

DRAFT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT AND ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Upgradation of Rongsai Borjhora Bajengdoba (RBB) Road from Single to Intermediate Lane

Meghalaya Logistics and Connectivity Improvement Project (MLCIP)

Submitted to



**Meghalaya Infrastructure Development Finance Corporation (MIDFC) Ltd.
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Document Information

This document includes ESIA Report of 18.27 km length of RBB Roads in Corridor 3 based on DPR dated 31-08-2025.

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ACRONYMS

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
Col	: 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
E&S Cell	: Environment& Social Cell, MPWD
ESMF	: Environmental and Social Management Framework
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
GRM	: Grievance Redress Mechanism
GHADC	: Garo Hills Autonomous District Council
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

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LULC	: Land Use Land Cover
MDF	: Moderately Dense Forest
MDR/ SH	: Major District Roads/State Highways
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
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
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
SEP	: Stakeholder Engagement Plan
SH	: Sexual Harassment
SIA	: Social Impact Assessment
SOP	: Standard Operating Procedures

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ST	:	Scheduled Tribes
SC	:	Scheduled Caste
OBC	:	Other Backward Caste
GC	:	General Caste
TSG	:	Technical Support Group
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

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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).	

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 126.27 kilometers (km) will be undertaken in West Meghalaya, followed by the remaining 211.18km in the following phases.

Disclaimer: This is a Draft Version and is being reviewed by the World Bank**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 Mawsmi-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°33'14.74"N 90°33'40.28"E	25°29'59.13"N 90°41'24.08"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°38'59.68"N 90°48'18.15"E	25°49'55.69"N 90°58'26.22"E
3.	Upgradation of Rongsai Boijhora Bajengdoba (RBB) Road from single to intermediate lane. (Corridor 3)	18.27	North Garo Hill	25°53'29.62"N 90°31'1.15"E	25°59'55.42"N 90°27'9.35"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°36'55.29"E	25°55'15.35"N 90°38'1.22"E
5.	Improvement of Ampati to Purakhasia Road (Corridor 8)	8.00	South West Garo Hill	25°18'39.79"N 90° 0'24.28"E	25°28'21.62"N 89°55'55.49"E

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Sl. No.	Name of the Corridors and Proposed Upgradation/Improvement	Length (Km)	Districts	Start point Coordinate	End Point Coordinate
6.	Improvement of Adugre to Purakhasia Road(Corridor 9)	20.00	South West Garo Hill & West Garo Hill	25°26'23.54"N 90°12'30.77"E	25°18'5.03"N 90°0'20.04"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
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°11'50.07"N 90°20'42.66"E	25°16'34.85"N 90°25'43.08"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°14'1.67"N 90°29'2.10"E	25°22'57.30"N 90°18'46.24"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.	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°53'55.73"N 90°36'52.52"E	25°43'11.45"N 90°22'43.20"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°31'46.51"N 90°51'41.36"E	25°21'33.75"N 90°39'32.89"E
5.	Construction of Baghmara Gittinggre Road to Chokpot C & RD Block via Mindikgre (Corridor 11)	20.30	South Garo Hill	25°15'18.40"N, 90°33'54.54"E	25°18'36.60"N, 90°26'25.76"E
6.	Construction of Mangsang to Mawshynrut (Riangdo) Road (Corridor 12)	38.00	West Khasi Hill	25°39'58.20"N 90°55'12.41"E	25°38'49.14"N 91° 3'14.02"E

1.2 UTILITY DETAILS

The project road corridor, classified as an Other District Road (ODR) with a total length of approximately 18.27 km, is equipped with several essential utility infrastructures. Electric poles, overhead electric lines, and Optical Fiber (OFR) cables run parallel to the road alignment. These utilities are critical for ensuring uninterrupted power supply and communication services in the project area and will be duly considered during road improvement and construction activities to avoid any disruption or damage.

A total of 177 electric poles, 7 transformers, and 70 electric line crossings are identified along the RBB road corridor for shifting. A total of 91 OFC pillars are identified for shifting along the RBB road corridor, comprising 66 on the LHS and 25 on the RHS. Details of utilities are given in **Annexure1.1**.

1.3 SCOPE FOR CONDUCTING THE ESIA STUDY

Accordingly, the scope of ESIA study for various environmental and social attributes was defined. Based on the screening and scoping outcomes, the following set of activities has been carried out for this detailed ESIA study.

- Information on the proposed sub-project components and activities to be gathered from DPR and site for each stage of the project cycle (Design, Pre-construction, Construction, and O&M), including location, project design, processes and materials to be used, expected waste generation, etc.
- Literature review and collection of data relevant to the study area.
- Environmental monitoring and Socio-Economic Survey to establish the baseline environmental and social status of the study area.
- Identification of the probable adverse E&S risks and impacts of the sub-project due to the construction and operation of the proposed improvement works.
- Identification of the stakeholders and various groups/institutions who are either affected or have

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an interest or a stake in the corridors, with additional emphasis on disadvantaged and vulnerable groups, and to carry out consultations with stakeholders to help elicit their concerns, suggestions, and support.

- Preliminary assessment of potential impacts of climate change and induced cumulative impacts.
- Preparing an ESMP outlining the measures for improving the environmental quality and social aspects, specifying responsibilities for implementing mitigation measures, budgetary and associated costs, and time schedules of their application in the sub-project cycle.
- Identification of the critical environmental and social attributes required to be monitored after the implementation of the proposed sub-project.

The study commenced with screening and scoping, during which key issues were identified through surveys, stakeholder engagement, and impact analysis. This was followed by an impact assessment using baseline data to evaluate potential environmental and social effects, propose mitigation strategies, and develop management plans. Finally, ongoing public consultation ensured stakeholder feedback shaped the assessment, leading to refined reports, approvals, and continuous monitoring throughout sub-project implementation.

1.3 APPROACH AND METHODOLOGY

The methodology adopted for the ESIA complied with the requirements of the World Bank ESF (ESSs), the EIA Notifications of the Ministry of Environment, Forest and Climate Change (MoEF&CC), the Indian Roads Congress (IRC) guidelines, the MoRTH Guidelines, and other national guidelines. The following table summarizes the approach adopted for conducting the ESIA study.

Table 1.3: Approach adopted for conducting the ESIA

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 round of consultations for FPIC.
3.	Baseline Data Collection	To assess the baseline environment and social conditions, the data has been accessed from authentic and verifiable sources as given in Table 1.2 for collecting the primary data through consultation, field survey, and secondary data.
4.	Impact Assessment	Using baseline data, the RBB 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

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Sl. No.	Stages	Activities Done
		with Indigenous Peoples (IP's) to further discuss the project design, benefits and impacts, and to provide the communities' priorities and inputs to drafting of the mitigation plans and measures. During this consultation, IPs' written consent to proceed with 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	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. 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.
8.	Final ESIA Report	The draft ESIA report and mitigation plans (ESMPs, RAP) 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

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 12 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 1.4 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 1.4: Source and methodology for primary and secondary data collection

Parameters	Secondary Source Environment
Air	Primary Survey Primary Monitoring Secondary Source Central pollution control Board (CPCB, https://cpcb.nic.in/) / Meghalaya State Pollution Control Board (MSPCB, https://megspcb.gov.in/)
Water	Primary Survey Primary Monitoring Secondary Source 1. District Survey Report, North Garo Hills District, 2024(https://northgarohills.gov.in/document/district-survey-report-of-north-garo-hills-district-for-sand-mining-2019/) 2.CGWBDData 2024(https://www.cgwb.gov.in/old_website/AQM/NAQUIM_REPORT/Meghalaya/North%20Garo%20Hills_Report.pdf)
Noise	Primary Survey Primary Monitoring Secondary Source CPCB (https://cpcb.nic.in/regulation-control/)
Soil	Primary Survey Primary Monitoring Secondary Source 1.District Irrigation Plan 2016-2020(https://pmksy.gov.in/mis/Uploads/2017/20170331050822078-1.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)
Biodiversity	Primary survey 1.Field observation 2.Vegetation assessment was conducted using Nested Quadrante method 4.Faunal assessment was conducted using Visual encounters, sign survey, line transect, and netting survey method

Parameters	Secondary Source
	<p>6.LULC analysis through ground truthing</p> <p>Secondary Source</p> <p>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</p>
Hazards and Vulnerability	<p>Primary survey</p> <p>Field observation and Consultation with concerned departments and local community</p> <p>Secondary Source</p> <p>1. District Disaster Management Plan for North Garo Hills, 2024 (https://northgarohills.gov.in/disaster-management/)</p> <p>2. Meghalaya State Disaster Management Authority (MSDMA) (https://msdma.gov.in/)</p>
Natural Environment	<p>Secondary Source</p> <p>1.Customized Rainfall Information System, Hydromet Division, IMD (https://hydro.imd.gov.in/) 2.District Census Handbook, North Garo Hills(https://northgarohills.gov.in/demography/) 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/2017/20170331050822078-1.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)</p>
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	

Parameters	Secondary Source
Land, Livelihood and Common Property Resources	Primary survey 1.Census/Household Survey (PAH:150) 2.Focus Group Discussions (3) 3.Key Informants Interviews (25) 4.Field Observations Secondary Source Census 2011 (https://www.census2011.co.in/)
	Other Socio-Economic Parameters
Ethnicity	Primary survey Consultation Secondary Source Census 2011(https://www.census2011.co.in/)
Gender	Primary Survey Focus Group Discussion Interviews Secondary Source 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
Prevalence of GBV	Primary survey Focus Group Discussions with women group Secondary Source Police records National Crime Records Bureau (NCRB) https://ncrb.gov.in

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 analyzes the legal and institutional framework for the project, within which the environmental and social assessment is carried out, and applies to the project. The Chapter also defines the roles and responsibilities of all direct and indirect stakeholders in meeting the applicable laws and regulations and WB's ESF.
Chapter 3	PROJECT ROAD DESCRIPTION – In this chapter, project corridor details are described from an environmental and social perspective with salient features including RoW, cross sections, traffic projections, corridor characteristics, settlements, and resource requirements, etc.
Chapter 4	THE BASELINE ENVIRONMENT chapter describes the existing baseline environmental conditions and the collection of secondary information regarding physical, biological, and socio-economic conditions of the study area, and the environmental quality of the study area – monitoring of air, noise, soil, surface, and groundwater. As part of the targeted assessment, baseline data focuses on the demographic, social, cultural, and political characteristics of indigenous/tribal communities; the land and territories they have traditionally owned, 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 outcomes.
Chapter 7	STAKEHOLDER CONSULTATION AND INFORMATION DISCLOSURE describes the various stakeholders and the 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 8	ENVIRONMENTAL AND SOCIAL MONITORING & REPORTING PROGRAMME This chapter covers reporting, monitoring, and the project's institutional framework.
Chapter 9	GRIEVANCE REDRESSAL MECHANISM
Chapter 10	CONCLUSION AND RECOMMENDATIONS

2. LEGAL AND INSTITUTIONAL FRAMEWORK

This chapter reviews all acts, rules, and policies applicable to the proposed road development.

2.1 APPLICABLE ENVIRONMENTAL AND SOCIAL REGULATIONS/ ACTS/ POLICIES AT NATIONAL AND STATE LEVEL

To understand the scope of the environmental and social assessment for the proposed improvements or road works, the relevant laws, legislation, and policies at the national and state levels were reviewed and summarized in Table 2.1 below, including an examination of the legal and institutional frameworks applicable to indigenous and tribal communities as part of the 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, stone crusher, DG set etc. during construction stage	Consent to Establish and operate through Contractor	Meghalaya State Pollution Control Board (MSPCB)
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 construction/labour camp	Consent to Establish and 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	Regulatory clearance not required but noise monitoring results should be below applicable standard as per CPCB .	MSPCB

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ Non-applicability	Regulatory Clearance Requirement	Authority
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	MSPCB
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	Required permission will be obtained by Contractor for proper disposal as per the site specific waste management plan.	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	Required permission will be obtained by Contractor for proper disposal as per the site specific waste management plan.	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 exceeding 200 kg for flammable non-toxic gases).	Petroleum and Explosives Safety Organization (PESO)
11	The Mines and Minerals	For development and regulation of mines and minerals in a sustainable	The construction of works will require stones, aggregates, sand, earth, etc.	Mining Permit from regional mine office. The EC is also	Mines and Mineral Department

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ Non-applicability	Regulatory Clearance Requirement	Authority
	(Development and Regulation) Act, 1957	manner. The rules regulate the mining of mineral and dealerships for mining and trading.		required for some minor minerals.	
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	There is no requirement of diversion of forest land for this road section as all the project activities will be done on Existing ROW.	No	State Forest Department, MoEF&CC
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 level Biodiversity Management Committees) for conservation of	Provisions of this act will not be applicable since road will not adversely affect any biological diversity	No	Meghalaya State Biodiversity Board

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ Non-applicability	Regulatory Clearance Requirement	Authority
		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.. Though two Elephant passing on Chainage 17+100 and 17+400 are falling on Sub Project Road. Proper mitigation measures like speed calming measures, safety signages will be undertaken.	No	State Forest Department
18	Eco-sensitive Zone Notifications 2015	The activities in areas around Wildlife Sanctuaries and National Parks are regulated from the perspective of conservation of wildlife	No ESZ falls within 10 km of the project road as per the Map provided by Forest Department.	No	MoEF&CC
19	State Compensatory Afforestation Fund Management and Planning Authority Forest (Conservation) Amendment Rules,	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	No forest area diversion involved in the project. Approximately 28 trees are to be felled and shall be compensated (1:10) as per the Act.	No	State Forest Department

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ Non-applicability	Regulatory Clearance Requirement	Authority
	2014	for afforestation, regeneration of forest ecosystem, wildlife protection and infrastructure development.			
20	Meghalaya State Compensatory Afforestation Fund Management and Planning Authority (MSCAFMPA). This body was constituted in alignment with the Compensatory Afforestation Fund Act, 2016	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
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. 28 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 measure; and specify roles and responsibilities to each dept. in relation to adopted measure	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

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ Non-applicability	Regulatory Clearance Requirement	Authority
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
27	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	This international convention, to which India is a signatory category, lists the endangered flora and fauna and regulates trade of these species	Project Intervention does not involve any trade of Endangered species	No	Meghalaya Forest Department and Wildlife Crime Control Bureau, MoEF&CC
28	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 barrels or 1,000 liters in a singletank requires license/approval.	License for storage from PESO (Petroleum and Explosives Safety Organization) for >25000L; NOC from District Authority/Fire Department. (for >2500 L to 25000L)	PESO, Nagpur (through Regional Office) & District Magistrate/Chief Controller of Explosives.
29	Ground Water Regulation (Central Ground Water Authority – CGWA)	Governs the extraction of groundwater for industrial, infrastructure, or commercial use. Requires NOC/permission prior to	Applicable (if groundwater extraction proposed) Groundwater extraction for construction, camp use, or dust suppression requires	NOC for groundwater abstraction.	CGWA or State Ground Water Authority (if notified).

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ Non-applicability	Regulatory Clearance Requirement	Authority
	Guidelines, 2017, adopted by States)	abstraction.	prior permission.		
30	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. Surface water from the Didram river can be used for road construction with prior permission from the Water Resources Department, North Garo Hills District, Meghalaya.	Permission/Allocation order for surface water abstraction.	Water Resources Department, Government of Meghalaya.
SOCIAL REGULATIONS					
1	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013	The Act ensures transparent land acquisition with fair 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.	Yes, as the area falls under 6th schedule A review of the legal and institutional framework applicable to indigenous/tribal communities.	No	Revenue Department, Government of Meghalaya, Garo 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

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ Non-applicability	Regulatory Clearance Requirement	Authority
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
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 India - The Sixth Schedule	Article 244(2) establishes Autonomous District Councils (ADCs) in tribal areas, granting them legislative and administrative	Applicable in designated tribal areas under the Sixth Schedule	No	Government of India, Autonomous District Councils

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ Non-applicability	Regulatory Clearance Requirement	Authority
		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					
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 injury or occupational disease.	Construction workers will be involved in the Project road corridors	Workmen compensation Insurance Policy	Commissioner for Workmen's Compensation
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

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ Non-applicability	Regulatory Clearance Requirement	Authority
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
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 establishments employing contract labour	Applicable to all implementing agencies	Labour License Required	Labour Commissioner, Meghalaya
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 is payable to an employee under the Act on satisfaction of certain	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ Non-applicability	Regulatory Clearance Requirement	Authority
	gratuity rules Meghalaya 1972	conditions on separation, if an employee has completed 5 years of service with employer			
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 accrued) at the end of his/her service term).	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya
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 people and for all matters connected there with or incidental thereto	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya
14	The Trade Union Act, 1926	Lays down the procedure for registration of trade union of workers and employers. The	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ Non-applicability	Regulatory Clearance Requirement	Authority
		trade unions registered under the Act have been given certain immunities for civil and criminal liabilities.			
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
116	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**.

2.3 RELEVANCE OF WB E&S STANDARDS 1 TO 10

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> <i>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.</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
ESS 3 – Resource Efficiency, Pollution Prevention	<i>ESS3 acknowledges that economic activity and urbanization contribute to pollution and resource</i>	Construction and Demolition activities and provision of support facilities	Yes	ESIA/MPWD/Contractor/CSC

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
and Management	<p>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 generation of hazardous and non-hazardous waste and manage the risks and impacts associated with pesticide use</p>	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.		
ESS 4 – Community Health and Safety	<p>ESS4 acknowledges that project activities, equipment, and infrastructure can heighten community exposure to risks and impacts.</p> <p>The major objective is to anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle.</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.	Yes	ESIA/DPR/MPWD/Contractor/CSC
ESS 5 – Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement	<p>ESS5 acknowledges that land acquisition and land use restrictions for projects can negatively affect communities, causing physical and economic displacement. "Involuntary resettlement" occurs when affected individuals or communities cannot refuse these actions.</p> <p>Major objective is to avoid or minimize</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. Respecting landowners' rights fosters community	Yes	ESIA/DPR/MPWD /RP Implementation Agency

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	<i>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>	trust, reduces conflicts, and supports social equity. A rights-based approach guarantees that affected individuals are treated justly and project proceeds smoothly.		
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><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></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 diverse land areas.	Yes	ESIA/DPR/MPWD/Contractor/CSC
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 identities and well-being</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
	<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>			
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><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></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 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.	Yes	ESIA/DPR/MPWD/Contractor/CSC
ESS 9 – Financial Intermediaries	<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</i>	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
	<p>supporting sustainable financial sector development and strengthening the role of domestic markets.</p> <p>The major objective is to outline how the FI will assess and manage the environmental and social risks and impacts linked to the subprojects it finances.</p>			
ESS 10 – Stakeholder Engagement and Information Disclosure	<p>ESS10 emphasizes the importance of open, transparent engagement between the borrower and project stakeholders as a key element of good practice.</p> <p>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.</p>	Effective stakeholder engagement enhances environmental and social sustainability, improves project acceptance, and contributes to successful project design and implementation.	Yes	ESIA/DPR/MPWD/Contractor/CSC

2.4 LAND REVENUE GOVERNANCE AND ADMINISTRATION IN GHADC

When Meghalaya was formed in 1972, the Garo Hills Autonomous District Council (GHADC) was retained with its mandate and governance framework largely unchanged. Over time, the Autonomous District Councils (ADCs) have undertaken efforts to codify tribal customary laws through legislations enacted under their authority. Traditional customary institutions have maintained a strong presence in the region, and despite the historical shifts introduced by the British administration and subsequently the Indian State, these institutions have continued to function adapting their practices to align with evolving legal and administrative frameworks.

The Sixth Schedule of the Constitution of India provides the framework for the establishment of Autonomous District Councils (ADCs) in tribal areas. Members of the ADCs are elected by the tribal population for a term of five years. The Garo Hills ADC functions with its own rural and urban local bodies, serving as an important institutional layer of governance.

ADCs act as a bridge between formal state structures and traditional tribal institutions, ensuring that governance reflects both constitutional provisions and customary practices. The Sixth Schedule establishes a system of autonomous, decentralized governance, endowing ADCs with legislative, executive, and judicial powers, including authority to adjudicate certain categories of civil and criminal cases.

In rural areas, traditional institutions such as the Nokmas a two-tier political system among the Garos continue to play a central role. In practice, it is not the State Government, but rather the Autonomous District Councils (ADCs) in conjunction with tribal institutions, that function as the primary authorities for the administration and management of natural resources, including land.

In the Garo Hills, the traditional village chief (Nokma) is regarded as the owner and custodian of community lands. In practice, the Nokma's husband exercises rights to manage the land through his wife, and may dispose of land only with her consent. Village inhabitants are entitled to cultivate as much land as they require, and may select plots within the village boundary, subject to the Nokma's approval. Outsiders are also permitted to settle in the village, provided they offer either an annual rent or a one-time gift/present to the headman.

Details of land procurement mechanisms are provided below in Table 2.3.

Table 2.3: of land procurement mechanisms

Category	Garos
Basis of classification	Ownership of land
Type of land	2 types of ownership
Control and Management	The ancestral head Nokma (head of the clan) manages and allots land to the community. While the Maharis (clan members) look after A-jinma land.
Inheritance	Women inherit and own property: It is usually the youngest daughter who inherits the property.
Records	<i>Pattas</i> are the primary records available in the region, dating from the colonial period. J.D. Walker demarcated the A.king land boundaries and gave the <i>Nokmas</i> settled maps in the late 1920s. The availability of patta documents in the villages part of the study show the colonial legacy which is often the only record of the land. (Marak, 1986). Garo Hill Autonomous District Council (GHADC) is known to have the maps for large parts of the district in the Garo Hills.
Systems for sale/purchase/ mortgage	<i>Pattas</i> are instrumental in mortgaging land in the bank for loans. Selling of the land in the village required <i>Nokmas</i> presence as witness. Any transactions or inheritance pertaining to the land is recorded in the patta at the District Council, Office
Managing private property	The <i>Nokna</i> (heiress) is the owner of family property and has a say in

Category	Garos
	management of both movable and immovable property, whether ancestral or self-acquired. Customarily, no property can be disposed of without the consent of the heiress. However, there might be variations in practice.
Managing community property	For the community lands, the power to make decisions is vested in the <i>nokma</i> of the village. For the clan land, the <i>nokna</i> (in heiress) along with her husband and the <i>chras</i> (brothers and maternal uncles) decides together. Any such transaction undertaken without prior consent of the wife (<i>nokna</i>) and her <i>Chra</i> is considered null and void (Marak, 1986).

Source: Momin, M. (Ed.). (2003). Readings in History and Culture of the Garos (Essays in honour of Milton S. Sangma). Regency Publications

3. PROJECT ROAD DESCRIPTION

3.1 RONGSAI BORJHORA BAJENGDOBA (RBB) ROAD

The Proposed road existed before the formation of Meghalaya state and ROW is limited only up to the existing Drain. The proposed RBB project road (Corridor 3) has a total length of 18.27 km, commencing from Kosi Junction at chainage 00+000 and terminating at Bajengdoba at chainage 18+270.

3.2 LOCATION DETAILS OF THE RBB ROAD

This stretch traverses a diverse landscape, including hilly terrains, agricultural lands, scrublands, built-up areas, and passes through 6 Villages including 17 habitations. The RBB Road serves as a critical regional connector, enhancing access to economic hubs, industrial centers, and tourism destinations.

Table 3.1 presents the chainage-wise details of Corridor 3 while **Figure 3.1** illustrates the road alignment map.

Table 3.1: Chainage wise RBB Road details

Sl. No.	Starting Chainage	End Chainage	Corridor No.	Project length as per DPR	Districts
1	00+000	18+270	3	18.27	North Garo Hills

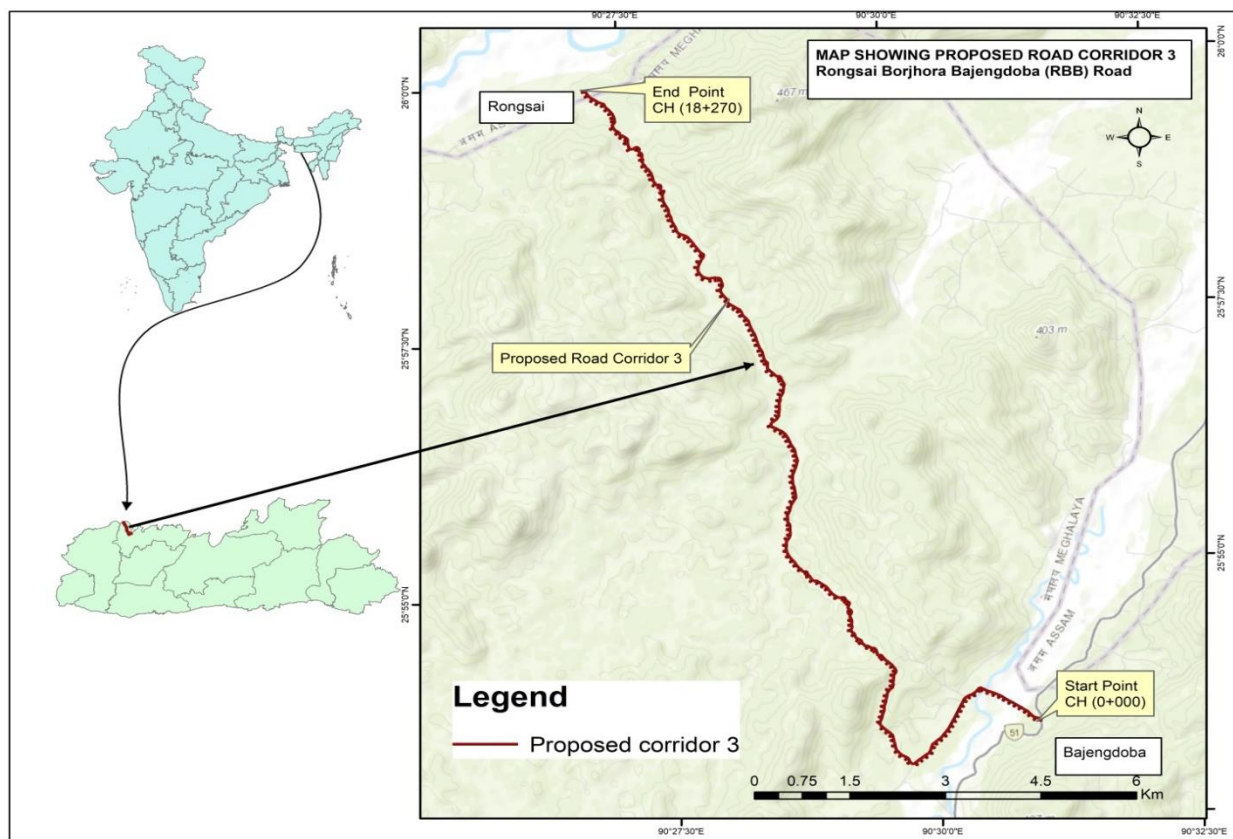


Figure 3.1: Road alignment map for RBB Road

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 assessment 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 ¹
3. 10 km of study area

The existing and proposed Right of Way (RoW) 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.

The study 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**.

¹ 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.

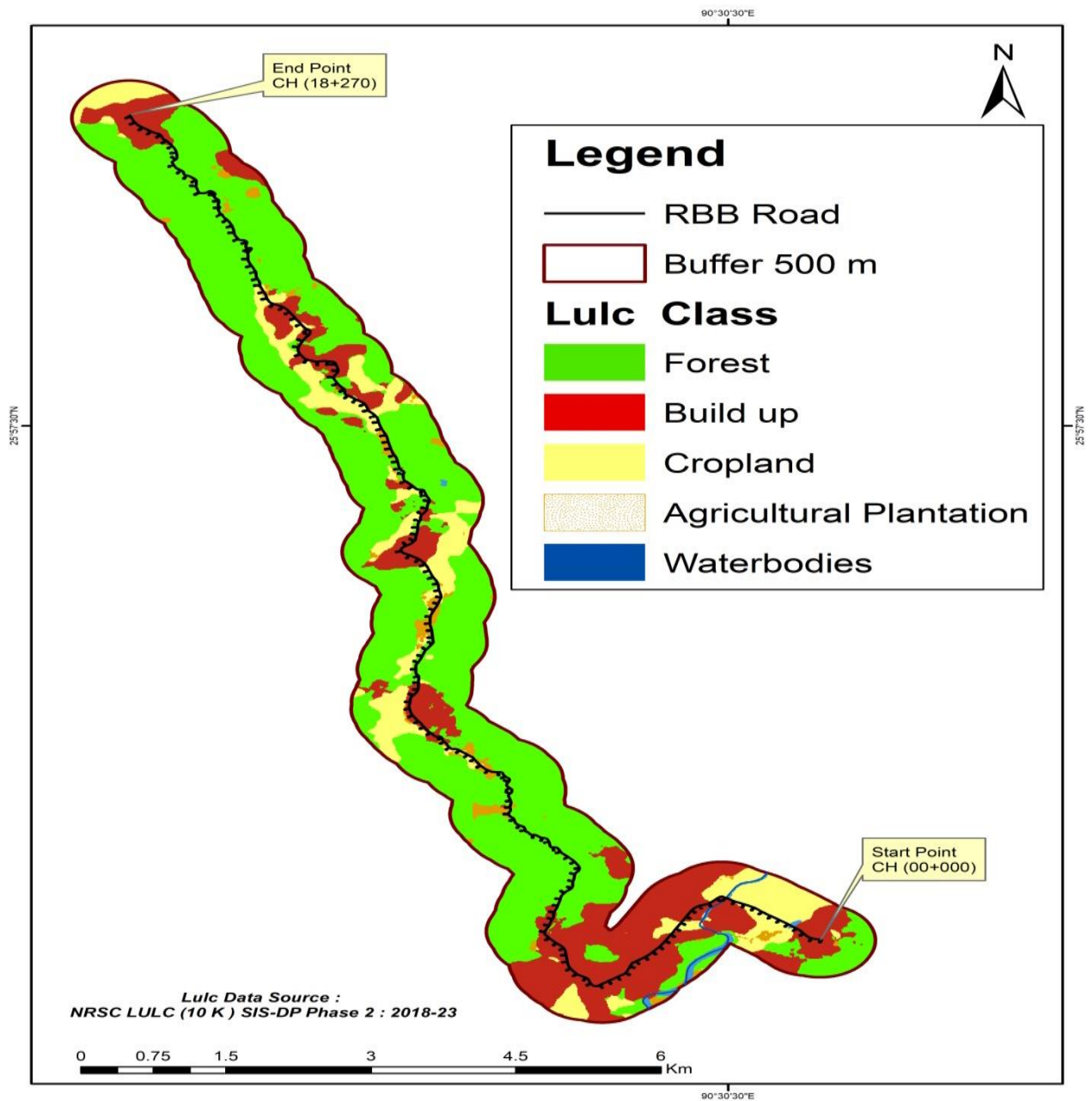


Figure 3.2: The LULC map of the direct impact area

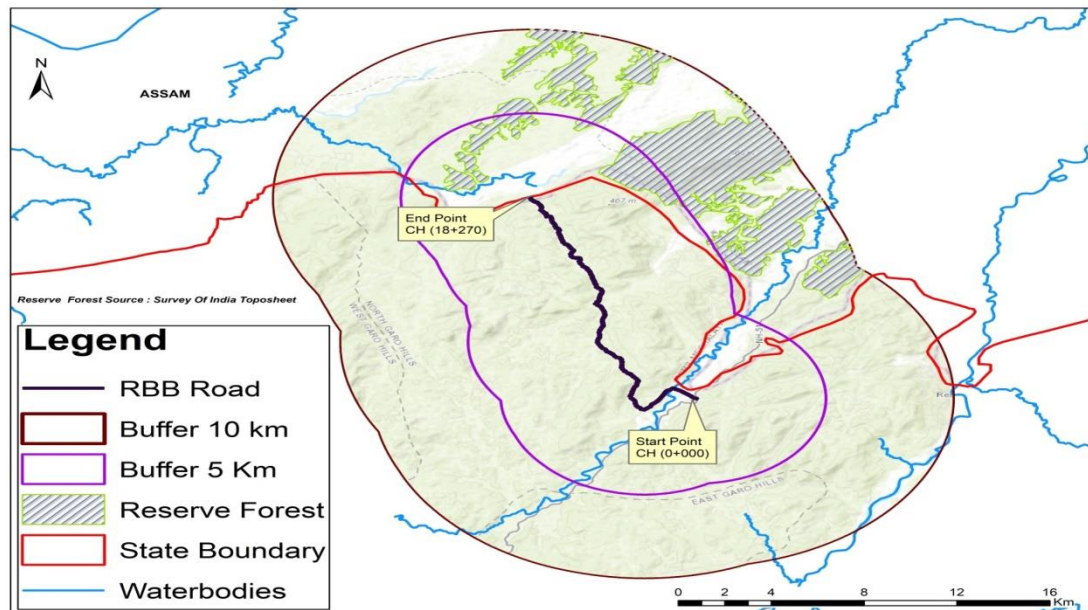


Figure 3.3: 10km Buffer area for project road

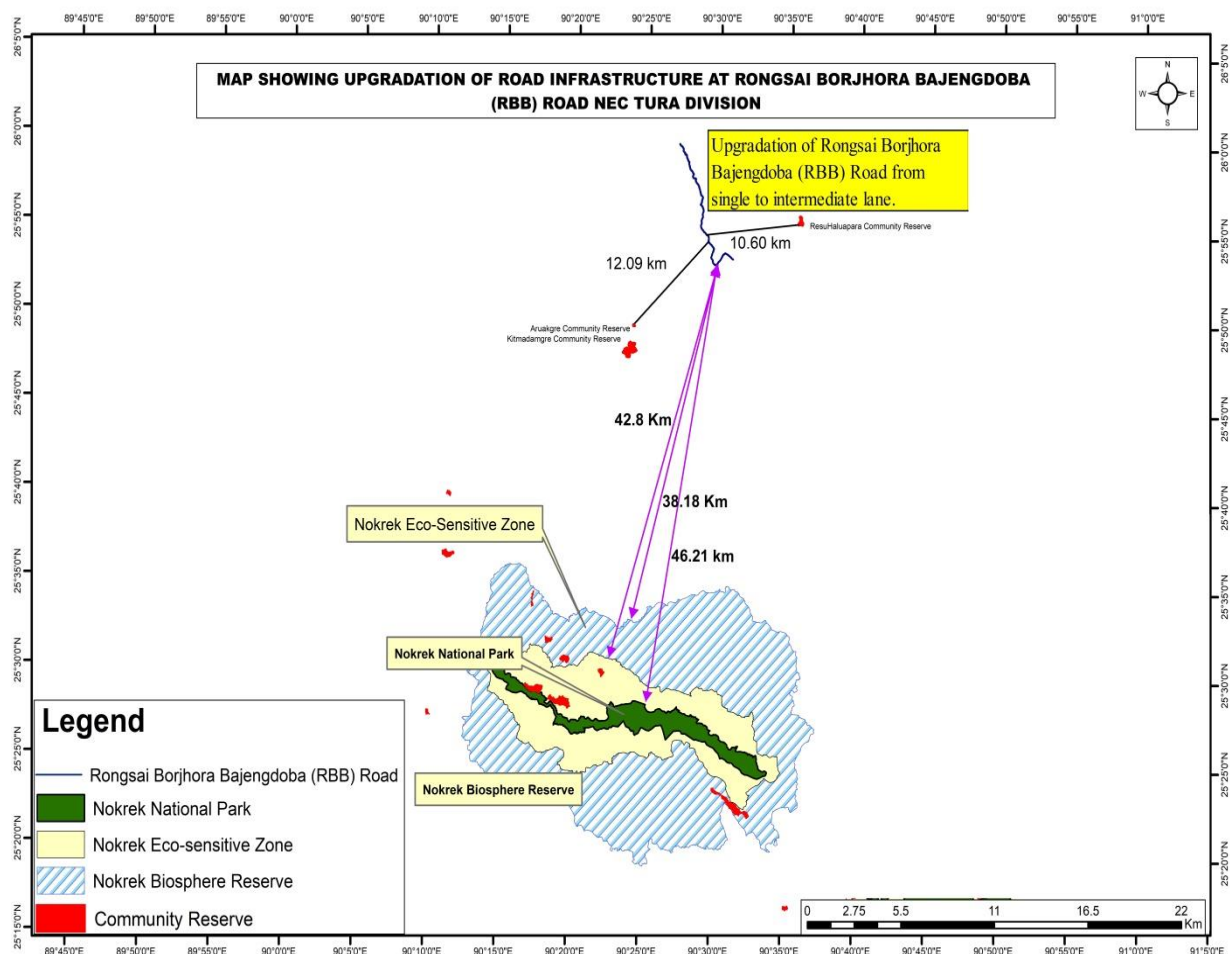


Figure 3.4: Map showing distance from Ecosensitive Zones w.r.t Project Road.

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 RBB ROADS

The key existing conditions and proposed improvements for the RBB project road are presented in the following sub-sections. These have been compiled based on primary field surveys and the Detailed Project Report (DPR).

3.4.1 RIGHT OF WAY, CARRIAGE WIDTH AND PAVEMENT CONDITIONS

The Right of Way (RoW) and Carriage Way (CW) for the 18.27 km sub-project road are summarized in **Table 3.2**. The Rongsai-Borjhora-Bajengdoba (RBB) Road is presently a single-lane roadway with a bituminous pavement surface. The existing road conditions are generally poor, with potholes prevalent across most stretches. Inadequate drainage exacerbates deterioration during rainfall, making traffic movement difficult, particularly on earthen sections. Notably, the road segments between chainages 12+000 and 12+200 currently lack a bituminous surface. Existing Carriage width of Sub Project road is 3.5 m and Proposed width is 5.5 m.

Table 3.2: Details of Existing ROW

S.No	Chainages (m)		EROW (in m)	Cuurent carriage width (m)	Proposed carriage width (m)
	From	To			
1.	0	200	12	3.5	5.5
2.	200	400	10	3.5	5.5
3.	400	600	12	3.5	5.5
4.	600	800	10	3.5	5.5
5.	800	1000	9	3.5	5.5
6.	1000	1200	10	3.5	5.5
7.	1200	1400	11	3.5	5.5
8.	1400	1600	10	3.5	5.5
9.	1600	1800	9	3.5	5.5
10.	1800	2000	13	3.5	5.5
11.	2000	2200	11.5	3.5	5.5
12.	2200	2400	14	3.5	5.5
13.	2400	2600	12	3.5	5.5
14.	2600	2800	14	3.5	5.5
15.	2800	3000	12	3.5	5.5
16.	3000	3200	12	3.5	5.5
17.	3200	3400	10	3.5	5.5
18.	3400	3600	11	3.5	5.5
19.	3600	3800	10	3.5	5.5
20.	3800	4000	10	3.5	5.5
21.	4000	4200	8	3.5	5.5
22.	4200	4400	12	3.5	5.5
23.	4400	4600	13	3.5	5.5
24.	4600	4800	11	3.5	5.5
25.	4800	5000	12	3.5	5.5
26.	5000	5200	10	3.5	5.5

27.	5200	5400	10	3.5	5.5
28.	5400	5600	12	3.5	5.5
29.	5600	5800	13	3.5	5.5
30.	5800	6000	10.5	3.5	5.5
31.	6000	6200	11	3.5	5.5
32.	6200	6400	11	3.5	5.5
33.	6400	6600	10	3.5	5.5
34.	6600	6800	9	3.5	5.5
35.	6800	7000	11.5	3.5	5.5
36.	7000	7200	11.5	3.5	5.5
37.	7200	7400	11	3.5	5.5
38.	7400	7600	9	3.5	5.5
39.	7600	7800	9	3.5	5.5
40.	7800	8000	11	3.5	5.5
41.	8000	8200	8.5	3.5	5.5
42.	8200	8400	10	3.5	5.5
43.	8400	8600	11.5	3.5	5.5
44.	8600	8800	11	3.5	5.5
45.	8800	9000	6.65	3.5	5.5
46.	9000	9200	8	3.5	5.5
47.	9200	9400	8	3.5	5.5
48.	9400	9600	12.3	3.5	5.5
49.	9600	9800	9.1	3.5	5.5
50.	9800	10000	10.2	3.5	5.5
51.	10000	10200	10.2	3.5	5.5
52.	10200	10400	9.6	3.5	5.5
53.	10400	10600	8.3	3.5	5.5
54.	10600	10800	8.00	3.5	5.5
55.	10800	11000	8.15	3.5	5.5
56.	11000	11200	11	3.5	5.5
57.	11200	11400	10.8	3.5	5.5
58.	11400	11600	11.7	3.5	5.5
59.	11600	11800	10.4	3.5	5.5
60.	11800	12000	12.7	3.5	5.5
61.	12000	12200	10.7	3.5	5.5
62.	12200	12400	8.4	3.5	5.5
63.	12400	12600	10.5	3.5	5.5
64.	12600	12800	10.6	3.5	5.5
65.	12800	13000	7.6	3.5	5.5
66.	13000	13200	8.5	3.5	5.5
67.	13200	13400	9.2	3.5	5.5
68.	13400	13600	10	3.5	5.5
69.	13600	13800	8	3.5	5.5
70.	13800	14000	8.15	3.5	5.5
71.	14000	14200	11	3.5	5.5
72.	14200	14400	10.8	3.5	5.5
73.	14400	14600	11.7	3.5	5.5
74.	14600	14800	11.7	3.5	5.5

75.	14800	15000	9.7	3.5	5.5
76.	15000	15200	13.2	3.5	5.5
77.	15200	15400	11.15	3.5	5.5
78.	15400	15600	11.8	3.5	5.5
79.	15600	15800	10	3.5	5.5
80.	15800	16000	8.7	3.5	5.5
81.	16000	16200	8.5	3.5	5.5
82.	16200	16400	8.9	3.5	5.5
83.	16400	16600	9.5	3.5	5.5
84.	16600	16800	11.3	3.5	5.5
85.	16800	17000	10.4	3.5	5.5
86.	17000	17200	9.2	3.5	5.5
87.	17200	17400	11.2	3.5	5.5
88.	17400	17600	8.3	3.5	5.5
89.	17600	17800	8.3	3.5	5.5
90.	17800	18000	8.1	3.5	5.5
91.	18000	18200	11.7	3.5	5.5
92.	18200	18270	15	3.5	5.5

Pavement Details:

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): 30 mm
- Dense Bituminous Macadam (DBM): 70 mm
- Wet Mix Macadam (WMM): 250 mm
- Granular Sub-Base (GSB): 200 mm

This results in a total pavement thickness of 550 mm, providing a robust structure capable of withstanding diverse traffic loads and environmental conditions.

Details of the five different cross-sections, along with the chainage-wise designs adopted, are provided in **Annexure 3.1**. Design details are given in **Figure 3.5**.

Junctions Details:

The details of major and minor junctions are provided in **Table 3.3**.

Table 3.3: List of Major and Minor Junctions of RBB Road Section

S.No	Chainage	Type	Side	Direction	Type of Junction
1.	0+000	T	Start Point	NH-217	Minor
2.	0+650	T	LHS	Village	Minor
3.	1+000	T	LHS	Bajong Bazaar	Minor
4.	1+125	T	RHS	Village	Minor
5.	1+390	T	RHS	Village	Minor
6.	1+420	T	RHS	Bajeng – Rongsai Rd	Minor
7.	1+525	T	RHS	Village	Minor
8.	1+900	+	-	Bajengdoba	Minor
9.	2+050	T	LHS	Village	Minor
10.	2+200	T	RHS	Village	Minor
11.	2+250	Y	LHS	Village	Minor
12.	2+325	T	RHS	Village	Minor
13.	2+600	Y	LHS	Village	Minor
14.	2+925	Y	LHS	Bajeng W Road	Minor
15.	3+150	T	RHS	Village	Minor
16.	3+250	Y	LHS	Bajeng Road	Minor
17.	3+500	T	LHS	Village	Minor
18.	3+700	T	RHS	Village	Minor
19.	5+150	Y	RHS	Village	Minor
20.	6+150	Y	LHS	Village	Minor
21.	7+500	T	RHS	Village	Minor
22.	8+180	Y	RHS	Gosingpita	Minor
23.	8280	+	-	Gosingpita	Minor
24.	9950	T	RHS	Village	Minor
25.	10120	Y	RHS	Village	Minor
26.	10300	+	-	Village	Minor
27.	10680	T	LHS	Village	Minor
28.	11250	T	RHS	Rangagora	Minor
29.	12920	T	RHS	Bolsong	Minor
30.	13650	+	-	Bolsong	Minor

S.No	Chainage	Type	Side	Direction	Type of Junction
31.	14400	Y	RHS	Bolsong	Minor
32.	14500	T	LHS	Village	Minor
33.	14940	T	RHS	Village	Minor
34.	16225	Y	LHS	Chiram Aga	Minor
35.	17100	T	RHS	Chiraragre	Minor
36.	17625	T	LHS	Village	Minor
37.	17700	Y	RHS	Chiraragre	Minor
38.	17900	Y	RHS	Borjhora	Minor
39.	18274	T	-		Minor

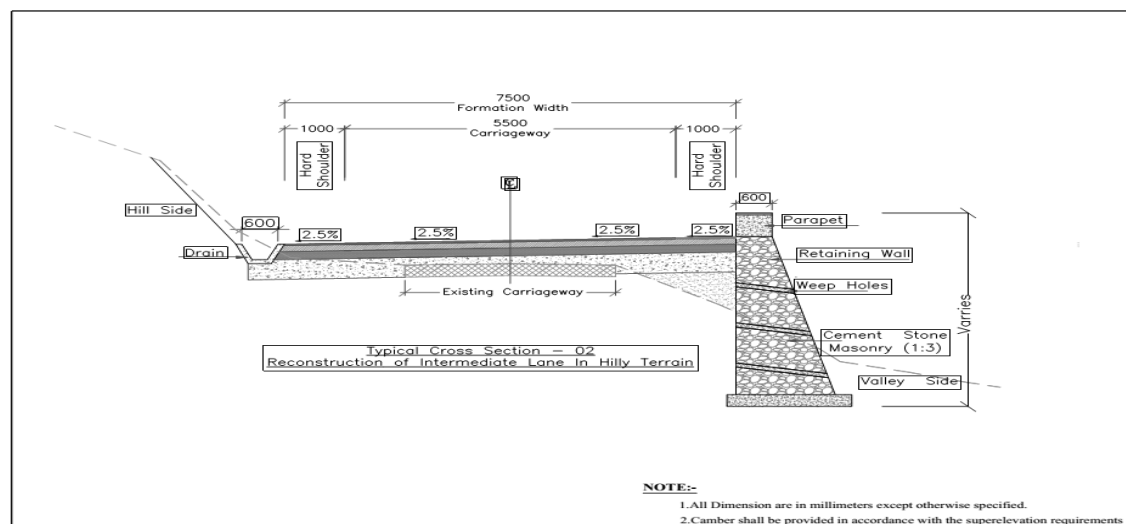
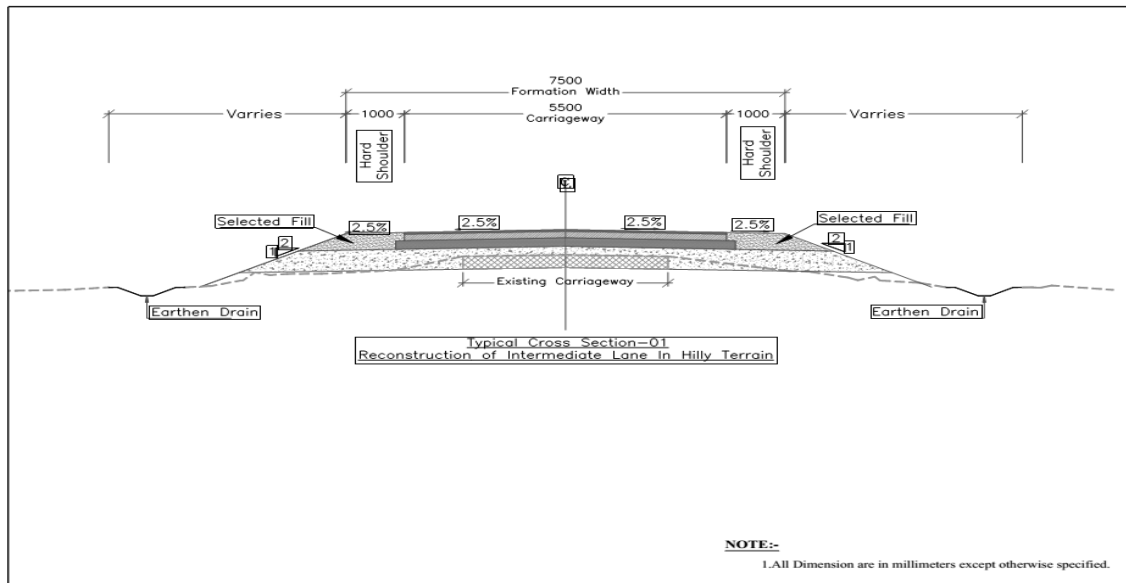
3.4.2 PROPOSED ROAD CROSS SECTIONS

The Rongsai–Borjhora–Bajengdoba (RBB) Road traverses gently undulating to moderately rolling terrain with elevations ranging from 100 m to 300 m amsl. The alignment largely follows the natural ground profile, requiring only localized earthwork. Minor cutting is needed between Chainage 8+500 to 9+300, where the road runs close to riverbanks and eroding slopes, necessitating bench cutting and slope protection such as gabion and retaining walls. Embankment raising is proposed at low-lying stretches CH 0+600 (300 mm raise with box culvert), CH 1+300 (250 mm raise due to monsoon submergence), and CH 9+950 (1–2.5 m near Didrum River) to prevent flooding and improve drainage. Overall, the corridor requires moderate earthwork, with no major cutting, and incorporates suitable drainage and slope stabilization measures to ensure long-term stability and all-weather connectivity.

A total of Thirty Two Typical Cross-Sections (TCS) have been proposed in the DPR (**Annexure 3.1**) for the 18.27 km road stretch. These TCSs vary, with some sections incorporating intermediate lanes, and are specifically designed to address the terrain and infrastructure requirements of the corridor, including provisions for road widening, slope stabilization, drainage, and utility corridors.

Based on these cross-sections, certain environmental and social impacts may arise, including additional land requirements, tree cutting, and disruption to local ecosystems, biodiversity loss, and alterations to the natural landscape

Details of the five different cross-sections, along with the chainage-wise designs adopted, are provided in **Annexure 3.1**. Design details are given in **Figure 3.5**.



