/ Compliances	Non-compliance to various Environmental/ social/ regulatory requirements pertaining to the proposed project could lead to legal Implications	<ul style="list-style-type: none"> ➤ Obtain all necessary statutory clearances (CTE, CTO, Labour License, Fire NOC, Tree Cutting Permission, etc.) ➤ Renew permits before expiry. 	Contractor/ MPWD	CTE, CTO, Labour License, Fire NOC, Tree Cutting Permission to be submitted and tracked	MPWD/PMC/CSC
2	Land Procurement	Loss of Land/ Livelihoods	<ul style="list-style-type: none"> ➤ RPF and RAP shall be followed. 	MPWD division, contractor and concerned authorities	Compensation records maintained; Grievances resolved	MPWD/CSC/NGO
3	Contractor's ESMP (CESMP) Preparation and Implementation	Inadequate preparation and implementation of CESMP by Contractor can leave environmental and social issues unattended	<ul style="list-style-type: none"> ➤ The contractor needs to follow the project ESMP to formulate the CESMP and get it approved by MPWD. 	Contractor	Approved CESMP including TMP, LMP and other relevant plans, and implemented;	MPWD/PMC/CSC
4	Identification of land for material storage yard/ construction camp/ labour camp	Discharges from Yards/ Camps to pollute the surroundings and lead to social tension.	<ul style="list-style-type: none"> ➤ Contractor needs to identify suitable land for storage yard/ construction camp/ labour camp ➤ The land shall not be closer to the water bodies, waterlogged areas or wetlands. ➤ The land will be handed back to the owner in the same condition as it was prior to the commencement of 	Contractor	Approved site location; Lease/NOC copies;	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			project activities, once the project is completed. ➤ Contractor to produce the lease agreements, NOC etc. for these lands.			
5	Supply of Construction Material	Sourcing materials from unauthorized sources.	➤ Procurement of construction material only from approved quarries and sites and licensed/ authorized vendors/ manufacturers. Contractor to produce approvals and receipts.	Contractor	EC, Permits, challans, Material source approval copies;	MPWD/CSC
6	Water	Pollution of surface and groundwater sources.	➤ The Contractor will be responsible for arranging adequate supply of water for the entire construction period. ➤ The contractor will minimize the pollution and wastage of water during construction	Contractor	Permission for Water source; Usage records; Wastewater management measures	MPWD/PMC/CSC
7	Appointment of Environment, Social and Safety Officers	Inefficient and incompetent supervision by contractors may lead to negative impacts on environment, Social, health and safety.	➤ The Contractor would prepare OHS plan and other required plans; as a part of CESMP, as per the WB guidelines. ➤ The contractor will appoint qualified and experienced Environment. Social and Safety personnel to ensure implementation of CESMP and occupational health and safety issues at the camps and construction work sites.	Contractor	To be mobilized before construction; approved OHS plan	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
8	Identification of OHS Hazard and Risk Categorization	May cause physical harm, injury, illness, or death to workers.	<ul style="list-style-type: none"> ➤ Conducting workplace inspections to identify hazards and document. ➤ Consulting with workers to identify hazards that may not be obvious to employers or safety professionals. ➤ Reviewing safety data sheets (SDSs) to collect information about the hazards of chemicals and other substances used in the workplace. ➤ Consulting with industry standards and regulations to identify specific hazards that must be addressed in the workplace. 	Contractor	OHS hazard register; Inspection reports;	MPWD/CSC
9	Other Construction Vehicles, Equipment and Machinery	Vehicles and equipment not complying with regulations may lead to pollution of environment.	<ul style="list-style-type: none"> ➤ The contractor will maintain records of fitness and Pollution Under Control (PUC) certificates for all vehicles and generators used during the contract period 	Contractor	Records of valid PUC / fitness; Inspection log	MPWD/PMC/CSC
10	Tree Cutting	Loss of green cover and biodiversity	<ul style="list-style-type: none"> ➤ Maximum efforts shall be made to minimize the number of trees to be felled. ➤ Tree cutting and disposal shall be done as per the Forest Dept. 	Contractor	Records of trees cut and saved.	MPWD/CSC
11	Joint field verification	The impacts may not have been identified in time.	<ul style="list-style-type: none"> ➤ The MPWD and the Contractor shall carry out joint field verification to ascertain the local complaints/suggestions and to confirm the need for additional protection measures or changes in 	Contractor	Verification reports;	MPWD

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			design/scale/nature of protection measures including the efficacy of enhancement measures suggested in the ESMP. The MPWD shall maintain proper documentation and justifications/reasons in all such cases.			
12	Damage to existing eco-system due to borrowing activities	Indiscriminate borrowing activities may damage the eco-system and lead to unproductive environment	<ul style="list-style-type: none"> ➤ The Contractor will have to obtain the Environmental Clearance for borrow areas. ➤ The borrow area will be operated as per the MoEFCC guidelines issued by the concerned SEAC and SEIAA. 	Contractor	Borrow area EC copy; Approved management and closure plan	MPWD /CSC
13	Identification of construction material transportation route	Inconveniences and safety issues to the public due to the material transport vehicles.	<ul style="list-style-type: none"> ➤ The material transport route through existing network of roads should be planned and approved by the local transport authorities. ➤ The local communities need to be consulted with prior information on any likely inconveniences. 	Contractor	Approved route plan; Community consultation record	MPWD/CSC
14	Identification of sites for debris disposal or wastes generated from construction camps and site offices	Pollution due to indiscriminate dumping of wastes. Wastes entering water bodies and groundwater causing pollution	➤ MPWD Division and the Contractor are responsible for identifying a suitable area in consultation with local administration to dispose of the wastes from labour camps, construction sites and site offices.	Contractor	Approved disposal site and its management plan; NOC, Agreement with landowner; Waste disposal records;	MPWD/CSC
15	Relocation of Utility and Common Property Resources	Loss of services from utilities and common property resources for	➤ When the utilities/ Common Property Resources need to be shifted, they will be shifted in	Contractor/ MPWD Division	Records of Relocation completion.	MPWD/ PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
	(CPR)	the public	consultation with the communities and with least inconvenience to the public. ➤ If any displacement of Utility/CPRs is required, they will be relocated with prior approval of the concerned agencies. The relocation site identification will be in accordance with the choice of the community.			
CONSTRUCTION						
1	Crushers, Hot mix Plants & Batching Plants	Impacts due to establishment and operation of plants and equipment	<ul style="list-style-type: none"> ➤ Crushers, hot-mix and batching plants shall be located at least 1000m (1km) away from residential/ settlements, forests, wildlife movement areas, and commercial establishments, preferably in the downwind direction. ➤ The Contractor shall submit a detailed layout plan for all such sites and seek prior approval before entering into a formal agreement with a landowner for setting-up such sites. ➤ Specifications of crushers, hot mix plants, and batching plants shall comply with the technical requirements of the contract and prior Consent / NOC for all such plants shall be obtained. 	Contractor	Approved layout plan; Valid NOCs/Consents; Dust suppression records; Air quality monitoring reports	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			➤ No such installation by the Contractor shall be allowed till all the required legal clearances are obtained from the competent authority.			
2	Borrow Areas	Impacts due to improper operation and closing of borrow areas	<ul style="list-style-type: none"> ➤ Borrow area should be located at a minimum distance of 300m from the residential/ settlement area. Proper barricading should be provided and access to the borrow areas should be restricted to the unauthorized persons. ➤ The Contractor should submit the EC, a copy of agreement with the landowner, borrow area management and closure plan before initiating any kind of borrowing activities. 	Contractor	EC and lease copies; Approved Borrow area restoration and Closure plan	MPWD/PMC/CSC
3	Quarries	Impacts due to improper management, operation and closing of quarries	<ul style="list-style-type: none"> ➤ The Contractor shall identify materials from legally valid quarries with existing NOC from the relevant departments. ➤ No quarry or associated plants can be set-up within 1000m from the residential/ settlement locations ➤ Contractor shall prepare a haul road network for quarry transport and ensure the suitability of such haul roads from the safety of residents, biodiversity and other environment points of views. 	Contractor	Quarry permit, EC; Safety inspection report; Haul road maintenance record, dust suppression measure, geotagged photos	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
4	Dismantling of Bridges/ Culverts/ Structures	Impacts due to improper dismantling and disposal	<ul style="list-style-type: none"> ➤ All necessary precautions shall be taken while working near cross-drainage channels, to prevent earthwork, stonework, construction materials from obstructing cross-drainage at rivers, streams, and drainage systems, or from causing flooding. ➤ Reusable materials (e.g., steel, stones, bricks) shall be segregated and stored properly for reuse or recycling. ➤ Non-recyclable debris and waste materials shall be transported to approved disposal sites identified and approved by the concerned authority. ➤ Disposal sites shall be located away from water bodies, agricultural lands, and other environmentally sensitive areas. ➤ Temporary barriers or silt fences shall be provided to prevent debris from entering watercourses. ➤ Upon completion, the associated disposal sites shall be restored to their original condition or as directed by the Engineer 	Contractor	Debris disposal/reuse records; Approved Site restoration plan; Photographic documentation.	MPWD/PMC/CSC
5	Bituminous waste disposal	Impacts due to hazardous wastes	<ul style="list-style-type: none"> ➤ The contractor shall maintain records of quantities generated, transported, and disposed of, along 	Contractor	Records of Waste reused/disposed; Details of	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>with details of the disposal site and approvals obtained.</p> <ul style="list-style-type: none"> ➤ Bituminous waste shall be collected and stored temporarily in impermeable, lined containers or areas to prevent leaching or contamination of soil and groundwater. ➤ The disposal of bituminous wastes shall be carried out by the Contractor at secure landfill sites approved by the concerned government authorities. ➤ No bituminous waste shall be disposed of in water bodies, open lands, agricultural fields, or along the roadside ➤ Periodic inspections shall be carried out to ensure compliance with waste management guidelines. ➤ Where feasible, recycling or reuse of scarified bituminous material in road base or other construction activities shall be promoted, subject to environmental and quality standards. 		approved disposal site; Photographic documentation.	
6	Contamination of Soil	Soil pollution due to Oil and fuel spills from construction equipment and plants.	<ul style="list-style-type: none"> ➤ Construction plants, workshops, and fuel storage areas shall be located at least 500 m away from any surface water body and environmentally sensitive locations. 	Contractor	Spill log; Waste oil disposal records; Fuel storage inspection record. Photographic	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ Oil interceptors shall be installed at construction camps, vehicle parking, and washing areas to trap oil and grease before wastewater is discharged. ➤ All fuel and lubricant storage tanks shall be placed on impermeable platforms or within bunded (contained) areas. ➤ Regular maintenance and inspection of construction equipment and vehicles shall be carried out to prevent leakage of oil, fuel, or hydraulic fluids. ➤ Spill control kits (absorbent pads, sand, and containment booms) shall be available at all fuel storage and handling locations. ➤ Used oil and lubricants shall be collected, stored in labelled, leak-proof containers, and handed over only to authorized aggregators/recyclers for disposal in compliance with applicable hazardous waste regulations. ➤ Records of fuel usage, storage, and waste oil disposal shall be maintained and made available for inspection. ➤ Stormwater runoff from fuel and equipment storage areas shall be 		documentation.	

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			directed through oil-water separators before discharge.			
7	Air Pollution - Dust Generation	Dust generation will cause air pollution and will have impacts on health and safety.	<ul style="list-style-type: none"> ➤ Vehicles delivering materials should be covered to reduce spills and dust blowing off the load. ➤ Water should be sprinkled regularly on the work sites. ➤ Road slopes to be covered immediately after completion. ➤ Speed limits shall be enforced for construction vehicles within and near project sites to reduce dust generation. ➤ Personal protective equipment (PPE) such as masks shall be provided to all workers exposed to dusty environments. ➤ Air quality monitoring shall be conducted periodically to ensure compliance with prescribed air quality standards. ➤ Community complaints related to dust shall be recorded, and addressed promptly. 	Contractor	Air quality monitoring reports; Dust suppression log; PPE compliance records	MPWD/PMC/CSC
8	Emissions	The emissions from vehicles and construction equipment will pollute the air causing health and safety issues as well.	<ul style="list-style-type: none"> ➤ Fitness and PUC of the vehicles and equipment's need to be ensured. ➤ LPG shall be used as fuel for cooking of food at construction labour camp instead of fuel wood. ➤ Dust extraction, collection and control systems shall be installed at 	Contractor	Valid PUC certificates; Equipment maintenance log; Emission test results	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			batching plants, crushers, and material handling areas to minimize particulate emissions.			
9	Contamination of Surface / Ground Water	Discharges from construction activities and construction camps/ labour will lead to surface/groundwater pollution.	<ul style="list-style-type: none"> ➤ All the debris resulting from construction activities and labour camp shall be removed from the site and disposed at approved sites away from water bodies, on a regular basis to prevent them from getting into surface runoff. ➤ Adequate sanitation and waste management facility to be provided in construction camp. ➤ Construction labours should be restricted from polluting the water sources or misusing the sources. ➤ Use least amount biodegradable bentonite slurry during piling work. ➤ Contain the Bentonite slurry properly, to not enter waterways or soil and dispose of the slurry appropriately after use. 	Contractor	Water quality monitoring report; Waste disposal records; Camp inspection records. Photographic documentation.	MPWD/PMC/CSC
10	Water requirement for project	Over extraction or exploitation of ground/surface water will lead to water scarcity.	<ul style="list-style-type: none"> ➤ Contractor to ensure optimum and judicious use of water; ➤ Discourage labour from wastage of water and applicable prior approvals shall be obtained from concerned authorities. ➤ Rainwater harvesting structures shall be installed at construction 	Contractor	Water consumption log; Permission for water source; Installation of Rainwater harvesting structure	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>camps and plant sites to promote sustainable use of water.</p> <ul style="list-style-type: none"> ➤ Awareness programs shall be conducted for laborers and staff on responsible water use and conservation practices. ➤ Records of daily water consumption shall be maintained as part of regular reporting. 			
11	Coffer dam to make dry working space for bridge work	Change in the flow pattern and quality of water, effect on local habitat	<ul style="list-style-type: none"> ➤ Selecting the right location for the cofferdam to minimize its impact on the environment. ➤ Using environmentally friendly materials to construct the cofferdam eg. Biodegradable/ reusable materials can be used instead of concrete. ➤ Restoring the environment after construction. This may involve replanting vegetation and removing any debris. 	Contractor	Worksite inspection record; Restoration completion record	MPWD/PMC/CSC
12	Noise from vehicles, plants and equipment	Noise from construction vehicles, plant and equipment will lead to noise pollution and cause health and safety issues	<ul style="list-style-type: none"> ➤ Construction operations should be undertaken primarily during day time to minimize noise impacts. ➤ Fitness and PUC of the vehicles and equipment's need to be ensured. ➤ No noisy construction activities will be permitted around educational institutions/ health centers (silence zones) and up to 100 m from other sensitive receptors. 	Contractor	Noise level test report; PPE usage record; Complaint register; vehicles, plants and equipment maintenance records.	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ Noise level monitoring shall be carried out as per the monitoring schedule. In case there is increase in noise level, preventive measures should be taken to reduce the noise level. ➤ Noise barriers and Hearing Protection devices (earplugs or earmuffs) should be provided 			
13	Blasting	Unmanaged blasting result in health and safety issues and accidents.	<ul style="list-style-type: none"> ➤ The Contractor will inform well in advance and obtain permission as is required from all Government Authorities, public bodies and private parties; ➤ Blasting will be carried out only with permission of Engineer-in-charge. All the statutory laws and regulations, rules etc., pertaining to acquisition, transport, storage, handling, and use of explosives will be strictly followed. ➤ Blasting management plan shall be developed and should be approved by the concerned authority. The same shall be strictly followed by the contractor. 	Contractor	Approved Blasting management Plan; Blasting permission; Incident log. Geotagged photos.	MPWD/PMC/CSC
14	Loss of trees and Plantation works	Cutting of trees can lead to loss of biodiversity.	<ul style="list-style-type: none"> ➤ Clearing and uprooting should be avoided beyond that which is directly required for construction activities. 	Contractor	Tree felling register; Plantation record;	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ Kerosene / LPG should be preferably used to avoid felling of the trees or provide community kitchen for the labour camps for cooking. ➤ Camps and storage yards shall be located in the areas already devoid of vegetation or having little vegetation 			
15	Terrestrial Flora and Fauna	Construction activities and workers may cause harm to flora and fauna.	<ul style="list-style-type: none"> ➤ All the workers will need to be oriented and monitored by the contractor so as not to cause any harm to the flora and fauna. ➤ Hunting and fuel wood collection will be strictly prohibited 	Contractor	Worker awareness attendance; Wildlife sighting log	MPWD/PMC/CSC
16	Aquatic Fauna	Construction activities and workers may cause harm to fauna.	<ul style="list-style-type: none"> ➤ Any works affecting aquatic habitat will be done during low flow (when water depth is less than 5 m) and when banks would be dry. ➤ Where any GI wire mesh gabions are used; all GI wire ends need to be folded inside. ➤ Ensure that no construction activities will be carried out during monsoon and the fish breeding season. 	Contractor	Work timing records; Site inspection checklist	MPWD/PMC/CSC
17	Occupational Health and Safety	When Occupational Health and Safety are compromised the associated risks from accidents and incidents	<ul style="list-style-type: none"> ➤ The Contractor would prepare OHS plan and other required plans as per the WBs guidelines. ➤ All the laborers to be engaged for construction works shall be 	Contractor	Approved OHS plan; OHS training log; PPE checklist; Awareness programme and	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
		could affect health and safety of the workers and others on constriction/ project sites. Improper first aid facilities on the sites could affect health and safety of workers and others.	<p>screened for health and adequately treated before issue of work permits.</p> <ul style="list-style-type: none"> ➤ Periodic health check-up of construction workers. ➤ Prevention of mosquito breeding need to be ensured at the project site and other ancillary areas ➤ The contractor's Environment and Safety personnels, shall ensure implementation of CESMP including Occupational health and safety issues at the camp, construction work sites ➤ Avoiding collection of stagnant water. Adequate drainage, sanitation and waste disposal will be provided at workplaces. ➤ All workers and staff should be provided with Personal Protective Equipment (PPE) appropriate to their job on-site and their use shall be ensured. ➤ All construction sites should be barricaded properly. ➤ Smoking should be prohibited near areas of fire or explosion risk. ➤ Sufficient supply of potable water should be ensured for all workers and employees on-site. 		Health inspection reports	

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ Ensure a FA room at the camp and first aid kits are available in all work areas. ➤ Safe working techniques will be followed up and all the workers will be trained. ➤ An Emergency Response system in case of any incidence will be developed and implemented. ➤ The Contractor will conduct awareness programmes on EHS, HIV/AIDS and other sexually transmitted diseases for workers at least once in a quarter and the record of such training programme must be recorded. ➤ Conduct regular safety audits on safety measures adopted during construction. 			
18	Community Health and Safety	The safety aspects like (i) safety of road users including pedestrians and cyclists (ii) safety of cattle; (iii) safety of local community (iv) unsafe/ hazardous traffic conditions due to construction vehicle movement need to be considered during the	<ul style="list-style-type: none"> ➤ Plants and equipment will be installed sufficiently away from the settlements. ➤ Proper caution signage, barricading, delineators, lightings etc. will be installed at construction zone and temporary diversions. ➤ Hard barricading will be provided at construction zone near habitation area and public roads, and the same will be maintained 	Contractor	Safety signage installed; Community complaint register; Traffic control records	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
		construction stage. Children are most vulnerable to injury due to vehicular accidents.	<p>throughout the construction period.</p> <ul style="list-style-type: none"> ➤ Proper traffic management will be ensured near roads of the Construction zone. ➤ Road safety education will be imparted to drivers running construction vehicles. In case of negligent driving, suitable action will be taken. ➤ Speed restrictions shall be imposed on project vehicles to control speeding. ➤ Installation of temporary speed bumps to control speed near designated pedestrian crossing areas/school areas/ market places/ religious places/ human habitations. ➤ The general public/ residents shall not be allowed to any of the risk areas of the project, e.g., excavation sites, construction sites and areas where heavy equipment is in operation. ➤ In the consideration of risk at civil works, each labour should be covered under ECA 1923 insurance until completion of work. 			
19	Emergency Response	Absence may result to	➤ Develop and implement ERS	Contractor	Approved ERP;	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
	system	increased incidents, injury, economic loss etc.	<ul style="list-style-type: none"> ➤ Train personnel Establish communication channels ➤ Systematic planning and training for emergencies. 		Emergency drill and training report; Incident response record	
20	Health Management – Communicable Diseases	The water fringe areas provides suitable habitats for the growth of vectors of various diseases, which is likely to increase the incidence of water-borne diseases.	<ul style="list-style-type: none"> ➤ There would be possibility of the transmission of communicable diseases due to migration of labour population from other areas at the construction site. ➤ Agreement shall be made with nearby health centre or hospital for emergency treatment. ➤ Special Measures for COVID 19 should be strictly followed at the camp and construction site. 	Contractor	Health screening record; Awareness session log; Medical report; Agreement with nearby hospital	MPWD/PMC/CSC
21	Risk of Natural Hazards	The project area is at risk from floods and Earthquakes.	<ul style="list-style-type: none"> ➤ Protection of Agriculture Land near roads/ bridges. ➤ The mitigation measures should be adopted as per norms of State Disaster Management Authority, Government of Meghalaya. 	Contractor	Site assessment report; Record of Compliance with SDMA norms	MPWD/PMC/CSC
22	Risk of Force Majeure Combine with previous	These unforeseen risks can have both adverse environmental and social impacts	<ul style="list-style-type: none"> ➤ All reasonable precaution will be taken to prevent danger of the workers and the public from fire, flood, drowning, etc. ➤ All necessary steps will be taken for prompt first aid treatment of all injuries likely to be sustained during the course of work. 	Contractor	Force majeure preparedness plan; Emergency contact list	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			➤ Contractor has to prepare a response plan before start of construction works			
23	Hygiene	Impacts related to unhygienic surroundings	<ul style="list-style-type: none"> ➤ At every workplace, good and sufficient water supply shall be maintained to avoid waterborne diseases to ensure the health and hygiene of workers. ➤ Adequate drainage, mobile toilets shall be provided at workplace. ➤ Preventive Medical care shall be provided to workers. ➤ Proper Hygiene shall be maintained 	Contractor	Sanitation inspection record; Hygiene logbook	MPWD/PMC/CSC
24	Traffic Management	Unplanned and unmanaged traffic diversion and detours can result in public nuisance.	<ul style="list-style-type: none"> ➤ Before start of the construction, proper traffic management plan will be prepared and submitted to MPWD for approval. Secure assistance from local police for traffic control during the construction. ➤ Necessary signage and barricading will be provided for safety of road users. ➤ Contractor will ensure that no construction materials and debris are lying on the road. It will be collected and disposed of properly. ➤ Unnecessary parking and sound pollution to be strictly avoided near settlements and sensitive 	Contractor	Approved TMP; Signage/barricade checklist; Traffic incident register; geotagged photos	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>receptor such as schools, hospital and cultural centers.</p> <ul style="list-style-type: none"> ➤ The contractor will ensure that the diversion/ detour is always maintained in running conditions, particularly during the monsoon to avoid disruption to traffic flow. 			
25	GBV-SEAH Risks	GBV-SEAH risks may arise due to labor influx	<ul style="list-style-type: none"> ➤ Ensure labor camps are away from settlement areas ➤ Ensure that every worker working in the project has been given an orientation on the Worker's Code of Conduct, especially on GBV and SEAH, and has signed the Code of Conduct. ➤ Conduct periodic awareness programs targeted at women laborers and women and children of communities residing close to the work sites for reporting incidents of GBV- SEAH ➤ Ensure complaints of GBV- SEAH are recorded and addressed with urgency. Ensure that name(s) of complainant(s) are kept in confidence and enable anonymous reporting of complaints. 	Contractor	Signed CoC register; GBV training log; GBV complaint record	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			➤ Activate GBV Grievance Redressal Committee immediately on receipt of any GBV- SEAH complaint. Take action on recommendation of the GBV Grievance Redressal Committee within 24 hours of submission of the report.			
26	Chance Finds	There is a possibility of Cultural relics, Chance finds at the construction sites. Without proper plan these artefacts may be misused by contractor/ workers.	➤ If any cultural remains of geologic or archaeological interest are found, CSC and MPWD shall be immediately informed of such discovery and carry out the instructions for dealing with the same.	Contractor	Chance find report; Notification records	MPWD/PMC/CSC
27	Compliance to Labour Welfare Laws and reporting	Workplace accidents and injuries, unsafe working condition, loss of productivity etc.	<ul style="list-style-type: none"> ➤ Establish a policy and ensure the compliance within the organization, from the top to the lowest-level employee, understands the importance of complying with labour laws and reporting. ➤ Employees should be trained on their rights and responsibilities under labour laws. ➤ Employees should have a way to report violations of labour laws without fear of retaliation. This could be a hotline, an email address, or a suggestion box. 	Contractor	Labour law compliance record; Training attendance record	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ Investigating and taking action on violations. This could include disciplinary action against the violator, or even legal action. ➤ Employees should be kept updated on the organization's compliance with labour laws. This could be done through regular training sessions, newsletters, or other communication channels. 			
28	Labour Influx	Strain on infrastructure, such as housing, healthcare, and education; social tension, as new arrivals compete with locals for jobs and resources.	<ul style="list-style-type: none"> ➤ Proper plan for labour influx by investing in infrastructure and social services. ➤ Governments can regulate the flow of labour to ensure that it is orderly and sustainable. ➤ Local communities can engage with new arrivals to help them understand the local culture and customs. ➤ Maximum use of local labours 	Contractor	Labour License and registration records; Local labour hiring records.	MPWD/PMC/CSC
29	GRM	Increased impunity, conflict and violence; Loss of trust and confidence	<ul style="list-style-type: none"> ➤ Establish a grievance redressal mechanism ➤ Ensure that the mechanism is impartial and independent ➤ Provide adequate support to people who use the mechanism ➤ Communicate effectively with people about the mechanism 	Contractor	GRM register; Grievance resolution records	MPWD/PMC/CSC
30	Monitoring and	Monitoring	<ul style="list-style-type: none"> ➤ The parameters to be monitored, 	Contractor	Monthly/quarterly	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
	Reporting (Monthly/ Quarterly)	environmental attributes like (Air, Water, Noise & soil microbiology) and proper reporting are important for the successful ESMP implementation	frequency and duration of monitoring as well as the locations to be monitored will be as per Monitoring Plan prepared. ➤ Regular submission of CESMP implementation monitoring report		ESMP compliance report; Monitoring data records	
	Operation Phase					
1	Debris and Waste from Clearing/ Closure of Construction Site, Labor Camps, Disposal Sites, and Borrow Areas	Land and soil contamination due to improper waste disposal; Aesthetic degradation; Health risks to nearby communities	<ul style="list-style-type: none"> ➤ Contractor shall prepare and implement a Site Restoration Plan approved by the Engineer. ➤ On completion of works, all temporary structures, debris, and wastes shall be cleared. ➤ Disposal pits and sanitation trenches shall be filled, compacted, and sealed. ➤ Topsoil removed during construction shall be re-spread to aid vegetation regrowth. ➤ Native grass or trees shall be planted to stabilize restored areas and improve aesthetics. 	Contractor	Site clearance restoration records and closure NOC; Geotagged photos	MPWD
2	Soil Erosion due to Runoff over Steep Slopes and Embankments	Loss of fertile topsoil; Siltation of nearby water bodies; Slope instability or road damage	<ul style="list-style-type: none"> ➤ Regularly inspect slopes and embankments for erosion signs. ➤ Implement bioengineering measures like turfing, hydroseeding, and vegetation planting. 	Contractor	Reports on Erosion inspection; implementation of mitigation measures; Drain	MPWD

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ Provide stone pitching, retaining walls, or gabions where needed. ➤ Maintain effective drainage systems to reduce concentrated runoff. 		maintenance log	
3	Water Pollution from Road Runoff and Drainage into Water Bodies	Deterioration of surface and groundwater quality; Sediment and oil contamination in nearby streams or waterbodies	<ul style="list-style-type: none"> ➤ Conduct regular water quality monitoring during operation phase. ➤ If pollutants exceed prescribed limits, install silt traps, or sedimentation chambers. ➤ Ensure roadside drains are cleaned and desilted regularly. ➤ Conduct public awareness to discourage waste disposal into water bodies. 	Contractor	Water quality monitoring results; Drain cleaning records	MPWD
4	Dust Generation from Vehicular Movement	Deterioration of ambient air quality; Nuisance to roadside residents and vegetation; Reduced visibility	<ul style="list-style-type: none"> ➤ Establish and maintain roadside plantation to serve as dust barriers. ➤ Maintain smooth road surfaces to minimize dust generation. ➤ Install signage discouraging over-speeding, which increases dust levels. 	Contractor	Air quality results; Plantation survival record	MPWD
5	Air Pollution from Vehicular Emissions	Increased levels of NOx, SO ₂ , CO, and PM; Health impacts on local population; Deterioration of roadside vegetation	<ul style="list-style-type: none"> ➤ Conduct ambient air quality monitoring at sensitive locations. ➤ Maintain green buffers along the corridor. ➤ Organize awareness campaigns for drivers on emission reduction and vehicle maintenance. 	Contractor	Air quality results; Plantation survival record ; Awareness records	MPWD

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
6	Noise Pollution from Increased Traffic Movement	Noise nuisance to residents; Disturbance to schools, hospitals, and wildlife	<ul style="list-style-type: none"> ➤ Conduct periodic noise level monitoring. ➤ Provide noise barriers, dense plantation near sensitive receptors. ➤ Enforce “No Horn” zones near schools and hospitals. ➤ Maintain road surface to minimize noise due to uneven pavement. 	Contractor	Noise monitoring results; Maintenance records	MPWD
7	Road Safety and Accident Risks	Traffic congestion; Increased likelihood of road accidents; Risk to pedestrians and local communities	<ul style="list-style-type: none"> ➤ Install and maintain proper signage, reflectors, and road markings. ➤ Ensure adequate lighting at intersections and pedestrian zones. ➤ Provide speed control measures and pedestrian crossings in settlement areas. ➤ Conduct community road safety awareness programs. 	Contractor	Accident record; Safety audit report; Awareness records	MPWD
8	Maintenance Waste from Roadside Maintenance, Drain Cleaning, or Repairs	Soil and water contamination from indiscriminate disposal; Visual pollution and clogging of drains	<ul style="list-style-type: none"> ➤ Collect and dispose of maintenance waste at designated locations. ➤ Prohibit dumping into drainage channels or low-lying areas. ➤ Reuse or recycle suitable materials (e.g., asphalt, concrete, metal). 	Contractor	Waste logbook; Disposal records	MPWD

8.3 Performance Indicators

Environmental and social components identified in affecting the environment and social conditions at critical locations have been suggested as performance indicators (PIs). For example, near the construction site, a thick layer of dust over the nearby vegetation/leaf is an indication that the dust control measures are not effective. The performance indicators shall be evaluated under three heads as;

- Environmental condition indicators to determine efficacy of environmental management measures in control of air, noise, water and soil pollution.
- Environmental and social management indicators to determine compliance with the suggested environmental and social management measures. Social monitoring indicators will be indicated as part of the Resettlement Action plan (RAP)/Indigenous People Development Plan (IPDP).
- Operational performance indicators have also been devised to determine efficacy and utility of the proposed mitigation measures.

The performance indicators and monitoring plans prepared for the road stretch are given in **Annexure 8.1**. Details of the performance indicative parameters for each of the component will have to be identified and reported during all stages of the implementation.

8.4 Monitoring Plan for Environmental Conditions

Environmental monitoring involves regular checking of the environmental management issues detailed in the ESMP and to ascertain whether the mitigation measures are achieving their objectives, according to the ESMP, with the progress of the works. It provides the necessary feedback for Project management to keep the programme on schedule.

For each environmental condition, the Monitoring Plan specifies the parameters to be monitored, the locations of monitoring sites, and the frequency and duration of monitoring. It also outlines the applicable standards, as well as the responsibilities for implementation and supervision. The Monitoring Plan, along with details of monitoring locations for environmental condition indicators during the construction and operation stages of the project, is presented in **Table 8.1**.

The monitoring will be carried out by Contractor through the NABL accredited agency and will be supervised by the Environment Specialists of the CSC/PMC and E&S Cell, MPWD.

8.5 Monitoring Plan for Social Conditions

The social monitoring plan is designed to track and evaluate the effectiveness of social safeguard measures implemented under the Environmental and Social Impact Assessment (ESIA). It ensures compliance with national and international social safeguard frameworks, including the Resettlement Action Plan (RAP) and the Indigenous Peoples Development Plan (IPDP). The monitoring plan for social condition indicators of the sub-project during the construction stage is presented in **Table 8.2**.

Table 8.2: Environmental Monitoring Plan for Environmental condition indicators (Air, Water, Noise and Soil)

Environmental Attribute	Timing	Parameter	Standards	Frequency	Duration	Location	Total no. of Samples during construction and operation stage.	Implementation
Air	Construction	CO, NOx, PM10, PM2.5 and SO2	CPCB Guidelines (NAAQMS/ Volume-I/2013-14)	4 locations for 3 Seasons* for 2 consecutive years	24 hours sampling	4 locations (Construction Plant Sites, settlements and Work Zones)	24	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
	Operation			4 locations for 3 Seasons for 1 year.		At 4 locations during operation stage where monitoring had been done during construction stage	12	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
Water	Construction	As per Drinking Water Standards	Indian standards for inland surface waters (IS:2296,1982) and for drinking water (IS:10500-2012)	(surface water at 2 locations for 3 Seasons for 2 consecutive years. Ground water at 4 locations for 3 seasons for 2 consecutive years	As per Grab Sampling guidelines	Drinking water samples from the labour camps and from hand pumps. Surface water from the water courses near the work site	36	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant

Environmental Attribute	Timing	Parameter	Standards	Frequency	Duration	Location	Total no. of Samples during construction and operation stage.	Implementation
						and River.		
	Operation			Surface water 2 locations for 3 Seasons for 1 year. Water (Ground water) at 4 locations for 3 Seasons for 1 year.		At locations where monitoring had been done during construction stage	18	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
Noise	Construction	Noise Levels on dB scale (A)	Noise rules 2000 by CPCB	4 locations for 3 Seasons for 2 consecutive years.	Leq in dB(A) of daytime and night-time	Near the working zones, sensitive receptors and construction plant sites.	24	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
	Operation			4 locations for 3 Seasons for 1 year.		At 04 locations during operation stage where monitoring had	12	Contractor through NABL accredited Laboratory and

Environmental Attribute	Timing	Parameter	Standards	Frequency	Duration	Location	Total no. of Samples during construction and operation stage.	Implementation
						been done during construction stage		supervised by Construction Supervision Consultant
Soil	Construction	Monitoring of Pb, SAR and Oil and Grease	(IS): 2720 for 'Method of Test for Soils'	4 locations for 3 Seasons for 2 consecutive years.	Grab Sampling	Soil at 4 locations 3 times a year for 24 Months	24	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
	Operation			4 locations for 3 Seasons for 1 year.			12	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant

*Except Monsoon

Social Monitoring will be done during Construction stage of the proposed Project as per the details provided in Table 8.3.

Table 8.3: Social Monitoring Plan

Indicator Category	Responsibility	Performance Indicators	Data Collection Method	Frequency
Resettlement & Livelihood Restoration	RP Implementation consultant/ MPWD	% of affected households receiving compensation & assistance	Household surveys, payment records	Quarterly
Labour & Working Conditions	Contractor/ CSC/ MPWD	Compliance with fair wages, working hours, safety	Labour camp inspections, interviews	Monthly
		% of local workforce employed in project	Contractor reports	Quarterly
Social Inclusion & Gender	CSC/ Contractor/ MPWD	% of women engaged in livelihood activities	Beneficiary tracking	Quarterly
Stakeholder Engagement & Grievance Redressal	CSC/ Contractor/ CSC/MPWD	No. of community consultations held	Consultation records	Bi-annually
		% of grievances resolved within set timeline	GRM logs	Quarterly
Indigenous Peoples & Cultural Heritage	CSC/ Contractor/ MPWD	Documentation of FPIC & community agreements	Meeting records, video/audio evidence	Ongoing
		No. of cultural sites protected/enhanced	Site inspections, community feedback	Annually

8.6 REPORTING SYSTEM

Reporting system for the project operates at two levels:

- Reporting for environmental condition indicators and environmental & social management indicators at site level
- Reporting for operational performance indicators at the PWD level.

The reporting system for environmental condition indicators and environmental and social management indicators is managed by the Contractor CSC, and E&S Cell - MPWD. The reporting system is presented in **Table 8.4**. Reporting formats prepared by the CSC/PMC for the Contractor will serve as the basis for implementation by the Contractor and monitoring by the CSC, E&S Cell - MPWD. The list of reporting formats prepared for the project is presented in **Table 8.5**.

- The reporting system shall start with the Construction Contractor who is the main executor of the implementation activities. The Contractor will report to the Construction Supervision Consultant (CSC)/Project Management Consultant (PMC), who in turn shall report to the E&S cell MPWD.
- Contractor will prepare its monthly and quarterly report format and get approval from CSC/PMC and likewise CSC/PMC will get approval of MPWD on its formats before reporting.

- The Contractor shall prepare formats and submit monthly and quarterly environmental and social compliance reports along with formal monthly and quarterly overall project reporting to the CSC.
- The CSC/PMC shall submit separate quarterly environmental and social monitoring reports to E&S cell MPWD in addition to submission of the summary of the activities of the month in the formal monthly report including any deviations and corrective actions
- E&S cell MPWD /CSC will be responsible for the preparation of the targets for identified non-compliances.
- Solutions for further effective implementation may also emerge as a result of the compliance monitoring reports.
- Environmental and Social Management Compliance Certificate shall be issued by Environment Specialist of CSC/PMC during the submission of each Interim Payment Certificate (IPC). This certificate will be based on compliance status of environmental and social measures during that tenure for which IPC has been produced.
- Photographic records will be kept to provide useful environmental monitoring tools. All material source locations, debris disposal locations, plants locations, Construction camp locations, Crusher locations etc. will have a complete photographic record. Photographs for all these establishments will be taken prior to establishment activities begin, during the establishment and operation process and after rehabilitation. The record will be submitted to CSC/PMC half yearly and will also be availed to PMC/ E&S cell MPWD, as and when required.
- A full record of construction activities shall be kept as a part of normal contract monitoring system.
- The operation stage monitoring reports may be annual, provided the Project Environmental and social completion report shows that the implementation was satisfactory.

This reporting will be as follows:

- Contractor reporting to the CSC/PMC
- CSC/PMC reporting to E&S Cell - MPWD
- MPWD reporting to the World Bank

Table 8.4: Reporting System for environmental & social management indicators

Items	Contractor	Project Management Consultant (PMC)		E&S cell (MPWD)		World Bank (WB)
	Implementation& Reporting to CSC/PMC	Supervision	Reporting to MPWD	Oversee Compliance Monitoring	Report to WB	Desired Supervision
Construction Stage						
Monitoring of Construction Site and Construction Camp	Before start of work	Regular	Monthly		Quarterly	Quarterly
Pollution Monitoring	As required	As required	Quarterly	Quarterly	Quarterly	Quarterly

Debris Disposal Area	Weekly	Regular	Monthly	Quarterly	Quarterly	Quarterly
Monitoring of Enhancements	Implementation	As required	Quarterly	Quarterly	Quarterly	Yearly
Topsoil Preservation	Weekly	As required	Monthly	Quarterly	Quarterly	Yearly
Borrow Area/Quarry Area	Regular	Regular	Monthly	Quarterly	Quarterly	Yearly
Tree Cutting	-	-	-	Quarterly	Quarterly	Yearly
Grievance from construction site	Regular	As required	Monthly	Monthly	Monthly	Yearly
Operation Stage						
Pollution Monitoring	For one year	As required	Quarterly	As per monitoring plan	-	-

Table 8.5: Reporting System for operational performance indicators

Item	Stage	Contractor	CSC/PMC	
		Implementation & reporting to CSC/PMC	Supervision	Reporting to E&S Cell
Approval of Construction Camp/Plant Site and its Management Plan	Pre-Construction	One Time	One Time	One Time
Approval of Borrow Management Plan (General & Specific)	Pre-Construction	General –One Time Specific re- development plan - one for each borrow area	Regular	Quarterly
Construction Camp and Plant Site Management	Construction	Monthly	Regular	Quarterly
Topsoil Management	Construction	Monthly	Regular	Quarterly
Pollution Control and Construction Plants	Construction	Monthly	Regular	Quarterly
Pollution Monitoring	Construction and Operation	-		Quarterly
Vehicles and Pollution Control	Construction	Monthly	Regular	Quarterly
Details of the DG Sets and Pollution Control	Construction	Monthly	Regular	Quarterly
Details of Oil Storage	Construction	Monthly	Regular	Quarterly

Working at Water Courses & Pollution Control	Construction	Monthly	Regular	Quarterly
Details of Water Extraction	Construction	Monthly	Regular	Quarterly
Details of Personal Protective Equipment	Construction	Monthly	Regular	Quarterly
Status of Consent for Water Extraction	Construction	Quarterly	Quarterly	Quarterly
Deviations and Corrective Actions	Construction	—	Monthly	Quarterly
Implementation of Enhancement Measures for Cultural Properties, Water Harvesting Structures	Construction	Monthly	Regular	Quarterly
Debris generated by the hill ward side widening, cutting of hill slopes	During construction	Throughout the construction period	Regular	Quarterly
Grievance Redressal Mechanism during Construction	During Construction	Monthly	Regular	Monthly
Work Force Management	During Construction	Monthly	Regular	Quarterly
Occupational Health Safety Measures	During Construction	Monthly	Regular	Quarterly
Road Safety Measures	During Construction	Monthly	Regular	Quarterly
Accidents Reporting	During Construction	Monthly	Regular	Quarterly

During regular monthly meetings, environmental and social aspects should be discussed, with the staff responsible for implementing the Environmental and Social Management Plan from the Contractor, E&S Cell, and PMC.

Environmental Monitoring Cost

The environmental monitoring budget has been estimated based on the project's length and the existing environmental conditions along the proposed alignment. A total of INR 10,26,000 has been projected to cover environmental monitoring activities during both the construction and operation stages. Detailed Environmental Monitoring Cost estimates are provided in **Table 8.6**.

Table 8.6: Environmental Monitoring Cost

S. No.	Environmental Attribute	Stage	Locations / Seasons	Unit	Quantity	Unit Rate (INR)	Cost (INR)
1	Air quality monitoring	Construction	4 locations, 3 seasons, 2 years	No.	24	9,000	2,16,000
2	Air quality monitoring	Operation	4 locations, 3 seasons, 1 year	No.	12	9,000	1,08,000
3	Water quality monitoring	Construction	4 locations, 3 seasons, 2 years (For ground water) and locations, 2 seasons, 2 years (For ground water),	No.	36	7,000	2,52,000
4	Water quality monitoring	Operation	Surface water 2 locations for 3 Seasons for 1 year. Ground water at 4 locations for 3 Seasons for 1 year	No.	18	7,000	1,26,000
5	Noise quality monitoring	Construction	4 locations, 3 seasons, 2 years	No.	24	3,000	72,000
6	Noise quality monitoring	Operation	4 locations, 3 seasons, 1 year	No.	12	3,000	36,000
7	Soil quality monitoring	Construction	4 locations, 3 seasons, 2 years	No.	24	6,000	1,44,000
8	Soil quality monitoring	Operation	4 locations, 3 seasons, 1 year	No.	12	6,000	72,000
	Total						10,26,000

8.7 INSTITUTIONAL FRAMEWORK OF THE PROJECT

The Meghalaya Infrastructure Development and Finance Corporation (MIDFC) will implement the MLCIP, leveraging World Bank experience from projects such as the *Meghalaya Integrated Transport Project (MITP)*, where a PMU coordinates activities across implementing agencies. E&S project staff under the PIU which is the PWD, Government of Meghalaya (MPWD) will manage safeguards as per the World Bank's Environmental and Social Framework (ESF). This will build considerable experience for MIDFC and the MPWD on WB procedures, especially in managing complex issues on resettlement, tribal land rights, biodiversity in hilly terrains, and engagement with Sixth Schedule institutions. Therefore, existing capacities must be leveraged such that experienced personnel are on-boarded during the preparation stage and lessons from past projects are duly integrated.

The project will be implemented through the MPWD, with MIDFC as the central PMU. Respective PIUs will be set up in the Department of Agriculture & Meghalaya Basin Management Agency (MBMA). A Project Management Consultant (PMC) and Construction Supervision Consultant (CSC) will also be engaged to backstop the PMU/PIU on specific technical, institutional, and monitoring tasks. The PMU, PIUs, PMC, and CSC must be adequately staffed with competitively recruited E&S Specialists to support preparing site-specific ESIs for DPRs and other E&S documents.

8.6.1 Governance and Overall Institutional Structure of the Project

The implementation arrangements will align with the current institutional architecture of the Government of Meghalaya (GoM), incorporating Sixth Schedule provisions for tribal autonomy. The MIDFC, responsible for overall project coordination and financing, will be the project holder and lead implementing agency. The MPWD will oversee civil works (roads, bridges, and ropeways), while Department of Agriculture (DoA), and MBMA will implement agrologistics and community components.

The MIDFC-PMU will oversee overall project management and coordination through officers experienced in World Bank procedures. The PMC, a team of experts and consultants headed by a Team Leader, will provide technical support for project activities that exceed the skill set of implementing agencies. The CSC will provide construction supervision. Additionally, the PMC/CSC will assist in collating information and documenting the same. The project implementation structure is shown in **Figure 8.1**.

