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DRAFT

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

For

Improvement of Rongjeng - Mangsang Adokgre (RMA) road from23rd to 44th Km including construction of a major Bridge at Eldek Akong and Bridge No. 1/6 –

Meghalaya Logistics and Connectivity Improvement Project (MLCIP)

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,
Shillong East Khasi Hills, Meghalaya-793003

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Document Information

This document includes ESIA Report of 22.00 km length of RMA Roads in Corridor 2.

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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
CoI	:	Corridor of Impact
CPR	:	Common Property Resources
CTE/CTO	:	Consent To Establish/Consent to Operate
CW	:	Carriageway
DG	:	Diesel Generator
DPR	:	Detailed Project Report
E&S	:	Environment and Social
EHS	:	Environment Health and Safety
EIA	:	Environmental Impact Assessment
ESF	:	Environmental and Social Framework
ESIA	:	Environmental and Social Impact Assessment
ESMP	:	Environmental and Social Management Plan
ESMU	:	Environment and Social Management Unit
ESMF	:	Environmental and Social Management Framework
ESRS	:	Environmental and Social Review Summary
ESS	:	Environmental and Social Standards
ESZ	:	Eco-Sensitive Zone

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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
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

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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

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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
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 second and third phases.

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					

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Sl. No.	Name of the Corridors and Proposed Upgradation/ Improvement	Length (Km)	Districts	Start point Coordinate	End Point Coordinate
East Meghalaya					
1.	Upgradation of Dkhiah - Sutnga - Saipung - Pala uptoSemmasi Road	64 Km	East Jaintia Hills	25° 21.818'N 92° 21.693'E	25° 22.638'N 92° 25.413'E
8.	Upgradation of Weiloi - Mawsynram Road uptoPhlangwanbroi	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 Mawsmai-Shella	42 Km	East Khasi Hills	25° 27.668'N 91° 49.619'E	25° 10.173'N 91° 44.580'E
10.	Upgradation of Umsning – Jagi Road i/c Major bridge	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.	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 23rd to 44th Km including construction of a major Bridge at Eldek Akong and Bridge No. 1/6	22.00	East GaroHill & 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.	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
6.	Strengthening and Improvement of Songsak- Mendipathar Road (MDR) including re-construction of weak CD Works and Bridges	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
8.	Improvement of Ampati to Purakhasia Road	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
9.	Improvement of Adugre to Purakhasia Road	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					
3.	Upgradation of Lakadong – Mooriap upto Semmasi Road	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
4.	Conversion Of 17 Weak Bridges Under Pynursla Division To Permanent R.C.C. Bridges	--	East Khasi Hills	--	--

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Sl. No.	Name of the Corridors and Proposed Upgradation/ Improvement	Length (Km)	Districts	Start point Coordinate	End Point Coordinate
5.	Reconstruction of a weak bridge into permanent RCC Bridge on Nongstoin-Maweit Road at 10th Km	39 m	West Khasi Hills	--	--
6.	Construction of Umpling Bridge including approaches (Inside Shillong City)	80m & 60m	East Khasi Hills	--	--
7.	Upgradation of Weiloi - MawkyrwatuptoKeniong including replacement of SPT Bridges into permanent RCC Bridge	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
9.	Upgradation including construction of road from Kongong (NH-06) to Shkentalang (NH-206) passing by the side of Phe and Rynji Falls	27 Km	East Jaintia Hills and West Jaintia Hills	--	--
11.	Construction of Umdang-Amarsang-Maheshkola Road	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					
7.	Improvement of Gasuapara Chokpot Road including construction of bridges	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
4.	Improvement and Upgradation of 12th Mile of TD Road to Chokpot including reconstruction of weak	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
5.	Strengthening and Improvement of Resu- Dekachang - Anogre via Gabil Road (MDR) including conversion of weak bridges into RCC bridges	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
10.	Construction of road from Shallang to Siju including construction of a major Bridge over Simsang River	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
11.	Construction of Baghmara Gittinggre Road to Chokpot C & RD Block via Mindikgre	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
12.	Construction of Mangsang to Mawshynrut (Riangdo) Road	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 proposed RMA Project Road, Corridor 2, spans 22 km, starting from Rongjeng - Mangsang Village (chainage 23+000) and ending at Adokgre (chainage 44+000). The corridor traverses a diverse landscape, including hilly terrains, agricultural lands, scrublands, built-up areas, un-classed forest land, and areas under shifting (jhum) cultivation. It also passes through 13 villages, and plays a crucial role in linking economic hubs and improving access to industrial centers and tourism destinations. The project falls under Schedule VI (tribal) areas.

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A total of 36 electric poles, and 37 electric line crossings are identified along the RMA road corridor for shifting. Of these, 15 poles are on the LHS and 21 on the RHS. Details of utilities are given in **Table 1.3.**

Table 1.3: Utility for Electricals

Utility for Electrical__Rongjeng-Mangsang-Adokgre (RMA)						
Chainage		Electric Pole		Transformer		Electric Crossing line
LHS	RHS	LHS	RHS	LHS	RHS	
23+000	24+000	1	2	0	0	2
24+000	25+000	0	1	0	0	3
25+000	26+000	1	0	0	0	5
26+000	27+000	1	1	0	0	2
27+000	28+000	0	0	0	0	0
28+000	29+000	0	0	0	0	0
29+000	30+000	0	0	0	0	0
30+000	31+000	3	2	0	0	5
31+000	32+000	0	0	0	0	1
32+000	33+000	0	0	0	0	1
33+000	34+000	0	0	0	0	0
34+000	35+000	0	0	0	0	0
35+000	36+000	0	0	0	0	0
36+000	37+000	0	0	0	0	1
37+000	38+000	4	3	0	0	8
38+000	39+000	0	4	0	0	3
39+000	40+000	0	0	0	0	0
40+000	41+000	0	0	0	0	0
41+000	42+000	0	2	0	0	1
42+000	42+886	5	6	0	0	5
Total		**15**	**21**	**0**	**0**	**37**

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 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.

1.4 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 1.4: 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 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

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.Sl. No.	Stages	Activities Done
		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.

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

a. **Baseline Information:** Key attributes of the sub-project area, including socio-economic data, land, physiography, drainage, geology, hydrogeology, land use, flora, fauna, forest / vegetation cover, climate, hazards, and vulnerability, were collected through both primary and secondary data sources. Primary data were gathered along the project corridor and within the direct impact area 500 m from the proposed RoW for sensitive environmental features and 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 1.5: 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 (MSPCBhttps://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.CGWBData 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-

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Parameters	Secondary Source
	change-vulnerability-index-and-district-level-risk-assessment.pdf)
Biodiversity	**Primary survey** 1.Field observation 2.Vegetation assessment was conducted using Nested Quadrate method 4.Faunal assessment was conducted using Visual encounters, sign survey, line transect, and netting survey method 6.LULC analysis through ground truthing **Secondary Source** 1.Desktop study/secondary data collection - Govt. notified acts, peer review published scientific articles, Govt. reports, 2.Online open-source biodiversity databases such as Meghalaya Biodiversity Portal (https://megbiodiversity.nic.in/), PARIVESH Portal (MoEF&CC) (https://parivesh.nic.in/), Global Forest Watch (https://www.globalforestwatch.org/), IUCN Red List of Threatened Species(https://www.iucnredlist.org/) 3.Stakeholder consultation
Hazards and Vulnerability	**Primary survey** Field observation and Consultation with concerned departments and local community **Secondary Source** 1. District Disaster Management Plan for North Garo Hills, 2024 (https://northgarohills.gov.in/disaster-management/) 2. Meghalaya State Disaster Management Authority (MSDMA) (https://msdma.gov.in/)
Natural Environment	**Secondary Source** 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)

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Parameters	Secondary Source
	7. Statistical Handbook, Meghalaya 2023 (https://des.megplanning.gov.in/documents/SHB2023-as-on-02-05-24.pdf)
Climate	**Secondary Source** India Meteorological Department – Shillong Climatological Normals, (1991–2020) (https://dsp.imdpune.gov.in/home_normals.php#)
	Land and Livelihood Impact
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**

Parameters	Secondary Source
	Workforce Participation Rate as per Census 2011 (https://www.census2011.co.in/) National Family Heath 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)

1.5 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

CHAPTER	DESCRIPTION
	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 of 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 and DG set during construction stage	Consent to Establish before Construction and Consent to Operate (Before Operation) 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 labour camp	Consent to Establish before Construction and Consent to Operate (Before Operation) 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

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	Permission will be requiredby Contractor.	Village Council, Municipal Boards
8	Solid Waste management Rules, 2016 and amended thereof	To manage solid waste or semi-solid domestic waste, sanitary waste	Solid Waste will be generated from proposed activities due to influx of labour	Permission will be required Contractor needs to submit plan for reuse or safe disposal	Village Council, Municipal Boards
9	Vehicle Act 1988 Central Motor Vehicle Rules 1989	To minimize the road accidents, penalizing the guilty, provision of compensation to victim and family and check vehicular air and noise pollution.	Transportation of manpower and material will involve vehicular movement. Vehicles must have valid Pollution Under Control (PUC) certificates, Insurance, Fitness Certificate. Driver should have valid Driving License.	PUC and fitness certificates, Insurance. Driving License, Fitness Certificate	State Transport Authorities approved PUC certificate providers
10	The Gas Cylinder Rules 2016	To regulate the storage of gas / possession of gas cylinder more than the exempted quantity.	Gas cylinders may be used during welding and other electromechanical work. Storage within threshold quantity and as per capability analysis. Handling with defined safe practices	Yes, Permission will be required by the Contractor if the storage of gas / possession of gas cylinder is more than the exempted quantity(i.e more than 25 cylinders of total weight exceeding 200 kg for flammable non-toxic gases).	Petroleum and Explosives Safety Organization (PESO)

11	The Mines and Minerals (Development and Regulation) Act, 1957	For development and regulation of mines and minerals in a sustainable manner. The rules regulate the mining of mineral and dealerships for mining and trading.	The construction of works will require stones, aggregates, sand, earth, etc.	Mining Permit from regional mine office. The EC is also required for some minor minerals.	Mines and Mineral Department
12	The Forest (Conservation) Act, 1980 and Amendments and The Forest (conservation) Rules 1981 and Amendments	To help conserve the country's forests. It strictly restricts and regulates the de-reservation of forests or use of forest land for non-forest purposes without the prior approval of the Government. To this end the Act lays down the pre-requisites for the diversion of forest land for non-forest purposes	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 biological diversity.	Provisions of this act will not be applicable since road will not adversely affect any biological diversity	No	Meghalaya State Biodiversity Board
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, 2014	It seeks to establish the National Compensatory Afforestation Fund under the Public Account of India, and a State Compensatory Afforestation Fund under the Public Account of each state. The collected funds will be utilized for afforestation, regeneration of forest ecosystem, wildlife protection and infrastructure development.	No forest area diversion involved in the project. Approximately 20 trees are to be felled and shall be compensated (1:10) as per the Act.	No	State Forest Department
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. 20 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
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 underground or 1,000 liters aboveground in drums/tanks) requires license/approval.	License for storage from PESO (Petroleum and Explosives Safety Organization); NOC from District Authority/Fire Department.	PESO, Nagpur (through Regional Office) & District Magistrate/Chief Controller of Explosives.
29	Ground Water Regulation (Central Ground Water Authority – CGWA Guidelines, 2017, adopted by States)	Governs the extraction of groundwater for industrial, infrastructure, or commercial use. Requires NOC/permission prior to abstraction.	Applicable (if groundwater extraction proposed) Groundwater extraction for construction, camp use, or dust suppression requires prior permission.	NOC for groundwater abstraction.	CGWA or State Ground Water Authority (if notified).
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 concerned Irrigation Department/Water Resources Department, North Garo Hills District, Meghalaya.	Permission/Allocation order for surface water abstraction.	Water Resources/Irrigation 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
3	Notification Land Acquisition through Direct Purchase by way of negotiated settlements for all departments in the state of Meghalaya, March,2022	It recommends land purchase through negotiation (and mutual consent) as the best approach by paying the landowners an incentive of 25%, inclusive of R&R benefits on the compensation calculated as per the provisions of Section 26 to 30 and First Schedule of the RFCTLARR Act.	Direct Negotiated settlement can be faster method of land acquisition	No	MPWD, Revenue Department/ District Administration, Village Council

4	Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014 & Meghalaya Street Vendors (Protection of Livelihood and Regulation of Street Vending) Rules, 2016	It regulates street vending and protects the rights of street vendors by legalizing their right; protects them from sudden eviction or relocation; spells their rights and obligations.	Applicable to all Project road corridors in case of economic displacement and relocation of street vendors.	No	District Administration/ District Municipal Authority, Village Councils under the Autonomous District Councils
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 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	Applicable in designated tribal areas under the Sixth Schedule	No	Government of India, Autonomous District Councils
LABOUR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTION WORK					
1	Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996	It regulates the employment and conditions of service of building and other construction workers and provides for their safety, health and welfare.	Applicable for all building or other constructions works under the project that employs 10 or more workers.	Establishment Registration is required	Labour Commissioner, Meghalaya
2	Workmen Compensation Act, 1923	It provides for payment of compensation by employers to their employees for injury by accident i.e., personal 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
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 rules Meghalaya 1972	Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation, if an employee has completed 5 years of service with employer	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya
10	Employees Provident Fund and Miscellaneous Provision Act, 1952	Provides for monthly contributions by the employer and as well as by workers with a provision as return of pension of a lump sum (principal and interest 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 trade unions registered under the Act have been given certain immunities for civil and criminal liabilities.	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya

15	Schedule Caste and Schedule Tribe (Prevention of Atrocities Act 1989)	Atrocity with SC and ST community is defined as an offense punishable under Section 3 of the Act	Project Area is protected under Sixth Schedule of the Constitution	No	Social Welfare Department, Meghalaya
16	The Meghalaya Highways Act, 1972	Regulates road development and transport services in Meghalaya to ensure planned infrastructure, maintenance, and efficient transport operations while promoting safety.	Applicable to all road development and transport projects in Meghalaya	No	Government of Meghalaya, Public Works Department (PWD)
17	Meghalaya Right to Public Services Act, 2020	Ensures timely delivery of notified public services to citizens by government departments, enhancing transparency, accountability, and efficiency in governance.	Applicable to all government departments and public service providers in Meghalaya	No	Meghalaya State Public Services Delivery Commission (MSPSDC)