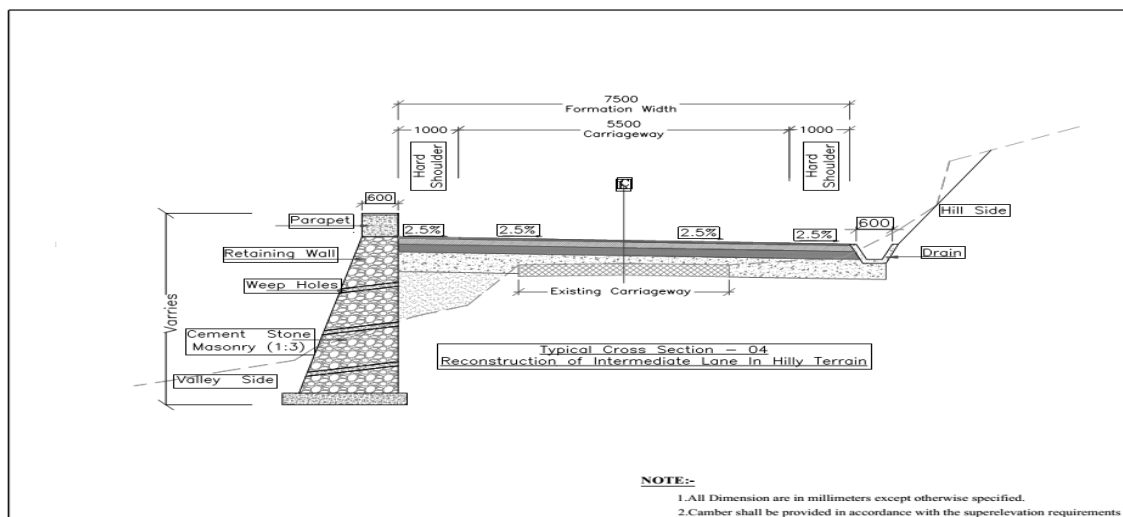
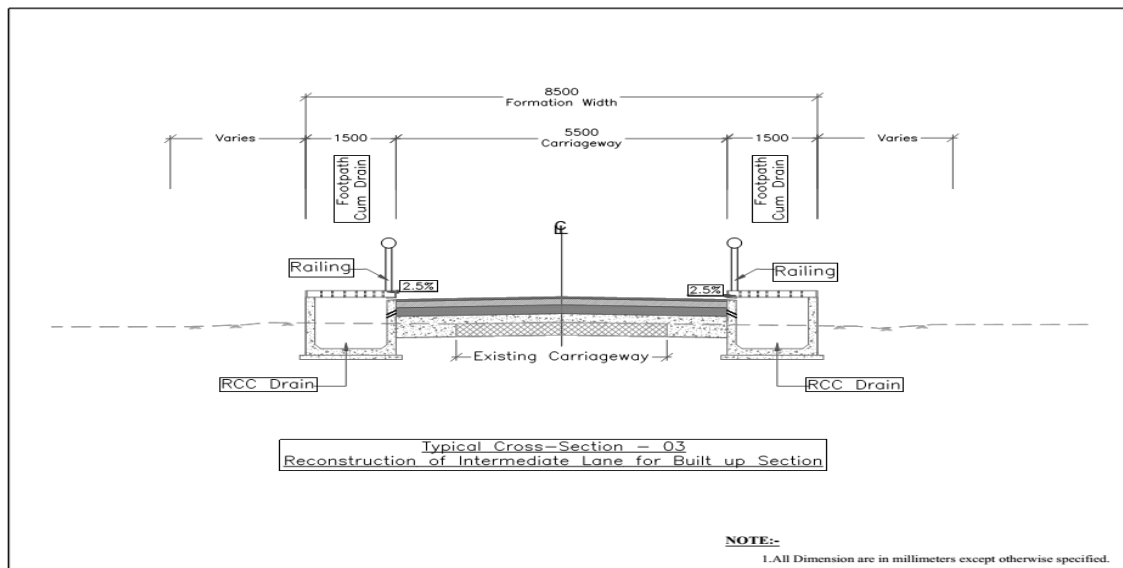


Figure 3.5: Typical Cross Sections

3.4.3 SETTLEMENTS AND CORRIDOR CHARACTERISTICS

3.4.3.1 Settlements:

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

Table 3.4: Chainage wise List of 17 Habitations/ 6 villages along the project road

Sl. No.	Chainage		Habitation	Village Name
1.	00+00	00+800	Kosi Junction	Bajengdoba (Upper Bajengdoba)
2.	00+800	01+200	Moamari	
3.	01+200	01+400	Omorpur	
4.	01+400	01+600	Omor Bazaar	
5.	01+600	02+600	Bajengdoba (village)	
6.	02+600	02+800	Upper Bajengdoba (village)	
7.	02+800	05+000	Line Ading	Bakenang Songma
8.	05+000	05+400	Rongbang	Mansingre
9.	05+400	06+800	Mansingre	
10.	06+800	08+800	Gosinpita	Gosinpita
11.	08+800	09+600	Bongbanchi	
12.	09+600	11+200	Aneaga	Bolsong
13.	11+200	12+200	Rangagora	
14.	12+200	12+600	Sembalgre	
15.	12+600	14+200	Bolsong	
16.	14+200	17+200	Waramgre	Borjhora
17.	17+200	18+270	Borjhora	

3.4.3.2 Corridor Characteristics

The salient features of the RBB road are summarized in **Table 3.5** below.

Table 3.5: Current Salient features of the RBB Road

Sl. No.	Characteristics	Features
1	Name of Road	Upgradation of Rongsai Borjhora Bajengdoba (RBB) Road from single to intermediate lane
2	Project Road Length	18.27 km
3	District	North Garo Hills
4	Villages/settlements enroute	6 Villages
5	Terrain	Hilly/Rural
	Existing	<ul style="list-style-type: none"> The road is affected by various surface damages, including potholes, cracks, and other deterioration. The section from chainage 12+900 to 12+200 does not have a proper paved or unpaved road; it is currently a human trail
6	Proposed treatment	Intermediate/ configurations, with or without paved shoulders, where required.
7	Bridges	No. of Major Bridge: 02 No. of Minor Bridges – 15
8	Culverts	100
9	Forests / environmentally sensitive areas	<ul style="list-style-type: none"> Passes through Community Land with vegetation (CH 17+100–17+500), Elephant corridors at CH 17+100 and CH 17+400
10	Religious Structures Affected	Nil
	Impacted Structures (including Temporary Structures)	150
11	Major CPR Impacted	No direct impact on CPR
12	Fifth/Sixth Scheduled Areas	Sixth Schedule Area
13	River crossings	02 river crossings (Didram River)
14	Water bodies / ponds	2 Streams, 1 pond (6+200)
15	Sensitive receptors	2LP School, 1 UP School, One Senior Secondary School, PWD office and Rest house, 1Petrol Pump, 1 JJM, 2 community centers. (Chainage details are given in Table 4.26). There is no direct impact on any of these CPR.
16	Transshipment areas/truck parking locations	Nil
17	Other features / issues if any	Nil
18	Land Requirement	0.608 Ha

3.4.4 TREES

The vegetation along the project road comprises a diverse mix of trees, shrubs, herbs, climbers, ferns, and grasses. Approximately 28 trees are likely to be impacted or require removal due to the proposed widening. Major trees impacted are Jackfruit, Mango, Arecanut, Bamboo, Teak, Sal, Neem, Peepal, Bargad, Siris, Guava, Ber, Moringa, etc.

Table 3.6: Chainage wise list of Trees

S.No	Chainage (Km)	Common Name	LHS/RHS	Botanical Name	Girth at Breast Height (cm)
1	0+200	Bamboo	LHS	Bambusa vulgaris	25
2	0+950	Arecanut Palm	RHS	Areca catechu	35
3	1+400	Jackfruit	LHS	Artocarpus heterophyllus	80
4	2+100	Guava	RHS	Psidium guajava	45
5	2+850	Mango	LHS	Mangifera indica	90
6	3+600	Teak	RHS	Tectona grandis	120
7	4+200	Sal	LHS	Shorea robusta	85
8	5+000	Neem	RHS	Azadirachta indica	80
9	5+650	Peepal	LHS	Ficus religiosa	120
10	6+200	Bargad (Banyan)	RHS	Ficus benghalensis	140
11	6+950	Siris	LHS	Albizia lebbeck	85
12	7+500	Arecanut Palm	RHS	Areca catechu	40
13	8+000	Bamboo	LHS	Bambusa tulda	90
14	8+700	Drumstick	RHS	Moringa oleifera	40
15	9+300	Guava	LHS	Psidium guajava	35
16	9+950	Jackfruit	RHS	Artocarpus heterophyllus	95
17	10+400	Mango	LHS	Mangifera indica	100
18	11+050	Neem	RHS	Azadirachta indica	70
19	11+800	Sal	LHS	Shorea robusta	90
20	12+400	Bamboo	RHS	Bambusa vulgaris	80
21	13+100	Arecanut Palm	LHS	Areca catechu	30
22	14+000	Ber (Indian Jujube)	RHS	Ziziphus mauritiana	40
23	14+700	Siris	LHS	Albizia lebbeck	95
24	15+300	Teak	RHS	Tectona grandis	75
25	16+200	Bamboo	LHS	Bambusa tulda	65
26	17+000	Mango	RHS	Mangifera indica	85
27	17+900	Peepal	LHS	Ficus religiosa	110
28	18+150	Neem	RHS	Azadirachta indica	60

Source: EIS Field Survey

To mitigate the ecological impact of tree loss, plantation at the ratio of 1:10 will be carried out. These mitigation 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**.

3.4.5 SLOPE PROTECTION WORKS

The project corridor in North Garo Hills, Meghalaya, encounters significant challenges due to its rugged terrain, characterized by high hills and deep valleys. The topographic profile of the Rongsai–Borjhora–Bajengdoba (RBB) Road indicates a gently undulating to moderately rolling terrain, with elevation ranging between 100 m and 300 m above mean sea level (amsl). The alignment traverses through a series of low hillocks and intervening valleys typical of the Meghalaya plateau. Overall, the terrain shows three major elevation peaks and two depressions along the 18.27 km stretch, suggesting alternating cut and fill sections. The highest elevation zones occur near the mid and terminal sections of the corridor, whereas the lowest points are located in valley sections characterized by seasonal

drainage or stream crossings. This topographical variation implies moderate earthwork requirements during construction, particularly in sections with steeper gradients. The general slope direction varies locally but follows the natural drainage pattern towards adjacent valleys, indicating the need for adequate drainage and slope protection measures. To address these issues, slope stabilization measures are essential to enhance the safety and resilience of the corridor, particularly given the district's susceptibility to landslides and the complexity of the topography. The sub-project proposes geotechnical solutions designed to stabilize both hillside cuts and valley-side slopes.

Location wise slope protection works proposed along with project is given in **Table 3.6** below.

Table 3.7: Slope protection works

Chainage	Side	Existing Angle of Repose (°)	Height of Cut (m)	Modified Angle of Repose (°)	Slope Protection work proposed
8+600	LHS	9.1°	0.96	26.6°	Toe wall/Protection works proposed due to soil erosion in the river on left side (LHS)
9+100	LHS	12.2°	1.29	26.6°	Protection work/Protection Works required due to soil erosion in the river on left side (LHS). Gabion and Retaining wall is Proposed.
9+200	LHS	20.1°	2.19	26.6°	River training work due to erosion in bridge foundation
9+950	RHS	5.3°	0.56	26.6°	Protection works at Didrum riverbank on right side (RHS)

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
- Community consultation for land identification for borrow areas, disposal sites, water availability, siting of camps, tree felling permission
- Identification of sources of construction material
- Contractor mobilization
- Setting of Construction Camp

3.5.2 CONSTRUCTION STAGE

- Site clearing & construction camp establishment
- Construction Material procurement & transportation

- Earthwork, hillside cutting, if required, embankment construction, GSB, WBM, operation of equipment, plant and machinery
- Structure demolition & construction work, if required
- Disposal site management
- 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

The district of North Garo Hills has come into existence in the year 2012 only. Details of construction material required for this project, their Source and Lead are given in **Table 3.8**.

Table 3.8: Source and Lead of Construction Materials

S. No.	Item	Unit	Estimated Quantity (from DPR / calc)	Quarry / Source Location	Total Lead (Km)
1	Earthwork (fill to be brought)	m ³	25,506.16	Local Area	9
	Surplus cut (to be disposed / reused)	m ³	76,034.44 (surplus from cut)	MPWD-designated disposal sites	as per site
2	Fine Sand	m ³	2,604.27	AMPT Road	52
3	Coarse Sand	m ³	260.43	AMPT Road	52
4	Aggregate (coarse aggregate)	m ³	5,208.55	Agia–Medhipara–Phulbaritura	96
5	Bitumen	MT	1,424	Guwahati IOCL Refinery	163
6	Emulsion	MT	111	Haldia to Site	1,050
7	TMT Bars	MT	259	Shillong (SAIL)	275
8	Cement	MT	2,718	Guwahati Cement Plant	160
9	Water	KL	50500	Didram River	-

Assessing the availability of suitable construction materials near the project road is crucial for a road project. Surface water from the Didram river can be used for road construction with prior permission from the concerned authority.

3.6.1 VOLUME OF CIVIL WORKS

The volume of civil works for MLCIP will be influenced by the type of construction methods, typical cross sections and specific materials used in the sub-project area. These civil works are essential for ensuring the highway's stability, safety and environmental sustainability thereby contributing to the long-term success of the road project. List of materials used such as Bituminous Concrete (BC), Dense Bituminous Macadam (DBM), Prime Coat (PC), Tack Coat (TC), Granular Sub Base (GSB), Wet Mix Macadam (WMM), and Shoulder treatments are included in the DPR. This comprehensive range of materials ensures the road's strength, durability and overall performance.

Based on the information provided in the DPR, the embankment protection measures are designed according to the height of the embankment to ensure slope stability and minimize erosion. For embankments having a height of less

than 2.0 m, turfing with suitable grass species will be carried out on the side slopes to prevent soil erosion and maintain surface stability. For embankments with heights ranging between 2.0 m and 3.0 m, a toe wall is proposed at the base of the slope to provide additional structural support and prevent scouring at the toe. In cases where the embankment height exceeds 3.0 m, a retaining wall will be provided on the fill side to retain the earth mass, while a breast wall will be constructed on the cut side to support the excavated slope and prevent slope failure. These protective measures have been proposed as per standard engineering practices and IRC guidelines to ensure the durability and safety of the road embankment structure.

As per the earthwork estimation for the project corridor, the total fill quantity is 25,506.16 m³, and the cut quantity is 1,01,540.60 m³. After balancing cut and fill requirements, there remains a surplus of approximately 76,034 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 and Bridge 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

The additional land required for the proposed road improvement is approximately 0.6081 ha. The majority of the works will be accommodated within the existing Right of Way (RoW). The small amount of additional land needed falls primarily under the ownership of the local community.

MPWD, in close coordination with the concerned Village Council and community, will secure the necessary land parcels through mutually agreed arrangements that are fully consistent with the principles of Free, Prior and Informed Consent (FPIC). This approach was discussed in detail during the FPIC consultation meetings with the Village Council head and community members, who expressed their general support for the project and willingness to facilitate the required land access in accordance with customary practices and applicable safeguards.

Land requirement details are given in **Table 3.9**.

Table 3.9: Land Requirement Details

LAND REQUIREMENT DETAILS							
Rongsai Borjhora Bajengdoba Road (RBB)							
S.N	Chainages		Area (In Sq. Mtr.)		Type of Land Community Owned Land	Road width (Dimension in mtr.) PROW	Remarks
	From	To	LHS	RHS			
1.	200	400	19.838	0.498	Community land	9	At Ch-300 to 400 River
2.	800	1000	21.888	19.843	Community land	9	
3.	1000	1200	17.59	0.06	Community land	9	At Ch-1+100 is River
4.	1600	1800	0	19.959	Community land	9	
5.	3200	3400	1.232	4.264	Community land	9	
6.	3600	3800	0.375	0	Community land	9	
7.	3800	4000	0	45.462	Community land	9	
8.	4000	4200	60.63	141.407	Community land	9	
9.	4600	4800	0	1.653	Community land	9	
10.	5000	5200	0	5.559	Community land	9	
11.	5200	5400	5.68	26.296	Community land	9	
12.	5800	6000	0	29.126	Community land	9	
13.	6400	6600	8.393	42.844	Community land	9	
14.	6600	6800	62.423	20.136	Community land	9	
15.	7200	7400	1.610	34.092	Community land	9	
16.	7400	7600	73.146	14.521	Community land	9	
17.	7600	7800	34.338	78.319	Community land	9	
18.	8000	8200	75.149	43.505	Community land	9	
19.	8200	8400	0.35	0	Community land	9	
20.	8800	9000	212.879	263.591	Community land	9	

LAND REQUIREMENT DETAILS							
Rongsai Borjhora Bajengdoba Road (RBB)							
S.N	Chainages		Area (In Sq. Mtr.)		Type of Land Community Owned Land	Road width (Dimension in mtr.) PROW	Remarks
	From	To	LHS	RHS			
21.	9000	9200	41.072	200.884	Community land	9	
22.	9200	9400	111.805	90.504	Community land	9	At Ch-9+200 is River
23.	9600	9800	16.698	34.169	Community land	9	
24.	9800	10000	0	2.257	Community land	9	
25.	10000	10200	0	0.847	Community land	9	
26.	10200	10400	21.730	7.596	Community land	9	
27.	10400	10600	105.776	104.696	Community land	9	
28.	10600	10800	47.009	199.009	Community land	9	
29.	10800	11000	96.974	98.363	Community land	9	
30.	11000	11200	2.884	2.566	Community land	9	
31.	11200	11400	0	5.057	Community land	9	At Ch-11+200 is River
32.	11600	11800	0	31.418	Community land	9	
33.	12200	12400	97.572	38.533	Community land	9	
34.	12800	13000	130.762	165.065	Community land	9	
35.	13000	13200	38.069	117.618	Community land	9	
36.	13400	13600	1.584	0.28	Community land	9	
37.	13600	13800	115.178	83.648	Community land	9	
38.	13800	14000	115.263	173.645	Community land	9	
39.	14000	14200	51.903	0.365	Community land	9	
40.	14800	15000	4.443	6.085	Community land	9	
41.	15000	15200	0	4.025	Community land	9	

LAND REQUIREMENT DETAILS							
Rongsai Borjhora Bajengdoba Road (RBB)							
S.N	Chainages		Area (In Sq. Mtr.)		Type of Land Community Owned Land	Road width (Dimension in mtr.) PROW	Remarks
	From	To	LHS	RHS			
42.	15400	15600	0	173.561	Community land	9	
43.	15600	15800	9.373	27.242	Community land	9	
44.	15800	16000	67.127	87.010	Community land	9	
45.	16000	16200	18.972	174.463	Community land	9	
46.	16200	16400	25.374	119.278	Community land	9	
47.	16400	16600	28.415	56.776	Community land	9	
48.	16600	16800	0	2.471	Community land	9	
49.	16800	17000	474.838	0	Community land	9	
50.	17000	17200	361.256	43.173	Community land	9	
51.	17200	17400	0	10.038	Community land	9	
52.	17400	17600	47.550	213.979	Community land	9	
53.	17600	17800	55.381	91.753	Community land	9	
54.	17800	18000	122.598	65.062	Community land	9	
Total Area in Sq Mtr.			2805.127	3276.194			
Area in Hectare			0.2805127	0.3276194	Total Area in Hectare		0.6081

Source: DPR Consultant

3.8 WATER REQUIREMENTS

The overall water requirement of the project is 54.5 KLD, of which 50.5 KLD will be used for construction activities and 4 KLD is required for domestic purposes. Details of Water requirement is given in Table 3.10.

Table 3.10: Water Requirement for Construction Works

Activity	Daily Demand (Liters/km)	Total for 18.27 km (Liters/day)	Remarks
Permanent Works	800 – 1000	16400	Concrete mixing, compaction, culverts, drains.
Dust Suppression at Work Zone	300 – 500	7400	Reduced due to frequent rain; use only on dry days.

Activity	Daily Demand (Liters/km)	Total for 18.27 km (Liters/day)	Remarks
Curing	300 – 500	7000	Rainfall may assist, but controlled curing still needed.
Laboratory	Fixed	1000	Centralized testing facility.
Haul Roads	300 –5600	6000	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.
Water used for Construction purpose		50,500	
Domestic Purpose	Fixed	4000	For 35–50 workers (drinking, cooking, sanitation).
Total		54500	

3.9 PROJECT COST

The total estimated cost of the project is approximately 180.17 Crore (as per DPR).

3.10 PROJECT IMPLEMENTATION SCHEDULE

Based on the stipulated criteria and conditions, MPWD will award Civil Works to the eligible contractor. The contractor will own the responsibility of procuring the quality material in sufficient quantity from the nearest authorized source and approved manufacturers. Equipment of prescribed standards should be used by the contractor.

The manpower requirement would vary over the construction period depending on the quantum and type of work involved. The peak manpower requirement would be approximately 35. The skilled manpower, primarily the machine operators and concrete casting crew would be migrant labour and would be accommodated in the construction camp for accommodation purposes. On an average the crew in the construction camp at a time is likely to be around 10 persons. It is estimated that about 60 to 70% workers will be from local area. Remaining skilled workers, operators, supervisors and engineers may be from outside area. The manpower required for the work shall be mobilized by the contractors as per schedule. The project construction period for 18.27 km subproject stretch is considered as 24 months.

4. BASELINE ENVIRONMENT

4.1 GENERAL

This chapter presents the existing environmental and social conditions of the RBB project area, encompassing natural, physical, biological, cultural, and socio-economic components. Based on this baseline scenario, potential impacts of the proposed sub-project will be identified. The approach and methodology for baseline data collection are detailed in Section 1.3 of Chapter 1

4.2 NATURAL ENVIRONMENT (METEOROLOGY)

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

4.2.1 CLIMATIC CONDITIONS

The climate in the project area is moderate and highly humid, with three distinct seasons: summer, rainy, and winter. The summer season occurs from March to May, followed by the southwest monsoon, which lasts until September. The winter season begins in November and continues through February

4.2.2 TEMPERATURE

In North Garo Hills, winter generally begins in mid-November, with January being the coldest month. During this period, maximum temperatures range from 24–26°C, while minimum temperatures can drop to 10–12°C. Summer starts in March, with July and August typically being the hottest months. During summer, maximum temperatures range between 30–33°C, and minimum temperatures are around 22–24°C. The monthly mean maximum and minimum temperatures for the nearest location, Shillong, as recorded by the India Meteorological Department (IMD), are presented in **Table 4.1**.

Table 4.1: Monthly Mean Maximum and Minimum Temperature

Month	Maximum Temperature in °C	Minimum Temperature in °C
January	24.5	12.5
February	25.0	13.0
March	30.0	18.0
April	31.0	20.5
May	32.5	22.0
June	31.5	23.5
July	33.0	25.0
August	32.8	25.2
September	32.0	24.0
October	30.5	21.5
November	28.5	17.0
December	25.5	13.5

Source: Climatological Table, 2020

Temperature Projection and Implications for RBB Road

According to the Meghalaya State Action Plan on Climate Change (SAPCC, 2022), the Garo Hills region including the North Garo Hills District is projected to experience an increase in mean annual temperature of approximately 1.8–1.9°C by the mid-century period (2021–2050) relative to the 1975 baseline, based on the HadRM3 (PRECIS) regional climate model under the A1B scenario. This gradual warming trend is expected to intensify surface heat exposure and increase the frequency of hot days. For the Rongsai–Borjhora–Bajengdoba (RBB) Road corridor, such temperature rise may accelerate bituminous pavement softening, rutting, and surface deformation, particularly in low-lying or exposed segments. To enhance climate resilience, it is recommended to adopt temperature-resistant bitumen grades (higher Performance Grade or polymer-modified binders), ensure adequate pavement compaction,

and improve roadside drainage and vegetative cover to mitigate thermal stress. The integration of these measures will align the road design and maintenance strategies with future climate projections for the region.

4.2.3 RAINFALL AND HUMIDITY

North Garo Hills experiences a subtropical monsoon climate with high humidity throughout the year. Pre-monsoon showers occur during April and May, often accompanied by thunderstorms and occasional hailstorms, followed by a brief dry spell. The southwest monsoon typically begins in late May or early June, with peak rainfall occurring between June and August. The hilly terrain, particularly in the southern and central parts of the district, receives the heaviest rainfall, which contributes to slope instability and increases the risk of landslides along the road corridor. The average annual rainfall during 2018-2020 is presented in **Table 4.2**, while **Table 4.3** provides the month-wise relative humidity for the year 2020 (nearest location: Shillong, IMD data).

Table 4.2: Last 5 years rainfall data for North Garo Hills District

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Rainfall
2018	15.2	18.0	50.0	80.0	200.0	400.0	350.0	320.0	250.0	80.0	20.0	10.0	1,693.2
2019	10.0	12.0	40.0	90.0	310.0	380.0	370.0	300.0	240.0	100.0	15.0	5.0	1,872.0
2020	12.0	15.0	55.0	100.0	320.0	420.0	360.0	330.0	260.0	90.0	10.0	8.0	2,020.0

Source: Customized Rainfall Information System, Hydromet Division, IMD

Table 4.3: Month-wise Relative Humidity

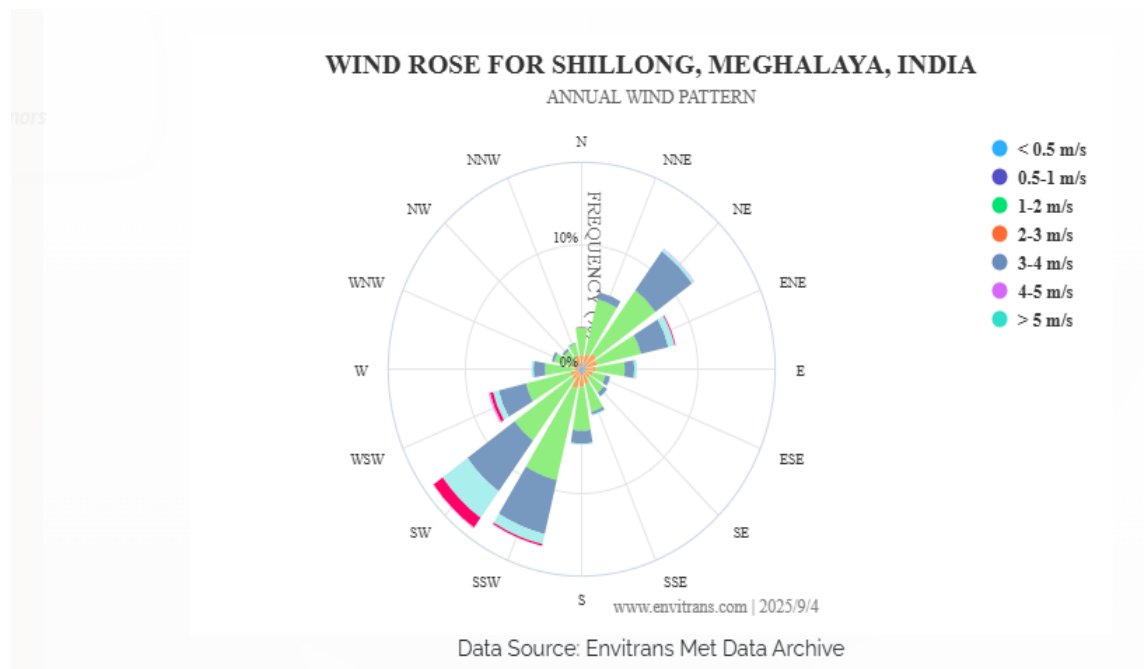
Month	08.30 Hrs	17.30 Hrs
January	88	75
February	85	70
March	80	65
April	82	73
May	87	78
June	93	90
July	92	88
August	90	85
September	88	82
October	85	78
November	83	73
December	87	75

Rainfall Projection and Implications for RBB Road

The Meghalaya State Action Plan on Climate Change (SAPCC, 2022) indicates that the Garo Hills region, including North Garo Hills District, is projected to experience an overall increase in annual rainfall by about 10–15% by mid-century (2021–2050) compared to the 1975 baseline, under the HadRM3 (PRECIS) regional model using the A1B scenario. While total monsoon rainfall is expected to rise, the distribution pattern will likely become more erratic, with intensified short-duration rainfall events and longer dry spells. Such changes could exacerbate surface runoff, soil erosion, and waterlogging along the Rongsai–Borjhora–Bajengdoba (RBB) Road corridor, particularly in low-lying and hilly sections. To address these risks, the project should incorporate enhanced cross-drainage capacity, lined roadside drains, bioengineering for slope protection, and rainwater outlet management to reduce erosion and flooding. The design must also ensure maintenance-friendly drainage infrastructure capable of handling increased peak flow intensities projected for the mid-century climate scenario.

4.2.4 WIND SPEED AND DIRECTION

Wind Rose diagram was prepared for 1 year, for the wind data recorded at Shillong (nearest station taken) is given in **Figure 4.1**. Average Wind speed of 1.6 m/s in the direction of NE to South west is observed.



Source: Envitrans

Figure 4.1: Wind rose Diagram

4.3 LAND ENVIRONMENT

4.3.1 PHYSIOGRAPHY AND ELEVATION

North Garo Hills District, the northern extension of the Garo Hills in Meghalaya, is characterized by hilly and undulating terrain interspersed with valleys and riverine tracts. The district is drained by several important rivers, including the Damring, Dudhnoi, Krishnai, Didram, Rongkhu, and Rongreng, all of which flow northward and eventually join the Brahmaputra. Elevation in the district ranges from approximately 100m above mean sea level in the northern plains adjoining Assam to over 1,000m in the southern highlands and ridges, with the central hilly belt generally lying between 300 and 600m. The district's physiography is defined by forested hills and sloping terrain that gradually descends northwards, giving North Garo Hills its distinct landscape².

Baseline Scenario for RBB Road

As per elevation map of North Garo Hills District, the RBB project road stretch lies in the range of 100-300 m. The corridor wise elevation map of the project stretch is given in **Figure 4.2**.

² District Census Handbook, North Garo Hills

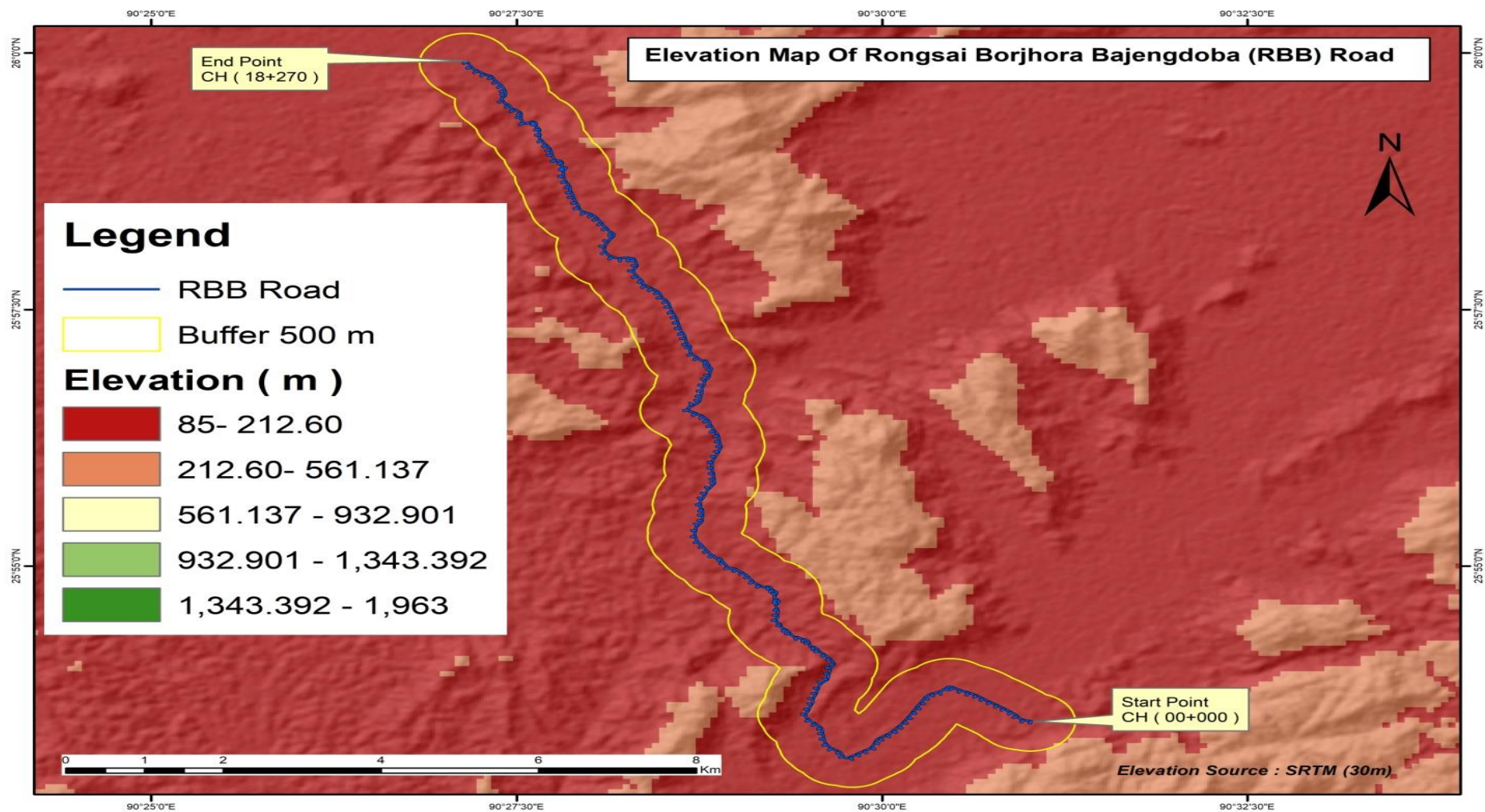


Figure 4.2: Elevation map of the RBB project area (Elevation Source: SRTM (30m))

4.3.2 GEOLOGY

Baseline Scenario for Sub- Project Road

Geology of the Sub Project Road

- Dominated by Precambrian crystalline basement rocks (gneiss, granite, quartzite).
- Patches of Gondwana sediments with coal measures are found along valleys and river sections.
- Alluvial deposits occur in the plains.
- The terrain is rugged and hilly in the south, gently sloping towards the north.
- Economic geology: Small coal deposits (Siju–Dudnai belt), building stones, laterite, and minor limestone.

Seismicity

- Corridor lies in **Seismic Zone V** (IS 1893 zoning). Use **importance factor per IRC:6**; detail retaining walls, culverts, and bridges for seismic earth pressures and bearings for **PGA ≈ 0.36 g** design basis.

Environmental & construction notes

- **Monsoon window:** Avoid deep cuts/excavations Jun–Sep; stage construction with temporary drains & silt traps.
- **Spoil management:** Designated tips on stable benches (>10 m from drainage), compacted in layers, with toe bunds.
- **Biodiversity:** Riparian buffers at stream crossings; avoid borrow from natural slopes with dense canopy.

The geology of the RBB Road is depicted in **Figure 4.3**, below.

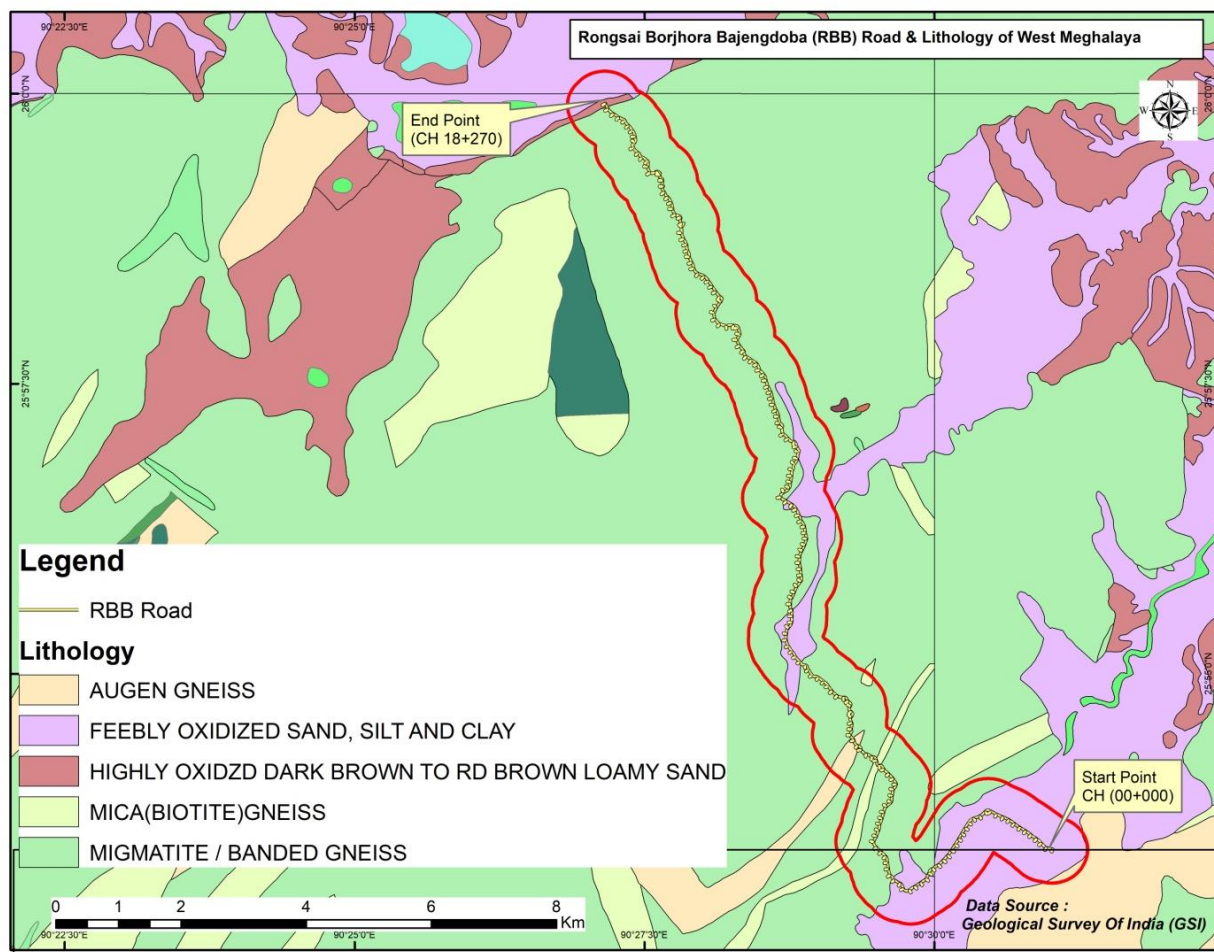


Figure 4.3: Local geology of the road stretch of corridor 3

4.3.3 GEO-MORPHOLOGY AND SOILS

Geomorphologically, the North Garo Hills District, through which the RBB Road traverses, can be classified into six physiographic domains: structural hills and valleys, structural plateau, active floodplain, older floodplain, younger alluvial plain, and pediment–pediplain complex. The road corridor predominantly passes through hilly and undulating terrain dominated by structural hills and valleys, gradually transitioning into plateau regions and floodplains in certain stretches.

Soils along the project road are predominantly laterite and lateritic in nature, with high acidity as a defining characteristic. In the hilly sections, where the parent rocks weather slowly and are frequently subjected to heavy rainfall, soils tend to be more acidic compared to the relatively low-lying plains. Soil texture varies from sandy loam to clay loam, with patches of lateritic red soil. These soils are rich in organic matter and nitrogen due to their relatively undisturbed and virgin condition. However, lateritic soils are susceptible to erosion and leaching during intense monsoonal rainfall, which can lead to degradation and slope instability in certain sections of the road.

Given the terrain and soil characteristics, the RBB Road requires adequate slope stabilization, drainage, and erosion-control measures such as check walls, bio-engineering techniques, and roadside plantation to minimize soil loss and maintain road stability. While the soil's acidity and high organic content support a variety of crops, the lack of adequate irrigation limits the successful cultivation of all crops³.

³ District Irrigation Plan 2016–2020, North Garo Hills, Government of Meghalaya.

Table 4.4: North Garo Hills District - Block wise major soil class area in Ha. and Land Slope

Name of the Block	Soil Type			Land Slope (%)			
	Major Soil Classes	Major Soil Type	Area (Ha)	0-3% (Ha)	3-8% (Ha)	8-25% (Ha)	>25% (Ha)
Bajengdoba Development Block (North Garo Hills)	Sandy loam to clay loam	Laterite & Lateritic soils	69,500	4,500	11,000	19,000	35,000

Source: District Irrigation Plan 2016–2020, North Garo Hills, Government of Meghalaya

Geomorphological map of North Garo Hills district is depicted in the **Figure 4.4** below.

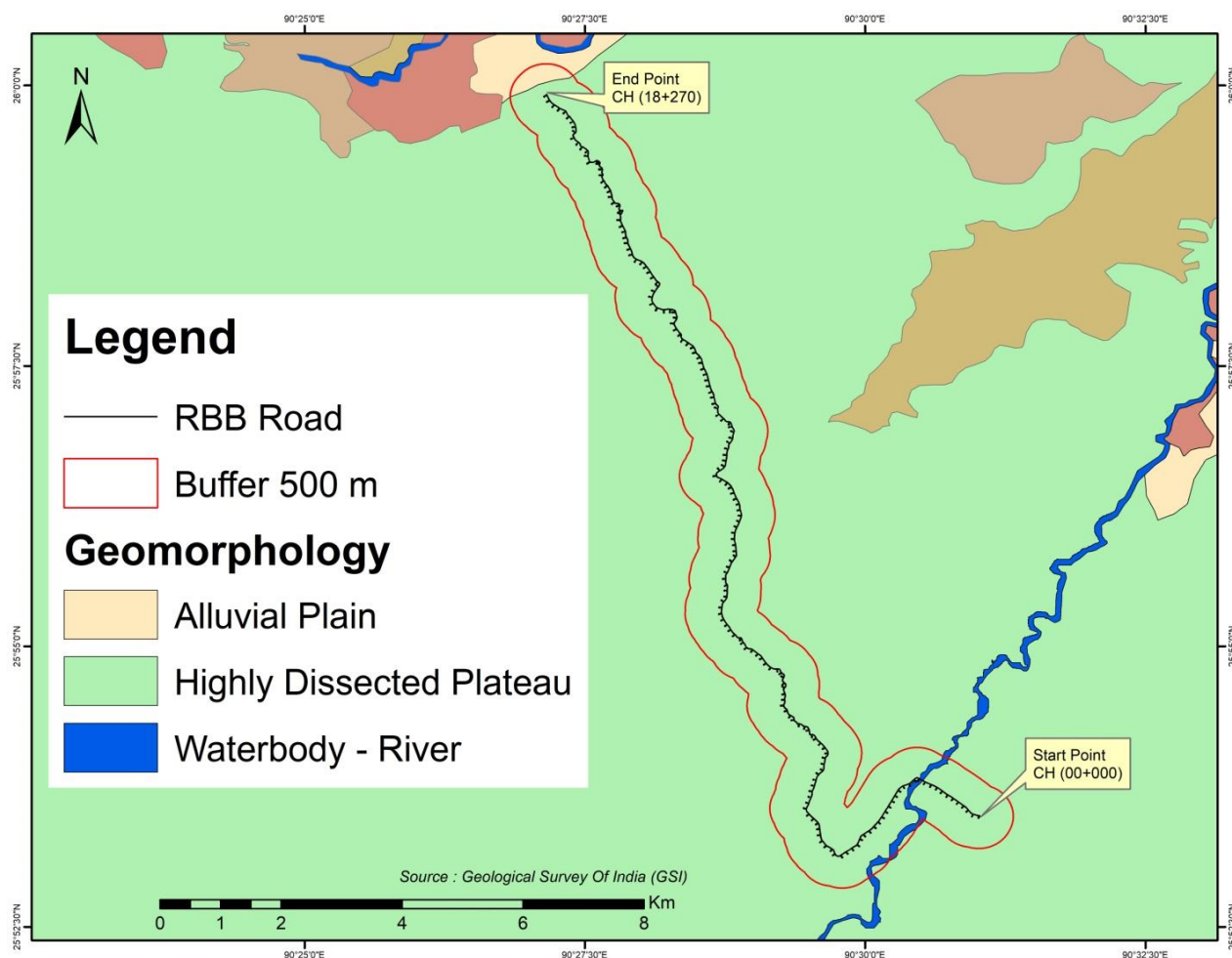


Figure 4.4: Geomorphological map of North Garo Hills district

4.3.4 LAND USE PATTERN

The LULC map⁴ of 500m reveals that the RBB stretches area comprises of 53% un-classed forest, 24% built up. The remaining 23% includes water bodies (3%), crop land (16%), and shifting cultivation areas (4%), etc. The LULC map of 500m on either side of the road is presented in **Figure 4.5** below

⁴ LULC Data source: NRSC: LULC (10 k) SIS-DP Phase-2: 2018-23

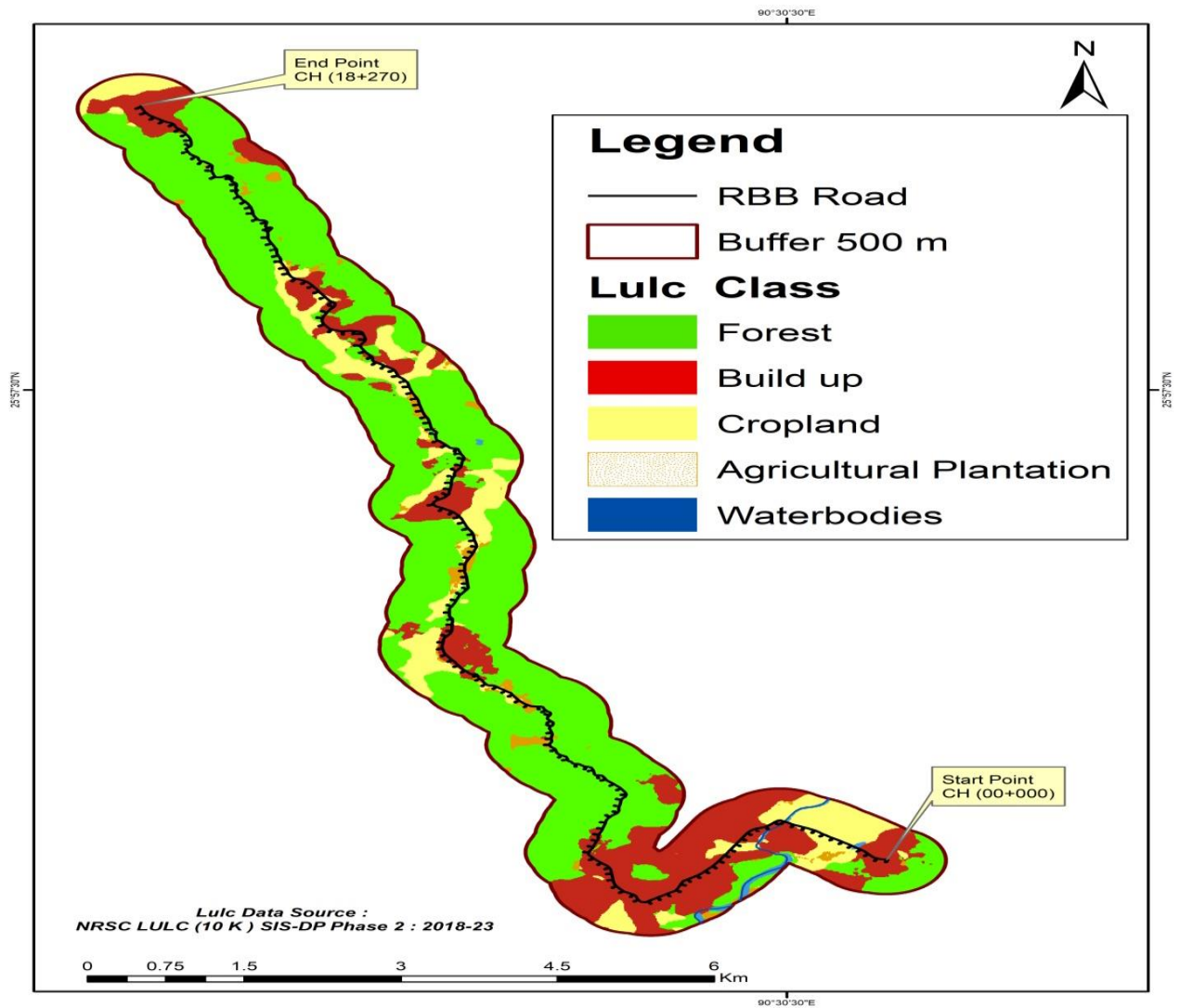


Figure 4.5: Land Use / Land Cover map of RBB road corridor

4.3.5 AGRICULTURE

Baseline Scenario in Project Corridor Area

According to the consultations that was organized with Indigenous communities, the majority of the population in the sub-project area relies on agriculture as their primary source of livelihood, with Jhum cultivation being the predominant farming practice among local communities. Key crops grown in the RBB road area include paddy, maize, sesame, 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

Details of the soil sampling locations are presented in **Table 4.5** and shown in **Figure 4.6**. The collected soil samples were analyzed for various parameters in an NABL-accredited laboratory. The soil monitoring results are presented in the **Table 4.6**.

Table 4.5: Soil Monitoring Locations

Sl. No.	Project Area	Monitoring Location	Sample Code	Geographical Coordinate	
				Latitude	Longitude
1	Corridor 3 18.27 km stretch	Bajongdoba Agriculture field	SQ1	25°54'50.20"N	90°29'9.23"E
2		Bolsong paddy field	SQ2	25°56'59.63"N	90°28'45.43"E
3		Borjhora Agriculture Field	SQ3	25°59'43.07"N	90°27'21.48"E

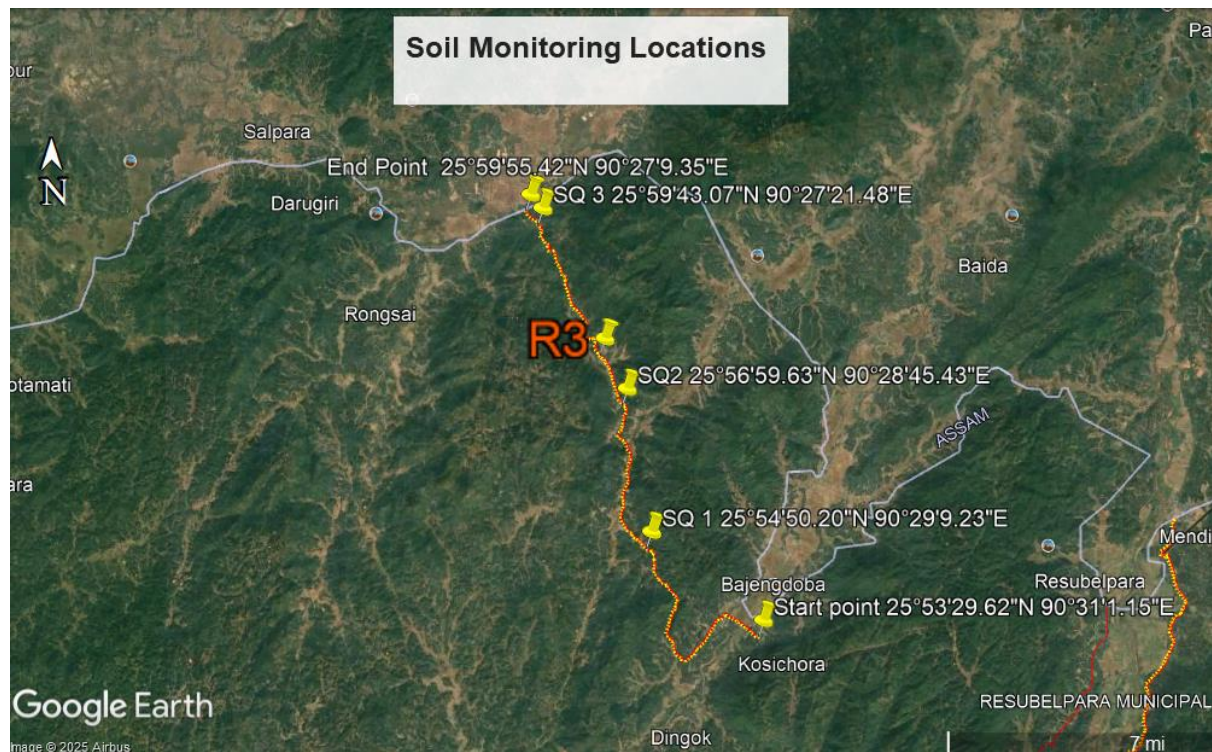


Figure 4.6: Soil monitoring locations

Table 4.6: Soil Monitoring Results in the sub-project area

Sl. No.	Parameters	Units	SQ1	SQ2	SQ3	Test Method
1	Colour		Brown	Brown	Brown	STRL/STP/SOIL/01
2	Textural Class		Sandy Loam	Sandy Loam	Sandy Loam	IS2720 (P-4),1985 (Reaff: 2015)
3	Bulk Density	gm/cm ³	1.30	1.29	1.33	IS 14765: 2000, RA 2010
4	Water Holding Capacity	%	29.4	29.6	27.8	STRL/STP/SOIL/01
5	Sand	%	54.0	53.1	59.0	IS2720 (P-4),1985 (Reaff: 2015)
6	Silt	%	27.8	25.9	22.1	IS2720 (P-4),1985 (Reaff: 2015)
7	Clay	%	18.2	21.0	18.9	IS2720 (P-4),1985 (Reaff: 2015)
8	pH (1:2 Suspension)	-	5.98	5.85	6.12	IS:2720 (P-26), 1987 (Reaff:2011)
9	Electrical Conductivity(1:2)	µmhos/cm	225.0	238.5	231.8	IS: 14767(2000), RA 201
10	Organic Matter	%W/W	3.32	3.48	3.10	STRL/STP/SOIL/01
11	Exchangeable Calcium	mg/kg	1270.0	1218.5	1195.2	IS 2720 (Part 24): 1976, RA 2010
12	Exchangeable Magnesium	mg/kg	510.4	488.2	465.6	IS 2720 (Part 24): 1976, RA 2010
13	Copper	mg/kg	10.5	9.8	11.2	IS 2720(Part-27): 1977
14	Nickel	mg/kg	7.4	8.1	9.4	IS 2720(Part-27): 1977
15	Chromium	mg/kg	10.8	9.4	9.9	IS 2720(Part-27): 1977

Sl. No.	Parameters	Units	SQ1	SQ2	SQ3	Test Method
16	Iron	mg/kg	78.5	84.6	91.2	IS 2720(Part-27): 1977
17	Lead	mg/kg	0.2	0.3	0.4	IS 2720(Part-27): 1977
18	Sulphate	mg/kg	13.2	15.1	17.5	IS 2720(Part-27): 1977
19	Nitrogen (as N)	Kg/Ha	238.0	229.4	205.8	IS:10158:1982, RA 2009
20	Phosphorous	Kg/Ha	105.6	99.8	94.2	IS:10158:1982, RA 2009
21	Exchangeable Potassium	Kg/Ha	52.4	56.8	61.5	STRL/STP/SOIL/01

Soils along the RBB Road corridor are sandy loam, well-drained and moderately acidic (pH 5.85–6.12), 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. No heavy metal contamination is observed, indicating the soil is suitable for plantation and greenbelt development.