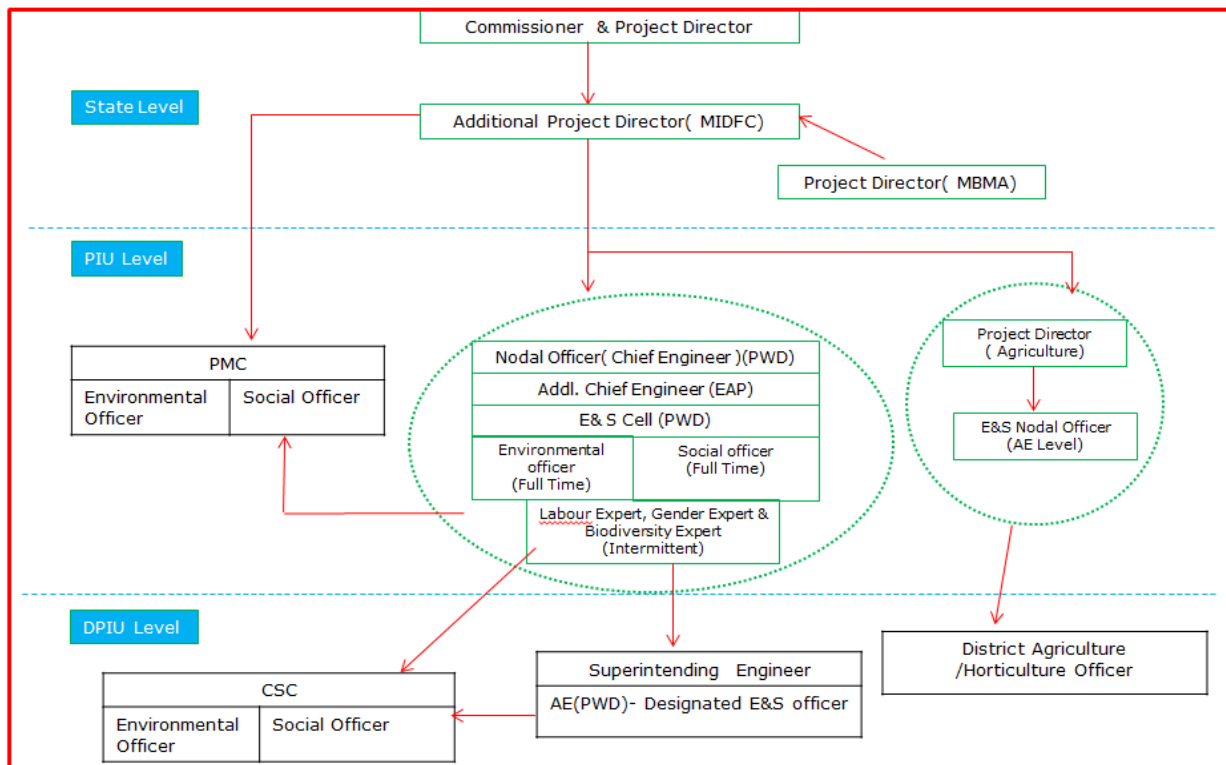


Figure 8.1: Project Implementation Organogram

Meghalaya Infrastructure Development and Finance Corporation (MIDFC) – Project Management Unit (PMU)

The Meghalaya Infrastructure Development and Finance Corporation (MIDFC) serves as the state’s nodal agency for planning, financing, and implementing major infrastructure and development projects across Meghalaya.

The Project Management Unit (PMU) under MIDFC serves as the central coordinating body providing strategic direction, policy alignment, and oversight for the project’s implementation. It manages planning, budgeting, and inter-agency coordination between PWD and MBMA, ensuring compliance with World Bank ESF, national, and state safeguard regulations and leads stakeholder engagement. Key officials include the Commissioner & Project Director, Additional Project Director (MIDFC), and specialized Procurement, Financial, and E&S Experts.

Project Implementation Unit (PIU) – Meghalaya Public Works Department (MPWD)

The Project Implementation Unit (PIU) under MPWD is the main agency implementing MLCIP’s road and connectivity components. It prepares DPRs, manages procurement, and oversees construction through Divisional PIUs and Supervision Consultants. The PIU ensures technical quality, environmental and social safeguard compliance, and coordination with local institutions. It reports progress to the PMU (MIDFC) and conducts capacity-building activities for field staff and contractors. Key officials include the Nodal officer (Chief Engineer -Roads), Additional Chief Engineer (EAP), Nodal Officer (Environmental), Liaison Officer (Social) and E&S Officers.

Project Implementation Unit (PIU – MBMA/DoA) for Agrologistics

The PIU within MBMA implements the Agrologistics Component, focusing on value chain enhancement, storage, processing, and market linkages. It identifies and develops agrologistics infrastructure, partners with agribusinesses and FPOs, and promotes sustainable, gender-inclusive models. The PIU ensures safeguard compliance, aligns logistics infrastructure with PWD connectivity works, and builds capacity among farmers and entrepreneurs. Key officials include the Project Director (MBMA), Nodal Officer (Agrologistics), and Social & Environmental Specialists responsible for technical coordination and safeguard adherence.

Divisional Project Implementation Units (DPIU – PWD)

Each DPIU under PWD acts as the field-level unit implementing infrastructure works through contractors under PIU and SC supervision. It ensures quality, safety, and timely execution, coordinates with district authorities and traditional institutions, monitors ESMP compliance, and submits progress reports to the PIU. DPIUs also facilitate community engagement and grievance redressal.

District Project Implementation Unit (DPIU –DoA / MBMA)

The DPIU under MBMA implements district-level agrologistics projects, linking FPOs, cooperatives, and private partners to strengthen value chains. It manages civil and non-civil works, oversees procurement, and ensures safeguard compliance. The unit coordinates with traditional institutions for site selection and promotes sustainable business models for the long-term operation of agrologistics facilities.

Project Management Consultant (PMC)

The Project Management Consultant (PMC) provides technical, managerial, and E&S support to the PMU and PIUs. It assists in DPR preparation, safeguards integration, progress monitoring, and capacity building, ensuring project quality, compliance, and timely implementation across all components.

Supervision Consultant:

The Supervision Consultant (SC) oversees on-site construction to ensure adherence to technical, contractual, and safeguard standards. It monitors quality, safety, and environmental compliance, verifies progress, supports DPIUs in documentation, and reports any deviations to the PIU for corrective action.

Project implementation will be guided by a comprehensive Project Operations Manual (POM), to be prepared by the PMU with support from the Project Management Consultant (PMC). Each implementing entity will provide its respective inputs, and the POM will be finalized within three months of the project's effectiveness date. The Project Operations Manual (POM) will be closely aligned with the Environmental and Social Management Framework (ESMF) to ensure that environmental and social safeguard processes are fully integrated into project planning, implementation, and reporting. It will include detailed operational guidance on screening, risk categorization, preparation of Environmental and Social Impact Assessments (ESIAs), and implementation of Environmental and Social Management Plans (ESMPs). The POM will also define roles and responsibilities of the PMU, PIUs, and DPIUs in environmental and social

compliance, outline reporting formats, and specify timelines for monitoring and audits. This alignment will ensure uniform application of safeguard measures across all project components, promote accountability, and strengthen the overall monitoring and evaluation (M&E) system under MLCIP.

8.6.2 Institutional Arrangement for E&S Management

- ❖ **Project Management Unit (PMU):** MIDFC will constitute a PMU, drawing from the pool of officers that already have experience with the World Bank procedures. PMU will be responsible for management and coordination of project implementation.
- ❖ **Project Implementation Unit (PIUs):** MIDFC will be supported by PIUs in the Public Works Department (Roads & Bridges), Agriculture, Horticulture, and MBMA, GoM. There will be Nodal Officers at E&S at all the PIUs. The PIUs will have Nodal Officers with assigned charge for E&S. They will not only oversee the implementation of Environmental and Social Codes of Practice during the construction but will also support in the integration of the environmental and social aspects into the agrologistics and community interventions. Currently, there is limited E&S staff in the PIUs – especially at Agriculture and MBMA levels such capacities will be required (and client has agreed to mobilize them before implementation begins).
- ❖ **Environment and Social (E&S) Cell:** Established within PWD, headed by the Additional Chief Engineer (EAP), and supported by two Executive Engineers, Environmental Officer (full-time), Social Officer (full-time), Labour Expert (intermittent), Gender Expert (intermittent), Biodiversity Expert (intermittent) and support staff. The E&S Cell will provide support to MIDFC and PIUs across all project stages:
 - Preparatory: Screening, assisting ESIA preparation, integration into DPRs, assisting PMC/CSC for statutory clearances
 - Implementation: Site inspections, monitoring, capacity building
 - Post-Implementation: Audits, lessons learned
- ❖ **Project Management Consultant (PMC):** The technical support for implementation of project activities that are beyond skill-set of implementing agencies will be brought in by the PMC, with a team of experts/consultants, headed by the Team Leader (TL). The PMC will have one Environmental and one Social Officer to support the PMU/PIU in the implementation of the ESMF for the project and the ESMP for each sub project. The Environment and Social Specialist will verify on site the implementation of the ESMP before each bill is submitted to PMU with recommendation for payment.
- ❖ **Construction Supervision Consultant (CSC)** The CSC will provide day-to-day supervision of construction works, with Environmental Specialist, Social Specialist, to ensure contractor compliance with ESMPs, OHS, labour standards, gender inclusion, and social safeguards.

The implementation structure for the environmental and social management has been aligned to the institutional structure of the project. The E&S institution would help integrate the sustainability principle in the ESMF into the construction of roads, bridges, ropeways, and Agrologistics systems, and the use of infrastructure in agriculture and logistics interventions planned under this project. The PMU,

PIUs, PMC, CSC, and the organizations supporting this project would ensure the effective engagement of stakeholders and handhold them through the project cycle to ensure that the project makes positive environmental and social benefits. The Institutional structure for implementation of the Environmental and Social Safeguard is presented in Figure 8-2.

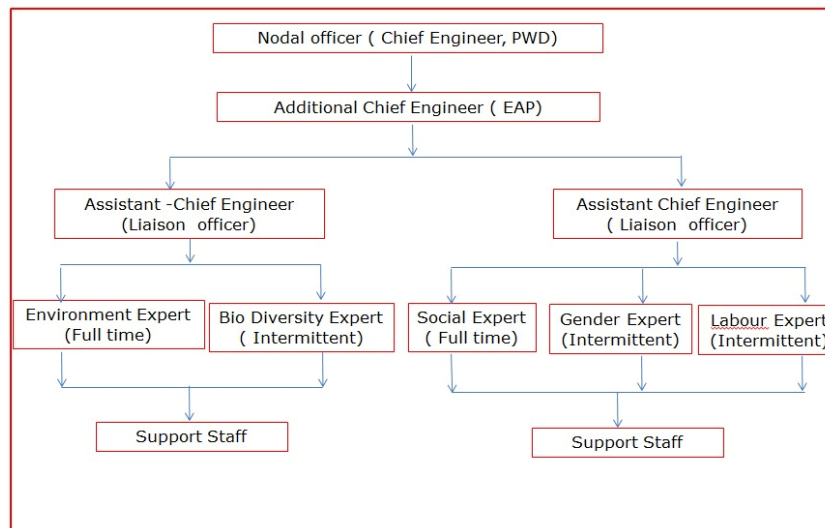


Figure 8.2: Organizational Structure of the E&S Cell

8.8 Roles and Responsibilities of Key Staff and Entities

The implementation of the Environmental and Social Management Framework (ESMF) under the Meghalaya Logistics Connectivity Improvement Project (MLCIP) will be supported by a multi-disciplinary team across the Project Management Unit (PMU), Project Implementation Units (PIUs), and field divisions. The key responsibilities of staff and entities involved are summarized in Table 8.7.

Table 8.7: The Key Responsibilities of Staff and Entities

Designation	Institution / Entity	Core Roles and Responsibilities	Environmental & Social Responsibilities (ESF-linked)	Reporting / Coordination Line
Commissioner-cum-Project Director (PMU)	MIDFC / Government of Meghalaya	Provides overall leadership and strategic direction for MLCIP. Ensures policy alignment, resource allocation, and compliance with World Bank ESF	Responsible for ensuring full ESF compliance, approval of ESMPs, oversight of land acquisition, labour management, stakeholder	Reports to Chief Secretary, GoM; Coordinates with PWD, MBMA, and World Bank.

		and national/state laws. Chairs Project Steering Committee and oversees inter-departmental coordination.	engagement, and reporting to World Bank.	
Additional Project Director (MIDFC)	MIDFC	Supports the Commissioner in day-to-day project management, coordination, budgeting, and decision-making. Oversees PIUs and ensures timely implementation and reporting.	Supervises implementation of ESMF, monitors environmental and social safeguard performance, ensures disclosure and grievance redress follow-up.	Reports to Commissioner-cum-Project Director; coordinates with PIUs, consultants, and PMU specialists.
Project Director (MBMA)	Meghalaya Basin Management Agency	Leads agrologistics component implementation, ensures integration of agricultural value chains, market linkages, and climate-resilient infrastructure.	Ensures compliance with ESS5 (Land Acquisition), ESS7 (Indigenous Peoples), and ESS10 (Stakeholder Engagement). Guides community consultations and inclusion of women and tribal groups.	Reports to Additional Project Director, MIDFC; coordinates with Agriculture, Horticulture, and FPOs.
Nodal Officer Cum Project Director (Chief	Public Works Department	Heads design, technical standards, and	Ensures engineering designs include	Reports to Commissioner (PMU) and coordinates with

Engineer, PWD)		construction quality control for connectivity works. Integrates environmental and social considerations in DPRs and tendering.	environmental safeguards, slope protection, and labour-safety features. Supervises PIU-PWD E&S compliance.	PIU engineers and E&S Cell.
Additional Chief Engineer (EAP)	PWD (Externally Aided Projects Wing)	Supports coordination with contractors and consultants for schedule, budget, and compliance.	Monitors contractor adherence to ESMP and safety standards. Provides quality assurance and periodic technical audits.	Reports to Chief Engineer; liaises with PMU and supervision consultants.
Environmental Expert	E&S Cell, PIU (PWD/MBMA)	Leads environmental screening, scoping, and monitoring of subprojects. Advises on mitigation measures, pollution control, and natural resource management.	Ensures ESMP implementation, site inspections, contractor environmental performance, and reporting under ESS1 and ESS3.	Reports to Additional Chief Engineer (EAP) and Nofal Officer/Chief Engineer, PWD.
Social Expert	E&S Cell, PIU (PWD/MBMA)	Conducts social screening, stakeholder consultations, and supervises RAP/IPDP implementation. Ensures fair	Monitors ESS5, ESS7, ESS10 compliance, supports GRM operation, and prepares social audit reports.	Reports to Additional Chief Engineer (EAP) and Nofal Officer/Chief Engineer, PWD.

		compensation and livelihood restoration.		
Gender Expert (Intermittent)	E&S (PIU/PMU Shared) Cell	Provides technical input on gender inclusion, women's employment, and gender-based violence prevention strategies.	Implements Gender Action Plan (GAP) and ensures compliance with ESS2 and ESS10.	Advises and reports to E&S Cell, PIU
Labour Expert (Intermittent)	E&S (PIU/PMU Shared) Cell	Advises on labour welfare, OHS standards, and contractor compliance. Conducts periodic labour audits and site safety training.	Ensures compliance with ESS2, BOCW Act 1996, and national labour codes. Supports management of worker grievances.	Advises and reports to E&S Cell, PIU
Biodiversity Expert (Intermittent)	E&S (PIU/PMU Shared) Cell	Provides expertise on ecological sensitivity, biodiversity conservation, and compensatory afforestation plans.	Ensures compliance with ESS6 (Biodiversity Conservation), screens sites for ecological risk, and develops mitigation strategies.	Advises and reports to E&S Cell, PIU and coordinates with Forest Department.
Environmental Expert	Project Management Consultant (PMC)	Supports PMU and PIU in reviewing environmental documents, conducting audits, and quality assurance	Verifies compliance with ESS1, ESS3, ESS4, and national environmental laws. Provides training inputs.	Reports to PIU and PMC Team Leader.

		for ESMP implementation.		
Social Expert	Project Management Consultant (PMC)	Advises on social safeguards, assists in RAP/IPDP implementation, and monitors GRM effectiveness.	Ensures ESS5 and ESS10 compliance, conducts stakeholder engagement verification, and prepares review reports.	Reports to PIU and PMC Team Leader.
Project Director (DPIU)	Divisional/District PIU (PWD/MBMA)	Leads division/district-level implementation, supervises contractors, and coordinates community liaison. Ensures field-level compliance with ESMPs.	Implements safeguard measures locally, supervises labour conditions, safety, and community consultations.	Reports to PIU Project Director and PMU.
Environmental & Social Officer	DPIU	Supports Project Director (DPIU) in monitoring E&S compliance, maintaining records, and conducting field verification.	Implements ESMP at site, manages grievance records, and reports progress to PIU.	Reports to DPIU Project Director and PIU E&S Cell.
Environmental Expert	Supervision Consultant	Conducts day-to-day site inspections, monitors ESMP compliance, and prepares environmental	Ensures mitigation measures are implemented and recommends corrective actions for non-	Reports to PIU and PMC.

		progress reports.	compliance.	
Social Expert	Supervision Consultant	Monitors social safeguards on-site, manages community engagement and grievance redress, and reports social performance.	Ensures adherence to RAP/IPDP commitments and ESS5 compliance.	Reports to PIU and PMC.
Project Director (Agriculture) / E&S Nodal Officer (Agrologistics)	Department of Agriculture / MBMA	Coordinates agrologistics subprojects, ensures integration of production, storage, and market infrastructure.	Ensures compliance with ESS3, ESS7, and ESS10. Oversees environmental management of cold-chain and market facilities.	Reports to Project Director (MBMA) and coordinates with District Agriculture Officers.
District Agriculture Officer	Department of Agriculture	Implements agrologistics facilities at field level, supports FPOs, and supervises sustainability practices.	Ensures environmentally sustainable operations and equitable access for smallholders and women farmers.	Reports to E&S Nodal Officer (Agrologistics) and MBMA.
Contractor	Contractor EHS Team	Executes construction in compliance with technical and E&S requirements. Prepares Contractor's ESMP (C-ESMP) and maintains OHS measures.	Ensures compliance with ESS2, ESS3, ESS4, and ESS10, manages worker welfare, waste disposal, and safety.	Reports to DPIU/PIU; supervised by Supervision Consultant.

Under the institutional arrangement for MLCIP, strict enforcement mechanisms ensure accountability in environmental and social (E&S) compliance. 1% retention from each contractor bill is applied for E&S non-compliance. The issue must be rectified within two billing cycles, failing which the amount is forfeited. More than five forfeitures trigger contract termination and encashment of the Environmental and Social (ES) Bank Guarantee by the PMU.

9. GRIEVANCE REDRESS MECHANISM

9.1 Introduction

Effective grievance redressal mechanisms ensure good governance, accountability, and transparency in managing and mitigating the environmental and social issues of a particular project. This consists of defining the process for recording/receiving complaints and their redressal in respect of environmental and social matters.

An integrated system will be established with Grievance Redressal Cells (GRCs), with necessary officers, officials, and systems at MIDFC (PMU). Grievances, if any, may be submitted through various mediums, including in person, in written form to a noted address, e-mail, or through direct calls to concerned official/s. The Social and Environmental Expert within PMU shall be responsible for coordination of grievance/complaints received.

The grievance redress mechanism should be in place at the time of initiating the implementation of R&RAP and civil construction activities in the project area. A platform for grievance redressal should be organized and its regular meetings may be conducted so as to allow people to put forth their grievances. It will help the appropriate authority to find solutions and amicably address the issues. The project, apart from web-based mechanism, will have a two-tier grievance redressal mechanism, i.e., (1) at the project site level, (2) State level (PMU level) .

Web-based grievance mechanism: MIDFC website will include a link where affected person(s) can register their complaints online. A telephone number will also be on the website of MIDFC and the project sites, so that the general public can register their complaint with the PMU office. In case of grievances received through a toll-free number or web-based system, a person should be made in-charge of screening and resolution of the same/communicating with the concerned divisions for resolution of the same. The person in-charge, based on the nature of the complaint, should forward the same to the concerned official. A ticket or a unique number will be generated for all such complaints. The complainant should follow up based on that unique number. All calls and messages should be responded to within 15 days. If a response is not received within 15 days, the complaint should be escalated to the Project Director.

Tier I: Under this project, the local Village Employment Councils (VECs) and community-level organizations will function as nodal point for the first-tier grievance redress mechanism. The local Headman will serve as the focal point responsible for receiving, documenting, and addressing complaints and feedback from stakeholders.

The Tier I Grievance Redress Cell shall operate under the Chairmanship of the Divisional/District Project Director (DPD) and will include the Resident Engineer (representing the Engineer), Environmental and Social (E&S) Experts of Construction Supervision Consultant (CSC), Environmental and Social Officers from the Divisional Project Implementation Unit (DPIU), representatives from relevant line departments, and representatives from local institutions.

Upon receipt of a grievance, the focal point shall review and assess the complaint for resolution at the local level. If the grievance or dispute cannot be satisfactorily resolved at the VEC level within thirty (15) days from the date of submission, the matter shall be escalated to the Project Management Unit (PMU)/ State Level for further review and mediation.

Tier II: If the aggrieved person is not satisfied with the decision of the site-level Grievance Cell, the grievance may be escalated to the PMU/State-level Grievance Redress Cell (Tier II). The Tier II Cell shall be chaired by the Secretary, Department of Planning, and shall include the Chief Engineer, Project Director, and Social Development Expert of the Project as members. The State-level Grievance Redress Cell shall review the case and provide its decision or recommendations within thirty (15) days of receiving the grievance.

If the aggrieved person is not satisfied with the decision of the State-level Grievance Cell, they shall have the right to seek redress through the judiciary. The Project Proponent shall extend all necessary assistance and support to the aggrieved person in pursuing the matter before the judicial authorities.

9.2 Grievance Redressal Mechanism (Grm) Flowchart

The following flowchart illustrates the three-tier grievance redressal mechanism with responsibilities and timelines for resolution.

Tier I: Project Site Level	Responsibility: VECs & Headman Timeline: Resolution within 15 days If unresolved → Escalate to PMU (Tier II)
Tier II: State Level (PMU)	Responsibility: Secretary Planning, Chief Engineer, Project Director, Social Expert Timeline: Resolution within 15 days

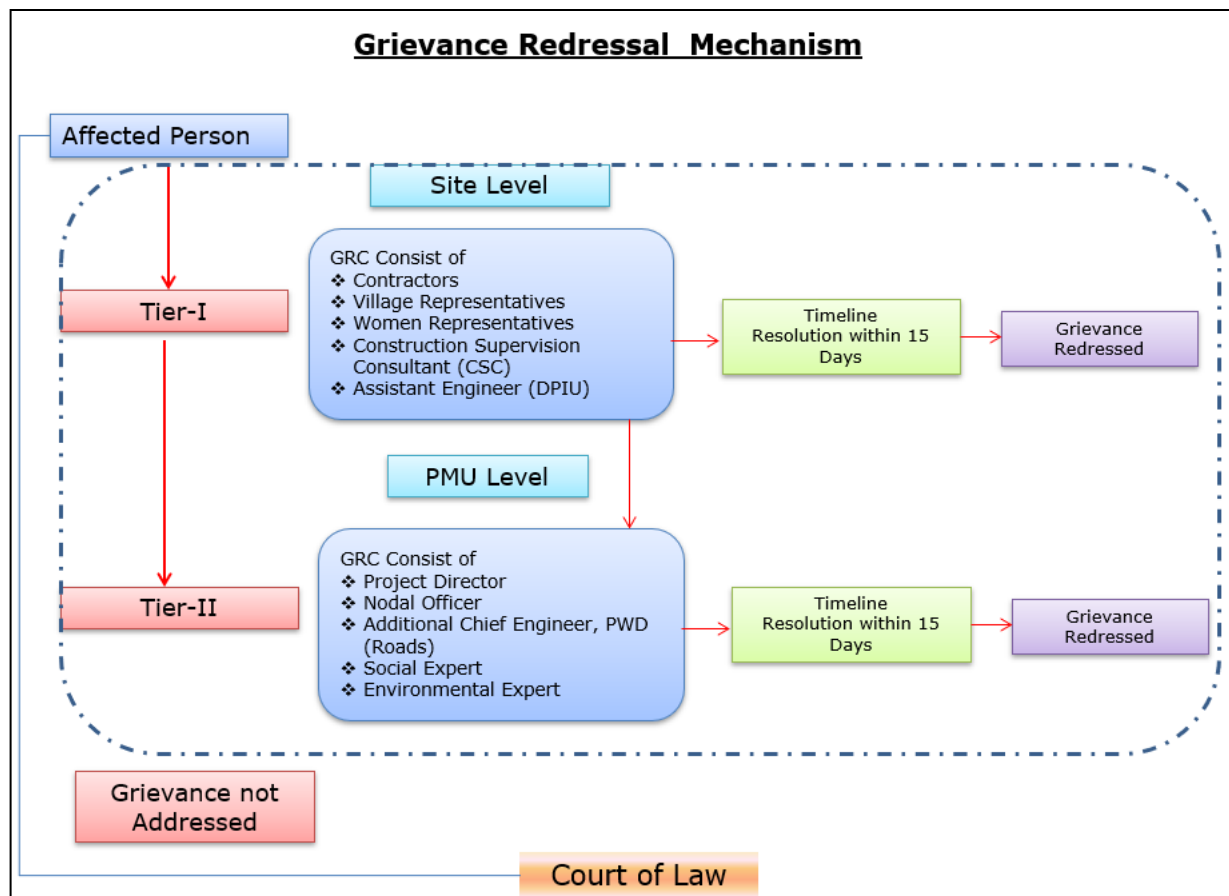


Figure 9.1: Grievance redressal Mechanism

(MIDFC website will include a link where affected person(s) can register their complaints online. A telephone number will also be on the website of MIDFC and the project sites, so that the general public can register their complaint with the PMU office)

9.2.1 Expanded Grievance Redressal Mechanism Details

To ensure the effectiveness and accessibility of the grievance redressal mechanism, it's crucial to elaborate on specific aspects of its implementation and operation. This includes detailed procedures, communication strategies, monitoring mechanisms, and capacity-building initiatives. Detailed Procedures for Grievance Submission and Processing

1. Multiple Channels for Grievance Submission:

In-Person: Designated officers at the project site and PMU office will be available during specified hours to receive grievances directly from affected persons. A standard form, available in local languages, will be provided to facilitate the submission process. The officer will assist individuals who may have difficulty filling out the form.

Written Submission: A dedicated postal address will be established for receiving written grievances. The address will be widely publicized through community meetings, public notices, and the project website.

Electronic Submission: The MIDFC website will feature a user-friendly online grievance submission portal. This portal will allow individuals to submit complaints in their preferred language. Upon submission, an automated acknowledgment will be sent to the complainant, along with a unique tracking number.

Toll-Free Helpline: A toll-free helpline will be operational during working hours, staffed by trained operators who can record grievances and provide information on the redressal process. The helpline number will be prominently displayed at project sites and in public areas.

Email Submission: A dedicated email address will be established for receiving grievances electronically. This address will be monitored regularly by the grievance focal point.

Details of contact for Grievances

Description	Contact details
Company:	PWD, Meghalaya
To:	Chief Engineer-cum-Nodal officer
Address:	HV9P+GFJ, Lachumiere, Shillong, Meghalaya 793001
E-mail:	esmlcip@gmail.com
Website:	http://megpwd.gov.in/contacts.html
Telephone:	Tel: 0364-3572466
Fax:	-

2. Grievance Logging and Acknowledgment:

All grievances received through any channel will be logged into a centralized Grievance Management System (GMS). The GMS will record the date of receipt, complainant details, nature of the grievance, and the assigned tracking number,

Within three working days of receiving a grievance, the complainant will be sent an acknowledgment letter or email, confirming receipt and providing the tracking number for future reference.

3. Grievance Screening and Assessment:

The grievance focal point will screen all logged grievances to determine their eligibility and relevance to the project. Grievances that are clearly outside the scope of the project or are frivolous will be rejected, with a clear explanation provided to the complainant.

Eligible grievances will be assessed to determine their severity, urgency, and complexity. This assessment will inform the prioritization and allocation of resources for investigation and resolution.

4. Grievance Investigation:

The grievance focal point will assign the grievance to the appropriate officer or department for investigation. The investigation will involve gathering information from relevant sources, including the complainant, project staff, community members, and technical experts.

The investigation will be conducted in a fair, impartial, and transparent manner. The complainant will be kept informed of the progress of the investigation and will be given the opportunity to provide additional information or clarification.

5. Grievance Resolution:

Based on the findings of the investigation, the grievance focal point will develop a proposed resolution, in consultation with relevant stakeholders. The resolution will aim to address the root cause of the grievance and provide a fair and equitable outcome for all parties involved.

The proposed resolution will be communicated to the complainant, along with an explanation of the rationale behind it. The complainant will be given the opportunity to accept or reject the proposed resolution.

6. Grievance Closure:

If the complainant accepts the proposed resolution, the grievance will be closed, and the outcome will be documented in the GMS.

If the complainant rejects the proposed resolution, the grievance will be escalated to the next tier of the grievance redressal mechanism.

9.2.2 World Bank Grievance Redressal System

The World Bank's Grievance Redress Services (GRS) provides a confidential mechanism for individuals and communities affected by World Bank financed projects to submit complaints regarding actual or potential harm. In the context of Meghalaya, integration of such a system must consider the state's complex socio-ethnic landscape.

Although community consultations did not report active social conflicts, secondary sources indicate the presence of inter-tribal tensions. Since its formation in 1972, Meghalaya has experienced ethnic conflicts between indigenous tribes and settler non-tribal communities. The dominance of business establishments, labor opportunities, and other economic sectors by settlers primarily economic migrants from Bangladesh, Nepal, and other parts of India created anxiety among the native population, culminating in three major ethnic riots between tribal and non-tribal communities.

By the late twentieth century, relations between ethnic communities showed relative improvement. While interactions between indigenous tribes and settler communities have largely stabilized, emerging tensions have shifted to dynamics among indigenous tribes themselves. This evolving context highlights the

importance of a responsive grievance redress system, such as the GRS, that is sensitive to inter-tribal dynamics and ensures that all affected individuals can safely report concerns related to development projects.

Note: please visit <http://www.worldbank.org/GRS> / www.inspectionpanel.org.. For information on how to submit complaints to the World Bank Inspection Panel,

➤ **Conflict Resolution through Grassroots Institutions**

In Meghalaya, conflicts are often resolved within tribal communities through grassroots institutions, guided by uncodified customary laws and practices. Among the Khasis, the Dorbar Shnong, and among the Garos, the Nokma, function as quasi-judicial bodies to settle disputes, including those related to land. Decisions made by these institutions are widely regarded as legitimate and are generally respected and adhered to by community members, reflecting the continued importance of traditional governance systems in maintaining social harmony.

➤ **Autonomous District Councils (ADCs)**

In addition to traditional governance systems, the Autonomous District Councils (ADCs), established under the Sixth Schedule for the administration of tribal areas, play a significant role in resolving local conflicts. According to a report published by Action Aid, the ADCs in Meghalaya have been comparatively more successful than those in other regions in protecting tribal rights, including rights to occupation, property ownership, and land tenure. The ADCs also have the authority to try offences committed by members of Scheduled Tribes within their respective jurisdictions. Judicial administration under the ADCs follows a two-tier system at the district and village levels: village councils can hear cases where both parties belong to Scheduled Tribes, while the District Courts serve as courts of appeal.

9.2.3 Communication Strategy

Community Awareness Campaigns: Conduct regular community awareness campaigns to inform local residents about the grievance redressal mechanism, its purpose, and how to access it. These campaigns will utilize a variety of communication channels, including community meetings, public notices, radio broadcasts, and social media.

Information Dissemination: Distribute information leaflets and posters in local languages, outlining the grievance redressal process, contact details, and timelines.

Stakeholder Engagement: Engage with local leaders, community representatives, and civil society organizations to promote awareness and understanding of the grievance redressal mechanism.

Website and Social Media: Maintain an up-to-date website and social media presence to provide information on the grievance redressal mechanism, including frequently asked questions, contact details, and progress updates on grievance resolution.

9.2.4 Monitoring and Evaluation

Grievance Tracking System: Implement a robust Grievance Management System (GMS) to track all grievances received, their status, and the outcomes of the redressal process. The GMS will generate regular reports on grievance trends, resolution times, and complainant satisfaction.

Regular Audits: Conduct regular audits of the grievance redressal mechanism to assess its effectiveness, identify areas for improvement, and ensure compliance with established procedures.

Complainant Feedback: Collect feedback from complainants on their experience with the grievance redressal mechanism. This feedback will be used to improve the quality of the service and ensure that it is meeting the needs of the community.

Key Performance Indicators (KPIs): Define and monitor key performance indicators (KPIs) to measure the effectiveness of the grievance redressal mechanism. These KPIs may include:

- Number of grievances received
- Percentage of grievances resolved within the target timeframe
- Complainant satisfaction rate
- Number of grievances escalated to higher tiers

9.2.5 Capacity Building

Capacity-building activities will include training grievance officers, creating awareness among community members on how to use the GRM, and guiding local leaders in resolving concerns at the community level. Further details are provided in the Capacity Development Chapter.

9.3 Integration with Project Management

Grievance Redressal as an Integral Part of Project Planning and Implementation: Integrate the grievance redressal mechanism into all stages of the project cycle, from planning and design to implementation and monitoring.

Coordination with Project Teams: Foster close coordination between the grievance redressal team and other project teams, such as the environmental and social safeguards team, the community engagement team, and the construction team.

Regular Reporting: Include regular reports on grievance redressal activities in project progress reports.

By implementing these detailed procedures, communication strategies, monitoring mechanisms, and capacity-building initiatives, the project can ensure that the grievance redressal mechanism is effective, accessible, and responsive to the needs of the community. This will contribute to building trust, promoting social harmony, and ensuring the long-term sustainability of the project.

10. CONCLUSION AND RECOMMENDATIONS

10.1 Conclusion

An Environmental and Social Impact Assessment Study was conducted to assess the potential environmental and social impacts of the project. Primary information about the project influence area was gathered using an Environmental and Social Screening Checklist to evaluate the extent of environmental and social impacts resulting from project interventions. Environmental and social baseline data were collected from secondary sources to depict the existing conditions of the project area accurately. This information serves as a foundation for assessing potential environmental and social impacts, as well as enhancing the accuracy of impact predictions. Additionally, public consultations and FPIC were held with stakeholders to incorporate their inputs and concerns. The key findings of the ESIA are summarized as follows:

- Proposed project will ease the traffic flow and create safe and smooth mobility to motor vehicles as well as pedestrians. The proposed road improvement can reduce travel time from the farthest section of the road to the nearby market from one hour to just 30 minutes. The project is imperative for encouraging more trade and commercial activity (including public transport) in the district of Ri Bhoi.
- The environmental and the social impact assessment have been conducted in accordance with World Bank ESF and National & State regulations. All the potential impacts were identified in relation to pre-construction, construction, and operation phases.
- The proposed project does not require environmental clearance or forest clearance.
- The proposed project alignment does not pass through any Wildlife Sanctuary/National Park/Biosphere Reserve/Tiger Reserve.
- No ASI Protected monuments found within 0.5 km from the project site.
- Approximately 22 nos. of trees located within the existing Right of Way (RoW) on both sides of the road will need to be felled. To mitigate the ecological impact of tree felling, compensatory afforestation should be undertaken in line with applicable environmental regulations and guidelines.
- Stakeholder Consultations were conducted to assess the perception of the people about the proposed project. The outcome of the consultations suggested that people are in general with the project because it will improve the present road conditions and connectivity. However, they also raised the requirement for the road safety measures; road furniture's (including streetlights, signage's, speed breaker etc.) and proper compensation for the loss of their assets.
- Occupational health and safety measures for both workers and the local community shall be ensured through the preparation and implementation of a comprehensive Labour Management Plan (LMP), in compliance with the World Bank's Environmental and Social Standard ESS2 on Labor

and Working Conditions.

- The mitigations will be further assured by a program of environmental and social monitoring conducted during construction and operation to ensure that all measures are implemented, and to determine whether the environmental and social conditions has stipulated or protected. This will include observations on- and off- site, document checks, and interviews with workers and beneficiaries, and any requirements for remedial action will be reported by the contractor to the MPWD.
- The ESMP shall be included in the bidding document along with appropriate contractual clauses for safeguarding the environment and social impacts during the project construction and operation (maintenance period).
- An overall project level and also construction stage level Grievance Redress Mechanism (GRM) will be formed to receive, feedback, suggestions and complaints, if any, from affected parties and addressing them during the construction stage and operation stage.
- The prepared ESMP will assist the Contractor and MPWD in mitigating the Environmental and Social impacts and guide them in the environmentally sound execution of the proposed project.
- A copy of the updated ESMP shall be always kept on-site during the construction period. As per the World Bank policy requirements, the prepared safeguard documents shall be disclosed in the World Bank website.

During the field survey, as well as consultations with the Detailed Project Report (DPR) team and the Public Works Department (PWD), several key issues were identified. For each observation, appropriate mitigation measures have been proposed to minimize adverse impacts and ensure smooth project implementation. These observations and their corresponding recommendations are summarized in **Table 10.1**.

Table 10.1: Observations and Corresponding Recommendations

CH No.	Type of Structures	Distance from the centre line	Mitigation measures proposed
44+400 LHS	Community Stock yard	7m	During construction, the access point should not be disturbed. Safety measures should be taken during the construction phase such as barricading, signages etc.
43+450 RHS	Community fish pond	15m	The valley side retaining wall needs to be proposed
48+320	Mawlaho Market	--	Junction needs to be improved
55+200 RHS	Synod Sec School	20m Access to school	Speed deduction measures need to be proposed. The retaining wall and access to the school will be realigned to avoid the blind curve.

62+136 RHS	Umlaper Sub centre	6m	Safety measures should be taken during the construction phase such as barricading, signages etc.
66+324 LHS	Umtraí PHC	50m	Safety measures during the construction phase
69+755 LHS	Church wall	3.5 m	Solar blinker and Junction development work is proposed
76+200 LHS	Hostel building	25m	Safety measures should be taken during the construction phase such as barricading, signages etc.

10.2 Recommendations

The following recommendations are made in accordance with the World Bank's Environmental and Social Standards (ESS) for the proposed Upgradation of Umsning - Jagi Road for Meghalaya Logistics and Connectivity Improvement Project (MLCIP), funded by the World Bank, to ensure environmentally sustainable and socially inclusive development outcomes:

- The Contractor should prepare a site-specific contractor Environmental and Social Management Plan called as C-ESMP based on final design and identifications of locations of construction camps, quarries and borrow areas etc. within one month from the date of entering into the contract.
- MPWD shall conduct required consultations regularly or as needed with all stakeholders, including local residents, village councils, and public representatives, and maintain records of each consultation and meeting. These consultations are to be carried out during the pre-construction and construction phases to ensure stakeholder concerns are addressed and documented.
- MPWD shall organize training for the capacity development of concerned E&S cell MPWD /PMC/CSC staff and district-level MPWD engineers on ESHS policies, regulations, and procedures for implementing, monitoring, and reporting ESMP measures. This training is to be conducted during the pre-construction phase.
- Contractors will engage the experienced ES&HS Staff for ESMP implementation as well as to ensure imparting induction, work-specific and other required trainings to the workers;
- MPWD will support Project Affected Peoples (PAP) as per RAP prepared for the project road stretch.
- Contractor/ MPWD to ensure the compliance of applicable laws at State/National level and relevant policies and best practices.
- The shifting of public utilities will be planned in advance to maintain supply of electricity and telephone services to people without or minimum disruptions, with prior intimation through Media, newspaper and other mode of communication.
- MPWD to monitor the implementation and redress of grievances timely and amicably.
- The contractor to ensure safe access to vulnerable people such as elderly and people with disabilities during the construction stage.