2.2 IRC AND MORTH CODES APPLICABLE TO THE PROJECT

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

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	*ESS1 outlines the Borrower's duties for evaluating, handling, and tracking environmental and social risks and impacts at each phase of a project* *Involves Preparation of ESA, ESIA, ESMF, RAP.*	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	*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.* *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.*	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	*ESS3 acknowledges that economic activity and urbanization contribute to pollution and*	Construction and Demolition activities and provision of	**Yes**	**ESIA/MPWD/Contractor/CSC**

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
Prevention and Management	*resource depletion, which can harm people, ecosystems, and the environment locally, regionally, and globally.* *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*	support facilities require waste and pollution management during construction and operations; prevention of risks due to chemicals and hazardous material use. Efficient use of raw material resources Energy, Air, Water, reuse of wastes and ensuring circularity etc. are important for overall sustainability.		
ESS 4 – Community Health and Safety	*ESS4 acknowledges that project activities, equipment, and infrastructure can heighten community exposure to risks and impacts.* *The major objective is to anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle.*	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	*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.*	Land acquisition might be required as part of the project for road expansion and it is necessary to prioritizethe protection of people's rights, ensuring a fair and transparent procedure. Respecting landowners'	**Yes**	**ESIA/DPR/MPWD /RP Implementation Agency**

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	Major objective is to avoid or minimize involuntary resettlement. Other objectives include avoiding forced evictions, mitigate unavoidable adverse social and economic impacts from land acquisition and improve the living conditions of vulnerable persons.	rights fosters community trust, reduces conflicts, and supports social equity. A rights-based approach guarantees that affected individuals are treated justly and project proceeds smoothly.		
ESS 6 – Biodiversity Conservation, and Sustainable Management of Living Natural Resources	*ESS6 acknowledges that safeguarding and conserving biodiversity, along with the sustainable management of living natural resources, are essential for achieving sustainable development.* *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.*	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	*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*	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	**Yes**	**ESIA/DPR/MPWD/CSC/Contractor**

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	participate in and benefit from development, while safeguarding their cultural identities and well-being *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.*	passes.		
ESS 8 – Cultural Heritage	*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.* *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.*	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	**Yes**	**ESIA/DPR/MPWD/Contractor/CSC**

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
		social acceptance of the project.		
ESS 9 – Financial Intermediaries	*ESS9 highlights the importance of strong domestic capital markets and access to finance for economic development, growth, and poverty reduction. The Bank is committed to supporting sustainable financial sector development and strengthening the role of domestic markets.* *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.*	ESS9 would not be specifically required because there are no third-party financial intermediaries involved.	**No**	
ESS 10 – Stakeholder Engagement and Information Disclosure	*ESS10 emphasizes the importance of open, transparent engagement between the borrower and project stakeholders as a key element of good practice.* *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.*	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: Land procurement mechanisms

Category	***Garos***
Basis of classification	Ownership of land
Type of land	2 types of ownership 4 sub-categories of ownership
Control and Management	The ancestral head Nokma (head of the clan) manages and allots land to the community. While the Maharis (clam members) look after A-jinma land.
Inheritance	Women inherit and own property: It is usually the youngest daughter who inherits the property.

Category	***Garos***
Records	Pattas 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 Nokmas 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	Pattas are instrumental in mortgaging land in the bank for loans. Selling of the land in the village required Nokmas 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 Nokna (heiress) is the owner of family property and has a say in 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 nokma of the village. For the clan land, the nokna (inheritress) along with her husband and the chras (brothers and maternal uncles) decides together. Any such transaction undertaken without prior consent of the wife (nokna) and her Chra is considered null and void (Marak, 1986).

3. PROJECT ROAD DESCRIPTION

3.1 Rongjeng - Mangsang Adokgre (RMA)

The Proposed road existed before the formation of Meghalaya state and ROW is limited only up to the existing Drain. The proposed RMA project road (Corridor 2) has a total length of 22 km, commencing from Rongjeng - Mangsang at chainage 23+000 and terminating at Adokgre at chainage 44+000

3.2 LOCATION DETAILS OF THE RMA ROAD

This stretch traverses a diverse landscape, including hilly terrains, agricultural lands, scrublands, built-up areas, and passes through 13 villages including habitations. The RMA 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 2 while **Figure 3.1** illustrates the road alignment map.

Table 3.1: Chainage wise RMA Road details

Sl. No.	Starting Chainage	End Chainage	Corridor No.	Project length as per DPR	Districts
1	23+000	44+000	2	22	East and North Garo Hills

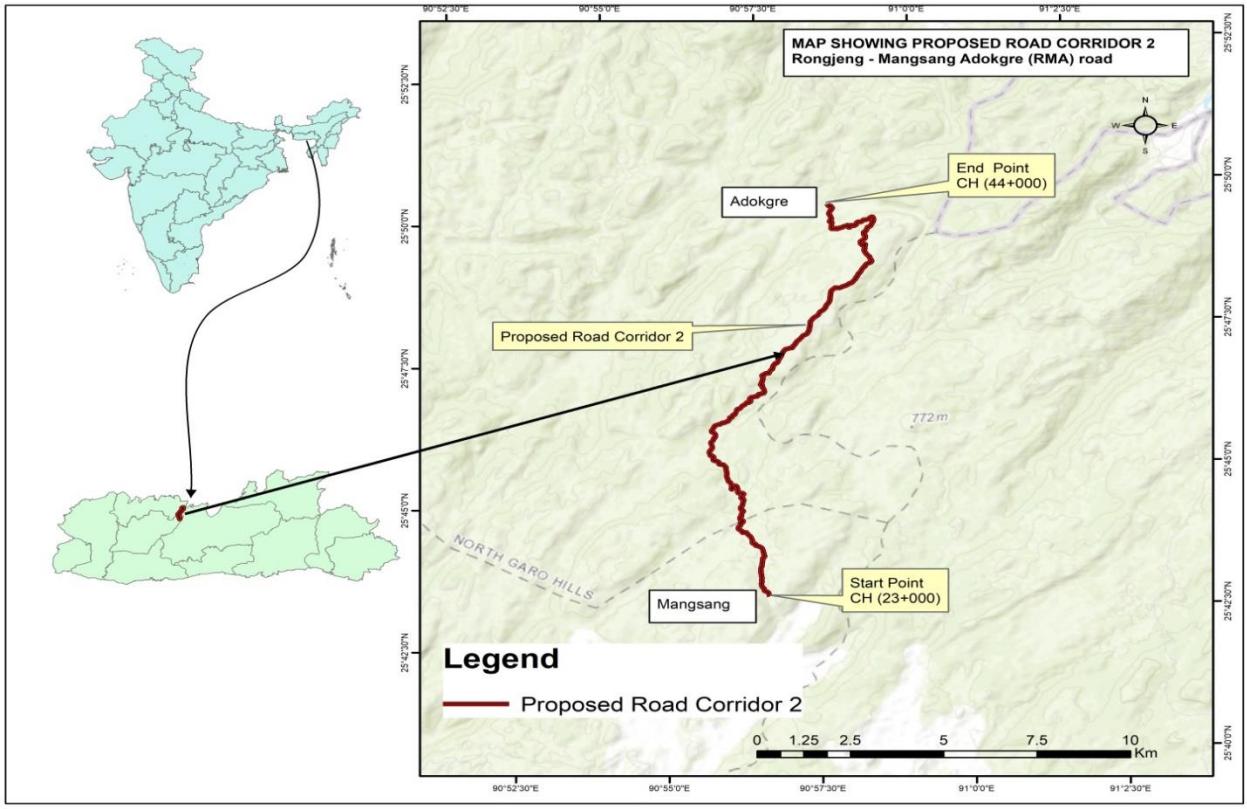


Figure 3.1: Road alignment map for RMA Road

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 impactof 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
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**.