4.4 WATER ENVIRONMENT

Water bodies in the RBB project area of 18.27 kms stretch are mainly Didram river, 01 ponds (within 50m), and 02 streams were observed during the field study. Several small perennial and seasonal streams intersect or run adjacent to the Rongsai–Borjhora–Bajengdoba (RBB) Road corridor in North Garo Hills District. These streams serve as vital sources of domestic water, livelihood support for nearby communities, and ecosystem linkages within the local drainage network. Local villages use the stream water primarily for washing, bathing, small-scale irrigation, and livestock watering, particularly during the dry months when groundwater availability is low. In some sections, community fish rearing and bamboo growth are also supported by these watercourses. The streams contribute to local groundwater recharge and wetland formation, enhancing biodiversity along riparian stretches. However, unregulated runoff from roads and nearby settlements occasionally leads to siltation and turbidity, affecting water quality and downstream use. The project design therefore emphasizes protection of natural flow channels, provision of cross-drainage structures, and controlled discharge of construction runoff to prevent any disruption or contamination of these locally significant water bodies. The below section describes the Surface and Ground water conditions in the sub-project area as well as the relevant water quality standards.

4.4.2 SURFACE WATER

02 Surface water samples have been selected from sources present along the project roads to ascertain the baseline conditions of the surface water quality. The surface water samples collected in the Month of October from the pond and river. Location details of the surface water samples are presented in **Table 4.7** and shown in **Figure 4.8**.

Table 4.7: Surface Water Monitoring Locations

S. No	Source of Sample	Sample Code	Geographical Coordinate	
			Latitude	Longitude
1	Pond	SW1	25°53'32.44"N	90°29'37.68"E

2	Dridam River	SW2	25°53'49.88"N	90°30'30.01"E
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Figure 4.7: Surface Water monitoring locations

pH values in the surface water samples were observed in the range of 7.1 to 7.6, indicating neutral to slightly alkaline nature. Dissolved Oxygen (DO) levels were found between 6.2 to 7.4 mg/L, showing adequate oxygen availability. The Biochemical Oxygen Demand (BOD) remained low, ranging from 1.8 to 3.2 mg/L, reflecting low organic pollution. Nitrate concentration was recorded between 0.6 to 1.4 mg/L, which is within permissible limits for Class C water quality. Heavy metals (such as Pb, Cd, Cr, Hg) were found below detectable limits, indicating absence of industrial contamination..

Table 4.8: Surface Water Quality Monitoring results in the project area

Sl. No.	Parameters	Unit	IS: 2296 - 1992 (Class C)	SW-1	SW-2	Test method
			Tolerance Limit			
1	pH	-	6.5 -8.5	7.21	7.20	IS: 3025(Pt-11)1983, RA. 2002
2	Temperature	°C	-	16.3	17.3	APHA 23 nd Edn.2017-2550 B
3	D.O	mg/l	Minimum -4	7.40	7.80	IS 3025(Part-38): 2006
4	BOD	mg/l	30	5.30	5.80	IS 3025(Part-44):1993, RA 2009
5	Colour	Hazen	300	5	5	IS: 3025 (Pt-4) 1983, RA 2017
6	Odour	-	-	Agreeable	Agreeable	IS: 3025(Pt-5)

Sl. No.	Parameters	Unit	IS: 2296 - 1992 (Class C)	SW-1	SW-2	Test method
			Tolerance Limit			
7	TDS	mg/l	1500	231.5	240.8	IS 3025(Part-16): 1984, RA 2006
8	TSS	mg/l	-	22.0	28.0	IS 3025(Part-17)
9	TKN	mg/l		2.2	2.8	IS: 3025(Pt-34)1988, RA. 2003
10	Ammonical Nitrogen	mg/l		0.46	0.48	IS: 3025(Pt-34)1988, RA. 2003
11	Nitrate (as NO ₃)	mg/l	50	2.1	3.3	IS: 3025(Pt-34)1988, RA. 2003
12	Free Ammonia	mg/l		<0.1	<0.1	IS: 3025(Pt-34)1988, RA. 2003
13	Chlorides (as Cl)	mg/l	600	30.2	26.8	IS 3025(Part-32): 1988
14	Sulphates (as SO ₄)	mg/l	400	31.3	25.8	IS 3025(Part-24):1986, RA 2003
15	Fluoride (as F)	mg/l	1.5	0.42	0.58	APHA 21 st Ed., 4500F(D)
16	Oil & Grease	mg/l	0.1	<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	<0.001	5530-B, C&E, APHA 23nd 2017
18.	Arsenic	mg/l	0.2	<0.1	<0.1	3110- B, APHA 23nd Ed. 2017 (AAS)
19	Mercury (as Hg)	mg/l	-	<0.001	<0.001	3110- B, APHA 23nd Ed.2017
20	Lead (as Pb)	mg/l	0.1	0.02	0.02	3110- B, APHA 23nd Ed. 2017 (AAS)
21	Cadmium (as Cd)	mg/l	0.01	0.001	0.002	3110- B, APHA 23nd Ed. 2017 (AAS)
22.	Chromium (as Cr ⁺⁶)	mg/l	0.05	0.02	0.03	IS 3025(Part-52): 200
23.	Copper (as Cu)	mg/l	1.5	0.12	0.21	3110- B, APHA 23nd Ed. 2017 (AAS)
24.	Zinc (as Zn)	mg/l	15	0.18	0.22	3110- B, APHA 23nd Ed. 2017 (AAS)
25	Selenium (as Se)	mg/l	-	<0.1	<0.1	IS: 3025 (P- 56)
26.	Anionic detergents (as MBAS)	mg/l	1.0	<0.1	<0.1	Annexure K Of IS 13428
27.	Iron (as Fe)	mg/l	50	0.43	0.36	3500-Fe- B, APHA 23nd Ed. 2017
28.	Sulphide (as H ₂ S)	mg/l	-	0.17	0.26	IS-3025 (P-29)
29.	Phosphate (as	mg/l	-	5.21	6.40	APHA 22 nd Edn.2012-4500-P C

Sl. No.	Parameters	Unit	IS: 2296 - 1992 (Class C)	SW-1	SW-2	Test method
			Tolerance Limit			
	PO ₄)					
30.	Cyanide (as CN)	mg/l	0.05	<0.1	<0.1	4500-CN-B, C & E, APHA 23rd Ed.2017
31.	Manganese (as Mn)	mg/l	-	0.03	0.04	3110- B, APHA 23rd Ed.2017
32.	COD	mg/l	-	22.2	16.4	IS 3025(Part-58): 2006
33.	Total Coli form	MPN/100ml	5000	650	1450	IS: 1622-1981

4.4.3 GROUND WATER

03 ground water samples from corridor 3 have been collected in the Month of October along the sub-project roads to ascertain the baseline conditions of the ground water quality. The sampling locations were selected based on the land-use pattern and competitive uses in the sub-project areas. Location details of the groundwater samples are presented in **Table 4.9** and shown in Figure 4.9 and results are presented in **Table 4.10**. Ground water samples have been analyzed in accordance with the Drinking Water Quality Standards of IS 10500:2012.

Table 4.9: Ground Water Sample Locations in the sub-project area

Sl. No	Project Area	Monitoring Location	Sample Code	Geographical Co-ordinates	
				Latitude	Longitude
1	Corridor 3 18.27 km stretch	GW at Bajengdoba Multi facility center	GW1	25°53'21.30"N	90°30'4.96"E
2		GW at Bolsong Kamagre Sub Center	GW2	25°57'4.60"N	90°28'42.38"E
3		GW at Gosingpita Songma U,P School and high School	GW3	25°58'1.81"N	90°28'8.15"E

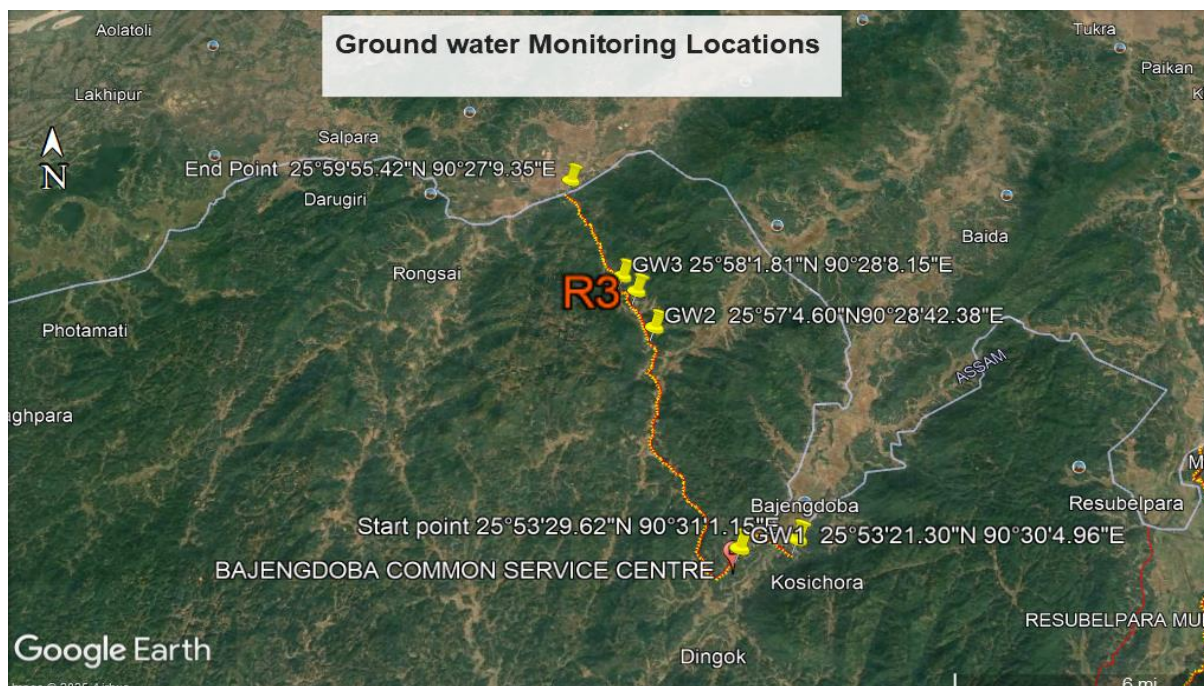


Figure 4.8: Ground Water monitoring locations

Groundwater samples GW-1, GW-2 and GW-3 were found to be clear, odourless and with acceptable taste, and turbidity remained below 1 NTU. The pH was within the desirable range (7.23–7.32). Total Hardness (121–123 mg/L), TDS (258–262 mg/L), Calcium, Magnesium, Chloride, Sulphate, and Nitrate were all well within desirable limits of IS 10500:2012. Slight Iron exceedance was observed (0.34–0.54 mg/L) compared to the desirable limit of 0.3 mg/L. All heavy metals such as Chromium, Arsenic, Aluminium, and Copper were below detectable limits, indicating no contamination from industrial or geogenic sources. Overall, the groundwater quality is suitable for drinking purposes after minimal treatment for iron removal.

Table 4.10: 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-
2	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS: 3025(Pt-
3	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	IS: 3025(Pt-
4	Turbidity	NTU	1	5	<1	<1	<1	IS 3025(Part-
5	pH	-	6.5-8.5	No Relaxation	7.25	7.32	7.23	IS: 3025(Pt-
6	Total Hardness (as CaCO ₃)	mg/l	200	600	123	121.8	122.4	IS 3025(Part-21)
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.44	0.34	0.54	3500-Fe- B,
8	Chlorides (as Cl)	mg/l	250	1000	19.8	23.1	20.4	IS 3025(Part-
9	Fluoride (as F)	mg/l	1	1.5	0.38	0.42	0.48	4500-F-(D),
10	TDS	mg/l	500	2000	258.5	261.1	262.2	IS 3025(Part-
11	Calcium (as Ca ²⁺)	mg/l	75	200	27.3	13.3	28.5	IS 3025(Part-
12	Magnesium (as Mg ²⁺)	mg/l	30	100	10.2	15.3	14.2	3500- Mg B,
13	Sulphate (as SO ₄ ²⁻)	mg/l	200	400	12.3	13.2	11.8	IS 3025(Part-

S. No.	Parameters	Unit	Limit (IS-10500:2012)		GW-1	GW-2	GW-3	Test method
			Desirable Limit	Permissible Limit				
14	Nitrate (as NO ₃)	mg/l	45	No Relaxation	14.2	8.4	9.2	IS: 3025(Pt-34)
15	Total Chromium (as Cr)	mg/l	0.05	No Relaxation	<0.01	<0.01	<0.01	3110- B, APHA 23nd
16	Alkalinity as	mg/l	200	600	141.2	126.6	138.4	IS 3025(Part-
17	Aluminium (as	mg/l	0.03	0.2	<0.01	<0.01	<0.01	IS 3025(Part-
18	Total Arsenic (as As)	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	3110- B, APHA 23nd
19	Copper (as Cu)	mg/l	0.05	1.5	<0.05	<0.05	<0.05	3110- B,
20	Manganese (as	mg/l	0.1	0.3	<0.01	<0.01	<0.01	3110- B,
21	Zinc (as Zn)	mg/l	5	15	0.22	0.16	0.22	3110- B,
22	Ammonia (as	mg/l	0.5	No Relaxation	<0.1	<0.1	<0.1	4500-NH3-B
23	Anionic	mg/l	0.2	1	<0.1	<0.1	<0.1	Annexure K of
24	Boron (as B)	mg/l	0.5	1	<0.5(BDL)	<0.5(BDL)	<0.5(BDL)	IS: 3025(Pt-
25	Mineral Oil	mg/l	0.5	No Relaxation	<0.1	<0.1	<0.1	S 3025(Part-
26	Phenolic	mg/l	0.001	0.002	<0.001	<0.001	<0.001	S 3025(Part-
27	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.002	<0.002	<0.002	3110- B,
28	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.1	<0.1	<0.1	500- CN-B, C
29	Lead	mg/l	0.01	No Relaxation	<0.01	<0.01	<0.01	3110- B,
30	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	<0.001	<0.001	3110- B,
31	Nickel (as Ni)	mg/l	0.02	No Relaxation	<0.02	<0.001	<0.001	3110- B,
32	Residual Free	mg/l	0.2	1.0	<0.2	<0.02	<0.02	4500-Cl-B,
33	Molybdenum	mg/l	<0.05	0.07	No	<0.2	<0.2	3110- B,
34	Polynuclear	mg/l	<0.0001	0.0001	No	No	No	APHA
35	Poly chlorinated	mg/l	<0.0001	0.0005	No	No	No	APHA
Microbiological Parameters								
36	Total Coli form	MPN/	Shall not be detectable in		<1	<1	<1	S: 1622-1981
37.	<u>E.Coli</u>	<u>E.Coli</u> /	Shall not be detectable in		Absent	Absent	Absent	S: 1622-1981

4.5 AIR ENVIRONMENT

4.5.1 AIR QUALITY

The Project has the potential to impact air quality, and while these impacts can be managed through mitigation measures outlined in the ESMP and adherence to good international practices, there remains a possibility of significant residual impacts

Residential and other sensitive locations proximity to roads were the criteria used for selecting the sample locations. Parameters like Particulate Matter (PM₁₀), Particulate Matter (PM_{2.5}), Sulphur dioxide (SO₂), Nitrogen dioxide (NO₂) and Carbon Monoxide (CO) were monitored. Map showing monitoring locations are given in **Table 4.12** & **Figure 4.10**.

Table 4.11: Ambient Air Quality Monitoring Locations

Sl. No.	Monitoring Location	Sample Code	Geographical Coordinate	
			Latitude	Longitude
1	Bajengdoba	AQ1	25°53'45.31"N	90°30'27.85"E
2	Bolsong	AQ2	25°57'3.08"N	90°28'41.54"E
3	Borjhora	AQ3	25°59'49.16"N	90°27'13.53"E



Figure 4.9: Air Quality monitoring locations

The Ambient Air quality results are presented in **Table 4.13**. The monitored ambient air quality along the corridor at Bajengdoba, Bolsong and Borjhora shows that PM₁₀ (43.4–46.2 µg/m³) and PM_{2.5} (18.2–21.6 µg/m³) remain well below the CPCB standards (100 µg/m³ and 60 µg/m³ respectively). Levels of SO₂ (5.9–6.4 µg/m³) and NO₂ (7.8–8.9 µg/m³) are also significantly lower than the permissible limit of 80 µg/m³, indicating minimal combustion-related emissions. CO concentrations (0.260–0.300 µg/m³) are negligible compared to the limit of 2000 µg/m³. Overall, the air quality in the project corridor is good and within National Ambient Air Quality Standards, suggesting no immediate air pollution concerns in the area.

Table 4.12: Ambient Air Quality Monitoring Results within project influence area

Sl. N o.	Proje ct Area	Location	Sample Code	Latitude (North)	Longitude (East)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	Sulphur Dioxide (SO ₂) (µg/m ³)	Nitrogen Dioxide (NO ₂) (µg/m ³)	Carbon Monoxide (CO) (µg/m ³)
1	18.27 km stretc h	Bajengd oba	A Q 1	25°53'45.3 1"N	90°30'27.85"E	46.2	21.6	6.1	8.9	0.260
2		Bolsong	A Q 2	25°57'3.08 "N	90°28'41.54"E	43.4	18.2	5.9	7.8	0.280
3		Borjhora	A Q 3	25°59'49.1 6"N	90°27'13.53"E	45.6	19.4	6.4	8.6	0.300
National Ambient Air Quality Standards, Central Pollution Control Board, 2009						100	60	80	80	2000
Test Methods						IS:51 82 (P- 23): 2006	SOP1/ STR L/ Ambi ent Air/ Gravi metri c meth od	IS:51 82 (P- 2): 2006	IS:5182 (P-6): 2006	IS:5182 (P- 10):199 , RA- 2003

4.6 NOISE ENVIRONMENT

The principal sources of construction noise and vibration anticipated during the Project include:

- Delivery and movement of staff, materials, construction plant, and machinery;
- Site preparation works, including establishment of construction camps;
- Hill cutting and excavation activities;
- Removal of existing road pavement and structures; and
- Restoration and finishing works.

Most of these activities are expected to occur in proximity to the existing road alignment. Night-time construction is not generally proposed, except under special circumstances where continuity of work is essential (e.g., critical traffic management needs or safety considerations). 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 was monitored over a period of 24 hour by the authorized NABL laboratory. The noise monitoring has been conducted in October,2025 for determination of noise levels at 03 locations for (Figure 4.11) in the direct impact area as per Table 4.14 below.

Table 4.13: Ambient Noise Monitoring Locations

S. No.	Locations	Monitoring code	Latitude	Longitude
1	Bajengdoba Market	NQ1	25°53'45.31"N	90°30'27.85"E
2	Bolsong Village	NQ2	25°57'3.08"N	90°28'41.54"E
3	Borjhora Village	NQ3	25°59'49.16"N	90°27'13.53"E

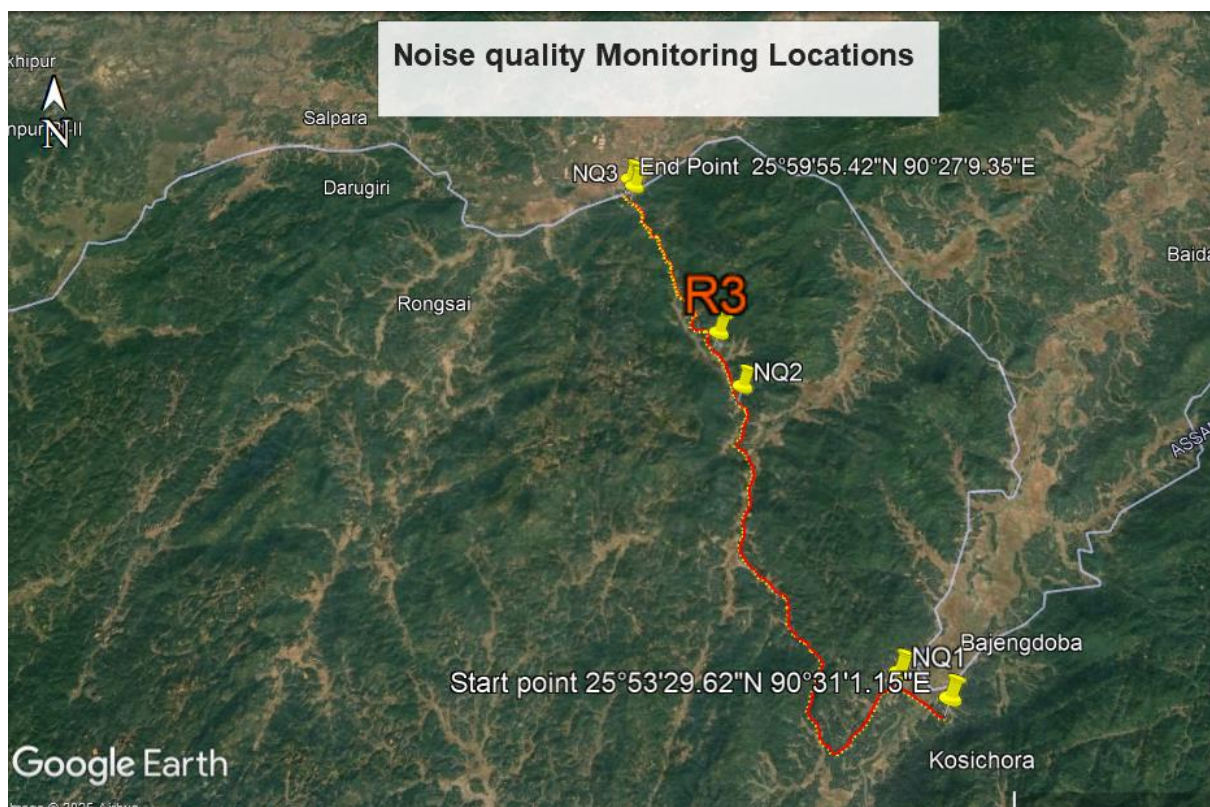


Figure 4.10: Noise quality monitoring locations

Average Ambient Noise Monitoring Results is given in **Table 4.15**.

Table 4.14: Average Ambient Noise Monitoring Results in the sub-project area (RBB Road)

Sl. No.	Location	Sample Code	Type of area	Equivalent Noise Level, Leq (Day*)	Equivalent Noise Level, Leq (Night**)	CPCB Day Limit	CPCB Night Limit
				dB (A)	dB (A)		

1	Bajengdoba Market	NQ1	Commercial	47.3	38.5	65	55
2	Bolsong Village	NQ2	Residential	42.4	34.6	55	45
3	Borjhora Village	NQ3	Residential	43.7	36.6	55	45

The monitored noise levels at all three locations are found to be well within the CPCB prescribed limits for their respective land-use categories. At Bajengdoba Market (NQ1), categorized as a commercial area, the recorded noise levels are 47.3 dB(A) during the day and 38.5 dB(A) during the night, which remain significantly lower than the commercial limits of 65 dB(A) (day) and 55 dB(A) (night). This indicates that commercial activities and vehicular movement in the market area are moderate and do not create any substantial noise disturbance.

In Bolsong (NQ2) and Borjhora (NQ3) villages, both classified as residential zones, the recorded daytime noise levels of 42.4 dB(A) and 43.7 dB(A) respectively, and nighttime levels of 34.6 dB(A) and 36.6 dB(A), are comfortably below the residential limits of 55 dB(A) (day) and 45 dB(A) (night). These results reflect a quiet rural acoustic environment where noise is limited mainly to routine household activities and occasional vehicular movement. Noise barriers are not required along the RBB road as the recorded noise levels at monitoring locations are well within the CPCB permissible limits for both day and night. The surrounding area has low traffic density and minimal sensitive receptors, ensuring no significant noise impact. Therefore, additional mitigation through barriers is not considered necessary.

Overall, the baseline acoustic environment in the study area is calm and stable, with no existing noise stress on the community. The present noise scenario does not indicate any adverse impact, and any future rise in noise, if associated with project activities, will need to be managed to maintain the current acceptable noise conditions.

4.7 BIOLOGICAL ENVIRONMENT

4.7.1 BIODIVERSITY IN NORTH GARO HILLS DISTRICT

Along the roadside, common plantation trees include Jackfruit, Arecanut, and Mango tree. In some stretches, Banana, Bamboo, and Areca Nut palms are also planted by villagers. Shrubs commonly observed include Lantana, Eupatorium, Hibiscus, Clerodendrum, and various Bamboo plants. In moist patches, ferns and thickets of Ardisia and Strobilanthes are also common. Common herbs along the roadside include grasses Mint, Wild Ginger, Turmeric, Broom grass etc.

A primary biodiversity survey was conducted during the field visit in August 2025. The survey recorded a total of 119 species of flora (comprising 68 tree species, 10 shrubs, 23 herbs, 11 ferns, and 7 grass species) and 18 species of aquatic biodiversity. In addition, 11 mammal species, 52 bird species, 19 reptile species, 2 amphibian species, 25 butterfly species, and 12 fish species were documented. The methodology adopted for biodiversity assessment is attached as **Annexure 4.1**.

Detailed list of flora, fauna, and aquatic biodiversity, along with their conservation status, is provided in **Annexure 4.2**.

During the field survey and consultations with local communities and forest department officials, no evidence of wild animal hunting was recorded within the Direct Impact area of the Project road corridor roads. However, improved connectivity after construction may increase the risk of hunting and illegal wildlife trade

In the North Garo Hills district of Meghalaya, traditional medicine remains central to primary healthcare among Garo communities, and alongside plants, animal by-products are also used for zootherapeutic remedies. While detailed, district-wide inventories are still scarce, evidence from the Garo Hills and neighboring Northeast India indicates that a variety of wild species are targeted for medicinal use and bushmeat, with pangolins and primates among the species of concern. Robust, site-level documentation from North Garo Hills is still limited, underscoring the need for focused surveys to map hunting hotspots and species affected within the district.

Given these findings, our study underscores the importance of conservation-driven infrastructure planning, ensuring that developmental activities in North Garo Hills align with ecological sustainability and biodiversity protection. The following sections provide a detailed breakdown of the biodiversity recorded, emphasizing species conservation status and the ecological significance of different taxonomic groups

4.7.2 BIODIVERSITY AND CRITICAL HABITAT IN SUB-PROJECT STRETCH PIA

The biodiversity within 10 km radius of the RBB Roads corridor-wise (refer to Section 3.3 on PIA) were studied based on the secondary sources followed by primary data collection in the direct impact area and presented in **Figure 3.2** in Chapter 3.

Project Influence Area (Within 10 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 4.16**.

Table 4.15: Biodiversity and critical habitat assessment-based on field survey and GIS analysis for the Direct Impact Area (10 km)

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	
	(ii) Reserve Forest (As notified under India Forest Act, 1927)	present	Dipkai R.F is at 2.27 Km, Ajagar Hill R.F at 3.64 km, Gandabari R.F at 5.81 km, Zengrazangsa R.F at 9.06 km in Assam from the Project Road
	(iii) Protected wetland of Meghalaya	Not Present	-
II.	b) Habitat of significant importance to Critically Endangered or Endangered species		
	(i) Species listed under Schedule I of the	Present	A total of 28 species are listed

Sl. No.	Habitat (includes natural or modified)	Observation	Remarks
	Wildlife (Protection) Act, 2022		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. Details are provided in Annexure 4.2
	(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	No threatened species were observed during the field surveys conducted within the project road corridor
	(iii) Critically Endangered/Endangered species as listed by the IUCN Red List of Threatened species	Present	Field observations confirm the presence of teak, which is categorized as Endangered according to the IUCN Red. One teak tree having girth 120 cm present within ROW but cutting may not be required.
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	
	(ii) Ramsar Site	Not present	
	(iii) Important fish & Key Biodiversity Area	Yes, present	<ul style="list-style-type: none"> • Dridam River @ chainage 1+100. • The Didram River and adjoining water bodies in North Garo Hills support a diverse freshwater fish community, including economically important species such as carps (<i>Labeo rohita</i>, <i>Catla catla</i>), barbs (<i>Puntius sophore</i>, <i>Raiamas bola</i>), and native species like the Garo Stone Loach (<i>Aborichthys garoensis</i>) and Garo Spineless Eel (<i>Garo khajurjai</i>). These species inhabit a range of environments, from fast-

Sl. No.	Habitat (includes natural or modified)	Observation	Remarks
			<p><i>flowing hill streams to rivers, ponds, and reservoirs, and are currently classified as Least Concern in terms of conservation.</i></p> <ul style="list-style-type: none"> <i>(Rec.Zool.Surv.India.72 Page 1-22 1977)</i>
	(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	Two non notified Elephant Passes were recorded at Chainage 17+100 and 17 +400 .
	(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 and Arecanut.

4.7.3 SUMMARY OF BIODIVERSITY ASSESSMENT AND RISKS

Most of the flora and fauna present within the Direct Impact Area fall under the Least Concern category as per the IUCN Red List of Threatened Species (IUCN, 2024).

A total of 28 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. This suggests that the project area or its surrounding ecological landscape may fall within the broader distribution range or potential habitat of these high-conservation-value species. Therefore, while no direct sightings were made, due consideration has been given to their possible occurrence, and appropriate mitigation and conservation measures will be planned to avoid any potential adverse impacts on these protected species.

A community land with vegetation falls within the Direct Impact Area of the project road between chainages 17+100 to 17+500. An elephant crossing (not notified) is also located within the same stretch at chainage 17+100 and 17+400. As informed by the Forest Range Officer, Elephant movement has been regularly observed along the project corridor, primarily between Waramgre village on the eastern side and the areas of Borjhora and Phokirmara towards the west. According to local information, elephants cross the road approximately seven to eight times each year, with peak activity occurring between October and March. The primary reason for their movement is foraging, as elephants travel between forest patches in search of food and water.

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, sources of livelihood, and income levels of the affected families.

The proposed project site is located in the North Garo Hills District of Meghalaya. Established in 2012 from the erstwhile East Garo Hills, the district covers an area of approximately 1,113 sq. km, with its administrative headquarters at Resubelpara. It shares boundaries with Assam to the north and east, East Garo Hills district to the south, and West Garo Hills district to the west.

Government and Administration: North Garo Hills is administered under the Government of Meghalaya and operates in accordance with the provisions of the Sixth Schedule of the Indian Constitution. This empowers the Garo Hills Autonomous District Council (GHADC) to manage matters related to land, forests, and customary practices, while law enforcement and other major state functions remain under the purview of the Meghalaya Government. The district is divided into five Community and Rural Development (C&RD) Blocks, including Resubelpara, Bajengdoba, and Kharkutta. The administrative headquarters is located at Resubelpara, which also serves as the main center for governance and coordination of developmental activities.

4.8.1 SOCIO-ECONOMIC PROFILE OF THE PROJECT ROADS

The socio-economic details of the RBB Road are discussed below. The methodology for data collection is detailed in section 1.3 of chapter 1.

4.8.2 DEMOGRAPHY

4.8.2.1 POPULATION

The project corridor passes through 6 villages namely Bakenang Songma, Bajengdoba (Upper Bajengdoba), Mansinggre, Gosingpita, Bolsong, and Borjhora (Borjhora). Based on the population size, it may be mentioned that smaller rural settlements such as Bakenang Songma (176), which have relatively lower populations. Overall, the gender distribution is generally balanced; however, certain settlements such as Bajengdoba (Upper Bajengdoba) and Gosingpita have a higher female-to-male ratio. Larger settlements like Gosingpita (736) and Upper Bajengdoba (501) play a key role in shaping the region's demographic profile, highlighting variations in population density along the corridor. The population distribution of the sub-project affected villages is presented in **Table 4.17**.

Table 4.16: Population distribution of the sub-project affected villages

Village Name	Total Population		
	Male	Female	Total
Bakenang Songma	92	84	176
Bajengdoba (Upper Bajengdoba)	248	253	501
Mansinggre	147	145	292
Gosingpita	361	375	736
Bolsong	155	146	301
Borjhora (Borjhora)	191	162	353

Source: Census 2011

4.8.2.2 SEX RATIO

The sex ratio across the project-affected villages shows notable variation according to Census 2011. Gosingpita (1,038) and Upper Bajengdoba (1,020), indicating a higher proportion of females. Mansinggre (986) and Bakenang Songma (913) reflect near-balanced ratios, though slightly skewed towards males. Bolsong (941) also shows a relatively lower female proportion, while Borjhora, with a sex ratio of 848, has the lowest among the listed villages. Overall, the sex ratio ranges from 848 to 1,123, reflecting significant inter-village differences.

in gender balance. Detailed sex ratio data for the project-affected villages and two towns are presented in **Table 4.18**.

Table 4.17: Sex ratio in the villages along the sub-project road

Sl. No.	Village Name	Sex Ratio
1.	Bakenang Songma	913
2.	Bajengdoba (Upper Bajengdoba)	1020
3.	Mansinggre	986
4.	Gosingpita	1038
5.	Bolsong	941
6.	Borjhora(Borjhora)	848

Source: Census 2011

4.8.2.3 SCHEDULED TRIBE POPULATION

The district is predominantly inhabited by Scheduled Tribe (ST) communities. Along the project road corridor, ST populations are mainly concentrated in smaller rural settlements. Gosingpita (717) and Upper Bajengdoba (495) record the highest ST populations, underscoring their demographic significance within the corridor. Medium-sized settlements such as Borjhara (353) and Bolsong (301) also exhibit a notable ST presence, while smaller village like Bakenang Songma (173) have comparatively lower ST populations. Gender distribution is generally balanced across the villages; however, some locations such as Upper Bajengdoba (249 females), Gosingpita (365 females), and Salinggre (89 females) have a slightly higher number of females than males. A detailed distribution of the ST population along the project corridor is provided in **Table 4.19**.

Table 4.18: Population distribution of the sub-project affected villages

Sl. No.	Village Name	ST Population			
		Male	Female	Total	Percentage
1.	Bakenang Songma	91	82	173	98.2
2.	Bajengdoba (Upper Bajengdoba)	246	249	495	98.80
3.	Mansinggre	147	144	291	99.66
4.	Gosingpita	352	365	717	97.42
5.	Bolsong	155	146	301	100.00
6.	Borjhora(Borjhora)	191	162	353	100.00

Source: Census 2011

4.8.2.4 WORKFORCE POPULATION

The workforce distribution in the project corridor indicates that rural settlements like Gosingpita (292 workers) and Upper Bajengdoba (130 workers) serve as key economic centers. Notably, Mansinggre demonstrates strong female workforce participation, with 58 out of 112 workers being women. The detailed workforce of the project affected villages is given in **Table 4.20**.

Table 4.19: Workforce Population in the Project road corridor area

Area	Main Workers (No.)			Marginal Workers (No.)			Total Workforce (No.)			Percentage
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
Bakenang Songma	17	5	22	0	0	0	17	5	22	12.50
Bajengdoba (Upper Bajengdoba)	77	42	119	5	6	11	82	48	130	25.95
Mansinggre	50	12	62	4	46	50	54	58	112	38.36

Area	Main Workers (No.)			Marginal Workers (No.)			Total Workforce (No.)			Percentage
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
Gosingpita	149	19	168	7	117	124	156	136	292	39.67
Bolsong	54	9	63	2	23	25	56	32	88	29.24
Borjhora	85	8	93	3	2	5	88	10	98	27.76

Source: Census 2011

4.8.3 EDUCATION

In Corridor 3, literacy levels vary across the villages. Bakenang Songma has a total literate population of 157, with 82 males and 75 females. Upper Bajengdoba shows higher literacy, with 413 literates comprising 203 males and 210 females. Mansinggre has 161 literates, including 91 males and 70 females, while Gosingpita leads with 470 literates, consisting of 250 males and 220 females. Bolsong records 249 literates, including 129 males and 120 females, and Borjhora has 273 literate individuals, comprising 148 males and 125 females. Overall, Gosingpita and Upper Bajengdoba exhibit the highest literacy levels, whereas Salinggre has the lowest.

The detailed distribution of literate and illiterate populations in the sub-project affected villages is provided in **Tables 4.21**.

Table 4.20: Literate Population in the Project road corridor area

Sl. No.	Literate Population				
	Village Name	Male	Female	Total	Percentage
1.	Bakenang Songma	82	75	157	89.20
2.	Bajengdoba (Upper Bajengdoba)	203	210	413	82.44
3.	Mansinggre	91	70	161	55.14
4.	Gosingpita	250	220	470	63.86
5.	Bolsong	129	120	249	82.72
6.	Borjhora	148	125	273	77.34

Source: Census 2011

4.8.4 WAGES AND BENEFITS

Public consultations with local communities revealed that wages in the project area are lower than in urban centers, and workers often do not receive benefits such as healthcare, pensions, or paid leave. According to the Department of Rural Development (2023–24), the notified wage rate for unskilled labor in these corridors is Rs. 541, as per the latest Meghalaya notification effective from 1 April 2025 (dated 21st July 2025). While the lower cost of living partially offsets these lower wages, achieving financial stability remains a challenge for many workers.

4.8.5 SEASONAL EMPLOYMENT

Along the RBB road, the settlement area has recently gained popularity as a tourist destination. However, during the off-season, tourism-related employment declines, resulting in temporary job losses. A significant portion of the population depends on agriculture and allied activities. As most employment opportunities are

seasonal, many workers experience periods of unemployment or underemployment outside peak farming seasons, which affects their income stability and financial security.

4.8.6 POVERTY

In Corridor-3, poverty rates are higher in rural areas compared to urban centers. Households in remote villages, where road connectivity is still developing, largely depend on subsistence farming. Limited access to markets, credit, and financial services further constrains their economic opportunities, contributing to the higher prevalence of poverty in these areas.

4.8.7 SOCIAL VULNERABILITIES

4.8.7.1 MIGRATION

Consultations with villagers indicate that residents prefer to remain within their local areas, primarily engaging in agriculture and commercial activities within their villages. Migration to other locations is uncommon, as most people choose to sustain their livelihoods locally.

4.8.7.2 CRIME

In Corridor 3, most disputes in the villages are resolved locally through traditional mechanisms, with the Nokma (village headman) playing a central role in dispute resolution. Only cases that cannot be settled at the community level or require legal intervention are escalated to and officially recorded by the police. **Table 4.22** presents the major crime cases registered at Bajengdoba Police Station over the years. During consultations with police officials, it was reported that crime levels in Corridor 3 are very low, and no specific crime-related data was shared.

Year/ Major crime	Crime against property	Robbery	Theft	Murder	Kidnapping	Others	Total cases Register
2019	9	0.5	8	0.5	2.5	16.5	37
2020	3.5	0	2	2.5	1.5	13.5	23
2021	2.5	0	2	1	2	11	18.5
2022	1.5	0	0	0	0.5	3.5	5.5
2023	1	0	0	1	1	10	13
2024	1	0.5	0	1	1	9.5	13

Source : Field Survey

4.8.7.3 GENDER BASED VIOLENCE

According to records from the Bajengdoba Police Station, no general Gender-Based Violence (GBV) cases have been reported in Corridor 3, indicating a relatively safe environment for women. However, two kidnapping cases involving women were recorded in 2023 and June 2024, highlighting isolated incidents that require attention. Additionally, cases under the Protection of Children from Sexual Offences (POCSO) Act have been registered over the years, including two cases in 2010 and single cases in 2019, 2022, 2023, and 2024. Consultations in Corridor 3 revealed that no such cases were reported in the current year.

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 land, structures, and

livelihoods. A structured, pretested questionnaire was used as the primary tool for conducting these surveys. The survey has been conducted in September 2025.

4.9.1 DEMOGRAPHY

The total number of project-affected households is 150. The Table 4.23 below summarizes the gender distribution of the head of the Household. In Corridor 3, out of 150 individuals in term of structure, 107 are male (71.3%) and 43 are female (28.7%), showing a clear male predominance.

Table 4.22: Gender Distribution of PAHs

Gender	Corridor 3	Percentage
Male	107	47.3
Female	43	28.7
Total	150	100

4.9.1.1 GENDER DISTRIBUTION OF PROJECT-AFFECTED PERSONS

Out of a total of 262 Project Affected Persons (PAPs), 136 are male (51.90%) and 126 are female (48.09%), indicating an almost equal distribution between male and female beneficiaries. Gender Distribution of Project-Affected Persons (PAPs) is given in Table 4.24.

Table 4.23: Gender Distribution of Project-Affected Persons (PAPs)

	Project Affected Persons	Percentage
Male	136	51.90
Female	126	48.09
Total	262	100

4.9.1.2 ETHNICITY

The detailed distribution of ethnic groups in corridor wise is given in Table 4.25 below. In Corridor 3, a total of 150 individuals belong to different communities. The majority are Garo (120 persons, 77.86%), followed by Rabha (14 persons, 10.69%), Muslims (12 persons, 9.16%), and Others (4 persons, 2.29%).

Table 4.24: Community Wise Distribution of PAHs

Communities	Corridor 3	Percentage
Garo	120	77.86
Rabha	14	10.69
Muslim	12	9.16
Others	4	2.29
Total	150	100

4.9.2 IMPACT TO VULNERABLE HOUSEHOLDS

Census and Socio-economic survey will identify vulnerable group of households which included women-headed households, below-poverty-line, physically disabled, and elderly population (60+ years). Table 4.26 below describes the distribution pattern of vulnerable group in the study area.

Table 4.25: Distribution of Vulnerable Group

Vulnerable Category	PAHs	Percentage
Schedule Tribe	150	100
Aged persons above 60 years	14	9.3

Below Poverty Line	0	0
Woman Headed Household	28	18.7
Other Backward Classes	0	0
Physically Challenged	0	0

4.9.3 ECONOMIC PROFILE

EMPLOYMENT PATTERNS

4.9.3.1 PRIVATE BUSINESS/ ENTREPRENEURSHIP DOMINANCE

Among the 150 Project Affected Households (PAHs), the majority (110) are engaged in private business, while 16 depend on agriculture and another 16 fall under non-working category. Only 8 households are involved in government or private service. Details are provided in **Table 4.27**.

Table 4.26: Occupation pattern of PAHs in sub-project area

Sl. No.	Occupation	PAHs
1	Agriculture	16
2	Private Business	110
3	Service (Govt./Pvt.)	8
4	Others (Non-Working)	16
Total		150

4.9.3.2 INCOME

In Corridor 3, none of the households fall in the annual income range below ₹50,000. A majority of 82 households (54.7%) earn between ₹50,000 and ₹1,00,000 annually, while 68 households (45.3%) have an income of more than ₹1,00,000, indicating relatively higher income levels among the affected families. Details are provided in **Table 4.28**.

Table 4.27: Annual Income Range of PAHs

Sl. No.	Annual Income Range of HH	Corridor 3	
		No. of PAHs	Percentage
1	less than 25000	0	0
2	25000- 50000	0	0
3	50000-100000	82	54.7
4	More than 100000	68	45.3
Total		150	100

4.9.4 EDUCATION

In Corridor 3, out of a total population of 262 persons, education levels show a balanced distribution across genders. The majority have studied up to high school (147 persons), followed by 37 with primary education and 25 with higher secondary education. A smaller group of 11 individuals are graduates or above, while 10 are illiterate. Overall, male (133) and female (129) participation across education levels is nearly equal. Details are provided in **Table 4.29**.

Table 4.28: Education Level of PAPs

Sl. No	Education	Corridor 3
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		Male	Female	Total
1	Children below 6 years	17	15	32
2	Primary (Class 1 to 4)	18	19	37
3	High School (Class 5-10)	75	72	147
4	Higher Secondary (Class 11-12)	13	12	25
5	Graduate and above	6	5	11
6	Illiterate	4	6	10
	Total	133	129	262

4.9.5 HEALTH STATUS

The predominant waterborne diseases in the study area include diarrhea, typhoid, and cholera, which pose significant health risks, particularly in regions with limited access to clean water and healthcare services as per public consultation with KII (Table 7.1). Poor sanitation and contaminated water sources further contribute to illnesses such as hepatitis A and typhoid fever. In addition, communicable diseases like dengue fever and respiratory infections continue to be prevalent concerns in the area (Table 7.1).

As per community consultation, RBB settlements have made significant progress in sanitation. However, some households still lack access to well-constructed toilets with proper sewage disposal systems. The absence of public toilets and washrooms remains a critical issue, especially for individuals working in open or shared spaces.

Bajengdoba PHC serves as the primary healthcare facility, supported by Resubelpara CHC within the Project Influence Area (PIA),

4.9.6 IMPACT TO STRUCTURES

The project corridor wise details of the impacted structures are given in below **Table 4.30**. Chainage wise details are provided in **Annexure 4.3**.

Table 4.29: Type of Impact on Project Affected Household

Type of Impacts	Corridor 3	%
Residential (Major)	0	0
Commercial (Major)	20	13.3
Res. Cum Commercial. (Major)	8	5.4
Other Minor Structures (Tin sheds, boundary walls)	20	13.3
Temporary Encroachment (temporary kiosks)	102	68
Total	150	100

4.9.7 LOSS OF TREES

Approximately 28 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).

4.9.8 COMMON PROPERTY RESOURCES




The Common Property Resources (CPR) assessment classifies structures into two categories: government facilities and community/public facilities. Government structures, comprising 14 minor structures such as compound walls (CWs) of government buildings, schools, and community halls, are situated away from the proposed ROW. Since they are outside the direct influence zone, no adverse impacts are anticipated. A summary of CPRs is provided in **Table 4.31**.




Table 4.30: Common Property Resources located within 50 m of the ROW





Sl. No.	Type of CPR Structures	Chainage	Distance from the PROW	Impact and mitigation Measures
1.	Bajengdoba PHC	Ch.01+400	50 m RHS	No direct impact; design speed reduced to 20 km/h with improved signage to enhance road safety.
2.	Post office	Ch.01+900	17 m RHS	
3.	Assistant Executive Engineer Office	Ch.02+300	50 m from center line LHS	
4.	PWD Roads Transit Rest House	Ch.02+400	50 m from center line LHS	
5.	Hostel	Ch.02+662	30 m from center line RHS	
6.	LP School	Ch.02+200	20 m from Center line LHS	No direct impact; design speed reduced to 20 km/h with improved signage to enhance road safety. Speed restriction signs before and after school (Both side of the school)
7.	LP School	Ch.03+200	20 m RHS	
8.	LP School	Ch.03+540	30 m from Centre line RHS	
9.	SSA School	Ch 10+200	20 m LHS	
10.	Church	Ch 10+400	6 m RHS	No direct impact; design speed reduced to 20 km/h with improved signage to enhance road safety.
11.	Community Hall	Ch 10+500	30 m from Centre line RHS	
12.	Church	Ch 02+914	30 m from Centre line RHS	
13.	Holy Family House	Ch 02+557	20 m from center line LHS	
14.	Bajendoba Baptist Church	Ch 1+800	50 m RHS	





An illustrative view of the CPRs / Other important locations, along with their respective distances from the centerline, is presented in **Figure 4.12** below.


Ch No.	LHS/RHS with distances	Structure / Details	Geo tagged photos
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Ch No.	LHS/RHS with distances	Structure / Details	Geo tagged photos
00+000	-	Starting Point Traffic congested conditions. T- junction improvement is proposed. Details are given in Table 6.2.	
18+300	-	End Point	
02+200	LHS at 20 m distance from Center line	School	

Ch No.	LHS/RHS with distances	Structure / Details	Geo tagged photos
00+188	LHS at 24 m distance from Center line	Community Storage Shade	 <p>Latitude: 25.892233 Longitude: 90.618285 Elevation: 89.6±3.87 m Accuracy: 6.627 m Time: 23-08-2025 12:01 Note: RBB</p>
01+400	RHS at 50 m distance from Center line	Bajengdoba PHC	 <p>Latitude: 25.896321 Longitude: 90.504724 Elevation: 81.7±1.12 m Accuracy: 9.652 m Time: 23-08-2025 12:24 Note: RBB</p>
1+800	RHS at 50 m distance from Center line	Bajendoba Baptist Church	 <p>Latitude: 25°53'31" Longitude: 90°30'10" Elevation: 44.82±53.9 m Accuracy: 13.14 m</p>

Ch No.	LHS/RHS with distances	Structure / Details	Geo tagged photos
01+900	RHS at 17 m distance from Center line	Post office	 <p>Latitude: 25.896331 Longitude: 90.50476 Elevation: 81.71±1.02 m Accuracy: 9.098 m Time: 23-08-2025 12:24 Note: RBB</p>
03+200	RHS at 20 m distance from Center line	School	 <p>Latitude: 25.889913 Longitude: 90.501127 Elevation: 81.52±17.4 m Accuracy: 10.1 m Time: 23-08-2025 12:31 Note: RBB</p>
02+300	LHS at 50 m from center line	Assistant Executive Engineer Office	 <p>Latitude: 25.883087 Longitude: 90.500689 Elevation: 85.07±2.5 m Accuracy: 41.78 m Time: 23-08-2025 12:33 Note: RBB</p>
02+400	LHS at 50 m distance from center line	PWD Roads Transit Rest House	 <p>Latitude: 25.888729 Longitude: 90.499692 Elevation: 82.93±4.52 m Accuracy: 3.79 m Time: 23-08-2025 12:35 Note: RBB</p>

Ch No.	LHS/RHS with distances	Structure / Details	Geo tagged photos
02+557	LHS at 20 m distance from center line	Holy Family House	 <p>Latitude: 25.887351 Longitude: 90.498852 Elevation: 86.03443 m Accuracy: 4.255 m Time: 23-08-2025 12:36 Note: RBB</p> <p>Powered by NoteCam</p>
02+662	RHS at 30 m distance from center line	Hostel	 <p>Latitude: 25.886883 Longitude: 90.498205 Elevation: 72.04735 m Accuracy: 6.167 m Time: 25-08-2025 12:37 Note: RBB</p> <p>Powered by NoteCam</p>
02+914	LHS at 30 m distance from center line	Church	 <p>Latitude: 25.885507 Longitude: 90.496203 Elevation: 88.441297 m Accuracy: 3.79 m Time: 25-08-2025 12:39 Note: RBB</p> <p>Powered by NoteCam</p>
10+500	RHS at 30 m distance from Centre line	Community Hall	 <p>Latitude: 25.942622 Longitude: 90.478026 Elevation: 73.554394 m Accuracy: 4.056 m Time: 23-08-2025 13:26 Note: RBB</p> <p>Powered by NoteCam</p>

Ch No.	LHS/RHS with distances	Structure / Details	Geo tagged photos
03+540	RHS at 30 m distance from Centre line	School	
01+765	RHS	Paddy Field	
10+200	LHS at 20 m from the Center line	SSA School	




Ch No.	LHS/RHS with distances	Structure / Details	Geo tagged photos
10+400	RHS at 6 m from the center line	Church	 <p>Latitude: 25.941427 Longitude: 90.478723 Altitude: 20.76±2.5 m Accuracy: 3.881 m Time: 22-09-2025 12:40 Note: RBB 10+400 C.L 4.8 m</p> <p>Powered by NoteCam</p>
17+080	LHS	Elephant Passing	 <p>Latitude: 25.941427 Longitude: 90.478723 Altitude: 20.76±2.5 m Accuracy: 3.881 m Time: 22-09-2025 12:40 Note: RBB 10+400 C.L 4.8 m</p> <p>Powered by NoteCam</p>
17+100 to 17+500	—	Community land with vegetation	 <p>Latitude: 25.894384 Longitude: 90.491955 Altitude: 39.67±8.68 m Accuracy: 5.582 m Time: 25-08-2025 12:47 Note: RBB</p> <p>Powered by NoteCam</p>

Figure 4.11: Illustrative view of the road features in Corridor 3

4.10 HAZARD AND VULNERABILITY PROFILE

The Hazard and Vulnerability profile of the RBB Road area and North Garo Hills district includes landslide hazards, flash flood, earthquake, etc. The drought, group clash, fire incidents, etc. also occur in the district. The seasonal hazard analysis of the North Garo Hills District⁵ is given in **Table 4.32** below.

Table 4.31: Hazard analysis

Type of	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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⁵ District Disaster Management Plan for Meghalaya, 2024

Hazards												
Landslide			←	---	---	---	---	---	---	---	→	
Earthquake	←	---	---	---	---	---	---	---	---	---	---	→
Flashflood		←	---	---	---	---	---	---	---	---	→	
Storm			←	---	---	---	---	---	---	---	→	
Fire Accident	←	---	---	---	---	---	---	---	---	---	---	→
River Erosion				←	---	---	---	---	---	---	→	
Industrial Hazard	←	---	---	---	---	---	---	---	---	---	---	→
Road Accident	←	---	---	---	---	---	---	---	---	---	---	→

4.10.1 EARTHQUAKE ZONES

The project road stretches fall under Zone – V, which is at Very High risk and intensity is IX. Seismic Zone details of North Garo Hills is presented in **Table 4.33**.

Table 4.32: Seismic Zone details of North Garo Hills

District	Seismic Zone	Notable Faults	Recent Earthquakes
North Garo Hills	Zone V (lower)	Internal faults like Dudhani, Darugiri	—

4.10.2 VULNERABILITY STATUS OF PROJECT

An assessment was done based on the number of occurrences through satellite image processing Science Research, Landslides, (2022), Meghalaya SAPCC. Based on this assessment list of various hazards and vulnerability status along the RBB Road are given below.