Upgradation of Umsning - Jagi Road (Remaining Portion from 40.13 - 80.00 Km) i/c Major bridge for Meghalaya Logistics and Connectivity Improvement Project (MLCIP), funded by the World Bank

Environmental And Social Impact Assessment Report

ANNEXURES

to DRAFT

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Upgradation of Umsning - Jagi Road (Remaining Portion from 40.13 - 80.00 Km) i/c Major bridge for Meghalaya Logistics and Connectivity Improvement Project (MLCIP), funded by the World Bank

Environmental And Social Impact Assessment Report

Annexure 2.1: IRC and MORTH Codes Applicable To The Project

Sl. No.	IRC Code/MORTH	IRC Code Theme
1	IRC:34-2011	Recommendations for Road Construction in Areas Affected by Water Logging, Flooding and/or Salts Infestation
2	IRC:56-2011	Recommended Practice for Treatment of Embankment and Roadside Slopes for Erosion Control
3	IRC:90-2010	Guidelines of Selection, Operation and Maintenance of Bituminous Hot Mix Plant
4	IRC:104-1988	Guidelines for EIA of Highway Projects
5	IRC:120-2015	Recommended Practice for Recycling of Bituminous Pavements
6	IRC:121-2017	Guidelines for Use of Construction and Demolition Waste in Road Sector
7	IRC:125-2017	Guidelines on Dozers for Highway Works
8	IRC:126-2017	Guidelines on Wet Mix Plant
9	IRC:137-2022	Guidelines on use of Fibre-Reinforced Polymer Bars in Road Projects
10	IRC:138-2023	Guidelines for Highway Engineers on Disaster Resilient Green Highways in Multi Hazard Ecosystem
11	IRC:2018	Pocket book for Road Construction Equipment
12	IRC:SP:13-2022	Guidelines for the Design of Small Bridges and Culverts
13	IRC:SP:21-2009	Guidelines on Landscaping and Tree Plantation
14	IRC:SP:42-2014	Guidelines on Road Drainage
15	IRC:SP:44-1994	Highway Safety Code
16	IRC:SP:48-1998	Hill Road Manual
17	IRC:SP:55-2014	Guidelines on Traffic Management in Work Zones
18	IRC:SP:73- 2018	Manual of Specifications & Standards for Two Lanning of Highways with Paved Shoulder
19	IRC:SP:84-2019	Manual of Specifications and Standards for Four Laning of Highways
20	IRC:SP:93-2017	Guidelines on Requirements for Environmental Clearances for Road projects
21	IRC:SP:96- 2012	Guidelines for Selection, Operation and Maintenance of Concrete Batching and Mixing Plants
22	IRC:SP-98-2020	Guidelines for the use of Waste Plastic in Hot Bituminous Mixes (Dry Process) in Wearing Courses
23	IRC:SP-103-2014	Guidelines on Tree Plantation along Rural Roads
24	IRC:SP-106-2015	Engineering Guidelines on Landslide Mitigation Measures for Indian Roads
25	IRC:SP-108-2015	Guidelines on Preparation and Implementation of Environment Management Plan
26	IRC:SP-113-2018	Guidelines on Flood Disaster Mitigation for Highway Engineers
27	IRC:SP:130-2022	Guidelines on Design and Installation of Noise Barriers for Roads
28	IRC:SP:133-2022	Guidelines on Reducing Carbon Footprint of Road Projects
29	MoRTH	Manual for Maintenance of Roads, 1983

(Source:<https://www.irc.nic.in/WriteReadData/LINKS/Catalogue%20Jan%20202492926e69-ea2d-4443-a94f-55e367f4feed.pdf>)

Annexure 3.1: Proposed Road Cross-Sections Chainage Wise

Sr. No.	Proposed Chainage		Length in (kms.)	TCS
	Start	End		
1	40.13	41.96	1.83	TCS-2
2	41.96	42.02	0.06	TCS-4
3	42.02	44.02	2.00	TCS-2
4	44.02	44.15	0.13	TCS-2
5	44.15	44.19	0.04	TCS-4
6	44.19	44.36	0.17	TCS-2
7	44.36	44.46	0.11	TCS-3
8	44.46	44.55	0.09	TCS-2
9	44.55	44.70	0.15	TCS-3
10	44.70	44.81	0.10	TCS-2
11	44.81	45.20	0.40	TCS-4
12	45.20	45.92	0.72	TCS-2
13	45.92	45.96	0.04	TCS-3
14	45.96	46.08	0.12	TCS-4
15	46.08	46.15	0.07	TCS-3
16	46.15	46.17	0.02	TCS-4
17	46.17	46.74	0.57	TCS-2
18	46.74	46.79	0.04	TCS-3
19	46.79	48.09	1.31	TCS-2
20	48.09	48.30	0.21	TCS-3
21	48.30	48.43	0.13	TCS-1
22	48.43	48.71	0.28	TCS-2
23	48.71	48.80	0.09	TCS-4
24	48.80	51.44	2.64	TCS-2
25	51.44	51.53	0.09	TCS-4
26	51.53	53.49	1.97	TCS-2
27	53.49	53.57	0.08	TCS-4
28	53.57	53.66	0.09	TCS-2
29	53.66	53.75	0.09	TCS-4
30	53.75	54.61	0.85	TCS-2
31	54.61	55.08	0.48	TCS-4
32	55.08	56.81	1.73	TCS-2
33	56.81	56.95	0.14	TCS-4
34	56.95	57.22	0.27	TCS-2
35	57.22	57.25	0.02	TCS-4
36	57.25	57.46	0.21	TCS-2
37	57.46	57.49	0.04	TCS-4
38	57.49	58.23	0.74	TCS-2
39	58.23	58.28	0.05	TCS-4
40	58.28	60.85	2.57	TCS-2
41	60.85	61.00	0.15	TCS-1
42	61.00	62.39	1.39	TCS-2
43	62.39	62.43	0.04	TCS-4
44	62.43	65.78	3.36	TCS-2

Sr. No.	Proposed Chainage		Length in (kms.)	TCS
	Start	End		
45	65.78	65.82	0.04	TCS-4
46	65.82	65.90	0.08	TCS-2
47	65.90	65.95	0.06	TCS-4
48	65.95	67.29	1.33	TCS-2
49	67.29	67.32	0.03	TCS-4
50	67.32	67.57	0.25	TCS-2
51	67.57	67.61	0.04	TCS-4
52	67.61	67.92	0.31	TCS-2
53	67.92	67.99	0.07	TCS-4
54	67.99	69.90	1.91	TCS-2
55	69.90	69.95	0.05	TCS-4
56	69.95	73.04	3.08	TCS-2
57	73.04	73.12	0.09	TCS-4
58	73.12	73.78	0.66	TCS-2
59	73.78	73.83	0.05	TCS-4
60	73.83	75.55	1.72	TCS-2
61	75.55	75.65	0.10	TCS-3
62	75.65	76.05	0.40	TCS-2
63	76.05	76.08	0.03	TCS-4
64	76.08	76.15	0.06	TCS-2
65	76.15	76.17	0.02	TCS-4
66	76.17	76.51	0.34	TCS-2
67	76.51	76.55	0.04	TCS-3
68	76.55	77.44	0.89	TCS-2
69	77.44	77.52	0.08	TCS-3
70	77.52	77.62	0.10	TCS-1
Total Length			37.485	

Annexure 3.2: Environment and Social Management Plan

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
PRE-CONSTRUCTION						
1	Consents/ Permits/ Approvals/ Compliances	Non-compliance to various Environmental/ social/ regulatory requirements pertaining to the proposed project could lead to legal Implications	<ul style="list-style-type: none"> ➤ Obtain all necessary statutory clearances (CTE, CTO, Labour License, Fire NOC, Tree Cutting Permission, etc.) ➤ Renew permits before expiry. 	Contractor/ MPWD	CTE, CTO, Labour License, Fire NOC, Tree Cutting Permission to be submitted and tracked	MPWD/PMC/CSC
2	Land Procurement	Loss of Land/ Livelihoods	<ul style="list-style-type: none"> ➤ RPF and RAP shall be followed. 	MPWD division, contractor and concerned authorities	Compensation records maintained; Grievances resolved	MPWD/CSC/NGO
3	Contractor's ESMP (CESMP) Preparation and Implementation	Inadequate preparation and implementation of CESMP by Contractor can leave environmental and social issues unattended	<ul style="list-style-type: none"> ➤ The contractor needs to follow the project ESMP to formulate the CESMP and get it approved by MPWD. 	Contractor	Approved CESMP including TMP, LMP and other relevant plans, and implemented;	MPWD/PMC/CSC
4	Identification of land for material storage yard/ construction camp/ labour camp	Discharges from Yards/ Camps to pollute the surroundings and lead to social tension.	<ul style="list-style-type: none"> ➤ Contractor needs to identify suitable land for storage yard/ construction camp/ labour camp ➤ The land shall not be closer to the water bodies, waterlogged areas or wetlands. 	Contractor	Approved site location; Lease/NOC copies;	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ The land will be handed back to the owner in the same condition as it was prior to the commencement of project activities, once the project is completed. ➤ Contractor to produce the lease agreements, NOC etc. for these lands. 			
5	Supply of Construction Material	Sourcing materials from unauthorized sources.	➤ Procurement of construction material only from approved quarries and sites and licensed/ authorized vendors/ manufacturers. Contractor to produce approvals and receipts.	Contractor	EC, Permits, challans, Material source approval copies;	MPWD/CSC
6	Water	Pollution of surface and groundwater sources.	<ul style="list-style-type: none"> ➤ The Contractor will be responsible for arranging adequate supply of water for the entire construction period. ➤ The contractor will minimize the pollution and wastage of water during construction 	Contractor	Permission for Water source; Usage records; Wastewater management measures	MPWD/PMC/CSC
7	Appointment of Environment, Social and Safety Officers	Inefficient and incompetent supervision by contractors may lead to negative impacts on environment, Social, health and safety.	<ul style="list-style-type: none"> ➤ The Contractor would prepare OHS plan and other required plans; as a part of CESMP, as per the WB guidelines. ➤ The contractor will appoint qualified and experienced Environment. Social and Safety 	Contractor	To be mobilized before construction; approved OHS plan	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			personnel to ensure implementation of CESMP and occupational health and safety issues at the camps and construction work sites.			
8	Identification of OHS Hazard and Risk Categorization	May cause physical harm, injury, illness, or death to workers.	<ul style="list-style-type: none"> ➤ Conducting workplace inspections to identify hazards and document. ➤ Consulting with workers to identify hazards that may not be obvious to employers or safety professionals. ➤ Reviewing safety data sheets (SDSs) to collect information about the hazards of chemicals and other substances used in the workplace. ➤ Consulting with industry standards and regulations to identify specific hazards that must be addressed in the workplace. 	Contractor	OHS hazard register; Inspection reports;	MPWD/CSC
9	Other Construction Vehicles, Equipment and Machinery	Vehicles and equipment not complying with regulations may lead to pollution of environment.	➤ The contractor will maintain records of fitness and Pollution Under Control (PUC) certificates for all vehicles and generators used during the contract period	Contractor	Records of valid PUC / fitness; Inspection log	MPWD/PMC/CSC
10	Tree Cutting	Loss of green cover and biodiversity	➤ Maximum efforts shall be made to minimize the number of trees to be felled.	Contractor	Records of trees cut and saved.	MPWD/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			➤ Tree cutting and disposal shall be done as per the Forest Dept.			
11	Joint field verification	The impacts may not have been identified in time.	➤ The MPWD and the Contractor shall carry out joint field verification to ascertain the local complaints/suggestions and to confirm the need for additional protection measures or changes in design/scale/nature of protection measures including the efficacy of enhancement measures suggested in the ESMP. The MPWD shall maintain proper documentation and justifications/reasons in all such cases.	Contractor	Verification reports;	MPWD
12	Damage to existing eco-system due to borrowing activities	Indiscriminate borrowing activities may damage the eco-system and lead to unproductive environment	➤ The Contractor will have to obtain the Environmental Clearance for borrow areas. ➤ The borrow area will be operated as per the MoEFCC guidelines issued by the concerned SEAC and SEIAA.	Contractor	Borrow area EC copy; Approved management and closure plan	MPWD /CSC
13	Identification of construction material transportation route	Inconveniences and safety issues to the public due to the material transport vehicles.	➤ The material transport route through existing network of roads should be planned and approved by the local transport authorities.	Contractor	Approved route plan; Community consultation record	MPWD/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			➤ The local communities need to be consulted with prior information on any likely inconveniences.			
14	Identification of sites for debris disposal or wastes generated from construction camps and site offices	Pollution due to indiscriminate dumping of wastes. Wastes entering water bodies and groundwater causing pollution	➤ MPWD Division and the Contractor are responsible for identifying a suitable area in consultation with local administration to dispose of the wastes from labour camps, construction sites and site offices.	Contractor	Approved disposal site and its management plan; NOC, Agreement with landowner; Waste disposal records;	MPWD/CSC
15	Relocation of Utility and Common Property Resources (CPR)	Loss of services from utilities and common property resources for the public	➤ When the utilities/ Common Property Resources need to be shifted, they will be shifted in consultation with the communities and with least inconvenience to the public. ➤ If any displacement of Utility/CPRs is required, they will be relocated with prior approval of the concerned agencies. The relocation site identification will be in accordance with the choice of the community.	Contractor/ MPWD Division	Records of Relocation completion.	MPWD/ PMC/CSC
CONSTRUCTION						
1	Crushers, Hot mix Plants & Batching Plants	Impacts due to establishment and operation of plants and equipment	➤ Crushers, hot-mix and batching plants shall be located at least 1000m (1km) away from residential/ settlements, forests,	Contractor	Approved layout plan; Valid NOCs/Consents; Dust suppression	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>wildlife movement areas, and commercial establishments, preferably in the downwind direction.</p> <ul style="list-style-type: none"> ➤ The Contractor shall submit a detailed layout plan for all such sites and seek prior approval before entering into a formal agreement with a landowner for setting-up such sites. ➤ Specifications of crushers, hot mix plants, and batching plants shall comply with the technical requirements of the contract and prior Consent / NOC for all such plants shall be obtained. ➤ No such installation by the Contractor shall be allowed till all the required legal clearances are obtained from the competent authority. 		records; Air quality monitoring reports	
2	Borrow Areas	Impacts due to improper operation and closing of borrow areas	<ul style="list-style-type: none"> ➤ Borrow area should be located at a minimum distance of 300m from the residential/ settlement area. Proper barricading should be provided and access to the borrow areas should be restricted to the unauthorized persons. 	Contractor	EC and lease copies; Approved Borrow area restoration and Closure plan	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			➤ The Contractor should submit the EC, a copy of agreement with the landowner, borrow area management and closure plan before initiating any kind of borrowing activities.			
3	Quarries	Impacts due to improper management, operation and closing of quarries	<ul style="list-style-type: none"> ➤ The Contractor shall identify materials from legally valid quarries with existing NOC from the relevant departments. ➤ No quarry or associated plants can be set-up within 1000m from the residential/ settlement locations ➤ Contractor shall prepare a haul road network for quarry transport and ensure the suitability of such haul roads from the safety of residents, biodiversity and other environment points of views. 	Contractor	Quarry permit, EC; Safety inspection report; Haul road maintenance record, dust suppression measure, geotagged photos	MPWD/PMC/CSC
4	Dismantling of Bridges/ Culverts/ Structures	Impacts due to improper dismantling and disposal	➤ All necessary precautions shall be taken while working near cross-drainage channels, to prevent earthwork, stonework, construction materials from obstructing cross-drainage at rivers, streams, and drainage systems, or from causing flooding.	Contractor	Debris disposal/reuse records; Approved Site restoration plan; Photographic documentation.	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ Reusable materials (e.g., steel, stones, bricks) shall be segregated and stored properly for reuse or recycling. ➤ Non-recyclable debris and waste materials shall be transported to approved disposal sites identified and approved by the concerned authority. ➤ Disposal sites shall be located away from water bodies, agricultural lands, and other environmentally sensitive areas. ➤ Temporary barriers or silt fences shall be provided to prevent debris from entering watercourses. ➤ Upon completion, the associated disposal sites shall be restored to their original condition or as directed by the Engineer 			
5	Bituminous waste disposal	Impacts due to hazardous wastes	<ul style="list-style-type: none"> ➤ The contractor shall maintain records of quantities generated, transported, and disposed of, along with details of the disposal site and approvals obtained. ➤ Bituminous waste shall be collected and stored temporarily in impermeable, lined containers or 	Contractor	Records of Waste reused/disposed; Details of approved disposal site; Photographic documentation.	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>areas to prevent leaching or contamination of soil and groundwater.</p> <ul style="list-style-type: none"> ➤ The disposal of bituminous wastes shall be carried out by the Contractor at secure landfill sites approved by the concerned government authorities. ➤ No bituminous waste shall be disposed of in water bodies, open lands, agricultural fields, or along the roadside ➤ Periodic inspections shall be carried out to ensure compliance with waste management guidelines. ➤ Where feasible, recycling or reuse of scarified bituminous material in road base or other construction activities shall be promoted, subject to environmental and quality standards. 			
6	Contamination of Soil	Soil pollution due to Oil and fuel spills from construction equipment and plants.	<ul style="list-style-type: none"> ➤ Construction plants, workshops, and fuel storage areas shall be located at least 500 m away from any surface water body and environmentally sensitive locations. ➤ Oil interceptors shall be installed at construction camps, vehicle 	Contractor	Spill log; Waste oil disposal records; Fuel storage inspection record. Photographic documentation.	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>parking, and washing areas to trap oil and grease before wastewater is discharged.</p> <ul style="list-style-type: none"> ➤ All fuel and lubricant storage tanks shall be placed on impermeable platforms or within bunded (contained) areas. ➤ Regular maintenance and inspection of construction equipment and vehicles shall be carried out to prevent leakage of oil, fuel, or hydraulic fluids. ➤ Spill control kits (absorbent pads, sand, and containment booms) shall be available at all fuel storage and handling locations. ➤ Used oil and lubricants shall be collected, stored in labelled, leak-proof containers, and handed over only to authorized aggregators/recyclers for disposal in compliance with applicable hazardous waste regulations. ➤ Records of fuel usage, storage, and waste oil disposal shall be maintained and made available for inspection. 			

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			➤ Stormwater runoff from fuel and equipment storage areas shall be directed through oil-water separators before discharge.			
7	Air Pollution - Dust Generation	Dust generation will cause air pollution and will have impacts on health and safety.	<ul style="list-style-type: none"> ➤ Vehicles delivering materials should be covered to reduce spills and dust blowing off the load. ➤ Water should be sprinkled regularly on the work sites. ➤ Road slopes to be covered immediately after completion. ➤ Speed limits shall be enforced for construction vehicles within and near project sites to reduce dust generation. ➤ Personal protective equipment (PPE) such as masks shall be provided to all workers exposed to dusty environments. ➤ Air quality monitoring shall be conducted periodically to ensure compliance with prescribed air quality standards. ➤ Community complaints related to dust shall be recorded, and addressed promptly. 	Contractor	Air quality monitoring reports; Dust suppression log; PPE compliance records	MPWD/PMC/CSC
8	Emissions	The emissions from vehicles and	➤ Fitness and PUC of the vehicles and equipment's need to be ensured.	Contractor	Valid PUC certificates;	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
		construction equipment will pollute the air causing health and safety issues as well.	<ul style="list-style-type: none"> ➤ LPG shall be used as fuel for cooking of food at construction labour camp instead of fuel wood. ➤ Dust extraction, collection and control systems shall be installed at batching plants, crushers, and material handling areas to minimize particulate emissions. 		Equipment maintenance log; Emission test results	
9	Contamination of Surface / Ground Water	Discharges from construction activities and construction camps/ labour will lead to surface/groundwater pollution.	<ul style="list-style-type: none"> ➤ All the debris resulting from construction activities and labour camp shall be removed from the site and disposed at approved sites away from water bodies, on a regular basis to prevent them from getting into surface runoff. ➤ Adequate sanitation and waste management facility to be provided in construction camp. ➤ Construction labours should be restricted from polluting the water sources or misusing the sources. ➤ Use least amount biodegradable bentonite slurry during piling work. ➤ Contain the Bentonite slurry properly, to not enter waterways or soil and dispose of the slurry appropriately after use. 	Contractor	Water quality monitoring report; Waste disposal records; Camp inspection records. Photographic documentation.	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
10	Water requirement for project	Over extraction or exploitation of ground/surface water will lead to water scarcity.	<ul style="list-style-type: none"> ➤ Contractor to ensure optimum and judicious use of water; ➤ Discourage labour from wastage of water and applicable prior approvals shall be obtained from concerned authorities. ➤ Rainwater harvesting structures shall be installed at construction camps and plant sites to promote sustainable use of water. ➤ Awareness programs shall be conducted for laborers and staff on responsible water use and conservation practices. ➤ Records of daily water consumption shall be maintained as part of regular reporting. 	Contractor	Water consumption log; Permission for water source; Installation of Rainwater harvesting structure	MPWD/PMC/CSC
11	Coffer dam to make dry working space for bridge work	Change in the flow pattern and quality of water, effect on local habitat	<ul style="list-style-type: none"> ➤ Selecting the right location for the cofferdam to minimize its impact on the environment. ➤ Using environmentally friendly materials to construct the cofferdam eg. Biodegradable/ reusable materials can be used instead of concrete. ➤ Restoring the environment after construction. This may involve 	Contractor	Worksite inspection record; Restoration completion record	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			replanting vegetation and removing any debris.			
12	Noise from vehicles, plants and equipment	Noise from construction vehicles, plant and equipment will lead to noise pollution and cause health and safety issues	<ul style="list-style-type: none"> ➤ Construction operations should be undertaken primarily during day time to minimize noise impacts. ➤ Fitness and PUC of the vehicles and equipment's need to be ensured. ➤ No noisy construction activities will be permitted around educational institutions/ health centers (silence zones) and up to 100 m from other sensitive receptors. ➤ Noise level monitoring shall be carried out as per the monitoring schedule. In case there is increase in noise level, preventive measures should be taken to reduce the noise level. ➤ Noise barriers and Hearing Protection devices (earplugs or earmuffs) should be provided 	Contractor	Noise level test report; PPE usage record; Complaint register; vehicles, plants and equipment maintenance records.	MPWD/PMC/CSC
13	Blasting	Unmanaged blasting result in health and safety issues and accidents.	<ul style="list-style-type: none"> ➤ The Contractor will inform well in advance and obtain permission as is required from all Government Authorities, public bodies and private parties; ➤ Blasting will be carried out only with permission of Engineer-in- 	Contractor	Approved Blasting management Plan; Blasting permission; Incident log. Geotagged photos.	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>charge. All the statutory laws and regulations, rules etc., pertaining to acquisition, transport, storage, handling, and use of explosives will be strictly followed.</p> <p>➤ Blasting management plan shall be developed and should be approved by the concerned authority. The same shall be strictly followed by the contractor.</p>			
14	Loss of trees and Plantation works	Cutting of trees can lead to loss of biodiversity.	<p>➤ Clearing and uprooting should be avoided beyond that which is directly required for construction activities.</p> <p>➤ Kerosene / LPG should be preferably used to avoid felling of the trees or provide community kitchen for the labour camps for cooking.</p> <p>➤ Camps and storage yards shall be located in the areas already devoid of vegetation or having little vegetation</p>	Contractor	Tree felling register; Plantation record;	MPWD/PMC/CSC
15	Terrestrial Flora and Fauna	Construction activities and workers may cause harm to flora and fauna.	<p>➤ All the workers will need to be oriented and monitored by the contractor so as not to cause any harm to the flora and fauna.</p>	Contractor	Worker awareness attendance; Wildlife sighting log	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			➤ Hunting and fuel wood collection will be strictly prohibited			
16	Aquatic Fauna	Construction activities and workers may cause harm to fauna.	<ul style="list-style-type: none"> ➤ Any works affecting aquatic habitat will be done during low flow (when water depth is less than 5 m) and when banks would be dry. ➤ Where any GI wire mesh gabions are used; all GI wire ends need to be folded inside. ➤ Ensure that no construction activities will be carried out during monsoon and the fish breeding season. 	Contractor	Work timing records; Site inspection checklist	MPWD/PMC/CSC
17	Occupational Health and Safety	When Occupational Health and Safety are compromised the associated risks from accidents and incidents could affect health and safety of the workers and others on construction/ project sites. Improper first aid facilities on the sites could affect health and safety of workers and others.	<ul style="list-style-type: none"> ➤ The Contractor would prepare OHS plan and other required plans as per the WBs guidelines. ➤ All the laborers to be engaged for construction works shall be screened for health and adequately treated before issue of work permits. ➤ Periodic health check-up of construction workers. ➤ Prevention of mosquito breeding need to be ensured at the project site and other ancillary areas ➤ The contractor's Environment and Safety personnels, shall ensure 	Contractor	Approved OHS plan; OHS training log; PPE checklist; Awareness programme and Health inspection reports	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>implementation of CESMP including Occupational health and safety issues at the camp, construction work sites</p> <ul style="list-style-type: none"> ➤ Avoiding collection of stagnant water. Adequate drainage, sanitation and waste disposal will be provided at workplaces. ➤ All workers and staff should be provided with Personal Protective Equipment (PPE) appropriate to their job on-site and their use shall be ensured. ➤ All construction sites should be barricaded properly. ➤ Smoking should be prohibited near areas of fire or explosion risk. ➤ Sufficient supply of potable water should be ensured for all workers and employees on-site. ➤ Ensure a FA room at the camp and first aid kits are available in all work areas. ➤ Safe working techniques will be followed up and all the workers will be trained. 			

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ An Emergency Response system in case of any incidence will be developed and implemented. ➤ The Contractor will conduct awareness programmes on EHS, HIV/AIDS and other sexually transmitted diseases for workers at least once in a quarter and the record of such training programme must be recorded. ➤ Conduct regular safety audits on safety measures adopted during construction. 			
18	Community Health and Safety	The safety aspects like (i) safety of road users including pedestrians and cyclists (ii) safety of cattle; (iii) safety of local community (iv) unsafe/ hazardous traffic conditions due to construction vehicle movement need to be considered during the construction stage. Children are most	<ul style="list-style-type: none"> ➤ Plants and equipment will be installed sufficiently away from the settlements. ➤ Proper caution signage, barricading, delineators, lightings etc. will be installed at construction zone and temporary diversions. ➤ Hard barricading will be provided at construction zone near habitation area and public roads, and the same will be maintained throughout the construction period. 	Contractor	Safety signage installed; Community complaint register; Traffic control records	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
		vulnerable to injury due to vehicular accidents.	<ul style="list-style-type: none"> ➤ Proper traffic management will be ensured near roads of the Construction zone. ➤ Road safety education will be imparted to drivers running construction vehicles. In case of negligent driving, suitable action will be taken. ➤ Speed restrictions shall be imposed on project vehicles to control speeding. ➤ Installation of temporary speed bumps to control speed near designated pedestrian crossing areas/school areas/ market places/ religious places/ human habitations. ➤ The general public/ residents shall not be allowed to any of the risk areas of the project, e.g., excavation sites, construction sites and areas where heavy equipment is in operation. ➤ In the consideration of risk at civil works, each labour should be covered under ECA 1923 insurance until completion of work. 			

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
19	Emergency Response system	Absence may result to increased incidents, injury, economic loss etc.	<ul style="list-style-type: none"> ➤ Develop and implement ERS ➤ Train personnel and Establish communication channels ➤ Systematic planning and training for emergencies. 	Contractor	Approved ERP; Emergency drill and training report; Incident response record	MPWD/PMC/CSC
20	Health Management – Communicable Diseases	The water fringe areas provides suitable habitats for the growth of vectors of various diseases, which is likely to increase the incidence of water-borne diseases.	<ul style="list-style-type: none"> ➤ There would be possibility of the transmission of communicable diseases due to migration of labour population from other areas at the construction site. ➤ Agreement shall be made with nearby health centre or hospital for emergency treatment. ➤ Special Measures for COVID 19 should be strictly followed at the camp and construction site. 	Contractor	Health screening record; Awareness session log; Medical report; Agreement with nearby hospital	MPWD/PMC/CSC
21	Risk of Natural Hazards	The project area is at risk from floods and Earthquakes.	<ul style="list-style-type: none"> ➤ Protection of Agriculture Land near roads/ bridges. ➤ The mitigation measures should be adopted as per norms of State Disaster Management Authority, Government of Meghalaya. 	Contractor	Site assessment report; Record of Compliance with SDMA norms	MPWD/PMC/CSC
22	Risk of Force Majeure Combine with previous	These unforeseen risks can have both adverse environmental and social impacts	<ul style="list-style-type: none"> ➤ All reasonable precaution will be taken to prevent danger of the workers and the public from fire, flood, drowning, etc. ➤ All necessary steps will be taken for prompt first aid treatment of all 	Contractor	Force majeure preparedness plan; Emergency contact list	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>injuries likely to be sustained during the course of work.</p> <p>➤ Contractor has to prepare a response plan before start of construction works</p>			
23	Hygiene	Impacts related to unhygienic surroundings	<p>➤ At every workplace, good and sufficient water supply shall be maintained to avoid waterborne diseases to ensure the health and hygiene of workers.</p> <p>➤ Adequate drainage, mobile toilets shall be provided at workplace.</p> <p>➤ Preventive Medical care shall be provided to workers.</p> <p>➤ Proper Hygiene shall be maintained</p>	Contractor	Sanitation inspection record; Hygiene logbook	MPWD/PMC/CSC
24	Traffic Management	Unplanned and unmanaged traffic diversion and detours can result in public nuisance.	<p>➤ Before start of the construction, proper traffic management plan will be prepared and submitted to MPWD for approval. Secure assistance from local police for traffic control during the construction.</p> <p>➤ Necessary signage and barricading will be provided for safety of road users.</p> <p>➤ Contractor will ensure that no construction materials and debris are lying on the road. It will be</p>	Contractor	Approved TMP; Signage/barricade checklist; Traffic incident register; geotagged photos	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>collected and disposed of properly.</p> <ul style="list-style-type: none"> ➤ Unnecessary parking and sound pollution to be strictly avoided near settlements and sensitive receptor such as schools, hospital and cultural centers. ➤ The contractor will ensure that the diversion/ detour is always maintained in running conditions, particularly during the monsoon to avoid disruption to traffic flow. 			
25	GBV-SEAH Risks	GBV-SEAH risks may arise due to labor influx	<ul style="list-style-type: none"> ➤ Ensure labor camps are away from settlement areas ➤ Ensure that every worker working in the project has been given an orientation on the Worker's Code of Conduct, especially on GBV and SEAH, and has signed the Code of Conduct. ➤ Conduct periodic awareness programs targeted at women laborers and women and children of communities residing close to the work sites for reporting incidents of GBV- SEAH 	Contractor	Signed CoC register; GBV training log; GBV complaint record	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ Ensure complaints of GBV- SEAH are recorded and addressed with urgency. Ensure that name(s) of complainant(s) are kept in confidence and enable anonymous reporting of complaints. ➤ Activate GBV Grievance Redressal Committee immediately on receipt of any GBV- SEAH complaint. Take action on recommendation of the GBV Grievance Redressal Committee within 24 hours of submission of the report. 			
26	Chance Finds	There is a possibility of Cultural relics, Chance finds at the construction sites. Without proper plan these artefacts may be misused by contractor/ workers.	<ul style="list-style-type: none"> ➤ If any cultural remains of geologic or archaeological interest are found, CSC and MPWD shall be immediately informed of such discovery and carry out the instructions for dealing with the same. 	Contractor	Chance find report; Notification records	MPWD/PMC/CSC
27	Compliance to Labour Welfare Laws and reporting	Workplace accidents and injuries, unsafe working condition, loss of productivity etc.	<ul style="list-style-type: none"> ➤ Establish a policy and ensure the compliance within the organization, from the top to the lowest-level employee, understands the importance of 	Contractor	Labour law compliance record; Training attendance record	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>complying with labour laws and reporting.</p> <ul style="list-style-type: none"> ➤ Employees should be trained on their rights and responsibilities under labour laws. ➤ Employees should have a way to report violations of labour laws without fear of retaliation. This could be a hotline, an email address, or a suggestion box. ➤ Investigating and taking action on violations. This could include disciplinary action against the violator, or even legal action. ➤ Employees should be kept updated on the organization's compliance with labour laws. This could be done through regular training sessions, newsletters, or other communication channels. 			
28	Labour Influx	Strain on infrastructure, such as housing, healthcare, and education; social tension, as new arrivals compete with locals for jobs and resources.	<ul style="list-style-type: none"> ➤ Proper plan for labour influx by investing in infrastructure and social services. ➤ Governments can regulate the flow of labour to ensure that it is orderly and sustainable. ➤ Local communities can engage with new arrivals to help them 	Contractor	Labour License and registration records; Local labour hiring records.	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> understand the local culture and customs. ➤ Maximum use of local labours 			
29	GRM	Increased impunity, conflict and violence; Loss of trust and confidence	<ul style="list-style-type: none"> ➤ Establish a grievance redressal mechanism ➤ Ensure that the mechanism is impartial and independent ➤ Provide adequate support to people who use the mechanism ➤ Communicate effectively with people about the mechanism 	Contractor	GRM register; Grievance resolution records	MPWD/PMC/CSC
30	Monitoring and Reporting (Monthly/ Quarterly)	Monitoring environmental attributes like (Air, Water, Noise & soil microbiology) and proper reporting are important for the successful ESMP implementation	<ul style="list-style-type: none"> ➤ The parameters to be monitored, frequency and duration of monitoring as well as the locations to be monitored will be as per Monitoring Plan prepared. ➤ Regular submission of CESMP implementation monitoring report 	Contractor	Monthly/quarterly ESMP compliance report; Monitoring data records	MPWD/PMC/CSC
	Operation Phase					
1	Debris and Waste from Clearing/ Closure of Construction Site, Labor Camps,	Land and soil contamination due to improper waste disposal;	<ul style="list-style-type: none"> ➤ Contractor shall prepare and implement a Site Restoration Plan approved by the Engineer. ➤ On completion of works, all temporary structures, debris, and wastes shall be cleared. 	Contractor	Site clearance restoration records and closure NOC; Geotagged photos	MPWD

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
	Disposal Sites, and Borrow Areas	Aesthetic degradation; Health risks to nearby communities	<ul style="list-style-type: none"> ➤ Disposal pits and sanitation trenches shall be filled, compacted, and sealed. ➤ Topsoil removed during construction shall be re-spread to aid vegetation regrowth. ➤ Native grass or trees shall be planted to stabilize restored areas and improve aesthetics. 			
2	Soil Erosion due to Runoff over Steep Slopes and Embankments	Loss of fertile topsoil; Siltation of nearby water bodies; Slope instability or road damage	<ul style="list-style-type: none"> ➤ Regularly inspect slopes and embankments for erosion signs. ➤ Implement bioengineering measures like turfing, hydroseeding, and vegetation planting. ➤ Provide stone pitching, retaining walls, or gabions where needed. ➤ Maintain effective drainage systems to reduce concentrated runoff. 	Contractor	Reports on Erosion inspection; implementation of mitigation measures; Drain maintenance log	MPWD
3	Water Pollution from Road Runoff and Drainage into Water Bodies	Deterioration of surface and groundwater quality; Sediment and oil contamination in nearby streams or waterbodies	<ul style="list-style-type: none"> ➤ Conduct regular water quality monitoring during operation phase. ➤ If pollutants exceed prescribed limits, install silt traps, or sedimentation chambers. ➤ Ensure roadside drains are cleaned and desilted regularly. 	Contractor	Water quality monitoring results; Drain cleaning records	MPWD

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			➤ Conduct public awareness to discourage waste disposal into water bodies.			
4	Dust Generation from Vehicular Movement	Deterioration of ambient air quality; Nuisance to roadside residents and vegetation; Reduced visibility	<ul style="list-style-type: none"> ➤ Establish and maintain roadside plantation to serve as dust barriers. ➤ Maintain smooth road surfaces to minimize dust generation. ➤ Install signage discouraging over-speeding, which increases dust levels. 	Contractor	Air quality results; Plantation survival record	MPWD
5	Air Pollution from Vehicular Emissions	Increased levels of NO _x , SO ₂ , CO, and PM; Health impacts on local population; Deterioration of roadside vegetation	<ul style="list-style-type: none"> ➤ Conduct ambient air quality monitoring at sensitive locations. ➤ Maintain green buffers along the corridor. ➤ Organize awareness campaigns for drivers on emission reduction and vehicle maintenance. 	Contractor	Air quality results; Plantation survival record ; Awareness records	MPWD
6	Noise Pollution from Increased Traffic Movement	Noise nuisance to residents; Disturbance to schools, hospitals, and wildlife	<ul style="list-style-type: none"> ➤ Conduct periodic noise level monitoring. ➤ Provide noise barriers, dense plantation near sensitive receptors. ➤ Enforce “No Horn” zones near schools and hospitals. ➤ Maintain road surface to minimize noise due to uneven pavement. 	Contractor	Noise monitoring results; Maintenance records	MPWD

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
7	Road Safety and Accident Risks	Traffic congestion; Increased likelihood of road accidents; Risk to pedestrians and local communities	<ul style="list-style-type: none"> ➤ Install and maintain proper signage, reflectors, and road markings. ➤ Ensure adequate lighting at intersections and pedestrian zones. ➤ Provide speed control measures and pedestrian crossings in settlement areas. ➤ Conduct community road safety awareness programs. 	Contractor	Accident record; Safety audit report; Awareness records	MPWD
8	Maintenance Waste from Roadside Maintenance, Drain Cleaning, or Repairs	Soil and water contamination from indiscriminate disposal; Visual pollution and clogging of drains	<ul style="list-style-type: none"> ➤ Collect and dispose of maintenance waste at designated locations. ➤ Prohibit dumping into drainage channels or low-lying areas. ➤ Reuse or recycle suitable materials (e.g., asphalt, concrete, metal). 	Contractor	Waste logbook; Disposal records	MPWD

A. CAPACITY DEVELOPMENT & TRAINING

To enhance the capabilities for implementation and monitoring of the Environmental and Social Management Plan (ESMP), it is recommended that structured training programs be conducted for all contractor and project personnel. These trainings will ensure compliance with regulatory requirements, improve awareness, and build competence in managing environmental and social (E&S) risks.

On-Boarding Phase

a. Induction Training

- Mandatory for all personnel before starting work.
- Covers Contractor's Environmental and Social Management Plan (C-ESMP), relevant national and international Environmental, Social, Health, and Safety (ESHS) regulations, and good practices.

b. Specialized Training

- Tailored training for personnel assigned to specific roles (e.g., environmental officer, safety officer, waste management supervisor).
- Delivered during the mobilization stage to ensure readiness for assigned responsibilities.

Implementation Phase

- **Ongoing Toolbox Talks:**
Conducted daily or weekly to address evolving risks, reinforce safety practices, and maintain continuous awareness among workers.
- **Supplemental Training:**
Provided after incidents or when new risks are identified. Designed to prevent recurrence and ensure the workforce remains updated on new safety/environmental requirements.
- **Routine Quarterly Training:**
- Organized by the contractor every three months to:
 - Review E&S compliance status and progress.
 - Share lessons learned from the previous quarter.
 - Develop action plans to address identified gaps or challenges.
 - Ensure alignment with sub-project E&S objectives and promote continuous improvement.

Table: Given below is the specialized training outline for contractor

Sl. No.	Training Title	Content Summary	Target Group	Purpose	Schedule / Stage
1	Code of Conduct Induction	Sensitization on local issues, introduction to the Code of Conduct, labor camp management	All workers	Ensure awareness of expected behavior, local sensitivities, and compliance with regulations	Onboarding (before deployment)

2	Health, Safety, and Environmental Hygiene	Safety procedures, first aid, environmental hygiene practices	All workers	Reduce occupational hazards and promote safe practices	Onboarding
3	Health and Safety Induction	Special focus on road safety, occupational health, and safety concerns	All workers	Educate on health and safety requirements	Onboarding and as needed
4	Toolbox Sessions	Task-specific safety measures and procedures for work environments	All workers	Reinforce safety protocols and reduce risks	Daily / Weekly
5	Equal Employment	Emphasis on equal employment opportunities and non-discrimination	All workers and management	Ensure ethical and fair employment practices	Onboarding and as needed
6	Social and Cultural Norms of Tribal Communities	Orientation on local cultural practices, traditions, and norms	Workers	Promote respect and awareness of tribal culture	Ongoing / as part of Code of Conduct
7	SEA/SH Prevention	Awareness on Gender-Based Violence (GBV), Sexual Exploitation, Abuse, Harassment, unsafe migration, and human trafficking	All workers	Prevent and address SEA/SH incidents	Induction / Toolbox Talks / Ongoing
8	HIV/AIDS & STD Awareness	Programs on HIV/AIDS, STDs, and links to SEA/SH risks	All workers and local communities	Promote awareness and prevention of health risks	Ongoing
9	Safe Handling of Hazardous Materials	Safety procedures for handling, storage, and disposal of hazardous substances	Workers involved in hazardous tasks	Ensure safe handling and reduce chemical risks	Onboarding and as needed
10	PPE Usage	Correct selection and use of Personal Protective Equipment (PPE)	All workers	Protect workers from occupational hazards	Onboarding and as needed
11	GRM and SEA/SH Reporting	Mechanisms for grievance redressal and confidential SEA/SH incident reporting	All workers and local communities	Ensure accessible, safe, and effective grievance mechanisms	Ongoing

These training programmes are expected to impart in-depth knowledge from experienced professional working at geographically distant locations. However, these training programmes are only indicative and can be considered in coordination with the respective institutes in geographically distant areas of the Indian sub-continent

B. Penalty Clause for Non – Compliance

Penalties for non-compliance of ESMP
Contractor's Responsibilities: <ul style="list-style-type: none"> Implement all assigned mitigation measures as per the ESMP and contract documents

<ul style="list-style-type: none"> • Address grievances raised by the public during project implementation • Undertake regular reporting to the CSC/PMC and E&S
<ul style="list-style-type: none"> • Any non-compliance in implementing the above responsibilities will attract penalties as detailed in the clause. • Major non-compliances <ul style="list-style-type: none"> a) Failure to obtain clearances/ permissions/ NoC/ Registrations/ Consent under statutory environment and labour regulations b) Unaddressed public complaints within the Contractor's scope, formally registered and communicated, within the time period set by CSC/PMC/E&S c) Inadequate safety arrangements or compromising occupational safety/serious hazards posing high risk levels to lives of personnel on site or conditions leading to possible suspension of work until safety is ensured, significant degradation of environment and continuous disturbances in settlements as determined by CSC/PMC/E&S d) Reoccurrence of any minor non-compliances • All non-compliances, which are not major lapses, will be categorized as minor lapses
<p>Penalty for lapses:</p> <ul style="list-style-type: none"> • A penalty amount of Rs. 5,000 per day or otherwise fixed by the MPWD for each minor non-compliance with CESMP • A penalty amount of Rs. 10,000 per day or otherwise fixed by the MPWD for each all-major non-compliance with CESMP. The amount shall be released only if the identified non-compliances are rectified within the duration specified by the MPWD/CSC/PMC. Duration specified shall consider the environmental and social damage/risks associated with non-compliances. Such specified duration shall not be more than 15 days. • Reoccurrence of the minor non compliances shall be treated as major lapses • Reoccurrence of all major non compliances, a penalty of Rs. 50,000 shall be levied for each such non - compliance.

Annexure 3.3: Details of Construction Materials

Sr. NO.	Descriptions	Unit	Quantity	Rate	Amount in Rs.
1	Clearing and Grubbing Road Land. Clearing and grubbing road land including uprooting rank vegetation, grass, bushes, shrubs, saplings and trees girth up to 300 mm, removal of stumps of trees cut earlier and disposal of unserviceable materials and stacking of serviceable material to be used or auctioned up to a lead of 1000 metres including removal and disposal of top organic soil not exceeding 150 mm in thickness. (2.3 ii A)	Hect	19.12	52646	1006452.00
2	Dismantling of Flexible Pavements Dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately. (2.5 II A)	cum	17571.09	724	12721472.00
3	Excavation in Hilly Area in Soil by Mechanical Means Excavation in soil in hilly area by mechanical means including cutting and trimming of side slopes and disposing of excavated earth with all lifts and lead upto 1000 metres (3.29)	cum	59807.56	255	15250927.00
4	Excavation in Hilly Area in Ordinary Rock by Mechanical Means not Requiring Blasting. Excavation in hilly area in ordinary rock not requiring blasting by mechanical means including cutting and trimming of slopes and disposal of cut material with all lift and lead upto 1000 metres (3.30)	cum	87952.29	355	31223063.00
5	Construction of Subgrade and Earthen Shoulders Construction of subgrade and earthen shoulders with approved material obtained from borrow pits with all lifts & leads, transporting to site, spreading, grading to required slope and compacted to meet requirement of Table 300-2 (3.18)	cum	152933.73	678	103689066.00
6	Cement Treated Crushed Rock or combination as per Clause 403.2 and Table 400.4 in Sub- base/ Base Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub- base/base. (4.6 i)	cum	74496.22	4021	299549319.00

7	Cement Treated Crushed Rock or combination as per Clause 403.2 and Table 400.4 in Sub- base/ Base Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub- base/base. (4.6 ii)	cum	22164.50	4060	89987862.00
8	Appraisal Interlayer (AIL) Water Bound Macadam Grading-III Providing, laying, spreading and compacting stone aggregates of specific sizes to water bound macadam specification including spreading in uniform thickness, hand packing, rolling with vibratory roller 8-10 tonnes in stages to proper grade and camber, applying and brooming requisite type of screening/ binding Materials to fill up the interstices of coarse aggregate, watering and compacting to the required density. By Mechanical Means: (4.10)	cum	21029.09	3348	70405377.00
9	Prime Coat : Providing and applying primer coat with bitumen emulsion on prepared surface of granular base including clearing of road surface and spraying primer at the rate of 0.60 kg/sqm using mechanical means. (5.1 i)	sqm	210290.85	62	13038033.00
10	Tack Coat : Providing and applying tack coat with bitumen emulsion using emulsion pressure distributor at the rate of 0.25 kg per sqm on the prepared bituminous/granular surface cleaned with mechanical broom. (5.2 i)	sqm	420581.70	19	7991052.00
11	Dense Graded Bituminous Macadam: Providing and laying dense graded bituminous macadam with 100-120 TPH batch type HMP producing an average output of 75 tonne per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5 percent by weight of total mix of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specification Clause 507 complete in all respects. (i) for for GradingII (19 mm nominal size) (5.5 ii)	cum	0.00	11142	0.00

12	Bituminous Concrete : Providing and laying bituminous concrete with 100-120 TPH batch type hot mix plant producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 5.4 to 5.6 percent of mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MORTH specification Clause : 509 complete in all respects for Grading II (10 mm nominal size) (5.7 I ii)	cum	8411.63	11755	98878758.00
13	Kilo Metre Stone: Reinforced cement concrete M15 grade kilometre stone of standard design as per IRC:8- 1980, fixing in position including painting and printing etc (8.12)				
i	Ordinary Kilometer stone (Precast)	Nos	31.00	3829	118699.00
ii	Fifth Kilometer stone (Precast)	Nos	7.00	6508	45556.00
iii	Hectometer stone (Precast)	Nos	149.00	1104	164496.00
14	Road Marking Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads @ 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 .The finished surface to be level, uniform and free from streaks and holes (8.11)	sqm	16744.90	2606	43637209.00
15	Metal Beam Crash Barrier Type - A, "W" : Providing and erecting a "W" metal beam crash barrier comprising of 3 mm thick corrugated sheet metal beam rail, 70 cm above road/ground level, fixed on ISMC series channel vertical post, 150 x 75 x 5 mm spaced 2 m centre to centre, 1.8 m high, 1.1 m below ground/road level, all steel parts and fitments to be galvanised by hot dip process, all fittings to conform to IS:1367 and IS:1364, metal beam rail to be fixed on the vertical post with a spacer of channel section 150 x 75 x 5 mm, 330 mm long complete as per Clause 810 (8.17 A)	sqm	13958.00	5075	70836850.00
16	Providing and fixing of retro- reflectorised cautionary, mandatory and inforamatory sign as per IRC :67 made of encapsulated lens type reflective sheeting vide clause 801.3, fixed over aluminium sheeting, 1.5 mm thick supported on a mild steel angle iron post 75 mm x 75 mm x 6 mm firmly fixed to the ground by means of properly designed foundation with M15 grade				

	cement concrete 45 cm x 45 cm x 60 cm, 60 cm below ground level as per approved drawing (8.4)				
i	90 cm equilateral triangle	Nos	150	9634	1445100
ii	60 cm equilateral triangle	Nos	250	6206	1551500
iii	60 cm circular	Nos	350	8450	2957500
iv	80 mm x 60 mm rectangular	Nos	290	11931	3459990
v	60 cm x 45 cm rectangular	Nos	170	8221	1397570
vi	60 cm x 60 cm square	Nos	230	9233	2123590
17	Road Markers/Road Stud with Lens Reflector Providing and fixing of road stud 100x100 mm diecast in aluminium, resistant to corrosive effect of salt and grit, fitted with lens reflector, installed in concrete or asphaltic surface by drilling hole 30mm upto depth of 60mm and bedded in a suitable bituminous grout or epoxy mortar, all as per BS:873(Part 4) 1973 (8.18)	Nos	800	2270	1816000
18	convex mirrors for road safety for blind curves	Nos	10	10000	100000
19	Road Delineators Supplying and installation of delineators (road way indicators, hazard markers, object markers), 80-100 cm high above ground level, painted black and white in 15 cm wide stripes, fitted with 80 x 100 mm rectangular or 75 mm dia circular reflectorised panels at the top, buried or pressed into the ground and confirming to IRC-79 and the drawings. (8.13)	Nos	580	2426	1407080
20	Construction of Semi Pucca R/wall of Av. Height 3.0m	Mtr	2210.00	15640.10	34564621.00
21	Construction of Semi Pucca B/wall of Av. Height 2.55m	Mtr	830.00	10423.90	8651837.00
22	Construction of PCC Edge wall of Av. Height 1.50m	Mtr	550.00	8924.00	4908200.00
23	Construction of Parapet wall	Nos	10468.50	2664.00	27888084.00
24	Construction of Pucca Drain	Mtr	760.00	5959.20	4528992.00
25	Construction of Channel Drain	Mtr	36711.00	966.80	35492194.80

26	Construction of Paver Block	Sqm	1520.00	620.00	942400.00
27	Construction of Steel Railing	Sqm	760.00	1960.00	1489600.00
28	Construction of Passenger Shelter	Mtr	20.00	400000	8000000.00
29	Construction of Street Lighting for fixing in Footpath	Mtr	30.00	25000	750000.00
30	Cross Drainage Structures (Slab Culverts)				
i	Excavation in foundations	Cum	4497.53	131	589176.43
ii	Cement Concrete (1:3:6) PCC M-10 Foundation & Plinth	Cum	281.91	7659	2159148.69
iii	Cement Concrete (1:2.5:5) PCC M-15 Foundation & Plinth	Cum	1435.22	7835	11244948.70
iv	Cement Concrete (1:2.5:5) PCC M-15 Sub Structure	Cum	1100.22	7835	8620223.70
v	Cement Concrete (1:1.5:3) RCC M-20 Super Structure	Cum	250.59	11282	2827156.38
vi	Wearing Coat M- 30 Grade	Sqm	193.00	20393	3935849.00
vii	Tor Steel Reinforcement for RCC Work.	MT	18.04	101978	1839683.12
31	QUANTITY CALCULATION FOR 1-ROW HP CULVERT				
i	Excavation for Structures Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material. (10.1 ii B)	cum	8977.45	131	1176046.21
ii	Providing/Laying for plain/reinforced concrete in open foundations complete as per drawing and technical specifications clause 802,803,1202 & 1203 PCC grade M-10 (1:3:6) nominal mix using 40mm down size	cum	403.37	7659	3089377.13
iii	Providing/Laying for plain/reinforced concrete in foundation and substructure complete as per drawing and technical specifications clause 802,804,1202 & 1203 PCC grade M-15 (1:2.5:5) nominal mix using 40mm-20mm down size aggregate.	cum	5251.61	7835	41146386.85

iv	Providing/Laying Plain/Reinforced cement concrete in sub-structure complete as per drawing and technical specifications clause 802, 804, 805, 806, 807, 1202 and 1204 PCC Grade M-20 (1:2:4) nominal mix.	cum	11.88	9552	113477.76
v	Providing/Laying cement concrete pipe NP3 for culverts on first class bedding of granular material in single row including fixing collar with cement mortar 1:2 clause 1106	Mtr	990.00	9985	9885150.00
vi	Back filling with stones behind abutment, wing walls and return walls complete as per drawing and technical specification clause 1204.3.8	cum	475.20	1433	680961.60
32	QUANTITY CALCULATION FOR BOX CULVERT				
i	Excavation for Structures Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material. (10.1 ii B)	Cum	16014.54	131	2097904.35
ii	Back filling behind abutments, wing walls and return walls with selected granular material of approved quality including all material, labour, equipment carriage etc. all complete as per drawing and Technical Specifications Clause 305.	Cum	1845.72	2319	4280216.89
iii	Back filling with filter media behind abutments, wing walls, & return walls, including all material, labour, equipment carriage etc. all complete as per drawing and Technical Specifications Clauses 305, 309 & 2502.	Cum	3658.25	1564	5721499.87
iv	Plain/Reinforced Cement Concrete (M-15) in Open Foundation complete as per Drawing and Technical Specifications.	Cum	1085.11	8646	9381882.40
v	Plain/Reinforced Cement Concrete in Open Foundation complete as per Drawing and Technical Specifications. RCC Grade M20 (Using Penetron Admixture@ 3kg/cum)	Cum	2665.08	9552	25456844.16
vi	Plain cement concrete/Reinforced cement concrete including centering and shuttering but excluding reinforcement all complete as per drawing and Technical Specifications Sections 1500 & 1700 in bridges, flyover and culverts.				
a	(i) M-30 grade in foundation	Cum	1424.28	11986	17071420.08
b	(ii) M-30 grade in Sub-structure	Cum	2131.47	13211	28158850.17
c	(iii) M-30 grade in Super-structure	Cum	495.00	14615	7234425.00

vii	Reinforced cement concrete including reinforcement complete as per drawings and Technical Specificationss Sections 1500,800, 1700 & 2703. M-30 grade concrete in RCC Railling	Mtr	528.00	3114	1644192.00
vii	HYSD/TMT bar reinforcement complete as per drawings and Technical Specificationss Section 1600.	MT	405.08	101978	41308738.35
ix	Providing and fixing drainage spouts for bridges as per Drawing and Technical Specificationss Clause 2705.	Num	264.00	8005	2113320.00
x	Weep holes as per spacifications	Num	4290.00	564	2419560.00
xi	Providing and laying boulders apron on river bed for protection against scour with stone boulders weighing not less than 40 kg each complete as per drawing and Technical specification.		139.21	2106	293183.43
xii	Flexible Apron :Construction of flexible apron 1 m thick comprising of loose stone boulders weighing not less than 40 kg beyond curtain wall.		1782.00	1403	2500146.00
32	QUANTITY CALCULATION FOR MINOR BRIDGE				
i	Excavation for Structures Earth work in excavation of foundation of structures as per drawing and technical specification, including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material. (10.1 ii B)	Cum	530.40	131	69482.40
ii	Back filling behind abutments, wing walls and return walls with selected granular material of approved quality including all material, labour, equipment carriage etc. all complete as per drawing and Technical Specificationss Clause 305.	Cum	419.10	2319	971892.90
iii	Back filling with filter media behind abutments, wing walls, & return walls, including all material, labour, equipment carriage etc. all complete as per drawing and Technical Specificationss Clauses 305, 309 & 2502.	Cum	100.00	1564	156400.00
iv	Plain/Reinforced Cement Concrete (M-15) in Open Foundation complete as per Drawing and Technical Specifications.	Cum	31.38	8646	271311.48
v	Plain cement concrete/Reinforced cement concrete including centering and shuttering but excluding reinforcement all complete as per drawing and Technical Specificationss Sections 1500 & 1700 in bridges, flyover and culverts.				
a	(i) M-30 grade in foundation	Cum	40.80	11986	489028.80
b	(ii) M-30 grade in Sub-structure	Cum	66.08	13211	872996.09
c	(iii) M-30 grade in Super-structure	Cum	37.05	14615	541485.75

vi	Reinforced cement concrete M-30 grade in approach slab including reinforcement for bridges complete as per drawing and Technical Specificationss Clause 2704.	Cum	50.40	17761	895154.40
vii	Reinforced cement concrete including reinforcement complete as per drawings and Technical Specificationss Sections 1500,800, 1700 & 2703. M-30 grade concrete in RCC Railling	Mtr	29.20	3114	90928.80
viii	HYSD/TMT bar reinforcement complete as per drawings and Technical Specificationss Section 1600.	MT	17.90	101978	1825178.79
ix	Providing 20mm expansion joint filled with compressible fiber board as per drawing and as per direction of the Engineer.		15.00	8290	124350.00
x	Providing and fixing drainage spouts for bridges as per Drawing and Technical Specificationss Clause 2705.	Num	4.00	8005	32020.00
xi	Weep holes as per spacifications	Num	40.00	564	22560.00

Annexure 4.1: Monitoring Results for the sub project

Soil

Soil monitoring was conducted at four locations in the month of October, 2025. Details of the soil sampling locations are presented in Table 1 and shown in Figure 1. The collected soil samples were analyzed for various parameters in an NABL-accredited laboratory. The soil monitoring results are presented in the Table 2.