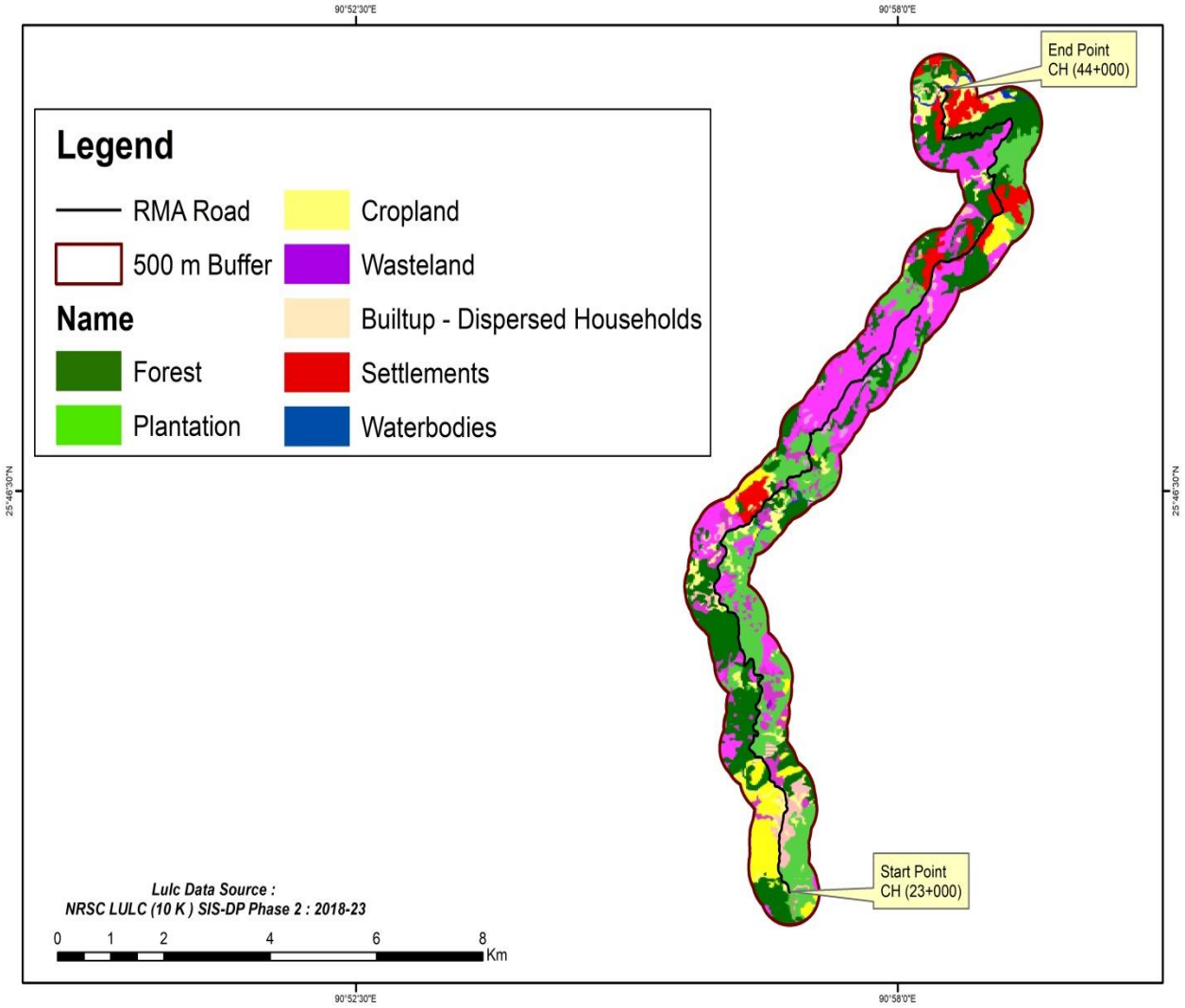


Figure 3.2: The LULC map of the direct impact area

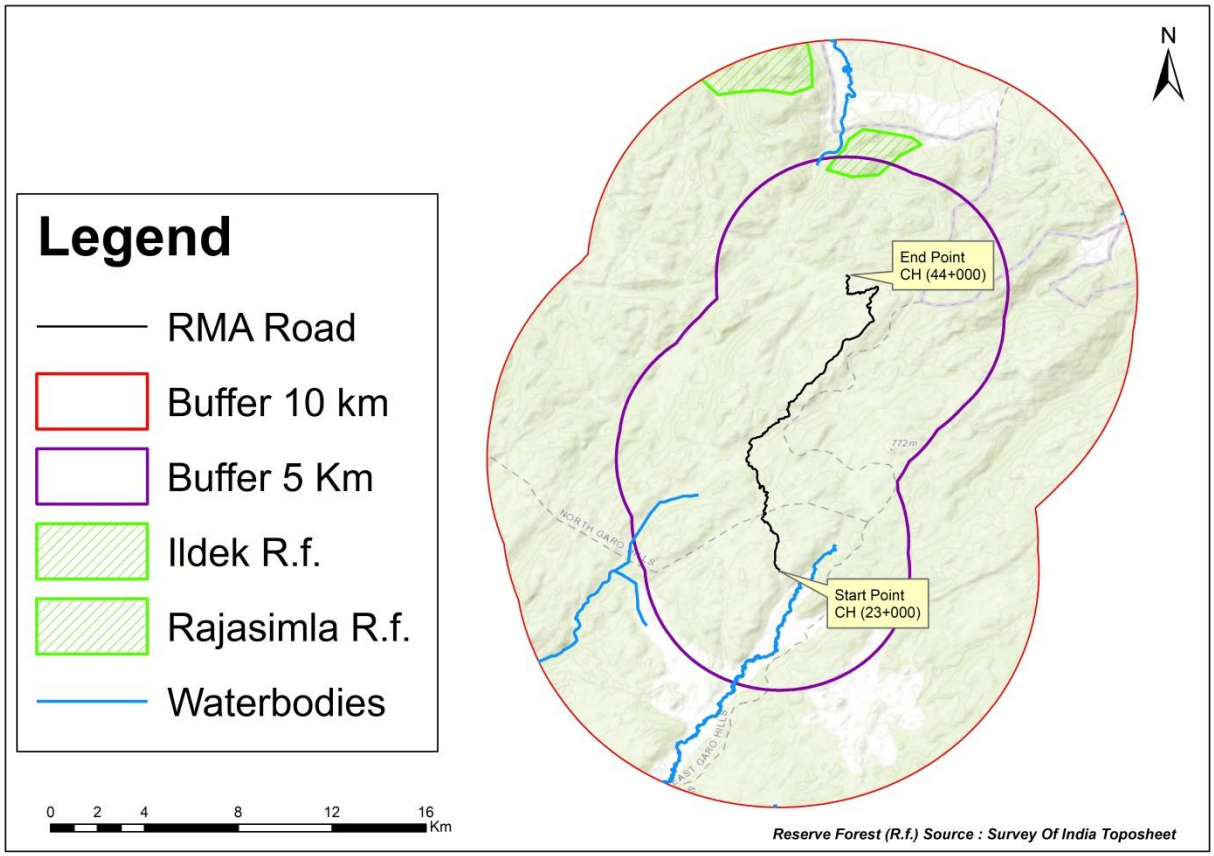


Figure 3.3: 10km Buffer area for project road

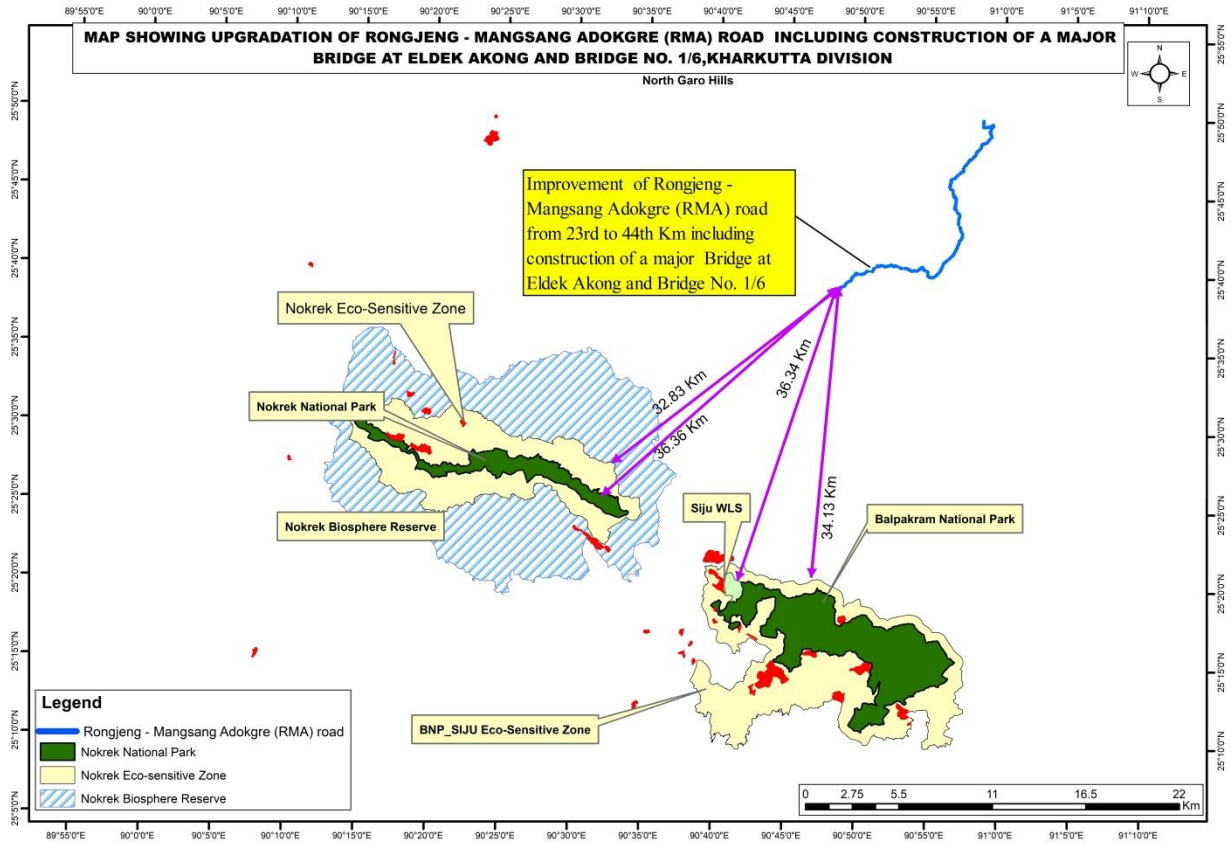


Figure 3.4: Map showing Environmental sensitivity of project road

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 RMA ROADS

The key existing conditions and proposed improvements for the RMA project roads 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 22 km sub-project road are summarized in **Table 3.2**. The existing road conditions are generally good, except potholes prevalent across some stretches. Inadequate drainage exacerbates deterioration during rainfall, making traffic movement difficult, particularly on earthen sections.

Table 3.2: Details of Existing Carriage way

Ch 5+100 to 6+800

Chainage		Terrain	Adjacent Landuse Pattern	Village / Town Name	Carriageway			Shoulder			Drainage (Lined / Earthen)
From	To	Plain Rolling Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
5+100	5+200	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
5+200	5+300	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
5+300	5+400	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
5+400	5+500	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
5+500	5+600	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
5+600	5+700	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
5+700	5+800	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
5+800	5+900	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
5+900	6+000	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
6+000	6+100	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
6+100	6+200	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
6+200	6+300	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
6+300	6+400	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
6+400	6+500	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
6+500	6+600	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
6+600	6+700	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
6+700	6+800	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen

Ch 6+800 to 8+500

Chainaqe		Terrain	Adjacent Landuse Pattern	Villaqe / Town Name	Carriaqeway			Shoulder			Drainaqe (Lined / Earthen)
From	To	Plain Rollinq Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
6+800	6+900	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
6+900	7+000	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
7+000	7+100	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
7+100	7+200	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
7+200	7+300	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
7+300	7+400	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
7+400	7+500	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
7+500	7+600	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
7+600	7+700	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
7+700	7+800	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
7+800	7+900	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
7+900	8+000	Hilly	Built-up	Rongbang	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
8+000	8+100	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
8+100	8+200	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
8+200	8+300	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
8+300	8+400	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
8+400	8+500	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen

Ch 8+500 to 10+200

Chainaqe		Terrain	Adjacent Landuse Pattern	Villaqe / Town Name	Carriaqeway			Shoulder			Drainaqe (Lined / Earthen)
From	To	Plain Rollinq Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
8+500	8+600	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
8+600	8+700	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
8+700	8+800	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
8+800	8+900	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
8+900	9+000	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
9+000	9+100	Hilly	Builtup	Diplokgittimg	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
9+100	9+200	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
9+200	9+300	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
9+300	9+400	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
9+400	9+500	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
9+500	9+600	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
9+600	9+700	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
9+700	9+800	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
9+800	9+900	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
9+900	10+000	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
10+000	10+100	Hilly	Builtup	Mitegittim	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
10+100	10+200	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen

Ch 10+200 to 11+900

Chainaqe		Terrain	Adjacent Landuse Pattern	Villaqe / Town Name	Carriaqeway			Shoulder			Drainaqe (Lined / Earthen)
From	To	Plain Rollinq Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
10+200	10+300	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
10+300	10+400	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
10+400	10+500	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
10+500	10+600	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
10+600	10+700	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
10+700	10+800	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
10+800	10+900	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
10+900	11+000	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
11+000	11+100	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
11+100	11+200	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
11+200	11+300	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
11+300	11+400	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
11+400	11+500	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
11+500	11+600	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
11+600	11+700	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
11+700	11+800	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
11+800	11+900	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen

Ch 11+900 to 13+600

Chainaqe		Terrain	Adjacent Landuse Pattern	Villaqe / Town Name	Carriaqeway			Shoulder			Drainaqe (Lined / Earthen)
From	To	Plain Rollinq Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
11+900	12+000	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
12+000	12+100	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
12+100	12+200	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
12+200	12+300	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
12+300	12+400	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
12+400	12+500	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
12+500	12+600	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
12+600	12+700	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
12+700	12+800	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
12+800	12+900	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
12+900	13+000	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
13+000	13+100	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
13+100	13+200	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
13+200	13+300	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
13+300	13+400	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
13+400	13+500	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
13+500	13+600	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen

Ch 13+600 to 15+300

Chainaqe		Terrain	Adjacent Landuse Pattern	Villaqe / Town Name	Carriaqeway			Shoulder			Drainaqe (Lined / Earthen)
From	To	Plain Rollinq Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
13+600	13+700	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
13+700	13+800	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
13+800	13+900	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
13+900	14+000	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
14+000	14+100	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
14+100	14+200	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
14+200	14+300	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
14+300	14+400	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
14+400	14+500	Hilly	Open	-	Bitumen	3.5	Fair	Earthen	1.00	Poor	Earthen
14+500	14+600	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
14+600	14+700	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
14+700	14+800	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
14+800	14+900	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
14+900	15+000	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
15+000	15+100	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
15+100	15+200	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
15+200	15+300	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen

Ch 15+300 to 17+000

Chainaqe		Terrain	Adjacent Landuse Pattern	Villaqe / Town Name	Carriaqeway			Shoulder			Drainaqe (Lined / Earthen)
From	To	Plain Rollinq Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
15+300	15+400	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
15+400	15+500	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
15+500	15+600	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
15+600	15+700	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
15+700	15+800	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
15+800	15+900	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
15+900	16+000	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
16+000	16+100	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
16+100	16+200	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
16+200	16+300	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
16+300	16+400	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
16+400	16+500	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
16+500	16+600	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
16+600	16+700	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
16+700	16+800	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
16+800	16+900	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
16+900	17+000	Hilly	Builtup	Mimilam Modepara	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen

Ch 17+000 to +18+700

Chainaqe		Terrain	Adjacent Landuse Pattern	Villaqe / Town Name	Carriaqeway			Shoulder			Drainaqe (Lined / Earthen)
From	To	Plain Rollinq Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
17+000	17+100	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
17+100	17+200	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
17+200	17+300	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
17+300	17+400	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
17+400	17+500	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
17+500	17+600	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
17+600	17+700	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
17+700	17+800	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
17+800	17+900	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
17+900	18+000	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
18+000	18+100	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
18+100	18+200	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
18+200	18+300	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
18+300	18+400	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
18+400	18+500	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
18+500	18+600	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
18+600	18+700	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen

Ch 18+700 to 20+400

Chainaqe		Terrain	Adjacent Landuse Pattern	Villaqe / Town Name	Carriaqeway			Shoulder			Drainaqe (Lined / Earthen)
From	To	Plain Rollinq Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
18+700	18+800	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
18+800	18+900	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
18+900	19+000	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
19+000	19+100	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
19+100	19+200	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
19+200	19+300	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
19+300	19+400	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
19+400	19+500	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
19+500	19+600	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
19+600	19+700	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
19+700	19+800	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
19+800	19+900	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
19+900	20+000	Hilly	Open	-	Gravel	5.5	Poor	Earthen	1.00	Poor	Earthen
20+000	20+100	Hilly	Built-up	Akong	Bitumen	3.5	Poor	Earthen	1.00	Poor	Earthen
20+100	20+200	Hilly	Built-up	Akong	Bitumen	3.5	Poor	Earthen	1.00	Poor	Earthen

20+200	20+300	Hilly	Built-up	Akong	Bitumen	3.5	Poor	Earthen	1.00	Poor	Earthen
20+300	20+400	Hilly	Built-up	Akong	Bitumen	3.5	Poor	Earthen	1.00	Poor	Earthen

Ch 20+400 to 20+980

Chainaqe		Terrain	Adjacent Landuse Pattern	Villaqe / Town Name	Carriaqeway			Shoulder			Drainaqe (Lined / Earthen)
From	To	Plain Rollinq Hilly			Surface Type	Width (m)	Condition	Type	Width (m)	Condition	
20+400	20+500	Hilly	Built-up	Akong	Bitumen	3.5	Poor	Earthen	1.00	Poor	Earthen
20+500	20+600	Hilly	Built-up	Akong	Bitumen	3.5	Poor	Earthen	1.00	Poor	Earthen
20+600	20+700	Hilly	Built-up	Akong	Bitumen	3.5	Poor	Earthen	1.00	Poor	Earthen
20+700	20+800	Hilly	Built-up	Akong	Bitumen	3.5	Poor	Earthen	1.00	Poor	Earthen
20+800	20+900	Hilly	Built-up	Akong	Bitumen	3.5	Poor	Earthen	1.00	Poor	Earthen
20+900	20+980	Hilly	Built-up	Akong	Bitumen	3.5	Poor	Earthen	1.00	Poor	Earthen

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.