1. High Vulnerability:

Roads in hilly areas, particularly other district road and its connecting roads, are highly vulnerable to landslides and debris slides during extreme rainfall events. Lack of proper drainage system exacerbates waterlogging, leading to structural damage. Along the project stretch, issues of water accumulation and submergence are observed at multiple locations. On the project road, At chainage 0+300, the area experiences submergence during the monsoon, while at 0+600, waterlogging is reported. Further, between chainage 1+300 and 1+600, recurring submergence is noted during the monsoon season, particularly pronounced near chainage 1+350 to 1+600.

2. Moderate Vulnerability:

Temperature fluctuations and high wind velocity contribute to gradual deterioration of road surfaces, especially asphalt roads. Over time, these conditions increase maintenance costs. Riverbank erosion is a significant concern along the stretch. At chainage 8+600, soil erosion is observed on the left-hand side (LHS) of the river. Further downstream, riverbank erosion is also noted at chainage 9+200 and 9+950, indicating recurring instability along this section of the river.

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 18.27 km priority roads in Corridor 3. This chapter analyzes the potential impacts arising from the implementation of project activities. The impacts differ in type, nature, magnitude, extent, timing, duration, certainty, and reversibility.

The assessment takes into account the nature of the project, the scope of activities, and the potential magnitude of impacts across different environmental and social components, namely:

- **Physical Environment:** air quality, water resources, noise levels, and soil
- **Biological Environment:** flora and fauna
- **Socio-economic Components:** property removal, land acquisition, ASI-protected sites, and influx of labor

5.2 IMPACTS IDENTIFICATION AND EVALUATION

The potential impacts were identified in three main steps:

1. Identification of project activities/aspects causing impacts;
2. Establishing affected environmental and social components (valued receptors). These were determined to 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. Determining potential environmental and social impacts in an impact Identification Matrix

Based on the understanding of the project information as outlined in chapter 3 and baseline environmental conditions detailed in chapter 4, the anticipated impacts of the MLCIP project are identified and discussed in the subsequent sections. The potential environmental and social impacts (both adverse and positive) of the MLCIP project activities during the Design, Construction and Operational Phases were identified and evaluated through the Leopold Matrix, where the interactions between relevant project activities and the natural/physical environmental components and the social components were considered to determine whether or not the interaction may create 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.

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	LN	N	N	LN
Labour Camp Siting & Mobilization	ESS1, ESS2, ESS4	MN	MN	MN	N	Low	MN	MN	N	MN	LN	N
Site identification for construction plants, quarrying, material storage	ESS2, ESS3, ESS4, ESS6	HN	HN	HN	MN	HN	HN	HN	MN	HN	HN	HN
Construction Phase												
Earthworks (Excavation, Filling)	ESS1, ESS3, ESS4	MN	HN	MN	HN	MN	MN	LN	LN	MN	MN	MN
Grading, Levelling and Surface laying	ESS2, ESS3, ESS4	HN	HN	MN	MP (Improved Stability)	MN	MN	LN	LN	MN	MN	MN
Drainage & Culvert Installation	ESS3, ESS4	N	LN	MP (Improved Drainage)	MP (Improved Stability)	LP	LP	LP	N	N	MP	LP
Slope Stabilization & Bioengineering	ESS3, ESS4, ESS6	N	N	LN	MP (Improved Slope Stability)	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, Labour Camps	ESS2, ESS3	MN	MN	MN	MN	LN	MN	LN	N	MN	LN	LN
Operational Phase												
Operational Traffic Flow	ESS4, ESS10	LN	LN	LN	LN	LN	MP (Improved Access to Health Services)	MP(Improved Connectivity)	LN	LN	MP (Improved Drainage)	MP (Improved Road Safety)
Transportation of Hazardous Materials	ESS4	MN	LN	LN	LN	MN	HN	HN	MN	HN	MN	HN
Compensatory	ESS6	HP	N	MP	MP	HP	MP	MP	LP	N	MP	HP

Plantation												
Monitoring & Community Engagement	ESS10	-	—	—	—	—	MP	MP	N	N	N	LP

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

Interpretation of Impact Assessment Matrix

The **Table 5.1** presents the environmental and social significance ratings of various project activities during the pre-construction, construction, and operational phases of the RBB Road sub-project.

Pre-Construction Phase

Activities such as site clearance, tree felling, and utility relocation (ESS1, ESS6, ESS8) are assessed as having moderate to minor (MN–LN) environmental and social impacts due to localized vegetation removal and possible disturbance to cultural or community assets. Labour camp siting and mobilization (ESS1, ESS2, ESS4) exhibit moderate risks, primarily associated with worker welfare, land use conflicts, and sanitation. Identification of sites for construction plants, quarrying, and material storage (ESS2, ESS3, ESS4, ESS6) represents a high-risk (HN) activity, as it can significantly affect land stability, noise, dust, and habitat quality if not properly managed.

Construction Phase

The earthworks, grading, and surface laying (ESS1–ESS4) have moderate to high impacts (MN–HN) due to soil disturbance, erosion, dust generation, and safety concerns, although they also produce positive impacts (MP) through improved slope stability and road quality. Drainage and culvert installation and slope stabilization with bioengineering (ESS3, ESS4, ESS6) are considered moderately positive (MP) activities, improving overall stability and flood resilience of the corridor. Construction water usage, waste generation, and fuel handling have low to moderate impacts, mainly localized and temporary in nature. Health and safety measures and OHS implementation (ESS2, ESS4) result in high positive impacts (HP) by improving worker welfare and reducing accident risks. Decommissioning of construction sites and labour camps carries minor to moderate residual impacts, which can be mitigated through site restoration and waste clearance.

Operational Phase

During operation, the road will yield several positive outcomes, including improved connectivity, access to health and education services, better drainage, and enhanced road safety (ESS4, ESS10). Compensatory plantation under ESS6 contributes high positive (HP) environmental benefits, supporting biodiversity restoration and slope stabilization. Finally, monitoring and community engagement (ESS10) ensure long-term sustainability and social inclusion, producing moderate to low positive impacts through participatory oversight and grievance redress.

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 Rongsai–Borjhora–Bajengdoba (RBB) Road. While most construction activities are proposed within the existing Right of Way (RoW), minor land requirement at specific locations for curve correction, embankment raising, drainage improvement, and slope protection.

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 28 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 177 electric poles, 7 transformers, and 70 electric line crossings have been identified along the RBB corridor for relocation—of which 71 poles are located on the Left-Hand Side (LHS) and 107 poles on the Right-Hand Side (RHS). Additionally, 91 Optical Fiber Cable (OFC) pillars will require shifting, comprising 66 on the LHS and 25 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 RBB corridor passes mostly through agricultural and open forest areas, there are patches of community forest, streams, and ecologically sensitive slopes 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 streams or forest patches.
- 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 RBB project area comprises an existing road that traverses through hill, rolling, and plain terrain. The land use along the road stretches is primarily agricultural, interspersed with dense vegetation and areas of shifting cultivation. The proposed improvement will follow the same alignment, upgrading the existing single/intermediate lane to an intermediate lane with paved shoulders, along with 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 Rongsai–Borjhora–Bajengdoba (RBB) Road traverses gently undulating terrain with elevations ranging from 100 m to 300 m amsl, where only minor cutting and filling are required to achieve the desired formation level. The total estimated cut quantity is 1,01,540.6 m³ and fill quantity is 25,506.16 m³, resulting in a surplus of approximately 76,034 m³ of excavated material to be disposed of at MPWD-designated sites. No major hill cutting is involved, though embankment raising is proposed in low-lying and flood-prone stretches about 300 mm at chainage 0+600 and 250 mm at chainage 1+300, with a drain-cum-footpath proposed between chainage 1+350 and 1+600 to prevent waterlogging and seasonal submergence. These works are aimed at improving drainage efficiency, slope stability, and road durability.

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:

- Engineering and bioengineering controls such as retaining walls, gabion works, toe walls, and river training structures (notably at chainages 8+600, 9+100, 9+200, and 9+950) to stabilize slopes and prevent erosion.
- Proper drainage management at waterlogged and flood-prone locations (CH 0+300, 0+600, 1+300, 1+350–1+600) through new bridges, culverts, and raised embankments to mitigate monsoon submergence.
- Traffic and safety management at critical points near settlements and schools (CH 2+150, 2+700, 2+950)

with signage, speed regulation, and curve correction.

- Replacement of damaged culvert (CH 11+780) to maintain hydraulic connectivity and minimize localized flooding.
- Wildlife and biodiversity protection at CH 17+100–17+400, ensuring no widening within forest limits and installation of elephant crossings and warning signage.

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.

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

5.4.2.1 IMPACTS ON GEOLOGY (ESS3)

The construction of RBB Roads 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.

With an estimated surplus of approximately 76,034 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, and river training structures at critical erosion-prone locations, particularly near chainage 8+600, 9+100, 9+200, and 9+950. 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)

Topsoil loss may occur in land parcels used for short-term purposes (e.g., borrow areas, construction camps) as well

as in areas permanently impacted due to road rehabilitation, unless measures for preservation are adopted. Project activities such as tree cutting and vegetation clearance within the existing Right of Way (ERoW), followed by construction, improvement, and strengthening of the carriageway, may contribute to this loss.

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 traverses areas with sandy loam soils containing small amounts of clay and exhibiting low to medium plasticity. These light-textured soils are prone to erosion by wind and rainfall, and in hilly stretches, slope instability and minor landslides may occur. 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)

Construction materials required for the project road will be transported from Borrow area and Quarries. Details of Quarries site is given in Table 3.5of Chapter 3.

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.
- Open borrow pits abandoned without proper restoration may lead to accidents and risks of social nuisance.

. The earthwork details in the project area are listed in **Table 5.3** below.

Table 5.2: Earthwork details in the project area

Corridor	Fill (m ³)	Cut (m ³)
Corridor-3	25506.16	101540.6.

From the above table it is calculated that after balancing cut and fill, the remaining quantity of 76034cu.m

earthwork will be dumped/disposed by the contractor only at a place designated and authorized by the MPWD. The details of muck disposal sites are provided in **Table 5.4**. Average height should be 1.5 m to 2 m.

Table 5.3: Details for the muck disposal sites

Dumping Location			Coordinate		Area m ²	Approx. Quantity (m ³)
SL. NO	LOCATION CHAINAGE	SIDE	Latitude	Longitude		
1	1+800	RHS	249854.24	2866213.13	2492	3,165 m ³
2	3+300	LHS	248857.18	2865626.21	4700	5,978 m ³
3	5+400	RHS	248757.55	2867484.95	2030	2,579 m ³
4	6+000	LHS	248326.6	2867865.49	2100	2,665 m ³
5	7+000	LHS	248028.49	2868644.19	2500	3,178 m ³
6	13+000	LHS	247021.61	2873814.41	20000	25,455 m ³
7	15+100	RHS	246235.12	2875505.38	6600	8,398 m ³
8	15+650	LHS	246040.98	2876015.66	3500	4,448 m ³
9	16+100	LHS	245922.52	2876356.38	1500	1,906 m ³
10	17+100	LHS	245550.82	2877081.96	3400	4,326 m ³

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 each muck disposal site is incorporated into the DPR. Dumpsite Stabilization Plan is attached as **Annexure 5.1**.

5.4.2.5 AMBIENT AIR QUALITY (ESS3)

Construction stage impacts will have adverse impacts on the workers as well as the settlements adjacent to the road, especially those in the downwind direction. There are two types of pollution, i.e. dust pollution and pollution from harmful gases.

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
- Stone crushing, handling, and storage of aggregates at on-site asphalt mixing plants are integral to the RBB Road Corridor project. These activities generate significant dust and noise.
- Site levelling and vegetation clearing, including the removal of trees and topsoil, are being carried out along the alignment to prepare for subgrade laying. These operations are critical but environmentally impactful, especially near forested or community areas.
- Concrete batching plants and asphalt mix plants are being set up along the corridor to support continuous construction. These facilities involve the mixing of aggregates with bitumen, releasing particulate matter, hydrocarbons, and heat, which may affect local air quality and nearby settlements
- Construction of structures and allied activities

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

- 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 (ESS3)

Impact Source	Mitigation Measures
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

Impact Source	Mitigation Measures
	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)

The scale of the construction necessary to upgrade the road and the corresponding slight increase in traffic is not expected to generate adverse impacts.

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, scheduling of high-noise works during daytime, and strict adherence to CPCB noise standards.

The scale of construction required for upgrading the RBB Road is moderate and confined mostly within the existing Right of Way (RoW). 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, 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 machineries are expected to generate noise levels in the range of 80 – 95 dB(A) at about 1m from the source; while the actual ambient noise level experienced at surrounding receptors will depend on distance, terrain, and intervening structures.

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 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.

At the outset, it should be noted that unavailability of exact information on the construction methodology, hours of work, no. of equipment and their ratings / fuel consumption, construction schedule, etc. are the limiting factors while estimate the construction noise for this subject project;

5.4.2.7 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 RBB Road corridor. Proposed sub project road run parallel to Didram river up to 2 km (Between Chainages, 1+100 to 3+100. 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. Fishing is practiced in the Didram River, which intersects the RBB Road corridor. 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.
- Stormwater Management: Construct peripheral drains around storage yards to collect and divert runoff to sedimentation pits before discharge. Prevent mixing of clean stormwater 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, which can disrupt drainage patterns and negatively impact riverine habitats. The road alignment generally follows the existing topography, except at the locations of cross-drainage structures. Within the project stretch of 18.27 km, there are 2 major bridges and 15 minor bridges exist. A total of 100 culverts are proposed for reconstruction and rehabilitation, including 1 slab culvert, 2 box culverts, 78 pipe culverts and 19 new pipe culverts.

If the existing culverts are not adequately strengthened during road widening and rehabilitation, they may fail structurally, leading to disruptions in water flow, increased flood risk, potential damage to the road, and safety hazards for road users and nearby communities.

5.4.2.8 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 however in this project the works are rehabilitation in nature, the quantum of water required will be minimal. However surface water RBB project road stretch will require 54.5 Cum/day. Although the actual water requirement may vary depending on the contractor's construction methodology and equipment usage. As discussed with the DPR team, the primary source of water for construction will be the Didram River. The availability of surface water is sufficient. Hence demand for the construction is proposed to be met from the surface water sources. The demand for construction is proposed to be met from surface water sources. The project area is not classified as critical, semi-critical or overexploited by CGWB. It is "safe" area for ground water abstraction.

There is no pressure on ground water resources as most of the water requirement will be fulfilled by surface water.

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5.4.2.9 CONSTRUCTION AND DEMOLITION WASTE (ESS3)

Construction and demolition (C&D) waste from major demolitions is not expected along the proposed RBB alignment because no permanent structures will be removed. Only temporary structures with masonry or light walls (e.g., temporary kiosks, sheds, boundary 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 waterbodies, 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:** prioritize 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.

5.4.2.10 MUNICIPAL SOLID WASTE (ESS4)

RBB road corridor will generate approximately 12 to 15 kg of municipal solid waste per day during the construction stage, this is estimated based on approximately 35 working people in the project site. 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.

5.4.2.11 HAZARDOUS WASTE (ESS4)

Approximately 140 cu.m. 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.

Corridor wise scarifying existing bituminous surface in the project area is listed in **Table 5.4** below.

Table 5.4: Amount of expected Scarified Bituminous material

Sl. No.	Description	Unit	Quantity
			Corridor-3
1.	Scarifying existing bituminous waste	cum	140

A small quantity of hazardous substances (such as diesel, petroleum products, and other chemicals) will be used or stored during the project. If not stored properly, these substances may cause leakage or spillage, leading to soil and water contamination. During the construction phase, used batteries are also likely to be generated, which must be disposed of in compliance with the Battery Waste Management Rules, 2022. Improper disposal of lead-based batteries can result in leakage of lead, causing soil and water pollution.

5.4.2.12 NATURAL DISASTER (ESS4)

Along the RBB Road, issues of water logging and submergence are observed at chainages 0+300, 0+600, 1+300, and 1+350–1+600. To mitigate these, a new bridge is proposed at chainage 0+300 to enhance cross-drainage capacity, while the road level will be raised by about 300 mm at 0+600 and 250 mm at 1+300 to prevent flooding during the monsoon. Additionally, a drain-cum-footpath is proposed on the LHS between 1+350 and 1+600 to improve surface runoff management. Proper side drains, erosion control measures, and routine maintenance will ensure effective stormwater discharge and protection of adjacent settlements.

5.4.2.13 DISRUPTION OF COMMUNITY SERVICES (ESS4)

During road construction, local infrastructure such as water supply lines, irrigation channels, drainage systems, and access roads may be affected. These facilities are essential for domestic water use, agricultural activities, and community mobility. Improper or incomplete restoration of these services can lead to adverse impacts on local livelihoods and may also affect the integrity and progress of the road works.

5.4.2.14 DIVERSION OF TRAFFIC (ESS4)

Since the road up gradation works will be on the existing road only, therefore there will be direct interface with the road traffic. The Short-term impacts associated with the project will be traffic diversion and management during the construction phase. Construction activities will cause hindrance to the existing traffic flow. There is a possibility of accident hazards during the construction phase of the project. It needs to be mentioned that though there are no direct impacts on the natural environment due to disruption/diversion of such services, diversion can also lead to adverse impacts, if not planned properly. Rapid restoration of diverted services can help in minimizing the severity of impacts arising out due to diversions of existing services.

5.4.2.15 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. Electrocution, 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 5.5 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 generation/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 • Water sprinkling to control dust 	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 • Use tag lines and certified riggers- • Prohibit standing under suspended loads 	Contractor / Safety Supervisor
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

Activity / Task	Potential Hazards	Associated Risks / Impacts	Proposed Mitigation & Control Measures	Responsible Agency
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 (atleast 10m) 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 hygienic toilets and waste bins 	Contractor / Camp Supervisor

Activity / Task	Potential Hazards	Associated Risks / Impacts	Proposed Mitigation & Control Measures	Responsible Agency
			<ul style="list-style-type: none"> Regular disinfection and waste removal- Conduct health check-ups 	
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

5.4.2.16 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.

5.4.2.17 ROAD SAFETY MEASURES (ESS4)

Road construction activities may temporarily affect the safety of commuters, pedestrians, students, women, and elderly people. However, with proper planning, safety measures such as signage, speed control, and awareness campaigns can significantly reduce risks and improve road user protection. While the project stretch is not affected by landslides, minor issues like water logging can be addressed effectively through drainage improvements and culvert construction, thereby enhancing long-term road usability. Although animal crossings have not been reported in the area, incorporating precautionary measures in the Contractor's C-ESMP will ensure readiness and strengthen the road's environmental safety. Overall, the project offers an opportunity to create a safer, better-drained, and more resilient roadway for all users.

5.4.2.18 ANTICIPATED IMPACTS ON BIOLOGICAL ENVIRONMENT (ESS6)

The Rongsai–Borjhora–Bajengdoba (RBB) Road project is a road improvement activity confined to the existing alignment, with no widening or diversion through undisturbed habitats. Although several Endangered and Critically Endangered species occur regionally within the 10 km Study area, the project does not intersect or significantly influence any critical habitat as defined under World Bank ESS6 Paragraph 27–29. Hence, no species or habitat within the project's area of influence qualifies as Critical Habitat. All species are therefore screened out from Critical Habitat consideration. The summary of Critical habitat analysis is summarized in **Table 5.7** below.

Table 5.6: Critical Habitat analysis

Scientific Name	IUCN Status	Restricted Range	Migratory / Congregatory	Habitat & Distribution	Likelihood of Occurrence in Project Area	Rationale for Critical Habitat Screening	Screened In / Out
<i>Gavialis gangeticus</i> (Gharial)	CR	No	Full Migrant	Large perennial rivers (Ganga–Brahmaputra system)	Low	Major rivers absent near RBB corridor; no suitable habitat	Out
<i>Pangshura sylhetensis</i> (Assam Roofed Turtle)	CR	Yes (Eastern Himalaya & NE India)	Non-migrant	Slow-flowing rivers and floodplains	Low	Possible regionally, but project area lacks perennial river stretches	Out
<i>Nilssononia nigricans</i> (Black Softshell Turtle)	CR	Yes (Assam & adjoining states)	Non-migrant	Temple ponds, lowland rivers	Low	Habitat absent in upland Garo Hills	Out
<i>Laticilla cinerascens</i> (Swamp Grass-babbler)	EN	Yes	Non-migrant	Tall wet grasslands in Brahmaputra floodplains	Low	Habitat absent; no wet grassland or marsh areas	Out
<i>Melanochelys tricarinata</i> (Tricarinate Hill Turtle)	EN	Yes	Non-migrant	Hill forests of NE India	Moderate	General hill forest species; no critical habitat fragmentation	Out
<i>Hoolock hoolock</i> (Western Hoolock Gibbon)	EN	Yes	Non-migrant	Evergreen forests of NE India	Moderate	May occur in Garo Hills, but no tree felling or habitat loss anticipated	Out
<i>Elephas maximus</i> (Asian Elephant)	EN	No	Non-migrant (seasonal mover)	Forests and corridors in Garo Hills	Moderate	Landscape species; project involves minor road improvement without corridor obstruction	Out
<i>Indotestudo elongata</i> (Elongated Tortoise)	CR	No	Non-migrant	Forest floor dweller in moist forests	Low	May occur regionally; no habitat removal or fragmentation	Out
<i>Morenia petersi</i> (Indian Eyed Turtle)	EN	No	Non-migrant	Rivers, ponds, wetlands	Low	Limited aquatic connectivity near corridor	Out
<i>Manis pentadactyla</i> (Chinese Pangolin)	CR	Yes	Non-migrant	Forested slopes, secondary growth	Moderate	Known from Garo Hills; minor works will not affect species viability	Out
<i>Nycticebus bengalensis</i> (Bengal	EN	No	Non-migrant	Evergreen and semi-evergreen forests	Moderate	Habitat likely near forest edges; no clearing proposed	Out

Scientific Name	IUCN Status	Restricted Range	Migratory / Congregatory	Habitat & Distribution	Likelihood of Occurrence in Project Area	Rationale for Critical Habitat Screening	Screened In / Out
Slow Loris)							
<i>Hardella thurjii</i> (Crowned River Turtle)	EN	No	Non-migrant	Large river systems	Low	Absent in upland terrain	Out
<i>Geoclemys hamiltonii</i> (Spotted Pond Turtle)	EN	No	Non-migrant	Wetlands and slow rivers	Low	No large ponds or oxbow lakes near corridor	Out
<i>Cuora mouhotii</i> (Keeled Box Turtle)	EN	No	Non-migrant	Forest floor species	Moderate	Widespread in NE forests; small-scale road work won't impact population	Out
<i>Batagur dhongoka</i> (Three-striped Roofed Turtle)	CR	Yes	Non-migrant	Large riverine stretches	Low	No major river system present	Out
<i>Manis crassicaudata</i> (Indian Pangolin)	EN	No	Non-migrant	Dry forests, scrubland	Moderate	Generalist species; wide-ranging, not site-specific	Out
<i>Cuon alpinus</i> (Dhole)	EN	No	Non-migrant	Forests, scrubland	Moderate	Regionally present; no significant habitat alteration	Out
<i>Sarcogyps calvus</i> (Red-headed Vulture)	CR	No	Congregatory	Open forests, settlements	Moderate	Scavenger; no nesting or congregation sites affected	Out
<i>Nilssonina hurum</i> (Indian Peacock Softshell Turtle)	EN	No	Non-migrant	Rivers and wetlands	Low	Major Riverine habitat absent	Out
<i>Varanus flavescens</i> (Yellow Monitor)	EN	No	Non-migrant	Semi-aquatic, open wetlands	Low	No suitable wetland habitat	Out
<i>Nilssonina gangetica</i> (Indian Softshell Turtle)	EN	No	Non-migrant	Rivers, ponds	Low	Unsuitable terrain	Out
<i>Axis porcinus</i> (Hog Deer)	EN	No	Non-migrant	Grasslands, floodplains	Low	Grassland habitat absent	Out
<i>Sterna acuticauda</i> (Black-bellied Tern)	EN	No	Migratory	River sandbars, wetlands	Low	No large river habitat	Out
<i>Haliaeetus leucoryphus</i> (Pallas's Fish Eagle)	EN	No	Migratory	Large water bodies, lakes	Low	Unsuitable upland terrain	Out

Scientific Name	IUCN Status	Restricted Range	Migratory / Congregatory	Habitat & Distribution	Likelihood of Occurrence in Project Area	Rationale for Critical Habitat Screening	Screened In / Out
<i>Aquila nipalensis</i> (Steppe Eagle)	EN	No	Full Migrant	Open landscapes, migratory flyways	Low	Transient winter visitor only	Out
<i>Emberiza aureola</i> (Yellow-breasted Bunting)	CR	Yes	Full Migrant	Wet paddy fields, reed beds	Low	Occasional migrant; no significant habitat available	Out
<i>Calidris tenuirostris</i> (Great Knot)	EN	Yes	Full Migrant	Coastal wetlands	None	Marine species; no inland habitat	Out
<i>Gyps bengalensis</i> (White-rumped Vulture)	CR	No	Congregatory	Forest edges, open country	Moderate	Possible foraging species; no nesting colonies in project zone	Out

CR: Critically Endangered, EN : Endangered

Mitigation Measures for Biodiversity Management

The proposed Rongsai–Borjhora–Bajengdoba (RBB) Road improvement project passes through a modified landscape interspersed with secondary vegetation, agricultural fields, and small forest patches. Although no critical habitat is present, the area supports regionally important biodiversity. To minimize ecological impacts during project implementation, the following mitigation and enhancement measures will be adopted.

○ Pre-Construction Phase

- **Tree Inventory and Compensatory Plantation:** Carry out a detailed tree inventory within the RoW before clearance and undertake compensatory plantation at a ratio of **1:10 or as prescribed by the Forest Department** using native species.
- **Avoidance of Sensitive Areas:** Restrict construction camps, material storage, and waste disposal away from forest patches, streams, and wildlife movement zones.
- **Scheduling of Works:** Plan vegetation clearance outside the local breeding and nesting season (typically March–June).

○ Construction Phase

- **Habitat Protection and Minimization:** Limit vegetation removal strictly within the approved RoW. Retain mature trees wherever technically feasible and avoid any activity in adjoining forest areas.
- **Noise and Vibration Control:** Restrict high-noise activities (e.g., blasting, piling) near forested stretches and avoid construction during early morning or night hours.
- **Prevention of Poaching and Wildlife Disturbance:** Strictly prohibit hunting, trapping, or feeding of wild animals by construction personnel; penalties and dismissal for violations will be enforced.
- **Pollution and Waste Management:** Ensure proper collection and disposal of construction waste, oil, and bituminous materials to prevent contamination of nearby soil and water bodies.
- **Lighting Management:** Use downward-facing, low-intensity lights near forested or sensitive zones to reduce disturbance to nocturnal species.
- **Elephant corridor management and monitoring:** In areas of known elephant movement, adopt measures such as speed restrictions (rumble strips/table-top crossing), signages and timed movement restrictions at night if necessary, to ensure safe passage and reduce human–elephant conflict. Installation of AI-based camera systems (as per RDSO specifications, RDSO/SPN/TC/65/2021) along identified elephant movement zones to continuously monitor and detect elephant presence. These cameras, equipped with thermal and optical sensors and AI-based analytics, will enable early warning and real-time alerts to project authorities and nearby communities, thereby minimizing the risk of elephant–vehicle collisions and ensuring safe wildlife movement across the corridor.

○ Operation Phase

- **Habitat Restoration and Plantation Maintenance:** Maintain and monitor compensatory plantations for at least **three years**, ensuring survival of at least 80% of planted saplings.
- **Wildlife Crossing Signage:** Maintain reflective wildlife crossing signs and speed limit boards (≤ 30 km/hr) near forest edges and movement corridors.
- **Monitoring of Wildlife Movements:** Collaborate with the Forest Department to document and respond to any wildlife movement issues along the corridor.
- **Community Awareness:** Promote awareness among local communities and drivers regarding safe wildlife passage and importance of biodiversity conservation.

Impacts on Aquatic Ecology:

During the construction phase, aquatic ecology may be affected by increased silt inflow into surface water bodies and the discharge of liquid wastes or 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 and soak pits to prevent direct sewage discharge into nearby water bodies.
- Disposal of construction material or debris into rivers, streams, or ponds will be strictly prohibited.
- Regular monitoring of water quality will be conducted to ensure compliance with environmental standards

Environmental impacts such as soil erosion (8+600) and riverbank erosion (9+200 and 9+950) will be addressed through toe wall protection works and river training measures. At 9+100, issues of drain/nalla submergence and erosion will be tackled with improved drainage management and erosion control structures. A damaged culvert at 11+780 requires replacement with a new structure to restore proper water flow. Details are given below

Chainage (km)	Issue / Environmental Impact	Type of Work Envisaged	Detailed Design Interventions / Description
8+600	Soil erosion along road slope / embankment	Toe wall & slope protection works	<ul style="list-style-type: none"> • Construction of RCC toe wall (0.6–1.0 m thick, M20–M25 concrete) with weep holes and filter media • Regrade and compact slope to stable gradient (2H:1V or flatter). • Provision of stone pitching (150–300 mm) or riprap over geotextile. • Application of vegetative turfing or vetiver grass for long-term stabilization. • Installation of subsurface drains/trench for seepage control.
9+100	Drain / nalla submergence and local erosion	Drainage improvement & erosion control structures	<ul style="list-style-type: none"> • Reprofilng and desilting of the drain to maintain free flow • Replacement of undersized culvert/pipe with adequate capacity (25–50 yr design storm). • Provision of inlet–outlet aprons, baffle blocks, stilling basin for energy dissipation. • Stabilization of banks with gabion revetment / riprap.

Chainage (km)	Issue / Environmental Impact	Type of Work Envisaged	Detailed Design Interventions / Description
9+200	Riverbank erosion (near approach)	River training & bank protection	<ul style="list-style-type: none"> Provision of riprap or gabion revetment on riverbank with geotextile underlay. Construction of RCC toe wall or stone apron (keyed 1.0–1.5 m below bed level). Installation of spurs/groynes at suitable angle (30°–60° upstream) to deflect flow. Application of vegetative measures (coir rolls, willow staking) on upper bank.
9+950	Severe riverbank erosion close to roadway	Comprehensive river training measures	<ul style="list-style-type: none"> Construction of gabion retaining wall and toe protection Provision of rock spurs and bank revetment to redirect flow away from embankment. Strengthening of upper bank with bio-engineering measures Inclusion of monitoring provision for post-monsoon inspection and maintenance.
11+780	Damaged culvert affecting drainage flow	Culvert replacement & flow restoration	<ul style="list-style-type: none"> Replacement of existing damaged culvert with RCC box culvert designed for 25–50 yr flood. Provision of head walls, wing walls, and apron at inlet/outlet. Proper bedding, filter layer, and backfill compaction. Install riprap apron to prevent scour Maintenance of freeboard and proper slope alignment for unhindered discharge.

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

During the operation stage, no significant impacts are anticipated, as rivers and ponds within the ROW are not expected to be adversely affected. With these safeguards, no negative impacts on aquatic ecology are envisaged in the operational phase.

IMPACTS ON ARCHAEOLOGICAL, HISTORICAL AND CULTURAL SITES (ESS8)

There are no historical and cultural sites of importance observed in the project stretch.

The other key potential impacts during the construction of the Project may be related to the risk of partial or total removal or destruction of unknown heritage assets (undiscovered archaeological sites) due to ground removal, which implies the need for setting 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 environmental impacts are expected from increased traffic volume and speed, which may elevate safety risks, particularly in rural areas. However, no sudden or significant increase in traffic is anticipated, as the road already exists and is open to public use.

The project also offers opportunities to restore vegetation around the road corridor and worksite through a compensatory plantation program. This initiative will enhance the aesthetic quality of the area and contribute to soil stabilization and reclamation.

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.

5.4.3.1 Impacts on Water Quality and Resources

During the operation phase, the likelihood of water quality degradation is very low. Potential impacts on surface water may arise only from accidental spills. However, the probability of such incidents is minimal, as the road design incorporates safety enhancements, including curve improvements, road widening, and pedestrian facilities, which collectively reduce the risk of accidents.

5.4.3.2 Impact on Air Quality

Vehicular emissions are the principal source of pollution during the operation stage. The RBB project road being mostly located adjacent to open agricultural land and un-classed forest, 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 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.

The construction of the RBB road is not expected to have significant social impacts on roadside communities, as 0.60 ha additional land is required for the project. The project aims to minimize social impacts by ensuring that all construction activities are confined within the existing Right of Way (RoW). Approximately 150 structures are expected to be affected by the project and they are present within RoW, including seven temporary shops and residential-related structures, a semi-pucca commercial shed, a staircase, and compound walls. FPIC was carried out as the project will result in loss of asset and cause relocation of IP's.

The road alignment requires minimal additional land (0.60 Ha) , as most mitigation and improvement works are confined within the existing paved road. Key interventions along the alignment include:

- **Chainage 0+00:** T-junction improvements can be executed within the current road width.
- **Chainage 0+300 to 1+600:** Measures such as new bridge construction, road raising (250–300 mm), and provision of drains and footpaths will require only minor widening along the alignment.
- **Chainage 2+150:** Installation of school safety signage within the existing right-of-way.
- **Chainage 2+700 to 2+950:** Curve corrections and speed signage will be implemented within the existing right-of-way.
- **Chainage 8+600 to 9+950:** Erosion control works, including toe walls and riverbank **protection**, may require small land strips adjacent to riverbanks for construction access.
- **Chainage 11+780:** Replacement of the damaged culvert will be carried out within the existing footprint.
- **Chainage 17+100 to 17+400:** Passing through community land with vegetation and elephant passes, no widening will occur; mitigation measures such as speed calming and warning signs will be installed within the existing roadway.

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 a 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 proposed road alignment requires 0.60 ha of additional land and involves 150 structures. Details of the project affected households have been discussed in section 4.9 of Chapter 4. The culverts, drains, and toe walls are carefully planned to minimize environmental and social impacts. Certain stretches of the road are prone to waterlogging, submergence, soil erosion, and sharp curves; these risks will be effectively managed through mitigation measures such as road raising, drainage improvements, protective walls, curve corrections, and safety signage.

These interventions will not only reduce potential hazards to traffic and nearby settlements but also enhance the safety, durability, and resilience of the road infrastructure during the monsoon season. In sensitive areas, including community vegetation's and elephant passages, the designs ensure minimal disturbance to natural habitats.

Overall, the project reflects a balanced approach, addressing potential environmental and social risks while improving road safety, accessibility, and ecosystem protection. Social impacts will be mitigated in accordance with the RBB Project Road Resettlement Action Plan, Integrated Development Plan (RAP, IPDP) and Environmental and Social Management Plan (ESMP).

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).

5.5.2 SOCIAL COMPONENT ISSUES: TEMPORARY RESTRICTION TO ACCESS

Potential Risks & Impacts

Construction activities, including road improvements and extensions, may result in temporary restrictions to access for residents and business owners. Limited or blocked access can disrupt daily commutes and hinder customer access to shops, potentially causing financial losses for local businesses and inconvenience for residents. Such disruptions may also lead to frustration within the community and generate dissatisfaction with the project if not properly managed.

5.5.3 SOCIAL COMPONENT ISSUES: DISRUPTION TO ACCESS ECOSYSTEM SERVICES

Potential Risks & Impacts

The commencement of construction may intensify pressure on other 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 Table 4.17 of Chapter 4. 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 road project such as Toilets, waiting sheds 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 mechanism.

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 violation

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.

According to the "Gender Statistics 2023" report for Meghalaya, in 2020 the North Garo Hills district had 16 registered crimes against women; in 2021 the number rose to 25. In the 2012-13 period, for the category of rape, only 2 cases were reported in North Garo Hills. State-wide, crimes against women have been rising significantly: from 255 cases in 2012 to 685 in 2021. GBV action plan has been prepared and attached as **Annexure 5.4**.

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 Procedure (LMP) and Work site safety plan (OHS Plan) outlines strategies for managing these risks. Labour Management Plan is attached as attached as **Annexure 5.2**. Occupational Health and Safety plan is attached as **Annexure 5.3**.

5.5.7 SEA/SH IMPACTS

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. Measures to address these risks are outlined in the ESMP and the SEA/SH Prevention and Response Action Plan.

According to the World Bank's GBV risk categorization, the "Moderate" risk category falls within a score range of 13 to 16. **Annexure 5.4** illustrates the project's risk categorization as "Moderate," with Corridor 3. GBV Action Plan is attached as **Annexure 5.5**.

5.5.8 POSITIVE SOCIAL/COMMUNITY IMPACTS

Overall, the proposed road project is expected to have a significantly positive impact on the socio-economic environment. The project will strengthen the existing road through widening, construction of new sections, paved shoulders, and improved drainage. Enhanced access to connecting roads and uninterrupted traffic flow on wider

roads will serve as a major stimulus for economic growth, particularly in the rural areas within the sub-project corridor.

During construction, local communities can benefit further if contractors prioritize hiring workers from nearby areas. Efforts should also be made to ensure non-discriminatory employment practices, particularly in the inclusion of women. Over the long term, the project is expected to contribute positively to poverty reduction and overall community development.

5.7 CLIMATE-RELATED IMPACT

Meghalaya faces significant challenges from climate change due to its diverse ecosystems, high biodiversity, and socio-economic dependence on agriculture, forestry, and natural resources. The state's unique geographic and climatic conditions make it highly vulnerable to climate-related impacts.

In recent years, the North Garo Hills has experienced erratic rainfall patterns, with prolonged dry spells and intense monsoon downpours causing water scarcity and flash floods. Rising temperatures have further disrupted ecological balance, affecting agricultural productivity, forest health, and water resources. Additionally, the district is located in **Seismic Zone V**, and the combination of climate-induced hazards and geophysical risks increases its overall vulnerability.

Given these challenges, it is essential to integrate climate mitigation and adaptation strategies into development planning. This approach will help minimize the long-term economic costs of adaptation and capitalize on potential opportunities arising from climate-resilient development. A detailed preliminary assessment of climate disaster risks has been undertaken, with further information provided in **Annexure 5.6**. Potential impacts of Climate Change trend on road transport infrastructure is provided in **Table 5.9**.

Table 5.7: Potential impacts of Climate Change trend on road transport infrastructure

Climate Trend / Parameter	Observed Pattern	Impact on Road Infrastructure	Adaptation measures
- High Rainfall Changes in the seasonal and annual average rainfall	- Extreme monthly rainfall (1968.5 mm in 2020) i. Impact on soil moisture levels, affecting the structural integrity of roads, culverts, bridges standing water on the road base ii Risk of flood from runoff, landslides, slope failures and damage to roads if changes occur in the precipitation pattern	- Increased risk of flooding leading to submersion of roads. - Erosion of road embankments and landslides in hilly terrains. - Structural damage to culverts and bridges. - .	<ul style="list-style-type: none"> • Certain critical sections affected by overland flooding of the road raised (vertical alignment, embankment improvement) to be free from the onslaught of flooding events under intense precipitation. • Road asset survey has considered certain critical road sections where the sub-grade strength and integrity were found to be compromised; the sub-grade strength specification meeting the recent-most IRC specifications has been adopted. • The highest assessment of design discharge for sizing culverts and bridges from among the several discharge methods as outlined in recent IRC guidelines have been adopted. • In terms of floodwater conveyance to prevent stagnation, closed concrete drains

Climate Trend / Parameter	Observed Pattern	Impact on Road Infrastructure	Adaptation measures
			<p>in settlement pockets have been provided.</p> <ul style="list-style-type: none"> Improved cross-drainage capacities required for the quick conveyance of floodwater by replacing small diameter pipes with box culverts with higher discharge openings has been considered. The bottom of the sub-grade has been kept 0.6m above HFL, to avoid over topping, water-logging of the road surface
Rising Temperatures	- Maximum temperature rising from 17.1°C to 29.1 °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. 	<p>a. An adequate binding layer thickness has been proposed to offset the wear, surface fatigue, and rutting under climate stresses.</p> <p>b. In terms of pavement integrity, the choice of viscosity grade VG30 has been maintained</p>

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

Alternative analysis was carried out for the project stretch vis-à-vis design scenarios and one scenario of without project. These are described in the following sections.

6.2.1 WITHOUT PROJECT SCENARIO

The road traverses areas with high population densities, particularly in Bajengdoba, 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.

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.

Component	"With" Project Scenario	"Without" Project Scenario
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 compensation.	No Felling of trees hence maintaining the healthy local ecology.
Pedestrian safety	Pedestrian facilities in the form of footpath, lightning, 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
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, telephones 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	Social development activities are likely to be significantly constrained due to the severe

Component	"With" Project Scenario	"Without" Project Scenario
	consequent increase in connectivity.	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

Chainage (km)	Proposed / Mitigation Measure Adopted	Purpose / Environmental Consideration
0+000	Improvement of existing T-junction	To ensure smooth traffic flow and reduce congestion and accident risk at intersection.
0+300	New bridge proposed as per bridge survey	To replace submerging causeway and maintain uninterrupted connectivity during monsoon; improve hydraulic capacity and safety.
0+600	Box culvert and level raised by 300 mm	To prevent waterlogging and improve longitudinal drainage in low-lying area.
1+300	Road level raised by 250 mm	To mitigate seasonal submergence and maintain all-weather accessibility.
1+350 – 1+600	Drain-cum-footpath (LHS)	To enhance roadside drainage and pedestrian safety in semi-urban section.
2+150	Speed restriction signage before and after school (both sides)	To reduce vehicular speed and ensure safety of school children and pedestrians.
2+700	Drain-cum-footpath (RHS)	To improve surface drainage and pedestrian movement near built-up area.
2+950	Speed restriction signage near sharp curve	To improve road safety and visibility at accident-prone curve section.
8+600	Toe wall and protection works (LHS)	To control soil erosion along river embankment adjacent to the road and protect pavement toe.
9+100	Drainage and erosion protection works (LHS)	To prevent drain/nalla submergence and slope erosion; improve cross-drainage and discharge management.
9+200	River training works near bridge foundation	To protect bridge foundation from scouring and channel migration through gabion revetment and spurs.
9+950	Riverbank protection works (RHS)	To stabilize eroding bank and prevent encroachment of river flow toward road embankment.

11+780	Replacement of failed culvert with new RCC structure	To restore proper drainage connectivity and prevent road damage due to water accumulation.
17+100 – 17+500	Elephant Corridor and Community land with vegetation Stretch, Only resurfacing of existing blacktop; no widening, cutting, or new construction permitted. Installation of cautionary wildlife signages, rumble strips, and reflective markings proposed. Construction activities restricted to daytime only under supervision of Forest Department.	To ensure uninterrupted wildlife movement, minimize noise and light disturbance, and avoid habitat fragmentation within the designated Elephant Corridor and Reserve Forest area.

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 12 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:

- No widening of the road stretch to avoid the significant loss of land, structures and livelihood.
- Elephant crossing and community (Ch17+100 to 17+400) forest falls under this location. The Existing Road Blacktop is covered only with no further improvement.
- Curves and Bends will be smoothed out to improve geometric design. Where adjustments may affect local settlements, realignment of the road 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 provides an overview of the stakeholder consultations carried out as part of the Environmental and Social Impact Assessments (ESIA) for the proposed Meghalaya Logistics and Connectivity Improvement Project (MLCIP). These consultations were aimed at ensuring a participatory approach to identifying and addressing potential environmental and social impacts associated with 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	Type of stakeholder
Project-Affected Parties	<ul style="list-style-type: none"> • Village community • Street side Shop Owners • Shop owners (NTH) • Residential structure owners <p>Nokma</p>
Interested Parties	<p>A. Government agencies</p> <ul style="list-style-type: none"> ▪ Public Works Department (Roads), Meghalaya (PWD-R) ▪ Garo Hills Autonomous District Council (GHADC) ▪ 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 ▪ Urban Affairs Department, Meghalaya (instead of Town Committee) ▪ Health & Family Welfare Department, Meghalaya (including AIDS Control Society functions) ▪ Department of Arts & Culture, Meghalaya (instead of Directorate of Archaeology, Meghalaya) ▪ District Social Welfare Office (North Garo Hills) ▪ District Legal Services Authority ▪ District Child Protection Unit ▪ Office of the Child Development Project Officer ▪ Jawahar Navodaya Vidyalaya, Bajengdoba, North Garo Hills. <p>B. Civil society organizations: Local NGOs such as</p> <ul style="list-style-type: none"> ▪ Bethany Society – strong presence of Community based work in the entire Garo Hills Region. ▪ ACHIK Youth Council / Achik Holistic Awakening Movement (AHAM) – strong socio-cultural and community development organisation in Garo Hills ▪ North Garo Hills Women's Self-Help Group Federations – grassroots women's groups working on livelihood and welfare ▪ Church-based Organisations (Baptist / Catholic Missions) – significant role in

Category of stakeholder	Type of stakeholder
	education, health, and social services across villages
	C. Community based Organization <ul style="list-style-type: none"> ▪ Bio-Diversity Management Committee
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 ESIA, consultations were conducted with representatives from all three categories of stakeholders. The consultations conducted with government agencies, communities, & other organizations with representation from vulnerable groups were undertaken. Special attention was given to engaging with communities from sub-project locations that are likely to experience significant impacts, such as impact on residential and commercial structures, impact on common property resources etc. Specific common property resources identified includes religious structures, public utilities, and other community assets critical to local livelihoods and cultural heritage.

Representatives from interested parties were consulted to incorporate their concerns and expertise to align the project with broader developmental objectives associated with economic and environmental goals. Key discussions during the consultations were focused on potential displacement, loss of livelihoods, environmental degradation, law & order issues in project area, forest land related issues, irrigation related, structural issues such as Cross Drainage Structures, etc., and related mitigation measures, ensuring that the concerns and suggestions of all stakeholders were documented and considered in project planning. The consultations provided valuable insights into the priorities and concerns of affected local community, helping to shape mitigation measures for minimizing adverse impacts.

Through public participation in consultations, stakeholder's viewpoints and suggestions were captured as an input to the technical design, which were duly considered, and all the suggestions were incorporated in the project design to the extent feasible and /or 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 details out the procedures of stakeholder engagement during the project cycle. The SEP outlines the process, methods and frequency of engagement with various stakeholders and will be accordingly implemented during the project period.

The project has prepared a project level Stakeholder Engagement Plan (SEP) which details out the procedures of stakeholder engagement during the project cycle. The SEP outlines the process, methods and frequency of engagement with various stakeholders and will be accordingly implemented 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 five 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, two Focus Group Discussions (FGDs) with youth and one Focus Group Discussions (FGDs) with women.


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
Preliminary consultation						
1	Market	23-08-2025	Local residents	<ul style="list-style-type: none"> • Participants expressed appreciation for the project and acknowledged its potential positive impacts on the community. • Concerns were raised regarding the poor condition of the existing road. • It was highlighted that children's education is being adversely affected due to difficulties in commuting caused by the poor road condition. • Participants reported that frequent road accidents are occurring as a result of the deteriorated road condition. 	<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. 	 <p>Latitude: 25.895926 Longitude: 90.505426 Elevation: 81416.35 m Accuracy: 4.302 m Time: 23-08-2025 12:13 Note: RBB</p>
Key Informant Interview						


Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
2	DFO East and North Garo Hill	21-08-2025	DFO	Existing RoW should be maintained at Community land with vegetation and Elephant passing	While designing the road through community land with vegetation areas and identified elephant passing locations, it is recommended that the existing Right of Way (RoW) be maintained without any additional widening, so as to minimize forest clearance and habitat disturbance. The road should be strengthened and upgraded within the available formation width, with slope protection measures such as bio-engineering and turfing instead of concrete structures to retain the natural landscape. At critical elephant crossing points, suitable wildlife-friendly structures such as underpasses or overpasses should be incorporated, along with appropriate signage, speed calming measures, and solar-powered warning systems to alert drivers. Natural drainage patterns must be preserved to avoid waterlogging, and noise-reducing pavement surfaces may be adopted to minimize disturbance to wildlife. During construction, night-time activities and dumping of debris within forest stretches should be strictly prohibited. Further, involvement of the local community in monitoring elephant movement, maintaining eco-friendly roadside plantations, and developing alternative fodder sources will help ensure that road development is balanced with ecological conservation and long-term sustainability.	 <p>Latitude: 25.509677 Longitude: 90.599502 Elevation: 286.951104 m Accuracy: 15.05 m Time: 21-08-2025 14:43</p>



Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
3	Forest ranger office	23-08-2025	Forest ranger and Forest Gard	<p>Community land with vegetation: Issues and processes related to management, access, and dependency on community land with vegetation resources.</p> <p>Elephant Movement: Seasonal patterns and frequency of elephant movement in and around the project area.</p> <p>Floral Diversity: Presence of floral species, including ecologically important and dominant species.</p> <p>Medicinal Plants: Availability and traditional use of medicinal plant species by the local community.</p>	Table topping will be done for smooth movement of elephant.	 <p>Latitude: 25.993825 Longitude: 90.457013 Elevation: 57.85±3.8 m Accuracy: 4.289 m Time: 23-08-2025 13:51 Note: RBB</p>



Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
4	PCCF, Shillong	28/8/25	Harish Chaudhry	key issues related to community land with vegetation management and local dependency were highlighted. The seasonal frequency of elephant movement in the project area was discussed, along with potential risks of human-wildlife conflict. The need for appropriate mitigation measures, such as road safety provisions and conservation-friendly design features, was emphasized.	<ul style="list-style-type: none"> Table topping will be done for smooth movement of elephant. <p>Existing RoW should be maintained at community land with vegetation and Elephant passing</p>	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
5	DPR Consultant	26-08-2025	DPR Consultants	<ul style="list-style-type: none"> Preliminary observations from an 18.27km 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 15 meters, in accordance with relevant codes for state highways. <p>A topographic survey has been conducted within a 60-meter width.</p>	<ul style="list-style-type: none"> Incorporate the 12-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. 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. Treatment of land slide in land slide 	 <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
					affected stretches.	
6		16/09/2025	Street Vendor	Participants appreciated the project and acknowledged its positive impact on the community.	Construct smoother roads to enhance accessibility and improve transportation.	 <p>Latitude: 25.8959009°N Longitude: 90.5054143°E Elevation: 81.41±14 m Accuracy: 42.5 m Time: 16-09-2025 12:21 Note: Rbb Road</p>
7				<p>Expressed a positive attitude toward the proposed project, citing expected improvements in road connectivity, access to health and education facilities, and local economic opportunities.</p> <p>He mentioned that the predominant waterborne diseases in the study area include diarrhoea, typhoid, and cholera. These illnesses pose significant health risks</p>	<ul style="list-style-type: none"> •Coordinate with the Public Health Engineering Department (PHED) for the provision of safe drinking water sources near habitations along the project corridor. • Ensure drainage and cross-drainage structures are designed to prevent stagnation and contamination of local water bodies. •Conduct periodic awareness programs during construction in coordination with local health 	 <p>Latitude: 25.99858896°N Longitude: 90.45264169°E Elevation: 71.35±13 m Accuracy: 15.3 m Time: 16-09-2025 15:00 Note: Rbb Road end point.</p>

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
				to the local population, particularly in villages with limited access to clean drinking water, inadequate sanitation facilities, and constrained healthcare services. Community representatives emphasized the need for improved water supply systems, regular health awareness campaigns, and strengthened public health infrastructure to mitigate these issues.	departments and NGOs on safe water use, sanitation, and hygiene practices (WASH). • Display information boards in local language on health and safety measures for workers and nearby communities.	
	Youth					
8		9. /09. /25	Youth (8 No.)	<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: 25.891226 Longitude: 90.498829 Altitude: -29.02±27.6 m Accuracy: 19.2 m Time: 09-09-2025 11:56 Meter: RBB road Village Nink Powered by NoteCam</p>

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
9		19.09.2025	Youth (5 nos.)	<ul style="list-style-type: none"> Promote skill-building, entrepreneurship, Better road connectivity for transportation of goods and services 	<ul style="list-style-type: none"> Establish feedback and monitoring mechanisms through the Stakeholder Engagement Plan (SEP) Integrate capacity-building and skill development components 	 <p>Latitude: 25.691315 Longitude: 90.49866 Elevation: 43.88±19.6 m Accuracy: 58.75 m Time: 19-09-2025 12:50 Note: RBB road, 2nd Consultation</p>
1		25.09.2025	Youth (5 nos.)	<ul style="list-style-type: none"> The youth were also taught about access to proper sanitation and other facilities if employed by the contractor during execution of the project. 	If any issues were to be faced by them in the near future then their problems and inconvenience can be brought forward to the GRM.	 <p>Latitude: 25.694 Longitude: 90.504573 Elevation: 53.53±25.2 m Accuracy: 300.0 m Time: 25-09-2025 12:44 Note: RBB Road consultation</p>
	Women FGD					

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1		19.09.2025	Women (5)	<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 • There is a pressing need for inclusive, women-centric interventions that promote local entrepreneurship, skills, and connectivity 	<ul style="list-style-type: none"> • Integrate women-focused skill development initiatives • Strengthen participation of women's Self-Help Groups (SHGs) in project-related awareness, monitoring, and plantation maintenance programs. 	
10		25.09.2025	women	<ul style="list-style-type: none"> • During the consultation, gender-related issues and concerns were discussed in detail with the women participants from the local community. The discussion emphasized the importance of women's participation and empowerment in project-related activities. 	<ul style="list-style-type: none"> • The Assistant Executive Engineer, PWD (Roads), NEC Sub-Division No. II, Tikrikilla, informed the participants that women engaged in any project-related work will be entitled to equal pay for equal work, in compliance with statutory norms. • He further assured that the project will ensure gender-sensitive facilities, including provision of separate sanitation units for women and adequate accommodation wherever required. The womenfolk appreciated the discussion and expressed their support for the project highlighting the need for continued attention to safety, privacy, and equal employment opportunities during implementation. 	