Table 1: Soil Monitoring Locations

Sl. No.	Project Area	Monitoring Location	Sample Code	Geographical Coordinate	
				Latitude	Longitude
1	Corridor 10	Sonidan (Agriculture field)	SQ1	25°52'57.36"N	92° 7'20.07"E
2		Korhadem (paddy field)	SQ2	25°57'20.29"N	92° 8'37.33"E
3		Umtraï (Agriculture Field)	SQ3	25°59'53.05"N	92° 7'55.48"E
4		Umsiang (Agriculture Field)	SQ4	26° 4'5.45"N	92° 9'56.69"E

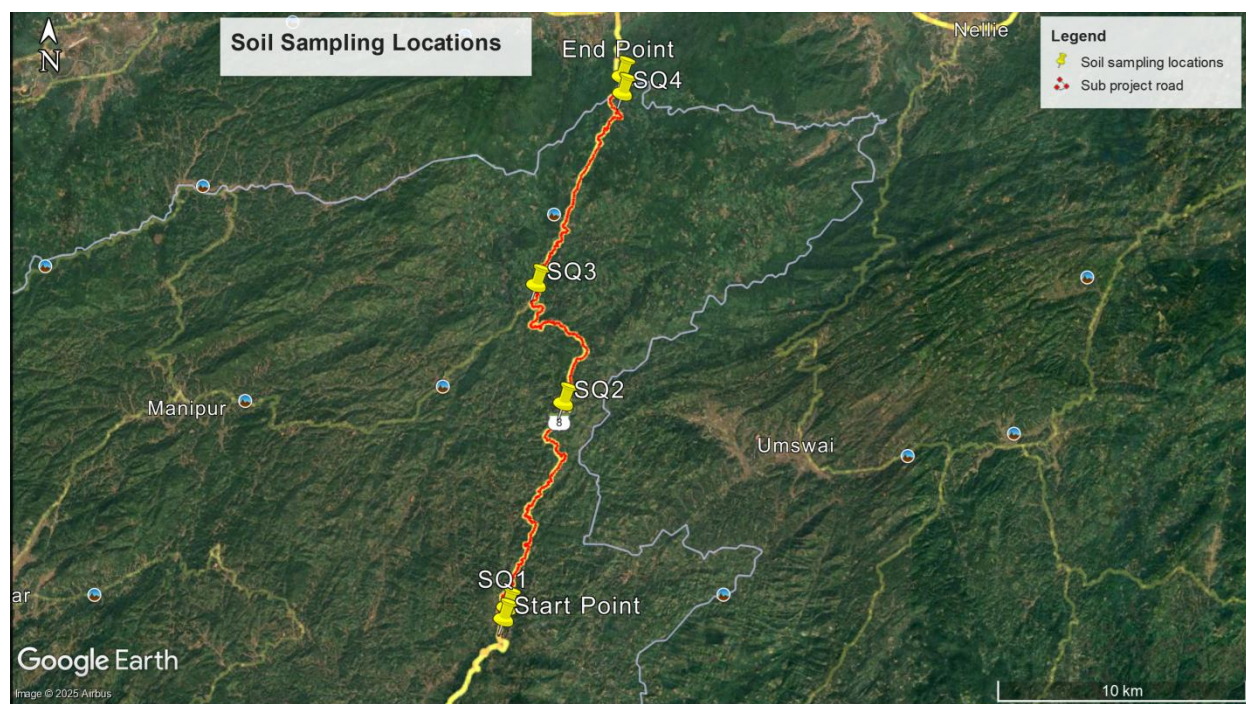


Figure 2: Soil monitoring locations

Table 2: Soil Monitoring Results in the sub-project road

Sl. No.	Parameters	Units	SQ1	SQ2	SQ3	SQ3	Test Method
1	Colour		Brown	Brown	Brown	Brown	STRL/STP/SOIL/01
2	Textural Class		Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	IS2720 (P-4),1985 (Reaff: 2015)
3	Bulk Density	gm/cm ³	1.5	1.6	1.3	1.3	IS 14765: 2000, RA 2010
4	Water Holding Capacity	%	22.2	26.2	23.9	23.2	STRL/STP/SOIL/01
5	Sand	%	51.8	52.9	55.7	55.0	IS2720 (P-4),1985 (Reaff: 2015)
6	Silt	%	25.0	24.1	23.5	22.8	IS2720 (P-4),1985 (Reaff: 2015)

Sl. No.	Parameters	Units	SQ1	SQ2	SQ3	SQ3	Test Method
7	Clay	%	23.2	23.1	20.8	22.2	IS2720 (P-4),1985 (Reaff: 2015)
8	pH (1:2 Suspension)	-	4.0	4.3	4.2	3.5	IS:2720 (P-26), 1987 (Reaff:2011)
9	Electrical Conductivity(1:2)	μmhos/cm	219.8	233.0	242.6	241.9	IS: 14767(2000), RA 2016
10	Organic Matter	%W/W	1.0	1.1	1.2	0.5	STRL/STP/SOIL/01
11	Exchangeable Calcium	mg/kg	813.8	843.7	737.7	737.0	IS 2720 (Part 24): 1976, RA 2010
12	Exchangeable Magnesium	mg/kg	238.8	208.7	288.7	288.0	IS 2720 (Part 24): 1976, RA 2010
13	Copper	mg/kg	2.6	2.9	1.6	0.9	IS 2720(Part-27): 1977
14	Nickel	mg/kg	0.9	1.4	0.1	-0.6	IS 2720(Part-27): 1977
15	Chromium	mg/kg	2.3	1.6	1.3	0.6	IS 2720(Part-27): 1977
16	Lead	mg/kg	0.3	0.4	0.4	0.3	IS 2720(Part-27): 1977
17	Sulphate	mg/kg	14.4	15.0	17.5	16.8	IS 2720(Part-27): 1977
18	Total Nitrogen (as N)	%	0.2	0.2	0.3	0.4	IS:10158:1982, RA 2009
19	Available Phosphorous	mg/kg	8.8	9.7	7.7	7.0	IS:10158:1982, RA 2009
20	Exchangeable Potassium	mg/kg	93.8	86.7	79.7	79.0	STRL/STP/SOIL/01

Ambient Air Quality

Residential and other sensitive locations proximity to roads were the criteria used for selecting the sample locations (Table 3). Four locations were selected for air quality monitoring. Monitoring was done in the month of

October. Parameters like Particulate Matter (PM 10), Particulate Matter (PM 2.5), Sulphur dioxide (SO₂), Nitrogen dioxide (NO₂) and Carbon Monoxide (CO) were monitored. Map showing monitoring locations are given in Figure 2. Ambient air quality results are given in Table 4.

Table 3: Air Monitoring Locations

Sl. No.	Project Area	Monitoring Location	Sample Code	Geographical Coordinate	
				Latitude	Longitude
1	Corridor 10	Sonidan	AAQ1	25°52'57.35"N	92° 7'20.06"E
2		Korhadem	AAQ2	25°57'20.28"N	92° 8'37.34"E
3		Umtraí	AAQ3	25°59'53.05"N	92° 7'55.48"E
4		Umsiang	AAQ4	26° 4'5.44"N	92° 9'56.67"E

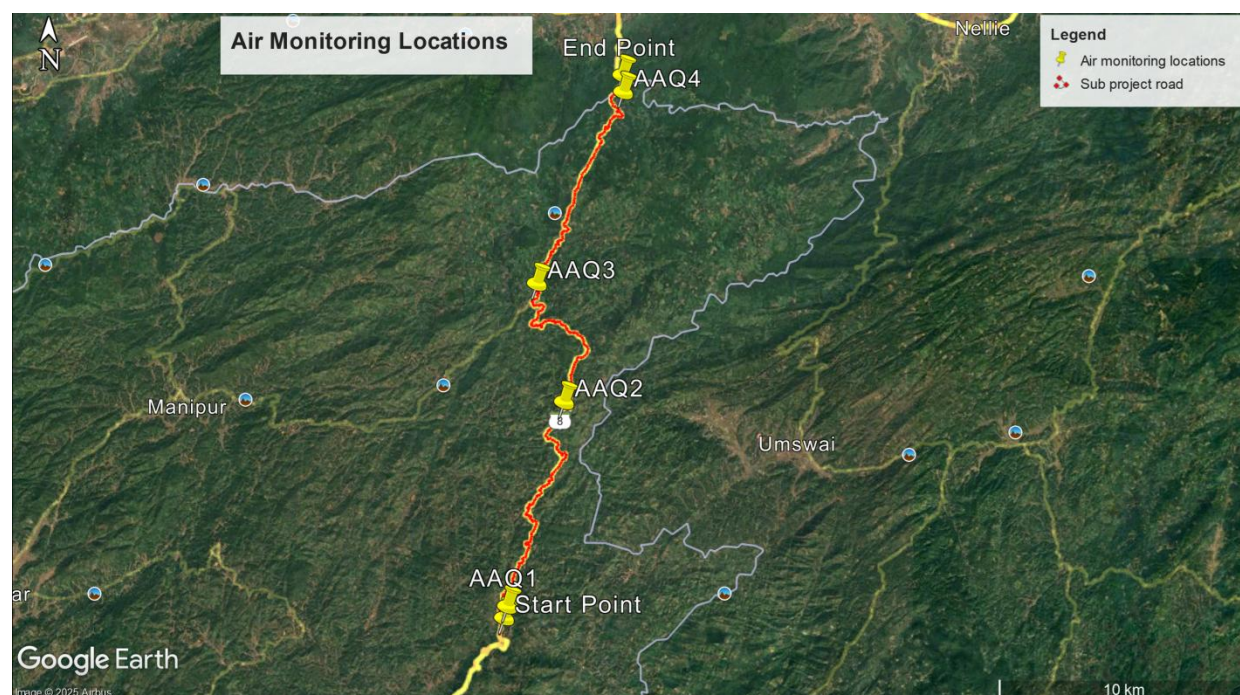


Figure 2: Air monitoring locations

Table 4: Ambient Air Quality Monitoring Results

Sl. No.	Project Area	Location	Sample Code	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	Sulphur Dioxide (SO ₂) (µg/m ³)	Nitrogen Dioxide (NO ₂)	Carbon Monoxide (CO) (µg/m ³)
1	Corridor 9	Sonidan	AAQ1	53.8	28.3	6.4	7.6	0.260
2		Korhadem	AAQ2	51.6	24.9	6.1	7.0	0.230
3		Umtraí	AAQ3	56.4	31.5	6.6	7.8	0.290
4		Umsiang	AAQ4	60.3	32.8	6.9	8.2	0.320
National Ambient Air Quality Standards, Central Pollution Control Board, 2009				100	60	80	80	2000

Ambient Noise Monitoring Results

This section describes the noise quality standards and the existing ambient noise levels, including the locations of the monitoring stations. To compute the average Noise Level dB (A), noise level is monitored over a period of 24 hour by the authorized NABL laboratory. The noise monitoring has been conducted for determination of noise levels at four locations for (Figure 3) in the month of October as per Table 5 below. Results are given in Table 6.

Table 5: Noise Monitoring Locations

Sl. No.	Project Area	Monitoring Location	Sample Code	Geographical Coordinate	
				Latitude	Longitude
1	Corridor 10	Sonidan	NQ1	25°52'57.35"N	92° 7'20.06"E
2		Korhadem	NQ2	25°57'20.28"N	92° 8'37.34"E

3		Umtrai	NQ3	25°59'53.05"N	92° 7'55.48"E
4		Umsiang	NQ4	26° 4'5.44"N	92° 9'56.67"E

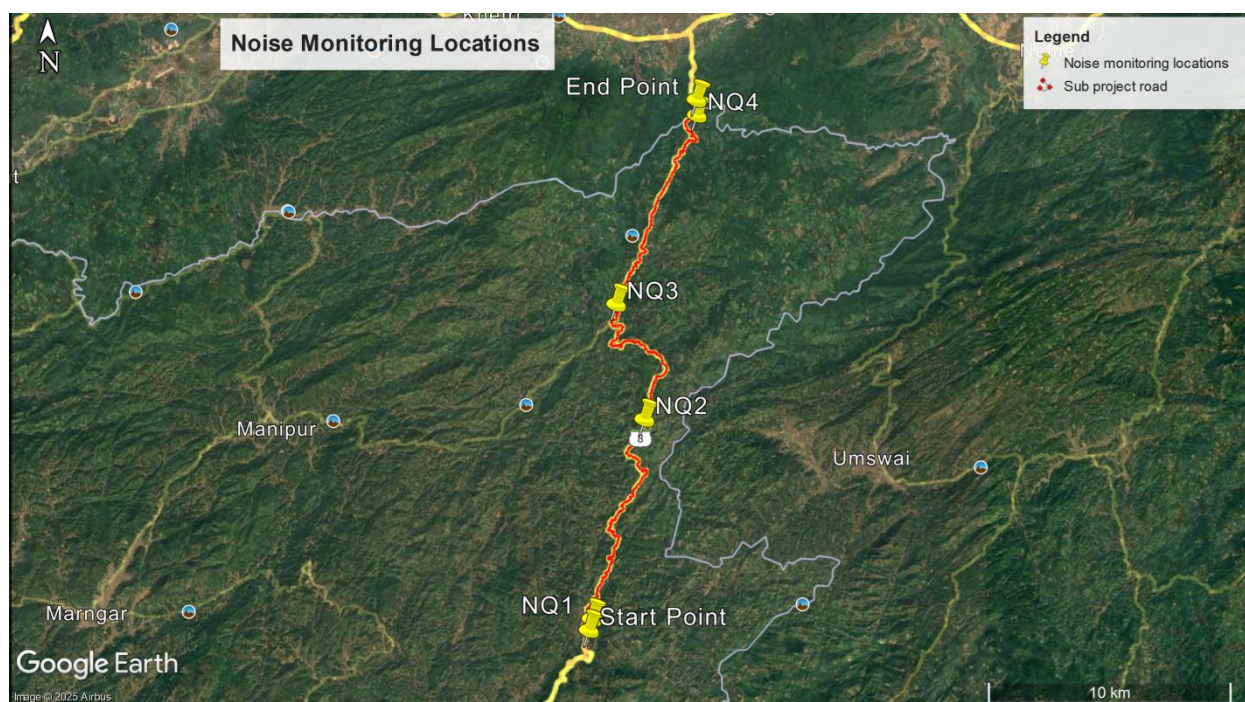


Figure 3: Noise monitoring locations

Table 6: Analysis of Noise Level Monitoring

Location	Land Use	Standards dB(A)		Day Time Leq (dB(A))	Night Time- Leq (dB(A))
		Day	Night		
Sonidan	Residential	55	45	52.6	37.7
Korhadem	Residential	55	45	51.2	35.6

Umtraí	Residential	55	45	53.7	36.9
Umsiang	Commercial	65	55	58.3	38.6

Ground water

Four ground water samples have been selected from sources present along the project road to ascertain the baseline conditions of the ground water quality. The Ground water samples were collected in the month of October. Location details of the surface water samples are presented in Table 7 and shown in Figure 4. Results of the Surface water quality are shown in Table 8.

Table 7: Water Monitoring Locations

Sl. No.	Project Area	Monitoring Location	Sample Code	Geographical Coordinate	
				Latitude	Longitude
1	Corridor 10	Sonidan	WQ1	25°52'57.22"N	92° 7'20.48"E
2		Korhadem	WQ2	25°57'21.34"N	92° 8'37.12"E
3		Umtraí	WQ3	25°59'54.23"N	92° 7'56.37"E
4		Umsiang	WQ4	26° 4'5.41"N	92° 9'55.34"E

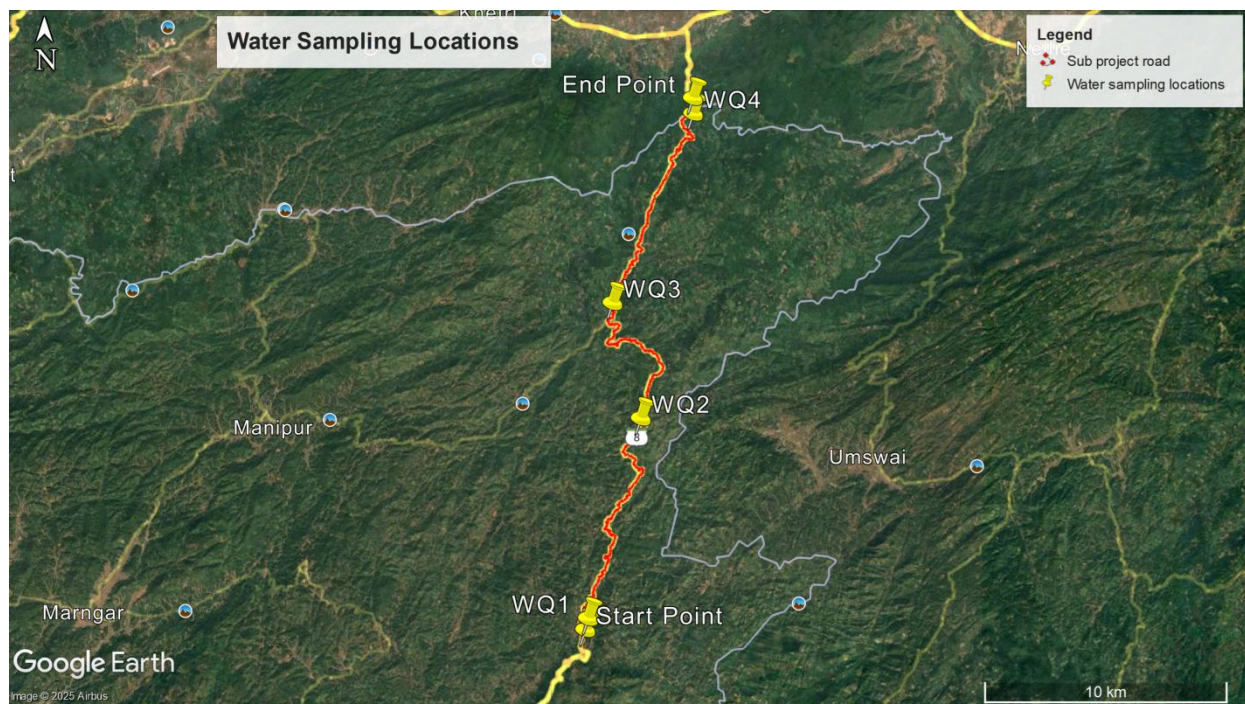


Figure 4: Water monitoring locations

Table 8: Ground Water monitoring results in the project area

S. No.	Parameters	Unit	Limit (IS-10500:2012)		GW-1	GW-2	GW-3	Test method
			Desirable Limit	Permissible Limit				
1	Color	Hazen	5	15	<5	<5	<5	IS: 3025(Pt-4)
2	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS: 3025(Pt-5)
3	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS: 3025(Pt-8)
4	Turbidity	NTU	1	5	<1	<1	<1	IS 3025(Part-10)
5	pH	-	6.5-8.5	No Relaxation	6.5	6.9	7.1	IS: 3025(Pt-11)
6	Total Hardness (as CaCO ₃)	mg/l	200	600	138	131	112	IS 3025(Part-21)
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.11	0.20	0.27	3500-Fe- B, APHA 23nd Ed.2017

S. No.	Parameters	Unit	Limit (IS-10500:2012)		GW-1	GW-2	GW-3	Test method
			Desirable Limit	Permissible Limit				
8	Chlorides (as Cl)	mg/l	250	1000	18.7	22.5	21.9	IS 3025(Part-32)
9	Fluoride (as F)	mg/l	1	1.5	BDL	BDL	BDL	4500-F-(D), APHA 23 st Ed.2017
10	TDS	mg/l	500	2000	179	192	188	IS 3025(Part-16)
11	CALCIUM (as Ca ²⁺)	mg/l	75	200	23.8	25.4	22.8	IS 3025(Part-40)
12	MAGNESIUM (as Mg ²⁺)	mg/l	30	100	19.2	17.7	13.9	3500- Mg B, APHA 23 rd Ed.2017
13	Sulphate (as SO ₄)	mg/l	200	400	10.6	15.2	13.6	IS 3025(Part-24)
14	Total Chromium (as Cr)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01	3110- B, APHA 23 rd Ed 2017
15	Alkalinity as CaCO ₃	mg/l	200	600	133.7	132.8	130.5	IS 3025(Part-23)
16	Aluminium (as Al)	mg/l	0.03	0.2	<0.01	<0.01	<0.01	IS 3025(Part-55)
17	Total Arsenic (as As)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	3110- B, APHA 23 rd Ed2017
18	Copper (as Cu)	mg/l	0.05	1.5	<0.05	<0.05	<0.05	3110- B, APHA 23 rd Ed2017
19	Manganese (as Mn)	mg/l	0.1	0.3	<0.01	<0.01	<0.01	3110- B, APHA 23 rd Ed2017
20	Zinc (as Zn)	mg/l	5	15	0.20	0.18	0.26	3110- B, APHA 23 rd Ed2017
21	Ammonia (as NH ₃ -N)	mg/l	0.5	No Relaxation	<0.1	<0.1	<0.1	4500-NH ₃ -B &C, APHA 23 rd ED2017

S. No.	Parameters	Unit	Limit (IS-10500:2012)		GW-1	GW-2	GW-3	Test method
			Desirable Limit	Permissible Limit				
22	Anionic Detergents (as MBAS)	mg/l	0.2	1	<0.1	<0.1	<0.1	Annexure K of IS-13428
23	Boron (as B)	mg/l	0.5	1	<0.5(BDL)	<0.5(BDL)	<0.5(BDL)	IS: 3025 (Pt-57)
24	Mineral Oil	mg/l	0.5	No Relaxation	<0.1	<0.1	<0.1	IS 3025(Part-39)
25	Phenolic Compound (as C ₆ H ₅ OH)	mg/l	0.001	0.002	<0.001	<0.001	<0.001	IS 3025(Part-44)
26	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.002	<0.002	<0.002	3110- B, APHA 23nd Ed2017
27	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.1	<0.1	<0.1	4500- CN-B, C & E, APHA 23nd Ed2017
28	Lead	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	3110- B, APHA 23nd Ed2017
29	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	<0.001	<0.001	3110- B, APHA 23nd Ed.2017
30	Nickel (as Ni)	mg/l	0.02	No Relaxation	<0.02	<0.001	<0.001	3110- B, APHA 23nd Ed.2017
31	Residual Free Chlorine	mg/l	0.2	1.0	<0.2	<0.02	<0.02	4500-Cl-B, APHA 23nd Ed2017
32	Molybdenum (Mo)	mg/l	<0.05	0.07	No Relaxation	<0.2	<0.2	3110- B, APHA 23nd Ed.2017
33	Polynuclear Aromatic Hydrocarbons	mg/l	<0.0001	0.0001	No Relaxation	No Relaxation	No Relaxation	APHA 6440,23nd Ed.2017
34	Poly chlorinated biphenyl	mg/l	<0.0001	0.0005	No Relaxation	No Relaxation	No Relaxation	APHA 6430,23nd Ed.2017

S. No.	Parameters	Unit	Limit (IS-10500:2012)		GW-1	GW-2	GW-3	Test method
			Desirable Limit	Permissible Limit				
35	Nitrate	mg/l	45	No Relaxation	9.8	8.7	12.8	IS: 3025(Pt-34)
36	Sodium (as Na ⁺)	mg/l	-	-	24.6	18.8	21.8	APHA 4500-Na B / IS 3025 (Part 45): 1993
37	Potassium (as K ⁺)	mg/l	-	-	5.8	7.9	7.2	APHA 4500-K B / IS 3025 (Part 45): 1993
Microbiological Parameters								
36	Total Coli form	MPN/ 100ml	Shall not be detectable in any 100 ml of sample		<1	<1	<1	IS: 1622-1981
37	<u>E.Coli</u>	<u>E.Coli</u> / 100ml	Shall not be detectable in any 100 ml of sample		Absent	Absent	Absent	IS: 1622-1981

Surface water

Surface water sample have been selected from river present along the project road to ascertain the baseline conditions of the surface water quality. The surface water samples collected included sample from river in the month of October. Location details of the surface water samples are presented in Table 9 and shown in Figure 5. Results of the surface water quality are shown in Table 10.

Table 9: Surface Water Sampling Locations

Sl. No.	Project Area	Monitoring Location	Sample Code	Geographical Coordinate	
				Latitude	Longitude
1	Corridor 10	Umsiang Ch 77+611	SW1 River Umsiang	26° 4'27.71"N	92° 9'55.05"E



Figure 5: Surface Water monitoring locations

Table 10: Surface Water sampling results in the project area

Sl. No.	Parameters	Unit	IS: 2296 - 1992 (Class C)	SW-1 River Umsiang	Test method
			Tolerance Limit		
1	pH	-	6.5 -8.5	7.20	IS: 3025(Pt-11)1983, RA. 2002
2	Temperature	°C	-	18.2	APHA 23 rd Edn.2017-2550 B

Sl. No.	Parameters	Unit	IS: 2296 - 1992 (Class C)	SW-1 River Umsiang	Test method
			Tolerance Limit		
3	D.O	mg/l	Minimum -4	7.2	IS 3025(Part-38): 2006
4	BOD	mg/l	30	5.8	IS 3025(Part-44):1993, RA 2009
5	Colour	Hazen	300	5	IS: 3025 (Pt-4) 1983, RA 2017
6	Odour	-	-	Agreeable	IS: 3025(Pt-5)
7	TDS	mg/l	1500	150.4	IS 3025(Part-16): 1984, RA 2006
8	TSS	mg/l	-	14.8	IS 3025(Part-17)
9	TKN	mg/l		2.2	IS: 3025(Pt-34)1988, RA. 2003
10	Ammonical Nitrogen	mg/l		0.42	IS: 3025(Pt-34)1988, RA. 2003
11	Nitrate (as NO ₃)	mg/l	50	2.0	IS: 3025(Pt-34)1988, RA. 2003
12	Free Ammonia	mg/l		<0.1	IS: 3025(Pt-34)1988, RA. 2003
13	Chlorides (as Cl)	mg/l	600	23.4	IS 3025(Part-32): 1988
14	Sulphates (as SO ₄)	mg/l	400	26.7	IS 3025(Part-24):1986, RA 2003
15	Fluoride (as F)	mg/l	1.5	0.45	APHA 21 st Ed., 4500F(D)
16	Oil & Grease	mg/l	0.1	<0.1	IS 3025(Part-39):1991, RA 2009
17	Phenolic Compound (as C ₆ H ₅ OH)	mg/l	0.005	<0.001	5530-B, C&E, APHA 23nd 2017
18.	Arsenic	mg/l	0.2	<0.1	3110- B, APHA 23nd Ed. 2017 (AAS)
19	Mercury (as Hg)	mg/l	-	<0.001	3110- B, APHA 23nd Ed.2017
20	Lead (as Pb)	mg/l	0.1	0.02	3110- B, APHA 23nd Ed. 2017 (AAS)

Sl. No.	Parameters	Unit	IS: 2296 - 1992 (Class C)	SW-1 River Umsiang	Test method
			Tolerance Limit		
21.	Cadmium (as Cd)	mg/l	0.01	0.001	3110- B, APHA 23nd Ed. 2017 (AAS)
22.	Chromium (as Cr ⁺⁶)	mg/l	0.05	0.02	IS 3025(Part-52): 200
23.	Copper (as Cu)	mg/l	1.5	0.10	3110- B, APHA 23nd Ed. 2017 (AAS)
24.	Zinc (as Zn)	mg/l	15	0.12	3110- B, APHA 23nd Ed. 2017 (AAS)
25	Selenium (as Se)	mg/l	-	<0.1	IS: 3025 (P- 56)
26.	Anionic detergents (as MBAS)	mg/l	1.0	<0.1	Annexure K Of IS 13428
27.	Iron (as Fe)	mg/l	50	0.28	3500-Fe- B, APHA 23nd Ed. 2017
28.	Sulphide (as H ₂ S)	mg/l	-	0.15	IS-3025 (P-29)
29.	Phosphate (as PO ₄)	mg/l	-	3.4	APHA 22 nd Edn.2012-4500-P C
30.	Cyanide (as CN)	mg/l	0.05	<0.1	4500-CN-B, C & E, APHA 23nd Ed.2017
31.	Manganese (as Mn)	mg/l	-	0.03	3110- B, APHA 23nd Ed.2017
32.	COD	mg/l	-	14.2	IS 3025(Part-58): 2006
33.	Total Coli form	MPN/100ml	5000	756	IS: 1622-1981

Annexure 4.2: Biodiversity Methodology (A Comprehensive Sampling Design and Indicators)

SECONDARY/DESKTOP DATA COLLECTION

Secondary data collection complemented primary field efforts by providing historical and contextual insights into the biodiversity of project district. The approach included:

1. Literature Reviews and Consultations:
 - a. Reviewed peer-reviewed articles, biodiversity reports, and government publications relevant to the region.
 - b. Consulted databases such as the IUCN Red List, ZSI records, and previous Environmental Impact Assessments (EIAs) conducted in nearby areas.
2. Use of Historical Biodiversity Records:
 - a. Incorporated species data from earlier surveys and studies conducted in project district.
 - b. Verified and updated records based on field observations to ensure data accuracy.

Subsequently, comprehensive tools such as Web-Based Sources and the following list (Below Table 1) of sources are used for the secondary data collection.

Table 1: Tools/Sources for identifying critical habitats

SI No.	Indicators	Tools	References
1	Natural Habitat/ Modified Habitat	Global Forest Watch Land Cover Layer	https://www.globalforestwatch.org/
2	Land Use Land Cover	Land Cover data by ESRI and Impact Observatory	Environmental Systems Research Institute, California
3	PAs, Conservation Reserve, Community Reserve, Reserve Forest & Eco-sensitive Zone	Parivesh portal	https://stgdev.parivesh.nic.in/kya-dev/#/
4	Tiger Reserve & Corridor	Download boundary file and overlay the project area	https://ntca.gov.in/dss/#decision-support-system
5	Elephant Reserve	Elephant Reserves of India: An Atlas	https://moef.gov.in/wp-content/uploads/2023/11/PE-Elephant-Reserve-of-India-an-atlas.pdf
6	Ramsar Site	Ramsar Sites Information Services	https://rsis Ramsar.org/
7	Key Biodiversity Area/Important Bird Area	Key Biodiversity Area	https://www.keybiodiversityareas.org/sites/search

SI No.	Indicators	Tools	References
8	Schedule Species (I-IV), Wildlife (Protection) Act, 1972	List of schedule species list (I - IV)	Wild Life (Protection) Amendment Act, 2022

Primary data collection:

1. Primary data collection involved direct fieldwork conducted during September to assess the biodiversity of the direct impact area of the project road. Key activities and followed methods included in the below Table 2.

Table 2: Primary data collections methods and indicators

Sl. No.	Biodiversity survey	Methods	Indicators
1	Vegetation	Nested quadrat method	Species richness, density, diversity indices and dominance
2	Mammal (diurnal and nocturnal)	Visual encounter and sign surveys using line transect method	Species richness and diversity and encounter rate
3	Avifauna	Line transects	Species richness and diversity and encounter rate
4	Reptiles and amphibians	Visual encounter (transect survey)	Species richness and diversity and encounter rate
5	Butterfly	Transect survey	Species richness and diversity and encounter rate
6	Aquatic fauna	Transect/Netting survey/Rod-line methods	Species richness and diversity and encounter rate

Meetings with Local government officials:

1. Various interactions and meetings were conducted with Forest Officials, biodiversity officers & other officials of PWD responsible for the project road. Meetings with forest department officials were done to request information about their working plan circles and their management of protected areas and to discuss about animal corridors if present in the vicinity of the project road.
2. Additionally, discussions were held with inhabitants near the project site, engaging various individuals to understand the current status of fauna along the road and nearby protected areas. The conversations focused on gathering information about the presence of wildlife, the frequency of sightings along the

roadside, and in nearby community forests. Questions were also asked regarding illegal activities, such as poaching of fauna and unauthorized logging of timber trees.

Data Analysis Methods

1. Collected data was analyzed using the following methods:

Species Categorization:

- a. Species were classified based on their taxonomic groups (mammals, birds, amphibians, reptiles, etc.).
- b. Conservation statuses were assigned using IUCN Red List categories and Wildlife Protection Act (WPA) schedules.

Threat Assessment:

- a. Identified species at risk due to habitat fragmentation, road construction, and human disturbances.
- b. Assessed habitat quality and connectivity using geographic data and field observations.

Habitat Mapping:

- a. Mapped key biodiversity hotspots and critical habitats along the proposed road alignment.
- b. Spatial data mapping- Ecological sensitive areas - proximity to respected PAs has been identified based on GIS SHP files obtained from forest department, topo sheets and satellite imagery.

Annexure 4.3: Detailed List of Flora and Fauna

List of trees (Source: Primary and Secondary data)

Sl. No.	Common Name	Scientific Name	IUCN Status	Family	Source
1	Bamboo	<i>Bambusa spp.</i>	LC	Poaceae	Primary
2	Banana (Wild)	<i>Musa balbisiana</i>	LC	Musaceae	Primary
3	Guava	<i>Psidium guajava</i>	LC	Myrtaceae	Primary
4	Lychee	<i>Litchi chinensis</i>	VU	Sapindaceae	Secondary
5	Mango	<i>Mangifera indica</i>	DD	Anacardiaceae	Secondary
6	Neem	<i>Azadirachta indica</i>	LC	Meliaceae	Primary
7	Orange	<i>Citrus sinensis</i>	LC	Rutaceae	Secondary
8	Peepal Tree	<i>Ficus religiosa</i>	LC	Moraceae	Secondary
9	Pine	<i>Pinus kesiya</i>	LC	Pinaceae	Primary
10	Tamarind	<i>Tamarindus indica</i>	LC	Fabaceae	Secondary

Source: Meghalaya State Biodiversity Strategy and Action Plan (MBSAP)

List of Shrubs (Source: Primary and Secondary data)

Sl. No.	Common Name	Scientific Name	IUCN Status	Family	Source
1	Castor Bean	<i>Ricinus communis</i>	LC	Euphorbiaceae	Secondary
2	Lantana	<i>Lantana camara</i>	LC	Verbenaceae	Primary
3	Ronga Bahak	<i>Phlogacanthus thyrsoformis</i>	LC	Acanthaceae	Primary

Source: Meghalaya State Biodiversity Strategy and Action Plan (MBSAP)

List of Herbs

Sl. No.	Common Name	Scientific Name	IUCN Status	Family	Source
1	Alligator Weed	<i>Alternanthera philoxeroides</i>	LC	Amaranthaceae	Primary
2	Pineapple	<i>Ananas comosus</i>	LC	Bromeliaceae	Primary
3	Beggar Tick	<i>Bidens pilosa</i>	LC	Asteraceae	Primary
4	Feather Celosia	<i>Celosia argentea</i>	LC	Amaranthaceae	Secondary
5	Red flower Ragleaf	<i>Crassocephalum crepidioides</i>	LC	Asteraceae	Secondary

Source: Meghalaya State Biodiversity Strategy and Action Plan (MBSAP)

List of Grass species (Source: Primary and Secondary data)

Sl. No.	Common Name	Scientific Name	IUCN Status	Family	Source
1	Mint / Pudina	<i>Mentha arvensis</i>	LC	Lamiaceae	Primary
2	Wild Ginger	<i>Zingiber zerumbet</i>	LC	Zingiberaceae	Primary
3	Gotu Kola / Indian Pennywort	<i>Centella asiatica</i>	LC	Apiaceae	Secondary
4	Broom Grass / Tiger Grass	<i>Thysanolaena maxima</i>	LC	Poaceae	Primary

Source: Meghalaya State Biodiversity Strategy and Action Plan (MBSAP)

List of Fern

Sl. No.	Common Name	Scientific Name	Family	Source
1	Walking maidenhair fern	<i>Adiantum philippense</i>	Pteridaceae	Secondary
2	Tree fern	<i>Alsophila latebrosa</i>	Cyatheaceae	Secondary
3	Bird's nest fern	<i>Asplenium nidus</i>	Aspleniaceae	Secondary
4	Creeping fern	<i>Bolbitis heteroclita</i>	Dryopteridaceae	Secondary
5	Dhekia	<i>Diplazium esculentum</i>	Athyriaceae	Secondary
6	Staghorn clubmoss	<i>Lycopodiella cernua</i>	Lycopodiaceae	Secondary
7	Lace fern	<i>Odontosoria chinensis</i>	Lindsaeaceae	Secondary
8	Giant Vine Fern	<i>Stenochlaena tenuifolia</i>	Blechnaceae	Secondary
9	Downy maiden fern	<i>Thelypteris dentata</i>	Thelypteridaceae	Secondary
10	Bracken fern	<i>Pteridium aquilinum</i>	Dennstaedtiaceae	Secondary
11	Rabbit's foot fern	<i>Davallia solida</i>	Davalliaceae	Secondary
12	Bird's claw fern	<i>Ceratopteris thalictroides</i>	Pteridaceae	Secondary
13	Common maiden fern	<i>Adiantum capillus-veneris</i>	Pteridaceae	Secondary
14	Water fern	<i>Marsilea minuta</i>	Marsileaceae	Secondary
15	Forked fern	<i>Dicranopteris linearis</i>	Gleicheniaceae	Secondary
16	Climbing fern	<i>Lygodium flexuosum</i>	Lygodiaceae	Secondary
17	Hairy fern	<i>Pteris vittata</i>	Pteridaceae	Secondary
18	Sensitive fern	<i>Onychium japonicum</i>	Pteridaceae	Secondary

Source: Meghalaya State Biodiversity Strategy and Action Plan (MBSAP)

List of Fauna

List of Bird species

Sl. No.	Common Name	Scientific Name	IUCN Status	WPA 1972 Schedule	Migration / Resident Status	Source
1.	Common Myna	<i>Acridotheres tristis</i>	LC	IV	Resident	Primary
2.	Common Tailorbird	<i>Orthotomus sutorius</i>	LC	IV	Resident	Secondary
3.	Emerald Dove	<i>Chalcophaps indica</i>	LC	IV	Resident	Primary
4.	Great Barbet	<i>Psilopogon virens</i>	LC	IV	Resident	Secondary
5.	House Sparrow	<i>Passer domesticus</i>	LC	IV	Resident	Secondary

6.	Indian Pond Heron	<i>Ardeola grayii</i>	LC	IV	Resident	Secondary
7.	Jungle Myna	<i>Acridotheres fuscus</i>	LC	IV	Resident	Secondary
8.	Red-vented Bulbul	<i>Pycnonotus cafer</i>	LC	IV	Resident	Secondary
9.	Shikra	<i>Accipiter badius</i>	LC	IV	Resident	Secondary
10.	Spotted Dove	<i>Spilopelia chinensis</i>	LC	IV	Resident	Secondary
11.	White-throated Kingfisher	<i>Halcyon smyrnensis</i>	LC	IV	Resident	Secondary
12.	Oriental White-eye	<i>Zosterops palpebrosus</i>	LC	IV	Resident	Secondary
13.	Asian Koel	<i>Eudynamys scolopaceus</i>	LC	IV	Resident	Primary
14.	Red Junglefowl	<i>Gallus gallus</i>	LC	II	Resident	Secondary
15.	Oriental Pied Hornbill	<i>Anthracoceros albirostris</i>	NT	I	Resident	Secondary
16.	Green-legged Partridge (Green-legged Hill Partridge)	<i>Arborophila chloropus</i>	LC	I	Resident	Secondary

Source: Meghalaya State Biodiversity Strategy and Action Plan (MBSAP)

List of Mammals, Reptiles (Source : Primary and Secondary data)

Mammals

Sl. No.	Common Name	Scientific Name	IUCN Status	Schedule Status (WPA 2022)	Source
1	Rhesus Macaque	<i>Macaca mulatta</i>	LC	NS	Secondary
2	Large Indian Civet	<i>Viverra zibetha</i>	LC	II	Secondary
3	Masked Palm Civet	<i>Paguma larvata</i>	LC	II	Secondary
4	Irrawaddy Squirrel	<i>Callosciurus pygerythrus</i>	LC	NS	Primary
5	Western Hoolock Gibbon	<i>Hoolock hoolock</i>	EN	I	Secondary
6	Bengal Slow Loris	<i>Nycticebus bengalensis</i>	EN	I	Secondary
7	Asian Elephant	<i>Elephas maximus</i>	EN	I	Secondary
8	Assam Macaque	<i>Macaca assamensis</i>	NT	II	Secondary
9	Rhesus Macaque	<i>Macaca mulatta</i>	LC	II	Secondary
10	Chinese Pangolin	<i>Manis pentadactyla</i>	LC	I	Secondary
11	Indian Pangolin	<i>Manis crassicaudata</i>	LC	I	Secondary

Source: Meghalaya State Biodiversity Strategy and Action Plan (MBSAP)

Reptiles

Sl. No.	Common Name	Scientific Name	IUCN Status	Schedule Status (WPA 2022)	Source
1	Common Garden Lizard	<i>Calotes versicolor</i>	LC	NS	Primary
2	Bronze Skink	<i>Eutropis macularia</i>	LC	NS	Secondary
3	White-spotted Supple Skink	<i>Lygosoma albopunctata</i>	LC	NS	Secondary
4	Banded Krait	<i>Bungarus fasciatus</i>	LC	NS	Secondary
5	Common Kukri Snake	<i>Oligodon arnensis</i>	LC	NS	Secondary
6	Snail-eater	<i>Pareas monticola</i>	LC	NS	Secondary

Source: Meghalaya State Biodiversity Strategy and Action Plan (MBSAP)

Amphibians

Sl. No.	Common Name	Scientific Name	IUCN Status	Schedule Status (WPA 2022)	Source
1	Asian Common Toad	<i>Duttaphrynus melanostictus</i>	LC	IV	Secondary
2	Khasi Hills Tree Frog	<i>Polypedates leucomystax</i>	LC	Not Listed	Secondary
3	Shillong Stream Frog	<i>Amolops shillongensis</i>	NT	Not Listed	Secondary
4	Shillong Bush Frog	<i>Raorchestes shillongensis</i>	LC	Not Listed	Secondary

Source: Meghalaya State Biodiversity Strategy and Action Plan (MBSAP)

Butterflies

Sl. No.	Common Name	Scientific Name	IUCN Status	Schedule Status (WPA 2022)	Source
1	Fringed Dawnfly	<i>Capila penicillatum</i>	LC	Not Listed	Secondary
2	Common Mormon	<i>Papilio polytes</i>	LC	Not Listed	Primary
3	Common Rose	<i>Pachliopta aristolochiae</i>	LC	Not Listed	Secondary
4	Swallowtail	<i>Papilio machaon</i>	LC	Not Listed	Secondary
5	Tailed Jay	<i>Graphium agamemnon</i>	LC	Not Listed	Secondary
6	Blue Tiger Butterflies	<i>Tirumala limniace</i>	LC	Not Listed	Secondary
7	Common Crow Butterflies	<i>Euploea core</i>	LC	Not Listed	Primary
8	Common Tiger Butterflies	<i>Danaus genutia</i>	LC	Not Listed	Secondary
9	Plain Tiger Butterflies	<i>Danaus chrysippus</i>	LC	Not Listed	Secondary
10	Great Orange Tip	<i>Hebomoia glaucippe</i>	LC	Not Listed	Secondary
11	Common Grass Yellow	<i>Eurema hecabe</i>	LC	Not Listed	Secondary

Source: Meghalaya State Biodiversity Strategy and Action Plan (MBSAP)

Annexure 5.1: Dumpsite Stabilization Plan

1. Introduction

The MLCIP road project involves widening, cutting, slope trimming, excavation for retaining walls, and construction of culverts/bridges. These activities will generate excavated soil, rock fragments, and construction spoils (collectively referred to as muck). Proper muck management is crucial in Meghalaya due to steep terrain, fragile geology, and high rainfall that increase erosion and landslide risks.