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 RMA Road Section

S.No	Chainage	Type	Side	Direction	Type of Junction
1.	1+900	Y	LHS	Village	Minor
2.	2+000	T	LHS	Village	Minor
3.	2+200	T	LHS	Village	Minor
4.	2+300	Y	RHS	Village	Minor
5.	2+750	T	RHS	Village	Minor
6.	2+870	Y	LHS	Mogru	Minor
7.	3+150	Y	RHS	Gandilgittim	Minor
8.	3+425	T	RHS	Village	Minor
9.	7+950	T	LHS	Village	Minor
10.	8+020	Y	LHS	Mangsang - Rajasimla Rd	Minor
11.	8+700	T	RHS	Village	Minor
12.	10+000	T	LHS	Dokongsi	Minor
13.	14+700	Y	RHS	Village	Minor
14.	15+225	Y	LHS	Village	Minor
15.	15+325	Y	LHS	Village	Minor
16.	16+300	Y	LHS	Village	Minor
17.	16+550	Y	LHS	Village	Minor
18.	16+700	Y	RHS	Memilam	Minor
19.	20+850	T	LHS	Village	Minor

Table 3.4: Details of Existing Minor Bridge

S. No.	Chainage	Span Arrangement (m)	Carriageway Width (m)	Structure	Retain / Replace	Remark
1.	3+400	1x11	7.50	RCC	Retain	Fair
2.	5+270	1x25.65	7.50	RCC	Retain	Fair
3.	9+250	1x12.85	7.50	RCC	Retain	Fair

Table 3.5: Details of Proposed Minor Bridge

S. No.	Chainage	Span Arrangement (m)	Carriageway Width (m)	Structure	Retain / Replace	Remark
1.	2+540	1x7	4.20	RCC	Reconstruction	Single lane structure
2.	1+320	1x12.7	4.20	RCC	Reconstruction	Single lane structure
3.	6+920	1x12.8	4.20	RCC	Reconstruction	Single lane MNB
4.	8+050	1x12	4.20	RCC	Reconstruction	Single lane

						MNB

Table 3.6: Details of Proposed Major Bridge

S. No.	Chainage	Span Arrangement (m	Carriageway Width (m)	Total Length (m)	Structure	Retain / Replace	Remark
1.	20+300	11x1	7.50	16.50	Pipe	Re-construction	Poor

Table 3.7: Details of Pipe Culverts

Sl. No.	Design Chainage	Span Arrangement (m)	Structure Type	Carriageway Width (m)	Retain / Replace
1	0+020	1x1.0	Pipe culvert	5.50	Retain
2	0+300	1x1.0	Pipe culvert	5.50	Retain
3	0+760	1x1.0	Pipe culvert	5.50	Retain
4	0+800	1x1.0	Pipe culvert	5.50	Retain
5	1+050	1x1.0	Pipe culvert	5.50	Retain
6	1+300	1x1.0	Pipe culvert	5.50	Retain
7	1+850	1x1.0	Pipe culvert	5.50	Retain
8	2+250	1x1.0	Pipe culvert	5.50	Retain
9	2+340	1x1.0	Pipe culvert	5.50	Retain
10	2+900	1x1.0	Pipe culvert	5.50	Retain
11	3+200	1x1.0	Pipe culvert	5.50	Retain
12	3+310	1x1.0	Pipe culvert	5.50	Retain
13	5+650	1x1.0	Pipe culvert	5.50	Retain
14	6+320	2x1.0	Pipe culvert	5.50	Retain
15	7+350	1x1.0	Pipe culvert	5.50	Retain
16	8+500	1x1.0	Pipe culvert	5.50	Retain
17	8+600	1x1.0	Pipe culvert	5.50	Retain
18	8+720	2x1.0	Pipe culvert	5.50	Retain
19	8+830	1x1.0	Pipe culvert	5.50	Retain
20	8+900	1x1.0	Pipe culvert	5.50	Retain
21	9+020	1x1.0	Pipe culvert	5.50	Retain
22	9+050	1x1.0	Pipe culvert	5.50	Retain
23	9+300	1x1.0	Pipe culvert	5.50	Retain
24	9+700	1x1.0	Pipe culvert	3.50	Retain
25	9+800	1x1.0	Pipe culvert	3.50	Retain
26	10+100	1x1.0	Pipe culvert	3.50	Retain
27	10+220	1x1.0	Pipe culvert	3.50	Retain
28	10+300	1x1.0	Pipe culvert	3.50	Retain
29	10+400	1x1.0	Pipe culvert	3.50	Retain
30	10+500	1x1.0	Pipe culvert	3.50	Retain
31	10+600	1x1.0	Pipe culvert	3.50	Retain
32	10+700	1x1.0	Pipe culvert	3.50	Retain
33	11+000	2x1.0	Pipe culvert	3.50	Retain
34	11+050	1x1.0	Pipe culvert	3.50	Retain
35	11+200	1x1.0	Pipe culvert	3.50	Retain
36	11+430	1x1.0	Pipe culvert	3.50	Retain

37	11+560	1x1.0	Pipe culvert	3.50	Retain
38	11+900	1x1.0	Pipe culvert	3.50	Retain
39	12+020	1x1.0	Pipe culvert	3.50	Retain
40	12+230	1x1.0	Pipe culvert	3.50	Retain
41	12+620	1x1.0	Pipe culvert	3.50	Retain
42	12+700	1x1.0	Pipe culvert	3.50	Retain
43	12+900	1x1.0	Pipe culvert	3.50	Retain
44	12+970	1x1.0	Pipe culvert	3.50	Retain
45	13+100	1x1.0	Pipe culvert	3.50	Retain
46	14+030	2x1.0	Pipe culvert	3.50	Retain
47	14+550	1x1.0	Pipe culvert	5.50	Retain
48	14+600	1x1.0	Pipe culvert	5.50	Retain
49	14+760	1x1.0	Pipe culvert	5.50	Retain
50	15+000	1x1.0	Pipe culvert	5.50	Retain
51	15+400	1.00	Pipe culvert	5.50	Retain
52	15+600	1.00	Pipe culvert	5.50	Retain
53	16+100	1.00	Pipe culvert	5.50	Retain
54	16+200	1.00	Pipe culvert	5.50	Retain
55	16+430	1.00	Pipe culvert	5.50	Retain
56	16+500	1.00	Pipe culvert	5.50	Retain
57	16+600	1.00	Pipe culvert	5.50	Retain
58	16+700	1.00	Pipe culvert	5.50	Retain
59	16+900	1.00	Pipe culvert	5.50	Retain
60	17+100	1.00	Pipe culvert	5.50	Retain
61	17+170	1x1.0	Pipe culvert	5.50	Retain
62	17+600	1x1.0	Pipe culvert	5.50	Retain
63	17+700	1x1.0	Pipe culvert	5.50	Retain
64	17+800	1x1.0	Pipe culvert	5.50	Retain
65	18+600	1x1.0	Pipe culvert	5.50	Retain
66	18+800	1x1.0	Pipe culvert	5.50	Retain
67	19+000	1x1.0	Pipe culvert	5.50	Retain
68	19+180	1x1.0	Pipe culvert	5.50	Retain

Table 3.8: Details of Existing Box Culverts

S. No.	Chainage	Span Arrangement (m)	Total Length (m)	Carriageway Width (m)	Remark	Retain / Replace
1.	1+750	1x1.5	1.50	5.50	Fair	Retain
2.	1+970	1x2.0	2.00	5.50	Fair	Retain
3.	3+800	1x2.0	2.00	5.50	Fair	Retain
4.	4+050	1x2.0	2.00	5.50	Fair	Retain
5.	4+430	1x2.0	2.00	5.50	Fair	Retain
6.	5+100	1x2.0	2.00	5.50	Fair	Retain
7.	5+700	1x1.25	1.25	5.50	Fair	Retain
8.	5+800	1x1.25	1.25	5.50	Fair	Retain
9.	6+420	1x3	3.00	5.50	Fair	Retain
10.	6+520	1x2	2.00	5.50	Fair	Retain
11.	7+050	1x2.0	2.00	5.50	Fair	Retain
12.	8+100	1x1.25	1.25	5.50	Fair	Retain

Table 3.9:Details of Proposed Box Culverts

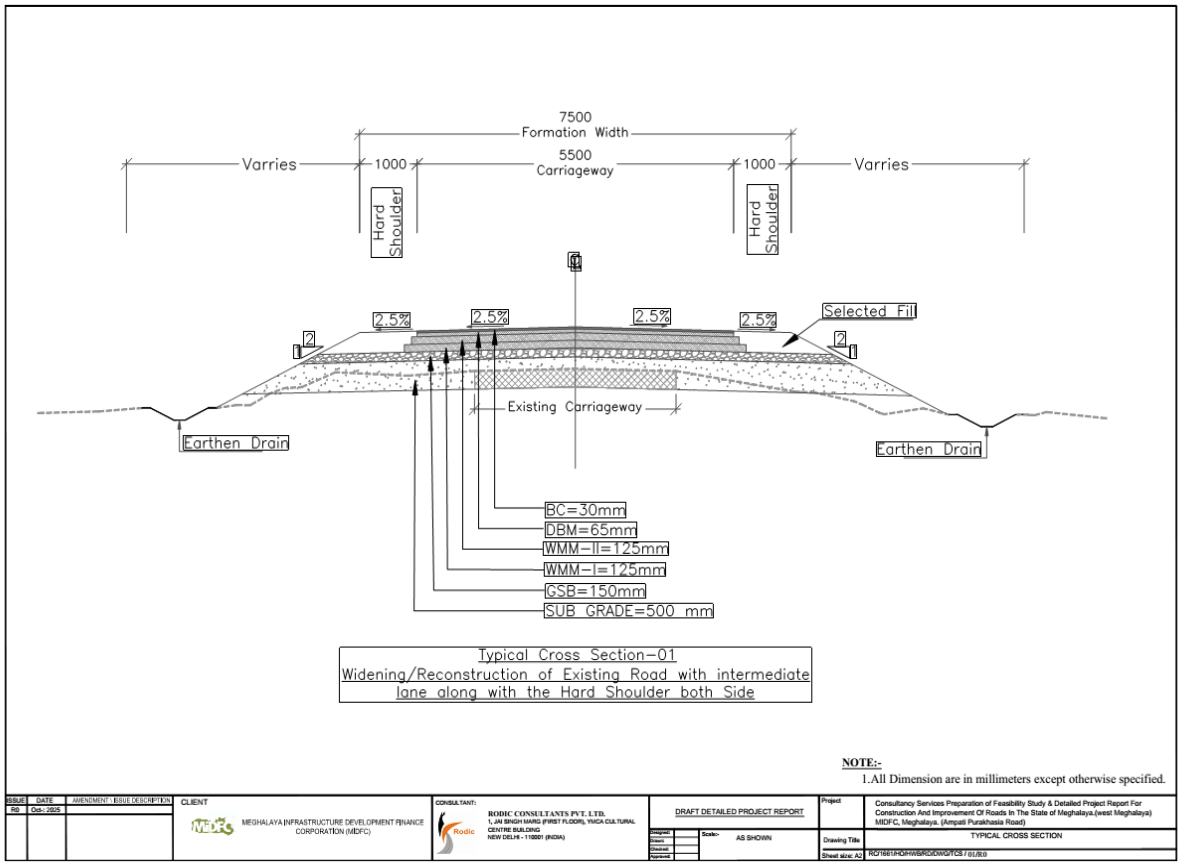
S. No.	Chainage	Span Arrangement (m)	Total Length (m)	Carriageway Width (m)	Remark	Retain / Replace
1.	2+000	1x5.45	5.45	4.20	Single lane structure	Reconstruction
2.	3+070	1x3	5.45	4.20	Poor	Reconstruction
3.	8+200	1x3.0	5.00	5.70	Poor	Reconstruction
4.	16+620	1x5.0	5.00	5.70	Poor	Reconstruction

3.4.2 PROPOSED ROAD CROSS SECTIONS

A total of Twenty Three Typical Cross-Sections (TCS) have been proposed in the DPR (**Annexure 3.1**) for the 22 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 5 different cross-sections, along with the chainage-wise designs adopted, are provided in **Annexure 3.1**. Design details are given in **Figure 3.5**.



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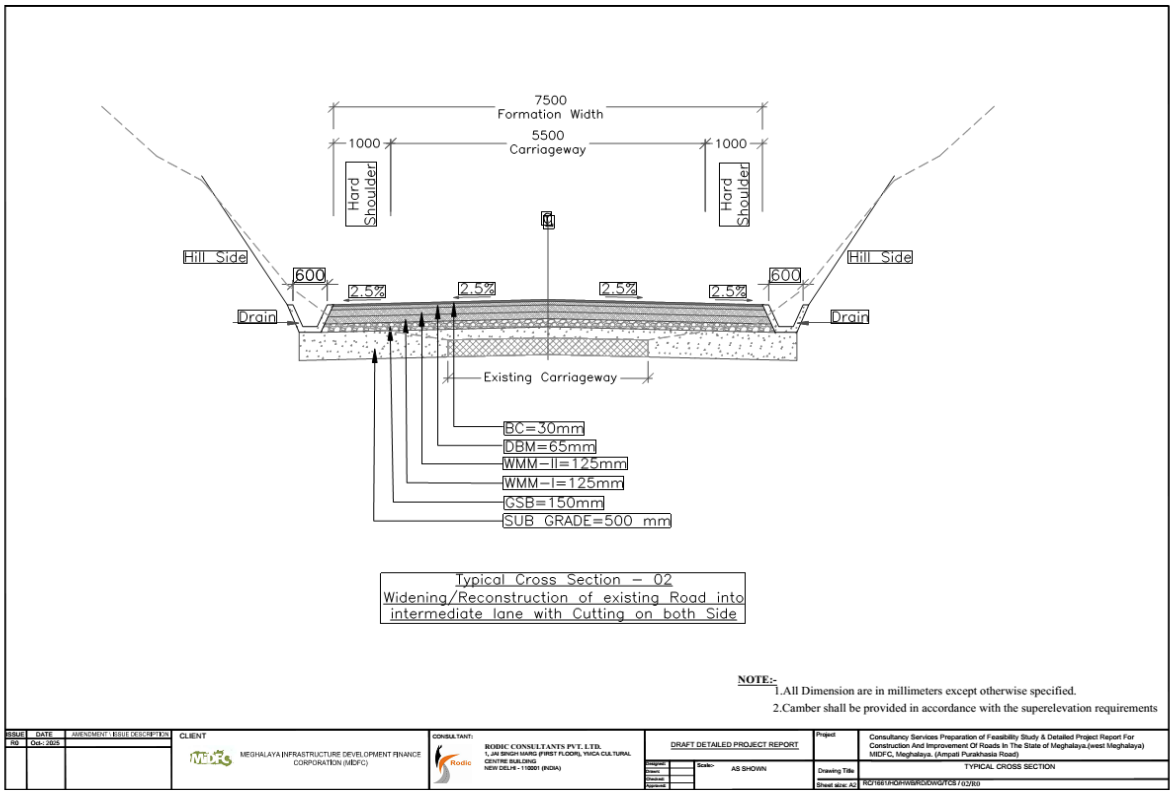

Typical Cross Section – 02
Widening/Reconstruction of existing Road into intermediate lane with Cutting on both Side

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

ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION
R0	Oct.- 2025	

CLIENT: MEGHALAYA INFRASTRUCTURE DEVELOPMENT FINANCE CORPORATION (MIDFC)

CONSULTANT: RODIC CONSULTANTS PVT. LTD. 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)

DRAFT DETAILED PROJECT REPORT

Scale:- AS SHOWN

Project: Consultancy Services Preparation of Feasibility Study & Detailed Project Report For Construction And Improvement Of Roads In The State of Meghalaya.(west Meghalaya) MIDFC, Meghalaya. (Ampati Purakhasia Road)