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 Nokmas (Village Head).

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 Nokma (village Head), village elders traditional leaders (Nokmas) 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, Community land with vegetation, water sources, and 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 Garo 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 Nokma (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 Garo 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 Garo 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 incorporate community feedback such as alignment adjustments at Elephant crossings 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 Nokma and Village council 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 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 (09 September 2025), the second FPIC consultation (19 September 2025) and Third round FPIC consultation (25 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. Letters are attached as Annexure 7.3.

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 was conducted by the ESIA team on **09.09.2025** at *Multifacility Hall at Bajengdoba* at 11A.M with a total of 44 participants. The participants included project-affected persons (PAPs), village headmen, government officials, civil society organizations, and representatives from the Village Council. The key concerns raised include the need for proper roadside infrastructure such as drains, footpaths, waiting sheds, and bus stops with zebra crossings near schools and junctions. Communities emphasized safety and amenities for students, including cycle parking areas and boundary walls for schools and churches. They also highlighted flood-prone stretches requiring embankment and culvert improvements, along with better approach roads to major habitations. 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 second FPIC meeting for the Rongsai Borjhora Bajengdoba Road (RBB) was subsequently convened at Bajengdoba Multifacility Hall on dated 19th September 2025. 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 Executive Engineer (EE), NEC Tura division, with active participation from the Assistant Executive Engineer (AEE), Sub-Divisional Officer (SDO), and representatives of key consultancy firms including Enviro Infra Solutions (ESIA Consultants), Rodic 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, 41 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 third round of consultations for FPIC for the *project road* was subsequently convened at Bajengdoba Multifacility Hall on dated 25th September 2025. The third round of FPIC consultation was conducted to reconfirm and document the communities' consent to the proposed project interventions following the disclosure of detailed design, mitigation measures, and findings from the Environmental and Social Impact Assessment (ESIA). It also served to validate the outcomes of the previous FPIC meetings. The session provided an opportunity for stakeholders to review the commitments made by the implementing agency, discuss the finalized mitigation and benefit-sharing measures, and formally reaffirm community consent before the project's implementation phase.


- The proceedings were presided over by the Executive Engineer (EE), NEC Tura division, with active participation from the representatives of key consultancy firms including Enviro Infra Solutions (ESIA Consultants), Rodic 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, 50 local stakeholders participants engaged actively in the discussions, reflecting the community's genuine interest in the proposed infrastructure development. 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 Garo, the local language, to ensure informed participation. A 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. The indigenous communities were given adequate time to discuss, ask questions, and deliberate before providing or withholding consent for the project.


Consultations were conducted in Garo, 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 thorough 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 meeting were recorded, analyzed, and formally documented. All the meetings were documented through minutes, photographs and videography which were taken to maintain a transparent record and to ensure that PAPs were not coerced into agreement but participated freely and voluntarily. Attendance was collected at each consultation to confirm the presence of key stakeholders and community members. The Minutes of meeting (MoM) including photographs and attendance sheet of the participants of FPIC 1 and 2 conducted is presented in **Annexure 7.3**. Outcomes of the 1st FPIC Meeting is presented in **Table 7.3**, 2nd FPIC in **Table 7.4** and photographs for the same are presented in **Figure 7.1** and **7.2**.

Table 7.3: Summary of the FPIC 1 Meeting

Issue discussed	Photograph
If drains along with proper footpaths can be provided in built up areas like market places and the school areas.	

Issue discussed	Photograph
<p>If bus stops with zebra crossings can be provided along all schools along RBB Road. Some high schools like the Kristo Jyoti High School with having more than 1000 students needed parking area with roof for cycles used by the students.</p>	 <p>Latitude: 25.889916 Longitude: 90.493115 Elevation: 88.44±3.76 m Accuracy: 3.79 m Time: 23-08-2025 12:43 Note: RBB</p>
<p>•Certain places like Moamari and Omon Bazar were susceptible to floods and water logging during extreme monsoons so raising of embankments and culverts were required at these certain stretches</p>	 <p>Latitude: 25.896926 Longitude: 90.505414 Elevation: 84.44±3.55 m Accuracy: 3.49 m Time: 23-08-2025 12:14 Note: RBB</p>
<p>If boundary walls can be provided to schools and churches that fall along RBB road.</p>	 <p>Latitude: 25.897361 Longitude: 90.498892 Elevation: 80.03±4.13 m Accuracy: 4.255 m Time: 23-08-2025 12:36 Note: RBB</p>
<p>If waiting sheds or bus stops can be provided at all important junctions and habitations.</p>	 <p>Latitude: 25.891411 Longitude: 90.536971 Altitude: 40.5±1.12 m Accuracy: 4.944 m Time: 23-08-2025 11:50 Note: RBB</p>

Issue discussed	Photograph
<p>If the approach to all major habitations can be developed or repaired as per the needs of the community.</p>	



FPIC II round details

The 2nd FPIC meeting for the Rongsai–Borjhora–Bajengdoba (RBB) Road project was held on 19 September 2025 at the Bajengdoba Multi-Facility Hall, chaired by the Assistant Executive Engineer, PWD (Roads), NEC Sub-Division II. PWD officials, ESIA experts from Satra, and DPR consultants from RODDIC participated, along with Nokmas, village representatives, and community members. A recap of the 1st FPIC meeting was shared, after which detailed alignment maps and drawings were presented. The Executive Engineer clarified that only minor portions of community and government land may be affected, with no major land requirement is anticipated; participants reviewed the plans and assured full cooperation. ESIA findings were restated, noting that only small structures and

limited community land may be impacted, and additional consent would be collected from absent stakeholders during the 3rd FPIC meeting. The project's positive impacts—employment, better connectivity, improved access to markets and services, and provision of amenities such as toilets and bus shelters—were highlighted. Potential construction-related impacts, including dust, noise, pollution, labour influx, and safety concerns, were discussed along with mitigation measures. The community was requested to identify suitable locations for labour camps and material storage to avoid inconvenience. The Tier-1 GRM committee, already formed with Nokmas and village headmen, had its roles and procedures explained again. Separate focused discussions were held with women and youth on gender issues and project-related opportunities. The rights of indigenous communities under the IPDP framework were emphasized, along with the importance of community-led development. In the open discussion, participants shared suggestions and agreed to submit written requirements during the next FPIC meeting. The meeting concluded with a vote of thanks and a closing prayer by the Village Headman of Bajengdoba.



Figure 7.2: Photograph of IInd round FPIC meeting held on 19th September 2025 at Bajengdoba Multifacility Hall.

Summary of Proceedings – Third Round FPIC Meeting

The third FPIC meeting for the proposed upgradation of RB8 (RBB) Road was chaired by the Assistant Executive Engineer, PWD (Roads), Tikrikilla, with participation from PWD officials, ESIA experts, DPR consultants (M/s Roddic Consultants Pvt. Ltd.), Nokmas, village headmen, and community members. The minutes of the previous FPIC meeting were reviewed to maintain continuity.

A presentation on the proposed road alignment was made, confirming that the project involves upgrading the existing road from a single lane to an intermediate lane (5.5 m). It was clarified that no major requirement of land is expected, though minor impacts on temporary structures and small private land parcels may occur. Communities expressed overall support and several Nokmas submitted NOCs.

Key Issues and Demands Raised:

Communities requested site-specific improvements such as:

- Construction of drains, footpaths, bus waiting sheds, zebra crossings, and public toilets.
- Toe walls and retaining walls for slope and paddy field protection.
- Safety measures near schools and public facilities.
- Protection works near rivers and hill slopes.
- Community infrastructure like boundary walls and community halls.

ESIA Findings:

The ESIA confirmed minimal land requirement. Temporary impacts were acknowledged and mitigation measures were discussed. The project is expected to improve connectivity and create local employment.

Construction Phase Concerns:

Possible impacts such as dust, noise, safety risks, and migrant labour influx were addressed. The PWD assured enforcement of worker conduct, health and safety measures, and monitoring.

Other Key Points:

- Locations for labour camps, borrow areas, and waste disposal sites have been identified with community participation.
- A Tier-I Grievance Redress Committee formed earlier remains active.
- Separate FGDs ensured inclusion of women and youth concerns, particularly regarding employment, sanitation, and safety.
- The importance of community participation under the Indigenous Peoples Development Plan (IPDP) was reiterated.

Conclusion:

The meeting ended with positive feedback and confirmation of continued community cooperation for the project's implementation.



Figure 7.3: Photograph of IIIrd round of FPIC meeting held on 19th September 2025 at Bajengdoba Multifacility Hall.

8. ENVIRONMENTAL AND SOCIAL MANAGEMENT, MONITORING AND 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.

Table 8.1: 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 	Contractor	Approved site location; Lease/NOC copies;	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>water bodies, waterlogged areas or wetlands.</p> <p>➤ 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.</p> <p>➤ Contractor to produce the lease agreements, NOC etc. for these lands.</p>			
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.	<p>➤ The Contractor will be responsible for arranging adequate supply of water for the entire construction period.</p> <p>➤ The contractor will minimize the pollution and wastage of water during construction</p>	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.	<p>➤ The Contractor would prepare OHS plan and other required plans; as a part of CESMP, as per the WB guidelines.</p> <p>➤ 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.</p>	Contractor	To be mobilized before construction; approved OHS plan	MPWD/PMC/CSC
8	Identification of OHS	May cause physical harm,	➤ Conducting workplace inspections to	Contractor	OHS hazard register;	MPWD/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
	Hazard and Risk Categorization	injury, illness, or death to workers.	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.		Inspection reports;	
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. ➤ 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.	➤ 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	<ul style="list-style-type: none"> ➤ 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	<ul style="list-style-type: none"> ➤ 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 	Contractor/ MPWD Division	Records of Relocation completion.	MPWD/ PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			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. ➤ No such installation by the Contractor shall be allowed till all the required legal clearances are obtained from the competent authority. 	Contractor	Approved layout plan; Valid NOCs/Consents; Dust suppression records; Air quality monitoring reports	MPWD/PMC/CSC
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 	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
			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.			
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	<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 	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
			<p>approved by the concerned authority.</p> <ul style="list-style-type: none"> ➤ 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 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 	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>management guidelines.</p> <p>➤ 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.</p>			
6	Contamination of Soil	Soil pollution due to Oil and fuel spills from construction equipment and plants.	<p>➤ Construction plants, workshops, and fuel storage areas shall be located at least 500 m away from any surface water body and environmentally sensitive locations.</p> <p>➤ Oil interceptors shall be installed at construction camps, vehicle parking, and washing areas to trap oil and grease before wastewater is discharged.</p> <p>➤ All fuel and lubricant storage tanks shall be placed on impermeable platforms or within bunded (contained) areas.</p> <p>➤ Regular maintenance and inspection of construction equipment and vehicles shall be carried out to prevent leakage of oil, fuel, or hydraulic fluids.</p> <p>➤ Spill control kits (absorbent pads, sand, and containment booms) shall be available at all fuel storage and handling locations.</p> <p>➤ Used oil and lubricants shall be collected, stored in labelled, leak-proof containers, and handed over only to authorized aggregators/recyclers for</p>	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>disposal in compliance with applicable hazardous waste regulations.</p> <ul style="list-style-type: none"> ➤ 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 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	<ul style="list-style-type: none"> ➤ Fitness and PUC of the vehicles and 	Contractor	Valid PUC	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
		vehicles and construction equipment will pollute the air causing health and safety issues as well.	<p>equipment's need to be ensured.</p> <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. 		certificates; 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
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 	Contractor	Water consumption log; Permission for water source; Installation of	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>shall be obtained from concerned authorities.</p> <ul style="list-style-type: none"> ➤ 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. 		Rainwater harvesting structure	
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 	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
			<p>zones) and up to 100 m from other sensitive receptors.</p> <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. ➤ 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. ➤ Kerosene / LPG should be preferably used to avoid felling of the trees or provide community kitchen for the labour camps for cooking. 	Contractor	Tree felling register; Plantation record;	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			➤ 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. Elephant movement on two chainages	<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 ➤ Speed coming measures, safety signages and Installation of AI-based camera systems (as per RDSO specifications, RDSO/SPN/TC/65/2021) along identified elephant movement zones to continuously monitor and detect elephant presence. 	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 could affect health and	<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 	Contractor	Approved OHS plan; OHS training log; PPE checklist; Awareness programme and Health inspection	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
		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>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. ➤ 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. 		reports	

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 vulnerable to injury due to vehicular accidents.	<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. ➤ 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 	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
			<p>on project vehicles to control speeding.</p> <ul style="list-style-type: none"> ➤ 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 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

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
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 has to prepare a response plan before start of construction works 	Contractor	Force majeure preparedness plan; Emergency contact list	MPWD/PMC/CSC
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. 	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
			<ul style="list-style-type: none"> ➤ 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 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 ➤ Ensure complaints of GBV- SEAH are recorded and addressed with urgency. Ensure that name(s) of complainant(s) 	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
			<p>are kept in confidence and enable anonymous reporting of complaints.</p> <p>➤ 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.</p>			
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.	<p>➤ 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.</p>	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.	<p>➤ 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.</p> <p>➤ Employees should be trained on their rights and responsibilities under labour laws.</p> <p>➤ 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.</p> <p>➤ Investigating and taking action on violations. This could include disciplinary action against the</p>	Contractor	Labour law compliance record; Training attendance record	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			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.	➤ 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	➤ 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	➤ 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

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
	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. ➤ 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. ➤ Conduct public awareness to 	Contractor	Water quality monitoring results; Drain cleaning records	MPWD

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			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 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
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 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

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
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)	3 locations for 3 Seasons* for 2 consecutive years	24 hours sampling	3 locations (Construction Plant Sites, settlements and Work Zones)	18	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
	Operation			3 locations for 3 Seasons for 1 Year		At 3 locations during operation stage where monitoring had been done during construction stage	9	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. Gground water at 2 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 and River.	24	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
	Operation			Surface water 2		At 4 locations	12	Contractor through

Environmental Attribute	Timing	Parameter	Standards	Frequency	Duration	Location	Total no. of Samples during construction and operation stage.	Implementation
				locations for 3 Seasons for 1 years. Water (Ground water) at 2 locations for 3 Seasons for 1 years.		during operation stage where monitoring had been done during construction stage		NABL accredited Laboratory and supervised by Construction Supervision Consultant
Noise	Construction	Noise Levels on dB (A) scale	Noise rules 2000 by CPCB	3 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.	18	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
	Operation			3 locations for 3 Seasons for 1year.		At 03 locations during operation stage where monitoring had been done during construction stage	9	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
Soil	Construction	Monitoring of Pb, SAR and Oil and Grease	(IS): 2720 for 'Method of Test for Soils'	2 locations for 3 Seasons for 2 consecutive years.	Grab Sampling	Soil at 2 location 3 times a year for 24 Months At 2 locations	12	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
	Operation			2 locations for 3 Seasons for 1Year			6	Contractor through NABL accredited

Environmental Attribute	Timing	Parameter	Standards	Frequency	Duration	Location	Total no. of Samples during construction and operation stage.	Implementation
						During operation stage where monitoring had been done during construction stage		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 8.2.

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	RP Implementation consultant/ Contractor/ MPWD	% of women engaged in livelihood activities	Beneficiary tracking	Quarterly
Stakeholder Engagement & Grievance Redressal	RP Implementation consultant/ Contractor/ MPWD	No. of community consultations held	Consultation records	Bi-annually
		% of grievances resolved within set timeline	GRM logs	Quarterly
Indigenous Peoples & Cultural Heritage	RP Implementation consultant/ 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 8.3**. 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 8.4**.

- The reporting system shall start with the Construction Contractor who is the main executor of the implementation activities. The Contractor will report to the Contractor Supervision Consultant (CSC) and the 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

Items	Contractor	Project Management Consultant (PMC)		ESMU (MPWD)		World Bank (WB)
	Implementation & Reporting to PMC /CSC	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		
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Table 8.5: Reporting System for operational performance indicators

Item	Stage	Contractor	Project Management Consultant (PMC)	
		Implementation & reporting to PMC	Supervision	Reporting to ESMU
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, CSC, PMCan and MPWD/ESMU

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 8,28,000 has been projected to cover environmental monitoring activities during both the construction and operation stages. Detailed cost estimates of Environmental Monitoring are provided in **Table 8.5**.

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	3 locations, 3 seasons, 2 years	No.	18	9,000	1,62,000
2	Air quality monitoring	Operation	3 locations, 3 seasons, 1 Year	No.	9	9,000	81,000
3	Water quality monitoring	Construction	2 locations, 3 seasons, 2 years (For surface and ground water each)	No.	24	7,000	1,68,000
4	Water quality monitoring	Operation	2 locations, 3 seasons, 1 year. (For surface and ground water each)	No.	6	7,000	42,000
5	Noise quality monitoring	Construction	3 locations, 3 seasons, 2 years	No.	18	3,000	54,000
6	Noise quality monitoring	Operation	3 locations, 3 seasons, 1 Year	No.	9	3,000	27,000
7	Soil quality monitoring	Construction	2 locations, 3 seasons, 2 years	No.	12	6,000	72,000
8	Soil quality monitoring	Operation	2 locations, 3 seasons, 1 Year	No.	6	6,000	36,000
	Total						6,42,000

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.

8.7.1 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**.

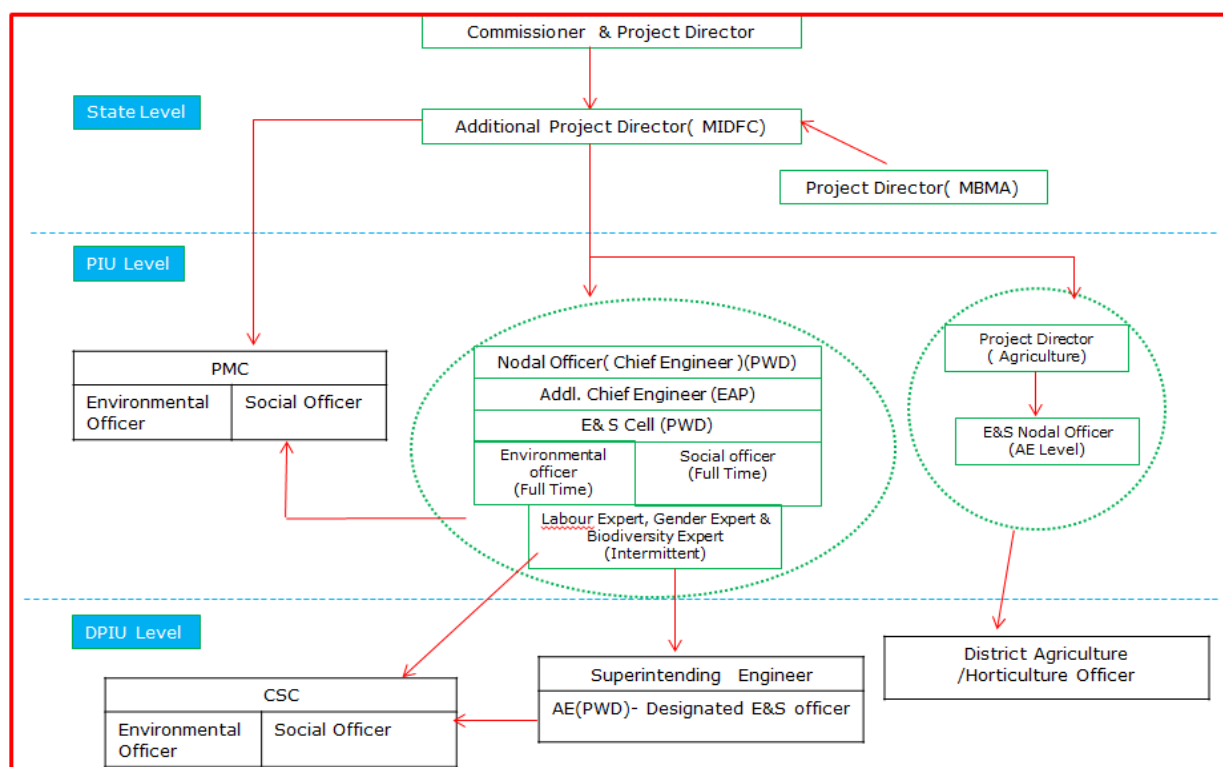


Figure 8.1 Project Implementation Organogram

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.

8.7.2 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.

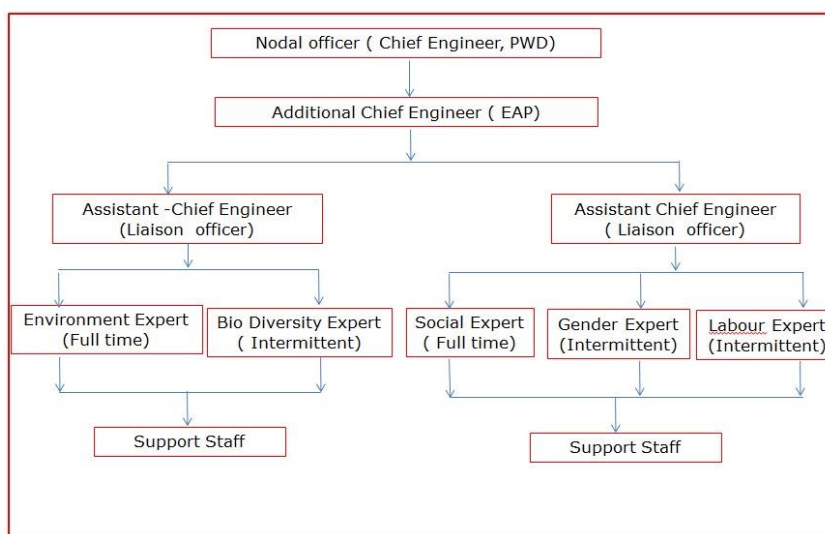


Figure 8.2: Organizational Structure of the E&S Cell

7.4 Roles and Responsibilities of Key Staff and Entities

The implementation of the projects under the Meghalaya Logistics and 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 below:

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 and national/state laws. Chairs Project Steering Committee and oversees inter-departmental coordination.	Responsible for ensuring full ESF compliance, approval of ESMPs, oversight of land acquisition, labour management, stakeholder engagement, and reporting to World Bank.	Reports to Chief Secretary, GoM; Coordinates with PWD, MBMA, and 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	Ensures compliance with ESS5 (Land Acquisition), ESS7 (Indigenous	Reports to Additional Project Director, MIDFC; coordinates with Agriculture, Horticulture,

Designation	Institution / Entity	Core Roles and Responsibilities	Environmental & Social Responsibilities (ESF-linked)	Reporting / Coordination Line
		value chains, market linkages, and climate-resilient infrastructure.	Peoples), and ESS10 (Stakeholder Engagement). Guides community consultations and inclusion of women and tribal groups.	and FPOs.
Nodal Officer Cum Project Director (Chief Engineer, PWD)	Public Works Department	Heads design, technical standards, and construction quality control for connectivity works. Integrates environmental and social considerations in DPRs and tendering.	Ensures engineering designs include environmental safeguards, slope protection, and labour-safety features. Supervises PIU-PWD E&S compliance.	Reports to Commissioner (PMU) and coordinates with 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	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.

Designation	Institution / Entity	Core Roles and Responsibilities	Environmental & Social Responsibilities (ESF-linked)	Reporting / Coordination Line
		management.		
Social Expert	E&S Cell, PIU (PWD/MBMA)	Conducts social screening, stakeholder consultations, and supervises RAP/IPDP implementation. Ensures fair compensation and livelihood restoration.	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.
Gender Expert (Intermittent)	E&S Cell (PIU/PMU Shared)	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 Cell (PIU/PMU Shared)	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 Cell (PIU/PMU Shared)	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.

Designation	Institution / Entity	Core Roles and Responsibilities	Environmental & Social Responsibilities (ESF-linked)	Reporting / Coordination Line
Environmental Expert	Project Management Consultant (PMC)	Supports PMU and PIU in reviewing environmental documents, conducting audits, and quality assurance for ESMP implementation.	Verifies compliance with ESS1, ESS3, ESS4, and national environmental laws. Provides training inputs.	Reports to PIU and PMC Team Leader.
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.

Designation	Institution / Entity	Core Roles and Responsibilities	Environmental & Social Responsibilities (ESF-linked)	Reporting / Coordination Line
Environmental Expert	Supervision Consultant	Conducts day-to-day site inspections, monitors ESMP compliance, and prepares environmental progress reports.	Ensures mitigation measures are implemented and recommends corrective actions for non-compliance.	Reports to PIU and PMC.
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.	Ensures compliance with ESS2, ESS3, ESS4, and ESS10, manages worker	Reports to DPIU/PIU; supervised by Supervision Consultant.

Designation	Institution / Entity	Core Roles and Responsibilities	Environmental & Social Responsibilities (ESF-linked)	Reporting / Coordination Line
		Prepares Contractor's ESMP (C-ESMP) and maintains OHS measures.	welfare, waste disposal, and safety.	

Under the institutional arrangement for MLCIP, strict enforcement mechanisms ensure accountability in environmental and social (E&S) compliance. A 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 REDRESSAL 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 Fifteen (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 Fifteen (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

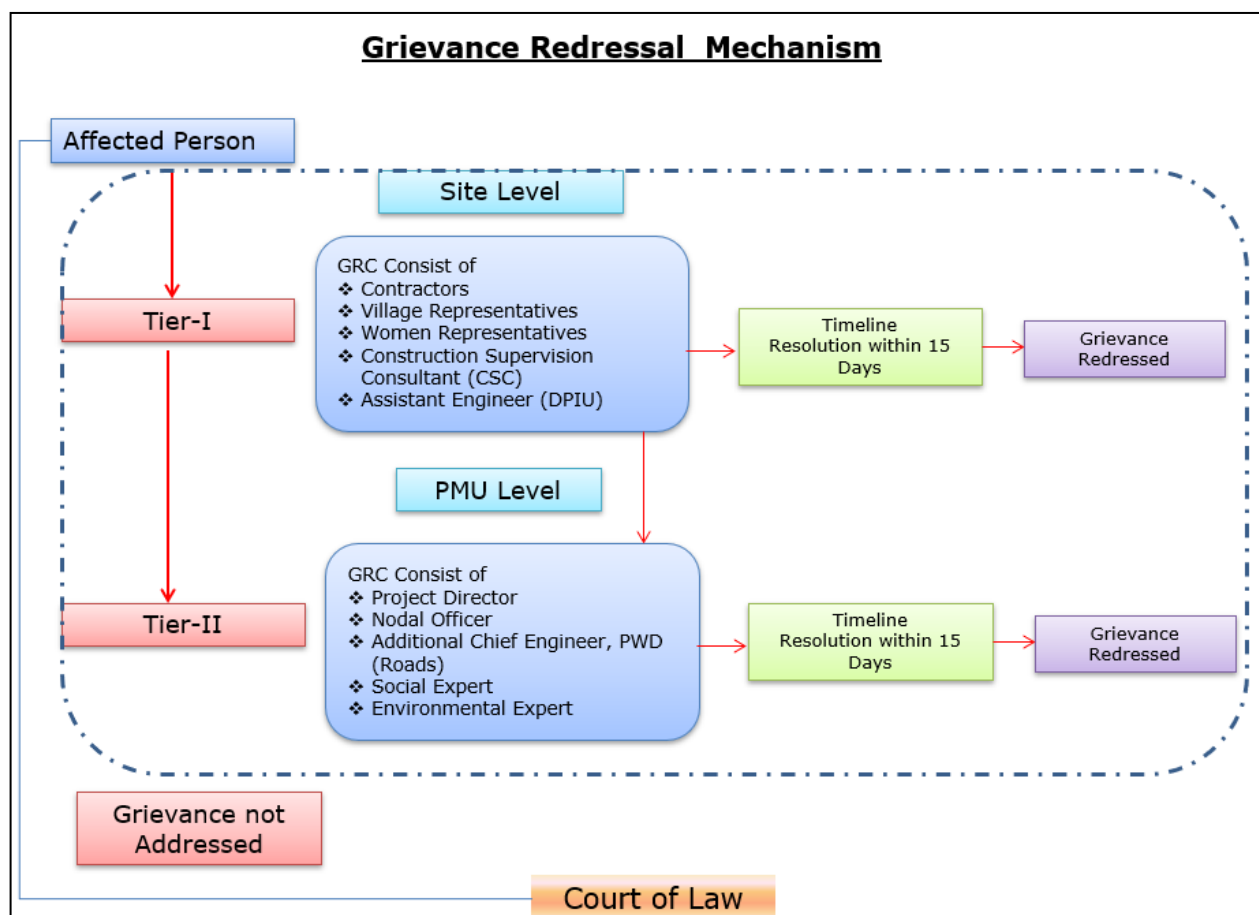


Figure 9.1: Grievance redressal Mechanism

(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., 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.

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. The Grievance Submission Form is given as Annexure -5

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 North Garo Hills.
- 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.
- Community land with vegetation is located along the project road corridor at chainages 17+100 to 17+500. However, as all construction activities will remain confined within the existing Right of Way (RoW), no adverse impact on this community land with vegetation is anticipated.
- The proposed project alignment does not pass through any Wildlife Sanctuary/National Park/Biosphere Reserve/Tiger Reserve. However, two non-notified elephant crossings are present at Chainage 17+100 and at 17+400.
- No ASI Protected monuments found within 0.5 km from the project site.
- Approximately 28 nos. of trees are located within the existing Right of Way (RoW) along both sides of the road. To mitigate the ecological impact of tree felling, compensatory plantation at 1:10 ratio for each tree cut should be undertaken in line with applicable environmental regulations and guidelines.
- The project road is expected to have some environmental and social impacts due to construction activities along the corridor, its proximity to culturally important sites such as community center, church, school, etc. and potential effects on Project-Affected Persons (PAPs) arising from access-related issues.
- 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: Environmental and social assessment findings with mitigation measures

Chainage	EIS observation	Proposed/Mitigation measure
0+00	Traffic congested conditions.	T- junction improvement is proposed
0+300	Submergence during monsoon	New Bridge is proposed
0+600	Water logging	Box Culvert/level proposed to be raised about 300 mm
1+300	Submergence during Monsoon season	Road level proposed to be raised by 250 MM
1+350 to 1+600	Submergence during Monsoon season	Drain cum footpath (LHS) is proposed
2+150	School	Speed restriction signs before and after school (Both side of the school)
2+700	Minor settlement is located along the Curvature	Curve correction to minimize the impact.
2+950	Sharp curve	Speed restriction signs due to sharp curve to avoid accident.
8+600	Soil erosion in the river on left side (LHS)	Toe wall/Protection works proposed due to soil erosion in the river on left side (LHS)
9+100	Drain/Nalla with 250 mm submergence during heavy rainfall; appropriate drainage management to be addressed and erosion control works may be proposed.	Appropriate measures shall be proposed to address the issue.
9+200	Riverbank erosion observed	River training work due to erosion in bridge foundation
9+950	Riverbank erosion observed	Protection works at riverbank on right side (RHS)
11+780	Damaged culvert	Culvert failure (New Culvert required)
17+100 to 17+400	community land with vegetation and 2 elephant passes	Elephant passes and community land with vegetation fall under this location. Speed calming measures and earning signs (No widening and work will be within existing paved road.

10.2 RECOMMENDATIONS

- The Contractor should prepare a site-specific contractor's 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 staff of ESMU/PMC and district level MPWD engineers on ESHS policies, regulations, implementation, monitoring and reporting about the ESMP implementation before construction activities.
- 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 RBB 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.

11. ANNEXURES TO DRAFT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT

For

Upgradation of Rongsai Borjhora Bajengdoba (RBB) Road from single to intermediate lane for
Meghalaya Logistics and Connectivity Improvement Project (MLCIP)
Corridor funded by the World Bank

Submitted To



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ANNEXURE 1.1 UTILITY DETAILS

Utility for Electrical__Rongsai Borj Bajeng Road (RBB)						
Chainage		Electric Pole		Transformer		Electric Crossing line
LHS	RHS	LHS	RHS	LHS	RHS	
0+000	1+000	7	7	1	2	7
1+000	2+000	5	30	0	4	9
2+000	3+000	1	19	0	0	10
3+000	4+000	12	12	0	0	6
4+000	5+000	14	0	0	0	2
5+000	6+000	1	13	0	0	6
6+000	7+000	8	2	0	0	6
7+000	8+000	0	1	0	0	3
8+000	9+000	2	1	0	0	2
9+000	10+000	2	1	0	0	6
10+000	11+000	9	13	0	0	3
11+000	12+000	1	6	0	0	8
12+000	13+000	8	1	0	0	2
13+000	14+000	1	1	0	0	0
14+000	15+000	0	0	0	0	0
15+000	16+000	0	0	0	0	0
16+000	17+000	0	0	0	0	0
17+000	18+000	0	0	0	0	0
18+000	18+247	0	0	0	0	0
Total		71	107	1	6	70

Utility for Electrical___Rongsai Borj Bajeng Road (RBB)			
Chainage		OFC PILLAR	
LHS	RHS	LHS	RHS
0+000	1+000	2	2
1+000	2+000	6	3
2+000	3+000	5	3
3+000	4+000	5	4
4+000	5+000	4	3
5+000	6+000	3	4
6+000	7+000	5	3
7+000	8+000	5	0
8+000	9+000	6	0
9+000	10+000	7	0
10+000	11+000	6	0
11+000	12+000	4	0
12+000	13+000	5	3
13+000	14+000	3	0
14+000	15+000	0	0
15+000	16+000	0	0
16+000	17+000	0	0
17+000	18+000	0	0
18+000	18+247	0	0
Total		66	25

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:93-2017	Guidelines on Requirements for Environmental Clearances for Road projects
20	IRC:SP:96- 2012	Guidelines for Selection, Operation and Maintenance of Concrete Batching and Mixing Plants
21	IRC:SP-103-2014	Guidelines on Tree Plantation along Rural Roads
22	IRC:SP-106-2015	Engineering Guidelines on Landslide Mitigation Measures for Indian Roads
23	IRC:SP-108-2015	Guidelines on Preparation and Implementation of Environment Management Plan
24	IRC:SP-113-2018	Guidelines on Flood Disaster Mitigation for Highway Engineers
25	IRC:SP:130-2022	Guidelines on Design and Installation of Noise Barriers for Roads
26	IRC:SP:133-2022	Guidelines on Reducing Carbon Footprint of Road Projects
27	MoRTH	Manual for Maintenance of Roads, 1983

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

ANNEXURE 2.2: COMPARATIVE ANALYSIS OF EXISTING STATE/NATIONAL LEGISLATIONS AND WORLD BANK ESF

WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
Assessment and Management of Environmental and Social Risks and Impacts	Environment Protection Act/ Rules 1986 and amendments till date EIA Notification 14th Sep 2006 and EIA Notification March 2020. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013	As per the MoEF&CC EIA Notification 2006, rural bridge works (<1,50,000 Sq. Mt of built-up area) do not require any EIA or approval from MoEF&CC or MSPCB. Borrowing of the minor minerals (earth, sand, aggregates, etc.) for embankments, bridges, approach roads, trucks and bus halts, etc. will require permissions from MSPCB and will require prior environmental clearance under the mining of minor minerals category. The MPWD will ensure that the ESIA and ESMPs prepared during project design, forms a part of the bid documents. MPWD will also ensure that provisions laid down in ESMPs, are implemented through civil work contractors and monitored by the MPWD Divisions/ E&S Specialists of MPWD/ consultants.
Labour and Working Conditions	Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 Workmen Compensation Act, 1923 Inter-state Migrant Workers Act, 1979 The Child Labour (Prohibition & Regulation) Amendment Act, 2016 Building and Other Construction Workers Welfare Cess Act, 1996 Sexual Harassment of Women at the Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act) Contract Labour (Regulation & Abolition) Act 1970 Payment of Wages Act, 1936 The minimum wages rules Meghalaya 1952 Payment of Gratuity Act, 1972	The national and state legal provisions cover all requirements of ESMF . A Labour Management Procedures is prepared for MPWD to regulate working conditions and management of labour relations including worker specific GRM, terms and conditions of employment, code of conduct, non-discrimination and equal opportunities, protection of labour force, prohibition of child/force labour and provision of OHS requirements. The main gap that LMP will cover is the OHS requirements of direct and contracted workers. The other gaps that the LMP fills are the provision of Code of Conduct for workers, GBV prevention measures, GRM for workers, etc., compliance to applicable labour laws, documentation on labour management by contractors and orientation training of civil work contractors and workers. The ESMP being prepared by the consultant need to ensure that the ESF requirements are integrated in the document with adequate monitoring

WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
	<p>The payment of gratuity rules Meghalaya 1972</p> <p>Employees Provident Fund and Miscellaneous Provision Act, 1952</p> <p>Maternity Benefit Act, 1951</p> <p>Meghalaya Maternity benefit Rules 1965</p> <p>Payment of Bonus Act, 1965</p> <p>The Payment of Bonus Rules Meghalaya 1975</p> <p>The Bonded Labour (Abolition) Act 1976</p> <p>Bonded Labour System (Abolition) Rules 1976</p> <p>The Trade Union Act, 1926</p>	<p>provisions. The consultant has to ensure relevant penalty clause are integrated in the ESMP document to be attached to the bidding documents. The MPWD will ensure implementation of ESMP prepared by the consultants and updated by the contractors and it have to be monitored by the MPWD Divisions/ ESMU/ consultants. The concerned Labour Officers will also be monitoring these.</p>
Resource Efficiency and Pollution Prevention and Management	<p>The Mines and Minerals (Development and Regulation) Act, 1957</p> <p>Meghalaya Minor Mineral Concession Rules 2013</p> <p>Meghalaya Mineral Regulation and Dealers Rules 2020</p> <p>Air (Prevention and Control of Pollution) Act, 1981, 1987</p> <p>Water Prevention and Control of Pollution) Act, 1974, 1988</p> <p>Noise Pollution (Regulation and Control Act) 2000 and amendments till date</p> <p>Hazardous & Other Waste (Management and Trans-boundary Movement) Rules, 2016</p> <p>Manufacture, Storage & imports of Hazardous Chemicals (MSIHC) Rules, 1989 as amended till date</p> <p>The Batteries (Management and Handling) Rules 2001</p> <p>Construction and Demolition Waste Management Rules, 2016</p> <p>Vehicle Act 1988 Central Motor Vehicle Rules 1989</p>	<p>The majority of ESMF requirements are directly addressed by existing regulations and indirectly for resource efficiency and climate change aspects, including pollution prevention and management. However, there are gaps in monitoring and reporting requirements, leading to insufficient data on pollution levels, resource consumption, and waste generation.</p> <p>Consultants preparing ESIA and ESMP will ensure relevant provisions are integrated in these documents. Bidding documents too shall be integrated with the relevant provisions and this will be monitored by the MPWD Divisions/E&S Specialists of MPWD/ consultants</p>
Community Health and Safety	<p>The Gas Cylinder Rules 2016</p> <p>Hazardous & Other Waste (Management and Trans-boundary Movement) Rules, 2016</p> <p>Disaster Management Act, 2005</p>	<p>These existing laws and rules are to protect community health and safety. Hence, these laws and rules fulfil the community health and safety requirements. The BIS standards and building codes address the community health and safety requirements. In addition, an ESMP will be prepared to be</p>

WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
	<p>Meghalaya State Disaster Management Policy 2010</p> <p>Solid Waste management Rules, 2016</p> <p>Plastic waste management Rules, 2016</p> <p>E-Waste Management Rules, 2016</p> <p>Air (Prevention and Control of Pollution) Act, 1981, 1987</p> <p>Water Prevention and Control of Pollution) Act, 1974, 1988</p> <p>Noise Pollution (Regulation and Control Act) 2000 and amendment till date</p> <p>Manufacture, Storage & imports of Hazardous Chemicals (MSIHC) Rules, 1989 as amended till date</p> <p>The Batteries (Management and Handling) Rules 2001</p> <p>Construction and Demolition Waste Management Rules, 2016</p> <p>Vehicle Act 1988 Central Motor Vehicle Rules 1989</p>	<p>implemented by the contractors, keeping community health and safety in mind.</p> <p>There is a gap in the consideration of excavation activities within sectors that may involve legacy contamination, which may pose risks to both occupational workers and the surrounding community.</p> <p>MPWD will ensure that the consideration of excavation areas with legacy contamination and implementation of suitable safety measures are incorporated to address community health and safety. The ESMP prepared during project preparation and implementation shall deal with community health and safety which shall include an OHS plan, labour Influx management Plan, workers camp management plan, traffic and road safety management plan, construction phase safety etc.</p> <p>The MPWD will ensure that the ESMF provisions are implemented through contractors and monitored by the MPWD Divisions/E&S Specialists of MPWD/ consultants.</p>
LA, Restriction on Land Use and Involuntary Resettlement	<p>The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013</p> <p>Meghalaya Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules, 2017</p> <p>Direct Purchase Policy for Land Acquisition for EAPs</p> <p>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</p> <p>The Meghalaya Highways Act, 1972</p>	<p>Gap exists specifically related to aspects such as the identification of non-titleholders as PAPs and cut off dates for non-titleholders. The gaps will be addressed with suitable provisions in RPF.</p> <p>Consultants preparing ESIA and ESMP will ensure relevant provision are integrated in these documents. Bidding documents too shall be integrated with the relevant provisions and this will be monitored by the MPWD Divisions/E&S Specialists of MPWD/ Construction Supervision consultants.</p>
Biodiversity Conservation and Sustainable Management of Living Natural Resources	<p>The Forest (Conservation) Act, 1980 and Amendments and The Forest (conservation) Rules 1981 and Amendments</p> <p>National Forest Policy 1988</p> <p>Biological Diversity Act, 2002</p> <p>Meghalaya Biodiversity Rules, 2010</p>	<p>Provisions from the acts meet the ESMF requirements. The concept of ecosystem resource management in India is addressed through various environmental and forestry laws, policies, and guidelines. One of the key legislations in this regard is the Forest (Conservation) Act, 1980. While the main focus of this act is on the conservation of forests, it encompasses the</p>

WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
	<p>Eco-sensitive Zone Notifications 2015</p> <p>State Compensatory Afforestation Fund Management and Planning Authority Forest (Conservation) Amendment Rules, 2014</p> <p>Meghalaya manages compensatory afforestation through the Meghalaya State Compensatory Afforestation Fund Management and Planning Authority (MSCAFMPA), established under the Compensatory Afforestation Fund (CAF) Act, 2016, Meghalaya Tree (Preservation) Act, 1976 ,Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)</p> <p>EIA Notification 14th Sep 2006 and subsequent amendments</p> <p>Meghalaya Forest Regulation (Amendment) Act, 2012</p>	<p>sustainable management of ecosystem resources. It includes considerations for environmental impact assessments, compensatory afforestation, and wildlife conservation. Additionally, the National Forest Policy of India, last revised in 1988, provides a broader framework for the sustainable management of forest resources, including ecosystems. It outlines principles for maintaining environmental stability, preserving biodiversity, and ensuring the overall health of ecosystems.</p> <p>The Wildlife Protection Act, 1972 primarily focuses on wildlife conservation and not only emphasizes the protection of wild animals but also includes provisions related to the preservation and management of their habitats. The act designates specific areas as "protected areas," such as wildlife sanctuaries, national parks, and community reserves, with the aim of conserving wildlife and maintaining ecological balance. Recognizing the vital role of habitats in the well-being of wildlife species, the act underscores the importance of declaring certain areas as protected zones to safeguard biodiversity.</p> <p>The Environmental Impact Assessment (EIA) process, governed by the Environment Impact Assessment Notification, 2006 addresses mitigation measures for projects that may have environmental and habitat implications.</p> <p>Gap exists since there is no specific comprehensive law in India that explicitly mandates a net gain standard for specific habitat types across the country. To bridge this gap, project specific ESMPs to include (for projects located in critical habitats/ eco-sensitive zones / having significant impacts on biodiversity) habitat treatment standards, including the implementation of net gain principles by providing a systematic and integrated approach to environmental and social management. ESMP to also address the wildlife presence and movement outside the protected area and in and around the Project road corridor locations including critical habitats by incorporating measures to identify, mitigate, and manage the impacts of projects on these sensitive ecosystems.</p>

WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
		The MPWD will ensure that the ESMF are implemented through them and contractors and monitored by the MPWD Divisions/ E&S Specialists of MPWD/ consultants. The Forest Department and the concerned Wildlife Wardens will be monitoring the implementation of these measures.
Indigenous Peoples	Article 366 (25) of the Constitution of India Article 244(1) of Constitution of India - The Fifth Schedule under Article 244(1) of a subsequent Act of Constitution "Scheduled Areas" as such areas as the President may by order declare to be Scheduled Areas after consultation with Governor of that State and The Meghalaya Transfer Of Land (Regulation) Act, 1971	Constitutional provisions define essential characteristics for a community to be identified as Scheduled Tribes and an area to be defined as Scheduled Area. The legislation on acquisition RFCTLAR&R mandates FPIC in Scheduled areas. Thus, the legislation meets the requirements of ESMF, including FPIC. The MPWD will ensure that the ESMF provisions are implemented through them and monitored by the MPWD Divisions/E&S Specialists of MPWD/ consultants.
Cultural Heritage	Ancient Monuments and Archaeological Sites and Remains Act, 1958 and 1959 The Treasure Trove Act 1878	The legislation meets the requirements of ESMF, mandating conservation of cultural and historical remains found within the country boundary. The Chance Finds procedures are available in the legislation. The chance find procedures will be included in ESMP. Impacts on religious structures (not protected, but social and cultural value) will be mitigated or managed through provisions for restoration. The MPWD will ensure that the ESMF are implemented through them and contractors and monitored by the MPWD Divisions/ E&S Specialists of MPWD/ consultants.
Stakeholder Engagement and Information Disclosure	EIA Notification 14th Sep 2006 and amendments till date. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 Right to Information Act, 2005	The legislation partly covers this ESS with the Acts mandating the need to provide information when asked for. Almost all government agencies have GRM and Citizen Charters detailing the redressal and service services. Stakeholder Engagement Plan (SEP) or equivalent document that is accessible to all stakeholders will be prepared. Further, national or state laws may have varying degrees of inclusivity in decision-making processes, potentially leading to marginalized communities' concerns being overlooked.