2. Quantity & Sources of Muck

Excavation will mainly occur along road cuttings, drainage works, and foundations for retaining/breast walls. The proposed road construction activity will involve a cut volume of 146587.150 m³ and a fill volume of 107844.900 m³. This indicates that the excavation requirement is more than the filling requirement, resulting in a surplus of approximately 38742.250 m³ of excavated material.

3. Criteria for Muck Disposal Site Selection

The following criteria shall guide the selection of muck disposal sites:

- **Proximity to Work Sites** – Disposal sites should be located within 2–3 km of the excavation area to minimize fuel consumption, traffic congestion, and road safety risks from muck transport.
- **Slope Stability** – Sites shall be located on naturally stable and gently sloping terrain (preferably <25°) and away from landslide-prone or erosion-prone areas.
- **Distance from Water Sources** – A minimum buffer of 50 m from streams/drains and 100 m from rivers/lakes shall be maintained to prevent siltation and contamination.
- **Avoidance of Habitation & Agriculture** – Disposal shall not be carried out near settlements, schools, or agricultural land to avoid livelihood and health impacts.
- **Non-Forest/Non-Encroachment Land** – Sites should preferably be on barren, community, or government land, avoiding forest land unless prior approval is obtained.
- **Approval & Community Consent** – All disposal sites must be approved by the Village Employment Council (VEC) / traditional institutions under KHADC/JHADC/GHADC, and endorsed by the State PWD/PIU.
- **Accessibility & Safety** – Sites should be accessible by haul roads without requiring major additional cutting, and safe for vehicle maneuvering.

The details for the muck disposal sites are presented in Table below:

Table: Details for the muck disposal site

S.No.	Location	Distance from UJ road (m)	Area of disposal site (ha)	Quantity of Muck to be disposed (cu.m)	Environment Sensitivity (If any)
1	Mawpat village at Ch 42+400 km	5	0.04	2900	To minimize environmental impacts, all efforts will be made to avoid cutting trees, and the site will be managed to preserve existing vegetation.
2	Mawlaho at Ch 48+200 km	5	0.07	5036	No specific environmental sensitivity noted
3	Sngahtyrkhang at Ch 59+700	5	0.14	10072	To minimize environmental impacts, all efforts will be made to avoid cutting trees, and the site will be managed to preserve existing vegetation.
4	Umtraï at Ch 67+000	10	0.28	20734.25	To minimize environmental impacts, all efforts will be made to avoid cutting trees, and the site will be managed to preserve existing vegetation.

4. Methodology of Muck Disposal

Utilization priority: Maximum use of excavated material in road embankment, shoulder filling, and construction of retaining/breast walls.

Disposal management include:

- Dumping muck in designated sites at slope $\leq 30^\circ$.
- Layer-wise compaction using machinery.

- Retaining walls or gabion walls constructed at toe of disposal sites.
- Drainage channels with weep holes for safe water passage.
- Temporary fencing to prevent spillage and encroachment.

5. Rehabilitation of Muck Disposal Sites

• Engineering Measures

- Construction of breast walls/retaining walls.
- Compaction of dumped muck in layers (500–700 mm).
- Surface levelling and provision of drainage.

• Biological Measures

- Covering muck with topsoil.
- Bamboo crib wall
- Plantation of native species.
- Turfing of slopes to minimize erosion.
- Community-based maintenance through Village Employment Councils/ Self-Help Groups.

6. Monitoring & Compliance

Regular monitoring will be conducted by PIU/PMC to ensure muck disposal is done only at designated sites. Compliance will be ensured with Meghalaya State Pollution Control Board (MSPCB) and MoRTH/IRC environmental guidelines. Geo-tagging of muck disposal sites under MLCIP will also be carried out.

Annexure 5.2: Details of Utilities

Sr. No.	FROM	TO	OFC			Electric pole			Transformer		
			LHS	RHS	Total	LHS	RHS	Total	LHS	RHS	Total
1	40+130	41+000	0	0	0	0	0	0	0	0	0
2	41+000	42+000	1	0	1	0	0	0	0	0	0
3	42+000	43+000	0	0	0	0	0	0	0	0	0
4	43+000	44+000	1	0	1	0	0	0	0	0	0
5	44+000	45+000	0	0	0	0	0	0	0	0	0
6	45+000	46+000	0	0	0	0	0	0	0	0	0
7	46+000	47+000	0	0	0	0	0	0	0	0	0
8	47+000	48+000	0	0	0	0	1	1	0	0	0
9	48+000	49+000	0	1	1	0	1	1	0	0	0
10	49+000	50+000	0	0	0	0	0	0	0	0	0
11	50+000	51+000	0	0	0	0	0	0	0	0	0
12	51+000	52+000	0	0	0	0	0	0	0	0	0
13	52+000	53+000	0	0	0	0	0	0	0	0	0
14	53+000	54+000	0	0	0	0	0	0	0	0	0
15	54+000	55+000	0	0	0	0	0	0	0	0	0
16	55+000	56+000	0	0	0	0	0	0	0	0	0
17	56+000	57+000	0	0	0	0	0	0	0	0	0
18	57+000	58+000	0	1	1	0	0	0	0	0	0
19	58+000	59+000	0	0	0	1	0	1	0	0	0
20	59+000	60+000	0	0	0	0	0	0	0	0	0
21	60+000	61+000	0	1	1	2	1	3	0	0	0
22	61+000	62+000	0	0	0	0	0	0	0	0	0
23	62+000	63+000	0	2	2	0	0	0	0	0	0
24	63+000	64+000	0	2	2	0	0	0	0	0	0
25	64+000	65+000	0	3	3	0	0	0	0	0	0
26	65+000	66+000	0	0	0	0	0	0	0	0	0
27	66+000	67+000	1	0	1	1	0	1	0	0	0
28	67+000	68+000	0	0	0	0	0	0	0	0	0
29	68+000	69+000	0	0	0	1	0	1	0	0	0
30	69+000	70+000	2	0	2	1	0	1	0	0	0
31	70+000	71+000	0	0	0	0	0	0	0	0	0
32	71+000	72+000	0	0	0	5	0	5	0	0	0
33	72+000	73+000	0	0	0	2	0	2	0	0	0
34	73+000	74+000	0	0	0	2	1	3	1	1	2
35	74+000	75+000	0	0	0	1	2	3	0	0	0
36	75+000	76+000	0	1	1	4	4	8	2	0	2
37	76+000	77+000	0	0	0	0	1	1	1	0	1
38	77+000	77+612	0	0	0	0	0	0	1	0	1
Total			5	11	16	20	11	31	5	1	6

Annexure 5.3: Gender-Based Violence (GBV) Action Plan

For

Meghalaya Logistics and Connectivity Improvement Project (MLCIP) Corridor funded by the World Bank

Submitted To



**Meghalaya Infrastructure Development Finance Corporation (MIDFC) Ltd.
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Gender-Based Violence (GBV) Action Plan for Road Projects under the Meghalaya Logistics and Infrastructure Connectivity Project (MLICP):

Executive Summary – GBV Action Plan:

Purpose & Scope

The GBV Action Plan (GBV-AP) establishes mandatory measures to prevent, mitigate, and respond to Gender-Based Violence (GBV) — including Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) — linked to road construction and associated civil works in Meghalaya. It applies to:

- Project-affected communities,
- Workers (contractors, subcontractors, labour camps),
- Service providers and stakeholders.

The plan aligns with World Bank Good Practice Notes (2018, 2022) and Indian laws (POSH Act, POCSO Act, DV Act, IPC provisions).

Key Risks Identified

- Labour influx of male-dominated workforce → SEA/SH risks.
- Remote sites, night works, poor lighting → heightened assault risks.
- Inadequate gender-sensitive facilities (WASH, transport).
- Child protection risks under POCSO Act.
- Weak referral services and under-reporting due to stigma.

Core Prevention & Mitigation Measures

At PIU level:

- Adoption and disclosure of GBV-AP.
- Contract clauses requiring GBV compliance.
- Codes of Conduct (CoC) signed by all workers and visitors.

At Contractor level:

- Worker induction on GBV/SEA/SH.
- POSH-compliant workplace redress mechanisms.
- Gender-segregated, safe accommodation and WASH facilities.
- Lighting, safe transport, restricted visitor access.
- Community awareness campaigns in Khasi, English.
- Zero tolerance of child labour; child protection protocols.

Survivor-Centred Response

- **Trained GBV focal persons** at PIU and contractor level.
- Immediate safety, psychological first aid, and confidential referrals.
- Referral network mapped (health, police, legal aid, NGOs, shelters).
- Costs for emergency medical, psychosocial support, and safe shelter covered by project budget.

SEA/SH-Sensitive Grievance Redress Mechanism (GRM)

- Multiple safe channels (toll-free phone, WhatsApp, boxes, female-only options).
- Confidential handling, no retaliation.
- Secure case records, anonymised reporting.
- Independent audits annually.

Capacity Building

- Training for PIU, contractors, workers, and community leaders.
- Refreshers every 6–12 months and during staff turnover.

Monitoring & Indicators

- % workers signing CoC and trained.
- Number of GBV/SEA/SH cases reported and referred within 72 hours.
- Functional GRM response times.
- Availability of gender-sensitive WASH and lighting at worksites.
- Community awareness sessions held.
- Quarterly reporting to PIU and World Bank; immediate notification of severe cases.

Institutional Roles & Resourcing

- PIU: Overall coordination, monitoring, reporting.
- Contractors: Site-level implementation, compliance, training.
- NGOs/Service Providers: Support for referral services and survivor care.
- Authorities (Police, Health, Legal Services): Provide statutory response.
- Budget lines: Training, IEC, focal staff, survivor support, safe infrastructure, monitoring/audits.

Conclusion

The GBV Action Plan provides a comprehensive framework to prevent, mitigate, and respond to gender-based violence, sexual exploitation, and harassment. By integrating prevention measures, victim-centered response mechanisms, grievance redress systems, capacity building, and robust monitoring, the plan ensures that both workers and project-affected communities are protected. Overall, the GBV-action plan strengthens social safeguards, enhances project accountability, and fosters a safe, inclusive, and equitable environment for all stakeholders involved in the MLCIP.

1. Purpose & scope:

This GBV Action Plan (GBV-AP) sets out mandatory prevention, mitigation and response measures for road construction works in Meghalaya where World Bank financing (or Bank-aligned safeguards) and Indian law apply. It covers project-affected communities, workers (contractor staff, labour camps), subcontractors, service providers and other project stakeholders across all civil works packages.

Key objectives:

- Prevent and reduce GBV (including Sexual Exploitation and Abuse — SEA — and Sexual Harassment — SH) associated with civil works and associated influx.
- Provide survivor-centered, timely and safe response and referrals.
- Ensure compliance with World Bank Good Practice Notes on GBV/SEA/SH and with Indian legislation (POSH, POCSO, Domestic Violence Act, IPC provisions).

2. Applicable policy & legal framework:

- World Bank: Good Practice Note — *Addressing Gender-Based Violence in Investment Project Financing Involving Major Civil Works* (GPN, 2018) and related ESF/SEA-SH guidance (2022). These set out risk-based requirements for assessment, mitigation, monitoring, and survivor-centered response.
- **India (national law):**
 - Sexual Harassment of Women at Workplace (Prevention, Prohibition & Redressal) Act, 2013 (POSH) — obligations for workplace prevention and redress (Internal Complaints Committee etc.).
 - Protection of Children from Sexual Offences (POCSO) Act, 2012 — mandatory reporting and child-sensitive procedures for offences against minors.
 - Protection of Women from Domestic Violence Act, 2005 — civil remedies and support services for survivors.
 - Indian Penal Code (notably sections on rape, sexual assault and trafficking), and Criminal Law (Amendment) Acts which expanded definitions and penalties.

These laws, together with World Bank guidance, require a survivor-centred, confidential, timely response and preventive measures such as codes of conduct, worker training, and site/community mitigation measures.

3. Risk profile:

- Influx of outside workers and truckers increased SEA/SH and tensions with local communities.
- Remote construction sites and night works with poor lighting elevated risk of assault.
- Male-dominated workforce and lack of female facilities sexual harassment and unsafe sanitation access.
- Child exposure near camps and worksites risk under POCSO.
- Weak/no confidential reporting channels or fear of retaliation under-reporting.
- Limited local referral services (health, psychosocial, medico-legal) in remote areas.

4. Prevention & mitigation measures (minimum required measures):

4.1 Project-wide (Owner / PIU responsibilities):

- GBV-AP adoption: PIU to adopt and publicly disclose this GBV-AP and ensure contract clauses require contractor compliance. (Incorporate into ESMF/ESCP).
- Codes of Conduct (CoC): Mandatory CoC for all project staff, contractors, suppliers and visitors that prohibit GBV/SEA/SH and set out sanctions. All staff sign before mobilisation. (Annex A: sample CoC).
- Contractual obligations: All construction contracts must include GBV-AP obligations: training, safe accommodation, gender-segregated sanitation, GRM accessible to survivors, and reporting obligations. Contractors' non-compliance leads to sanctions/disqualification per World Bank practice.

4.2 Site-level (Contractor responsibilities):

- **Worker management & workplace safeguards:**

- Pre-employment checks, code of conduct acknowledgement, worker induction covering GBV/SEA/SH and local cultural sensitivity.
- Establish workplace sexual harassment redress mechanisms in line with POSH for female employees (Internal Complaints Committee or facility-level arrangement).
- Gender parity in recruitment where feasible; recruit female staff for site safety focal roles.

- **Accommodation & camp management**

- Separate, lockable sleeping quarters for women and men; separate WASH (toilet/shower) facilities with lighting and locks; secure water and food distribution; supervision to prevent exploitation.
- No unauthorised visitors; visitor sign-in and buddy system for movement at night.

- **Infrastructure & site security:**

- Safe access routes, adequate lighting around camps, work sites, access roads and public toilets; secure fencing where needed.
- Safe transport to/from work with driver CoC and seat allocation that prevents isolated travel of women at night.

- **Community risk mitigation:**

- Time-constrained works (limit night work near villages), work scheduling to reduce congregation of workers near sensitive community areas (schools, markets).
- Community awareness campaigns on GBV risks, rights and available services; engagement with women's groups, panchayats and customary leaders.

- **Child protection:**

- Zero-tolerance for child labour; protocols to prevent children's access to worksites; community awareness regarding POCSO obligations and reporting.

4.3 Information, Education & Communication (IEC):

- Visible IEC materials in local languages (Khasi, English) with messages on GBV prevention, how to report, contact points, and confidentiality assurances.
- IEC at community meetings, contractor inductions and with transport operators.

5. Survivor-centered response & referral pathway:

All responses must follow survivor-centred principles: safety, confidentiality, choice, non-discrimination, informed consent, and do no harm.

5.1 Immediate on-site response:

- Trained GBV focal person (PIU and contractor) receives initial disclosures, ensures immediate safety, provides first-line psychosocial support (PFA), and with consent initiates referrals. Avoid taking statements that are forensic in nature unless survivor requests/consents.

5.2 Referral network (establish before works begin):

- Map local health facilities capable of clinical management of rape/assault (medico-legal exam), police stations, POCSO Special Juvenile Police Units (for minors), Protection Officers under DV Act, legal aid clinics, NGOs providing GBV/psychosocial support and shelters. Maintain updated contact list in each district/package. (**Annex B: Referral checklist template**).

5.3 Reporting & mandatory obligations:

- For GBV incidents involving children, the POCSO Act mandates reporting to police/Authorities — follow legal obligations while protecting the child's best interests.
- Maintain confidentiality: information only shared on a need-to-know basis and with survivor consent, except where law requires mandatory reporting (e.g., POCSO).
- Provide information on legal rights and options, safe transport to services, and cover costs for emergency medical

care, psychosocial support and temporary safe shelter (project to establish a budget line).

6. Grievance Redress Mechanism (GRM) — SEA/SH sensitive:

- Multiple reporting channels: in-person (PIU/GRM desk), toll-free phone number, WhatsApp, suggestion boxes near public places, and female-only channels. Ensure anonymity option.
- Safe intake & triage: Trained staff record basic info, assess risk, and fast-track SEA/SH/child protection cases to a GBV referral team.
- Confidential handling: SEA/SH cases reported through GRM should trigger confidential escalation to the GBV focal person and PIU manager; no public disclosure.
- No retaliation clause: Protect complainants/workers from retaliation; immediate interim measures (reassignment, temporary suspension of alleged perpetrator) while respecting due process.
- Record keeping: Secure, encrypted records with restricted access; aggregate, anonymised data used for monitoring.
- External oversight: Annual audit of GRM handling and quality of response (third-party where appropriate).

7. Capacity building & training:

- PIU & contractor management: 1–2 days training on GBV risks, survivor-centered response, referral pathways, mandatory reporting, confidentiality and monitoring.
- Front-line staff & security personnel: focused training on CoC, safe conduct, non-coercive behaviour, and immediate response protocols.
- Community stakeholders: orientation workshops for village leaders, women's groups, schools on GBV prevention, how to support survivors, and POCSO awareness.
- Regular refreshers: at least every 6–12 months and on staff turnover.

8. Monitoring, indicators & reporting:

PIU to include GBV indicators in regular monitoring and in the Project's ESMF. Key indicators:

- Number of GBV/SEA/SH incidents reported (disaggregated by type, sex, age).
- Number of reported incidents receiving referral and services within 72 hours.
- Number of staff/contractor workers trained on GBV (by sex).
- Number of worksites with adequate lighting and gender-segregated WASH facilities.
- GRM response times and case closure rates.
- Number of community awareness events and participants (disaggregated by sex/age).

Reporting: Quarterly summary to PIU and World Bank task team; immediate reporting (within 72 hours) of severe incidents to the Bank in accordance with ESF/World Bank requirements.

9. Institutional responsibilities & resourcing:

9.1 Roles:

- Project Implementing Unit (PIU) (Social/GBV focal point): overall GBV-AP coordination, disclosure, oversight of contractors, GRM management, monitoring & reporting.
- Contractor: implement site-level prevention & mitigation measures; maintain confidential incident log; ensure accommodation and transport safety; train workers.
- Third-party service providers/NGOs: provide PSS, legal aid and referrals where government services are limited.
- District Authorities / Police / Health Facilities: receive referrals and provide medico-legal, police investigation and protection services.

9.2 Budgeting:

Allocate dedicated GBV budget lines in each package for:

- Training and IEC materials;
- Staffing (GBV focal points; helpdesk);
- Survivor support (medical, PSS, temporary shelter, legal aid);
- Site infrastructure improvements (lighting, WASH);
- Monitoring, third-party audits and rapid response contingency (emergency funds).

10. Confidential recordkeeping & data protection:

- Store GBV case records on secure servers with restricted access; anonymise data used for monitoring.
- No identifying information to be shared in public disclosure documents.
- Follow applicable Indian privacy/data protection rules; obtain survivor consent before sharing any case details except where mandatory reporting applies.

11. Community engagement & culturally sensitive measures:

- Engage customary institutions, village councils, women's self-help groups and local NGOs early — co-design awareness and mitigation measures in Khasi and English.
- Use local female mobilisers and translators for outreach to women and girls.
- Respect local cultural protocols while aligning with survivor rights and legal obligations.

12. Incident management workflow:

1. Receipt of disclosure/complaint (GRM / direct to GBV focal person).
2. Initial triage & safety assessment (within 24 hours).
3. Immediate safety & medical referrals (within 24–72 hours).
4. Offer first-line psychosocial support (PFA) and information on options.
5. If incident involves child — follow POCSSO mandatory reporting and child protection protocols.
6. Document (confidential) and monitor case, provide survivor support, and implement interim measures to prevent retaliation.
7. Closure & anonymised reporting; lessons learned to PIU for risk reduction.

12.1 Next steps / actions required from PIU (checklist)

1. Adopt and disclose this GBV-AP publicly.
2. Complete package-level GBV risk assessments and referral mapping for each project district in Meghalaya.
3. Insert GBV obligations and CoC into tender documents and contracts.
4. Recruit/appoint GBV focal persons in PIU and ensure contractor focal persons.
5. Develop and fund the project-level survivor emergency fund.
6. Begin capacity building for PIU, contractors and local stakeholders, and roll out IEC.
7. Establish GRM channels (including anonymous reporting) and test them before major civil works start.
8. Start monthly monitoring and quarterly reporting (anonymised) and share relevant escalations with the Bank as required.

13. Gender Distribution of Project-Affected Persons:

The gender distribution of Project-Affected Persons (PAPs) of 14 project-affected households shows a nearly balanced composition, with a slightly higher proportion of males. Out of a total of 82 PAPs, 42 individuals (52%) are male, while 40 individuals (48%) are female. The gender distribution of PAPs is presented in **Table** below.

Table : Gender Distribution of Project-Affected Persons (PAPs)

Gender	Project Road	
	Project Affected Persons	Percentage
Male	42	52.0
Female	40	48.0
Total	82	100.0

Source: EIS primary survey – 2025

14. Conclusion

The GBV Action Plan provides a structured framework to prevent and respond to risks of sexual exploitation, abuse, and harassment in Meghalaya Road projects. By embedding accountability in contracts, strengthening referral pathways, and ensuring continuous monitoring, the project commits to a zero-tolerance approach to GBV and to safeguarding the dignity and rights of women, children, and vulnerable groups in Meghalaya.

Annexure A: Code of Conduct on Gender-Based Violence (GBV), Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH)

1. Purpose:

This Code of Conduct (CoC) aims to prevent, mitigate, and address Gender-Based Violence (GBV), including Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH), in connection with the Meghalaya Road Projects. All contractor staff, sub-contractors, consultants, suppliers, and project-related personnel are required to understand, sign, and comply with this CoC.

2. Key Principles

All personnel shall:

- Treat women, men, children, and communities with respect, dignity, and fairness.
- Not use language, gestures, or behaviour that is sexually suggestive, abusive, or offensive.
- Maintain a zero-tolerance approach to GBV, SEA, SH, child abuse, and exploitation.
- Respect the cultures, traditions, and laws of Meghalaya while upholding human rights and gender equality.
- Uphold confidentiality and non-retaliation in reporting and responding to GBV/SEA/SH.

3. Prohibited Behaviours

All personnel are strictly prohibited from:

1. Engaging in SEA/SH or any form of GBV against community members, co-workers, or others.
2. Sexual activity with children (anyone under 18 years) regardless of consent — strictly prohibited under Indian law (POCSO Act, 2012).
3. Sexual relationships with community members in exchange for money, goods, employment, or services.
4. Sexual harassment in the workplace, including unwelcome advances, comments, or physical conduct (covered under POSH Act, 2013).
5. Violence, threats, or intimidation against colleagues, community members, or survivors of GBV/SEA/SH.
6. Possession, distribution, or consumption of illegal substances on project sites or camps.
7. Use of children for labour or involving them in hazardous work.

4. Required Conduct

All personnel must:

- Attend mandatory training on GBV/SEA/SH, child protection, and respectful workplace behaviour.
- Sign and acknowledge this CoC before commencing work.
- Report any suspected or actual violations immediately to the GBV Focal Person, GRM channel, or designated authority.
- Support survivor-centered response — ensuring confidentiality, safety, and dignity of survivors.
- Cooperate fully in any investigation or disciplinary process.

5. Responsibilities of Managers and Supervisors

Managers and supervisors must:

- Ensure that all workers understand and comply with this CoC.
- Promote a respectful workplace and address complaints promptly.
- Take immediate disciplinary action for any CoC violations.
- Ensure safe, gender-segregated living, sanitation, and working conditions at camps and worksites.

6. Sanctions for Non-Compliance

Violations of this CoC will result in disciplinary measures, which may include:

- Verbal or written warning;
- Suspension without pay;
- Termination of employment/contract;

- Referral to law enforcement agencies under Indian Penal Code, POSH Act (2013), POCSO Act (2012), or Domestic Violence Act (2005), as applicable.

7. Acknowledgment

I have read and understood this Code of Conduct. I agree to abide by its terms at all times during my involvement in the Umsning - Jagi Road Project. I understand that failure to comply will result in disciplinary action and may lead to termination of my employment and/or legal prosecution.

Name of Worker: _____

Signature: _____

Date: _____

Employer/Contractor: _____

Annexure B

(B1) Package-Level GBV Risk Assessment

1. Context and Risk Factors

- Geographic context: Ri-Bhoi is a predominantly rural, hilly, and forested area with scattered villages and limited road connectivity. Road works will involve camp-based labour near remote settlements.
- Labour influx risk: Medium–High. Contractors are likely to bring in male-dominated workforces from outside Meghalaya (Assam, Bihar, UP, etc.), increasing the risk of SEA/SH and community tensions.
- Demographics & social norms: High proportion of indigenous Khasi population, matrilineal system but still strong male decision-making in public domains.
- Local GBV prevalence: Underreporting is common due to stigma and reliance on traditional dispute mechanisms. Women's SHGs and church-based groups are active but formal services are limited.
- Children & adolescents: Vulnerable to risks from worker interaction near schools/market areas; risk of exploitation in exchange for money, gifts, or alcohol.

2. Risk Rating

- SEA/SH risk: High (due to labour influx, weak formal services, low reporting).
- Workplace sexual harassment risk: Moderate (few women workers expected, but risks exist).
- Child protection risk (POCSO): High (schools located near worksites, children often present on roadsides).
- Community backlash/stigma: Moderate–High (fear of reputational damage leads to underreporting).

3. Mitigation Priorities

- Mandatory Codes of Conduct and repeated training for all workers.
- Strong community awareness in Khasi language on GBV/SEA/SH risks and reporting channels.
- Safe camp design (segregated sanitation, lighting, no alcohol zones).
- Engagement of women's SHGs, and church leaders as community allies.
- Partnership with NGOs in Ri-Bhoi district for survivor support; emergency transport for referrals.
- SEA/SH-sensitive Grievance Redress Mechanism (confidential, female focal points).

(B2) Referral Contact Sheet – Ri-Bhoi, Meghalaya

(To be displayed at worksites and GRM desks; in English & Khasi versions for accessibility)

Service Type	Institution/Provider	Location & Contact	Notes
Police (Women/Child Protection)	Women Police and Juvenile Police Units under Meghalaya Police, Ri Bhoi:	<ul style="list-style-type: none"> Women Police Station, Nongpoh: O/C Women PS, Nongpoh – 8794154480 ribhoi.gov.in+3megsocialwelfare.gov.in+3ribhoi.gov.in+3 Nongpoh PS: 03638-232237 MeghalayaPolice+3ribhoi.gov.in+3ribhoi.gov.in+3 Umiam PS: 03638-2570234 ribhoi.gov.in+2ribhoi.gov.in+2 Juvenile Police Unit: Nongpoh – (same contact as Nongpoh PS) 	These units deal with POCSO, juvenile issues etc. The Special Juvenile Police Unit has SI / CWO officers at these PSes.
Child Protection (POCSO, Juvenile Unit)	District Child Protection Unit (DCPU), Ri Bhoi:	Address: Sajer Nongpoh near Punjab National Bank, Nongpoh - 793102. Contact: 9856030336 (DCPO). Email: ekharp.2016@gmail.com. Emergency: 1098.	Implements Integrated Child Protection Scheme (ICPS); supports POCSO cases and child welfare. Applications/interviews via District Social Welfare Officer, Nongpoh.
Health – Emergency & Medico-Legal	Nongpoh Civil Hospital (upgraded CHC)	Location: Nongpoh, Ri Bhoi District, Meghalaya - 793102. DMHO Contact: 9366771980. Email: dmhorbd@gmail.com. State Ambulance/Emergency: 108 (24x7).	For medico-legal: Refer to CHC or Ganesh Das Government Hospital (Shillong) for forensic support.
Psychosocial Support & Counselling	Special Cell for Women (Nongpoh Police); Social Welfare Dept (DSWO Office)	dsworbd@gmail.com · 9366197286: Office of Social Welfare Officer, Down Gate, Nongpoh, Ri-Bhoi District.	
Legal Aid	Meghalaya State Legal Services Authority (MSLSA):	Helpline: 15100 (toll-free). Address: Shillong	Entitled groups include women, children, SC/ST; apply via district offices.
Shelter / Safe Home	One Stop Centre (OSC), Nongpoh; Swadhar Greh (Social Welfare)	SC: Integrated under Social Welfare Dept, Nongpoh - 793102. Contact via DSWO: 03638-232010. Swadhar Greh: Shelter for distressed women/children; short/long-term	

		stay. Contact via Dept: 03638-232010.	
Women Helpline (24x7)	National Women Helpline: 181 (toll-free, multilingual support).	Shillong	
Childline (24x7)	Childline India: 1098 (toll-free, nationwide).	Through the DCPU	

Advices for Contractors & PIU

- Display this contact sheet in labour camps, site offices, and GRM desks in English and Khasi language.
- GBV focal person must ensure confidential referral with survivor consent.
- Keep emergency transport budget ready to transfer survivors to Hospital or NGO services.
- Regularly update phone numbers and verify service availability.

Annexure C: GBV Incident Intake Form & Triage Checklist:

(Confidential – Do not disclose without survivor consent, except where legally mandated)

Section 1: Survivor Safety & Immediate Needs (Triage)

(To be completed as soon as a survivor discloses an incident)

- Is the survivor in immediate danger? ☐ Yes ☐ No
- Does the survivor need urgent medical attention (within 72 hours)? ☐ Yes ☐ No
- Is the survivor under 18 years old (POCSO Act applies – mandatory police reporting)? ☐ Yes ☐ No
- Does the survivor require emergency shelter? ☐ Yes ☐ No
- Is safe and confidential transport available? ☐ Yes ☐ No

Immediate Action Taken (tick):

- ☐ Survivor referred to hospital
- ☐ Survivor referred to police
- ☐ Survivor referred to psychosocial counsellor
- ☐ Survivor provided temporary safe accommodation
- ☐ Survivor given information on rights and options

Section 2: Basic Incident Details

(Record only minimum necessary information. Do NOT pressure survivor for details.)

- Date of disclosure: ____ / ____ / ____
- Location of disclosure: _____
- Name of focal person receiving disclosure: _____
- Survivor sex/age: ☐ Female ☐ Male ☐ Other | Age: ____
- Survivor consent to referral? ☐ Yes ☐ No (explain options)
- Type of incident (tick all that apply, per survivor's words):
 - ☐ Sexual Harassment
 - ☐ Sexual Exploitation / Abuse (SEA)
 - ☐ Physical Assault
 - ☐ Child Sexual Abuse (POCSO)
 - ☐ Domestic Violence
 - ☐ Other (specify): _____
- Alleged perpetrator: ☐ Worker (contractor) ☐ Community Member ☐ Other
- Incident date (if provided): ____ / ____ / ____
- Incident location (general, no detail): _____

Section 3: Survivor's Choices & Consent

- Survivor wants to:
 - ☐ Report to Police
 - ☐ Seek medical care
 - ☐ Seek counselling
 - ☐ Request safe shelter
 - ☐ Take no action now
- Survivor consent for information sharing (tick):
 - ☐ Health facility
 - ☐ Police
 - ☐ NGO counsellor

☐ Legal aid

☐ None

Signature/thumbprint of survivor (if willing): _____

Signature of GBV focal person: _____

Section 4: Referral Actions Taken

- Referred to: _____
- Referral date/time: ____ / ____ / ____ at ____ hrs
- Escort/transport provided: ☐ Yes ☐ No
- Costs covered from emergency fund: ☐ Yes ☐ No
- Follow-up scheduled: ____ / ____ / ____

Section 5: Confidential Recordkeeping

- Case ID (non-identifying code): _____
- File kept in: ☐ Locked cabinet ☐ Secure digital (password protected)
- Access restricted to: PIU GBV focal person + authorised personnel only.
- Survivor informed of confidentiality? ☐ Yes ☐ No

Guidance Notes for Focal Persons

- Use survivor's own words; avoid judgment.
- Do not probe or force details.
- Always prioritise safety, confidentiality, and informed consent.
- If survivor is a minor (<18), you are legally obliged to report to police under the POCSO Act (2012).
- Share only with relevant referral service providers.
- Provide emotional support: listen, believe, and reassure.

Annexure D: Sample Contract Clauses on GBV/SEA/SH

1. Contractor Obligations

- The Contractor shall adopt and implement the GBV Action Plan as part of the project Environmental & Social Management Plan (ESMP).
- The Contractor shall designate at least one trained GBV/SEA/SH focal person at site level.
- The Contractor shall ensure that all workers (including subcontractors and labour suppliers) sign and adhere to the Code of Conduct (Annex A).

2. Worker Training & Awareness

- All workers must attend mandatory GBV/SEA/SH induction training prior to commencing work.
- The Contractor shall conduct quarterly refresher sessions on:
 - Zero tolerance for SEA/SH
 - Workers' rights under Indian law (POSH Act, POCSO, IPC, Labour Codes)
 - Reporting and referral pathways (Annex B & C).

3. Prohibited Conduct

The Contractor shall ensure that all workers refrain from:

- Sexual harassment, exploitation, or abuse of any person.
- Engaging in sexual activity with persons under 18 years (irrespective of consent – strict liability under POCSO Act).
- Sexual relations with project-affected persons in exchange for money, goods, or services.
- Any form of violence, coercion, or intimidation against workers, community members, or survivors.

4. Reporting & Response

- The Contractor shall establish a confidential grievance redress mechanism (GRM) with channels for anonymous reporting.
- The Contractor shall immediately notify the PIU/Employer's GBV focal person of any reported incident, while safeguarding survivor confidentiality.
- The Contractor shall facilitate survivor referral to medical, psychosocial, legal, and protection services as per the Referral Pathway (Annex B).

5. Accountability & Sanctions

- Failure of Contractor or subcontractor staff to comply with the Code of Conduct or GBV clauses will result in disciplinary measures, including:
 - Formal warning
 - Suspension without pay
 - Immediate termination of employment
 - Reporting to police authorities where legally required.
- The Employer may impose financial penalties for each confirmed GBV/SEA/SH case linked to Contractor personnel, up to 10% of contract value, in addition to legal liability.
- Repeated non-compliance may result in contract termination.

6. Employer Oversight

- The Employer (PIU/Project Authority) shall:
 - Monitor Contractor's compliance with GBV Action Plan during site supervision.
 - Include GBV performance in monthly and quarterly progress reviews.
 - Require Contractor to submit confidential GBV compliance reports.
- Independent audits of GBV measures may be conducted at any stage.

7. Budget Provisions

The Contractor shall allocate sufficient budget to cover:

- Worker training sessions

- Translation and dissemination of Codes of Conduct
- Engagement of GBV focal persons
- Support for safe transport and survivor referral
- Emergency funds for immediate survivor needs (within ethical guidelines).

8. Legal Compliance

- All Contractor actions shall comply with Indian Legislations:
 - POSH Act, 2013 (Sexual Harassment of Women at Workplace Act)
 - POCSO Act, 2012 (Protection of Children from Sexual Offences)
 - IPC Sections 354, 376, 509 (sexual offences)
 - Bonded Labour and Child Labour (Prohibition & Regulation) Acts
 - Relevant Meghalaya state labour laws.
- In case of conflict between national law and World Bank requirements, the higher standard shall prevail.

Annexure E: GBV Risk Monitoring Framework

1. Objectives

- Track implementation of the GBV Action Plan at package level.
- Ensure accountability of Contractor, PIU, and stakeholders.
- Provide early warning of risks and gaps in prevention/response.
- Report compliance to the World Bank, PIU, and State Authorities.

2. Roles & Responsibilities

Agency	Responsibility
Contractor GBV Focal Person	Maintain records, conduct worker training, track Code of Conduct compliance, report incidents (confidential).
PIU GBV Specialist	Verify contractor reports, conduct site audits, coordinate with service providers, report to World Bank.
Third-Party Monitor / NGO Partner	Independent verification, community consultations, survivor support follow-up.
World Bank Task Team	Oversight, compliance checks, technical guidance.

3. Monitoring Indicators

Domain	Indicator	Frequency	Source of Verification
Contractor Compliance	% of workers who signed Code of Conduct	Monthly	Contractor HR records, random checks
	% of subcontractors oriented on GBV	Quarterly	Training registers
	Number of GBV focal persons appointed & trained	Quarterly	Appointment letters, training reports
Capacity Building	% of workers receiving induction on GBV/SEA/SH	Monthly	Training attendance sheets
	Number of community awareness sessions conducted	Quarterly	PIU/NGO reports
Incident Reporting & Response	Number of GBV complaints received via GRM (disaggregated by type)	Monthly	GRM register (confidential)
	% of cases referred to health, police, legal, or counselling services within 24–48 hrs	Quarterly	Referral Contact Sheet (Annex B)
	% of survivors who report satisfaction with support services (anonymous feedback)	Semi-annual	NGO surveys
Accountability & Sanctions	Number of workers sanctioned for GBV violations	Quarterly	Contractor HR disciplinary records
	Amount of financial penalties imposed for GBV non-compliance	Annual	PIU reports
Community Engagement Audit & Oversight	% of community members aware of GRM and referral pathways	Semi-annual	Focus group discussions, surveys
	Number of PIU site inspections including GBV monitoring	Quarterly	PIU field visit reports
	Independent audit findings on GBV Action Plan implementation	Annual	Third-party audit report

4. Reporting Framework

- Contractor GBV focal person → submits monthly GBV compliance note to PIU.
- PIU GBV Specialist → consolidates into quarterly GBV report for World Bank.
- Third-party monitor/NGO → provides independent verification reports twice a year.
- Annual consolidated report → submitted to World Bank including lessons learned and corrective actions.

5. Risk Levels & Triggers

Risk Level	Trigger Examples	Required Action
Low	No incidents reported, >80% workers trained, CoC signed	Routine monitoring
Moderate	1–2 minor cases of harassment reported; gaps in training coverage	Corrective Action Plan by Contractor within 30 days
High	>2 confirmed SEA/SH incidents; repeated contractor non-compliance	Financial penalties, management review, intensified monitoring
Critical	Systemic cover-ups, failure to report, survivor backlash	Suspension of contract payments, possible termination, legal escalation

6. Confidentiality & Ethics

- Survivor data must never be disclosed without consent.
- Reports should contain aggregated data only (no personal identifiers).
- Monitoring team must be trained on Do No Harm, GBV principles, and survivor-cantered approach.

Annexure 5.4 Labour Management Plan (LMP)

For

Meghalaya Logistics and Infrastructure Connectivity Project (MLICP)

1. Introduction:

The Labour Management Plan (LMP) outlines the framework for managing labour-related issues in the Meghalaya Logistics and Infrastructure Connectivity Project (MLICP). The objective is to ensure compliance with applicable national labour laws, safeguard worker rights, prevent exploitation, and promote safe, fair, and equitable working conditions. The plan applies to direct workers, contracted workers, community workers, and primary supply workers engaged under the project.

2. Objectives:

- Ensure fair treatment, non-discrimination, and equal opportunity for all workers.
- Protect workers' rights as per Indian legislations and international standards (World Bank ESS2).
- Provide safe and healthy working conditions.
- Prevent the use of child labour and forced labour.
- Establish a functional grievance redressal mechanism (GRM) for workers.
- Strengthen capacity of contractors and sub-contractors for compliance.

3. Applicable Legal Framework:

The project will comply with the following labour laws:

1. Payment of Wages Act, 1936 – timely and fair wage payment.
2. Minimum Wages Act, 1948 – ensure minimum wages for construction workers.
3. Equal Remuneration Act, 1976 – equal wages and non-discrimination.
4. Contract Labour (Regulation & Abolition) Act, 1970 – registration, welfare measures, and licensing for contractors.
5. Payment of Gratuity Act, 1972 – terminal benefits after minimum service.
6. Employees' Provident Fund & Miscellaneous Provisions Act, 1952 – PF contributions and benefits.
7. Payment of Bonus Act, 1965 – bonus to eligible workers.
8. Maternity Benefit Act, 1961 – leave and benefits for women employees.
9. Child Labour (Prohibition & Regulation) Act, 1986 – prohibition of child labour below 14 years.

10. Inter-State Migrant Workmen (Regulation of Employment & Conditions of Service) Act, 1979 – facilities for migrant workers.
11. Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 – welfare, safety, health, and cess collection.

4. Labour Use in the Project:

The project will engage different categories of labour:

- Direct Workers: Staff hired by the Project Implementing Unit (PIU), PMU, and consultants.
- Contracted Workers: Workers engaged by civil works contractors and sub-contractors.
- Primary Supply Workers: Labour involved in material supply (stone, sand, cement, bitumen, etc.).
- Community Workers (if applicable): Local villagers engaged in small-scale work or maintenance.

5. Labour Influx and Local Norms:

- Most labour will be drawn from local communities.
- Limited skilled/semi-skilled labour may migrate from outside Meghalaya.
- Contractors must ensure registration of inter-state migrant workers as per law.
- Customary land and village institutions will be consulted to ensure harmony with local governance and community values.
- Peak manpower requirement: ~50 personnel.
- Skilled workers (machine operators, concrete casting crew) mainly migrant workers.
- ~60–70% of workforce to be sourced locally; remaining skilled workers, supervisors, and engineers from outside.
- Workers accommodated in construction camp.
- Manpower mobilization aligned with construction schedule.

6. Key Labour Risks:

- Influx of outside labour creating pressure on local resources.
- Occupational Health and Safety (OHS) risks due to construction activities.
- Risk of child labour or bonded labour.
- Gender-based violence (GBV), sexual exploitation, and harassment (SEAH).
- Wage disputes and delayed payments.
- Lack of access to grievance redressal for contract workers.

7. Labour Management Procedures:

7.1 Recruitment and Employment:

- Priority to local labour as per community norms.
- Transparent recruitment through contractors, avoiding middlemen.
- Maintain worker registers with demographic and employment details.
- Written contracts/appointment letters for all workers.

7.2 Wages and Benefits:

- Payment of wages electronically/bank transfer wherever feasible.
- Equal pay for equal work for men and women.
- Wage slips issued monthly.
- Contribution to PF/ESI as per eligibility.

7.3 Working Conditions and Hours:

- Working hours not to exceed 8 hours/day and 48 hours/week.
- Weekly rest, overtime payment as per law.
- Rest shelters and drinking water at worksites.

7.4 Occupational Health & Safety (OHS):

- Compliance with Building and Other Construction Workers Act, 1996.
- Provision of PPE (helmets, gloves, masks, boots, safety harnesses).
- First aid kits and trained personnel on-site.
- Mandatory safety induction and periodic training.
- Accident reporting and compensation mechanism.

7.5 Prohibition of Child and Forced Labour:

- Contractors must certify non-engagement of child labour below 18 years in hazardous work.
- Forced or bonded labour is strictly prohibited.

7.6 Gender and Inclusion Measures:

- Equal wages and opportunities for women workers.
- Provision of separate toilets, changing rooms, and crèche facilities (if >50 female workers).
- Sensitization on gender-based violence (GBV), harassment, and zero-tolerance policy.