Drawing Title: TYPICAL CROSS SECTION

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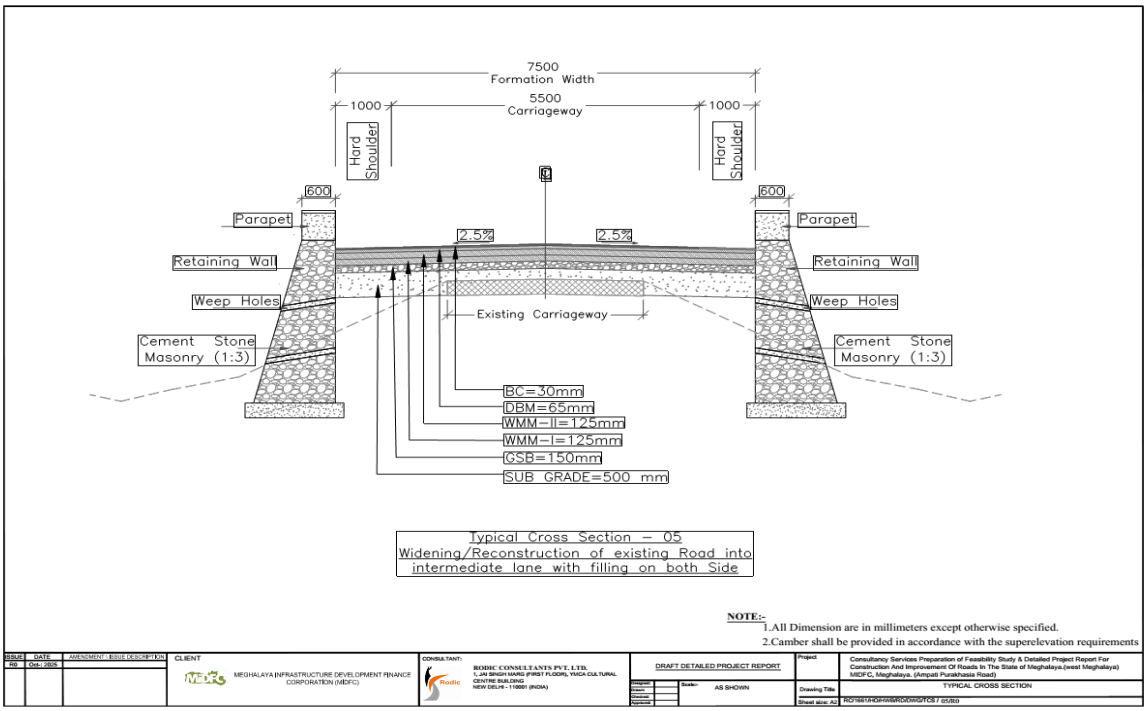

Typical Cross Section – 05
Widening/Reconstruction of existing Road into intermediate lane with filling on both Side

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

ISSUE	DATE	AMENDMENT / ISSUE DESCRIPTION
R0	Oct.- 2025	

CLIENT: MEGHALAYA INFRASTRUCTURE DEVELOPMENT FINANCE CORPORATION (MIDFC)

CONSULTANT: RODIC CONSULTANTS PVT. LTD. 1, JAI SINGH MARG (FIRST FLOOR), YMCA CULTURAL CENTRE BUILDING NEW DELHI - 110001 (INDIA)

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Drawing Title: TYPICAL CROSS SECTION

Sheet size: A2

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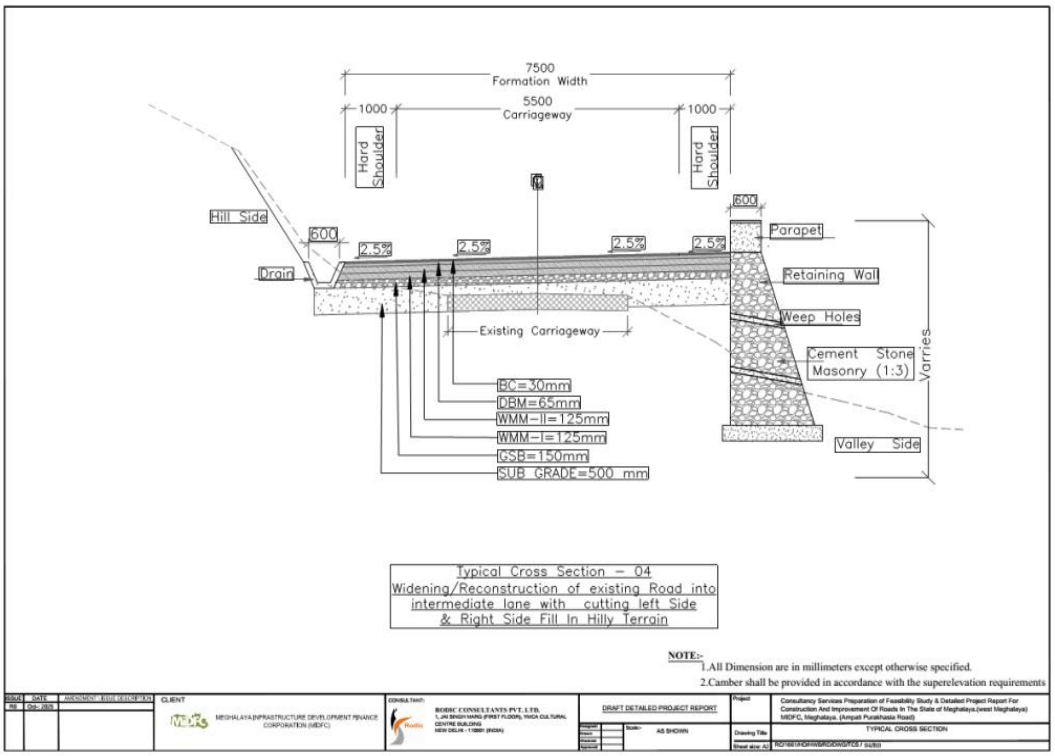


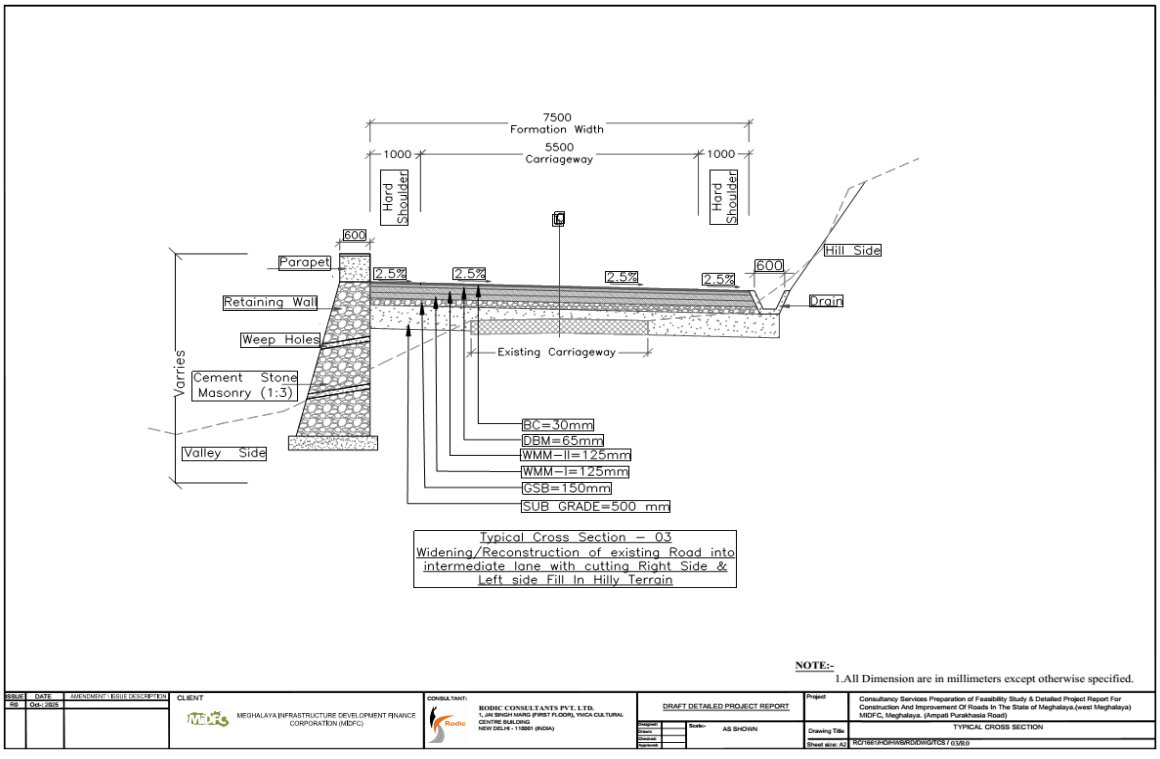


Figure 3.5: Typical Cross Sections

3.4.3 SETTLEMENTS AND CORRIDOR CHARACTERISTICS

3.4.3.1 Settlements:

The RMA Road passes through hilly terrain, rural settlements and towns. The details of the settlements along the stretch are presented in **Table 3.10** below.

Table 3.10: Chainage wise List of villages & towns along the project road

Sl. No.	Chainage		Settlements
1	22+000	23+000	Masang Imtra Gittim (Imtra-Apal (Mangsang Imtra-Gittim)
2	23+000	23+500	Ronga Apal (Agal)
3	23+500	26+000	Nengkram
4	26+000	27+500	Rongchong
5	27+500	28+200	Nongkongkil
6	28+200	28+500	Gandil gittim (Gandilgittim)
7	28+500	29+500	Rema Gittim (Remagittim)
8	29+500	31+000	Gajil gittim (Jajilgittim)
9	35+300	36+200	Mite gittim (Mittegittim)
10	36+200	38+000	Memillam Modipara (Mawdipara)
11	40+500	41+500	Memillam
12	41+500	43+000	Tingba
13	43+000	44+000	Ildek Akong

3.4.3.2 Corridor Characteristics

The salient features of the RMA road are summarized in **Table 3.11** below

Table 3.11.: Salient features of the RMA Road

Sl. No.	Characteristics	Features
1	Name of Road	Rongjeng Mangsang Adokgre (RMA) Road (22 KM)
2	Project road corridor road Length	22 km (including approaches of Bridge)
3	District	East Garo Hills and North Garo Hills
4	Villages/settlements enroute	13 villages
5	Terrain	Plain/Hilly/Rural
	Existing	The road is affected by various surface damages, including potholes, cracks, and other deterioration
6	Proposed treatment	Brownfield Improvement of sharp curves within the RoW, reconstruction of weak and damaged/ new culverts and bridges, rehabilitation and strengthening of existing pavement to intermediate lane and protection works.
7	Bridges	No. of Major Bridge – 1 No. of Minor Bridges - 7
8	Culverts	84

Sl. No.	Characteristics	Features
9	Forests / environmentally sensitive areas	Along the project road, the vegetation includes a diverse mix of trees, shrubs, herbs, climber, fern and grasses. A total 20 trees are coming on proposed ROW. No. of trees within toe line are 18 trees on the left-hand side (LHS) and 43 on RHS. However, approximately 20 trees may be impacted / likely to be cut due to the proposed activities under this project. **Species recorded from Primary Survey:** **Trees**: Jackfruit, Arecanut, Bamboo, Banana **Shrubs**: Lantana Eupatorium, Hibiscus, Clerodendrum. In moist patches, ferns and thickets of Ardisia and Strobilanthes. **Herbs/Grasses:** Cynodon, Mint, Wild Ginger, Turmeric, Centella, Broom grass.
10	Religious Structures Affected	Nil
	Impacted Structures (including Temporary Structures of NTHs)	5
11	Fifth/Sixth Scheduled Areas	Sixth Schedule Area
12	River crossings	Proposed road is crossing the river
13	Water bodies / ponds	Ildek river
14	Sensitive receptors	2 School, 1 community hall, 1 post office, at More than 20m from center line of black top, Not impacted, only at the time of construction provision of barricade and speed reduction measures will be taken.
15	Transshipment areas/truck parking locations	-
17	Other features / issues if any	-

3.4.4 TREES

The vegetation along the project road comprises a diverse mix of trees, shrubs, herbs, climbers, ferns, and grasses. However Approximately 20 trees are likely to be impacted or require removal due to the proposed widening and improvement. Major trees impacted are Jackfruit, Arecanut, Bamboo, and Banana, etc.

Table 3.12: Chainage wise list of Trees

S. No.	Chainage (km)	Common Name	Botanical Name	Girth at Breast Height (cm)	Approx. Height (m)	Remarks
1	23+000-24+000	Bamboo (Clump)	Bambusa vulgaris	25	8	Dense clump near roadside
2	23+000-24+000	Arecanut Palm	Areca catechu	35	9	Part of farm boundary
3	24+000-25+000	Jackfruit	Artocarpus heterophyllus	80	12	Mature fruit-bearing tree

4	25+000-26+000	Jackfruit	Artocarpus heterophyllus	80	12	Mature fruit-bearing tree
5	25+000-26+000	Guava	Psidium guajava	45	6	Homestead planting
6	25+000-26+000	Mango	Mangifera indica	90	14	Large fruit-bearing tree
7	26+000-27+000	Neem	Azadirachta indica	80	10	Common near habitation area
8	26+000-27+000	Neem	Azadirachta indica	80	10	Common near habitation area
9	26+000-27+000	Neem	Azadirachta indica	80	10	Common near habitation area
10	26+000-27+000	Neem	Azadirachta indica	80	10	Common near habitation area
11	27+000-28+000	Mango	Mangifera indica	90	14	Large fruit-bearing tree
12	27+000-28+000	Mango	Mangifera indica	90	14	Large fruit-bearing tree
13	27+000-28+000	Mango	Mangifera indica	90	14	Large fruit-bearing tree
14	28+000-29+000	Jackfruit	Artocarpus heterophyllus	77	11	Mature fruit-bearing tree
15	28+000-29+000	Jackfruit	Artocarpus heterophyllus	82	10	Mature fruit-bearing tree
16	29+000-30+000	Sal	Shorea robusta	85	15	Native forest species near roadside
17	29+000-30+000	Sal	Shorea robusta	85	15	Native forest species near roadside
18	30+000-31+000	Neem	Azadirachta indica	80	10	Common near habitation area
19	30+000-31+000	Neem	Azadirachta indica	80	10	Common near habitation area
20	30+000-31+000	Peepal	Ficus religiosa	120	15	Large sacred tree near temple

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 East and North Garo Hills, Meghalaya, encounters significant challenges due to its rugged terrain, characterized by high hills and deep valleys. The topographic profile of the Rongjeng – Mangsang Adokgre (RMA) Road indicates a gently undulating to moderately rolling terrain, with elevation ranging between 212 m and 932 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 22 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 3.13** below.