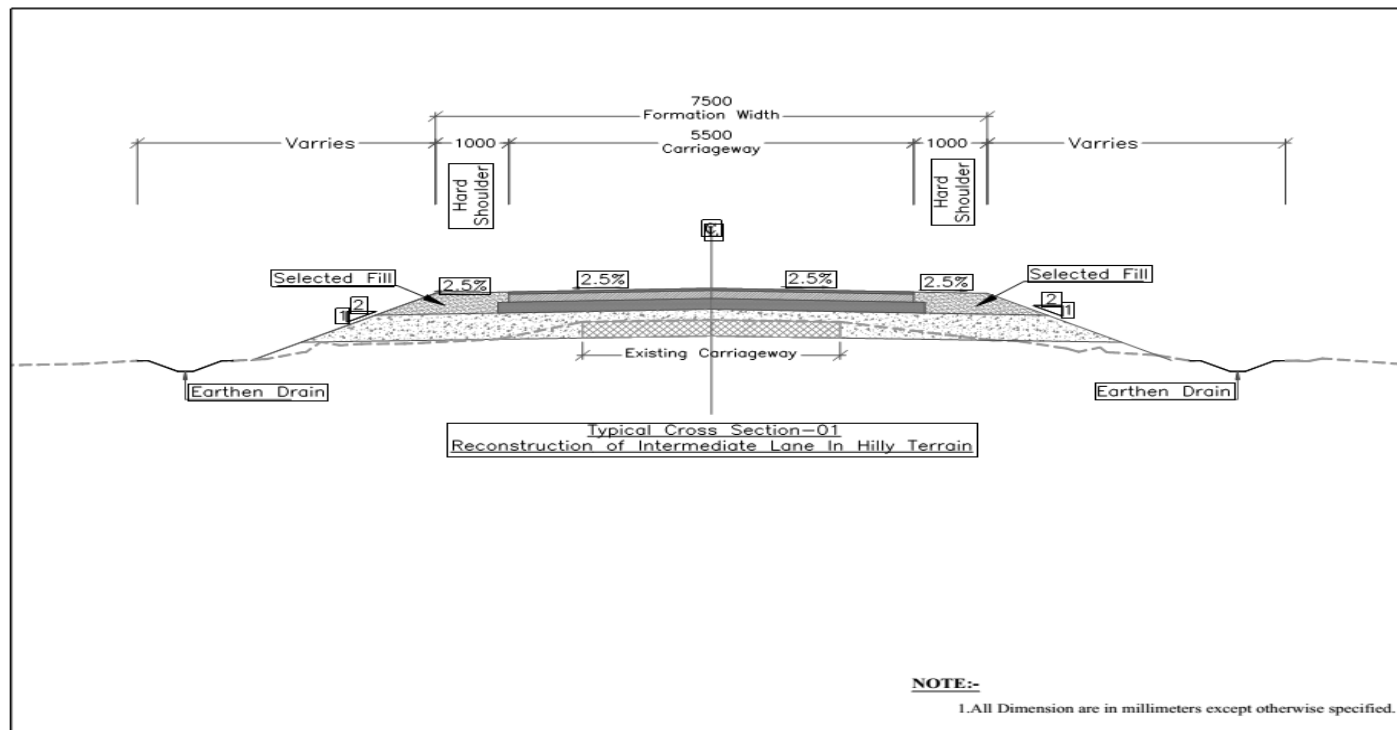
WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
		<p>Forest rights, and eco system services of the community shall be captured during engagement by the consultants.</p> <p>The MPWD will ensure that the ESMF are implemented through them and contractors and monitored by the MPWD Divisions/E&S Specialists of MPWD/ consultants.</p>

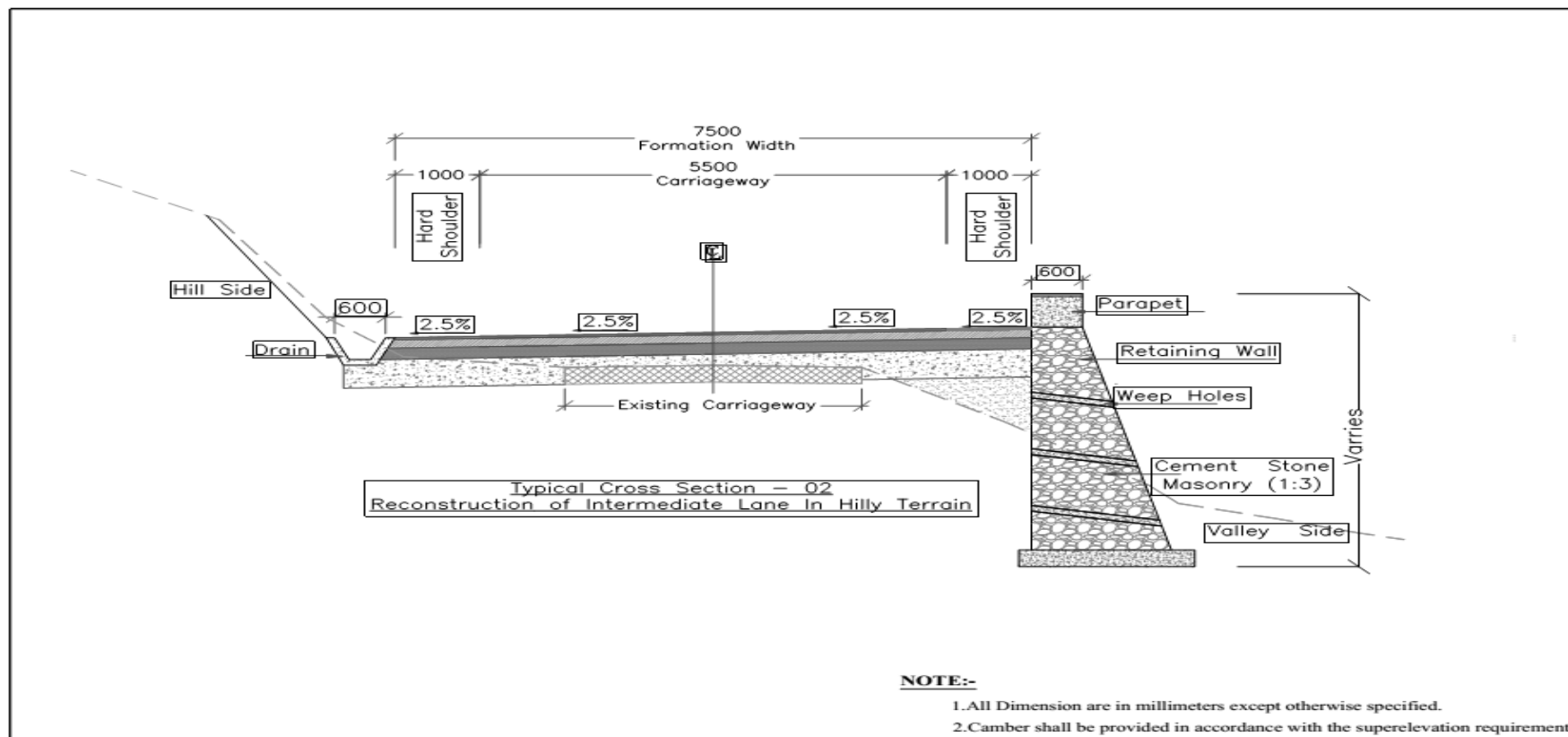
ANNEXURE 3.1: PROPOSED ROAD CROSS-SECTIONS**(a) Typical road cross sections for Corridor 3**

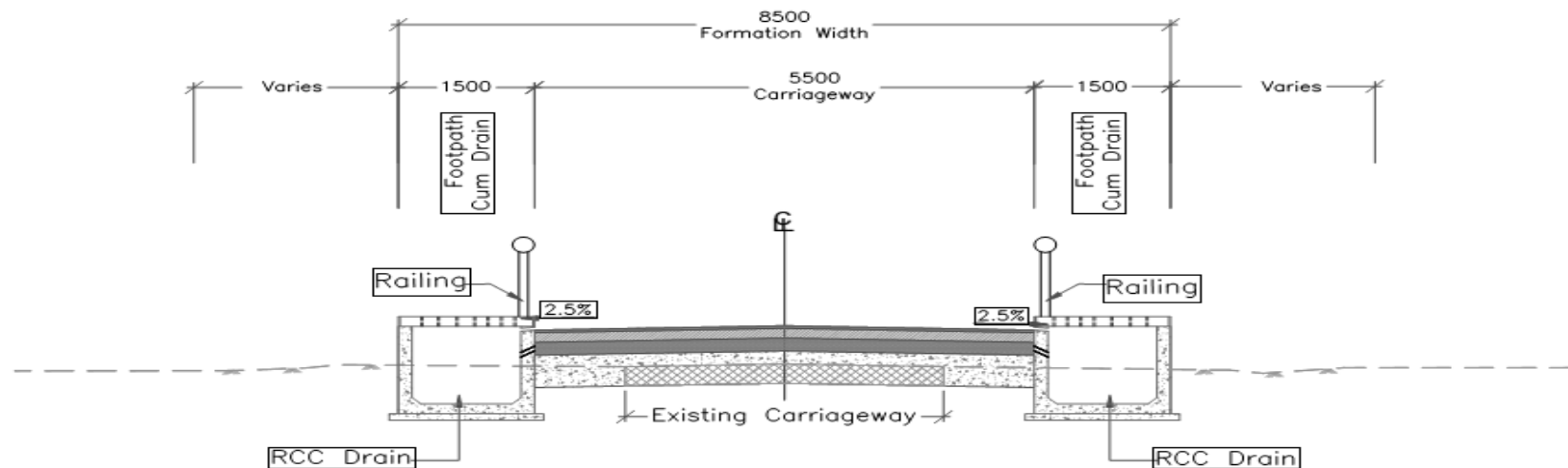
SL. No	From	To	Length	TCS Type	TCS Description
1	0	1280	1280	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
2	1280	1620	340	TCS-3	Widening/Reconstruction of intermediate lane in built-up Section with Drain both Side
3	1620	2500	880	TCS-2	Widening/Reconstruction of intermediate lane with retaining wall RHS and Breast Wall LHS
4	2500	2900	400	TCS-3	Widening/Reconstruction of intermediate lane in builtup Section with Drain both Side
5	2900	3960	1060	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
6	3960	4580	620	TCS-4	Widening/Reconstruction of intermediate lane with retaining wall LHS and Breast Wall RHS
7	4580	4980	400	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
8	4980	5340	360	TCS-4	Widening/Reconstruction of intermediate lane with retaining wall LHS and Breast Wall RHS
9	5340	5860	520	TCS-2	Widening/Reconstruction of intermediate lane with retaining wall RHS and Breast Wall LHS
10	5860	6340	480	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane

SL. No	From	To	Length	TCS Type	TCS Description
11	6340	6740	400	TCS-4	Widening/Reconstruction of intermediate lane with retaining wall LHS and Breast Wall RHS
12	6740	7180	440	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
13	7180	8280	1100	TCS-4	Widening/Reconstruction of intermediate lane with retaining wall LHS and Breast Wall RHS
14	8280	8500	220	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
15	8500	9060	560	TCS-4	Widening/Reconstruction of intermediate lane with retaining wall LHS and Breast Wall RHS
16	9060	10830	1770	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
17	10830	11070	240	TCS-4	Widening/Reconstruction of intermediate lane with retaining wall LHS and Breast Wall RHS
18	11070	11340	270	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
19	11340	12000	660	TCS-4	Widening/Reconstruction of intermediate lane with retaining wall LHS and Breast Wall RHS
20	12000	12420	420	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
21	12420	12660	240	TCS-4	Widening/Reconstruction of intermediate lane with retaining wall LHS and Breast Wall RHS

SL. No	From	To	Length	TCS Type	TCS Description
22	12660	13030	370	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
23	13030	13440	410	TCS-4	Widening/Reconstruction of intermediate lane with retaining wall LHS and Breast Wall RHS
24	13440	15150	1710	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
25	15150	15480	330	TCS-2	Widening/Reconstruction of intermediate lane with retaining wall RHS and Breast Wall LHS
26	15480	15790	310	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
27	15790	16600	810	TCS-4	Widening/Reconstruction of intermediate lane with retaining wall LHS and Breast Wall RHS
28	16600	16920	320	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
29	16920	17030	110	TCS-4	Widening/Reconstruction of intermediate lane with retaining wall LHS and Breast Wall RHS
30	17030	17160	130	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane
31	17160	17500	340	TCS-5	Elephant Corridor (Follow existing alignment with overlay)
32	17500	18247	747	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane



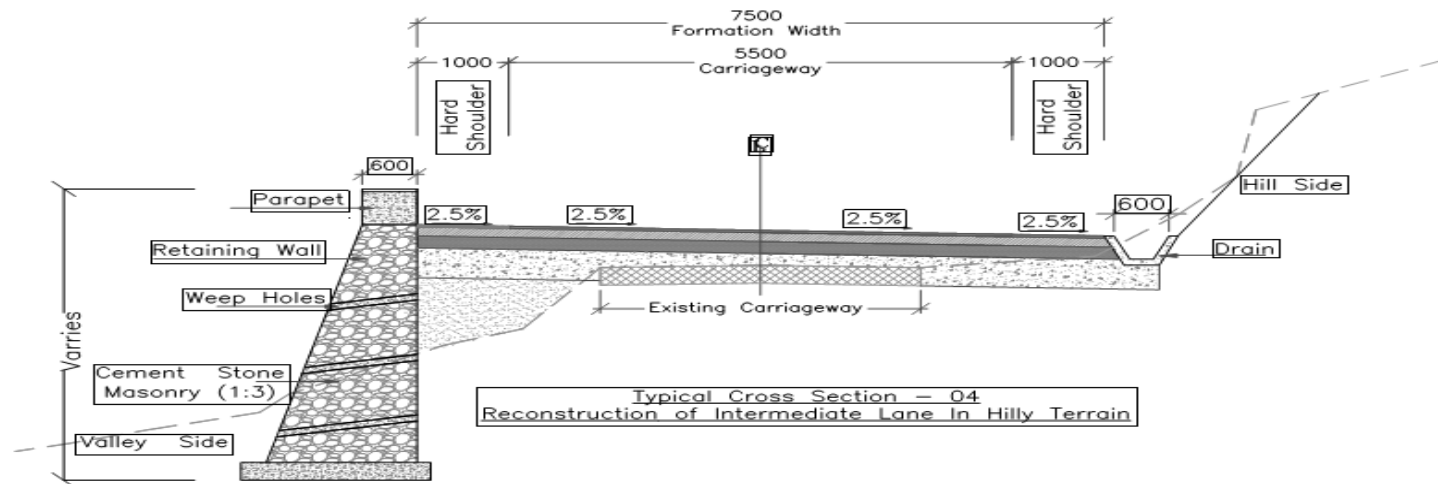




Typical Cross-Section - 03
Reconstruction of Intermediate Lane for Built up Section

NOTE:-

1.All Dimension are in millimeters except otherwise specified.



NOTE:-

1. All Dimension are in millimeters except otherwise specified.
2. Camber shall be provided in accordance with the superelevation requirements

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. ➤ 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. 	Contractor	Approved site location; Lease/NOC copies;	MPWD/PMC/CSC
5	Supply of Construction Material	Sourcing materials from unauthorized sources.	<ul style="list-style-type: none"> ➤ Procurement of construction material only from approved quarries and sites 	Contractor	EC, Permits, challans, Material	MPWD/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			and licensed/ authorized vendors/ manufacturers. Contractor to produce approvals and receipts.		source approval copies;	
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 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
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	Vehicles and equipment not complying with	<ul style="list-style-type: none"> ➤ The contractor will maintain records of fitness and Pollution Under Control 	Contractor	Records of valid PUC / fitness;	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
	and Machinery	regulations may lead to pollution of environment.	(PUC) certificates for all vehicles and generators used during the contract period		Inspection log	
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 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	<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

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
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	<ul style="list-style-type: none"> ➤ 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	<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 	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
			<p>contract and prior Consent / NOC for all such plants shall be obtained.</p> <p>➤ No such installation by the Contractor shall be allowed till all the required legal clearances are obtained from the competent authority.</p>			
2	Borrow Areas	Impacts due to improper operation and closing of borrow areas	<p>➤ 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.</p> <p>➤ 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.</p>	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	<p>➤ The Contractor shall identify materials from legally valid quarries with existing NOC from the relevant departments.</p> <p>➤ No quarry or associated plants can be set-up within 1000m from the residential/ settlement locations</p> <p>➤ 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.</p>	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	<p>➤ All necessary precautions shall be taken while working near cross-drainage channels, to prevent earthwork, stonework, construction materials from</p>	Contractor	Debris disposal/reuse records; Approved Site restoration	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>obstructing cross-drainage at rivers, streams, and drainage systems, or from causing flooding.</p> <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 		plan; Photographic documentation.	
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 areas to prevent leaching or contamination of soil and groundwater. ➤ The disposal of bituminous wastes shall be carried out by the Contractor at 	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>secure landfill sites approved by the concerned government authorities.</p> <ul style="list-style-type: none"> ➤ 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 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 	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>handling locations.</p> <ul style="list-style-type: none"> ➤ 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 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. 	Contractor	Air quality monitoring reports; Dust suppression log; PPE compliance records	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			➤ Community complaints related to dust shall be recorded, and addressed promptly.			
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 batching plants, crushers, and material handling areas to minimize particulate emissions. 	Contractor	Valid PUC certificates; Equipment maintenance log; Emission test results	MPWD/PMC/CSC
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 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. 	Contractor	Noise level test report; PPE usage record; Complaint register; vehicles, plants and	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ 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 		equipment maintenance records.	
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. ➤ Kerosene / LPG should be preferably 	Contractor	Tree felling register; Plantation record;	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>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>			
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> <p>➤ Hunting and fuel wood collection will be strictly prohibited</p>	Contractor	Worker awareness attendance; Wildlife sighting log	MPWD/PMC/CSC
16	Aquatic Fauna	Construction activities and workers may cause harm to fauna.	<p>➤ 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.</p> <p>➤ Where any GI wire mesh gabions are used; all GI wire ends need to be folded inside.</p> <p>➤ Ensure that no construction activities will be carried out during monsoon and the fish breeding season.</p>	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	<p>➤ The Contractor would prepare OHS plan and other required plans as per the WBs guidelines.</p> <p>➤ All the laborers to be engaged for construction works shall be screened for health and adequately treated before issue of work permits.</p> <p>➤ Periodic health check-up of construction workers.</p> <p>➤ Prevention of mosquito breeding need to be ensured at the project site and</p>	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
		safety of workers and others.	<p>other ancillary areas</p> <ul style="list-style-type: none"> ➤ 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. ➤ 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 			

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			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 vulnerable to injury due to vehicular accidents.	<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. ➤ 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 	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
			<p>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.</p> <p>➤ In the consideration of risk at civil works, each labour should be covered under ECA 1923 insurance until completion of work.</p>			
19	Emergency Response system	Absence may result to increased incidents, injury, economic loss etc.	<p>➤ Develop and implement ERS</p> <p>➤ Train personnel Establish communication channels</p> <p>➤ Systematic planning and training for emergencies.</p>	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.	<p>➤ There would be possibility of the transmission of communicable diseases due to migration of labour population from other areas at the construction site.</p> <p>➤ Agreement shall be made with nearby health centre or hospital for emergency treatment.</p> <p>➤ Special Measures for COVID 19 should be strictly followed at the camp and construction site.</p>	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.	<p>➤ Protection of Agriculture Land near roads/ bridges.</p> <p>➤ The mitigation measures should be adopted as per norms of State Disaster Management Authority, Government of Meghalaya.</p>	Contractor	Site assessment report; Record of Compliance with SDMA norms	MPWD/PMC/CSC
22	Risk of Force Majeure	These unforeseen risks can have both adverse	➤ All reasonable precaution will be taken to prevent danger of the workers and	Contractor	Force majeure preparedness plan;	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
	Combine with previous	environmental and social impacts	<p>the public from fire, flood, drowning, etc.</p> <ul style="list-style-type: none"> ➤ All necessary steps will be taken for prompt first aid treatment of all injuries likely to be sustained during the course of work. ➤ Contractor has to prepare a response plan before start of construction works 		Emergency contact list	
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 receptor such as schools, hospital and cultural 	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>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. ➤ 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. 	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
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. ➤ 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. 	Contractor	Labour law compliance record; Training attendance record	MPWD/PMC/CSC
28	Labour Influx	Strain on infrastructure, such as housing, healthcare, and education;	➤ Proper plan for labour influx by investing in infrastructure and social services.	Contractor	Labour License and registration records; Local labour hiring	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
		social tension, as new arrivals compete with locals for jobs and resources.	<ul style="list-style-type: none"> ➤ 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 		records.	
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, 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. 	Contractor	Site clearance restoration records and closure NOC; Geotagged photos	MPWD

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ 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. ➤ 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	Increased levels of NOx,	<ul style="list-style-type: none"> ➤ Conduct ambient air quality monitoring at sensitive locations. 	Contractor	Air quality results;	MPWD

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
	Vehicular Emissions	SO ₂ , CO, and PM; Health impacts on local population; Deterioration of roadside vegetation	<ul style="list-style-type: none"> ➤ Maintain green buffers along the corridor. ➤ Organize awareness campaigns for drivers on emission reduction and vehicle maintenance. 		Plantation survival record ; Awareness records	
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

A. CAPACITY DEVELOPMENT & TRAINING

To enhance the capabilities for implementation of the Environmental and Social Management and Monitoring Plan (ESMMP), 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
<p>Contractor's Responsibilities:</p> <ul style="list-style-type: none"> • Implement all assigned mitigation measures as per the ESMP and contract documents • 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"> • An amount of minimum Rs. 10000 and maximum of Rs. 5 lakhs for each minor non-compliance with CESMP • An amount of minimum Rs. 10 lakhs and maximum of Rs. 20 lakhs for 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 E&S/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. 20 lakhs shall be levied for each such non compliance.

ANNEXURE 4.1: BIODIVERSITY METHODOLOGY (A COMPREHENSIVE SAMPLING DESIGN AND INDICATORS)

SECONDARY/DESKTOP DATA COLLECTION

1. Secondary data collection complemented primary field efforts by providing historical and contextual insights into the biodiversity of **North Garo Hill**. The approach included:
2. 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.
3. Use of Historical Biodiversity Records:
 - a. Incorporated species data from earlier surveys and studies conducted in **North Garo Hill**.
 - b. Verified and updated records based on field observations to ensure data accuracy.
4. Subsequently, comprehensive tools such as IBAT-Alliance, Web-Based Sources and the following list (Below Table) 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	Protected Wetland of Meghalaya	State Notification (2023)	Wetlands (Conservation and Management) Rules, 2017
7	Ramsar Site	Ramsar Sites Information Services	https://rsis.ramsar.org/
8	Key Biodiversity Area/Important Bird Area	Key Biodiversity Area	https://www.keybiodiversityareas.org/sites/search
9	Schedule Species (I-IV), Wildlife (Protection) Act, 1972	List of schedule species list (I - IV)	Wild Life (Protection) Amendment Act, 2022

Primary data collection:

5. Primary data collection involved direct fieldwork is conducted between August 2025 to September 2025 to assess the biodiversity of the direct impact area of the project road. Key activities and followed methods included in the below Table.

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:

6. Various interactions and meetings were conducted with, Environmental expert of MPWD & other officials of MPWD 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.

7. 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.

8. Data Analysis Methods

Collected data was analyzed using the following methods:

Species Categorization:

- c. Species were classified based on their taxonomic groups for Flora (Trees, Herbs, shrubs, Climbers and Grasses and Fauna (mammals, birds, amphibians, reptiles, etc.).
- d. 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/MPWD department, topo sheets and satellite imagery

ANNEXURE 4.2: DETAILED LIST OF FLORA, FAUNA, AND AQUATIC BIODIVERSITY, ALONG WITH THEIR CONSERVATION STATUS

During the survey, the team has also given emphasis to the presence of different species within the 10 km Buffer area of the project site through interview, field visit and literature review. The tree species common to the project site includes – *Teak*, *Ficus*, *Arjuna tree*, *Bamboo*, *Areca nut*, *Ber*, *Guava*, *Banana* etc.

List of trees (Source : Primary and Secondary data)

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
1.	Cluster Fig	<i>Ficus recemosa</i>	NL	Moraceae
2.	Japanese Raisin Tree	<i>Hovenia dulcis</i>	LC	Rhamnaceae
3.	Subabul	<i>Leucaena leucocephala</i>	NL	Fabaceae
4.	Sonajhuri	<i>Acacia auriculiformis</i>	LC	Fabaceae
5.	Amla	<i>Phyllanthus emblica</i>	LC	Phyllanthaceae
6.	Amoora	<i>Aglaia spectabilis</i>	LC	Meliaceae
7.	Areca palm	<i>Areca catechu</i>	LC (Decreasing)	Arecaceae
8.	Arjun tree	<i>Terminalia arjuna</i>	NL	Combretaceae
9.	Baheda	<i>Terminalia bellirica</i>	LC	Combretaceae
10.	Bamboo	<i>Bambusa tulda</i>	NL	Poaceae
11.	Bamboo	<i>Dendrocalamus hamiltonii</i>	NL	Poaceae
12.	Banana	<i>Musa balbisiana</i>	LC	Musaceae
13.	Banana	<i>Musa paradisiaca</i>	NL	Musaceae
14.	Bando lata	<i>Spatholobus parviflorus</i>	LC	Fabaceae
15.	Bhelu	<i>Tetrameles nudiflora</i>	LC	Tetramelaceae
16.	Black catechu	<i>Senegalia catechu</i>	LC	Fabaceae
17.	Black Plum	<i>Syzygium cumini</i>	LC	Myrtaceae
18.	Black Siris	<i>Albizia odoratissima</i>	LC	Fabaceae
19.	Bonsum	<i>Phoebe goalparensis</i>	NL	Lauraceae
20.	Burflower-tree	<i>Neolamarckia cadamba</i>	LC	Rubiaceae
21.	Chamkathal	<i>Artocarpus chaplasha</i>	LC	Moraceae
22.	Cashew	<i>Anacardium occidentale</i>	LC	Anacardiaceae
23.	China berry	<i>Melia azedarach</i>	LC	Meliaceae
24.	Chorai	<i>Vitex peduncularis</i>	LC	Lamiaceae
25.	Climbing wattle	<i>Senegalia pennata</i>	LC	Fabaceae
26.	Cluster fig tree	<i>Ficus racemosa</i>	NL	Moraceae
27.	Coconut palm	<i>Cocos nucifera</i>	NL	Arecaceae
28.	Common jujube	<i>Ziziphus jujuba</i>	LC	Rhamnaceae
29.	Cotton tree	<i>Bombax ceiba</i>	LC	Malvaceae

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
30.	Dog Teak	<i>Dillenia pentagyna</i>	LC	Dilleniaceae
31.	Dotted fig	<i>Ficus geniculata</i>	NL	Moraceae
32.	Drumstick tree	<i>Moringa oleifera</i>	LC	Moringaceae
33.	Dulloo bamboo	<i>Schizostachyum dullooa</i>	NL	Poaceae
34.	East Himalayan Dalbergia	<i>Dalbergia stipulacea</i>	LC	Fabaceae
35.	Elephant rope tree	<i>Sterculia villosa</i>	LC	Malvaceae
36.	False ashoka tree	<i>Polyalthia longifolia</i>	LC	Annonaceae
37.	Forest red gum	<i>Eucalyptus tereticornis</i>	LC	Myrtaceae
38.	Gamhar	<i>Gmelina arborea</i>	LC	Lamiaceae
39.	Ghora neem	<i>Melia azedarach</i>	LC	Meliaceae
40.	Golden shower	<i>Cassia fistula</i>	LC	Fabaceae
41.	Guava	<i>Psidium guajava</i>	LC	Myrtaceae
42.	Gulmohor	<i>Delonix regia</i>	LC	Fabaceae
43.	Hairy fig	<i>Ficus hispida</i>	NL	Moraceae
44.	Hibiscus	<i>Hibiscus rosa-sinensis</i>	LC	Malvaceae
45.	Hog Creeper	<i>Deguelia scandens</i>	LC	Fabaceae
46.	Indian ash tree	<i>Lannea coromandelica</i>	LC	Anacardiaceae
47.	Indian Bael tree	<i>Aegle marmelos</i>	NT	Rutaceae
48.	Indian gooseberry	<i>Phyllanthus emblica</i>	LC	Phyllanthaceae
49.	Indian mahogany	<i>Cedrela toona</i>	LC	Meliaceae
50.	Indian sandalwood	<i>Santalum album</i>	VU	Santalaceae
51.	Indian trumpet flower	<i>Oroxylum indicum</i>	LC	Bignoniaceae
52.	Jackfruit	<i>Artocarpus heterophyllus</i>	NL	Moraceae
53.	Kassod	<i>Senna siamea</i>	LC	Fabaceae
54.	Khasi pine	<i>Pinus kesiya</i>	LC	Pinaceae
55.	Lantana	<i>Lantana camara</i>	NL	Verbenaceae
56.	Lychee	<i>Litchi chinensis</i>	VU	Sapindaceae
57.	Mango	<i>Mangifera indica</i>	DD	Anacardiaceae
58.	Mohaneem	<i>Azadirachta indica</i>	LC	Meliaceae
59.	Night-blooming jasmine	<i>Nyctanthes arbor-tristis</i>	LC (Stable)	Oleaceae
60.	Orchid tree	<i>Bauhinia tomentosa</i>	LC	Fabaceae
61.	Peepal tree	<i>Ficus religiosa</i>	LC	Moraceae
62.	Pongam Tree	<i>Pongamia pinnata</i>	LC (Stable)	Fabaceae
63.	Teak	<i>Tectona grandis</i>	EN	Lamiaceae

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
64.	Tamarind tree	<i>Tamarindus indica</i>	LC (Stable)	Fabaceae
65.	Tree bean	<i>Parkia timoriana</i>	LC	Fabaceae
66.	Wild guava	<i>Careya arborea</i>	LC	Lecythidaceae
67.	Woolly Rosebay Dyeing	<i>Wrightia arborea</i>	LC	Apocynaceae
68.	Zinghal	<i>Stereospermum colais</i>	LC	Bignoniaceae

Species observed during Primary Survey are highlighted with Blue colour

List of Shrubs (Source: Primary and Secondary data)

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
1.	Bogang	<i>Clerodendrum buchananii</i>	Not Listed	Lamiaceae
2.	Orange Chinese hat plant	<i>Holmskioldia sanguinea</i>	Not Listed	Lamiaceae
3.	Siam Weed	<i>Eupatorium odoratum</i>	Not Listed	Asteraceae
4.	Lantana	<i>Lantana camara</i> L.	Not Listed (Invasive)	Verbenaceae
5.	Indian rhododendron	<i>Melastoma malabathricum</i> L.	Not Listed	Melastomataceae
6.	Wild Nongmangkha	<i>Phlogacanthus curviflorus</i>	Not Listed	Acanthaceae
7.	Ronga bahak	<i>Phlogacanthus thyriformis</i>	Not Listed	Acanthaceae
8.	Castor bean	<i>Ricinus communis</i> L.	LC	Euphorbiaceae
9.	Indian Snakeweed	<i>Stachytarpheta indica</i> (L.) Va	Not Listed	Verbenaceae
10.	Congo jute	<i>Clerodendrum indicum</i>	Not listed	Lamiaceae

Species observed during Primary Survey are highlighted with Blue colour

List of Herb: (Source : Primary and Secondary data)

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
1.	Fringed Pod Toothache Plant	<i>Acmella</i> (Kunth)	NL	Asteraceae
2.	Marsh para cress	<i>Acmella uliginosa</i>	NL	Asteraceae
3.	Sticky snakeroot	<i>Ageratina adenophora</i>	NL (Invasive)	Asteraceae
4.	Chick weed	<i>Ageratum conyzoides</i> L.	NL (Invasive)	Asteraceae
5.	Bluemink	<i>Ageratum houstonianum</i>	NL	Asteraceae
6.	Alligator weed	<i>Alternanthera philoxeroides</i>	NL (Invasive)	Amaranthaceae
7.	Pineapple	<i>Ananas comosus</i> (L.)	LC	Bromeliaceae
8.	Beggar Tick	<i>Bidens pilosa</i> L.	LC	Asteraceae
9.	Feather celosia	<i>Celosia argentea</i> L.	LC	Amaranthaceae
10.	Siam weed	<i>Chromolaena odorata</i> (L.)	NL (Invasive)	Asteraceae
11.	Redflower ragleaf	<i>Crassocephalum crepidioides</i> (Benth.)	NL	Asteraceae
12.	Gallant soldier	<i>Galinsoga parviflora</i>	LC	Asteraceae
13.	Fringed quickweed	<i>Galinsoga quadriradiata</i>	NL	Asteraceae
14.	Pennsylvania cudweed	<i>Gamochaeta pensylvanica</i>	LC	Asteraceae
15.	Jom lakhut	<i>Hellenia speciosa</i>	LC	Costaceae
16.	Cogon grass	<i>Imperata cylindrica</i>	LC	Poaceae
17.	Durun bon	<i>Leucas aspera</i>	LC	Lamiaceae
18.	Staghorn clubmoss	<i>Lycopodiella cernua</i>	LC	Lycopodiaceae
19.	Sensitive plant	<i>Mimosa pudica</i> L.	NL	Fabaceae
20.	Congress grass	<i>Parthenium hysterophorus</i> L.	NL (Invasive)	Asteraceae
21.	Stinking cassia	<i>Senna tora</i>	LC	Fabaceae
22.	Arrowleaf sida	<i>Sida rhombifolia</i> L.	LC	Malvaceae
23.	Asian broom grass	<i>Thysanolaena latifolia</i>	LC	Poaceae

Species observed during Primary Survey are highlighted with Blue colour

List of Fern (Source : Primary and Secondary data)

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
1.	Walking maidenhair fern	<i>Adiantum philippense</i>	NL	Pteridaceae
2.	Tree fern	<i>Alsophila latebrosa.</i>	NL	Cyatheaceae
3.	Bird's nest fern	<i>Asplenium nidus</i> L.	LC	Aspleniaceae
4.	Creeping Fern	<i>Bolbitis heteroclita</i>	NL	Dryopteridaceae
5.	Ardisia	<i>Ardisia solanacea</i>	LC	Primulaceae
6.	Indigo Plant	<i>Strobilanthes cusia</i>	LC	Athyriaceae
7.	Dhekia	<i>Diplazium esculentum</i>	NL	Athyriaceae
8.	Staghorn clubmoss	<i>Lycopodiella cernua</i>	LC	Lycopodiaceae
9.	Lace fern	<i>Odontosoria chinensis</i>	NL	Lindsaeaceae
10	Giant Vine Fern	<i>Stenochlaena tenuifolia</i>	NL	Blechnaceae
11	Downy maiden fern	<i>Thelypteris dentata</i>	NL	Thelypteridaceae

Species observed during Primary Survey are highlighted with Blue colour

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

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
1.	Bermuda Grass / Durva	<i>Cynodon dactylon</i>	Least Concern (LC)	Poaceae
2.	Giant reed	<i>Arundo donax</i> L.	NL (Invasive)	Poaceae
3.	Mint / Pudina	<i>Mentha arvensis</i>	Least Concern (LC)	Lamiaceae
4.	Wild Ginger	<i>Zingiber zerumbet</i>	Least Concern (LC)	Zingiberaceae
5.	Turmeric / Haldi	<i>Curcuma longa</i>	Data Deficient (DD) in IUCN; widely cultivated	Zingiberaceae
6.	Gotu kola / Indian Pennywort	<i>Centella asiatica</i>	Least Concern (LC)	Apiaceae
7.	Broom Grass / Tiger Grass	<i>Thysanolaena maxima</i>	Least Concern (LC)	Poaceae

Species observed during Primary Survey are highlighted with Blue colour

List of Fauna:

List of Bird Species (Source : Primary and Secondary data)

Common Name	Scientific Name	IUCN Status	WPA 1972 Schedule	Migration / Resident Status
Black Drongo	<i>Dicrurus macrocercus</i>	Least Concern	IV	R
Blue-throated Barbet	<i>Psilopogon asiaticus</i>	Least Concern	IV	R
Common Myna	<i>Acridotheres tristis</i>	Least Concern	IV	R
Common Tailorbird	<i>Orthotomus sutorius</i>	Least Concern	IV	R
Emerald Dove	<i>Chalcophaps indica</i>	Least Concern	IV	R
Great Barbet	<i>Psilopogon virens</i>	Least Concern	IV	R
House Sparrow	<i>Passer domesticus</i>	Least Concern	IV	R
Indian Pond Heron	<i>Ardeola grayii</i>	Least Concern	IV	R
Jungle Myna	<i>Acridotheres fuscus</i>	Least Concern	IV	R
Red-vented Bulbul	<i>Pycnonotus cafer</i>	Least Concern	IV	R
Shikra	<i>Accipiter badius</i>	Least Concern	IV	R
Spotted Dove	<i>Spilopelia chinensis</i>	Least Concern	IV	R
White-throated Kingfisher	<i>Halcyon smyrnensis</i>	Least Concern	IV	R
Oriental White-eye	<i>Zosterops palpebrosus</i>	Least Concern	IV	R
Asian Koel	<i>Eudynamys scolopaceus</i>	Least Concern	IV	R
Common Hoopoe	<i>Upupa epops</i>	Least Concern	IV	WM
Rufous Woodpecker	<i>Micropternus brachyurus</i>	Least Concern	IV	R
Common Iora	<i>Aegithina tiphia</i>	Least Concern	IV	R
Scarlet Minivet	<i>Pericrocotus flammeus</i>	Least Concern	IV	R
Bronzed Drongo	<i>Dicrurus aeneus</i>	Least Concern	IV	R
Black-hooded Oriole	<i>Oriolus xanthornus</i>	Least Concern	IV	R
Rufous Treepie	<i>Dendrocitta vagabunda</i>	Least Concern	IV	R
Barn Swallow	<i>Hirundo rustica</i>	Least Concern	IV	WM
Asian Pied Starling	<i>Gracupica contra</i>	Least Concern	IV	R
Paddy Field Pipit	<i>Anthus rufulus</i>	Least Concern	IV	R
Oriental Turtle Dove	<i>Streptopelia orientalis</i>	Least Concern	IV	R
Red-collared Dove	<i>Streptopelia tranquebarica</i>	Least Concern	IV	R
Green Bee-eater	<i>Merops orientalis</i>	Least Concern	IV	R
White Wagtail	<i>Motacilla alba</i>	Least Concern	IV	WM
Grey Wagtail	<i>Motacilla cinerea</i>	Least Concern	IV	WM
Citrine Wagtail	<i>Motacilla citreola</i>	Least Concern	IV	WM
Common Stonechat	<i>Saxicola torquatus</i>	Least Concern	IV	R
Crimson Sunbird	<i>Aethopyga siparaja</i>	Least Concern	IV	R
Purple Sunbird	<i>Cinnyris asiaticus</i>	Least Concern	IV	R
Jungle Owlet	<i>Glaucidium radiatum</i>	Least Concern	IV	R
Jungle Babbler	<i>Turdoides striata</i>	Least Concern	IV	R
Greater Necklaced Laughing Thrush	<i>Garrulax pectoralis</i>	Least Concern	IV	R
Black-throated Sunbird	<i>Aethopyga saturata</i>	Least Concern	IV	R
Green-tailed Sunbird	<i>Aethopyga nipalensis</i>	Least Concern	IV	R
Purple-rumped Sunbird	<i>Leptocoma zeylonica</i>	Least Concern	IV	R
Ruby-cheeked	<i>Chalcoparia singalensis</i>	Least Concern	IV	R

Common Name	Scientific Name	IUCN Status	WPA 1972 Schedule	Migration / Resident Status
Sunbird				
Scarlet-backed Flowerpecker	<i>Dicaeum cruentatum</i>	Least Concern	IV	R
Plain Prinia	<i>Prinia inornata</i>	Least Concern	IV	R
Swamp Grass-babbler	<i>Laticilla cinerascens</i>	Endangered	I	R
Red-headed Vulture	<i>Sarcogyps calvus</i>	Critically Endangered	I	R
White-rumped Vulture	<i>Gyps bengalensis</i>	Critically Endangered	I	R
Pallas's Fish Eagle	<i>Haliaeetus leucoryphus</i>	Endangered	I	WM
Steppe Eagle	<i>Aquila nipalensis</i>	Endangered	I	WM
Yellow-breasted Bunting	<i>Emberiza aureola</i>	Critically Endangered	I	WM
Great Knot	<i>Calidris tenuirostris</i>	Endangered	I	WM
Black-bellied Tern	<i>Sterna acuticauda</i>	Endangered	I	R
Hog Deer (semi-aquatic habitat species)	<i>Axis porcinus</i>	Endangered	I	R

- R = Resident
- WM = Winter Migrant
- SV = Seasonal Visitor

Species observed during Primary Survey are highlighted with Blue colour

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

Sl. No.	Name	Scientific name	IUCN status	Schedule status (WPA 2022)
Mammals				
1.	Rehsus Macaque	<i>Macaca mulata</i>	LC	NS
2.	Boro endur	<i>Cannomis badius</i>	LC	NS
3.	Large Indian Civet	<i>Viverra zibetha</i>	LC	II
4.	Masked Palm Civet	<i>Paguma larvata</i>	LC	II
5.	Irrawaddy Squirrel	<i>Callosciurus pygerythrus</i>	LC	NS
6.	Elephant	<i>Elephas maximus indicus</i>	EN	I
7.	Western Hoolock Gibbon	<i>Hoolock hoolock</i>	CR	I
8.	Chinese Pangolin	<i>Chinese Pangolin</i>	EN	I
9.	Indian Pangolin	<i>Indian Pangolin</i>	EN	I
10.	Dhole (Asiatic Wild Dog)	<i>Dhole (Asiatic Wild Dog)</i>	EN	I
11.	Bengal Slow Loris	<i>Bengal Slow Loris</i>	EN	I
Reptiles				
1.	Common Garden Lizard	<i>Calotes versicolor</i>	NE	NS
2.	Bronze Skink	<i>Eutropis macularia</i>	LC	NS
3.	White-spotted Supple Skink	<i>Lygosoma albopunctata</i>	LC	NS
4.	Banded Krait	<i>Bungarus fasciatus</i>	LC	NS
5.	Common Kukri Snake	<i>Oligodon arnensis</i>	LC	NS
6.	Snail-eater	<i>Pareas monticola</i>	LC	NS
7.	Gharial	<i>Gavialis gangeticus</i>	EN	I
8.	Assam Roofed Turtle	<i>Pangshura sylhetensis</i>	CR	I
9.	Black Softshell Turtle	<i>Nilssonia nigricans</i>	CR	I
10.	Tricarinate Hill Turtle	<i>Melanochelys tricarinata</i>	VU	I
11.	Elongated Tortoise	<i>Indotestudo elongata</i>	CR	I
12.	Indian Eyed Turtle	<i>Morenia petersi</i>	EN	I
13.	Crowned River Turtle	<i>Hardella thurjii</i>	VU	I
14.	Spotted Pond Turtle	<i>Geoclemys hamiltonii</i>	VU	I
15.	Keeled Box Turtle	<i>Cuora mouhotii</i>	EN	I
16.	Three-striped Roofed Turtle	<i>Batagur dhongoka</i>	EN	I
17.	Indian Peacock Softshell Turtle	<i>Nilssonia hurum</i>	VU	I
18.	Indian Softshell Turtle	<i>Nilssonia gangetica</i>	VU	I
19.	Yellow Monitor	<i>Varanus flavescens</i>	EN	I
Amphibians				
1.	Indian Bullfrog	<i>Hoplobatrachus tigerinus</i>	LC	II
2.	Baibung Small Treefrog	<i>Theloderma baibungense</i>	LC	NS
Butterflies				
1.	Teinopalpus imperialis	<i>Byasa dasarada</i>	NT	NS
2.	Bhutanitis lidderdalii	<i>Graphium aggamemnon</i>	LC	NS
3.	Troides helena	<i>Delias descombesi</i>	LC	NS
4.	Papilio bianor	<i>Hypolimnas bolina</i>	LC	NS

Sl. No.	Name	Scientific name	IUCN status	Schedule status (WPA 2022)
5.	Papilio paris	<i>Moduza procris</i>	LC	NS
6.	Papilio memnon	<i>Charaxes bharata</i>	LC	NS
7.	Papilio polytes	<i>Graphium cloanthus</i>	LC	NS
8.	Papilio clytia	<i>Kallima inachus</i>	LC	NS
9.	Graphium sarpedon	<i>Papilio polytes</i>	LC	NS
10.	Graphium doson	<i>Junonia almana</i>	LC	NS
11.	Graphium agamemnon	<i>Junonia iphita</i>	LC	NS
12.	Atrophaneura varuna	<i>Acraea issoria</i>	LC	NS
13.	Lamproptera curius	<i>Troides helena</i>	LC	NS
14.	Pachliopta aristolochiae	<i>Pachliopta aristolochiae</i>	LC	NS
15.	Kallima inachus	<i>Papilio eurypylus</i>	LC	NS
16.	Hypolimnas bolina	<i>Elymnias patna</i>	LC	NS
17.	Elymnias hypermnestra	<i>Cyrestis thyodamas</i>	LC	NS
18.	Junonia atlites	<i>Troides aeacus</i>	LC	NS
19.	Junonia lemonias	<i>Papilio helenus</i>	LC	NS
20.	Danaus chrysippus	<i>Graphium macareus</i>	LC	NS
21.	Tirumala limniace	<i>Danaus chrysippus</i>	LC	NS
22.	Parantica aglea	<i>Graphium doson</i>	LC	NS
23.	Euploea core	<i>Junonia orithya</i>	LC	NS
24.	Neptis hylas	<i>Prosotas nora</i>	LC	NS
25.	Ypthima baldus	<i>Heliophorus epicles</i>	LC	NS

Species observed during Primary Survey are highlighted with Blue colour

Aquatic Biodiversity

List of Fish

Order	Scientific Name	Common Name	Local Name	IUCN Status	Habitat Type
Cypriniformes	<i>Puntius sophore</i>	Pool Barb	Na Patchi / Puti	LC	Rivers, floodplains, ponds
Cypriniformes	<i>Puntius chola</i>	Barb	Na Patchi / Puti	LC	Rivers, floodplains
Cypriniformes	<i>Gudusia chapra</i>	Indian River Shad	Na Patchi / Puti	LC	Rivers, reservoirs
Cypriniformes	<i>Raiamas bola</i>	Trout Barb	—	LC	Clear hill streams
Cypriniformes	<i>Labeo rohita</i>	Rohu	Khabaw	LC	Rivers, ponds, floodplains
Cypriniformes	<i>Catla catla</i>	Catla	—	LC	Rivers, reservoirs
Other Cypriniformes	<i>Cyprinus carpio</i>	Common Carp	—	VU	Lakes, still waters, reservoirs
Perciformes	<i>Channa stewartii</i>	Snakehead	Na Chi	LC	Streams, ponds, slow waters
Nemacheilidae	<i>Aborichthys garoensis</i>	Garo Stone Loach	—	VU	Hill streams, bottoms in Garo Hills
Synbranchidae	<i>Garo khajuriai</i>	Garo Spineless Eel	—	NT	Freshwater demersal, hill streams / bottoms

(Source: Primary and Secondary data)

List of Phytoplanktons

Class	Genus / Species Found
Bacillariophyceae (Diatoms)	<i>Frustulia</i> sp., <i>Gyrosigma</i> sp., <i>Navicula</i> sp., <i>Tabellaria</i> sp., <i>Gomphonema</i> sp., <i>Fragilaria</i> sp., <i>Diatoma</i> sp., <i>Synedra</i> sp., <i>Pinnularia</i> sp.
Chlorophyceae (Green algae)	<i>Staurastrum rotundum</i> , <i>Staurastrum leptocladium</i> , <i>Cosmarium decoratum</i> , <i>Cosmarium reniforme</i> , <i>Cosmarium leibleinii</i> , <i>Draparnaldiopsis</i> sp., <i>Hyalotheca</i> sp., <i>Spirogyra</i> sp., <i>Gonatozygon</i> sp., <i>Ulothrix</i> sp., <i>Eudorina</i> sp.
Cyanophyceae / Cyanobacteria	<i>Anabaena</i> sp., <i>Oscillatoria</i> sp., <i>Microcystis aeruginosa</i> , <i>Nostoc</i> sp.
Desmidiaceae (Green algae)	<i>Closterium</i> sp., <i>Pirulina</i> sp.
Chrysophyceae (Golden-brown algae)	<i>Dinobryon sociale</i>
Dinophyceae (Dinoflagellates)	<i>Ceratium</i> sp., <i>Glenodinium</i> sp., <i>Ceratium hirudinella</i>

(Source Secondary and Primary)

ANNEXURE 4.4: STRUCTURE DETAILS

TABLE 1: LIST OF NTH ON RHS

Sr.No	Ch		Type of Structure(RHS)	Remarks
	From	To	NTH	
1	2	3	4	5
2	0+000	1+000	10	
3	1+000	2+000	4	
4	2+000	3+000	5	
5	3+000	4+000	4	
6	4+000	5+000	4	
7	5+000	6+000	0	
8	6+000	7+000	6	
9	7+000	8+000	0	
10	8+000	9+000	10	Market Area (Gosingpita Bazar)
11	9+000	10+000	1	
12	10+000	11+000	10	
13	11+000	12+000	1	Market Area (Bolsong Bazar)
14	12+000	13+000	2	
15	13+000	14+000	0	
16	14+000	15+000	1	
17	15+000	16+000	2	
18	16+000	17+000	0	
19	17+000	18+000	7	
20	18+000	18+277	3	Borjhora Ends
		Total	70	

TABLE 3: LIST OF NTH ON LHS

Sl. No	Chainage		Type of Structure(LHS)	Remarks
	From	To	NTH	
1	2	3	4	5
2	0+000	1+000	15	Weekly Market (Bajengdoba Market)
3	1+000	2+000	20	
4	2+000	3+000	8	
5	3+000	4+000	4	
6	4+000	5+000	3	
7	5+000	6+000	1	
8	6+000	7+000	0	
9	7+000	8+000	6	
10	8+000	9+000	3	Market Area (Gosingpita Bazar)
11	9+000	10+000	0	Community Shed
12	10+000	11+000	6	
13	11+000	12+000	3	Market Area (Bolsong Bazar)
14	12+000	13+000	0	
15	13+000	14+000	4	
16	14+000	15+000	3	
17	15+000	16+000	0	
18	16+000	17+000	0	
19	17+000	18+000	0	
20	18+000	18+277	4	Borjhora Ends
		Total	80	

Existing Culvert/BridgeMajor Bridge

Chainage	Carriageway	Structure	Retain / Replace	Remark
0+350	7.50	RCC	Poor condition	2-Lane MJB
1080	7.5	RCC	Fair	Vegetative cover shall be removed and concrete surface repair required due to exposed reinforcement in Girders.

Minor Bridge

S.No	Chainage	Carriageway	Structure	Retain / Replace
1.	0+350	7.50	RCC	Retain
2.	0+500	7.50	RCC	Retain
3.	4+640	7.50	RCC	Retain
4.	5+310	7.50	RCC	Retain
5.	6+100	7.50	RCC	Retain
6.	6+300	7.50	RCC	Retain
7.	9+150	7.50	RCC	Retain
8.	11+140	7.50	RCC	Retain
9.	12+750	7.50	RCC	Retain
10.	13+050	7.50	RCC	Retain
11.	15+200	7.50	RCC	Retain
12.	15+600	7.50	RCC	Retain
13.	16+270	7.50	RCC	Retain
14.	17+200	7.50	RCC	Retain
15.	17+590	7.50	RCC	Retain

Proposed Pipe Culvert

Sl. No	Retain / Replace	Design Chainage	Structure Type	Span Arrangement (m) C/C Exp.	Total Length (m)
1	New proposal	1+310	Pipe culvert	1x1.2	1.2
2	New proposal	3+250	Pipe culvert	1x1.2	1.2

Sl. No	Retain / Replace	Design Chainage	Structure Type	Span Arrangement (m) C/C Exp.	Total Length (m)
3	New proposal	4+150	Pipe culvert	1x1.2	1.2
4	New proposal	4+500	Pipe culvert	1x1.2	1.2
5	New proposal	5+050	Pipe culvert	1x1.2	1.2
6	New proposal	5+520	Pipe culvert	1x1.2	1.2
7	New proposal	5+630	Pipe culvert	1x1.2	1.2
8	New proposal	6+500	Pipe culvert	1x1.2	1.2
9	New proposal	9+820	Pipe culvert	1x1.2	1.2
10	New proposal	10+980	Pipe culvert	1x1.2	1.2
11	New proposal	13+300	Pipe culvert	1x1.2	1.2
12	New proposal	14+060	Pipe culvert	1x1.2	1.2
13	New proposal	15+730	Pipe culvert	1x1.2	1.2
14	New proposal	16+330	Pipe culvert	1x1.2	1.2
15	New proposal	16+480	Pipe culvert	1x1.2	1.2
16	New proposal	16+740	Pipe culvert	1x1.2	1.2
17	New proposal	16+850	Pipe culvert	1x1.2	1.2
18	New proposal	17+440	Pipe culvert	1x1.2	1.2

Sl. No	Retain / Replace	Design Chainage	Structure Type	Span Arrangement (m) C/C Exp.	Total Length (m)
19	New proposal	17+670	Pipe culvert	1x1.2	1.2

Existing Pipe Culverts

Sl. No.	Chainage	Span Arrangement (m) C/C Exp.	Structure Type	Remarks
1.	0+740	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
2.	1+680	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
3.	1+780	2x1.0	Widening required	Widening required
4.	1+850	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
5.	2+010	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
6.	3+080	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
7.	3+380	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
8.	3+500	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
9.	3+950	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
10.	4+050	1x1.0	Head wall in poor condition	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
11.	4+250	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.

Sl. No.	Chainage	Span Arrangement (m) C/C Exp.	Structure Type	Remarks
12.	4+300	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
13.	4+600	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
14.	4+750	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
15.	4+860	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
16.	4+990	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
17.	5+170	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
18.	5+300	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
19.	5+450	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
20.	5+550	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
21.	5+750	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
22.	5+850	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.

Sl. No.	Chainage	Span Arrangement (m) C/C Exp.	Structure Type	Remarks
23.	5+980	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
24.	6+400	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
25.	6+590	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
26.	6+725	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
27.	6+950	1x1.0	Headwall in poor condition	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
28.	7+010	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
29.	7+090	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
30.	7+200	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
31.	7+240	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
32.	7+500	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
33.	7+680	2x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.

Sl. No.	Chainage	Span Arrangement (m) C/C Exp.	Structure Type	Remarks
34.	7+900	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
35.	8+010	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
36.	8+090	2x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
37.	8+310	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
38.	8+500	2x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
39.	8+750	2x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
40.	8+930	2x1.0	widening required	Widening required
41.	9+040	2x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
42.	9+420	2x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
43.	9+905	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
44.	11+111	2x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.

Sl. No.	Chainage	Span Arrangement (m) C/C Exp.	Structure Type	Remarks
45.	11+200	2x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
46.	11+480	2x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
47.	11+590	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
48.	11+600	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
49.	11+840	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
50.	12+090	1x1.0	Headwall in poor condition	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
51.	12+195	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
52.	12+350	1x1.0	Headwall in poor condition	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
53.	12+440	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
54.	12+690	2x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
55.	12+790	2x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.

Sl. No.	Chainage	Span Arrangement (m) C/C Exp.	Structure Type	Remarks
56.	12+995	2x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
57.	13+070	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
58.	13+500	1x1.0	Headwall in poor condition	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
59.	13+640	2x1.0	Headwall in poor condition	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
60.	13+850	1x1.0	Headwall in poor condition	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
61.	14+440	1x1.0	Headwall in poor condition	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
62.	14+570	1x1.0	Headwall in poor condition	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
63.	14+700	1x1.0	Headwall in poor condition	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
64.	14+920	1x1.0	Headwall in poor condition	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
65.	14+970	1x1.0	Headwall in poor condition	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
66.	15+080	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.

Sl. No.	Chainage	Span Arrangement (m) C/C Exp.	Structure Type	Remarks
67.	15+310	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
68.	15+460	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
69.	15+595	1x1.0	Headwall in poor condition	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
70.	15+900	1x1.0	Headwall in poor condition	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
71.	15+980	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
72.	16+095	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
73.	16+180	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
74.	16+605	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
75.	17+000	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
76.	17+195	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.
77.	17+350	1x1.0	Retain	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.

Sl. No.	Chainage	Span Arrangement (m) C/C Exp.	Structure Type	Remarks
78.	18+070	1x1.0	Headwall in poor condition	Culvert shall be cleaned on U/S and D/S ends. Head wall needs to be repaired. Quadrant pitching and floor aprons shall be provided.

Existing Box Culvert

Sl. No.	Chainage	Span Arrangement (m) C/C Exp.	Structure Type	Remarks
1.	0+600	1x1.0	Reconstruct	Fair condtion, Box Culvert required
2.	11+780	1x1.0	Reconstruct	Culvert failed due to overflow so Box culvert required

Existing Slab Culvert

Sl. No.	Chainage	Span Arrangement (m) C/C Exp.	Structure Type	Remarks
1.	13+900	1x6.25	Retain	Fair condtion, Vegetative cover shall be removed and concrete surface repair required. Deck slab, railings & settled approaches need to be repaired

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 101540.6 m³ and a fill volume of 25506.16 m³. This indicates that the excavation requirement is nearly double the filling requirement, resulting in a surplus of approximately 15351.56 cu.m 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

Dumping Location			Coordinate		Area m2
SL. NO	LOCATION CHAINAGE	SIDE	Latitude	LONGITUDE	
1	1+800	RHS	249854.24	2866213.13	2492
2	3+300	LHS	248857.18	2865626.21	4700
3	5+400	RHS	248757.55	2867484.95	2030
4	6+000	LHS	248326.6	2867865.49	2100
5	7+000	LHS	248028.49	2868644.19	2500

6	13+000	LHS	247021.61	2873814.41	20000
7	15+100	RHS	246235.12	2875505.38	6600
8	15+650	LHS	246040.98	2876015.66	3500
9	16+100	LHS	245922.52	2876356.38	1500
10	17+100	LHS	245550.82	2877081.96	3400

▪ 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.