7.7 Worker Grievance Redressal Mechanism (GRM):

- A separate Workers' GRM within the project GRM.
- Accessible to all categories of workers (direct, contracted, supply).
- Confidential handling of complaints, especially GBV/SEAH.
- Multiple channels: complaint box at site, hotline, community liaison officer.
- Timely resolution and feedback to complainants.

8. Roles and Responsibilities:

- PIU / PMU: Overall monitoring of LMP compliance, reporting to funding agency/World Bank.
- Contractors: Implementation of labour welfare and OHS measures; maintain registers; ensure legal compliance.
- Supervision Consultants: Monitor contractor compliance, conduct site inspections.
- Village Institutions: Support monitoring of labour influx, community safety, and conflict resolution.

9. Training and Capacity Building:

- Induction training on workers' rights, OHS, GBV/SEAH, and GRM.
- Regular refresher training for workers and supervisors.
- Awareness campaigns in collaboration with local institutions.

10. Monitoring and Reporting:

- Contractors to submit monthly reports on labour use, wage payments, accidents, grievances.
- PIU/PMC to carry out quarterly compliance monitoring.
- Labour audits to verify adherence to laws and LMP provisions.

11. Code of Conduct (CoC):

All workers will sign a Code of Conduct, covering:

- Prohibition of sexual harassment, exploitation, and abuse.
- Respect for local culture and customs.
- Zero tolerance for alcohol/drug use at work sites.
- Respectful behaviour with community members.

12. Budget:

Contractors shall include costs for labour welfare, OHS, training, and GRM in the bid. PIU will allocate resources for monitoring and capacity-building.

Annexure – 1: Standard Contract Clauses for Labour Management and Compliance:

1. General Provisions:

- The Contractor shall comply with all applicable labour laws of India and World Bank's ESS2 on Labour and Working Conditions.
- The Contractor shall ensure fair treatment, non-discrimination, and equal opportunity for all workers, including women, persons with disabilities, and socially vulnerable groups.
- No child labour (below 18 years in hazardous work) or forced labour shall be employed.

2. Recruitment and Employment:

- Priority shall be given to hiring local workers from within the project area in consultation with traditional institutions.
- All workers shall be registered with complete demographic details.
- Written employment contracts shall be issued to all workers, specifying wages, working hours, benefits, and conditions.

3. Wages and Benefits:

- The Contractor shall pay wages not less than those prescribed under the Minimum Wages Act, 1948, and as notified by the Government of Meghalaya.
- Wages shall be paid at least once every month, preferably through bank transfers.
- Equal pay for equal work shall be ensured for men and women workers.
- Wage slips shall be provided to workers with details of payments and deductions.
- Mandatory contributions (EPF, ESI, Bonus, etc.) shall be made in accordance with applicable laws.

4. Working Conditions:

- No worker shall be required to work for more than 8 hours per day and 48 hours per week, except with overtime compensation as per law.
- Workers shall be entitled to one day of rest every seven days.
- The Contractor shall provide:
 - Adequate drinking water, sanitation facilities (separate for men and women), and rest shelters.
 - Proper accommodation for migrant workers, where applicable.
 - Medical facilities including first aid, doctor-on-call, and emergency transport.

5. Occupational Health and Safety (OHS):

- The Contractor shall comply with the Building and Other Construction Workers Act, 1996 and other safety regulations.

- All workers shall be provided with Personal Protective Equipment (PPE) such as helmets, gloves, boots, safety belts, and masks at no cost.
- Safety induction and regular training shall be provided to workers.
- Accident/incident registers shall be maintained, and accidents shall be reported immediately to the Engineer/PIU.
- Compensation for injury or death shall be provided in line with the Employees' Compensation Act, 1923.

6. Gender Equality and Inclusion:

- Women workers shall not be discriminated against in wages, work allocation, training, or promotions.
- Separate toilets, washing facilities, and changing rooms shall be provided for women.
- Where more than 50 female workers are employed, the Contractor shall provide crèche facilities as per the Maternity Benefit Act, 1961.
- Sensitization programs on Gender-Based Violence (GBV), Sexual Exploitation and Abuse (SEA), and Sexual Harassment at Workplace shall be conducted.

7. Grievance Redressal Mechanism (GRM):

- The Contractor shall establish a workers' grievance mechanism at the site with multiple options (complaint box, helpline, community liaison officer).
- Grievances shall be resolved within 7 working days and escalated to PIU if unresolved.
- Special confidential channels shall be available for GBV/SEA-related complaints.

8. Code of Conduct (CoC):

- All workers (including sub-contractors and suppliers) shall sign a Code of Conduct covering:
 - Prohibition of sexual harassment, exploitation, and abuse.
 - Respect for local customs, culture, and community norms.
 - No alcohol, drugs, or violence at worksites.
 - Zero tolerance for child labour and forced labour.

9. Monitoring and Reporting:

- The Contractor shall submit **monthly labour reports** including:
 - Number of workers employed (by category, gender, origin – local/migrant).
 - Wage payments and deductions.
 - OHS compliance, accidents/incidents.
 - Grievances received and resolved.

- The PIU/Supervision Consultant shall have unrestricted access to worksites, labour camps, and records for monitoring compliance.

10. Sanctions for Non-Compliance:

- Non-compliance with these provisions shall attract penalties, including:
 - Withholding of payments.
 - Deduction of costs incurred by PIU in ensuring compliance.
 - Termination of contract for repeated violations.

Annexure – 2: Sample Code of Conduct (CoC) for Workers and Supervisors:

Purpose:

This Code of Conduct sets standards of behaviour expected from all workers, supervisors, contractors, and sub-contractors engaged in the Meghalaya Road Projects. Compliance is mandatory.

Commitments of All Workers:

1. Compliance with Laws and Rules:

- I will comply with all Indian labour laws, project labour management rules, and site safety regulations.

2. Respect for Local Communities and Culture:

- I will respect the customs, traditions, and cultural practices of the local communities.
- I will not trespass or misuse community resources without consent.

3. Prohibition of Child Labour and Forced Labour:

- I will not employ or support the use of child labour (under 18 years in hazardous work).
- I will not participate in or allow forced or bonded labour.

4. Safe Work Practices:

- I will wear and use the personal protective equipment (PPE) provided to me.
- I will follow safety instructions and report unsafe conditions or accidents immediately.

5. Gender Equality and Non-Discrimination:

- I will treat women and men equally in work and wages.
- I will not discriminate against anyone based on caste, ethnicity, religion, gender, or disability.

6. Prohibition of Sexual Exploitation and Abuse (SEA)/GBV:

- I will not engage in sexual harassment, exploitation, or abuse of any person.
- I understand that sexual relations with minors (below 18 years) are strictly prohibited and punishable under law.
- I will not exchange money, goods, or services for sexual favours.

7. Prohibition of Drugs, Alcohol, and Violence:

- I will not consume or be under the influence of drugs or alcohol at the workplace.
- I will not engage in fighting, intimidation, or violent behaviour.

8. Grievance Reporting:

- I will raise concerns and grievances through the established Worker Grievance Redress Mechanism (GRM).
- I will cooperate in resolving grievances fairly.

Acknowledgement:

I, the undersigned, have read and understood this Code of Conduct. I agree to comply with it throughout my employment on the Road Projects. I understand that violations may result in disciplinary action, including termination of employment or legal action.

Worker's Name: _____

Designation/Role: _____

Signature/Thumbprint: _____

Date: _____

Contractor's Representative (Witness): _____

Annexure 5.5: Occupational Health and Safety Plan (OHSP)

1. Introduction:

The Occupational Health and Safety Plan (OHSP) provide guidelines for managing workplace health and safety risks during the construction and operation of MLCIP Projects. It ensures compliance with relevant Indian legislations and World Bank/IFC Environmental and Social Standards (ESS2 & ESS4). The Plan aims to safeguard workers, contractors, communities, and road users from occupational accidents, injuries, and diseases.

2. Objectives:

Prevent workplace accidents, injuries, and occupational diseases.

Ensure safe working conditions for all project personnel.

Comply with national legal requirements and international OHS standards.

Establish procedures for emergency response, accident reporting, and corrective action.

Promote health awareness and capacity-building of workers.

3. Roles and Responsibilities:

Project Implementation Unit (PIU):

- ✓ Ensure contractor compliance with OHS requirements.
- ✓ Monitor safety performance through site inspections and audits.

Contractor:

- ✓ Prepare and implement site-specific OHS plans.
- ✓ Appoint a Safety Officer for each package.
- ✓ Provide Personal Protective Equipment (PPE) to all workers.
- ✓ Maintain records of accidents, near misses, and corrective actions.

Construction Supervision Consultant (CSC):

- ✓ Verify contractor compliance.
- ✓ Conduct joint safety inspections with PIU and Contractor.
- ✓ Provide training and awareness sessions.

Workers:

- ✓ Follow safety protocols and wear PPE at all times.
- ✓ Report unsafe conditions and accidents immediately.

4. Hazard Identification and Risk Management:

Key Occupational Hazards:

- ✓ Working at height (bridges, culverts, hill slopes).
- ✓ Roadside excavation, tunneling, and blasting in hilly terrain (If applicable).
- ✓ Exposure to dust, noise, and vibrations.
- ✓ Manual handling and lifting of heavy materials.
- ✓ Vehicle and machinery movement.
- ✓ Electrical hazards from temporary connections.
- ✓ Extreme weather conditions (heavy rainfall, landslides).

Risk Control Measures (Hierarchy of Controls):

- ✓ Elimination – Avoid hazardous practices where possible.
- ✓ Substitution – Use less hazardous materials/processes.
- ✓ Engineering Controls – Guardrails, barricades, warning signs.
- ✓ Administrative Controls – Work permits, job rotation, shift planning.
- ✓ PPE – Helmets, safety shoes, gloves, ear plugs, masks, reflective jackets.

5. Health and Safety Procedures:

General Site Safety:

- ✓ Fencing and barricades around construction sites.
- ✓ Clear signage in English, Khasi (local languages).
- ✓ Adequate lighting at night.
- ✓ Safe drinking water, sanitation, and first aid facilities.

Personal Protective Equipment (PPE):

- ✓ Mandatory: Safety helmet, safety shoes, reflective jacket.
- ✓ Task-based: Gloves, ear protection, eye protection, dust masks, harness.
- ✓ Contractor responsible for supply, training, and replacement.

Traffic and Road Safety:

- ✓ Prepare a Traffic Management Plan (TMP).
- ✓ Warning signs, flagmen, and speed limits near work zones.
- ✓ Separate entry/exit for construction vehicles.
- ✓ Awareness campaigns for communities and school children.

Machinery and Equipment Safety:

- ✓ Regular maintenance and inspection.
- ✓ Operator licenses and training.
- ✓ Emergency shut-off procedures.

Emergency Preparedness and Response:

- ✓ Emergency contact numbers displayed at site.
- ✓ Site-specific Emergency Response Plan (ERP).
- ✓ Fire extinguishers at key locations.
- ✓ First Aid kits with trained first aiders.
- ✓ Tie-ups with nearest Primary Health Centre (PHC)/hospital.

Occupational Health:

- ✓ Pre-employment and periodic medical check-ups.
- ✓ Health awareness on communicable diseases (TB, HIV/AIDS, COVID-19).
- ✓ Separate facilities for men and women workers.
- ✓ Safe accommodation (if labor camps are established).

6. Training and Capacity Building:

Induction training for all workers before mobilization.

Tool-box talks (daily/weekly on-site briefings).

Specialized training: Working at height, First aid and firefighting, Electrical safety, Defensive driving.

7. Incident Reporting and Monitoring:

All incidents (accidents, near misses, unsafe acts) must be reported within 24 hours.

Contractor maintains Incident Register.

CSC/PIU investigates major accidents and ensures corrective action.

Monthly OHS performance reports submitted to PIU.

8. Monitoring Indicators:

Indicator	Monitoring Method
Number of accidents and near misses	Incident Register & Reports
Percentage of workers provided with PPE	Site Inspections
Number of safety trainings/tool-box talks conducted	Training Records

Number of safety audits and inspections	Audit Reports
Compliance with OHS standards	Monthly Reports

9. Budgetary Provision:

Contractor must allocate a specific budget for OHS, covering PPE, signage, first aid, training, and worker insurance.

10. Documentation and Record Keeping:

OHS Policy and Procedures.

Worker orientation and training records.

Medical check-up reports.

Accident/incident investigation reports.

OHS monthly compliance checklists.

Annexures: OHS Forms and Checklists:

Annexure 1: Accident / Incident Reporting Form:

Date & Time of Incident	
Location of Incident	
Name(s) of Injured Person(s)	
Nature of Injury / Illness	
Description of Incident	
Immediate Action Taken	
Witness Name(s) & Contact	
Reported By / Signature	

Annexure 2: Safety Audit Checklist:

Checklist Item	Yes/No	Remarks
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Are all workers provided with appropriate PPE?		
Is PPE being worn correctly?		
Are barricades/signages in place at hazardous areas?		
Are first aid kits available and updated?		
Are fire extinguishers accessible and functional?		
Is site housekeeping maintained?		
Are emergency contact numbers displayed?		
Are tool-box talks conducted regularly?		

Annexure 3: Toolbox Talk Register:

Date	Topic Discussed	Trainer's Name	Workers Attended (Signatures)

Annexure 4: Medical Check-up Register:

Worker Name	Date of Check-up	Type of Check-up (Pre-employment/Periodic)	Findings / Remark	Doctor's Signature

Annexure 5: Training Attendance Sheet:

Date	Training Topic	Trainer's Name	Worker Name	Signature

Annexure 6: Monthly OHS Performance Reporting Format:

Contractor: _____

Package No.: _____

Reporting Month: _____

Submitted To: PIU (through CSC)

Date of Submission: _____

Section A: Workforce Details:

Indicator	This Month	Cumulative (Project to Date)
Total number of workers employed		
Number of new workers inducted with safety orientation		

Number of skilled operators/drivers licensed		
----------------------------------------------	--	--

Section B: Training and Awareness:

Indicator	This Month	Cumulative
Number of safety inductions conducted		
Number of toolbox talks conducted		
Number of safety trainings/workshops conducted		
Number of awareness campaigns (HIV/AIDS, GBV, Road Safety)		

Section C: Health and Medical:

Indicator	This Month	Cumulative
Number of pre-employment medical check-ups		
Number of periodic health check-ups		
Number of health awareness sessions conducted		

Section D: Incidents and Accidents:

Indicator	This Month	Cumulative
Number of fatal accidents		
Number of non-fatal accidents		
Number of near misses reported		
Number of lost workdays due to injury		

Section E: Safety Compliance:

Indicator	This Month	Cumulative
Percentage of workers provided with PPE		
Number of safety inspections conducted		
Non-compliance issues identified		
Corrective actions implemented from previous inspections		

Section F: Summary:

- Key Safety Achievements: _____
- Major Issues/Challenges: _____
- Corrective Actions Planned for Next Month: _____

Prepared By (Contractor Safety Officer): _____

Verified By (CSC Safety Specialist): _____

Reviewed By (PIU): _____

Occupational Health, Safety, and Environmental (OHSE) Compliance Inspection Checklist

	<i>Inspection Items</i>	<i>Implemented?</i>		<i>N/A</i>	<i>Actions to be Taken</i>
		<i>Yes</i>	<i>No</i>		
1.00	General				
1.01	All employees have completed Occupational Health and Safety orientation (induction training)				
1.02	Hazard communication has been implemented				
1.03	Housekeeping acceptable				
1.04	Proper PPE being issued and utilized				
1.05	All construction and emergency signs posted				
1.06	Risk assessment conducted, discussed with all employees, documented and available on site				
1.07	Proper entrances and egress at all work fronts				
1.08	OHS Register and reporting mechanism exists				
2.00	Environment				
2.01	Measures to prevent water pollution in place (clear storm water drains etc.)				
2.02	Water from cleaning of equipment directed to specific locations.				
2.03	Adequate measures taken to prevent contamination of surface water, groundwater and soil by the effluents from storage areas, including raw materials, chemicals, and wastes.				
2.04	Fuel storage tank well bunded to contain spill in case of tank failure.				
2.05	Fuelling done away from waterways.				
2.06	Spill kit is available and adequately stocked				
2.07	All site staff trained in emergency spill response.				
2.08	Waste properly managed on the site.				
2.09	Hazardous materials stored appropriately with Material Safety Data Sheet's kept nearby.				
2.10	Dust control measures in place.				
2.11	Construction site watered to minimize dust generated				
2.12	Stockpiles of dusty materials covered or watered				
2.13	All vehicles carrying dust materials covered or watered.				
2.14	Proper management of excavated soils.				

2.15	Adequate odor control measures taken.				
2.16	Are plant and equipment well maintained? (any black smoke observed, please indicate the plant/equipment)				
3.00	Site clean and tidy				
3.01	Chemical waste properly stored and labelled				
3.02	Separate labelled containers/areas provided for facilitating recycling and waste segregation				
3.03	Waste removed offsite regularly				
3.04	Is there any waste burnt on site?				
3.05	Are proper measures to control oil spillage during maintenance or to control other chemicals spillage? (e.g. provide drip trays)				
3.06	Are drip trays free of oil and water?				
3.07	Are oil drums and plants/equipment provided with drip trays?				
4.00	Excavation and Trenches				
4.01	All construction and emergency signs posted				
4.02	Barricades present				
4.03	Other underground utility lines mark out				
4.04	Protective systems in place i.e., shoring, shielding and sloping where applicable				
4.05	Proper Ladder available in excavations				
4.06	Excavated soils and equipment away from cut trenches at least one meter away				
5.00	Electrical Safety				
5.01	Do electrical devices have a current inspection and coding?				
5.02	Is electrical equipment properly maintained?				
5.03	Is equipment properly grounded?				
5.04	Are fuses provided?				
5.05	Are electrical dangers posted?				
5.06	Are proper fire extinguisher(s) provided?				
5.07	Are terminal boxes equipped with required covers, and is the cover used?				
5.08	Are circuits labelled in terminal boxes?				
5.09	Are all electrical distribution boards IP rated.				
5.10	LOTO system in place				
5.11	Do electrical circuit has ELCB in place				

6.00	Scaffolding				
6.01	Is erecting the scaffold properly supervised?				
6.02	Are all structural members free from defects, and do they meet safety factors?				
6.03	Are all scaffold connections secured?				
6.04	Are scaffolds erected on solid footing?				
6.05	Is scaffold tied to structure?				
6.06	Are working areas free of dirt, debris, snow, ice, and grease?				
6.07	Are employees protected from falling objects?				
6.08	Is scaffold plumb and square, with cross-bracing?				
6.09	Are guard rails, intermediate rails, and toe boards in place?				
6.10	Is the work platform is 100% Covered				
6.11	Are ropes and cables in good condition?				
6.12	Is fall protection available and in use?				
7.00	Demolition				
7.01	Is an engineering survey provided in writing?				
7.02	Does documentation show operations planned ahead?				
7.03	Is shoring of adjacent structures complete?				
7.04	Are utilities marked and shut off?				
7.05	Are hazardous materials or chemicals removed from any pipes, tanks, or equipment?				
8.00	Fire prevention				
8.01	Are an adequate number and types of fire extinguisher(s) available at labour camps, construction camps, etc?				
8.02	Is fire prevention/extinguisher training performed?				
8.03	Are inspections of fire extinguishers performed periodically?				
8.04	Is the telephone number of the fire department posted?				
8.05	Are fire extinguisher(s) provided on appropriate equipment?				
8.06	Are flammable liquids stored in approved containers and correctly labelled?				
8.07	Are flammable liquids properly stored?				
8.08	Is a fire alarm available?				
8.09	Is a fire evacuation plan established?				
8.10	Are fuel supplies protected from accidental impact?				
8.11	Is fire training given to appropriate				

	personnel?				
8.12	Is equipment shut down prior to refueling?				
8.13	Is equipment properly grounded to fuel trucks before refueling?				
8.14	Are no-smoking signs posted and enforced?				
8.15	Are hydrants clear and access to public thoroughfare open?				
9.00	Hoists, Cranes, and Derricks				
9.01	Are annual inspections completed?				
9.02	Have operators been properly tested, and are their physical exams current?				
9.03	Are daily inspections completed by operators?				
9.04	Are outriggers used?				
9.05	Are power lines deactivated or removed, or are warning signs posted with at least 3M of clearance from overhead power lines				
9.06	Are hoists designed by a competent professional engineer?				
9.07	Is proper loading for capacity at lifting radius?				
9.08	Is equipment operated in accordance with the manufacturer's instructions?				
9.09	Does a competent person inspect the crane?				
9.10	Is equipment properly lubricated and maintained?				
9.11	Is load testing accomplished?				
9.12	Are signal workers properly trained and placed where needed?				
9.13	Are alarms working and audible?				
10.00	Welding and cutting				
10.01	Are all welding and cutting operators qualified?				
10.02	Are screens and shields in place?				
10.03	Is oxygen and acetylene stored properly?				
10.04	Are bottles not in use secured with caps in place?				
10.05	Is proper eye protection and PPE used?				
10.06	Are fire extinguisher(s) located near operations?				
10.07	Is a "hot work" permit completed and posted in areas requiring a permit?				
10.08	Are valves shut off and regulators backed off each night?				
10.09	Are flashback arresters placed on hoses (O2 and fuel gas)?				
10.10	Is electrical equipment grounded?				
10.11	Is the area inspected for fire hazards?				
10.12	Are gas lines and power cables protected				

	and in good				
10.13	Is proper ventilation ensured?				
10.14	Is there a welding permit program?				
11.00	Power Tools				
11.01	Is proper housekeeping conducted where tools are used?				
11.02	Are inspections and proper maintenance of tools performed?				
11.03	Are tools grounded properly or double-insulated?				
11.04	Are tool guards in place and used correctly?				
11.05	Are damaged or malfunctioning tools tagged out until repaired or replaced?				
11.06	Are tools in compliance with local laws and ordinances?				
11.07	Are all operators qualified?				
11.08	Are tools protected from unauthorized use?				
11.09	Is competent instruction and supervision provided?				
11.10	Are cords included in electrical inspection?				
12.00	Traffic Management				
12.01	Area Traffic Management plan is documented and implemented				
12.02	Are traffic signage properly posted and adequate				
12.03	Are there trained personnel i.e., flag men to direct traffic				
12.04	Is there proper delineation of the work front				
12.05	Area traffic diversion signals well luminated during night time				
13.00	Barricades				
13.01	Placed for work site perimeter				
13.02	Placed for all excavations				
13.03	Placed for swing radius of crane or other equipment				
13.04	Placed for drop areas of construction materials				
14.00	Hygiene and Sanitation				
14.01	Drinking water is provided in clean vessels				
14.02	Toilets are available and adequate				
14.03	Hand washing facilities available with soap				
14.04	Toilet range between 1 unit per 6 persons to 1 unit for 15 persons				
14.05	1 urinal units to 15 persons				
14.06	Shower/ Bathroom facilities – 1 unit to 15 persons to 1 unit per 6 persons				

14.07	Separate kitchen facilities. No cooking in living room				
15.00	HIV, AIDS and STIs				
15.01	Awareness campaigns conducted				
15.02	Covid 19 prevention measures implemented				
15.03	Condoms being distributed				
15.04	Employees showing signs and symptoms of covid 19 are allowed to seek medical assistance				
16.00	Policies and Procedures				
16.01	Contractors' health and safety Management Plan is available on site				
16.02	All employees are aware of safe systems of work and the incident management procedure				
16.03	Method statements are available				
17.00	First Aid				
17.01	First Aid kit is available and adequately stocked				
17.02	There is at least one trained first aider on site				
17.03	First aid kit inspection is being conducted				
18.00	Incident Management				
18.01	Incident Management Procedure is available				
18.02	All incidents are reported, documented and investigated accordingly				
18.03	CAPA (Corrective Action and Preventive Action) is being implemented accordingly				
18.04	Emergency contact numbers i.e., health centers/ambulance, safeguards team, first aiders, utility providers, police etc. are available on site				
19.00	Trainings				
19.01	Employees received HSE induction training				
19.02	Training records are available and properly documented				
19.03	Employees involved in high risks activities have received special training				

Annexure 5.6: Climate Disaster Risks Assessment

1. Changing Rainfall Patterns

- Extreme rainfall events are increasing in Ri-Bhoi, consistent with regional climate trends, intensifying risks of flash floods and landslides.
- Despite its high rainfall, variability is emerging: erratic monsoon events threaten agriculture, water availability, and infrastructure.
- Local rainfall trends indicate occasional deficits during peak monsoons, affecting traditional jhum cultivation and water-dependent livelihoods.

2. Forest Vulnerability & Biodiversity

- A significant portion of Ri-Bhoi forests show high vulnerability to climate and human pressures, with NDVI analyses indicating localized forest degradation.
- Key concerns include loss of forest cover, declining carbon stocks, and pressures on biodiversity hotspots, particularly in high-altitude and northern areas.

3. Localized Vulnerability Hotspots

- Block-level analysis in Ri-Bhoi identifies several highly vulnerable areas, driven by limited rural credit, low household incomes, constrained health and education services, and dependence on forest resources.
- These vulnerabilities compound exposure to climate-induced hazards, particularly landslides and soil erosion in steep terrain.

4. Socioeconomic and Ecological Impacts

- Agriculture, largely rain-fed, faces crop failures due to erratic rainfall and shifting monsoon patterns.
- Water resources, including streams and catchments, are under stress, affecting hydropower potential and domestic supply.
- Forest-dependent livelihoods and eco-tourism are disrupted due to biodiversity loss, and changing climatic conditions.

5. Potential impacts of Climate Change trend on road transport infrastructure

Due to the uneven climatic behaviour, it is essential that climate mitigation and adaptation plans to combat the impacts of climate change are factored in the development process to avoid economic burden of adaptation in the long run, and gain from new opportunities that will be thrown up along the way. The Potential impacts of Climate Change trend on road transport infrastructure are provided in Table below:

Table: Potential impacts of Climate Change trend on road transport infrastructure

Climate Trend / Parameter	Observed Pattern	Impact on Road Infrastructure
High Rainfall	High Rainfall 2,100–2,500 mm (Umroi)	- Erosion of road embankments and landslides in hilly terrains. - Structural damage to culverts and bridges.
Low Rainfall	- Significant drop in annual rainfall	- Dry soil conditions may cause cracks in asphalt roads. - Lower soil stability, leading to uneven settling of road foundations.

	-Reduced annual rainfall correlates with reduced soil moisture and vegetation	- Loss of vegetation can weaken slopes and lead to landslides in hilly areas like East Khasi Hills. - Roads may face increased dust and reduced traction due to dry conditions.
Rising Temperatures	- Maximum temperature rising from 24.5°C to 28.0°C	- Higher temperatures cause thermal expansion of road materials, leading to surface cracks. - Softening of asphalt during hot days can cause deformation and rutting.
Landslide Risk	- Frequent rainfall and runoff events increase landslide susceptibility in the district's terrain	- Roads in hilly areas may face closures due to landslides. - Increased repair costs for damaged road sections and disrupted connectivity to remote areas.

6. Adaptation and Mitigation Measures

To build resilience and protect communities and ecosystems in project area, the following measures are recommended:

- **Slope and Road Stabilization:** Retaining walls, bioengineering techniques, and slope stabilization to prevent landslides.
- **Infrastructure Resilience:** Use of geotextiles, reinforced pavements, and climate-resilient road materials to withstand heavy rainfall.
- **Drainage and Flood Management:** Construction of culverts, roadside drains, and floodwater channels in low-lying areas to manage runoff.
- **Water Resource Management:** Catchment restoration, rainwater harvesting, and climate-resilient irrigation systems.
- **Monitoring & Early Warning:** Regular maintenance, periodic inspection of roads, and landslide early warning systems.
- **Sustainable Livelihood Support:** Promotion of climate-resilient farming practices, biodiversity-friendly land use, and financial inclusion measures for local communities.

Annexure 7.1: Summary Of Consultations

Table 1: Suggestions from stakeholders for design input in DPR

Sl. No.	Key issues from stakeholder on existing road condition	Suggestions from stakeholders for Incorporation in project
1	Insufficient Road Width: The current road network is too narrow, making it difficult for vehicles, particularly large ones like buses and trucks. This leads to congestion, delays, and increased accident risks, especially in hilly regions where sharp turns and steep inclines exacerbate the problem. Emergency vehicles also face difficulties in reaching remote areas due to road congestion.	Road Expansion and Traffic Regulation: Where feasible, widen the roads and introduce traffic management measures such as one-way systems, designated passing zones, and controlled vehicle movement in high-risk areas. Implement lane discipline through clear road markings and enforce speed limits to ensure safe and smooth traffic flow. Explore alternative routes for heavy vehicles to ease congestion in densely populated areas.
2	Deteriorating Road Conditions: Many road stretches suffer from potholes, uneven terrain, and partial pavement, making driving hazardous. These poor conditions worsen during heavy rains, leading to vehicles skidding, accidents, and increased maintenance costs for drivers. The lack of proper road foundation in some areas leads to premature deterioration.	Resilient Road Construction: Utilize high-quality, weather-resistant materials such as reinforced asphalt or concrete to improve durability. Implement a preventive maintenance program that includes periodic road resurfacing, pothole repairs, and regular inspections.
3	Absence of Traffic-Calming Measures: High-speed driving through densely populated zones such as schools, marketplaces, and residential areas significantly increases the risk of pedestrian accidents. The lack of speed bumps, zebra crossings, and designated pedestrian walkways further endangers people, particularly children and the elderly.	Speed Control Strategies: Install speed bumps, rumble strips, and designated pedestrian crossings in high-traffic zones. Place traffic signs warning drivers to slow down near schools, hospitals, and marketplaces. Conduct community awareness programs on road safety and responsible driving. Deploy traffic enforcement personnel in high-risk areas to ensure compliance.
4	Lack of Proper Signage and Road Markings: Many critical road sections such as intersections, curves, pedestrian crossings, and accident-prone zones lack clear signage, leading to confusion among drivers and pedestrians. Poorly visible or missing lane markings result in erratic driving behavior and unsafe road conditions, especially at night.	Improved Road Signage: Deploy reflective and highly visible road signs indicating speed limits, pedestrian crossings, sharp turns, and road hazards. Clearly mark lanes and install guiding arrows at intersections to ensure proper navigation. Place electronic or solar-powered signboards where visibility is low. Conduct periodic maintenance to ensure signs remain visible and intact.
5	Ineffective Drainage Infrastructure: The absence of a proper drainage system results in	Storm water Drainage Development: Construct well-planned drainage

Sl. No.	Key issues from stakeholder on existing road condition	Suggestions from stakeholders for Incorporation in project
	waterlogging, road erosion, and hazardous driving conditions during the monsoon season. Standing water on roads damages road surfaces and creates a breeding ground for mosquitoes, increasing health risks.	channels along roads to prevent water stagnation. Implement regular desilting and cleaning of drainage systems to keep them functional. Use permeable road surfaces in flood-prone areas to improve water absorption. In hilly regions, incorporate slope-based drainage solutions to redirect excess rainwater safely.


Table 2: Summary of consultations with Project Affected Parties from local community

Sl. No.	Summary of Issues	Suggestions / Responses provided
1	<ul style="list-style-type: none"> - The local community relies heavily on nearby forests for firewood, food, and construction materials. How will the project prevent resource depletion during construction? - What steps will ensure the community's access to these resources is unaffected, and how will sustainable alternatives be introduced to reduce environmental impact? 	<ul style="list-style-type: none"> - Affected farmers will receive compensation for any agricultural land impacted, following standard procedures. - The community will retain access to nearby forest resources like firewood and water, with measures to promote sustainable use and prevent depletion.
2	<ul style="list-style-type: none"> - Poor connectivity and limited infrastructure in rural Ri-Bhoi make agriculture less viable, particularly for older farmers. - Challenges include inadequate transportation, restricted access to resources, and communication barriers, discouraging farming. - An ageing farmer population and youth migration to urban areas due to low profitability, limited credit access, and traditional farming methods exacerbate the issue. - These factors reduce interest in farming, 	<ul style="list-style-type: none"> - Vocational training programs for youth will be promoted to enhance employability and provide alternative income sources. - The project will facilitate connections to training schemes, assess local needs, and coordinate with training providers to support the community.

Sl. No.	Summary of Issues	Suggestions / Responses provided
	necessitating better infrastructure, financial aid, and modern practices.	
3	- The local land governance system in Ri-Bhoi restricts non-tribals from purchasing land or settling permanently.	- The project will respect the socio-economic structure of the community, ensuring no disruption during implementation. All land-related decisions will be made in consultation with the local council.
4	- Lack of a formal land records system in Ri-Bhoi complicates dispute resolution.	- Local tribal leaders will work to establish a transparent land use framework. - The project will ensure clear communication on land processes, with a dedicated grievance redressal mechanism to address community concerns promptly and transparently.
5	- The community emphasized that land matters in Ri-Bhoi are managed by the council, and they should be included in the land acquisition process for the project.	- Free, Prior, and Informed Consent (FPIC) will be conducted to address individual and council concerns early in the project. - A clear land tenure framework will be established, incorporating council approval processes to ensure transparency for all stakeholders. - A rehabilitation policy will be implemented, offering fair compensation and support aligned with community values.
6	- How will the project address the needs of school-going children during construction to minimize disruptions to their education, transportation, and daily routines?	- The project will prioritize minimal disruption for school children, particularly in transportation. - Collaboration with village councils and school authorities will ensure effective solutions, including a tailored transportation plan during construction.

Sl. No.	Summary of Issues	Suggestions / Responses provided
7	- Will construction impact cultural, historical, or heritage sites in Ri-Bhoi? How will the project respect local cultural practices?	- The contractor will avoid impacting significant cultural or heritage sites, with preservation measures if any are identified. - Community consultations will guide project planning to respect cultural practices, and labor will be trained to adhere to local traditions, monitored throughout the project.

Table 3: Summary of Consultation With Institutions

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1	DPR Consultant	25-08-2025	DPR Consultants	<ul style="list-style-type: none"> Preliminary observations from an 37.481 km site visit were presented, along with information requirements. Current data for Existing Right of Way (ERoW) and Proposed Right of Way (PRoW) is unavailable. PRoW will be considered as 10 meters, in accordance with relevant codes for state highways. 	<ul style="list-style-type: none"> Incorporate the 10-meter Proposed Right of Way (PRoW) into the design to ensure compliance with relevant codes for state highways. Utilize the data from the topographic survey conducted within a 60-meter width to inform the design process and address any topographical challenges. Develop flexible design options that can accommodate variations in the PRoW, ensuring that any potential adjustments can be made without significant delays. Integrate drainage solutions into the design to manage water runoff effectively, particularly in areas 	 <p>Latitude: 25.58179 Longitude: 91.884458 Elevation: 1510.94204 m Accuracy: 286.1 m Time: 25-08-2025 16:48 Note: Discuss/review</p>

SI · N o.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
				<ul style="list-style-type: none"> ▪ A topographic survey has been conducted within a 60-meter width. 	<p>prone to landslides or flooding.</p> <ul style="list-style-type: none"> ▪ Consider the inclusion of safety features such as guardrails and proper signage to enhance road safety along the newly proposed road alignment. ▪ Plan for ecological assessments to ensure that the road design minimizes environmental impacts, especially in sensitive areas identified during the site visit. ▪ Allow for future expansion possibilities in the design to accommodate potential increases in traffic volume and road usage over time. ▪ Engage with local communities to gather input and address concerns regarding the design, particularly in relation to access and land. 	

Annexure 7.2: Stakeholder Engagement Plan

For

Upgradation of Umsning - Jagi Road

For

**Meghalaya Logistics and Connectivity
Improvement Project (MLCIP),
funded by the World Bank**

November 2025

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INTRODUCTION/PROJECT DESCRIPTION

Meghalaya stands as a vital gateway in India's northeastern landscape, stitching together the Barak and Brahmaputra Valleys like a lush green bridge of hills and clouds. Road transport forms the lifeline of this mountainous state, carrying more than 80 percent of its freight and virtually all passenger movement. Yet, for nearly half of its people, reliable all-weather roads remain a distant promise, and aging timber bridges continue to restrict mobility, like weary sentinels struggling under modern demands.

To address the challenges mentioned above holistically, the Government of Meghalaya, with financing and technical support from the World Bank, has conceptualized a project titled the Meghalaya Logistics and Corridor Improvement Project (MLCIP). MLCIP aims to provide efficient, resilient, and safe connectivity to key regional, rural corridors and economic centers in Meghalaya by applying best practices in resource management, reducing greenhouse gas (GHG) emissions, improving road safety, and implementing an asset management system. The state aims to significantly increase agriculture's economic contribution and per capita income by improving market access through an efficient, all-weather transport and logistics infrastructure and services network. The improved network will enhance market access and logistics efficiency, reduce average cost/time for select agriculture and horticulture products along key economic corridors, and strengthen institutional capacity for managing efficient, climate-resilient, and safe transport and logistics infrastructure.

The project envisions:

- Upgrading existing roads to intermediate standards, with context-appropriate paved shoulders.
- Reconstructing and strengthening culverts and bridges to ensure durability and safety.
- Constructing new bridges and cross-drainage structures to secure all-weather connectivity and climate resilience.

Project Development Objective (PDO)

The Project Development Objective (PDO) is to enhance the climate and disaster resilience of critical public infrastructure specifically roads and bridges and strengthen agro-logistics infrastructure and services.

Project Components

The MLCIP will be implemented in Meghalaya and comprises the following components

Component 1. Climate-Resilient Roads, Bridges and Road Safety: Upgrading of selected 740 km roads and 347.5 m of bridges with climate-resilient features against flooding and landslides, including: (i) upgradation of damaged road sections to intermediate lane width; (ii) stabilizing hillside slopes by providing weep holes and applying civil and bio-engineering solutions; (iii) enhancing the resilience of side drains, culverts and bridge structures; protecting valley-side slopes; and widening the road formation; (iv) constructing innovative, climate-resilient bridge structures.

Component 2. Agro-Logistics Infrastructure and Service: Developing a green rural freight and public transportation system including: (a) establishing rural transportation hubs, including truck bays, loading and unloading ramps, container bays, sheds, container yards, offices, refreshment areas,

taxi/bus bays, and installing solar panels within the compound of the hubs; (b) establishing a freight terminal integrated with a district logistics park; (c) establishment of ropeways for transporting farm products from hills; (d) geo-referenced multipurpose bus/taxi/truck stops at farm-product collection points and habitation clusters; (e) high-speed internet/fiber optics connectivity to hubs and multipurpose bus/taxi stops at collection points; and (f) provision of roadside amenities and marketplaces.

Component 3. Institutional Strengthening: Training programs, workshops, and exposure visits; development of technical manuals, SOPs, and guidelines; inclusion of local knowledge and traditional practices; building the institutional capacity of line departments and community organizations.

Component 4. Contingent Emergency Response Component (CERC) The CERC will support PWD/MIDFC in case of an Eligible Crisis or Emergency in responding promptly and effectively to it as per the Contingent Emergency Response Manual. Following an eligible crisis or emergency, the Recipient may request the Bank to re-allocate project funds to support emergency response and reconstruction.

The MLCIP is being prepared under the Environmental and Social Framework (ESF World Bank's Environmental and Social Framework (ESF).

OBJECTIVE/ DESCRIPTION OF SEP

The overall objective of this SEP is to define a program for stakeholder engagement, including public information disclosure and consultation throughout the entire project cycle. The SEP outlines the ways in which the implementing agencies (Public Works Department, Department of Agriculture, Meghalaya Basin Development Authority) will communicate with stakeholders and includes a mechanism by which people can raise concerns, provide feedback, or make complaints about project activities or any activities related to the project. The details are given in *Annexure -I*

STAKEHOLDER IDENTIFICATION AND ANALYSIS

Stakeholder identification is the process of determining all individuals, groups, or institutions that may be directly or indirectly affected by the project or that may influence its outcomes. Categorization ensures that stakeholders are grouped according to their level of impact, interest, and influence, which helps design tailored engagement strategies.

Methodology

In order to meet best practice approaches, the project will apply the following principles for stakeholder engagement:

- **Openness and life-cycle approach:** Public consultations for the sub projects will be arranged during the whole life cycle, carried out in an open manner, free of external manipulation, interference, coercion, or intimidation.
- **Informed participation and feedback:** Information will be provided to and widely distributed among all stakeholders in an appropriate format; opportunities are provided for communicating stakeholder feedback, and for analyzing and addressing comments and concerns.
- **Inclusiveness and sensitivity:** Stakeholder identification is undertaken to support better communications and build effective relationships. The participation process for the projects

is inclusive. All stakeholders at all times are encouraged to be involved in the consultation process. Equal access to information is provided to all stakeholders. Sensitivity to stakeholders' needs is the key principle underlying the selection of engagement methods. Special attention is given to vulnerable groups that may be at risk of being left out of project benefits, particularly women, the elderly, persons with disabilities, displaced persons, and migrant workers and communities, and the cultural sensitivities of diverse ethnic groups.

For the MLCIP, the following stakeholders have been identified and analyzed per project component. These stakeholders include affected parties, other interested parties and disadvantaged/vulnerable individuals or groups.

Affected Parties

Project-Affected People (PAPs): Individuals, households, and communities residing in the project area who may be positively or negatively impacted (e.g., landowners, tenants, shopkeepers, transport users). Affected parties are local communities, community members, and other individuals or groups who may experience direct impacts from the project i.e. families residing in areas where project interventions (e.g., road construction, corridor development) are planned; Khasi communities whose land, resources, or livelihoods may be affected, Women, elderly, persons with disabilities, and marginalized households who may face disproportionate impacts; Village councils, clan leaders, and traditional authorities involved in local governance and decision making, Individuals or groups dependent on forests, rivers, or other natural resources in the project area for livelihood, cultural, or religious purposes; Traders, transport operators, and service providers whose activities may be affected during construction or operation.

Table 1: List of affected parties

Component 1: Climate-Resilient Roads, Bridges and Road Safety	<ul style="list-style-type: none"> • Titleholders, including residential owners, commercial property owners, and tenants whose assets or land may be affected. • Non-titleholders such as squatters, encroachers, and street vendors along the right of way (RoW) whose properties or incomes may be temporarily or permanently affected by land procurement or construction activities. • Land users with cultivated land or other uses along the existing RoW who may be impacted. • Rural road users, pedestrians, residents, and communities that may face temporary inconvenience or restricted access due to construction works • Village Councils (Dorbar Shnong) whose community owned lands or assets may be affected. • Religious and Indigenous Faith Institutions whose religious structures or land may be affected.
Component 2: Agro-Logistics Infrastructure and Service	<ul style="list-style-type: none"> • Marginal and small farmers, entrepreneurs, Self-Help Groups (SHGs), and Farmer Producer Groups (FPGs) who are expected to benefit from the agricultural development initiatives. • Rural road users, residents and communities that may be temporarily inconvenienced by construction works.
Component 3: Institutional	<ul style="list-style-type: none"> • Exposure visits to similar projects, institutions, or regions to exchange knowledge, share best practices, and adopt innovative approaches.

Strengthening	<ul style="list-style-type: none"> Preparation of standardized manuals, operating procedures, and guidelines to ensure consistency, efficiency, and sustainability in project planning, implementation, and monitoring.
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Other Interested Parties

- Local associations, cooperatives, self-help groups, and civil society organizations/NGOs working on environmental protection, social inclusion, human rights, and indigenous peoples' welfare;
- Academic and research institutions, universities, and think tanks providing technical expertise;
- Religious and cultural institutions;

Line departments and agencies such as the Revenue Department, Meghalaya State Pollution Control Board, Forest Department, Horticulture Department, Social Welfare Department, Labour Department, District Child Protection Unit, MBMA etc.;

- Industries, traders, and businesses along the corridors;

NGOs and CBOs working in the project areas;

- Media
- The general Public.

Stakeholders in Community Development

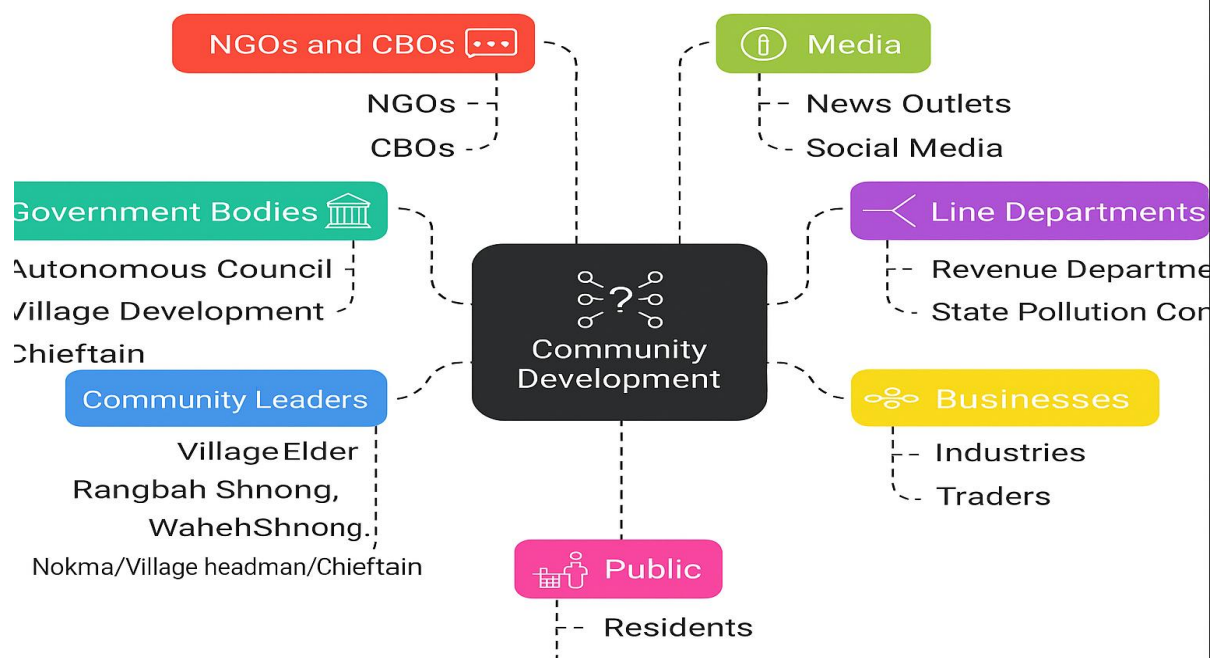


Figure 1: Stakeholders in Community Development

Disadvantaged/vulnerable individuals or groups

Within the Project, the vulnerable or disadvantaged groups may include but are not limited to the following:

Table - 2: Vulnerable Groups

Component 1: Climate-Resilient Roads, Bridges and Road Safety	<ul style="list-style-type: none"> • Affected parties that belong to the vulnerable category: elderly people, persons with disabilities, ethnic and religious minorities, children, and refugees, Women headed households, scheduled caste, scheduled tribe, and below poverty line (BPL) category— who may be disproportionately impacted due to land procurement. • Persons with disabilities (PWD), elderly who are likely to be affected due to temporary restriction in access. • Indigenous communities (Khasi) whose customary lands, traditional territories, and natural resources may be affected, requiring FPIC procedures under ESS7
Component 2: Agro-Logistics Infrastructure and Service	<ul style="list-style-type: none"> • Rural women and girls: Often primary users of public transport for market access, education, or healthcare; they may face safety risks, harassment, or exclusion from new green systems • Low-income farmers and small-scale traders: Rely on freight for goods transport; vulnerable to increased costs or disruptions during transition • Indigenous or ethnic minority communities: In rural project areas, they could be displaced or lose traditional access routes
Component 3: Institutional Strengthening	<ul style="list-style-type: none"> • Women in technical or institutional roles: Often underrepresented in transport/rural development sectors; training may exclude them due to childcare burdens, location biases, or gender norms, perpetuating inequities in manual/SOP creation. • Ethnic minorities or indigenous staff/community representatives: May face language/cultural barriers in training; guidelines could ignore their traditional knowledge, leading to non-inclusive policies. • Persons with disabilities in institutional teams: Training formats (e.g., in-person workshops) might not accommodate mobility or accessibility needs, excluding them from skill-building and manual development.