Table 3.13 Slope protection works

Chainage	Existing Angle of Repose (°)	Height of Cut (m	Modified Angle of Repose (°)	Slope Protection work proposed
23+140 to 42+825	18°	12	26.6°	Nailing/Anchoring+Shortcrete, Turfing, Gabian Wall, Toe Wall, RE/RS Wall with Facia

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 East and North Garo Hills has come into existence in the year 2012 only. And as such many of the governmental establishments are not located or established in the district. The pace of growth is also very slow. The mining activity is negligible in the district which is mostly for sand and for local consumption only.

Details of construction material required for this project, their Source and Lead are given in **Table 3.14.**

Table 3.14: 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	590854.96	Local Area	10
	Surplus cut (to be disposed / reused)	m^3	4,23,553.52 (surplus from cut)	MPWD-designated disposal sites	as per site
2	Sand	m^3	91325	Nearest River RMA	1
4	Aggregate (coarse aggregate)	m^3	219862	Nearest River RMA	1
5	Bitumen	MT	1431	Guwahati IOCL Refinery	166
6	Emulsion	MT	116	Haldia to Site	1,027
7	TMT Bars	MT	263	Shillong (SAIL)	163
8	Cement	MT	51163	Guwahati Cement Plant	166
9	Water	KL	93,306.407	Ildek	-

(Source: DPR)

Assessing the availability of suitable construction materials near the project road is crucial for a road project. Surface water from the Ildek river can be used for road construction with prior permission from the concerned Irrigation Department, North Garo Hills District, Meghalaya.

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 5,90,854.96m³, and the cut quantity is 10,14,408.48m³. After balancing cut and fill requirements, there remains a surplus of approximately 4,23,553.52 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

31.0001138 ha land is required for the road project, as most of the construction will be carried out entirely within the existing Right of Way (RoW) varies from 7.5 to 14.5 m. A total of 31.0001138 ha land may be required for the proposed road construction, with the land primarily belonging to MPWD and the Community. MPWD will obtain the required land through voluntary donation if required from the Village Council. This approach was also discussed with the Village Community Council head and local villagers during the FPIC meetings. Land requirement details are given in **Table 3.15**.

Table 3.15: Land Requirement Details

LAND REQUIREMENT DETAILS							
Road (RMA)							
S.N	Chainages		Area (In Sq. Mtr.)		Type of Land (Govt./Pvt)	Road width (Dimension in mtr.) PROW	Remarks
	From	To	LHS	RHS			
1	23000	23200	2189.836	1246.751	Pvt.	29	
2	23200	23400	4607.367	2083.77	(Govt.+Pvt)	42	
3	23400	23600	2130.388	5357.408	Pvt.	52	
4	23600	23800	2527.722	5220.034	Pvt.	50	
5	23800	24000	1350.312	2590.307	Pvt.	38	
6	24000	24200	688.538	1624.978	(Govt.+Pvt)	25	
7	24200	24400	1116.003	1337.729	Pvt.	20	At Ch-24+300 Drain
8	24400	24600	1867.89	884.261	Pvt.	23	
9	24600	24800	1591.007	678.847	Pvt.	21	
10	24800	25000	1305.422	760.889	Pvt.	23	At Ch-25+000 Drain
11	25000	25200	862.159	1742.331	Pvt.	22	
12	25200	25400	626.317	944.527	Pvt.	16	
13	25400	25600	633.408	1743.896	Pvt.	21	At Ch-25+525 Drain

14	25600	25800	484.634	1945.289	Pvt.	24	
15	25800	26000	2036.499	797.985	Pvt.	27	
16	26000	26200	2039.496	797.828	Pvt.	33	
17	26200	26400	973.88	1343.756	Pvt.	25	
18	26400	26600	866.196	1764.062	Pvt.	25	At Ch-26+400 Drain
19	26600	26800	846.354	2161.856	Pvt.	25	
20	26800	27000	1268.883	2472.783	Pvt.	32	
21	27000	27200	786.806	1968.633	Pvt.	25	
22	27200	27400	798.192	2387.933	Pvt.	26	
23	27400	27600	719.443	2127.801	Pvt.	25	
24	27600	27800	891.588	2677.58	Pvt.	33	
25	27800	28000	574.65	2635.744	Pvt.	30	
26	28000	28200	1824.878	1880.423	Pvt.	35	
27	28200	28400	2367.511	1197.946	Pvt.	41	At Ch-28+200 Drain
28	28400	28600	2487.96	683.848	Pvt.	29	
29	28600	28800	1389.36	865.64	Pvt.	29	
30	28800	29000	2191.876	849.789	Pvt.	26	
31	29000	29200	1238.314	1055.757	Pvt.	21	
32	29200	29400	1977.363	837.009	Pvt.	27	
33	29400	29600	1851.272	742.254	Pvt.	24	
34	29600	29800	2336.721	825.206	Pvt.	28	
35	29800	30000	789.828	1416.242	Pvt.	23	
36	30000	30200	1175.703	677.224	Pvt.	17	
37	30200	30400	1182.114	1460.927	Pvt.	24	
38	30400	30600	788.703	773.489	Pvt.	19	
39	30600	30800	686.675	899.801	Pvt.	17	
40	30800	31000	732.199	1306.709	Pvt.	22	
41	31000	31200	1486.001	572.98	Pvt.	22	At Ch-31+000 Drain
42	31200	31400	3037.158	652.72	Pvt.	28	
43	31400	31600	1313.135	1225.832	Pvt.	22	
44	31600	31800	1756.684	1062.913	Pvt.	19	
45	31800	32000	1576.969	1126.781		20	
46	32000	32200	1483.303	1279.968		25	
47	32200	32400	2845.905	1849.654		40	At Ch-32+200 Drain
48	32400	32600	2452.4	2170.267		34	
49	32600	32800	2616.414	3330.189		45	
50	32800	33000	2608.611	4068.659		47	
51	33000	33200	1507.621	3323.031		43	
52	33200	33400	2946.717	1726.072		32	
53	33400	33600	2454.684	909.616		26	
54	33600	33800	4893.664	1354.182		43	
55	33800	34000	3996.626	3559.418		43	
56	34000	34200	1630.55	2220.571		33	
57	34200	34400	1398.663	1126.176		19	

58	34400	34600	1221.277	1222.266		20	
59	34600	34800	1421.6	1661.858		24	
60	34800	35000	1733.826	1418.474		24	
61	35000	35200	1337.025	1139.993		21	
62	35200	35400	1277.374	1009.957		15	
63	35400	35600	1035.859	951.445		14	
64	35600	35800	1104.498	1015.054		14	
65	35800	36000	1026.737	1330.186		16	
66	36000	36200	1219.415	974.18		15	
67	36200	36400	1152.698	1094.673		17	
68	36400	36600	1061.367	978.809		15	
69	36600	36800	1096.331	1086.429		19	
70	36800	37000	996.694	873.801		14	
71	37000	37200	874.193	771.332		15	
72	37200	37400	893.022	801.176		14	
73	37400	37600	888.885	924.116		15	
74	37600	37800	1032.191	1138.957		17	
75	37800	38000	1667.311	1514.721		19	
76	38000	38200	1243.48	1149.627		16	
77	38200	38400	922.708	873.638		21	
78	38400	38600	1814.065	1116.559		19	
79	38600	38800	1281.747	1149.571		20	
80	38800	39000	1206.209	1402.632		20	
81	39000	39200	944.43	1272.548		22	
82	39200	39400	1628.208	1510.621		23	
83	39400	39600	1490.233	1276.022		15	
84	39600	39800	1122.905	1117.894		22	
85	39800	40000	1410.25	1449.03		23	
86	40000	40200	1846.204	1328.727		27	
87	40200	40400	2829.705	1291.84		21	
88	40400	40600	1536.202	979.995		31	
89	40600	40800	2599.565	1653.868		38	
90	40800	41000	3960.496	1154.84		37	
91	41000	41200	3702.609	1022.711		33	
92	41200	41400	3155.643	1075.201		25	
93	41400	41600	1712.148	1040.993		26	
94	41600	41800	2297.625	988.612		20	
95	41800	42000	1489.222	1246.726		27	
96	42000	42200	2291.164	973.556		31	
97	42200	42400	3146.644	887.089		40	
98	42400	42600	1387.8	1502.816		24	
99	42600	42800	993.163	1430.203		22	

100	42800	42886	404.967	603.854		17	
Total Area in Sq Mtr.			**164266.267**	**145734.871**			
Area in Hectare			**16.4266267**	**14.5734871**	**Total Area in Hectare**		**31.0001138**

3.8 WATER REQUIREMENTS

The overall water requirement of the project is 66 KLD, of which 60 KLD will be used for construction activities and 6 KLD is required for domestic purposes. Details of the water requirement is given in **Table 3.16**.

Table 3.16: Water Requirement for Construction Works

Activity	Daily Demand (Liters/km)	Total for 22 km (Liters/day)	Remarks
Permanent Works	800 – 1000	19800	Concrete mixing, compaction, culverts, drains.
Dust Suppression at Work Zone	300 – 500	8800	Reduced due to frequent rain; use only on dry days.
Curing	300 – 500	8800	Rainfall may assist, but controlled curing still needed.
Laboratory	Fixed	1000	Centralized testing facility.
Haul Roads	300 –5600	8000	Frequent spraying due to erosion-prone slopes.
Crusher	Fixed	8700	For aggregate washing and dust control.
Plant Cleaning & Workshop Washing	Fixed	4000	Includes batching plant and machinery.
Domestic Purpose	Fixed	4000	For 35–50 workers (drinking, cooking, sanitation).
Total		**63100**	

3.9 PROJECT COST

The total estimated cost of the project is approximately 40.06 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 45. The skilled manpower, primarily the machine operators and concrete casting crew would be migrant labour and would be placed in the construction camp for accommodation purposes. On an average the crew in the construction camp at a time is likely to be around12 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 22 km subproject stretch is considered as 24 months.

Disclaimer: This is a Draft Report and is under review by the World Bank

4. BASELINE ENVIRONMENT

4.1 GENERAL

This chapter presents the existing environmental and social conditions of the RMA project area, compassing 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 East Garo Hills, winter generally begins in mid-November, with January being the coldest month. During this period, maximum temperatures range between 24–26°C, while minimum temperatures can drop to 10–12°C. Summer begins in March, with July and August typically being the hottest months. During summer, maximum temperatures range from 30–33°C, and minimum temperatures are around 22–24°C.

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

Month	Maximum Temperature in °C	Minimum Temperature in °C
January	24.5	12.5
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 RMA 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 Rongjeng – Mangsang Adokgre (RMA) 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

East Garo Hills experience 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.

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

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

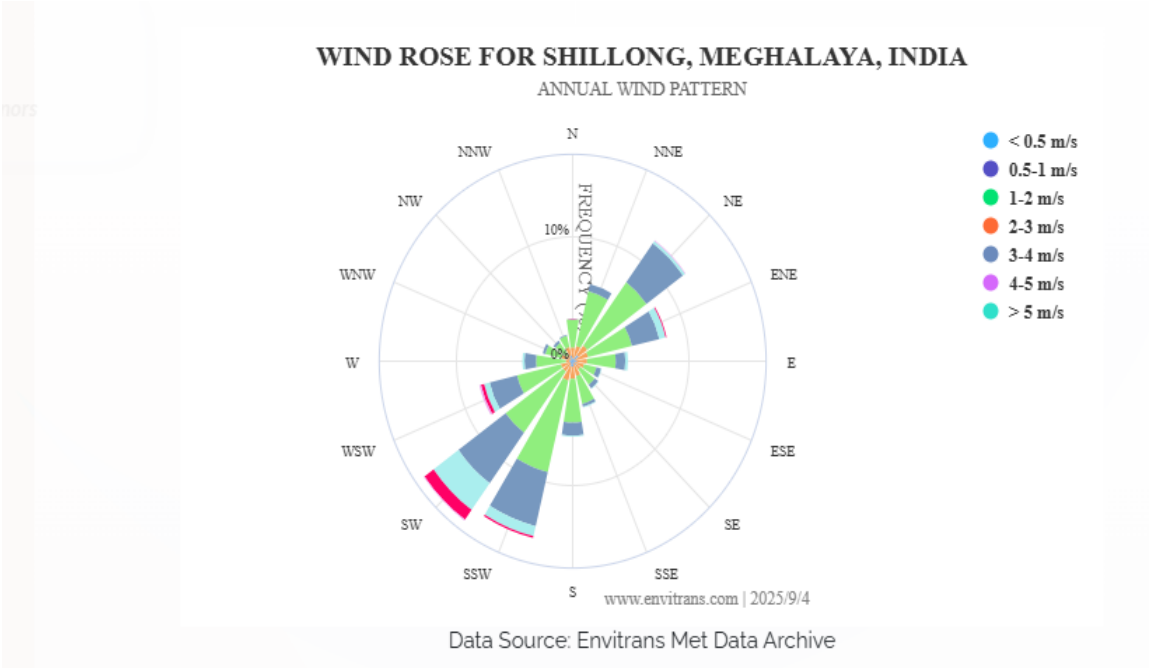
Month	08.30 Hrs	17.30 Hrs
January	88	75
February	85	70
March	80	65
April	82	73
May	87	78
June	93	90
July	92	88
August	90	85
September	88	82
October	85	78
November	83	73
December	87	75

Rainfall Projection and Implications for RMA Road

The Meghalaya State Action Plan on Climate Change (SAPCC, 2022) indicates that the Garo Hills region, including North and East 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 Rongjeng – Mangsang Adokgre (RMA) 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

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

4.3.1 PHYSIOGRAPHY AND ELEVATION

East Garo Hills District, located in the central part of Meghalaya, is characterized by rugged hilly terrain, interspersed with deep valleys, forested slopes, and seasonal streams. The district is drained by several important rivers, including the Simsang, Daring, Didram, and Rongreng, which generally flow eastward or southeastward, with some eventually entering Bangladesh as part of trans boundary river systems. Elevation in the district ranges from around 150 meters above mean sea level in the low-lying eastern areas to over 1,400 meters in the southwestern highlands, particularly around the Nokrek Biosphere Reserve, one of the highest points in the Garo Hills. The physiography of East Garo Hills is marked by steep ridges, forested hills, and undulating plateaus, descending gradually toward the plains in the east, which gives the district its varied and dramatic landscape[1].