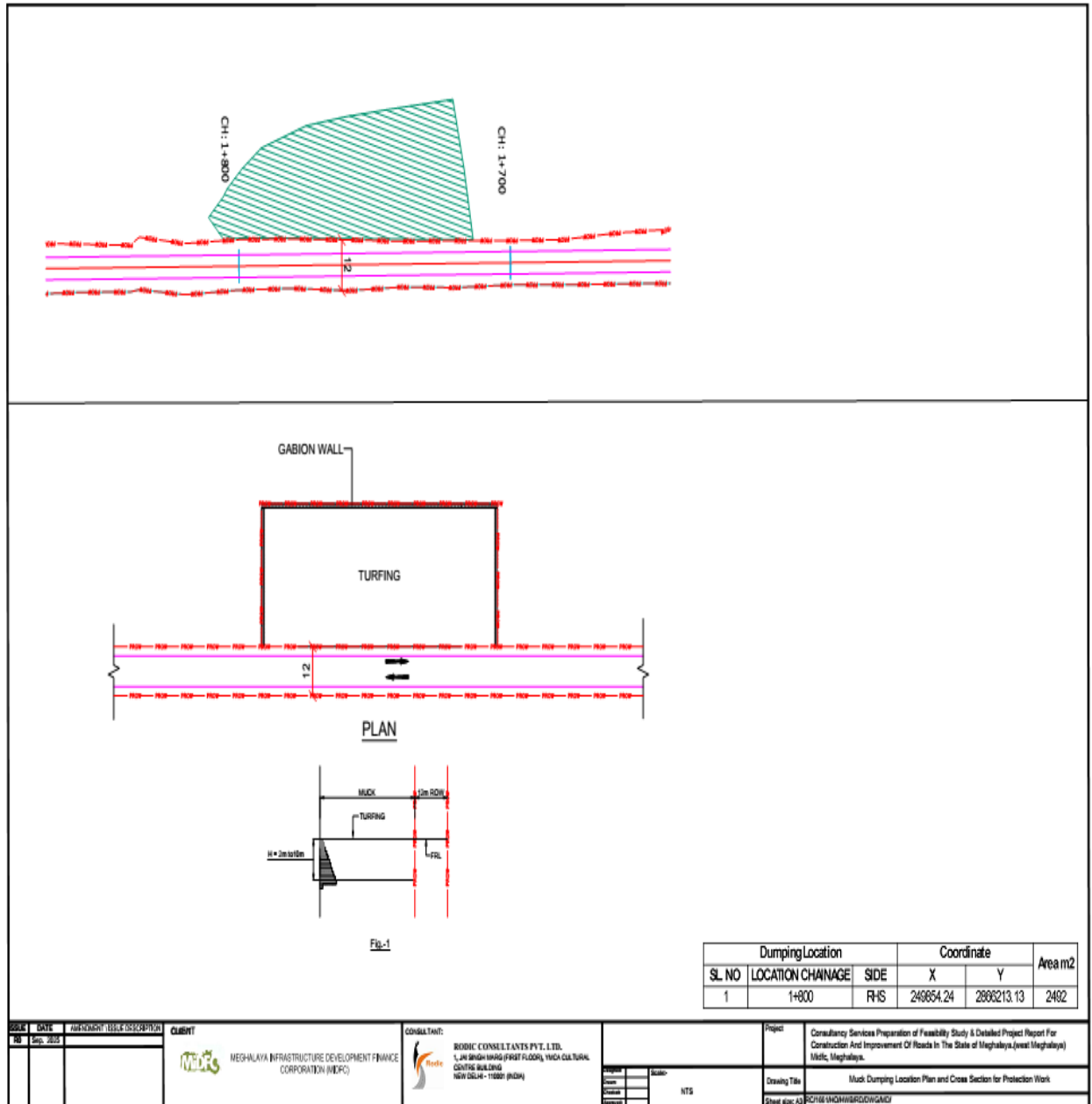
Biological Measures

- Covering muck with topsoil.
- Plantation of native species.
- Bamboo crib wall
- Turfing of slopes to minimize erosion.
- Community-based maintenance through Village Employment Councils/ Self-Help Groups.

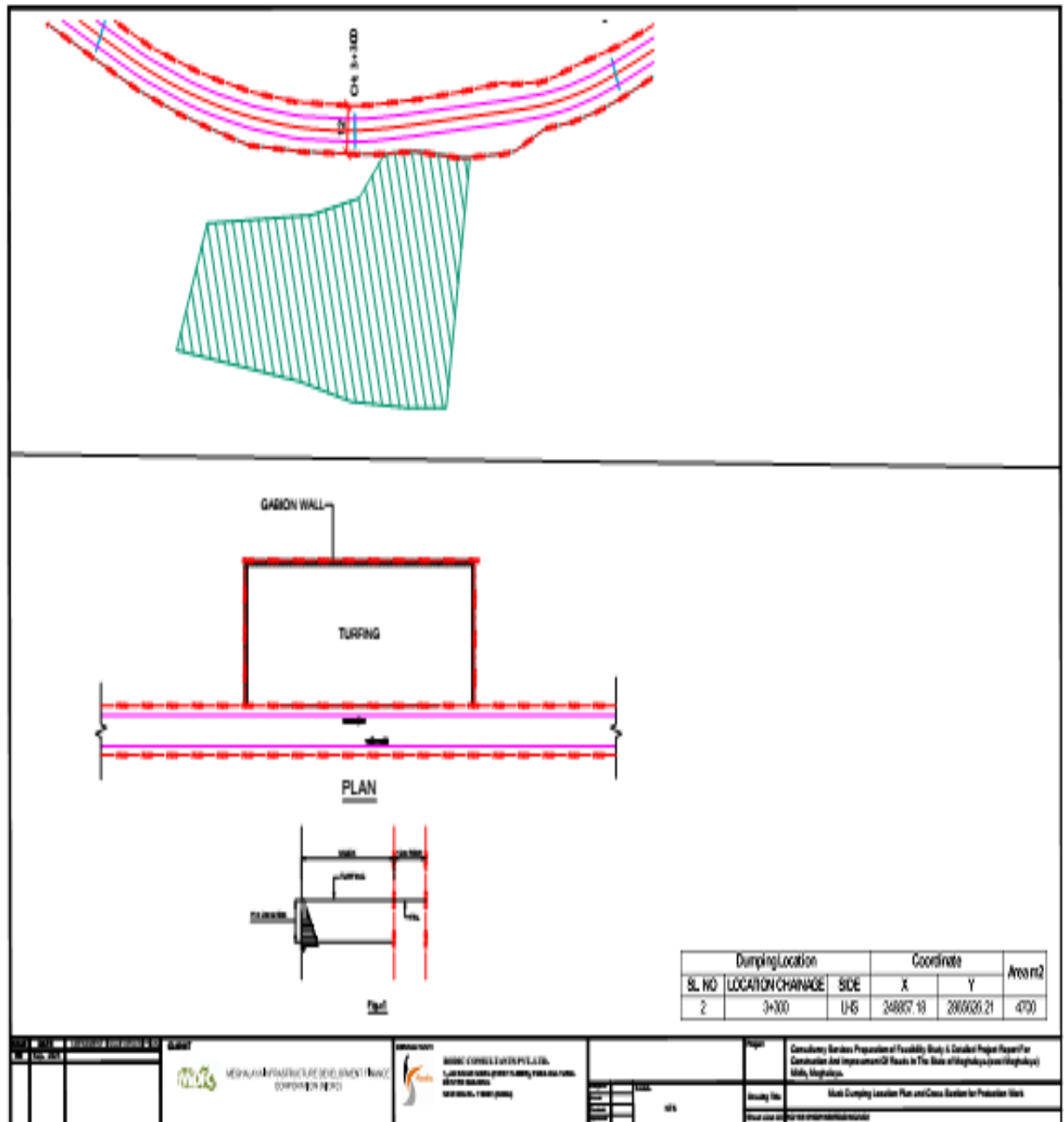
▪ 6. MONITORING & COMPLIANCE

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.

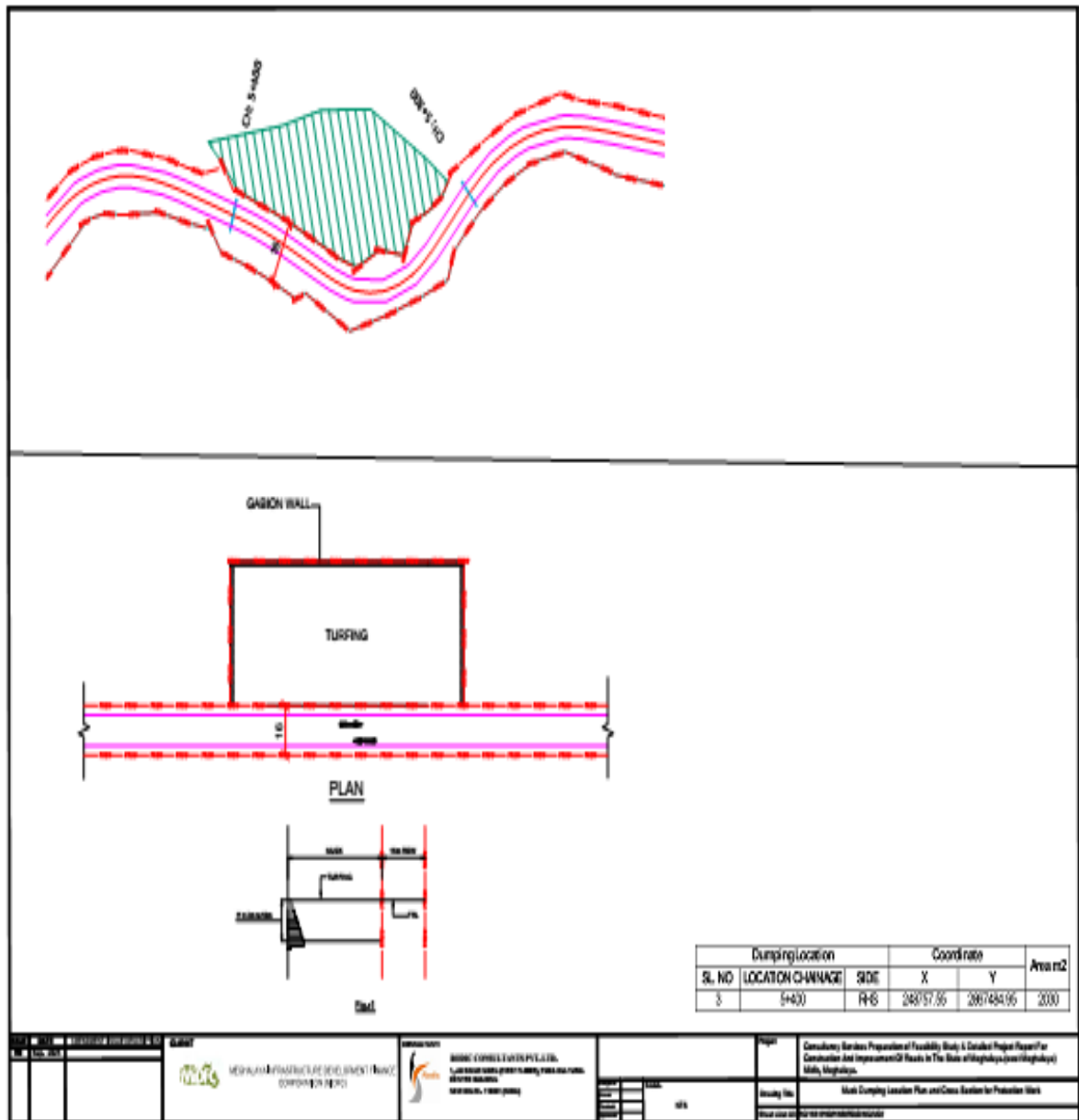
Typical drawing of muck disposal site is given below



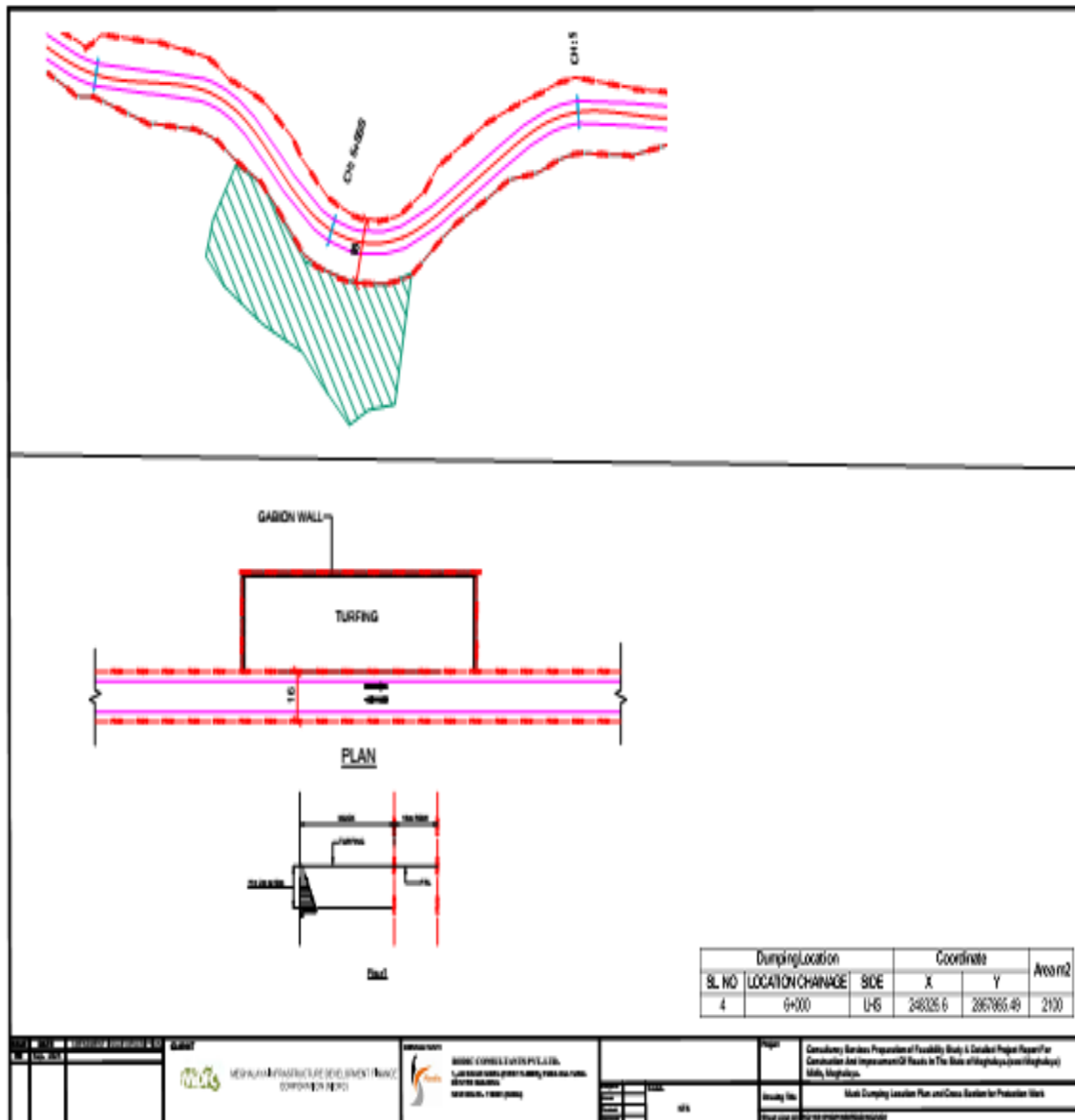
Dumping Location 1



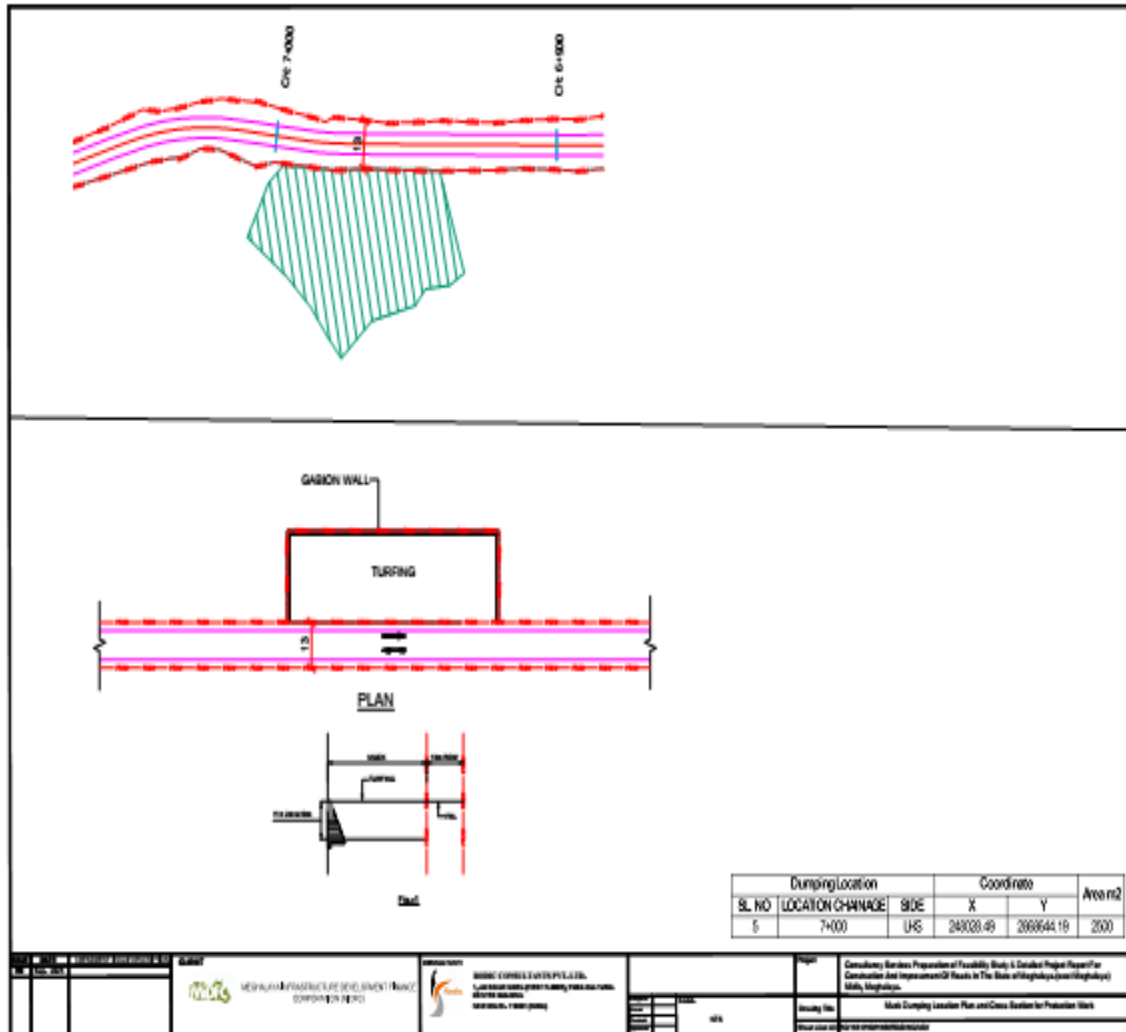
Dumping Location 2



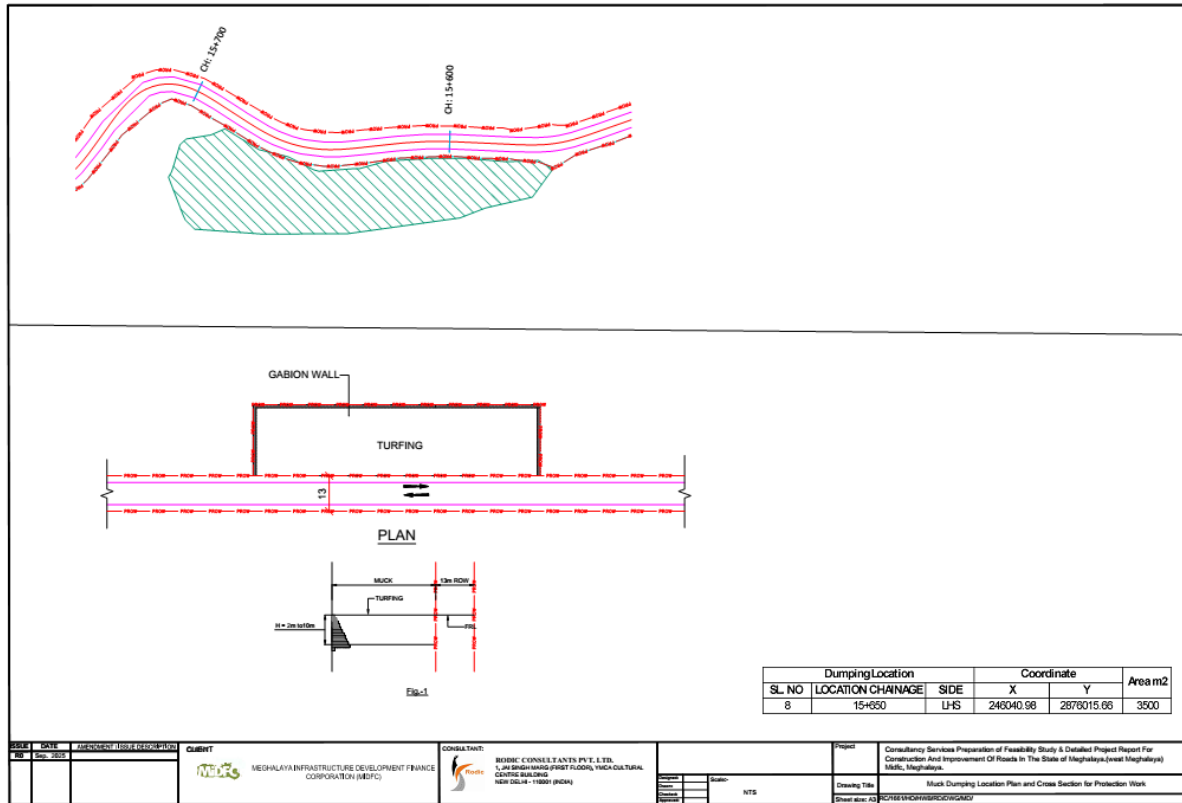
Dumping Location 3



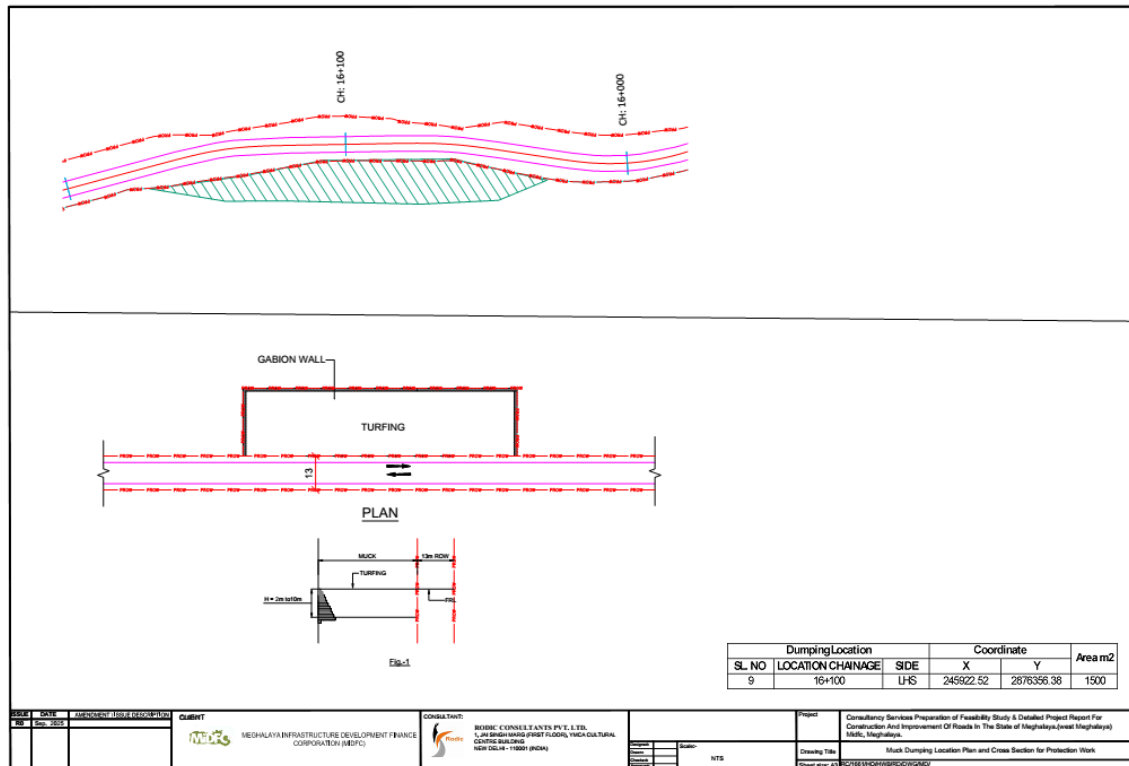
Dumping Location 4



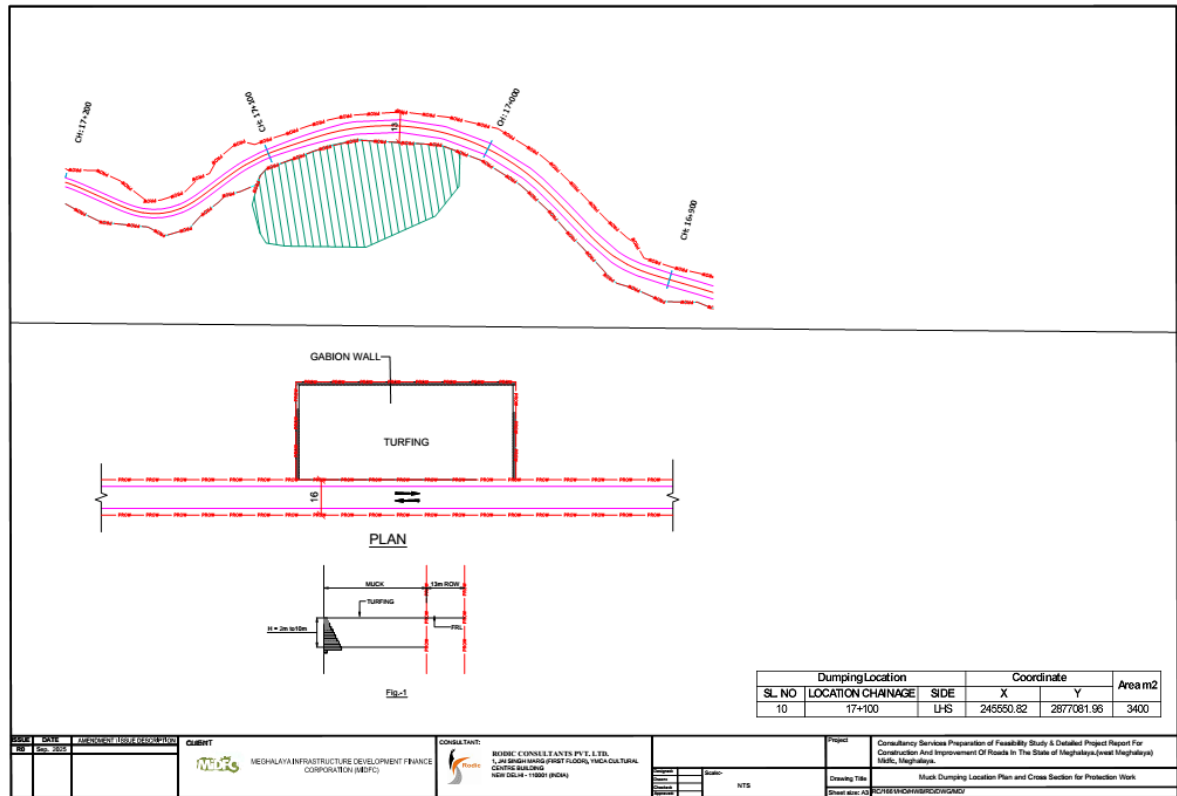
Dumping Location 5



Dumping Location 7

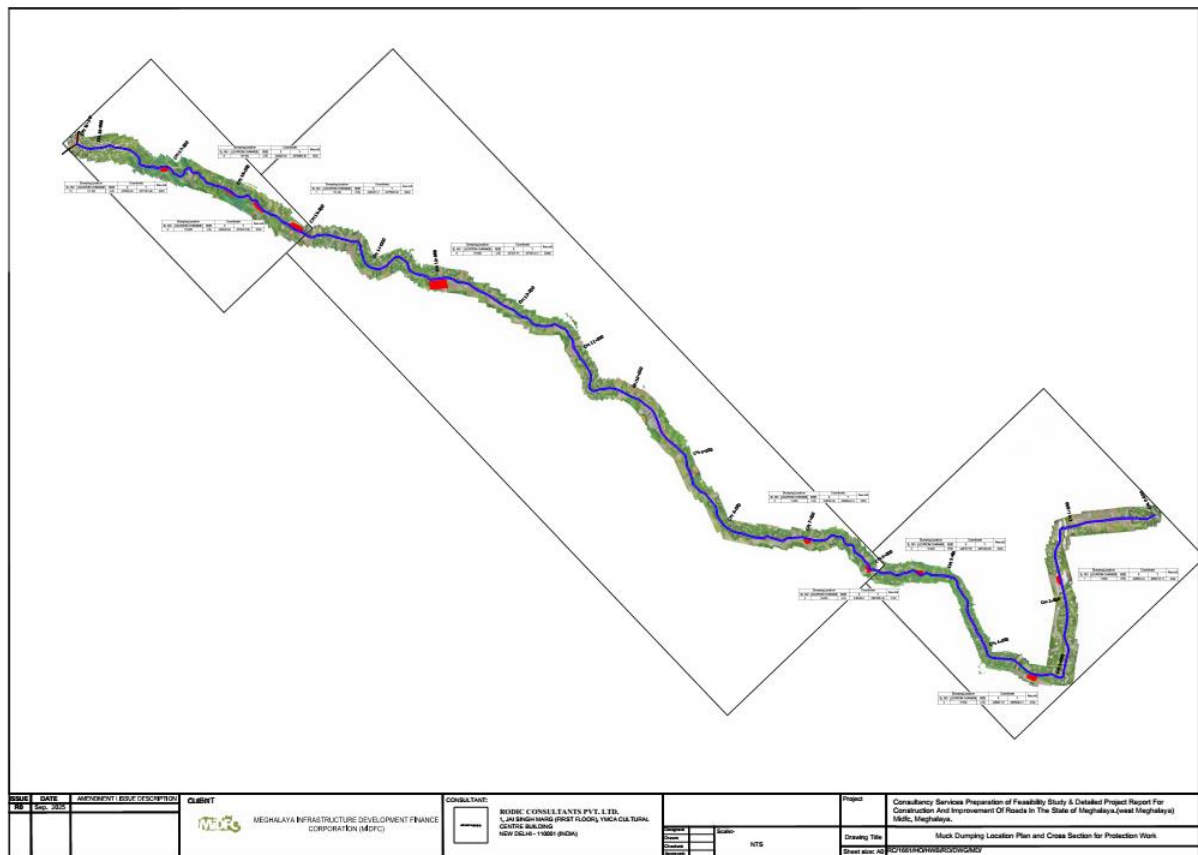


Dumping Location 8



Dumping Location 10

MLCIP - Upgradation of Rongsai Borjhora Bajengdoba (RBB) Road from single to intermediate lane
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT



Consolidated Drawing

ANNEXURE 5.2: 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 (Dorbar Shnong, Nokma, Dolloi, Syiem, etc.) will be consulted to ensure harmony with local governance and community values.
- Peak manpower requirement: ~35 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 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 (Dorbar Shnong, Nokma, Dolloi, Syiem, etc.).
- 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 Meghalaya 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 5.3: 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:

1. Prevent workplace accidents, injuries, and occupational diseases.
2. Ensure safe working conditions for all project personnel.
3. Comply with national legal requirements and international OHS standards.
4. Establish procedures for emergency response, accident reporting, and corrective action.
5. Promote health awareness and capacity-building of workers.

▪ 3. ROLES AND RESPONSIBILITIES:

6. Project Implementation Unit (PIU):
 - ✓ Ensure contractor compliance with OHS requirements.
 - ✓ Monitor safety performance through site inspections and audits.
7. 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.
8. Construction Supervision Consultant (CSC):
 - ✓ Verify contractor compliance.
 - ✓ Conduct joint safety inspections with PIU and Contractor.
 - ✓ Provide training and awareness sessions.
9. Workers:
 - ✓ Follow safety protocols and wear PPE at all times.
 - ✓ Report unsafe conditions and accidents immediately.

▪ 4. HAZARD IDENTIFICATION AND RISK MANAGEMENT:

10. 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).

11. 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:**

12. General Site Safety:

- ✓ Fencing and barricades around construction sites.
- ✓ Clear signage in English, Garo (local languages).
- ✓ Adequate lighting at night.
- ✓ Safe drinking water, sanitation, and first aid facilities.

13. 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.

14. 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.

15. Machinery and Equipment Safety:

- ✓ Regular maintenance and inspection.
- ✓ Operator licenses and training.
- ✓ Emergency shut-off procedures.

16. 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.

17. 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:**

18. Induction training for all workers before mobilization.
19. Tool-box talks (daily/weekly on-site briefings).
20. Specialized training: Working at height, First aid and firefighting, Electrical safety, Defensive driving.

▪ **7. INCIDENT REPORTING AND MONITORING:**

21. All incidents (accidents, near misses, unsafe acts) must be reported within 24 hours.
22. Contractor maintains Incident Register.
23. CSC/PIU investigates major accidents and ensures corrective action.
24. 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:**

- 25. OHS Policy and Procedures.
 - 26. Worker orientation and training records.
 - 27. Medical check-up reports.
 - 28. Accident/incident investigation reports.
 - 29. 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
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 / Remarks	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

	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
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.				

	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
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?				

	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
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				

	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
	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?				

	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
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?				

	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
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?				

	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
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?				

	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
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				

	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
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				

	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
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 5.4: 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.
House No. L/A-56, Lower Nongrim Hills, Top Floor,
Meghalaya Basin Development Authority (MBDA) Building,
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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, Garo, and English.
- Zero tolerance of child labour; child protection protocols.

Victim -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 establishes a zero-tolerance framework for GBV, SEA, and SH in Meghalaya Road projects. By embedding obligations into contracts, building referral pathways, strengthening accountability, and prioritising survivor safety, the project safeguards the dignity and rights of women, children, and vulnerable groups.

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, Garo, 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. 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 Garo 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:

- Receipt of disclosure/complaint (GRM / direct to GBV focal person).
- Initial triage & safety assessment (within 24 hours).
- Immediate safety & medical referrals (within 24–72 hours).
- Offer first-line psychosocial support (PFA) and information on options.
- If incident involves child — follow POCSO mandatory reporting and child protection protocols.
- Document (confidential) and monitor case, provide survivor support, and implement interim measures to prevent retaliation.
- Closure & anonymised reporting; lessons learned to PIU for risk reduction.

12.1 Next steps / actions required from PIU (checklist)

- Adopt and disclose this GBV-AP publicly.
- Complete package-level GBV risk assessments and referral mapping for each project district in Meghalaya.
- Insert GBV obligations and CoC into tender documents and contracts.
- Recruit/appoint GBV focal persons in PIU and ensure contractor focal persons.
- Develop and fund the project-level survivor emergency fund.
- Begin capacity building for PIU, contractors and local stakeholders, and roll out IEC.
- Establish GRM channels (including anonymous reporting) and test them before major civil works start.
- Start monthly monitoring and quarterly reporting (anonymised) and share relevant escalations with the Bank as required.

13. Gender Distribution of Project-Affected Persons:

Out of a total of 262 Project Affected Persons (PAPs), 136 are male (51.90%) and 126 are female (48.09%), indicating an almost equal distribution between male and female beneficiaries. Gender Distribution of Project-Affected Persons (PAPs) is given in Table 4.20.

Table Gender Distribution of Project-Affected Persons (PAPs)

	Project Affected Persons	Percentage
Male	136	51.90
Female	126	48.09
Total	262	100

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 Meghalaya 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: North Garo Hills 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 Garo population, matrilineal system but still strong male decision-making in public domains. Customary institutions (Nokma/Chieftain system) play key role in dispute resolution.
- 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.
- Law enforcement & services: District HQ at Resubelpara has police and district hospital, but limited psychosocial and shelter facilities. Referral to NGOs in Tura (West Garo Hills) often required.

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 Garo language on GBV/SEA/SH risks and reporting channels.
- Safe camp design (segregated sanitation, lighting, no alcohol zones).
- Engagement of Nokmas, women’s SHGs, and church leaders as community allies.
- Partnership with NGOs in Tura for survivor support; emergency transport for referrals.
- SEA/SH-sensitive Grievance Redress Mechanism (confidential, female focal points).

○ (B2) Referral Contact Sheet – North Garo Hills, Meghalaya

(To be displayed at worksites and GRM desks; in English & Garo/Khasia versions for accessibility)

Service Type	Institution/Provider	Location & Contact	Notes
Police (Women/Child Protection)			
Child Protection (POCSO, Juvenile Unit)			
Health – Emergency & Medico-Legal			
Psychosocial Support & Counselling			
Legal Aid			
Shelter / Safe Home			
Women Helpline (24x7)			
Childline (24x7)			

Advices for Contractors & PIU

- Display this contact sheet in labour camps, site offices, and GRM desks in English and Garo language.
- GBV focal person must ensure confidential referral with survivor consent.
- Keep emergency transport budget ready to transfer survivors to Resubelpara Hospital or Tura 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-centered approach.

ANNEXURE 5.5: CLIMATE DISASTER RISKS ASSESSMENT OF SUB-PROJECT AREAS

1. Changing Rainfall Patterns

- **Extreme rain events are escalating.** Research shows that extreme daily rainfall occurrences in western Meghalaya have quadrupled from the 1950s to 2021, driven by climate change and moisture-laden monsoonal dynamics ¹
- **Monsoon deficits are emerging.** Despite its reputation as the ‘abode of clouds,’ Meghalaya recorded a staggering 56% rainfall deficit during the 2025 southwest monsoon, putting agriculture and water security at serious risk ².
- **Western rainfall trends vary.** While West Khasi Hills show increasing precipitation (about 6 mm/day), West Garo Hills have seen a decline (approximately –6.85 mm/day)

2. Forest Vulnerability & Biodiversity

- Nearly **25% of Meghalaya’s forests** are currently categorized as highly or very highly vulnerable according to IPCC-based assessments, with notably higher disturbance in the north and western Garo Hills
- **Forest disturbance**, as seen via negative NDVI trends, has been pronounced in these areas, reflecting degradation in forest structure and carbon stocks.

3. Localized Vulnerability Hotspots

- A detailed block-level analysis across Meghalaya found that **25 out of 39 C&RD blocks** are classified as highly or very highly vulnerable. Key drivers include low household incomes, limited access to rural credit, poor health infrastructure such as Anganwadi coverage, and sparse forest resources.

At the broader district scale, **West Khasi Hills** stands out as **very high vulnerability**, with other districts like East Khasi Hills, South West Garo Hills, and others in the “high vulnerability” category.

4. Socioeconomic and Ecological Impacts

- **Agriculture**, heavily dependent on rain, is suffering due to erratic rains and rising temperatures, undermining crop yields and traditional jhum cultivation practices
- **Water resources and hydropower** potential are threatened by inconsistent water flows and seasonal shortages
- **Livelihoods are strained:** Forest degradation, biodiversity loss, and shifting patterns in rainfall are disrupting eco-tourism, traditional farming, and forest-dependent activities

To build resilience and protect West Meghalaya's communities and ecosystems, targeted measures should include:

- Integrating fine-scale climate vulnerability data into local planning.

- Enhancing financial inclusion (e.g., rural credit access) and bolstering health and social infrastructure.
- Promoting sustainable forest management and biodiversity-friendly land use.
- Strengthening water resource initiatives like catchment restoration and irrigation.
- Supporting climate-resilient farming practices to reduce dependence on monsoons.

Adaptation Measures: To reduce the impact of rainfall the following adaptation and mitigation measures are recommended

- Retaining walls, bio-engineering techniques, and slope stabilization
- Use of geotextiles and reinforced pavement
- For drainage Improvement Culverts, roadside drains, and floodwater channels in low-lying areas.
- For pavement strengthening climate-resilient Road materials to withstand heavy rainfall-induced damage.
- For Regular Maintenance & Monitoring the Early warning systems and periodic inspections for landslides and road deterioration important.

Project specific Potential impacts of Climate Change trend on road transport infrastructure

Climate Trend / Parameter	Observed Pattern	Impact on Road Infrastructure	Adaptation measures
- High Rainfall Changes in the seasonal and annual average rainfall	- Extreme monthly rainfall (1968.5 mm in 2020) i. Impact on soil moisture levels, affecting the structural integrity of roads, culverts, bridges standing water on the road base ii Risk of flood from runoff, landslides, slope failures and damage to roads if changes occur in the precipitation pattern	- Increased risk of flooding leading to submersion of roads. - Erosion of road embankments and landslides in hilly terrains. - Structural damage to culverts and bridges. - .	<ul style="list-style-type: none"> • Certain critical sections affected by overland flooding of the road raised (vertical alignment, embankment improvement) to be free from the onslaught of flooding events under intense precipitation. • Road asset survey has considered certain critical road sections where the sub-grade strength and integrity were found to be compromised; the sub-grade strength specification meeting the recent-most IRC specifications has been adopted. • The highest assessment of design discharge for sizing culverts and bridges from among the several discharge methods as outlined in recent IRC guidelines have been adopted. • In terms of floodwater conveyance to prevent stagnation, closed concrete drains in settlement pockets have been provided. • Improved cross-drainage capacities required for the quick

Climate Trend / Parameter	Observed Pattern	Impact on Road Infrastructure	Adaptation measures
			<p>conveyance of floodwater by replacing small diameter pipes with box culverts with higher discharge openings has been considered.</p> <ul style="list-style-type: none"> The bottom of the sub-grade has been kept 0.6m above HFL, to avoid over topping, water-logging of the road surface
Rising Temperatures	- Maximum temperature rising from 17.1°C to 29.1 °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. 	<p>a. An adequate binding layer thickness has been proposed to offset the wear, surface fatigue, and rutting under climate stresses.</p> <p>b. In terms of pavement integrity, the choice of viscosity grade VG30 has been maintained</p>

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 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.	Storm water Drainage Development: Construct well-planned drainage 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"> Given that villagers are entirely dependent on nearby forests for fuel, food, and building materials, how will the potential for localized resource depletion be managed with the commencement of construction? What measures will be put in place to ensure that the community's reliance on these resources is not negatively impacted, and how will sustainable alternatives be provided to prevent further environmental strain? 	<ul style="list-style-type: none"> Farmers were informed that if their agricultural land gets affected by the project, they will be compensated as per established procedure. Community was assured that they will be provided with access to nearby forest areas for resources such as firewood, water and forest resources.
2	<ul style="list-style-type: none"> Lack of accessibility and poor connectivity in rural areas make agriculture less attractive, especially for older individuals. Limited transportation, poor access to resources, and communication barriers hinder farming. The ageing population in agriculture leads to a shortage of younger farmers, as the current generation views farming as physically demanding and financially unstable. Many young people migrate to cities for better opportunities, while the sector faces challenges like low profitability, limited access to credit, and outdated farming practices. These factors contribute to a growing reluctance to continue farming, requiring improvements in infrastructure, financial support, and modern agricultural practices to sustain the sector. 	<ul style="list-style-type: none"> Participants were informed that vocational training for the youth in rural areas can improve their employability and offer alternative livelihoods. The community can be connected with these schemes, identifying local training needs, creating awareness, and coordinating with training providers.
3	<ul style="list-style-type: none"> The land governance system of villages restricts non-tribals from buying land or settling permanently 	<ul style="list-style-type: none"> No steps will be taken up which disturbs the socio-economic fabric of the community during project implementation. Every decision regarding land acquisition and other related matters will be taken up jointly in consultation with the council.
4	<ul style="list-style-type: none"> Absence of local land records register makes resolving disputes challenging. 	<ul style="list-style-type: none"> Authorities informed that local tribal leaders and community members try their best to create a transparent framework for land use and access. Community will be further made aware during project for land related processes and timely communication from local authorities and contractors. The project will have a dedicated grievance redress mechanism that will


Sl. No.	Summary of Issues	Suggestions / Responses provided
		handle all the grievances of the communities. The platform will ensure that there is time to time update which is shared with the community through the grievance redressal cell.
5	<ul style="list-style-type: none"> Community raised the point that Land issues in North Garo Hills are entirely at the discretion of the council. They should also be made part of the land acquisition process during project implementation. 	<ul style="list-style-type: none"> Community was informed that project authorities will carry out FPIC to understand concerns of individual members of the community and also engage with the council early in the road construction project planning process to ensure that land use decisions and approvals align with their policies and regulations, fostering collaboration and mutual understanding of the community. Establish a clear framework for land tenure and rights that incorporates council's approval process, ensuring that all stakeholders, including non-tribals, are informed about requirements for land access related to the project. Integrate traditional rehabilitation policy that considers community needs and values when acquiring land for the project, ensuring that affected individuals receive fair compensation and support.
6	<ul style="list-style-type: none"> How will the needs of school-going children be carefully considered and addressed during the construction phase of the project, particularly in relation to any potential disruptions to their daily routines, transportation, and access to education? What measures will be put in place to minimize any negative impacts on their schooling during this period? 	<ul style="list-style-type: none"> During the construction phase of the project, the project authorities will ensure that school-going children face minimal disruption to their daily routines, especially in terms of transportation. Project authorities will collaborate with the Village-level councils to identify potential challenges and address them effectively. Additionally, project authorities will engage with school authorities to ensure a seamless transportation plan for children during the road construction period.
7	<ul style="list-style-type: none"> Will the construction affect any cultural, historical, or heritage sites in the area? How will the project ensure that the local cultural practices and traditions are respected? 	<ul style="list-style-type: none"> Contractor will ensure that no such significant sites are affected. If any are identified, appropriate measures will be taken to preserve them. Local communities will be consulted during the planning process, and cultural practices will be considered in the road design and construction to ensure that they are respected. Labor Management Procedures will stipulate measures for sensitization of labors vis a vis local cultural practices and traditions. This will be monitored by contractor throughout the project.

Table 1: 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.	DFO East and North Garo Hill	21-08-2025	DFO	Existing RoW should be maintained at Community forest and Elephant passing	While designing the road through community forest areas and identified elephant passing locations, it is recommended that the existing Right of Way (RoW) be maintained without any additional widening, so as to minimize forest clearance and habitat disturbance. The road should be strengthened and upgraded within the available formation width, with slope protection measures such as bio-engineering and turfing instead of concrete structures to retain the natural landscape. At critical elephant	 <p>Latitude: 25.509677 Longitude: 90.599502 Elevation: 296.95+104 m Accuracy: 15.03 m Time: 21-08-2025 14:43</p>

Sl No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					crossing points, suitable wildlife-friendly structures such as underpasses or overpasses should be incorporated, along with appropriate signage, speed calming measures, and solar-powered warning systems to alert drivers. Natural drainage patterns must be preserved to avoid waterlogging, and noise-reducing pavement surfaces may be adopted to minimize disturbance to wildlife. During construction, night-time activities and dumping of debris within forest stretches should be strictly prohibited. Further, involvement of the local community in	

Sl No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					monitoring elephant movement, maintaining eco-friendly roadside plantations, and developing alternative fodder sources will help ensure that road development is balanced with ecological conservation and long-term sustainability.	
2.	Forest ranger office	23-08-2025	Forest ranger and Forest Gard	<p>Community Land with Vegetation: Issues and processes related to management, access, and dependency on community forest resources.</p> <p>Elephant Movement: Seasonal patterns and frequency of elephant movement in and around the project area.</p> <p>Floral Diversity: Presence of</p>	Table topping will be done for smooth movement of elephant.	

Sl No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
				floral species, including ecologically important and dominant species. Medicinal Plants: Availability and traditional use of medicinal plant species by the local community.		
3.	DPR Consultant	26-08-2025	DPR Consultants	<ul style="list-style-type: none"> Preliminary observations from an 18.27 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 15 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 12-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 	 <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 Powered by NoteCam</p>

Sl No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					<p>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	

Sl No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					<p>possibilities in the design to accommodate potential increases in traffic volume and road usage over time.</p> <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. Treatment of land slide in land slide affected stretches. 	
4.	PCCF, Shillong	28/8/25	Harish Chaudhry	<ul style="list-style-type: none"> key issues related to community forest management and local dependency were highlighted. The seasonal frequency of elephant movement in the project area was discussed, along with potential risks of human–wildlife conflict. The need for appropriate mitigation measures, such as road safety provisions and conservation-friendly design features, was 	<ul style="list-style-type: none"> Table topping will be done for smooth movement of elephant. Existing RoW should be maintained at Community forest and Elephant passing 	

Sl No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
				emphasized.		

ANNEXURE 7.2: STAKEHOLDER ENGAGEMENT PLAN

Prepared for:

MLCIP - Upgradation of Rongsai Borjhora Bajengdoba (RBB)

October 2025

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▪ INTRODUCTION/PROJECT DESCRIPTION

1. 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.

2. 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.

3. 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)

4. 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

5. 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.

6. The MLCIP is being prepared under the Environmental and Social Framework (ESF World Bank's Environmental and Social Framework (ESF).

▪ OBJECTIVE/ DESCRIPTION OF SEP

7. 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

8. **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

9. 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.

10. 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.

11. **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, Jaintia (Pnar), and Garo 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 (, Nokmas etc) 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 Strengthening	<ul style="list-style-type: none"> • Exposure visits to similar projects, institutions, or regions to exchange knowledge, share best practices, and adopt innovative approaches. • Preparation of standardized manuals, operating procedures, and guidelines to ensure consistency, efficiency, and sustainability in project planning, implementation, and monitoring.

- 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, MBMAetc.;
- Industries, traders, and businesses along the corridors;
- NGOs and CBOs working in the project areas;
- Media
- The general Public.

Stakeholders in Community Development

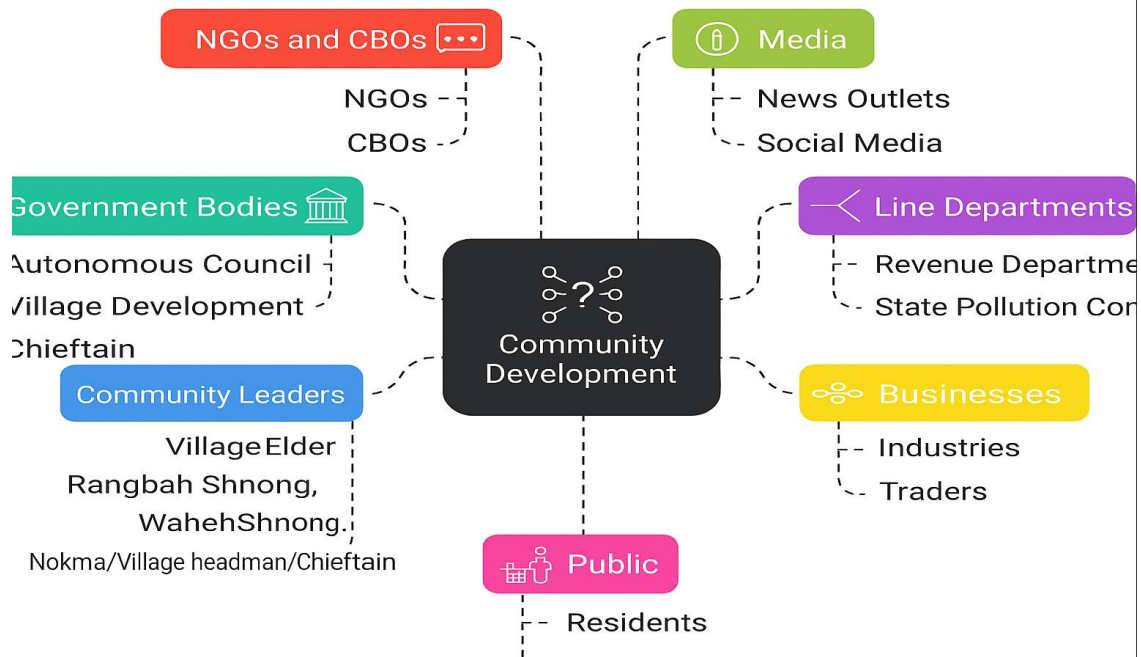


Figure 1: Stakeholders in Community Development

12. 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, Jaintia, Garo) 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.