Vulnerable groups within the communities affected by the project will be further confirmed and consulted through dedicated means, as appropriate. Description of the methods of engagement that will be undertaken by the project is provided in the following sections.


STAKEHOLDER ENGAGEMENT PROGRAM



Summary of stakeholder engagement done during project preparation



During project preparation, the following public consultation meetings were conducted:



Table 3: Stakeholder Consultation Summary


Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
3.	Mawlaho	22-08-2025	Men (6)	<ul style="list-style-type: none"> Participants appreciated the project and acknowledged its positive impact on the community. Highlighted concerns about non-functional streetlights Requested fair compensation and support in case of any demolitions affecting their properties or livelihoods. Strong support from the local community for the project Hill cutting in many 	<ul style="list-style-type: none"> Construct smoother roads to enhance accessibility and improve transportation. Prioritize immediate repairs to address safety and mobility concerns in the community. Ensure fair compensation and support for individuals affected Hill cutting required 	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
4.	Umtraí	22-08-2025	Men (8)	<p>road stretches.</p> <ul style="list-style-type: none"> • Suggestions were made to include speed breakers and signage in residential zones to ensure traffic safety. • Several attendees emphasized the importance of regular maintenance after project completion • Requested fair compensation and support in case of any demolitions affecting their properties or livelihoods. • Appreciation was expressed for efforts taken to engage the community and consider their feedback. 	<ul style="list-style-type: none"> • Construct smoother roads to enhance accessibility and improve transportation. • Prioritize immediate repairs to address safety and mobility concerns in the community. • Integrate pedestrian footpaths, ramps for differently-abled individuals, and tactile paving for visually impaired pedestrians in the design. 	
Key Informant Interview						

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
3.	Umtraí	30.09.2025	PAH	<ul style="list-style-type: none"> Participants appreciated the project and acknowledged its positive impact on the community. 	<ul style="list-style-type: none"> Construct smoother roads to enhance accessibility and improve transportation. 	 <p>Time: 30-09-2025 14:04 Note: 58+476 Powered by NoteCam</p>
4.	Sonidan	30.09.2025	PAH	<ul style="list-style-type: none"> Minimum cutting of trees 	<ul style="list-style-type: none"> Construction is restricted to existing RoW 	 <p>Latitude: 25.922762 Longitude: 92.13218 Elevation: 762.38±41.6 m Accuracy: 3.9 m Time: 30-09-2025 12:40 Note: 48+340 Powered by NoteCam</p>

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
						 <p>Latitude: 25.922837 Longitude: 92.132185 Altitude: 718.1+146.0 m Accuracy: 11.1 m Time: 30-09-2025 12:33 Note: 48x340</p>
FGD with Youth						
2.	19.09.2025	Umlaper	Youth (8 nos.)	<ul style="list-style-type: none"> • Limited local opportunities, inadequate skill development platforms, and lack of structured guidance • Migration remains a major coping strategy, but often comes with social and economic risks 	<ul style="list-style-type: none"> • Integrate capacity-building and skill development components • Encourage microenterprise development by promoting small-scale livelihood opportunities • 	 <p>Latitude: 25.992069 Longitude: 92.139983 Altitude: 584.66+2.5 m Accuracy: 9.935 m Time: 19-09-2025 14:55 Note: FFGC 2 Umlaper</p>
FGD with Women						

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
3.	19.09.2025	Sonidan	Women 4 nos.)	<ul style="list-style-type: none"> Women are eager to contribute economically but are constrained by limited opportunities, social barriers, and lack of structured support 	<ul style="list-style-type: none"> Integrate women-focused skill development initiatives 	 <p>Latitude: 25.879672 Longitude: 92.125452 Elevation: 955.66±2.9 m Accuracy: 3.79 m Time: 19-09-2025 12:09 Note: FPIC 2 UJ road fgd</p>
4.	19.09.2025	Umsiang	Women 2 nos.)	<ul style="list-style-type: none"> There is a pressing need for inclusive, women-centric interventions that promote local entrepreneurship, skills, and connectivity 	<ul style="list-style-type: none"> Strengthen participation of women's Self-Help Groups (SHGs) in project-related awareness, monitoring, and plantation maintenance programs. 	 <p>Latitude: 26.065637 Longitude: 92.165125 Elevation: 186.04±67.9 m Accuracy: 1744.0 m Time: 19-09-2025 17:58 Note: FPIC 2 Umsiang</p>
Consultation with DPR consultant						

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
2.	DPR Consultant	25-08-2025	DPR Consultants	<ul style="list-style-type: none"> ▪ Preliminary observations from an 37.481 km site visit were presented, along with information requirements. ▪ Current data for Existing Right of Way (ERoW) and Proposed Right of Way (PRoW) is unavailable. ▪ PRoW will be considered as 10 meters, in accordance with relevant codes for state highways. • A topographic survey has been conducted within a 60-meter width. 	<ul style="list-style-type: none"> ▪ Incorporate the 10-meter Proposed Right of Way (PRoW) into the design to ensure compliance with relevant codes for state highways. ▪ Utilize the data from the topographic survey conducted within a 60-meter width to inform the design process and address any topographical challenges. ▪ Develop flexible design options that can accommodate variations in the PRoW, ensuring that any potential adjustments can be made without significant delays. ▪ Integrate drainage solutions into the design to manage water runoff effectively, particularly in areas prone to landslides or flooding. 	 <p>Latitude: 25.58179 Longitude: 91.884458 Elevation: 1510.9±2.04 m Accuracy: 286.1 m Time: 25-08-2025 16:48 Note: Discuss/review</p> <p>Powered by NoteCam</p>

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					<ul style="list-style-type: none"> ▪ Consider the inclusion of safety features such as guardrails and proper signage to enhance road safety along the newly proposed road alignment. ▪ Plan for ecological assessments to ensure that the road design minimizes environmental impacts, especially in sensitive areas identified during the site visit. ▪ Allow for future expansion possibilities in the design to accommodate potential increases in traffic volume and road usage over time. • Engage with local communities to gather input and address concerns regarding the design, particularly in relation to access and land. 	

Summary of project stakeholder needs and methods, tools, and techniques for stakeholder engagement

The Stakeholder Engagement Plan below outlines the engagement process, methods, including sequencing, topics of consultations and target stakeholders. The World Bank and the Borrower do not tolerate reprisals and retaliation against project stakeholders who share their views about Bank-financed projects.

Stakeholder engagement plan

Table: 4 Stakeholder Engagement Plan

Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
Preparation and Implementation stage	During Environmental and Social Impact Assessment (ESIA) and thereafter quarterly	<ul style="list-style-type: none"> - Present the project and receive feedback on project activities, timelines of civil works, and physical restrictions, if any. - Consult on key risks and impacts - Prior information on Work plan and Work schedules - Share details on GBV/ SEA/SH prevention and mitigation measures. - Give information on Grievance Redressal Mechanism 	<ul style="list-style-type: none"> • Community consultations • Public Meetings • Site visits 	General Public	MPWD and ESIA Consultant
Preparation stage	During ESIA, and thereafter monthly till disbursement is completed.	<ul style="list-style-type: none"> - Present the project and receive feedback on project activities, - Consult on key risks and impacts - Seek Free, Prior, and Informed Consent (FPIC) as per the World Bank ESS7 (Annex 4) - Compensation and R&R provisions as per the Entitlement matrix including payment modalities and disbursement status. 	<ul style="list-style-type: none"> • Meaningful consultations (Refer to 4.3) • Surveys • Focus Group Meetings/ Discussions • Village level 	Affected Parties	MPWD and ESIA Consultant

Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
		<ul style="list-style-type: none"> - Give information on Grievance Redressal Mechanism 	<ul style="list-style-type: none"> meetings • Site visits 		
Preparation stage	During ESIA and Detailed Project Report (DPR) preparation	<ul style="list-style-type: none"> - Present the project and receive feedback on key risks and challenges related to activities - Propose special provisions in place for vulnerable groups. E.g. Additional assistance for ST, BPL and WHH under entitlement matrix. - Measures to address temporary restriction to access during construction period. - Specific design interventions for persons with disabilities, women, children and elderly to ensure universal accessibility. - Benefits provided under the project for small and marginal farmers and women entrepreneurs. - Give information on Grievance Redressal Mechanism in an accessible manner. 	<ul style="list-style-type: none"> • Focus Group Meetings/ Discussions • One-on-one interviews <p>(Using tools and methods to ensure accessibility and full participation)</p>	<p>Vulnerable groups</p> <p>BPL, Women headed households, Persons with disabilities, elderly, Children along with their guardians</p>	ESIA Consultant MPWD
Preparation and Implementation stage	During ESIA and thereafter twice a year	<ul style="list-style-type: none"> - Present the project design, scope, approach, benefits, timelines, progress - Process related to public engagement and entitlements prior to alignment of land for developmental activities - Seek Free, Prior, and Informed Consent (FPIC) as per the World Bank ESS7 for initiating the activities. - Give information on Grievance Redressal Mechanism 	Consult with Heads of Traditional Institutions, Village Elders, Executive Members of the Village Councils (Dorbar Shnongs).	Autonomous District Council, Village Development Council (Dorbar Shnongs).	MPWD

Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
Preparation stage	During ESIA, and thereafter monthly till disbursement is completed.	<ul style="list-style-type: none"> - Present the project design, scope, approach, benefits, timelines, progress - Process related to land requirement for the project - Disbursement of compensation and R&R - Any prior permission required for initiating the activities - Give information on Grievance Redressal Mechanism 	<ul style="list-style-type: none"> - One-on-one interviews - Official letter or notification - Approvals by the district administration - Workshops and trainings 	District Administration	MPWD
Preparation stage	During ESIA	<ul style="list-style-type: none"> - Present the project design, scope, approach, benefits, timelines, progress - Any prior permission required for initiating activities in tribal areas - Give information on Grievance Redressal Mechanism 	<ul style="list-style-type: none"> - One-on-one interview - Official letter or notification - Approvals by the department - Workshops and trainings 		MPWD
Implementation stage	During construction phase on monthly basis, till completion of civil works	<ul style="list-style-type: none"> - Compliance on relevant labour norms applicable for construction related activities 	<ul style="list-style-type: none"> - Site inspections - Compliance reports and 	Contractor	MPWD

Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
			records submission Workshops and trainings		
Implementation stage	Prior to commencement of civil works and thereafter as and when reports are required.	<ul style="list-style-type: none"> - Compliance on relevant environmental norms applicable for construction related activities - Required permissions, certificates, etc. to be sought 	<ul style="list-style-type: none"> - Official letter or notification - Compliance reports and records submission and approvals by MSPCB Workshops and trainings	Meghalaya State Pollution Control Board	MPWD
Preparation stage	During ESIA	<ul style="list-style-type: none"> - Present project information and planned activities - Give information on Grievance Redressal Mechanism 	<ul style="list-style-type: none"> - Face to face and virtual meetings Workshops and trainings	Other Line departments- Social Welfare, Police and transport officials	MPWD
Implementation stage	During construction phase on daily basis, till completion of civil works	<ul style="list-style-type: none"> - Occupational and community health and safety requirements as per ESMP and LMP - Workers' code of conduct and other measures to manage SEA/SH risks 	<ul style="list-style-type: none"> - Face to face trainings - Toolbox trainings for 	Labor Contractors and workers	Supervision Consultants and Contractors

Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
		<ul style="list-style-type: none"> - Give information on workers' Grievance Redressal Mechanism 	<p>workers</p> <p>Signages in construction sites and camps</p>		
Preparation and Implementation stage	During ESIA and thereafter twice a year.	<ul style="list-style-type: none"> - Present project information and planned activities - Give information on workers' Grievance Redressal Mechanism - Feedback and support in SEA/SH risk management 	<ul style="list-style-type: none"> - One on one interviews - Face-to-face or virtual meetings, webinars - Seminar and workshops 	Autonomous District Council, Village Development Council (Dorbar Shnongs).	MPWD
Preparation and Implementation stage	As and when required.	<ul style="list-style-type: none"> - Present project information and planned activities - Outputs and outcomes of the project - Role and support required from media Success stories 	<ul style="list-style-type: none"> - Press Release/ Notes - Monthly Health Bulletins - Inputs for OpEds - Short films/ Reels/Posts for social media <p>Social Media</p>	Media	MPWD

Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
			platforms of Meghalaya Government		

Strategy to incorporate the view of vulnerable groups

The project will implement differentiated engagement measures for groups requiring special attention including women-headed households, persons with disabilities, elderly persons, economically disadvantaged families, and all indigenous communities. Engagement will ensure accessibility through sign language interpretation, large print materials, accessible meeting venues, flexible timing to accommodate care responsibilities, and culturally appropriate protocols respecting traditional governance structures. These targeted consultations will ensure that the perspectives, concerns, and priorities of vulnerable groups are meaningfully incorporated into project planning and decision-making.

To ensure that all stakeholders especially vulnerable groups can participate meaningfully and access information, the project will adopt the following measures:

Table 5: Strategy to incorporate the views of vulnerable groups

Vulnerable Group	Measures
Women headed households, and women entrepreneurs	<ul style="list-style-type: none"> Ensuring gender balance in engagement teams is critical to fostering trust and creating an environment where all participants, particularly women, feel comfortable sharing their perspectives. Surveys as well as other stakeholder engagement activities will be designed to accommodate women in unpaid care work, ensuring that they have the opportunity to participate fully in discussions. Flexible scheduling, accessible formats, and supportive measures such as childcare or safe transport will be provided to enable their meaningful engagement. For all in-person community engagement activities, provisions will be made for childcare, safe transport, and secure meeting venues to ensure that participants—particularly women and caregivers—can attend and participate fully. These measures aim to remove practical barriers and create a safe, accessible, and enabling environment for engagement. Gender-segregated consultations and other targeted approaches will be employed to provide women and girls with safe and enabling spaces for participation. These measures aim to encourage open dialogue, ensure that their perspectives are freely expressed, and promote equitable inclusion in project decision-making.
Affected parties belonging to BPL categories	<ul style="list-style-type: none"> All consultations will be scheduled during non-business or off-hours to accommodate participants' availability, ensuring that community members, particularly women and those engaged in work or care giving, can participate fully in the engagement process.
Elderly and people with existing medical conditions	<ul style="list-style-type: none"> The project will identify stakeholders with specific needs who may be at higher risk of being excluded or adversely affected, including women-headed households, persons with disabilities, the elderly, marginalized farmers, and economically disadvantaged groups. Information will be provided in an accessible and user-friendly manner to ensure that all stakeholders, including those with literacy or visual challenges, can understand and engage with project-related content. Measures will

Vulnerable Group	Measures
	<p>include - large print materials and clear, legible fonts; plain and simple local languages</p> <ul style="list-style-type: none"> All consultations will be conducted in comfortable, accessible, and well-lit venues to ensure participants can engage effectively. Venues will be chosen to accommodate persons with disabilities, the elderly, and other vulnerable groups, providing safe and welcoming environments for open dialogue.
Persons with disabilities	<ul style="list-style-type: none"> Information will be provided in accessible formats to ensure inclusion of persons with disabilities and those using assistive technologies. Ensuring accessibility measures are implemented where needed, based on the specific requirements of participants All stakeholder engagement activities will consider and account for gender, age, disability, socio-economic status, and other dimensions of identity and vulnerability. This ensures that consultations are inclusive, that the perspectives of marginalized groups are captured, and that project design and mitigation measures address the needs of those most at risk of exclusion or adverse impacts.
Indigenous Communities	<ul style="list-style-type: none"> FPIC procedures conducted through traditional institutions following customary protocols <ul style="list-style-type: none"> Consultations in local languages (Khasi) with cultural interpreters Respect for traditional decision-making timelines and consensus-building processes Integration of customary law and traditional knowledge systems Consultation with Village Councils, Rangbah Shnong, and Village Elders

The project road has Khasi community, governed by customary laws and traditional institutions. FPIC ensures that their collective rights and decision-making processes are respected; Constitutional protections (Sixth Schedule) also require consultation and consent from Autonomous District Councils and local communities; World Bank ESS7 (Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities) mandates FPIC when projects may affect customary lands, cultural heritage, or cause relocation. Therefore meaningful consultations will be conducted with affected tribal households, Heads of Traditional Institutions, Rangbah Shnong /village headmen, and Village Development Committee (VDC) chairpersons in a culturally appropriate manner and will include FPIC procedures where project activities affect customary lands or traditional territories. These consultations will take into account the following factors:

- Early Engagement** – Consultations will begin early in the project planning process to gather initial views on the project proposal and inform project design.
- Encouraging Feedback** – Stakeholder input will be actively solicited to inform project design and identify and mitigate environmental and social risks and impacts.
- Ongoing Process** – Engagement will be continuous throughout the project lifecycle.
- Prior Disclosure of Information** – Relevant, transparent, objective, meaningful, and easily accessible information will be shared in advance, in culturally appropriate formats and the relevant local language, ensuring stakeholders have adequate time for meaningful consultation.

- e) **Responsive Approach** – Feedback from stakeholders will be considered and addressed systematically.
- f) **Inclusive Engagement** – Efforts will be made to support active and inclusive participation of all project-affected parties.
- g) **Free from Manipulation or Coercion** – Consultations will be conducted without external interference, discrimination, intimidation, or coercion.
- h) **Documentation and Disclosure** – All consultations will be documented and disclosed by the Meghalaya Public Works Department (MPWD) to ensure transparency and accountability.

Reporting back to stakeholders

Stakeholders will be kept informed as the project develops, including reporting on project environmental and social performance and implementation of the stakeholder engagement plan and Grievance Mechanism, and on the project's overall implementation progress.

- **Internal Reporting:** The Project Management Unit (PMU) and implementing agencies will maintain comprehensive records of all stakeholder engagement activities, including meeting minutes, attendance sheets, feedback received, and grievances addressed.
- **External Reporting:** Periodic reports on stakeholder engagement will be shared with government authorities, funding agencies, and local communities, highlighting consultation activities, issues raised, and actions taken.
- **Public Disclosure:** Summaries of stakeholder engagement outcomes will be made available through community notice boards, offices of the DPIUs, and digital platforms to ensure transparency.

RESOURCES AND RESPONSIBILITIES FOR IMPLEMENTING STAKEHOLDER ENGAGEMENT ACTIVITIES

Resources

The **Meghalaya Public Works Department (MPWD)** will have overall responsibility for overseeing stakeholder engagement activities. The day-to-day implementation of these activities will be carried out by the **Environmental and Social Cell (E&S Cell)**, which is part of the MPWD's Project Implementation Unit.

The **MPWD** holds ultimate responsibility for the implementation of the Stakeholder Engagement Framework and Plans, ensuring that engagement activities are conducted in a timely, inclusive, and culturally appropriate manner, and that feedback is integrated into project planning and decision-making.

Table 6: Stakeholder Engagement Activities

Agency/ Individual	Role and Responsibility
MPWD	<ul style="list-style-type: none"> • Mobilization of External Expertise - Engage external consultants for conducting Environmental and Social Impact Assessments (ESIAs) and preparing site-specific Environmental and Social Management Plans (ESMPs), Resettlement Action Plans (RAPs), and Indigenous Peoples Development Plans (IPDPs). Undertake Free, Prior, and Informed Consent (FPIC) processes based on meaningful consultations with relevant stakeholders.

Agency/ Individual	Role and Responsibility
	<ul style="list-style-type: none"> • Technical Expertise for Vulnerable Groups - Mobilize technical expertise to ensure safe and culturally appropriate consultations with vulnerable groups or on sensitive topics, as required. • Approval and Oversight of Stakeholder Engagement Plan - Review and approve the content of the draft Stakeholder Engagement Plan (SEP), including any revisions. • Approval of Information, Education, and Communication (IEC) Materials - Approve all IEC materials prior to release, including communication materials, PowerPoint presentations, posters, leaflets, brochures, and media inserts (TV, radio, or online). • Authorization of Stakeholder Engagement Events -Approve and authorize all stakeholder engagement events and the disclosure of materials required to support these events, ensuring alignment with the SEP and cultural appropriateness.
MPWD	<ul style="list-style-type: none"> • Provide overall guidance, oversight, and monitoring of the Stakeholder Engagement Plan (SEP) to ensure that engagement activities are conducted effectively, inclusively, and in a culturally appropriate manner. This includes tracking progress, addressing gaps, ensuring compliance with project policies and safeguards, and providing technical and operational support to the implementing teams. • Prepare and provide appropriate Information, Education, and Communication (IEC) and other communication materials tailored to different stakeholder categories. These materials will ensure that relevant project information is clearly and effectively conveyed, taking into account stakeholders' literacy levels, languages, cultural contexts, and specific information needs. • Finalize the timing, duration, and sequence of all SEP-related information disclosure and stakeholder engagement activities. This ensures that consultations and information sharing are conducted at times that maximize stakeholder participation and allow sufficient time for meaningful feedback, particularly for vulnerable and marginalized groups. • Organize orientation and capacity-building sessions for MPWD staff to ensure a clear understanding of the Stakeholder Engagement Plan (SEP) and the requirements for its operationalization. This will enable staff to effectively implement engagement activities, follow culturally appropriate consultation practices, and respond to stakeholder feedback in line with project policies and safeguards.
CSC/ PMC/ MPWD	<ul style="list-style-type: none"> • Participate directly in all face-to-face stakeholder meetings or identify suitable representatives to ensure effective engagement. This ensures that stakeholders have a direct point of contact, that consultations are properly facilitated, and that feedback is accurately recorded and addressed. • Review and sign off on the minutes of all stakeholder engagement events to ensure accuracy and completeness. They will also maintain an up-to-date stakeholder database, capturing details of participants, feedback received, and follow-up actions, to support monitoring, reporting, and continuous improvement of

Agency/ Individual	Role and Responsibility
	<p>stakeholder engagement activities.</p> <ul style="list-style-type: none"> Ensure the active participation and inclusion of stakeholders from vulnerable groups, such as women-headed households, persons with disabilities, the elderly, marginalized farmers, and economically disadvantaged households. Special efforts will be made to remove barriers to their engagement and ensure their perspectives are meaningfully considered in project planning and decision-making.

The stakeholder engagement activities will be documented through:

- During the ESIA, a record of stakeholder engagement carried out with — description of the stakeholders consulted, a summary of the feedback received, and a brief explanation of how the feedback was taken into account, or the reasons why it was not— will be documented in the ESIA, ESMP, RAP, IPDP and other E&S instruments prepared.
- During implementation, stakeholder engagement activities will be documented in the MIS tool prepared under MLCP project for E&S risk management.

The budget for the SEP is as follows.

Table 7: The budget for SEP

Budget Category	Quantity	Unit Cost (INR)	Duration	Total (INR)	Remarks
1. Staff & Field Support					
Community Liaison Officers (3 persons)	3	50,000/month	36 months	54,00,000	Slight salary optimization
Social/Communication Consultant	1	60,000/month	24 months	14,40,000	Consultant only during active implementation
Staff Travel & Local Transport	24 months	15,000/month	24 months	3,60,000	Only during engagement phases
Subtotal:				72,00,000	
2. FPIC Meetings & Community Consultations					
FPIC I, II, III (combined logistics)	3 meetings	35,000/meeting	One-time	1,05,000	Hall, refreshments, PA
Cluster Village Consultations	18 events	5,000/event	24 months	90,000	Only priority villages
Subtotal:				1,95,000	
3. Information & Awareness Materials					

Budget Category	Quantity	Unit Cost (INR)	Duration	Total (INR)	Remarks
Posters & GRM Leaflets	6,000 copies	60/copy	One-time	3,60,000	Key locations, not mass printing
Community Radio & Social Messaging	18 months	15,000/month	18 months	2,70,000	Phased messaging only
Subtotal:				6,30,000	
4. Trainings & Capacity Building					
ESMP + Worker Safety + GRM Training	6 sessions	35,000/session	24 months	2,10,000	PIU + Contractor combined
Women SHG & Youth Livelihood Orientation	6 sessions	15,000/session	24 months	90,000	Targeted groups only
Subtotal:				3,00,000	
5. Monitoring & Feedback					
Mid-Term & Endline Survey (Combined Effort)	1 package	3,50,000	Project-wide	3,50,000	One consultant, not two
6. GRM Implementation					
GRC Training	6 sessions	30,000/session	24 months	1,80,000	Reduced frequency
Suggestion Boxes	50 units	2,500/unit	One-time	1,25,000	Only strategic points
GRM Signages & Hotline Info Boards	Lump sum	—	One-time	1,50,000	
Subtotal:				4,55,000	
7. Contingency / Miscellaneous	Lump sum	—	—	2,00,000	Capped & controlled
Revised Grand Total:				92,30,000	≈ INR 9.23 million

Note: *Salary costs can be indicative.

Management functions and responsibilities

MPWD will be responsible to carry out the Stakeholder Engagement activities. At the same time the PMC supports the Project Management Unit (PMU) in overall coordination, planning, and supervision of the project. Preparing and reviewing designs, drawings, DPRs, and bid documents. Ensuring compliance with environmental and social safeguard instruments (ESMF, ESMP, RAP, SEP, LMP, etc.). Where as The CSC provides field-level supervision, quality assurance, and compliance monitoring during construction. Supervising contractor's performance and ensuring adherence to technical specifications and timelines. Monitoring implementation of Environmental, Health, Safety, and Social

(EHS&S) measures on-site. Supporting the Environmental and Social Cell and PIUs in verifying ESMP and labour management compliance.

The stakeholder engagement activities will be documented through:

- During the ESIA, a record of stakeholder engagement carried out with — description of the stakeholders consulted, a summary of the feedback received, and a brief explanation of how the feedback was taken into account, or the reasons why it was not— will be documented in the ESIA, ESMP, RAP-IPDP and other E&S instruments prepared.
- During implementation, stakeholder engagement activities will be documented through MoMs, written consents, videography, geo tagged photos, attendance sheets and the monitoring app prepared by E&S Cell of the MPWD.

GRIEVANCE REDRESSAL MECHANISM

A Grievance Redressal Mechanism is a system that allows not only grievances, but also queries, suggestions, positive feedback, and concerns of project-affected parties related to the environmental and social performance of a project to be submitted and responded to in a timely manner. The main objective of a Grievance Redressal Mechanism is to assist to resolve complaints and grievances in a timely, effective, and efficient manner that satisfies all parties involved. For Sexual Exploitation Abuse/ Sexual Harassment (SEA/SH): The MPWD has setup an Internal Complaints Committee (ICC) for addressing any SEA/SH-related complaints at the workplace. The committee is constituted as per the requirements of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act).

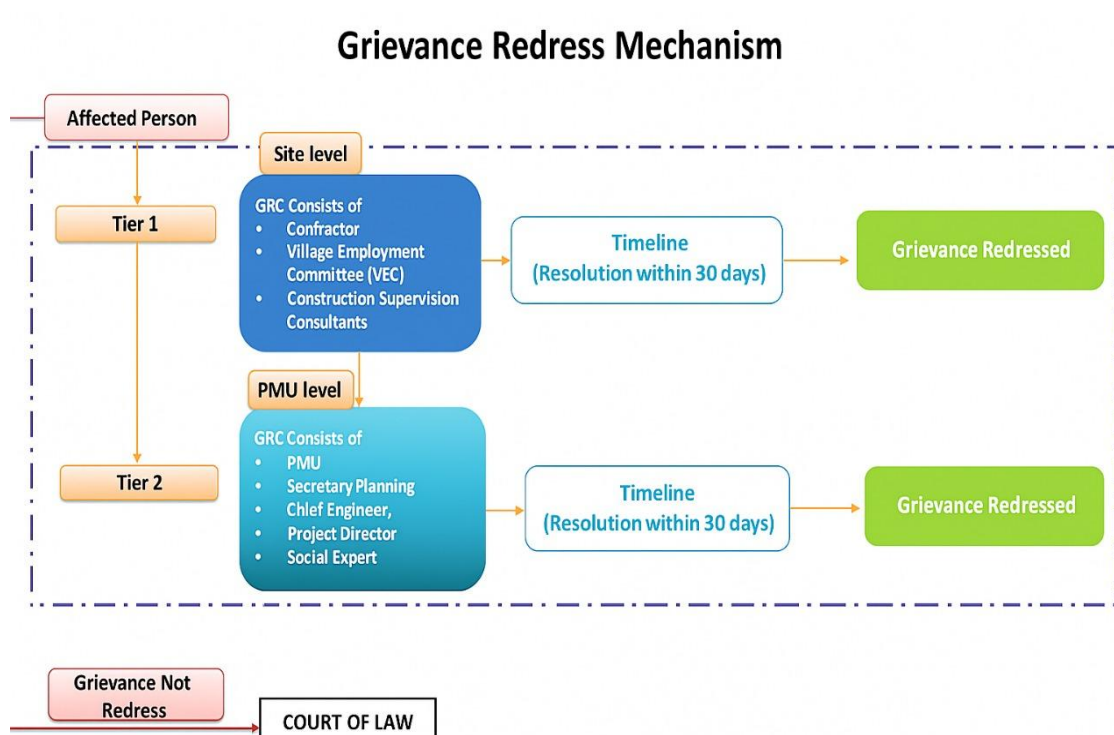


Figure 2: Grievance Redressal Mechanism

Description of Grievance Redressal Mechanism

Table 8: Description of Grievance Redressal Mechanis

Step	Description of process (e.g.)	Timeframe	Responsibility
GRM implementation structure	<p>Grievances under the Project can be submitted through the online grievance register integrated with Helpline and online portal through emails or the CM Connect Helpline no.</p> <p>Additionally, grievance can also be submitted directly to officials or through letters/emails to the Grievance Redressal Committees (GRCs) formed at the PMU, and site level.</p> <p>If grievance is not resolved at site level GRC within 30 days (depending on the nature of the grievance) the grievance is forwarded to level PMU GRC.</p> <p>When no resolution is made at level (PMC) GRC which need to be resolved within 30 days of receiving the complaint. The process will go to Court of Law.</p>	Throughout the project lifecycle	MPWD
Grievance uptake	<p>Grievances can be submitted via the following channels:</p> <ul style="list-style-type: none"> • Suggestion boxes in divisional and sub-divisional offices. • Toll free Helpline number • Web portal (https://www.mpwd.in) • E-mail, post and in-person to Site Divisional and State level grievance redressal committee. 	During construction and operation stage	Public Works Department, Department of Agriculture, & MBMA.,

Step	Description of process (e.g.)	Timeframe	Responsibility
Sorting, processing	Any complaint received is immediately forwarded to the site level official (AEs/ supervision consultants/ contractors); logged in the online grievance register; categorized according to the following complaint types: land/ asset related disputes, environment related, construction related disputes, SEA/SH, worker/employment specific, and others. For Sexual Exploitation Abuse/ Sexual Harassment (SEA/SH): The MPWD has setup an Internal Complaints Committee (ICC) for addressing any SEA/SH-related complaints at the workplace. The committee is constituted as per the requirements of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act).	Upon receipt of complaint	Person-in-charge of Online Portal, E&S experts at the Divisional level, E&S Cell, GRMCs
Acknowledgement and follow-up	Receipt of the grievance is acknowledged to the complainant by issuance of a unique identification number (UIN) which will be sent to the complainant through a phone call or SMS within 3 working days. If the complaint is received through Portal or Helpline number, operator will log the complaint and acknowledge its receipt immediately.	Within 3 days of receipt	Person-in-charge of Online Portal, Designated E&S Officers at the Divisional level, E&S Cell, GRMCs
Verification, investigation, action	Investigation of the complaint is led by GRC at site. A proposed resolution is formulated by site level GRC and communicated to the complainant through SMS in the registered mobile number.	Within 7 working days	GRC at site level composed of contractor, PMC, local representative from the community,
Monitoring and evaluation	Data on complaints are collected in project portal and reported to the PMU; and reported to the World Bank every quarter.	Upon receipt of complaint/ quarterly basis	CSC/PMC and E&S Cell

Step	Description of process (e.g.)	Timeframe	Responsibility
Provision of feedback	Feedback from complainants regarding their satisfaction with complaint resolution is collected through SMS or verbally, once the complaint is resolved.	Upon redressal of complaint	Person-in-charge of Online Portal, E&S experts at the Divisional level, ESMC, GRCs
Training	Training needs for staff/consultants in the PMU, GRC, Contractors, and Supervision Consultants are as follows: <ul style="list-style-type: none"> - Grievance management and documentation - Stakeholder engagement and documentation - Gender sensitization and handling of grievances related to SEA/SH 		E&S Cell, MPWD
If relevant, payment of reparations following complaint resolution	Payment of reparations following complaint resolution will be documented and signed by both parties on receipt of the amount. [Note: Payment of reparation related to employee accidents and fatalities will be undertaken as per the requirements of the Employee Compensation Act, 1923.]	Throughout the project lifecycle	MPWD
Appeals process	If the complainants are not satisfied with the proposed resolution of the complaint, they can escalate the complaint to the GRCs at the PMU level. The complainants are also free to approach the court of law at any time of their own will at any stage, and accessing the country's legal system can run parallel to accessing the Grievance Redressal Mechanism and is not dependent on the negative outcome of the Grievance Redressal Mechanism. Once all possible means to resolve the complaint have been proposed and if the complainant is still not satisfied, then they should be advised of their right to legal recourse.		SITE at the PMU and divisional level

The Grievance Redressal Mechanism will provide appeals process if the complainant is not satisfied with the proposed resolution of the complaint. Once all possible means to resolve the complaint have been proposed and if the complainant is still not satisfied, then they should be advised of their right to legal recourse. At the Site Level, the site engineers from the DPIUs, Designated E&S Officers of the DPIUs are also included.

The grievance mechanism for workers will be setup by the contractors prior to convening of civil works. The grievance mechanism process has been described in detail in the Labor Management Procedures.

Recourse for Sexual Exploitation Abuse/ Sexual Harassment (SEA/SH): The MPWD has setup an Internal Complaints Committee (ICC) for addressing any SEA/SH-related complaints at the workplace. The committee is constituted as per the requirements of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act). The MPWD has in place necessary mechanisms and procedures following a survivor-centered approach that prioritizes survivors' dignity, confidential reporting with safe and ethical documentation of SEA/SH issues. Additionally, SEA/SH referral pathways will be established and communicated to all staff at the PMU, divisional office and site levels including contractors. Further, all contractors have been mandated to setup an Internal Complaints Committee as per the POSH Act. The contractors will also prepare and implement the workers' code of conduct to be always adhered by workers.

MONITORING AND REPORTING

Summary of how SEP implementation will be monitored and reported

The SEP will be monitored based on both qualitative reporting (based on progress reports) and quantitative reporting linked to results indicators on stakeholder engagement and grievance performance.

SEP reporting will include the following:

- (i) Progress reporting on the Stakeholder Engagement commitments under the Environmental and Social Commitment Plan (ESCP).
- (ii) Cumulative qualitative reporting on the feedback received during SEP activities, in particular (a) issues that have been raised that can be addressed through changes in project scope and design, and reflected in the basic documentation such as the Project Appraisal Document, Environmental and Social Assessment, Resettlement Action Plan- Indigenous Peoples Development Plan (RAP-IPDP), or SEA/SH Action Plan, if needed; (b) issues that have been raised and can be addressed during project implementation; (c) issues that have been raised that are beyond the scope of the project and are better addressed through alternative projects, programs or initiatives; and (d) issues that cannot be addressed by the project due to technical, jurisdictional or excessive cost-associated reasons. Minutes of meetings summarizing the views of the attendees can also be annexed to the monitoring reports.
- (iii) Quantitative reporting based on the indicators included in the SEP.

Reporting back to stakeholder groups

The SEP will be revised and updated as necessary during project implementation.

Quarterly summaries and internal reports on public grievances, enquiries, and related incidents, together with the status of implementation of associated corrective/preventative actions will be collated by responsible staff and referred to the project managers.

Specific mechanisms to report back to the stakeholders include the following: annual reports, newsletters and articles disclosed on the MPWD's websites and workshops. This reporting back to the stakeholders will be done on an annual basis.

Table 9: Reporting back to stakeholder groups

Stakeholder (Group or Individual)	Summary of Feedback	Response of Project Implementation Team	Follow-up Action / Next Steps
Local Communities (PAPs, Village Representatives, Dorbar Shnong)	Strong support for road upgrading; requested roadside drains, footpaths, retaining/breast walls, bus waiting sheds, public toilets, and safety measures. Requested boundary walls for schools/churches and proper muck disposal.	Clarified that upgrading will remain within the existing RoW. Assured fair compensation per State laws & World Bank safeguards. Requests for community amenities and protection works will be integrated into DPR & ESMP.	Final designs to be shared with local stakeholders before construction. Feedback to be included in DPR/ESMP. Joint verification and disclosure before commencement.
Commuters and Daily Road Users	Requested streetlights, zebra crossings, signage, speed control near markets/schools, and waiting sheds at junctions.	Safety features such as lighting, signage, pedestrian crossings, and waiting sheds will be incorporated. Locations to be finalized in consultation with community.	Safety plan to be disclosed. Install signage, lighting, and speed control measures during construction.
Youth Groups	Raised concerns about limited employment and migration; requested preference in project jobs and vocational/skill development. Suggested promotion of eco-tourism and agro-based livelihoods.	Commitment to prioritize local youth for unskilled/semi-skilled jobs. Coordination with government skill development programs; encourage entrepreneurship and livelihood activities.	Link youth with skill training and entrepreneurship schemes. Monitor local employment. Integrate youth livelihood actions in ESMP.
Women Groups / SHG Members	Need for livelihood opportunities, access to finance, market linkages, and training in weaving/agro-processing/poultry. Requested safer mobility, street lighting, and better transport connectivity.	Integrated needs in Gender Action Plan & IPDP. Women-focused livelihood support, SHG strengthening, and safety improvements included.	Conduct training programs with ICDS/NRLM. Ensure safety enhancements (lighting, pedestrian provisions) in populated areas. Monitor participation of women.
Traditional Governance Institutions (Dorbar Shnong / Village Councils)	Requested involvement in decisions about camp sites, borrow areas, and monitoring worker behavior. Provided NOCs with conditions for environmental and community safety.	Acknowledged Dorbar as key partners. Committed to ongoing engagement. Labour Management Plan & Code of Conduct to be enforced with village monitoring.	Regular coordination with Dorbar Shnong. Activate GRC with community representation. Include local leaders in environmental/social monitoring.

Vulnerable Households	Requested support to minimize livelihood disruption and ensure access during construction.	Vulnerable households prioritized for assistance under RPF/IPDP.	Verify list of vulnerable households; provide assistance; monitor during construction.
Government Representatives / Engineering & Consultant Teams (PWD, ESIA, DPR, ESMF)	Emphasized coordinated communication, transparent disclosure, and adherence to safeguards.	PIU committed to multi-stakeholder coordination and safeguard compliance. Regular reviews planned.	Conduct periodic inter-agency meetings to track compliance, address grievances, and ensure transparency.

Annexure 1

Sl. No.	Location / District	Road Location / Name / Project Stretch	Date of Consultation	No. of Participants	Key Stakeholders Consulted	Key Issues and Suggestions Raised by Participants	Response / Action by Project Implementation Team (PIT)	Follow-up Actions / Next Steps	Timeline / Responsibility (Tentative)
1	Sonidan, Umlaper & Umsiang villages, Ri Bhoi District	Umsning – Jagi Road (FPIC–I)	04.09.2025	61	Project-Affected Persons (PAPs), Village Headmen (Rangbah Shnong), KHADC Representatives, Women Groups, Youth Groups, Government Officials, Civil Society	<ul style="list-style-type: none"> Concerns on displacement, livelihood loss, and protection of CPRs. Requests for drainage, bus sheds, footpaths, streetlights. Need for advance intimation on land requirement. Slope safety measures like retaining/breast walls. Junction improvement where needed. 	<ul style="list-style-type: none"> Project team explained that work is within existing RoW. Any land requirement will be processed legally with proper compensation. Community requests (drains, footpaths, bus sheds, breast walls) to be incorporated. FPIC principles explained; consent process initiated. 	<ul style="list-style-type: none"> DPR to integrate additional community infrastructure. ESIA to reflect social and environmental mitigation. Share revised designs with each Dorbar Shnong. 	Sept–Oct 2025 / PWD, DPR Consultant, ESIA Team
2	Sonidan, Umlaper	Umsning – Jagi	19.09.2025	75	AEE, SDO, ESIA Team (Enviro	<ul style="list-style-type: none"> Need for stand sheds at 	<ul style="list-style-type: none"> DPR team committed to 	<ul style="list-style-type: none"> Incorporate stand sheds, 	Oct–Nov 2025 / ESIA & DPR

	& Umsiang villages, Ri Bhoi District	Road (FPIC-II & Transact Walk)			Infra Solutions), DPR Team (KOBA Engineering), ESMF Team (Satra Consultancy), Village Headmen, Women, Youth	chainages 40+600 & 41+100. • Need for subway at chainage 45+000 (community to provide land free). • Protection near water sources; avoid contamination. • Need for muck disposal plan and slope stabilization. • Safety provisions at steep sections.	verifying all locations and incorporating feasible demands. • Water source protection assured with buffer zones. • Realignment proposal to be examined technically. • Muck disposal areas to be designed as per ESMP. • Women and youth consultations documented separately.	subway, and slope measures in DPR. • Conduct site-validation visits with Dorbar Shnong. • Finalize safe muck disposal sites. • Prepare FPIC agreement summary for community countersignature.	Consultants under PIU supervision
3	Sonidan Village, Ri Bhoi District	Umsning – Jagi Road (FPIC-III)	10.10.2025	34	AEE, SDO, ESIA Team, DPR Consultants, Village Headmen, Women and Youth Groups	• Community reconfirmed consent after final design disclosure. • Requests for streetlights, roadside drains, bus sheds, road	• PIT confirmed inclusion of streetlights, drainage, retaining/breast walls, bus sheds, and safety structures. • Consent	• Implement all agreed community infrastructure and safeguards. • Maintain monthly coordination meetings during	Nov 2025 – Jan 2026 / PIU & Contractors under supervision of EE, Ri Bhoi

						<p>safety near public structures, and slope protection.</p> <ul style="list-style-type: none"> • Emphasis on coordination and timely construction. • No dissent recorded. 	<p>formally recorded and signed by all key participants.</p> <ul style="list-style-type: none"> • GRM process explained again. 	<p>construction.</p> <ul style="list-style-type: none"> • Share final approved DPR and ESMP with Dorbar Shnong. 	
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Annexure 2: Monitoring and Reporting on the SEP

Key evaluation questions	Specific Evaluation questions	Potential Indicators	Data Collection Methods
GRM. To what extent have project-affected parties been provided with accessible and inclusive means to raise issues and grievances? Has the implementing agency responded to and managed such grievances?	<ul style="list-style-type: none"> • Are project affected parties raising issues and grievances? • How quickly/effectively are the grievances resolved? 	<ul style="list-style-type: none"> • Usage of GRM and/or feedback mechanisms • Requests for information from relevant agencies. • Use of suggestion boxes placed in the villages/project communities. • Number of grievances raised by workers, disaggregated by gender of workers and worksite, resolved within a specified time frame. • Number of Sexual Exploitation, and Abuse/Sexual Harassment (SEA/SH) cases reported in the project areas, which were referred for health, social, legal and security support according to the referral process in place. (if applicable) • Number of grievances that have been (i) opened, (ii) opened for more than 30 days, (iii) resolved, (iv) closed, and (v) number of responses that satisfied the complainants, during the reporting period disaggregated by category of grievance, gender, age, and location of complainant. 	Records from the implementing agency and other relevant agencies

Key evaluation questions	Specific Evaluation questions	Potential Indicators	Data Collection Methods
Stakeholder engagement impact on project design and implementation. How have engagement activities made a difference in project design and implementation?	<ul style="list-style-type: none"> • Was there interest and support for the project? • Were there any adjustments made during project design and implementation based on the feedback received? • Was priority information disclosed to relevant parties throughout the project cycle? 	<ul style="list-style-type: none"> • Active participation of stakeholders in activities • Number of actions taken in a timely manner in response to feedback received during consultation sessions with project affected parties. • Number of consultation meetings and public discussions where the feedback and recommendation received is reflected in project design and implementation. • Number of disaggregated engagement sessions held, focused on at-risk groups in the project. 	Stakeholder Consultation Attendance Sheets/Minutes Evaluation forms Structured surveys Social media/traditional media entries on the project results
Implementation effectiveness. Were stakeholder engagement activities effective in implementation?	<ul style="list-style-type: none"> • Were the activities implemented as planned? Why or why not? • Was the stakeholder engagement approach inclusive of disaggregated groups? Why or why not? 	<ul style="list-style-type: none"> • Percentage of SEP activities implemented. • Key barriers to participation identified with stakeholder representatives. • Number of adjustments made in the stakeholder engagement approach to improve projects' outreach, inclusion and effectiveness. 	Communication Strategy (Consultation Schedule) Periodic Focus Group Discussions Face-to-face meetings and/or Focus Group discussions with Vulnerable Groups or their representatives

Annexure 7.3: MOM of FPIC 1,2 & 3

Minutes of Meeting with Regard to the Initiation of FPIC Process for Meghalaya Logistics and Connectivity Improvement Project under the Chairmanship of Shri F. C. Pathaw, Assistant Executive Engineer, PWD (Roads) Mawhati Sub-Division.