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, Ildek, Didram, Rongkhu, and Rongreng, all of which flow northward to eventually join the Brahmaputra. Elevation in the district ranges from approximately 100 meters above mean sea

[1] District Census Handbook,East and North Garo Hills

level in the northern plains adjoining Assam to over 1,000 meters in the southern highlands and ridges, with the central hilly belt generally lying between 300 and 600 meters. The district's physiography is defined by forested hills and sloping terrain that gradually descends northwards, giving North Garo Hills its distinct landscape

Baseline Scenario for RMA Road

As per elevation map of East and North Garo Hills District, the RMA project road stretch lies in the range of 212-932 m . The corridor wise elevation map of the project stretch is given in **Figure 4.2**.

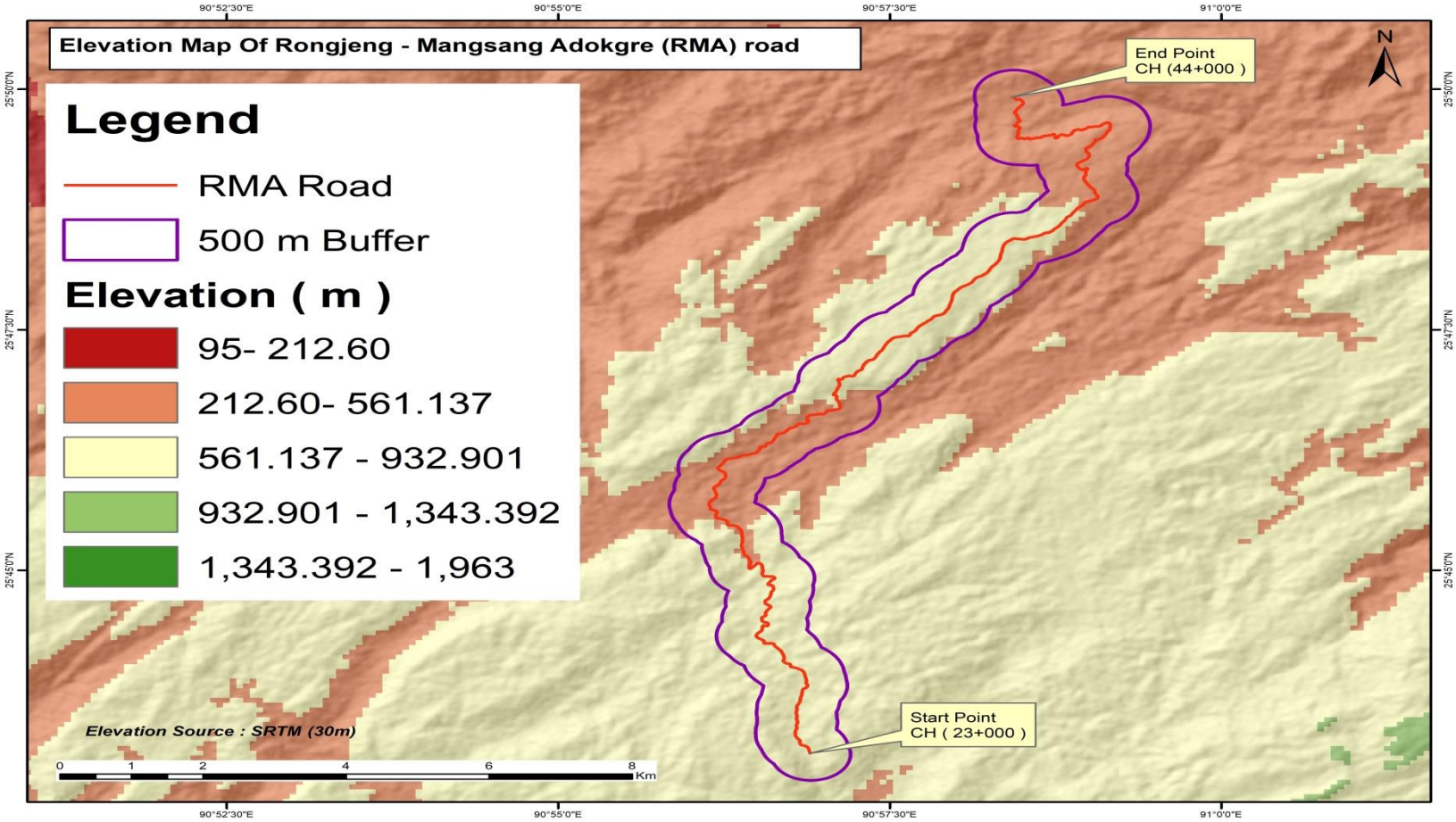


Figure 4.2: Elevation map of the RMA project area

4.3.2 GEOLOGY

Baseline Scenario for Sub- Project Road

- Dominated by Precambrian crystalline basement rocks including granite gneiss, schist and quartzite, forming the core hilly terrain.
- Gondwana sedimentary units comprising sandstone, shale and coal seams occur in the Dambo–Rongjeng–Williamnagar–Songsak belt.
- Tertiary Garo Group sediments (sandstone, siltstone, shale, carbonaceous shale and coal) are present and are economically significant due to coal occurrences.
- Alluvial deposits occur along the lower valleys and floodplains of the Simsang River.
- Economic geology includes major coal deposits in the Rongrenggre–Nangalbibra–Darugiri belt, with minor limestone and clay occurrences reported.

Site-Specific Geology (RMA Road, East Garo Hills)

- DPR-recommended mitigation includes geometry improvement, curve correction and junction safety measures at chainage 26+500, with installation of convex mirrors and traffic management systems.
- Environmentally sensitive stretches at 31+100 (RHS: LP School), 33+200 (LHS: LP School) and 39+200 (LHS: Church) require pedestrian pathways, zebra crossings, cautionary signages and strengthened road markings to ensure commuter and student safety.
- Landslide-prone zones along the alignment will be treated using retaining walls, rock bolts, geotextiles and slope-stabilization techniques on hilly sections.
-
- Construction and labour camps will be sited in consultation with Nokma and local communities, with provisions for safe fuel/oil storage, spill-control systems, drainage with oil-grease separators and organized waste management.
- Noise modelling will determine the need for noise-barriers in sensitive locations.
- Slope sections consist of weathered/lateritic soil overlying crystalline basement; steep cut slopes are underlain by colluvium and slope-wash deposits, posing erosion and slope-failure risks.
-
- Groundwater generally occurs in shallow weathered layers with perched water in clay pockets; monsoon runoff is rapid along roadside drains and seasonal streams.
-
- The ESIA will proceed with detailed assessments based on scoping insights, ensuring integration of stakeholder feedback and environmental/social safeguards.
- The project follows MPWD-ESMF and World Bank ESS requirements, applying the mitigation hierarchy and assessing alternatives to minimize adverse impacts.

- ESMP development, monitoring plans and follow-up studies are recommended to maintain compliance with World Bank guidelines.
- Detailed design may modify the number and location of alignments, but the nature of impacts is expected to remain broadly consistent.
- Requirements for land requirement and compensation for trees, crops and structures will be addressed through RAP and IPDP during finalization.

North Garo Hills

- Dominated by Precambrian crystalline basement rocks (gneiss, granite, quartzite).
- Patches of Gondwana sediments containing coal measures occur along valleys and river courses.
- Alluvial deposits are present in the northern plains.
- Terrain is rugged and hilly in the south, gradually sloping towards the north.
- Economic geology includes small coal deposits (Siju–Dudnai belt), building stones, laterite and minor limestone.

Seismicity

- The corridor falls under Seismic Zone V as per IS 1893.
- Design must adopt the relevant importance factor of IRC:6, and retaining structures, culverts and bridge components must consider seismic earth pressures with design PGA ≈ 0.36 g.

Environmental & construction notes

- Avoid deep excavation and major cut slopes during the monsoon (June–September); adopt staged construction with temporary drainage and silt-traps.
- Spoil disposal must be carried out only at designated stable benches (>10 m from drainage lines), compacted layer-wise and protected with toe bunds.
- Maintain riparian buffers at stream crossings; avoid borrow areas on natural forested slopes with dense canopy.

The geological map of the Project Road is given in **Figure 4.3** below.

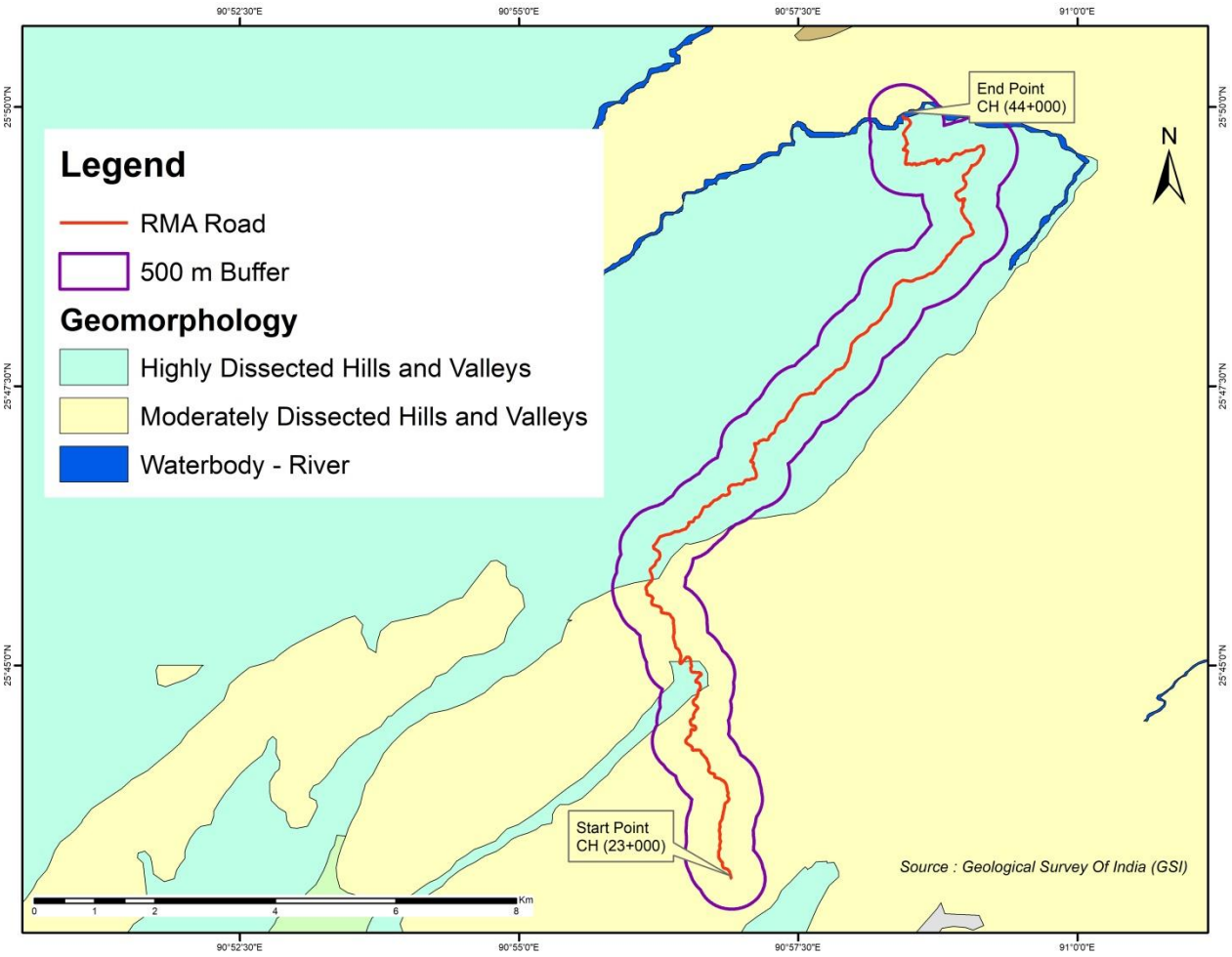


Figure 4.3: Local geology of the road stretch of corridor 2

4.3.3 GEO-MORPHOLOGY AND SOILS

Geomorphologically, the North and East Garo Hills District, through which the RMA 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 soils, with acidity as a major characteristic. In the hilly sections, where the parent rocks weather slowly and are regularly washed by high rainfall, the soils are highly acidic compared to the relatively low-lying plains. The 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 nature. However, lateritic soils are prone to erosion and leaching during heavy monsoonal rainfall, leading to degradation and slope instability in certain road stretches.

Given the terrain and soil characteristics, the RMA 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[2].

Table 4.4: 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)
Kharkutta Development Block (North Garo Hills)	Sandy loam to clay loam	Laterite & Lateritic soils	64,780	5,200	11,500	18,400	29,680
Rongjeng (East Garo Hills Sub-Division)	Clay loam & loamy soil	Laterite & Lateritic soils	77,120	4,200	11,800	20,700	40,420

[2]**Source:-** Divisional Soil and Water Conservation Dept., William Nagar, East Garo Hills

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

[2]District Irrigation Plan 2016–2020, East and North Garo Hills, Government of Meghalaya.