13. 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

14. 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
Preliminary consultation						
1	Market	23-08-2025	Local residents	<ul style="list-style-type: none"> Participants expressed appreciation for the project and acknowledged its potential positive impacts on the community. Concerns were raised regarding the poor condition of the existing road. It was highlighted that children's education is being adversely affected due to difficulties in commuting caused by the poor road condition. Participants reported that frequent road accidents are occurring as a result of the deteriorated road condition. 	<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. 	 <p>Latitude: 25.895926 Longitude: 80.505426 Elevation: 8141±6.35 m Accuracy: 4.302 m Time: 23-08-2025 12:13 Water: RBB</p>
Key Informant Interview						




MLCIP - Upgradation of Rongsai Borjhora Bajengdoba (RBB) Road from single to intermediate lane


ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT


Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1	DFO East and North Garo Hill	21-08-2025	DFO	Existing RoW should be maintained at Community forest and Elephant passing	While designing the road through community forest areas and identified elephant passing locations, it is recommended that the existing Right of Way (RoW) be maintained without any additional widening, so as to minimize forest clearance and habitat disturbance. The road should be strengthened and upgraded within the available formation width, with slope protection measures such as bio-engineering and turfing instead of concrete structures to retain the natural landscape. At critical elephant crossing points, suitable wildlife-friendly structures such as underpasses or overpasses should be incorporated, along with appropriate signage, speed calming measures, and solar-powered warning systems to alert drivers. Natural drainage patterns must be preserved to avoid waterlogging, and noise-reducing pavement surfaces may be adopted to minimize disturbance to wildlife. During construction, night-time activities and dumping of debris within forest stretches should be strictly prohibited. Further, involvement of the local community in monitoring elephant movement, maintaining eco-friendly roadside plantations, and developing alternative fodder sources will help ensure that road development is balanced with ecological conservation and long-term sustainability.	 <p>Latitude: 25.509677 Longitude: 90.599502 Elevation: 286.95±1.04 m Accuracy: 16.03 m Time: 21-08-2025 14:43</p>

MLCIP - Upgradation of Rongsai Borjhora Bajengdoba (RBB) Road from single to intermediate lane

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT



Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1	Forest ranger office	23-08-2025	Forest ranger and Forest Gard	<p>Community land with vegetation: Issues and processes related to management, access, and dependency on community forest resources.</p> <p>Elephant Movement: Seasonal patterns and frequency of elephant movement in and around the project area.</p> <p>Floral Diversity: Presence of floral species, including ecologically important and dominant species.</p> <p>Medicinal Plants: Availability and traditional use of medicinal plant species by the local community.</p>	Table topping will be done for smooth movement of elephant.	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1	PCCF, Shillong	28/8/25	Harish Chaudhry	key issues related to community forest management and local dependency were highlighted. The seasonal frequency of elephant movement in the project area was discussed, along with potential risks of human–wildlife conflict. The need for appropriate mitigation measures, such as road safety provisions and conservation-friendly design features, was emphasized.	<ul style="list-style-type: none"> Table topping will be done for smooth movement of elephant. <p>Existing RoW should be maintained at Community forest and Elephant passing</p>	




Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1	DPR Consultant	26-08-2025	DPR Consultants	<ul style="list-style-type: none"> Preliminary observations from an 18.27 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 15 meters, in accordance with relevant codes for state highways. <p>A topographic survey has been conducted within a 60-meter width.</p>	<ul style="list-style-type: none"> Incorporate the 12-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. 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 	 <p>Latitude: 25.58179 Longitude: 91.884458 Elevation: 1510.9±2.04 m Accuracy: 2863 m Time: 25-08-2025 16:48 Note: Discuss/review</p> <p>Powered by NoteCam</p>

MLCIP - Upgradation of Rongsai Borjhora Bajengdoba (RBB) Road from single to intermediate lane

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					<p>relation to access and land.</p> <ul style="list-style-type: none"> Treatment of land slide in land slide affected stretches. 	
1		16/09/2025	Street Vendor	<p>Participants appreciated the project and acknowledged its positive impact on the community.</p>	<p>Construct smoother roads to enhance accessibility and improve transportation.</p>	 <p>Latitude: 25.8959009°N Longitude: 90.5054143°E Elevation: 81.41±14 m Accuracy: 42.5 m Time: 16-09-2025 12:21 Note: Rbb Road</p>
1				<p>Expressed a positive attitude toward the proposed project, citing expected improvements in road connectivity, access to health and education facilities, and local economic opportunities.</p> <p>He mentioned that the predominant waterborne diseases in the study area include</p>	<ul style="list-style-type: none"> Coordinate with the Public Health Engineering Department (PHED) for the provision of safe drinking water sources near habitations along the project corridor. Ensure drainage and cross-drainage structures are designed to prevent stagnation and contamination of local water bodies. Conduct periodic awareness 	 <p>Latitude: 25.99858896°N Longitude: 90.45264169°E Elevation: 71.35±13 m Accuracy: 15.3 m Time: 16-09-2025 15:00 Note: Rbb Road end point.</p>

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
				<p>diarrhoea, typhoid, and cholera. These illnesses pose significant health risks to the local population, particularly in villages with limited access to clean drinking water, inadequate sanitation facilities, and constrained healthcare services. Community representatives emphasized the need for improved water supply systems, regular health awareness campaigns, and strengthened public health infrastructure to mitigate these issues.</p>	<p>programs during construction in coordination with local health departments and NGOs on safe water use, sanitation, and hygiene practices (WASH).</p> <ul style="list-style-type: none"> • Display information boards in local language on health and safety measures for workers and nearby communities. 	
	Youth					

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1		9. /09. /25	Youth (8 No .)	<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: 25.851226 Longitude: 90.498828 Altitude: -29.02±27.6 m Accuracy: 19.2 m Time: 09-09-2025 11:56 Note: RBB road Village No.</p>
2		19.09.2025	Youth (5 nos.)	<ul style="list-style-type: none"> • Promote skill-building, entrepreneurship, • Better road connectivity for transportation of goods and services 	<ul style="list-style-type: none"> • Establish feedback and monitoring mechanisms through the Stakeholder Engagement Plan (SEP) • Integrate capacity-building and skill development components 	 <p>Latitude: 25.891313 Longitude: 90.498668 Elevation: 47.88±19.6 m Accuracy: 50.75 m Time: 19-09-2025 12:30 Note: RBB road 2nd Consult</p>
2		25.09.25	Youth (5 nos.)	<ul style="list-style-type: none"> • The youth were also taught about access to proper sanitation and other facilities if employed by the contractor during execution of the project. 	<p>If any issues were to be faced by them in the near future then their problems and inconvenience can be brought forward to the GRM.</p>	 <p>Latitude: 25.894 Longitude: 90.504573 Elevation: 53.53±25.2 m Accuracy: 300.0 m Time: 25-09-2025 12:44 Note: RBB Road consultant</p>

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
	Women FGD					
2		19.09.2025	Women (5)	<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 • There is a pressing need for inclusive, women-centric interventions that promote local entrepreneurship, skills, and connectivity 	<ul style="list-style-type: none"> • Integrate women-focused skill development initiatives • Strengthen participation of women's Self-Help Groups (SHGs) in project-related awareness, monitoring, and plantation maintenance programs. 	 <p>Latitude: 25.89147 Longitude: 90.498851 Elevation: 54.0743.65 m Accuracy: 4.148 m Time: 19-09-2025 13:11 Note: RBB road 2nd Consultand meeting at Bajengdoba</p>
10		25.09.2025	women	<ul style="list-style-type: none"> • During the consultation, gender-related issues and concerns were discussed in detail with the women participants from the local community. The discussion emphasized the importance of women's participation and empowerment in project-related activities. 	<ul style="list-style-type: none"> • The Assistant Executive Engineer, PWD (Roads), NEC Sub-Division No. II, Tikrikilla, informed the participants that women engaged in any project-related work will be entitled to equal pay for equal work, in compliance with statutory norms. • He further assured that the project will ensure gender-sensitive facilities, including provision of separate sanitation units for women and adequate accommodation wherever required. The womenfolk appreciated the discussion and expressed their support for the project highlighting the need for continued attention to safety, privacy, and equal employment opportunities during implementation. 	 <p>Latitude: 25.891209 Longitude: 90.498789 Altitude: 1264211 m Accuracy: 2115 m Time: 25-09-2025 13:03 Note: RBB Road consult</p>

Summary of project stakeholder needs and methods, tools, and techniques for stakeholder engagement

15. 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 Workplan and Work schedules - Share details on GBV/ SEA/SH prevention and mitigation measures. <p>Give information on Grievance Redressal Mechanism</p>	<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. <p>Give information on Grievance Redressal Mechanism</p>	<ul style="list-style-type: none"> • Meaningful consultations (Refer to 4.3) • Surveys • Focus Group Meetings/ Discussions • Village level meetings • Site visits 	Affected Parties	MPWD and ESIA Consultant
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. 	<ul style="list-style-type: none"> • Focus Group Meetings/ Discussions • One-on-one interviews <p>(Using tools and methods to</p>	<p>Vulnerable groups</p> <p>BPL, Women headed households, Persons with disabilities,</p>	ESIA Consultant MPWD

Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
		<ul style="list-style-type: none"> - 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. <p>Give information on Grievance Redressal Mechanism in an accessible manner.</p>	ensure accessibility and full participation)	elderly, Children along with their guardians	
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. <p>Give information on Grievance Redressal Mechanism</p>	Consult with Heads of Traditional Institutions, Village Elders, Executive Members of the Village Councils (, Nokmas, etc).	Autonomous District Council, Village Development Council (, Nokmas, etc).	MPWD
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 <p>Give information on Grievance Redressal Mechanism</p>	<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

Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
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 <p>Give information on Grievance Redressal Mechanism</p>	<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 <p>Compliance reports and records submission Workshops and trainings</p>	Contractor	MPWD
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 <p>Required permissions, certificates, etc. to be sought</p>	<ul style="list-style-type: none"> - Official letter or notification - Compliance reports and records submission and approvals by MSPCB <p>Workshops and</p>	Meghalaya State Pollution Control Board	MPWD

Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
			trainings		
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 <p>Workshops and trainings</p>	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 <p>Give information on workers' Grievance Redressal Mechanism</p>	<ul style="list-style-type: none"> - Face to face trainings - Toolbox trainings for workers <p>Signages in construction sites and camps</p>	Labor Contractors and workers	Supervision Consultants and Contractors
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 (Nokmas, etc).	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 	<ul style="list-style-type: none"> - Press Release/ Notes 	Media	MPWD

Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
		Success stories	<ul style="list-style-type: none"> - Monthly Health Bulletins - Inputs for OpEds - Short films/ Reels/Posts for social media Social Media platforms of Meghalaya Government		

Strategy to incorporate the view of vulnerable groups

16. 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.

17. 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 include - large print materials and clear, legible fonts; plain and simple local languages 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

Vulnerable Group	Measures
	<ul style="list-style-type: none"> 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/Jaintia/Garo) 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/ Nokmas, and Village Elders

18. The project road has Garo 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, Nokma/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:

- a) **Early Engagement** – Consultations will begin early in the project planning process to gather initial views on the project proposal and inform project design.
- b) **Encouraging Feedback** – Stakeholder input will be actively solicited to inform project design and identify and mitigate environmental and social risks and impacts.
- c) **Ongoing Process** – Engagement will be continuous throughout the project lifecycle.
- d) **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

19. 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

20. 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.

21. 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. • 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

Agency/ Individual	Role and Responsibility
	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 stakeholder engagement activities. 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.

22. 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 MLCIP project for E&S risk management.

23. 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					
Posters & GRM Leaflets	6,000 copies	60/copy	One-time	3,60,000	Key locations, not mass printing
Community Radio & Social	18	15,000/month	18	2,70,000	Phased messaging only

Budget Category	Quantity	Unit Cost (INR)	Duration	Total (INR)	Remarks
Messaging	months		months		
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

24. 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.

25. 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

26. 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).

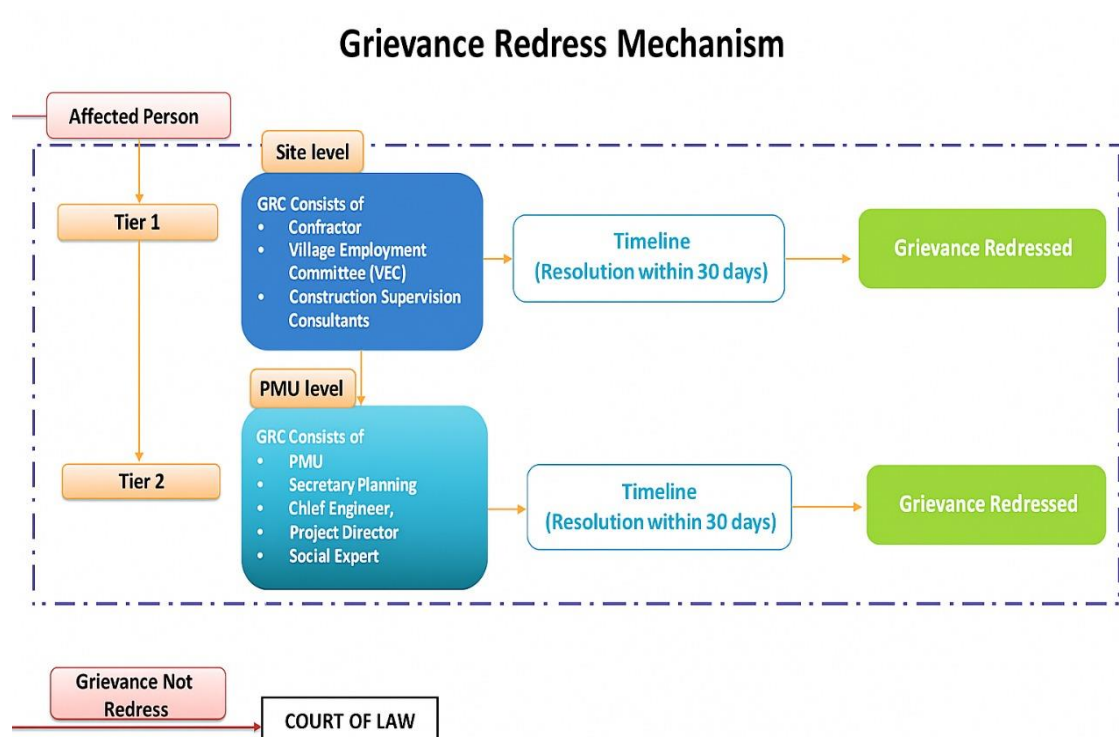


Figure 2: Grievance Redressal Mechanism

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>	Throughout the project lifecycle	MPWD

Step	Description of process (e.g.)	Timeframe	Responsibility
	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.		
Grievance uptake	Grievances can be submitted via the following channels: <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.,
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	Data on complaints are collected in	Upon receipt of	CSC/PMC and E&S Cell

Step	Description of process (e.g.)	Timeframe	Responsibility
evaluation	project portal and reported to the PMU; and reported to the World Bank every quarter.	complaint/ quarterly basis	
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 out 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.

27. 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.

28. 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

29. 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.

30. 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

31. The SEP will be revised and updated as necessary during project implementation.

32. 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.

33. 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, Nokmas, Village Representatives)	Communities expressed overall support for the road upgrading. Requested construction of roadside drains, footpaths, bus waiting sheds, zebra crossings, public toilets, and improvement of approach roads. Sought fair compensation where small land parcels or temporary structures may be affected. Requested boundary walls for schools/churches and protection works (toe walls/retaining walls) in vulnerable slope and paddy field areas.	The project team clarified that the road will be upgraded within the existing RoW with minimal land requirement. Fair and transparent compensation will be ensured where required, as per state law and World Bank safeguards. Community infrastructure requests have been documented for integration into the detailed design.	Final design drawings with incorporated site-specific improvements to be shared with the community / Nokmas. Consultation feedback to be reflected in DPR and ESMP. Disclosure to be done prior to works commencement.
Commuters and Daily Road Users	Highlighted need for road safety measures, including street lighting, pedestrian crossings, speed control measures near settlements, markets, and schools. Requested waiting sheds at junctions.	Road safety features will be integrated into the design. Streetlighting and zebra crossings near schools and market areas will be included. Locations for waiting sheds and signage will be finalized with community input.	Safety design plan to be presented in community meeting. Signage and speed control features to be installed during construction.
Youth Groups	Raised concerns about limited employment opportunities, suggested local preference in project jobs, and requested skill development vocational training aligned with construction and post-construction livelihood sectors. Highlighted opportunities for eco-tourism and agro-based livelihood promotion.	Project team acknowledged the need for employment support. Assured that local labor will be given priority for unskilled and semi-skilled works. Will coordinate with government programs for youth skill development and entrepreneurship support.	PIU to publish job requirement notices locally. Link youth with skill training schemes through local development agencies. Monitor local hiring during construction.
Women Groups / SHG Members	Expressed need for women-friendly livelihood support, market linkages for weaving/agro-products, and awareness on government schemes. Requested improved transport access to reduce mobility challenges and increase access to markets, education, and healthcare. Highlighted safety concerns near schools and community spaces.	Women's participation concerns are recognized under the IPDP framework. Women-specific livelihood strengthening, SHG enterprise support, and awareness programs will be included. Road safety features near schools and public institutions will be prioritized.	Women-specific training and enterprise facilitation sessions to be planned with ICDS / NRLM. Road design to ensure visibility and safe pedestrian spaces near common public facilities.

Stakeholder (Group or Individual)	Summary of Feedback	Response of Project Implementation Team	Follow-up Action/ Next Steps
Traditional Governance Institutions (Nokmas / Village Councils)	Requested continued consultation, involvement in finalizing camp locations, borrow areas, and monitoring of construction workers' behavior. Confirmed readiness to cooperate and several Nokmas provided NOCs.	Team assured that Village Councils will remain key decision-making partners through implementation. Labour management plan and Code of Conduct for workers will be enforced, with village monitoring support.	Maintain regular coordination meetings during construction. Grievance Redress Committee to remain active and community-accessible.
Vulnerable Households	Requested special attention to avoid livelihood disruption and to ensure support during temporary access or mobility impacts.	Vulnerable households will be prioritized under entitlement support and monitored throughout construction.	Social team to validate vulnerable households list and ensure assistance as per RPF/IPDP.

Annexure 1

Sl. No.	Location / District	Road Location / Name	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	North Garo Hills District	Bajengdoba Multi-Facility Hall (FPIC – I)	09-09-2025	44	Nokmas, Village Headmen, PWD, PWD Women Representatives, Officials	Requested drains, footpaths, waiting sheds, cycle parking near schools, boundary walls for schools/churches, and proper approach roads. Sought flood mitigation through culverts & embankments.	Concerns acknowledged. Site-specific infrastructure requests recorded for DPR alignment and ESMP integration. Emphasized minimal land impact and adherence to safeguard provisions.	Mapping of requested infrastructure to be done during final design verification. Community to receive prior disclosure of final drawings.	Design Revision Stage – Oct–Nov 2025 / PWD (Roads), DPR Consultant
2	North Garo Hills District	Rongsai and Borjhora Area (FPIC – II)	19-09-2025	41	Local Residents, Youth Groups, Women SHGs, ESIA Team, DPR Team	Discussed project objectives and ESIA findings. Requested employment preference for locals and proper labour camp planning.	PIT committed to local labor prioritization and strict labour management protocols. Tier-I GRC re-affirmed as active. Construction safety and	Share job opportunities information locally; conduct safety awareness programs pre-construction. Continue regular GRC	Pre-Construction & Construction Phase – Jan 2026 onward / Contractor, PWD, Social Team

Sl. No.	Location / District	Road Location / Name	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)
						Raised safety concerns during construction. Highlighted need for Tier-I Grievance Committee clarity.	community communication to be ongoing.	meetings.	
3	North Garo Hills District	Tikrikilla Sub-Division (FPIC – III)	25-09-2025	38	Assistant Executive Engineer, PWD Officers, DPR Consultants, Nokmas, Village Elders, Community Representatives	Reiterated need for drains, toe/retaining walls, safety near schools, and protection works near river/fields. Communities submitted NOCs and expressed cooperation for road works.	PIT confirmed upgrade to 5.5 m intermediate lane with minimal land acquisition. Protection structures and safety elements to be designed based on field requirement and community input.	Finalize list of locations requiring toe walls, pedestrian safety zones, waiting sheds. Share final design alignment with community before tendering.	Final DPR Validation – Nov–Dec 2025 / PWD (Roads), DPR Consultant, Community Representatives

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
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

Key evaluation questions	Specific Evaluation questions	Potential Indicators	Data Collection Methods
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 3: Requirements for Free, Prior and Informed Consent (FPIC) aligned with the World Bank ESF and National Laws.

The essential six steps for conducting successful FPIC

Step - 1: Send a letter to all stakeholders about FPIC 15 days prior to the meeting.

Step - 2: First round of consultation for the screening and also building awareness and need for FPIC

Step - 3: 2nd round of Consultation is for get the input on design, draft plan and plan and consent for the project.

Step - 4: To share the Minutes of meetings with representative council, ADC, State government and to obtain NOC from autonomous council.

Step - 5: To conduct 3rd round of consultation on draft disclosed documents (ESMF, ESMP, RAP, IPDP, LMP, JCP, Design) to seek their feedback and also outcome from previous consultation.

Step- 6: Seeking written consent for overall project (From ADC, Village Concill, Nokma).

The procedure outlined below for FPIC is as per the requirements of World Bank ESS7 and with reference to the MPWDs ESMF.

Requirements	World Bank ESF (ESS 7)	National Laws (India)	Measures to be Adopted
Application of Free, Prior and Informed Consent (FPIC)	FPIC is required in circumstances where the project will: have adverse impacts on land and natural resources under traditional ownership or customary use; cause relocation of Indigenous Peoples; or have significant impacts on Indigenous Peoples' cultural heritage (ESS7 Paras 25–26).	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013 (RFCTLARR), Forest Rights Act 2006 (FRA), and AMASR Act 1958 mandate community consent in Scheduled Areas for land acquisition and cultural heritage protection.	FPIC will be undertaken at all road sites and road stretches where customary or community land and resources are affected. The requirement extends beyond Scheduled Areas to all Indigenous communities under the Sixth Schedule districts of Meghalaya.
Risk Identification for FPIC	Borrower engages independent social specialists to identify risks and potential impacts to Indigenous communities (Para 24 of ESS7).	Rule 5 of RFCTLARR Rules 2015: Independent organization to conduct Social Impact Assessment (SIA).	coordination with traditional institutions, local authorities, and project implementation agencies to ensure full participation and culturally appropriate decision-making by affected communities.
Whose Consent is Needed	Consent is the collective support of affected Indigenous Peoples reached through a culturally appropriate process (Para 26 of ESS7).	Consent of Gram Sabha required in Scheduled Areas; if not constituted, Panchayats or Autonomous District Councils can provide consent (Section 41(3) of	For Meghalaya, FPIC will be obtained through the Heads of Traditional Institutions such as the Nokmas, ensuring at least 50% participation and one-third women

Requirements	World Bank ESF (ESS 7)	National Laws (India)	Measures to be Adopted
		RFCTLARR).	attendees.
Documentation Process	Borrower documents mutually agreed processes for good-faith negotiations and outcomes, including dissenting views (Para 25(c) of ESS7).	RFCTLARR (SIA and Consent) Rules 2014 require signed records and resolutions of Gram Sabha meetings with terms and conditions of consent (Rule 17).	FPIC documentation will include: minutes of meetings, signatures of attendees, video/photo records, consent resolutions, Records will be disclosed publicly at village and district levels.
Validity of Consent	FPIC valid when collective consent is confirmed through transparent and inclusive process; if FPIC cannot be ascertained, project elements cannot proceed (Paras 25(d) and 27).	Resolution without explicit consent statement considered invalid (Rule 17(7) of RFCTLARR Rules 2014).	Only subprojects and road stretches receiving documented community consent will proceed; others will be redesigned or relocated in consultation with communities.

Annexure - 4

Photo documentation of Stakeholder Consultation



MLCIP - Upgradation of Rongsai Borjhora Bajengdoba (RBB) Road from single to intermediate lane

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT

Photograph of 1st FPIC meeting held on 9th September 2025 at Bajengdoba Multifacility Hall.



Photograph of IInd round FPIC meeting held on 19th September 2025 at Bajengdoba Multifacility Hall.



Photograph of IIIrd round of FPIC meeting held on 19th September 2025 at Bajengdoba Multifacility Hall.

Annexure 7.3 : MoM FPIC 1, 2 and 3

Annexure 7.3 : MoM FPIC 1, 2 and 3

GOVERNMENT OF MEGHALAYA
OFFICE OF THE EXECUTIVE ENGINEER, P.W.D. (ROADS)
NEC DIVISION, TURA.

No. PW/EE/NEC/

Date:

To,

The Nodal Officer (MITP), PWD (Roads)
Meghalaya, Shillong

Sub: 1st FPIC Meeting for Meghalaya Logistics and Connectivity Improvement Project.
(Rongsai Borjhora Bajengdoba Road)

Sir,

With reference to the subject cited above, I have the honour to submit herewith the following details for favour of your kind information and necessary action:

1. Copy of the meeting notice.
2. Confirmation by Community head (fixing the date and venue for the meeting)
3. Minutes of the meeting.
4. Attendance sheet.
5. Photographs.

Yours faithfully

(G. M. Sangma)
Executive Engineer, P.W.D. (Roads),
NEC Division, Tura.

No.PW/EE/NEC/

Dated Tura, the

Copy to:

1. The Assistant Executive Engineer, PWD (Roads), Sub-Division No.II, Tikrikilla Division for information and necessary action.
2. Office copy.

GOVERNMENT OF MEGHALAYA
OFFICE OF THE EXECUTIVE ENGINEER, P.W.D. (ROADS)
NEC DIVISION, TURA.

No. PW/EE/NEC/

Date: 1/09/2025

To,

The Nokma/Headman,
Bajengdoba , North Garo Hills.

Sub: Conduct of FPIC -1 (Free Prior, Informed Consent) meeting.

Sir/Madam,

With reference to the subject cited above, I would like to bring to your kind attention regarding the necessity for conducting an FPIC-1 meeting which has to be done from your end to apprise and keep all the stakeholders involved before taking the next step in designing and construction of Rongsai Borjhora Bajengdoba Road. The time and place for the meeting can be decided from your end and do so before the second week of September. However, in this meeting which has to be conducted from your end, the undersigned would like to urge you and all the stakeholders involved like the land owners, school and village committees to come forward and give your valuable opinions and suggestions that will be essential during the framing of the detailed project report for construction of the aforementioned road so that no inconvenience is caused to anyone during the execution of the project.

Looking forward to your kind cooperation.

Yours faithfully

(G. M. Sangma)
Executive Engineer, P.W.D. (Roads),
NEC Division, Tura.

Minutes of the 1st FPIC Meeting at Bajebgdoba multi-facility centre

Project: Rongsai Borjhora Bajengdoba Road (RBB).

Date: 9th September 2025

Time: 11:30 AM

Venue: Bajengdoba Multifacility Hall.

Members Present: As per the attendance sheet (enclosed)

Proceedings:

1. The meeting was chaired by the Assistant Executive Engineer, PWD (Roads), NEC Sub-Division No. II, Tikrikilla. The Chair opened the proceedings by introducing the PWD officials present and then invited all Nokmas, village headmen, and community representatives to introduce themselves.
2. The Assistant Executive Engineer explained the purpose of the meeting, emphasizing the importance of consultation with all stakeholders for the proposed improvement and widening of the 18.27 km Rongsai – Borjhora – Bajengdoba road. He clarified that the existing single-lane carriageway of 3.75 metres would be upgraded to an intermediate lane of 5.50 metres.
3. The Chair then handed over the proceedings to the Executive Engineer, PWD (Roads), NEC Division, Tura, who delivered a detailed explanation of Free, Prior and Informed Consent (FPIC).

The Executive Engineer emphasized that FPIC is not merely a procedural requirement but a fundamental right of indigenous peoples. He highlighted the relevance of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), adopted by the UN General Assembly on 13 September 2007, which explicitly recognizes FPIC as a critical safeguard. The Declaration ensures that indigenous and local communities are fully informed, consulted in good faith, and give their consent before any development project that may affect their lands, territories, or resources is approved or implemented.

The Executive Engineer further explained that the FPIC process is designed to promote transparency, build mutual trust, and demonstrate respect for community rights and traditional decision-making processes. It guarantees that communities have the opportunity to understand the project fully, express their views freely, and influence project design without any coercion or pressure.

Thereafter, the following key aspects of the project were discussed in detail with the community:

- Project purpose, scope of work, and implementation arrangements
- Expected benefits of the improved road
- Possible social, environmental, and cultural impacts
- Due to the proposed expansion from single lane to intermediate lane, additional land may be required for curve improvements, construction of drains, footpaths, and other allied structures. No major land requirement is anticipated; however, minor portions of private and government land may be affected along the alignment. Some tree cutting may also be required for curve improvement and drainage works.

- Exact land requirement details will be shared with the community in the 2nd FPIC meeting after submission of the Detailed Project Report (DPR) by the consultants.
 - Roles, responsibilities, and rights of the community throughout the project cycle, including possible outcomes during implementation.
4. The meeting witnessed active and enthusiastic participation from Nokmas, village headmen, and community representatives. The Nokmas and headmen assured full cooperation and committed to raising awareness about the project in their respective villages and to bring forward any issues that may arise during construction.
 5. Community members raised the following suggestions and requests, which were duly noted:
 - Provision of covered drains and proper footpaths in built-up areas, particularly near market places and schools
 - Construction of bus stops with zebra crossings near all schools along the RBB road; special mention was made of Kristo Jyoti High School (with over 1,000 students), which requires a covered parking area for students' bicycles
 - Raising of road embankment and provision/upgradation of culverts at flood-prone locations such as Moamari and Omon Bazar to prevent water logging during heavy monsoon
 - Construction of boundary walls for schools and churches located along the road alignment
 - Provision of waiting sheds/bus stops at all major junctions and habitations
 - Improvement/repair of approach roads to major habitations as per community needs
 6. The Executive Engineer acknowledged all suggestions and assured the house that feasible requests would be incorporated in the detailed design.
 7. The EE then introduced the Grievance Redressal Mechanism (GRM), explaining that it will serve as the first point of contact for community grievances related to the project. The GRM will involve community representatives, women, youth, contractors, and government officials to address concerns efficiently.

The Tier I Grievance Redress Cell shall operate under the Chairmanship of the Village Head or any representative nominated by the Village Councils and will include the Resident Engineer (representing the Engineer), Environmental and Social (E&S) Experts of Construction Supervision Consultant (CSC), Environmental/Social Officers and Assistant Engineers from the department, 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 project level within fifteen (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 PWD as members. The State-level Grievance Redress Cell shall review the case and provide its decision or recommendations within fifteen (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.

8. The Executive Engineer then formally inducted key stakeholders (Nokmas, headmen, and community representatives) into the GRM committee. It was agreed that the date and venue of the 2nd FPIC meeting would be finalized and communicated through the GRM.

The meeting concluded successfully with a vote of thanks and a closing prayer offered by the Village Headman of Line Ading locality.

Photograph of 1st FPIC meeting held on 9th September 2025 at Bajengdoba Multifacility Hall.



Photograph of 1st FPIC meeting held on 9th September 2025 at Bajengdoba Multifacility Hall.



**GOVERNMENT OF MEGHALAYA
OFFICE OF THE EXECUTIVE ENGINEER, P.W.D. (ROADS)
NEC DIVISION, TURA.**

No. PW/EE/NEC/

Date:

To,

The Nodal Officer (MITP), PWD (Roads)
Meghalaya, Shillong

Sub: 2nd FPIC Meeting for Meghalaya Logistics and Connectivity Improvement Project.
(Rongsai Borjhora Bajengdoba Road)

Sir,

With reference to the subject cited above, I have the honour to submit herewith the following details for favour of your kind information and necessary action:

1. Copy of the meeting notice.
2. Confirmation by Community head (fixing the date and venue for the meeting)
3. Minutes of the meeting.
4. Attendance sheet.
5. Photographs.

Yours faithfully

(G. M. Sangma)
Executive Engineer, P.W.D. (Roads),
NEC Division, Tura.

No.PW/EE/NEC/

Dated Tura, the

Copy to:

1. The Assistant Executive Engineer, PWD (Roads), Sub-Division No.II, Tikrikilla Division for information and necessary action.
2. Office copy.

**GOVERNMENT OF MEGHALAYA
OFFICE OF THE EXECUTIVE ENGINEER, P.W.D. (ROADS)
NEC DIVISION, TURA.**

No. PW/EE/NEC/

Date: 9/09/2025

To,

The Nokma/Headman,
Bajengdoba , North Garo Hills.

Sub: Conduct of FPIC -1 (Free Prior, Informed Consent) meeting.

Sir/Madam,

With reference to the subject cited above, I would like to bring to your kind attention regarding the necessity for conducting an FPIC-2 meeting which has to be done from your end to apprise and keep all the stakeholders involved before taking the next step in designing and construction of Rongsai Borjhora Bajengdoba Road. The time and place for the meeting can be decided from your end and do so before the second week of September. However, in this meeting which has to be conducted from your end, the undersigned would like to urge you and all the stakeholders involved like the land owners, school and village committees to come forward and give your valuable opinions and suggestions that will be essential during the framing of the detailed project report for construction of the aforementioned road so that no inconvenience is caused to anyone during the execution of the project.

Looking forward to your kind cooperation.

Yours faithfully

(G. M. Sangma)
Executive Engineer, P.W.D. (Roads),
NEC Division, Tura.

Minutes of the 2nd FPIC Meeting at Bajengdoba multi-facility centre

Project: Rongsai Borjhora Bajengdoba Road (RBB).

Date: 19th September 2025

Time: 11:00 AM

Venue: Bajengdoba Multifacility Hall.

Members Present: As per the attendance sheet(enclosed)

Proceedings:

1. **Opening and Introductions** The meeting was chaired by the Assistant Executive Engineer, PWD (Roads), NEC Sub-Division No. II, Tikrikilla. The Chair welcomed everyone and introduced the PWD officials, environmental and social experts from the ESIA team (Satra), and the DPR consultants (RODDIC) present for the second FPIC consultation. Nokmas, village representatives, and community members from various villages along the RBB road introduced themselves. A brief recap of the discussions and outcomes of the 1st FPIC meeting was shared with all participants.
2. **Project Presentation and Alignment Review** The Executive Engineer, PWD (Roads), NEC Division, Tura, reiterated the purpose of the meeting and the importance of continuous stakeholder consultation. The RODDIC consultants displayed detailed alignment maps and drawings of the proposed road improvement. The Executive Engineer clarified the likely minor impacts on community land and government land, particularly near bridge approaches. Participants, including Nokmas, headmen, and community members, examined the drawings closely. It was confirmed that no major land requirement is envisaged for the project. Feedback from the community was positive, and the Nokmas and village headmen assured full cooperation during project execution.
3. **Findings from Environmental and Social Impact Assessment (ESIA)** It was reiterated that the project involves no major land requirement. However, minor portions of community land and a few temporary structures may be affected. Since some community members could not attend, their views and consent will be specifically obtained during the 3rd FPIC meeting.
4. **Positive Impacts of the Project:** The Executive Engineer highlighted key benefits, including generation of local employment, improved connectivity, better access to markets and services, and enhanced road safety. He informed the gathering that community facilities such as public toilets, bus waiting sheds, and other amenities can also be provided under the project wherever required.
5. **Construction-Induced Impacts and Mitigation Measures** Potential temporary disturbances during construction were openly discussed, including dust, noise, air and water pollution, safety concerns for women and children, risks of labour exploitation, and influx of workers (particularly from neighbouring Assam during bridge construction). Corresponding mitigation measures contained in the Environmental and Social Management Plan were explained to ensure minimal inconvenience to the communities.
6. **Site-Specific Planning** The Executive Engineer emphasized the need to identify suitable locations for labour camps, material storage yards, and other temporary facilities so that local residents are not inconvenienced. She requested the Nokmas and village representatives to suggest appropriate sites and convey the same to the department at the earliest.
7. **Grievance Redressal Mechanism (GRM)** The Tier-1 (project/site-level) GRM committee has been constituted with Nokmas, village headmen, and other responsible community members. The Executive Engineer explained the roles, responsibilities, and operational procedure of the GRM to all present.

8. **Focused Group Discussions (FGDs)** Separate discussions were held with women participants on gender-related concerns and proposed mitigation measures. A similar session was conducted with the youth to address their specific issues and suggestions.
9. **Indigenous Peoples Development Plan (IPDP)** The Executive Engineer elaborated on the rights of indigenous communities under the project framework, stressing the importance of active community participation and incorporation of local needs for the overall development of the Bajengdoba–Borjhora area.
10. **Open Discussion and Community Feedback** Towards the end, ample time was provided for general feedback. Participants actively shared valuable suggestions on all agenda items. They assured that specific community requirements would be submitted in writing during the next (3rd) FPIC meeting.
11. **Closure** The Executive Engineer noted all suggestions and requested the community, through the Nokmas and GRM members, to propose convenient dates and venue for the 3rd FPIC meeting. The meeting concluded successfully with a vote of thanks and a closing prayer offered by the Village Headman of Bajengdoba locality.
12. Enclosed

- Confirmation by Community head (fixing the date and venue for the meeting)
- Minutes of the meeting.
- Attendance sheet.
- Photographs.

Assistant Executive Engineer, P.W.D.(Roads)
NEC Sub-Division No -II, Tikrikilla.

Executive Engineer, P.W.D (Roads),
NEC Division, Tura.

FPIC -II meeting at Bajengdoba multi facility hall with regard to RBB Road.



Latitude: 25.89147
Longitude: 90.498831
Elevation: 54.07±3.65 m
Accuracy: 4.148 m
Time: 19-09-2025 13:11
Note: RBB road 2nd Consultand meeting at Bajengdoba

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FPIC -II meeting at Bajengdoba multi facility hall with regard to RBB Road.





Latitude: 25.89131
Longitude: 90.498657
Elevation: 48.78±20.7 m
Accuracy: 16.19 m
Time: 19-09-2025 12:36
Note: RBB road 2nd Consultand meeting at Bajengdoba

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GOVERNMENT OF MEGHALAYA
OFFICE OF THE EXECUTIVE ENGINEER, P.W.D. (ROADS)
NEC DIVISION, TURA.

No. PW/EE/NEC/

Date: 3/09/2025

To,

The Nodal Officer (MITP), PWD (Roads)
Meghalaya, Shillong.

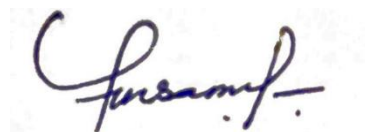
Sub: 3rd FPIC Meeting for Meghalaya Logistics and Connectivity Improvement Project. (Rongsai Borjhora Bajengdoba Road)

Sir,

With reference to the subject cited above, I have the honour to submit herewith the following details for favour of your kind information and necessary action:

1. Copy of the meeting notice.
2. Confirmation by Community head (Fixing the date and venue for the meeting along with the NOC for construction of RongsaiBorjhoraBajengdoba Road.)
3. Minutes of the meeting.
4. Attendance sheet.
5. Photographs.
6. Petition by the Nokma/Headmen/Village individuals.

Yours faithfully



(G. M. Sangma)
Executive Engineer, P.W.D. (Roads),
NEC Division, Tura.

No.PW/EE/NEC/

Dated Tura, 3/09/2025

Copy to:

1. The Assistant Executive Engineer, PWD (Roads), Sub-Division No.II, Tikrikilla Division for information and necessary action.

GOVERNMENT OF MEGHALAYA
OFFICE OF THE EXECUTIVE ENGINEER, P.W.D. (ROADS)

NEC DIVISION, TURA.

No. PW/EE/NEC/

Date: 9/09/2025

To,

The Nokma/Headman,
Bajengdoba , North Garo Hills.

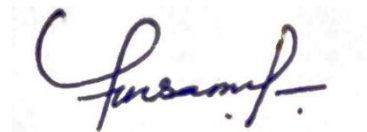
Sub: Conduct of FPIC -III (Free Prior Informed Consent) meeting.

Sir/Madam,

With reference to the subject cited above, I would like to bring to your kind attention regarding the necessity for conducting an FPIC-III meeting which has to be done from your end to apprise and keep all the stakeholders involved before taking the next step in designing and construction of RongsaiBorjhoraBajengdoba Road. The time and place for the meeting can be decided from your end and do so before the second week of September. However, in this meeting which has to be conducted from your end, the undersigned would like to urge you and all the stakeholders involved like the land owners, school and village committees to come forward and give your valuable opinions and suggestions that will be essential during the framing of the detailed project report for construction of the aforementioned road so that no inconvenience is caused to anyone during the execution of the project.

Looking forward to your kind cooperation.

Yours faithfully



(G. M. Sangma)
Executive Engineer, P.W.D. (Roads),
NEC Division, Tura.

Minutes of the 3rd FPIC Meeting at Bajengdoba multi-facility centre

Project: Rongsai Borjhora Bajengdoba Road (RBB).

Date: 25th September 2025

Time: 11:00 AM

Venue: Bajengdoba Multifacility Hall.

Members Present: As per the attendance sheet (enclosed)

Proceedings:

1. Opening remarks.

The meeting was chaired by The Assistant Executive Engineer, PWD (Roads), NEC Sub-Division No. II, Tikrikilla who began with introduction of the officials of PWD, environment and social experts and DPR team from Roddic who were present for the second round FPIC meeting. Nokmas, village representatives and the other people from many villages along RBB road came to attend the meeting. Minutes of FPIC-III meeting was recapitulated to all the people present in the meeting.

2. Project presentation.

A detailed map showing alignment of the proposed road was presented by an engineer from Roddic consultants. The Assistant Executive Engineer, PWD (Roads), NEC Sub-Division No. II, Tikrikilla then invited the Nokmas and village headmen starting from the 1st kilometer, Kosi and thereafter proceeding gradually up to the last 18th kilometre, Borjhora.

The Assistant Executive Engineer clarified regarding the possible impact on land with regard to the members present in the meeting as the existing road would be upgraded from the existing single lane (3.75m width) to an intermediate (5.5m width) lane. Nokmas, village headmen along with their respective villagers came forward to check the plan on paper to ascertain the exact locations where land may be impacted due to the proposed construction.

Feedback from the affected persons and the other individuals present in the meeting was positive and the village headman and the Nokma assured PWD to extend all cooperation during execution of the project.

3. Finding from ESIA.

It was observed that no major land requirement in this project. However, some temporary sheds may be affected along with private lands. Those affected had queries that was answered by a member of the ESIA team.

Never the less, the people of the area were very supportive and **the Nokmas and village headmen even brought NOC for their respective villages** when it came to upgradation of Rongsai Borjhora Bajengdoba Road. **The main concern of the people where land would be impacted was the construction of toe walls along stretches where paddy fields are located and construction of protection works along hill sides where earthwork cutting will be involved.**

4. Positive impacts of the project.

The Assistant Executive Engineer then highlighted the positive impacts that would happen with the implementation of such a big project. Besides improved connectivity by upgrading the existing road, employment of local people and other opportunities can come up once the construction work starts.

Facilities such as construction of public toilets, bus shelters and other such similar amenities that can be taken up under this project is made aware to the people in the previous FPIC-II meeting.

The people along RBB Road through their respective Headmen brought a petition with the following demands;

- Drains with footpath and railing required at Kosi bazaar. Bus waiting shed also required. (Chainage-0.00Km)

- Road is submerged at chainage 0.600 Km so embankment has to be raised along with provision of new culvert. Toe walls to be provided on both sides so paddy fields will not be affected during earthwork. Footpath with bus waiting shed also required at Moamari Junction.
- Drains with footpath required at Omon bazaar (Chainage-1.30Km). Bus waiting shed also required. Zebra crossing and rumble strips required in front of schools and public places like church. Construction of public toilets also mentioned in the petition.
- Portions between 1.20Km to 1.30Km usually submerged during heavy rains so road level needs to be raised with provision of a culvert.
- Toe walls required at 1.80Km as paddy fields are present and road needs expansion.
- Construction of new community hall for Upper Bajengdoba locality (Chainage-2.50Km) along with boundary wall. Bus waiting shed is also required. River protection works are required along Didram River as the river often overflows during monsoons.
- Retaining walls required at 2.90Km and 3.20Km to protect existing houses during road expansion.
- Drains with footpath and bus stop required at Kristo Jyoti Higher Secondary School and Government LP School. (Chainage-3.50Km) Zebra crossings and speed calming measures required. Development of parking space for cycles also mentioned in the petition. Construction of separate toilets for boys and girls required for both the schools.
- Cross drainage works required at 4.10Km along with protection works to safeguard the existing road formation.
- At Mansinggre locality, (Chainage 5.40Km to 7.60Km) people have no objection to expansion of road but demand toe walls along paddy fields and protection works at uphill side of road formation. Bus waiting sheds also to be provided.
- Drains with footpath required at Gosinpita Bazaar. (Chainage-8.00Km) Bus waiting shed, zebra crossings and speed calming measures required. Construction of separate toilets for boys and girls required at Gosinpita Secondary School. Protection works required at 9.20 Km.
- Bus waiting shed and community hall required for Bongbanchi village. (Chainage-9.6Km)
- Bus waiting shed required at Ane Aga village. (Chainage-10.80Km) Protection works along with boundary wall required for Ane Aga LP School.
- Bus waiting shed required at Rangagora village. (Chainage-12.00Km)
- Speed calming measures required near Bolsong Baptist Church and near Mount Zion School. Bus waiting sheds are also required at these places.
- Retaining wall required at 12.50Km.
- Approach road to Waramgre villages, around 610 metres needs to be constructed. (Chainage-17.60Km) Bus waiting shed required at 17.60Km and river protection works required for Waramja Church.

5. Construction induced impacts and mitigation.

Next Assistant Executive Engineer, PWD (Roads), NEC Sub-Division No. II, Tikrikilla pointed out the possible setbacks that may or may not occur during the time of construction of the bridge. Issues such as safety of women and children, exploitation of workers and other similar events were made aware to the people present in the meeting. Other possible impacts such as noise, water and air pollution was also discussed along with inflow of labour from the neighbouring state of Assam during construction of RBB Road.

6. Site specific planning (DPR and ESIA)

With implementation of the project, sites for labour camps and other similar temporary sheds may be necessary so suitable places need to be identified. Burrow pits and disposal sites also needed to be identified. The Assistant Executive Engineer had asked the villagers to identify such locations and inform the department in the previous meeting.

PWD with the help of Nokma and other village people identified such locations and a same was submitted to the Nodal Officer (MITP), PWD (Roads), Meghalaya, Shillong vide letter No. PW/EE/NEC/RDS-46/735, dated 30th September, 2025.

7. Grievance redress mechanism (GRM) – ESMF

Tier -1 GRM is formed and members from the responsible members from the community like

Nokma and village headman during the first meeting held on the 9th of September, 2025. Functions and responsibilities of the GRM were also explained and briefed to all present by The Executive Engineer, PWD(Roads), NEC Division, Tura.

Members of the GRM Tier-1 remain the same since the first meeting and happily obliged to their responsibilities.

8. Focused group discussions (FDGs)

Gender related issues and mitigation measures were explained and discussed with the women folk present in the meeting. The Assistant Executive Engineer, PWD (Roads), NEC Sub-Division No. II, Tikrikilla then talked about women empowerment and if employed in any work related to the project, they had the right to equal pay as the men. They also have the right to proper sanitation facilities with separate toilets besides proper accommodation.

Thereafter the similar issues and mitigation measures are discussed with the youth present in the meeting. The youth were also taught about access to proper sanitation and other facilities if employed by the contractor during execution of the project.

If any issues were to be faced by them in the near future then their problems and inconvenience can be brought forward to the GRM.

9. Indigenous peoples development plan (IPDP) – ESMP/ESIA.

The Executive Engineer, PWD (Roads), NEC Division, Tura had discussed the rights of the indigenous people in the previous meeting held on the 19th of September, 2025. The Assistant Executive Engineer, PWD (Roads), NEC Sub-Division No. II, Tikrikilla once again elaborated the importance of the people's participation and the community's needs that are required in the overall development along RBB road and without putting the community first, the village cannot develop.

10. Open discussion

With the meeting in the last stages, time was given to all present for feedback and opinions with regard to the project. The people present were very pro active gave valuable inputs and suggestions on all the above discussed agendas. Various questions were also raised which were answered by The Assistant Executive Engineer on PWD's behalf. Upon observing satisfaction from the people present, the meeting wound up for closure.

11. Closure

The Assistant Executive Engineer, PWD (Roads), NEC Sub-Division No. II, Tikrikilla thanked everyone and the meeting concluded successfully with the vote of thanks and a prayer by the Village Headman of Ane Aga locality.

12. Enclosed

- Copy of the meeting notice.
- Confirmation by Community head (Fixing the date and venue for the meeting along with the NOC for construction of RongsaiBorjhoraBajengdoba Road.)
- Attendance sheet.
- Photographs.
- Petition by the Nokma/Headmen/Village individuals.

Assistant Executive Engineer, P.W.D.(Roads)
NEC Sub-Division No -II, Tikrikilla.

Executive Engineer, P.W.D (Roads),
NEC Division, Tura.





Time: 25-09-2025 11:25
Note: RBB Road consultant meeting at Bajengdoba multifaseliti hall

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FPIC -III meeting at Bajengdoba multi facility hall with regard to RBB Road.



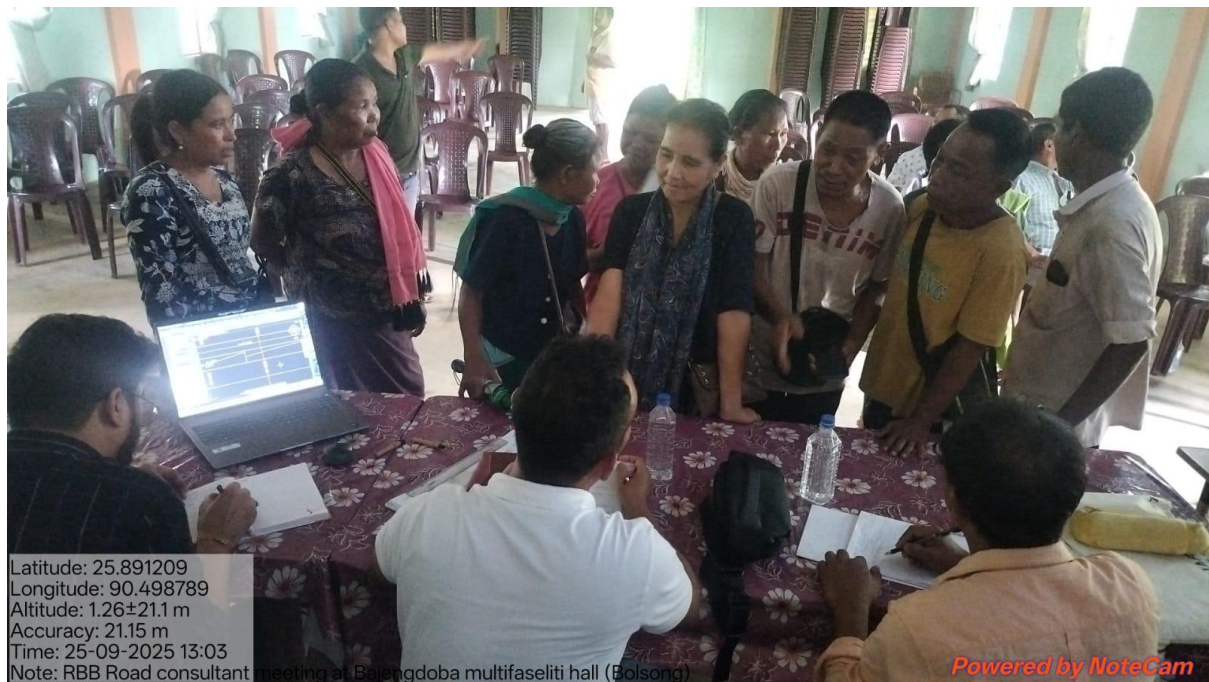
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Accuracy: 300.0 m
Time: 25-09-2025 12:44
Note: RBB Road consultant meeting at Bajengdoba multifaseliti hall (Gosingpita)

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FPIC -III meeting at Bajengdoba multi facility hall with regard to RBB Road.





FPIC -III meeting at Bajengdoba multi facility hall with regard to RBB Road.

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
2	Quantity of Debris and Spoils to be disposed off <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
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
4	<ul style="list-style-type: none"> No. of Trees to be Cut No. of Trees cut % Progress on the tree removal	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 grade	Storage of excavated materials	Pre-Construction and Construction	Contractor
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
6	Implementation of enhancement measures for Noise Barrier at sensitive locations	Enhancements	Construction	Contractor
7	Drainage <ul style="list-style-type: none"> Length (by type) No. of Locations 	Work sites	Construction	Contractor
8	Safety Provisions <ul style="list-style-type: none"> Signage (by type and no.) Crash barriers Footpath 	Work sites	Construction	Contractor
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
10	No. of HIV awareness sessions conducted	Registers/Reports/Geotagged	Construction	Contractor

Sl. No.	Description of Item	Indicator	Stage	Responsibility
		Photos		
11	No. of safety awareness sessions conducted	Registers/Reports/Geotagged Photos	Construction	Contractor
12	Accidents/Incidents <ul style="list-style-type: none"> No of accidents/incidents recorded 	Along sub-project road	During construction	Contractor
13	Environmental parameter monitoring in accordance with the frequency and duration of monitoring as well as the locations as per the Monitoring Plan given in Table 7-2 .	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 Combined No. of People Trained <ul style="list-style-type: none"> Departmental Staff Contractors 	Training Imparted	Construction /Operational stage	MPWD
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	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	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	MPWD
18	Land, structure & Livelihood compensations paid	Number of PAPs compensated; amount disbursed as per	Construction stage	GHADC, MPWD

Sl. No.	Description of Item	Indicator	Stage	Responsibility
		RAP/IPDP		
19	Vulnerable groups	Type of consultations undertaken; Compensations paid in time.	Construction stage	GHADC, MPWD
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
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	MPWD/ Contractor/ CSC