Date: 04th September 2025

Time: 10:00 AM

Venue: Sonidan Community Hall, Sonidan

Chairman: Shri F.C.Pathaw, Assistant Executive Engineer, PWD (Roads) Mawhati Sub-Division

Purpose of the Meeting: Initiation of FPIC Process for Meghalaya Logistics and Connectivity Improvement Project MLCIP, a World Bank-aided initiative aimed at providing efficient, resilient, and safe connectivity to key regional corridors and economic centers in Meghalaya.

Name of the Road: Umsning-Jagi Road (40th Km to 80th Km)

Attendees: Officials from PWD (Roads) Mawhati Sub-Division, representatives from local communities including headmen, women, youth and stakeholders from affected localities (detailed attendance sheet annexed).

- The meeting commenced with the Chairman welcoming the PWD officials, community representatives, and other stakeholders. The Chairman informed that the meeting was convened after getting the consent from the various Headmen of different localities and also expressed gratitude for their participation and support in initiating the proposed project.
- The Chairman provided a brief overview of the meeting's purpose, referencing the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) adopted by the UN General Assembly on 13th September 2007, which emphasizes the rights of indigenous peoples to self-determination and participation in decisions affecting their lands and resources.
- The Chairman elaborated on the principles of Free, Prior, and Informed Consent (FPIC), ensuring that affected communities have the authority to decide on development projects impacting them. This process prevents coercion and fosters equitable relationships. Key principles were detailed as follows:
 - **Free:** Consent is provided voluntarily, without coercion, manipulation, or intimidation.
 - **Prior:** Consent is sought well in advance, allowing sufficient time for community decision-making processes.
 - **Informed:** Communities receive complete, accessible, and understandable information on the project's scope, potential impacts (positive and negative, including reversibility), alternatives, and mitigation measures. Consultations will be conducted in local languages (e.g., Khasi) to ensure full comprehension.
 - **Consent:** Consent is expressed formally through the community's own customary or chosen decision-making institutions or representatives; it must be documented, can be withdrawn if conditions change, and the absence of consent (or a "no") must be fully respected
- The Chairman further outlined the project's objectives: To enhance connectivity to growth centers, improve rural and district-level logistics infrastructure and services, increase market

access for agriculture and horticulture products, reduce transportation costs and time, and strengthen institutional capacity for climate-resilient transport and logistics. This aligns with broader goals of economic development, user safety, traffic efficiency, and minimal environmental impact through sustainable planning.

- Expected benefits were discussed, including economic (e.g., increased income from better market access for agricultural goods, job opportunities in construction and logistics), social (e.g., improved access to education, healthcare, and services), and infrastructural (e.g., all-weather, climate-resilient roads promoting community well-being).
- Additional project details were shared by PWD representatives, including the funding agency (World Bank), expected road width (typically 5.5-7.5 meters for intermediate lanes, subject to design), and timelines for design and execution.
- Potential impacts on social, environmental, and cultural aspects were openly addressed. These may include the need for private or community land for road widening, curve improvements, drains, retaining walls, bridges, and culverts; tree felling; utility shifting; and temporary construction disturbances (e.g., noise, dust, traffic disruptions). However, impacts will be minimized through careful planning, with no major land requirement being anticipated. Environmental and Social Impact Assessments (ESIAs) will be conducted to identify and mitigate risks, incorporating climate resilience measures. Cultural heritage sites will be protected, and biodiversity considerations (e.g., in forested areas) will be prioritized.
- The Chairman emphasized the communities' role in the FPIC process, inviting active participation before and during project execution. Community leaders were urged to cooperate for successful implementation, with ongoing consultations to build trust and address concerns.
- A detailed introduction to the Grievance Redress Mechanism (GRM) was provided, including multi-tiered structures: local-level committees for initial complaints, escalation to district/project authorities, and independent oversight. Community members can submit grievances via phone, email, suggestion boxes, or in-person, with timelines for resolution (e.g., 15 days). The GRM committee will be formed shortly, including representatives from communities, NGOs, and PWD, to handle issues related to land, impacts, or other concerns. This aligns with World Bank's Stakeholder Engagement Plan (SEP).
- The floor was opened for discussions and clarifications:
 - Representatives expressed enthusiasm for the project, noting it as a long-awaited initiative for regional development.
 - Key concerns raised included transparency in land requirements; stakeholders requested advance notification to affected landowners.
 - Regarding land requirement, the Chairman clarified that any required land will undergo due process as per the provisions of the law.
 - Doubts on compensation were addressed, reaffirming adherence to legal and policy frameworks for fair entitlements.
 - Requests were made for additional amenities such as street lights, footpaths, proper drainage systems, bus sheds, and safety features in inhabited areas.
 - The meeting resolved to extend full cooperation for timely execution and urged prompt resolution of any issues during implementation by relevant authorities.

- For FPIC-2, it was agreed to hold the meeting on 25th September 2025 at Sonidan Community Hall (or a mutually convenient date) following completion of the geometric design by the consultant. Invitations will be extended to key leaders, NGOs, headmen, and other stakeholders for in-depth discussions on design, impacts, and consent.

The meeting concluded with remarks from the Headman of Sonidan Village, thanking attendees for their participation and underscoring the importance of collective commitment for project success. The Headman highlighted anticipated benefits in enhancing livelihoods and connectivity for the community.

Annexes:

- Attendance Sheet
- Photos of the meetings
- Letter of consent for convening of the meeting from the Local Headmen.

This MoM was prepared and verified by the Chairman and will be disclosed locally and shared with the World Bank as per project requirements



(F.C. Pathaw)

Assistant Executive Engineer,
Public Works Department (Roads)
Mawhati Sub-division, Mawhati

Minutes of Meeting with Regard to the Initiation of FPIC Process for Meghalaya Logistics and Connectivity Improvement Project under the Chairmanship of Shri F. C. Pathaw, Assistant Executive Engineer, PWD (Roads) Mawhati Sub-Division.

Date: 04th September 2025

Time: 12:00 PM

Venue: Umlaper Community Hall, Umlaper.

Chairman: Shri F.C.Pathaw, Assistant Executive Engineer, PWD (Roads) Mawhati Sub-Division

Purpose of the Meeting: Initiation of FPIC Process for Meghalaya Logistics and Connectivity Improvement Project MLCIP, a World Bank-aided initiative aimed at providing efficient, resilient, and safe connectivity to key regional corridors and economic centers in Meghalaya.

Name of the Road: Umsning-JagiRoad (40th Km to 80th Km)

Attendees: Officials from PWD (Roads) Mawhati Sub-Division, representatives from local communities including headmen, women, youth and stakeholders from affected localities (detailed attendance sheet annexed).

- The meeting commenced with the Chairman welcoming the PWD officials, community representatives, and other stakeholders. The Chairman informed that the meeting was convened after getting the consent from the various Headmen of different localities and also expressed gratitude for their participation and support in initiating the proposed project.
- The Chairman provided a brief overview of the meeting's purpose, referencing the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) adopted by the UN General Assembly on 13th September 2007, which emphasizes the rights of indigenous peoples to self-determination and participation in decisions affecting their lands and resources.
- The Chairman elaborated on the principles of Free, Prior, and Informed Consent (FPIC), ensuring that affected communities have the authority to decide on development projects impacting them. This process prevents coercion and fosters equitable relationships. Key principles were detailed as follows:
 - **Free:** Consent is provided voluntarily, without coercion, manipulation, or intimidation.
 - **Prior:** Consent is sought well in advance, allowing sufficient time for community decision-making processes.
 - **Informed:** Communities receive complete, accessible, and understandable information on the project's scope, potential impacts (positive and negative, including reversibility), alternatives, and mitigation measures. Consultations will be conducted in local languages (e.g., Khasi) to ensure full comprehension.
 - **Consent:** Consent is expressed formally through the community's own customary or chosen decision-making institutions or representatives; it must be documented, can be withdrawn if conditions change, and the absence of consent (or a "no") must be fully respected.
- The Chairman further outlined the project's objectives: To enhance connectivity to growth centers, improve rural and district-level logistics infrastructure and services, increase market access for agriculture and horticulture products, reduce transportation costs and time, and strengthen institutional capacity for climate-resilient transport and logistics. This aligns with broader goals of economic development, user safety, traffic efficiency, and minimal environmental impact through sustainable planning.
- Expected benefits were discussed, including economic (e.g., increased income from better market access for agricultural goods, job opportunities in construction and logistics), social

(e.g., improved access to education, healthcare, and services), and infrastructural (e.g., all-weather, climate-resilient roads promoting community well-being).

- Additional project details were shared by PWD representatives, including the funding agency (World Bank), expected road width (typically 5.5-7.5 meters for intermediate lanes, subject to design), and timelines for design and execution.
- Potential impacts on social, environmental, and cultural aspects were openly addressed. These may include the need for private or community land for road widening, curve improvements, drains, retaining walls, bridges, and culverts; tree felling; utility shifting; and temporary construction disturbances (e.g., noise, dust, traffic disruptions). However, impacts will be minimized through careful planning, with no major land requisition anticipated. Environmental and Social Impact Assessments (ESIAs) will be conducted to identify and mitigate risks, incorporating climate resilience measures. Cultural heritage sites will be protected, and biodiversity considerations (e.g., in forested areas) will be prioritized.
- The Chairman emphasized the communities' role in the FPIC process, inviting active participation before and during project execution. Community leaders were urged to cooperate for successful implementation, with ongoing consultations to build trust and address concerns.
- A detailed introduction to the Grievance Redress Mechanism (GRM) was provided, including multi-tiered structures: local-level committees for initial complaints, escalation to district/project authorities, and independent oversight. Community members can submit grievances via phone, email, suggestion boxes, or in-person, with timelines for resolution (e.g., 15days). The GRM committee will be formed shortly, including representatives from communities, NGOs, and PWD, to handle issues related to land, impacts, or other concerns. This aligns with World Bank's Stakeholder Engagement Plan (SEP).
- The floor was opened for discussions and clarifications:
 - Representatives expressed enthusiasm for the project, noting it as a long-awaited initiative for regional development.
 - Key concerns raised included transparency in land requirements; stakeholders requested advance notification to affected landowners.
 - Regarding land requirement, the Chairman clarified that any required land will undergo due process as per the provisions of the law.
 - Doubts on compensation were addressed, reaffirming adherence to legal and policy frameworks for fair entitlements.
 - Requests were made for additional amenities such as street lights, footpaths, proper drainage systems, bus sheds, and safety features in inhabited areas.
 - The meeting resolved to extend full cooperation for timely execution and urged prompt resolution of any issues during implementation by relevant authorities.
- For FPIC-2, it was agreed to hold the meeting on 25th September 2025 at Umlaper Community Hall (or a mutually convenient date) following completion of the geometric design by the consultant. Invitations will be extended to key leaders, NGOs, headmen, and other stakeholders for in-depth discussions on design, impacts, and consent.

The meeting concluded with remarks from the Headman of Umlaper Village, thanking attendees for their participation and underscoring the importance of collective commitment for project success.

Annexes:

- Attendance Sheet
- Photos of the meetings
- Letter of consent for convening of the meeting from the Local Headmen.

This MoM was prepared and verified by the Chairman and will be disclosed locally and shared with the World Bank as per project requirements



(F.C. Pathaw)

Assistant Executive Engineer,
Public Works Department (Roads)
Mawhati Sub-division, Mawhati

Minutes of Meeting with Regard to the Initiation of FPIC Process for Meghalaya Logistics and Connectivity Improvement Project under the Chairmanship of Shri F. C. Pathaw, Assistant Executive Engineer, PWD (Roads) Mawhati Sub-Division.

Date: 04th September 2025

Time: 03:00 PM

Venue: Umsiang Community Hall, Umsiang.

Chairman: Shri F.C.Pathaw, Assistant Executive Engineer, PWD (Roads) Mawhati Sub-Division

Purpose of the Meeting: Initiation of FPIC Process for Meghalaya Logistics and Connectivity Improvement Project MLCIP, a World Bank-aided initiative aimed at providing efficient, resilient, and safe connectivity to key regional corridors and economic centers in Meghalaya.

Name of the Road: Umsning-Jagi Road (40th Km to 80th Km)

Attendees: Officials from PWD (Roads) Mawhati Sub-Division, representatives from local communities including headmen, women, youth and stakeholders from affected localities (detailed attendance sheet annexed).

- The meeting commenced with the Chairman welcoming the PWD officials, community representatives, and other stakeholders. The Chairman informed that the meeting was convened after getting the consent from the various Headmen of different localities and also expressed gratitude for their participation and support in initiating the proposed project.
- The Chairman provided a brief overview of the meeting's purpose, referencing the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) adopted by the UN General Assembly on 13th September 2007, which emphasizes the rights of indigenous peoples to self-determination and participation in decisions affecting their lands and resources.
- The Chairman elaborated on the principles of Free, Prior, and Informed Consent (FPIC), ensuring that affected communities have the authority to decide on development projects impacting them. This process prevents coercion and fosters equitable relationships. Key principles were detailed as follows:
 - **Free:** Consent is provided voluntarily, without coercion, manipulation, or intimidation.
 - **Prior:** Consent is sought well in advance, allowing sufficient time for community decision-making processes.
 - **Informed:** Communities receive complete, accessible, and understandable information on the project's scope, potential impacts (positive and negative, including reversibility), alternatives, and mitigation measures. Consultations will be conducted in local languages (e.g., Khasi) to ensure full comprehension.
 - **Consent:** Consent is expressed formally through the community's own customary or chosen decision-making institutions or representatives; it must be documented, can be withdrawn if conditions change, and the absence of consent (or a "no") must be fully respected.
- The Chairman further outlined the project's objectives: To enhance connectivity to growth centers, improve rural and district-level logistics infrastructure and services, increase market access for agriculture and horticulture products, reduce transportation costs and time, and strengthen institutional capacity for climate-resilient transport and logistics. This aligns with broader goals of economic development, user safety, traffic efficiency, and minimal environmental impact through sustainable planning.
- Expected benefits were discussed, including economic (e.g., increased income from better market access for agricultural goods, job opportunities in construction and logistics), social

(e.g., improved access to education, healthcare, and services), and infrastructural (e.g., all-weather, climate-resilient roads promoting community well-being).

- Additional project details were shared by PWD representatives, including the funding agency (World Bank), expected road width (typically 5.5-7.5 meters for intermediate lanes, subject to design), and timelines for design and execution.
- Potential impacts on social, environmental, and cultural aspects were openly addressed. These may include the need for private or community land for road widening, curve improvements, drains, retaining walls, bridges, and culverts; tree felling; utility shifting; and temporary construction disturbances (e.g., noise, dust, traffic disruptions). However, impacts will be minimized through careful planning, with no major land requirement being anticipated. Environmental and Social Impact Assessments (ESIAs) will be conducted to identify and mitigate risks, incorporating climate resilience measures. Cultural heritage sites will be protected, and biodiversity considerations (e.g., in forested areas) will be prioritized.
- The Chairman emphasized the communities' role in the FPIC process, inviting active participation before and during project execution. Community leaders were urged to cooperate for successful implementation, with ongoing consultations to build trust and address concerns.
- A detailed introduction to the Grievance Redress Mechanism (GRM) was provided, including multi-tiered structures: local-level committees for initial complaints, escalation to district/project authorities, and independent oversight. Community members can submit grievances via phone, email, suggestion boxes, or in-person, with timelines for resolution (e.g., 15-30 days). The GRM committee will be formed shortly, including representatives from communities, NGOs, and PWD, to handle issues related to land, impacts, or other concerns. This aligns with World Bank's Stakeholder Engagement Plan (SEP).
- The floor was opened for discussions and clarifications:
 - Representatives expressed enthusiasm for the project, noting it as a long-awaited initiative for regional development.
 - Key concerns raised included transparency in land requirements; stakeholders requested advance notification to affected landowners.
 - Regarding land requirement, the Chairman clarified that any required land will undergo due process as per the provisions of the law.
 - Doubts on compensation were addressed, reaffirming adherence to legal and policy frameworks for fair entitlements.
 - Requests were made for additional amenities such as street lights, footpaths, proper drainage systems, bus sheds, and safety features in inhabited areas.
 - The member presents also suggest that, in case the road alignment passes near the buildings, Retaining Wall/ breast wall or any similar structure may be provided to bring stability to the exposed soil strata.
 - It is also suggested junction improvement may be provided wherever necessary.
 - The meeting resolved to extend full cooperation for timely execution and urged prompt resolution of any issues during implementation by relevant authorities.
- For FPIC-2, it was agreed to hold the meeting on 25th September 2025 at Umsiang Community Hall (or a mutually convenient date) following completion of the geometric design by the consultant. Invitations will be extended to key leaders, NGOs, headmen, and other stakeholders for in-depth discussions on design, impacts, and consent.

The meeting concluded with remarks from the Headman of Umsiang Village, thanking attendees for their participation and underscoring the importance of collective commitment for project success. The Headman highlighted anticipated benefits in enhancing livelihoods and connectivity for the community.

Annexes:

- Attendance Sheet
- Photos of the meetings
- Letter of consent for convening of the meeting from the Local Headmen.

This MoM was prepared and verified by the Chairman and will be disclosed locally and shared with the World Bank as per project requirements



(F.C Pathaw)

Assistant Executive Engineer,
Public Works Department (Roads)
Mawhati Sub-division, Mawhati

Minutes of 2nd Free Prior Inform Consent – (FPIC)

Name of Project Road: Umsning Jagi Road

Location of Consultation: Sonidan Community Hall

District: Ri Bhoi District

Block: Umsning

Village: Sonidan

Date: 19th September 2025

Free Prior Inform Consent FPIC 2 for Umsning Jagi Road is being organized at Sonidan village on the 19th Sep 25. Attendees present during the meeting were Assistant Executive Engineer PWD (Roads) Mawhati Sub Division, consultant from SATRA, KOBA, EIS and village representatives attended the meeting. Total 22 numbers of participants participated in the meeting.

Agendas of the meeting

1. Reading of previous minutes of the meeting
2. Presentation on the draft DPR
3. Session on ESIA
4. Briefing on GRM and its constituent by the ESMF team
5. Forum/open discussion
6. Wind-Up session

The meeting started with a welcome address by the village headman of Sonidan village in which he welcomed all the participants. Thereafter the minutes of the previous meeting was read out by Assistant Executive Engineer PWD (Roads) Mawhati Sub Division.

- **Session on DPR:** The session on the draft DPR is taken by KOBA consultant, whereby during the presentation, briefing on the physical dimension of the existing road and the proposed geometric design for the up gradation was deliberate. Further, consultation on the provision of footpaths cum drainage system was discussed and these items may be included in the DPR for the safety and smooth movement of pedestrian. The DPR Consultant further elaborated on the possible impact of the project by analysis Chainage wise. During the course of presentation, it was informed that additional land is required on five locations due to proposed curve correction. The locations expected to be impacted were shared with the audience and were subsequently identified by the member's presents. On the Road safety issues, it was informed that additional team of road safety audit will be involve to maintain high level of safety measures especially in the build areas where Schools and public Building are presents. Special cares are taken to not disturb the environmental elements like Ponds and water bodies. It was further informed that Junction improvement will be provided wherever necessary along with speed calmer. It was also stressed that no infrastructure are unnecessary disturbed beyond the required ROW. The session was then opened for the house if they had any queries. If any structures are impacted during the time of construction, it will be repaired by the contractor.

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Respondent 1: Expressed happiness for the upcoming project and seek readiness for the cooperation of all villagers.

Representatives 2: Issues on the land compensation were enquired whether if there is any financial assistance from the Government.

Response ESMF: If there are such cases there a framework will be developed and compensation process will be considered accordingly.

Response: Any additional impact beyond the existing ROW will be ascertained by the ESIA tam and the same may be put include in the report.

Representative 3: The villagers expressed their support for the project implementation and enquired whether provisions of street lights and Bus sheds can be incorporated in the DPR.

Response AEE: The DPR consultant was requested for inclusion of such requirements provided the community would facilitate the availability of land for such assets.

Representative 4: Representative request for realignment of the road at CH 47.

Response AEE: Necessary site inspection to be conducted jointly by the teams involved.

- **Session on Environmental Social Impact Assessment:** Team Leader EIS consultant discuss on the important of keeping the interest of both environmental and social which can caused temporarily or permanently impact during the course of construction. It was informed on the need to check on the machinery pollution emissions and to strictly follow certain pollution parameter and proper management on water and waste treatment plant to be strictly followed on the stretch of the road. The expected air emission from machinery used during the construction is to be kept in check and a thorough presentation were emphasized on the safety measures like boundary wall, Road signage, footpaths, drainage system etc. Expected hindrances like temporary pollution, blockade, and delay in work were also briefed however expectation on the advantages would far weight the disadvantages. Benefits of the Project were elaborate, The team explained the expected benefits from this project and are broadly economic, social, and infrastructural in nature, leading to increased income, better living standards, improved access to services, and enhanced community well-being through better roads, transportation of Agricultural goods and as well as job opportunities.
- **Session on GRM:** The GRM framework was further taken up by the ESMF consultant whereby the different Tiers of the mechanism and its constituent were duly explained. The two tiers involved in the process were extensively elaborated and subsequently its function and jurisdiction were also discussed. The mechanism at the village level and its composition were duly explained along with its function. The consultant stressed on the need of community involvement in the project implementation and the grievances if any will be addressed on the committee formed. Separate session with the women folks were also conducted by the ESMF Consultant to discussed about the gender implication of the project.

A closing remark was delivered by the Headman of Sonidan Village whereby he thanks and appreciates everyone who attended the meeting and more importantly for their active participation in the discussion. The Headman emphasized that the commitment to this project is critical for its success, and meeting the goals is anticipated from everyone. The meeting was followed by a site inspection with the representative of Mawlaho Village to identify the impact of the alignment of the project.



(F. C Pathaw)

Assistant Executive Engineer
Public Works Department (Roads)
Mawhati Sub-division, Mawhati

Minutes of 2nd Free Prior Inform Consent – (FPIC)

Name of Project Road: Umsning Jagi Road
Location of Consultation: Umlaper Community Hall
District: Ri Bhoi District **Block:** Umsning **Village:** Umlaper
Date: 19th September 2025

Free Prior Inform Consent FPIC 2 for Umsning Jagi Road is being organized at Umlaper village on the 19th Sep 25. Attendees present during the meeting were AEE PWD Mawhatii Sub Division, consultant from SATRA, KOBAS, ESIA and village representatives attended the meeting. Total 35 no of participants participated in the meeting.

Agendas of the meeting:

- 7. Reading of previous minutes of the meeting
- 8. Presentation on the draft DPR
- 9. Session on ESIA
- 10. Briefing on GRM and its constituent by the ESMF team
- 11. Forum/open discussion
- 12. Wind-Up session

The meeting started with a welcome address by the village headman of Umlaper village in which he welcomed all the participants and expresses gratitude to the PWD department and the consultants present. He concluded his speech by handed over the session to AEE for the better orientation and clarification on the project. Thereafter the minutes of the previous meeting was read out by AEE.

- **Session on DPR:** The session on the draft DPR is taken by KOBAS consultant, whereby during the presentation, briefing on the physical dimension of the existing road and the proposed geometric design for the up gradation was deliberate. Further, consultation on the provision of footpaths cum drainage system was discussed and these items may be included in the DPR for the safety and smooth movement of pedestrian. The DPR Consultant further elaborates on the possible impact of the project by analysis Chainage wise. During the course of presentation, it was informed that additional land is required on five locations due to proposed curve correction. The following location that might be impacted by the proposed geometric designed was discussed.

Critical Locations where Geometric Improvement Required on Umsning - Jagi Road (39.870 Km)

Sl no	Location	Area required in sqm	Remarks
1	41.10 to 41.30 Km	1241.583	Curve correction
2	45.90 to 46.20 Km	937.4	Curve correction
3	47.17 to 47.30 Km	397.81	Curve correction
4	48.00 to 48.30 Km	1100	Curve correction
5	57.10 to 57.30 km	151.049	Curve correction

On the Road safety issues, it was informed that additional team of road safety audit will be involve to maintain high level of safety measures especially in the build areas where Schools and public Building are presents. Special cares are taken to not disturb the environmental elements like Ponds and water bodies. It was further informed that Junction improvement will be provided wherever necessary along with speed calmer. It was also stressed that no infrastructure are unnecessary disturbed beyond the required ROW. The session is then open for the house if they have any queries. If any structures are impacted during the time of construction, it will be repaired by the contractor.

Representative 1: The current IOW which is needed is of 10m, for the current existing land, is there land as per requirements?

AEE respond: Additional land for curve correction has been discussed but if any other impact caused will be examined further and will be informed accordingly

R1Q2: If we don't get the 10 m land what will be the solution? Will the road remain within the same dimension?

AEE respond: The minimum ROW is necessary especially in the location where the habitation is presents since additional land is required for footpath etc.

Representative 2: will there be any footpaths

AEE Respond: It will be considered wherever necessary.

Representative: Question whether there will be any safety measures for houses that are located uphill and near the road formation.

AEE respond: Yes, an assessment will be made and accordingly the design will be made but mitigation measures on such land will be taken up. (ESIA team will make an assessment on the particular site).

- **Session on Environmental Social Impact Assessment:** Team Leader EIS consultant discuss on the important of keeping the interest of both environmental and social which can caused temporarily or permanently impact during the course of construction. It was informed on the need to check on the machinery pollution emissions and to strictly follow certain pollution parameter and proper management on water and waste treatment plant to be strictly followed on the stretch of the road. The expected air emission from machinery used during the construction is to be kept in check and a thorough presentation were emphasise on the safety measures like boundary wall, Road signage, footpaths, drainage system etc. Expected hindrances like temporary pollution, blockade, and delay in work were also briefed however expectation on the advantages would far weight the disadvantages. Benefits of the Project were elaborate, The team explained the expected benefits from this project and are broadly economic, social, and infrastructural in nature, leading to increased income, better living standards, improved access to services, and enhanced community well-being through better roads, transportation of Agricultural goods and as well as job opportunities.
- **Session on GRM:** The GRM framework was further taken up by the ESMF consultant whereby the different Tiers of the mechanism and its constituent were duly explained. The two tiers involved in the process were extensively elaborated and subsequently its function and jurisdiction were also discussed. The mechanism at the village level and its composition were duly explained along with its function. The consultant stressed on the need of community involvement in the project implementation and the grievances if any will be addressed on the committee formed. Separate session with the women folks were also conducted by the ESMF Consultant to discussed about the gender implication of the project.

A closing remark was delivered by the Headman of Umlaper Village whereby he thanks and appreciates everyone who attended the meeting and more importantly for their active participation in the discussion. The Headman emphasize that the commitment to this project is critical for its success, and meeting the goals is anticipated from everyone.

(F. C Pathaw)

Assistant Executive Engineer
Public Works Department (Roads)
Mawhati Sub-division, Mawhati

Minutes of 2nd Free Prior Inform Consent – (FPIC)

Name of Project Road: Umsning Jagi Road
Location of Consultation: St Francis D’Assisi School
District: Ri Bhoi District **Block:** Umsning **Village:** Umsiang
Date: 19th September 2025
Free Prior Inform Consent FPIC 2 for Umsning Jagi Road is being organized at Umsaing village on the 19th Sep 25. Attendees present during the meeting were AEE PWD Mawhatii Sub Division, consultant from SATRA, KOBA, ESIA and village representatives attended the meeting. Total 18 numbers of participants participated in the meeting.
Agendas of the meeting:
13. Reading of previous minutes of the meeting
14. Presentation on the draft DPR
15. Session on ESIA
16. Briefing on GRM and its constituent by the ESMF team
17. Forum/open discussion
18. Wind-Up session

The meeting started with a welcome address by the village headman of Umsaing village in which he welcomed all the participants and expresses gratitude to the PWD department and the consultants present. He concluded his speech by handed over the session to AEE for the better orientation and clarification on the project. Thereafter the minutes of the previous meeting was read out by AEE.

- Session on DPR:** The session on the draft DPR is taken by KOBA consultant, whereby during the presentation, briefing on the physical dimension of the existing road and the proposed geometric design for the up gradation was deliberate. Further, consultation on the provision of footpaths cum drainage system was discussed and these items may be included in the DPR for the safety and smooth movement of pedestrian. The DPR Consultant further elaborates on the possible impact of the project by analysis Chainage wise. During the course of presentation, it was informed that additional land is required on five locations due to proposed curve correction. The following location that might be impacted by the proposed geometric designed was discussed.

Critical Locations where Geometric Improvement Required on Umsning - Jagi Road (39.870 Km)

Sl no	Location	Area required in sqm	Remarks
1	41.10 to 41.30 Km	1241.583	Curve correction
2	45.90 to 46.20 Km	937.4	Curve correction
3	47.17 to 47.30 Km	397.81	Curve correction
4	48.00 to 48.30 Km	1100	Curve correction
5	57.10 to 57.30 km	151.049	Curve correction

On the Road safety issues, it was informed that additional team of road safety audit will be involve to maintain high level of safety measures especially in the build areas where Schools and public Building are presents. Special cares are taken to not disturb the environmental elements like Ponds and water bodies. It was further informed that Junction improvement will be provided wherever necessary along with speed calmer. It was also stressed that no infrastructure are unnecessary disturbed beyond the required ROW. The session is then open for the house if they have any queries. If any structures are impacted during the time of construction, it will be repaired by the contractor.

Representative 1: Request for the provision of Retaining wall/Breast wall or any other protection

structure on location where landslide are expected to occur during monsoon season..

DPR Respond: Such provision will be proposed wherever necessary.

Representative: in case of uphill excavation, will there be any retaining wall to be considered?

DPR response: Bases on the impact assessments, proper mitigation measures will be taken up for safety measures.

Women Representative: Questioned on the impact which will be caused to the commercial trees like rubber and areca nuts etc.

Respond ESIA: Based on the assessment which will be made, if the trees are impacted, proper framework will be followed as compensation of the same will be fairly followed.

- **Session on Environmental Social Impact Assessment:** Team Leader EIS consultant discuss on the important of keeping the interest of both environmental and social which can caused temporarily or permanently impact during the course of construction. It was informed on the need to check on the machinery pollution emissions and to strictly follow certain pollution parameter and proper management on water and waste treatment plant to be strictly followed on the stretch of the road. The expected air emission from machinery used during the construction is to be kept in check and a thorough presentation were emphasise on the safety measures like boundary wall, Road signage, footpaths, drainage system etc. Expected hindrances like temporary pollution, blockade, and delay in work were also briefed however expectation on the advantages would far weight the disadvantages. Benefits of the Project were elaborate, The team explained the expected benefits from this project and are broadly economic, social, and infrastructural in nature, leading to increased income, better living standards, improved access to services, and enhanced community well-being through better roads, transportation of Agricultural goods and as well as job opportunities.
- **Session on GRM:** The GRM framework was further taken up by the ESMF consultant whereby the different Tiers of the mechanism and its constituent were duly explained. The two tiers involved in the process were extensively elaborate and subsequently its function and jurisdiction were also discussed. The mechanism at the village level and its composition were duly explained along with its function. The consultant stressed on the need of community involvement in the project implementation and the grievances if any will be addressed on the committee formed. Separate session with the women folks were also conducted by the ESMF Consultant to discussed about the gender implication of the project.

A closing remark was delivered by the Headman of Umsiang Village whereby he thanks and appreciates everyone who attended the meeting and more importantly for their active participation in the discussion. The Headman emphasize that the commitment to this project is critical for its success, and meeting the goals is anticipated from everyone.

(F. C Pathaw)

Assistant Executive Engineer
Public Works Department (Roads)
Mawhati Sub-division, Mawhati

Minutes of 3rd Free Prior Inform Consent – (FPIC)

Name of Project Road: Umsning Jagi Road
Location of Consultation: Sonidan Community Hall
District: Ri Bhoi District **Block:** Umsning **Village:** Sonidan
Date: 10th October 2025

Free Prior Inform Consent FPIC 2 for Umsning Jagi Road is being organized at Sonidan village on the 10th October 2025. Attendees present during the meeting were Assistant Executive Engineer PWD (Roads) Mawhati Sub Division, consultant from KOBA, ESIA and village representatives attended the meeting. Total 34 numbers of participants participated in the meeting.

Agendas of the meeting

- 1. Presentation of Final Project Design and Mitigations Content
- 2. Discussion on the Economic and social impact on the corridor.
- 3. Permanent and Temporary likely impact on the Corridor
- 4. Q&A: Open floor with translators to ensure accessibility for all attendees

The meeting started with a welcome address by the village headman of Sonidan village in which he welcomed all the participants. Thereafter the minutes of the previous meeting was read out by Assistant Executive Engineer PWD (Roads) Mawhati Sub Division.

- **Session on DPR:** A brief session on the draft DPR is taken by KOBA consultant, whereby during the presentation, it was reiterated about the physical dimension of the existing road and the proposed geometric design for the up gradation was deliberate. Further, The DPR consultant stress that any additional requirement such as Drainage, Footpath, Bus shed, etc would required additional land in which the AEE PWD (Rds) emphasized on the need of such infrastructure especially on the habitation area.
- **Discussion on the Economic and social impact on the corridor.**

The ESIA representative has identified the following observation on the likely hood Economic and social impact.

Chainage wise details of likely affected structures for UJ Road

S.No	CH No	Village name	Distance from center line (m)	Type of Structures
1.	44+350 LHS	Sonidan	3.5	Residential Compound wall
2.	44+400 RHS	Sonidan	3.0	Shop
3.	44+500 RHS	Sonidan	3.0	Community Parking Shed
4.	47+700 LHS	Mawshunam	3.0	Residential Compound wall
5.	48+340 RHS	Mawshunam	3.50	Residential Compound Wall
6.	58+476 LHS	Sngahtyrkhang	2.5	Residential Compound Wall
7.	60+945 RHS	Sngahtyrkhang	3.0	Waiting stand
8.	61+000 LHS	Umlamphlang	3.0	Waiting stand
9.	61+825 LHS	Umlamphlang	3.0	Waiting stand
10.	62+152 RHS	Umlaper	3.0	Residential Compound wall
11.	64+690 LHS	Umtraï	3.0 m	3 Shops
12.	66+312 LHS	Umtraï	3.0	Shop
13.	66+588 LHS	Umtraï	4.5	Waiting stand
14.	69+776 LHS	MawshangMawksiew	4.0	Church (Compound wall)
15.	75+050 LHS	UmsiangMaiong	3.0	Shop
16.	75+610 RHS	UmsiangMaiong	2.5	Waiting stand
17.	76+560 LHS	Kraikajam	4.0	Shop

The ESIA representative gave a brief explanation on the above findings and enlightens the house regarding the impact accordingly with chainage wise. Further, it was discussed about the additional land requirement for curve correction as disclosed in the last meeting and it was decided that the ESIA team will identify the land owner and to take the matter forward as soon as possible.

A closing remark was delivered by the Headman of Sonidan Village whereby he thanked and appreciated everyone who attended the meeting and more importantly for their active participation in the discussion. The Headman emphasize that the commitment to this project is critical for its success, and meeting the goals is anticipated from everyone.



(F. C Pathaw)

Assistant Executive Engineer
Public Works Department (Roads)
Mawhati Sub-division, Mawhati

Minutes of 3rd Free Prior Inform Consent – (FPIC)

Name of Project Road: Umsning Jagi Road

Location of Consultation: Sonidan Community Hall

District: Ri Bhoi District

Block: Umsning

Village: Sonidan

Date: 10th October 2025

Free Prior Inform Consent FPIC 2 for Umsning Jagi Road is being organized at Sonidan village on the 10th October 2025. Attendees present during the meeting were Assistant Executive Engineer PWD (Roads) Mawhati Sub Division, consultant from KOBA, ESIA and village representatives attended the meeting. Total 34 numbers of participants participated in the meeting.

Agendas of the meeting

5. **Presentation of Final Project Design and Mitigations Content**
6. **Discussion on the Economic and social impact on the corridor.**
7. **Permanent and Temporary likely impact on the Corridor**
8. **Q&A: Open floor with translators to ensure accessibility for all attendees**

The meeting started with a welcome address by the village headman of Sonidan village in which he welcomed all the participants. Thereafter the minutes of the previous meeting is being read out by Assistant Executive Engineer PWD (Roads) Mawhati Sub Division.

- **Session on DPR:** A brief session on the draft DPR is taken by KOBA consultant, whereby during the presentation, it was reiterated about the physical dimension of the existing road and the proposed geometric design for the up gradation was deliberate. Further, The DPR consultant stress that any additional requirement such as Drainage, Footpath, Bus shed, etc would required additional land in which the AEE PWD (Rds) emphasized on the need of such infrastructure especially on the habitation area.

- **Discussion on the Economic and social impact on the corridor.**

The ESIA representative has identified the following observation on the likely hood Economic and social impact.

Chainage wise details of likely affected structures for UJ Road

S.No	CH No	Village name	Distance from center line (m)	Type of Structures
18.	44+350 LHS	Sonidan	3.5	Residential Compound wall
19.	44+400 RHS	Sonidan	3.0	Shop
20.	44+500 RHS	Sonidan	3.0	Community Parking Shed
21.	47+700 LHS	Mawshunam	3.0	Residential Compound wall
22.	48+340 RHS	Mawshunam	3.50	Residential Compound Wall
23.	58+476 LHS	Sngahtyrkhang	2.5	Residential Compound Wall

S.No	CH No	Village name	Distance from center line (m)	Type of Structures
24.	60+945 RHS	Sngahtyrkhang	3.0	Waiting stand
25.	61+000 LHS	Umlamphlang	3.0	Waiting stand
26.	61+825 LHS	Umlamphlang	3.0	Waiting stand
27.	62+152 RHS	Umlaper	3.0	Residential Compound wall
28.	64+690 LHS	Umtra	3.0 m	3 Shops
29.	66+312 LHS	Umtra	3.0	Shop
30.	66+588 LHS	Umtra	4.5	Waiting stand
31.	69+776 LHS	MawshangMawksi ew	4.0	Church (Compound wall)
32.	75+050 LHS	UmsiangMaiong	3.0	Shop
33.	75+610 RHS	UmsiangMaiong	2.5	Waiting stand
34.	76+560 LHS	Kraikajam	4.0	Shop

The ESIA representative gave a brief explanation on the above findings and enlightens the house regarding the impact accordingly with chainage wise. Further, it was discussed about the additional land requirement for curve correction as disclosed in the last meeting and it was decided that the ESIA team will identify the land owner and to take the matter forward as soon as possible.

A closing remark was delivered by the Headman of Sonidan Village whereby he thanks and appreciates everyone who attended the meeting and more importantly for their active participation in the discussion. The Headman emphasize that the commitment to this project is critical for its success, and meeting the goals is anticipated from everyone.



(F. C Pathaw)

Assistant Executive Engineer
Public Works Department (Roads)
Mawhati Sub-division, Mawhati

Annexure 8.1: Performance Indicators

Environmental and social components identified of significance in affecting the environment and social conditions at critical locations have been suggested as performance indicators (PIs). For example, near the construction site, a thick layer of dust over the nearby vegetation/leaf is an indication that the dust control measures are not effective. The performance indicators shall be evaluated under three heads as;

- Environmental condition indicators to determine efficacy of environmental management

measures in control of air, noise, water and soil pollution.

- Environmental and social management indicators to determine compliance with the suggested environmental and social management measures.
- Social monitoring indicators such as payment of compensation/assistance, no. of grievances resolved, no. of women engaged in livelihood activities, no. of local workforce employed etc.
- Operational performance indicators have also been devised to determine efficacy and utility of the proposed mitigation measures.
- Stakeholder Engagement and Consultation Indicators will evaluate the effectiveness of meaningful consultations conducted throughout the project lifecycle to ensure the transparency and accountability of the project.

The performance indicators and monitoring plans prepared for the road section are presented in **Table 1**.

Details of the performance indicative parameters for each of the component have to be identified and reported during all stages of the implementation.

Table 1: Performance Indicators

Sl. No.	Description of Item	Indicator	Stage	Responsibility
1	<ul style="list-style-type: none"> No. of sites for which Restoration Plans have been prepared No. of Site Restored and Rehabilitated No. of Sites handed over 	Quarries	Pre-Construction	Contractor/CSC/PMC
2	<p>Quantity of Debris and Spoils to be disposed off</p> <ul style="list-style-type: none"> No. of locations Approved for Debris disposal Quantity disposed off at each location No. of locations for which Rehabilitation works have been completed 	Disposal sites	Construction	Contractor/CSC/PMC
3	<ul style="list-style-type: none"> No. of location/s identified for the Construction camp and Construction Plant sites No. of location/ s approved Lay-out/s Approved No. of sites for which Site Restoration and Rehabilitation has been completed 	Construction Camps and Plant Sites	Pre-Construction and Construction	Contractor/CSC/PMC
4	<ul style="list-style-type: none"> No. of Trees to be Cut No. of Trees cut <p>% Progress on the tree removal</p>	Tree cutting	Pre-Construction	MPWD and Forest Department
5	No. of Locations identified for temporary storage areas for storage of the excavated materials to be used in embankment and sub	Storage of excavated materials	Pre-Construction and Construction	Contractor

Sl. No.	Description of Item	Indicator	Stage	Responsibility
	grade			
5	Before the onset of monsoon all the debris/excavated material shall be cleaned from the work sites and disposed of at the pre-identified approved locations.	Silting of Water bodies	Construction	Contractor/CSC/PMC
6	Implementation of enhancement measures for Noise Barrier at sensitive locations	Enhancements	Construction	Contractor/CSC/PMC
7	Drainage <ul style="list-style-type: none"> Length (by type) No. of Locations 	Work sites	Construction	Contractor/CSC/PMC
8	Safety Provisions <ul style="list-style-type: none"> Signage (by type and no.) Crash barriers Footpath 	Work sites	Construction	Contractor/CSC/PMC
9	Soil erosion prevention measures <ul style="list-style-type: none"> Construction of retaining walls Downstream at culvert locations (No. of Locations & length) 	Work sites	Construction	Contractor/CSC/PMC
10	No. of HIV awareness sessions conducted	Registers/Reports/Geotagged Photos	Construction	Contractor/CSC/PMC
11	No. of safety awareness sessions conducted	Registers/Reports/Geotagged Photos	Construction	Contractor/CSC/PMC
12	Accidents/Incidents <ul style="list-style-type: none"> No of accidents/incidents recorded 	Along sub-project road	During construction	Contractor/CSC/PMC
13	Environmental parameter monitoring in accordance with the frequency and duration of monitoring as well as the locations as per the Monitoring Plan	Air Quality Noise Quality Soil Quality Water Quality Report and geotagged photos.	Construction and Operation stage	Contractor through NABL Accredited agency.
14	No. of Training Sessions Organized for <ul style="list-style-type: none"> Departmental Staff Contractors 	Training Imparted	Construction /Operational stage	CSC/PMC/MPWD

Sl. No.	Description of Item	Indicator	Stage	Responsibility
	<ul style="list-style-type: none"> Combined No. of People Trained Departmental Staff Contractors 			
15	No. of awareness sessions for educating the public about road safety and other environmental aspects (Such as waste dumping, preservation of enhanced sites, pollution and health impacts etc.)	-	Construction/ Operation Stage	CSC/PMC/MPWD
16	No. of Trees Planted (Total) <ul style="list-style-type: none"> No. of Trees Planted along Roadsides No. of Trees planted at other locations (such as camps, debris disposal sites and plant areas) No. of trees planted at enhancement sites 	Roadside and other plantation areas	Post construction stage	Contractor/MPWD
17	Survival Rate Trees Planted (Average) <ul style="list-style-type: none"> Compensatory Afforestation Roadside Plantation Other locations (such as camps, debris disposal sites and plant areas Enhancement sites) 	Roadside and other plantation areas	Post construction stage	Contractor/CSC/PMC/MPWD
18	Land, structure & Livelihood compensations paid	Number of PAPs compensated; amount disbursed as per RAP/IPDP	Construction stage	MPWD/ Village Councils as per existing Customary Laws.

Sl. No.	Description of Item	Indicator	Stage	Responsibility
19	Vulnerable groups	Type of consultations undertaken; Compensations paid in time.	Construction stage	MPWD/ Village Councils as per existing Customary
20	Grievance Mechanism	Number of complaints resolved within stipulated time; No of RTI applications filed; SEA/SH complaints filed.	Construction stage	Project Grievance Committee/ Site Grievance committee/CSC/PMC/MPWD
21	Stakeholder Engagement and Meaningful Consultations	Number and frequency of consultations held at different project stages. Level of participation from diverse stakeholder groups, Extent to which stakeholder concerns and suggestions have been integrated into decision-making, mitigation measures, Documentation.	Continuous	Contractor/CSC/PMC/MPWD