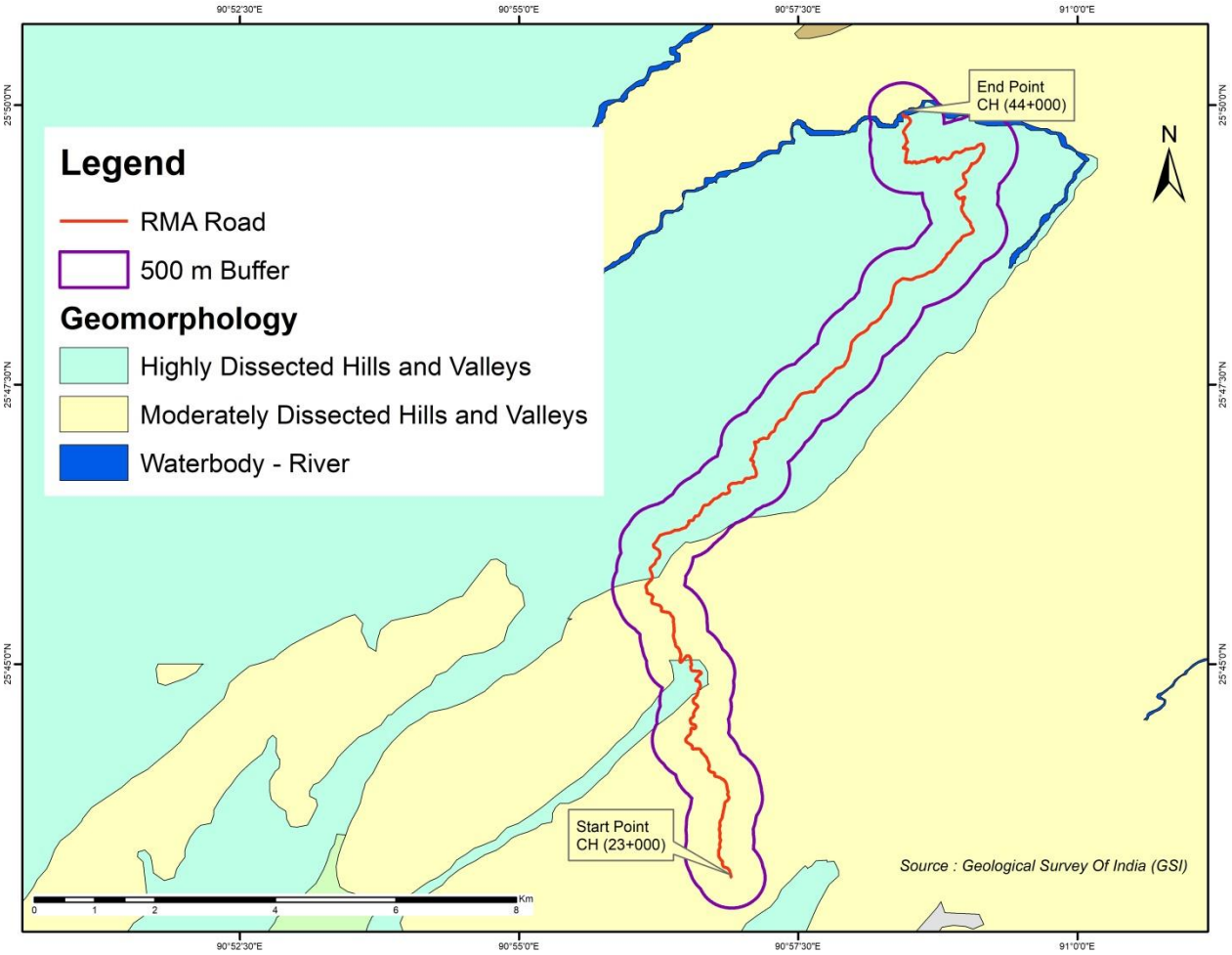


Figure 4.4: Geomorphological map of Project Road

4.3.4 LAND USE PATTERN

The LULC map[3] of 500m reveals that the Along the RMA Road, the land use distribution shows that settlements occupy the largest share at forest land constitutes the major portion, covering 23.62% of the total area. Plantation for 16.59%, while crop land represents 6.01%. Waste land covers 41.84%, and water bodies occupy 2.93% of the total area. This pattern reflects a mixed landscape with significant portions under settlements, natural vegetation, and scrub, while agricultural land and water resources form smaller shares. The LULC map of 500m on either side of the road is presented in **Figure 4.5** below

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

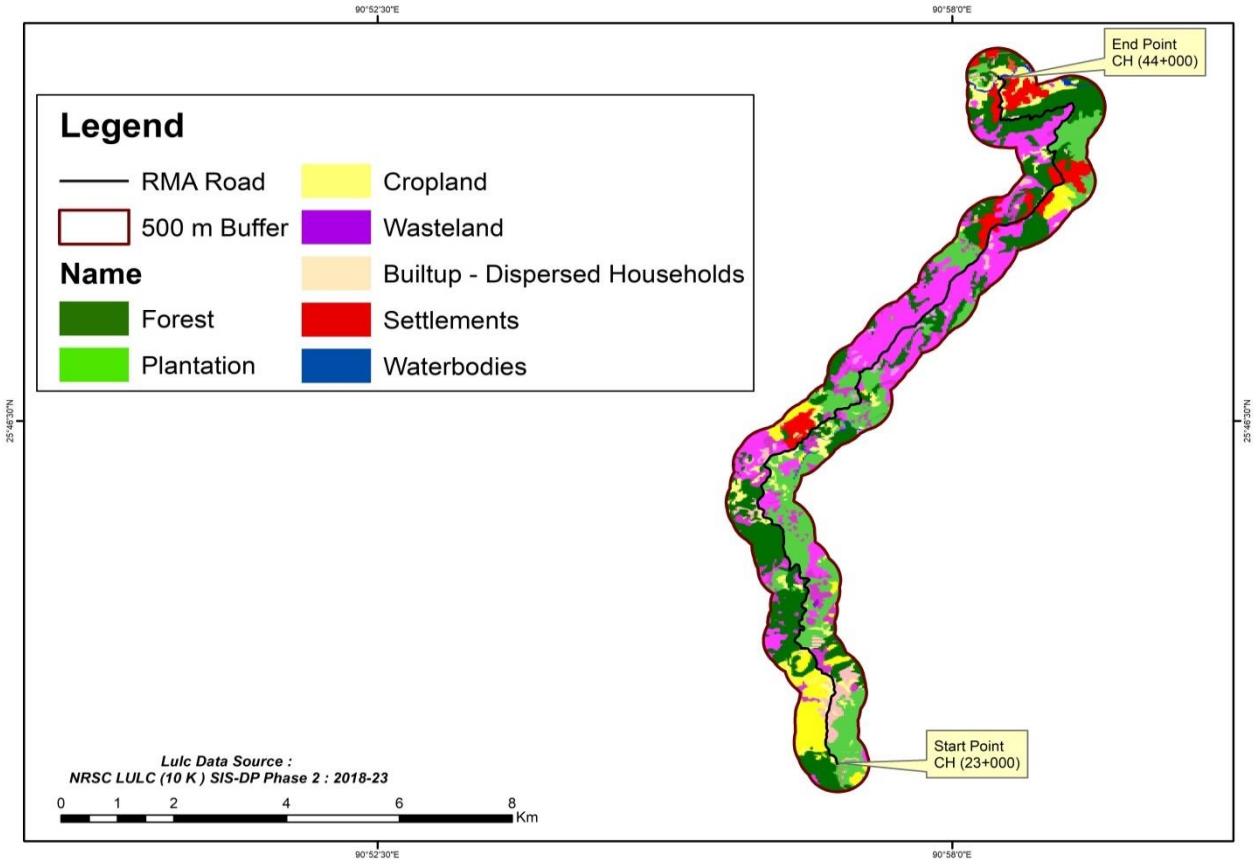


Figure 4.5: Land Use / Land Cover map of RMA road corridor

4.3.5 AGRICULTURE

Baseline Scenario in Project Corridor Area

According to the consultations that were 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 RMA road area include paddy, maize, sesame, millet, jowar, cauliflower, cabbage, chilli, bitter gourd, tomatoes, lettuce, pumpkin, betel nut, betel leaf, pineapple, and banana. Farmers primarily sell their products in local markets, while surplus yields are supplied to other districts or states through vendors.

4.3.6 SOIL QUALITY

The soil quality of East Garo Hills is largely influenced by its hilly terrain, high rainfall, and forest cover. The soils are predominantly red loamy to sandy loam in texture, developed from weathered rocks such as gneiss, schist, and sandstone. They are generally acidic in reaction (pH 4.5–6.0) due to leaching under heavy rainfall conditions. Organic matter content is relatively high, particularly in forested areas, but the soils are often deficient in available phosphorus and potash, while nitrogen content is moderate to high because of organic matter accumulation. The fertility status, therefore, varies from low to medium, depending on land use and intensity of cultivation. Shifting cultivation (jhum) and deforestation tend to reduce soil fertility, increase erosion, and expose the soils to degradation. Valley areas and gentle slopes with better soil depth are more suitable for paddy and horticultural

crops, while the upland soils are mainly used for maize, millets, ginger, and other dry land crops. Overall, the district's soils are productive under proper management but require conservation practices to prevent erosion and sustain fertility.

The soils of North Garo Hills are mainly red loamy and lateritic, acidic in nature, and prone to erosion on slopes, while fertile alluvial soils occur in valley bottoms and river plains. Overall, the soils are moderately fertile, support paddy, maize, and horticulture, but need liming and soil conservation for sustained productivity.[4].

According to secondary data sources, the soil along the proposed RMA road alignment is predominantly sandy loam to clay loam in texture, with moderate organic matter content. In general, the soils are slightly acidic to neutral in pH, reflecting the typical characteristics of the North Garo Hills region. Fertility status is low to medium with limited nitrogen and phosphorus availability, while potassium levels are comparatively better. The soils are moderately erodible, particularly in sloping sections, which may require stabilization measures during construction.

Soil monitoring was conducted at 03 locations in the month of October. Details of the soil sampling locations are presented in Table 1 and shown in Figure 1 of **Annexure 4.4**. The collected soil samples were analyzed for various parameters in an NABL-accredited laboratory. The soil monitoring results are presented in Table 2 of **Annexure 4.4**.

The soil quality at all three sampling locations (SQ1, SQ2 and SQ3) indicates a sandy loam textural class with good organic matter content (≈3.5–4.1%). The soil pH remains mildly acidic (5.45–5.88), which is characteristic of the region's agricultural soils. Electrical conductivity values (198–235 µmhos/cm) fall within the normal range, indicating no salinity issues.

Primary nutrient levels show moderate nitrogen (269–289 kg/ha), adequate phosphorous (81–94 kg/ha) and moderate potassium (73–85 kg/ha) across all three locations, supporting good soil fertility. Exchangeable calcium and magnesium are present at healthy levels.

Concentrations of heavy metals such as copper, nickel, chromium, iron, and lead are found to be low and within natural background levels, indicating no anthropogenic contamination in the monitored soils.

4.4 WATER ENVIRONMENT

4.4.1 HYDROGEOLOGY OF EAST GARO HILLS DISTRICT

The hydrogeology of North and East Garo Hills District is primarily controlled by its hilly terrain, lateritic cover, and underlying hard rock formations. Groundwater occurrence is mainly limited to weathered and fractured zones of Precambrian crystalline rocks, gneisses, and granites. The aquifers are generally discontinuous, with yields depending on the thickness of the weathered mantle and the presence of fractures/joints. Shallow aquifers occur at depths of 10–30 m bgl, recharged mostly by rainfall during the monsoon season. Springs and seepages are common sources of drinking water for rural communities. The groundwater potential is moderate to low, with localized availability in valley fills and alluvial tracts. Overall, the district relies more on surface water sources (streams, rivers, and springs) than on large-scale groundwater extraction. The hydrogeological map of East Garo Hills and North Garo Hills district is given in below **Figure 4.6**. and **Figure 4.7.** respectively.

The hydrogeological map of East Garo Hills district is given in below **Figure 4-6**.

[4]DYNAMIC GROUND WATER RESOURCES OF MEGHALAYA, 2024

Disclaimer: This is a Draft Version and is under review by the World Bank

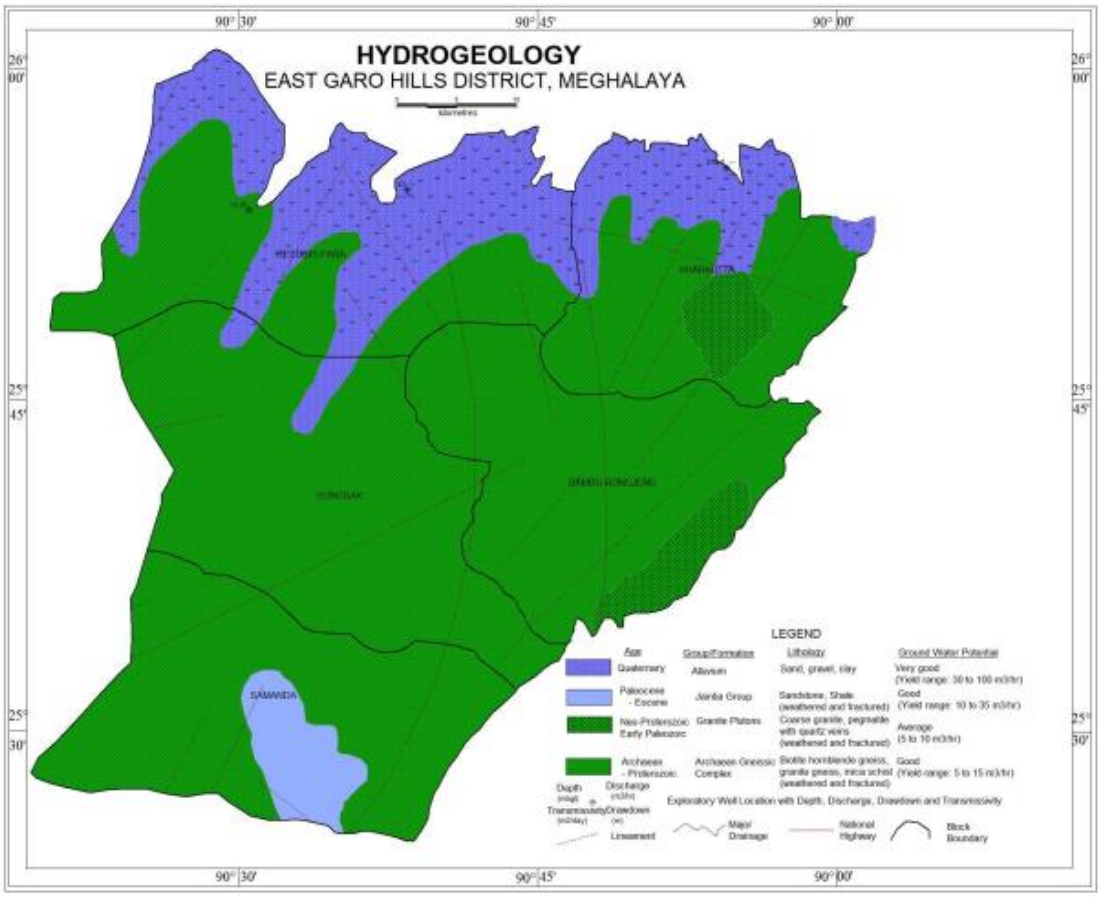


Figure 4.6: Hydrogeological map of East Garo Hills district (Source: CGW, 2020)

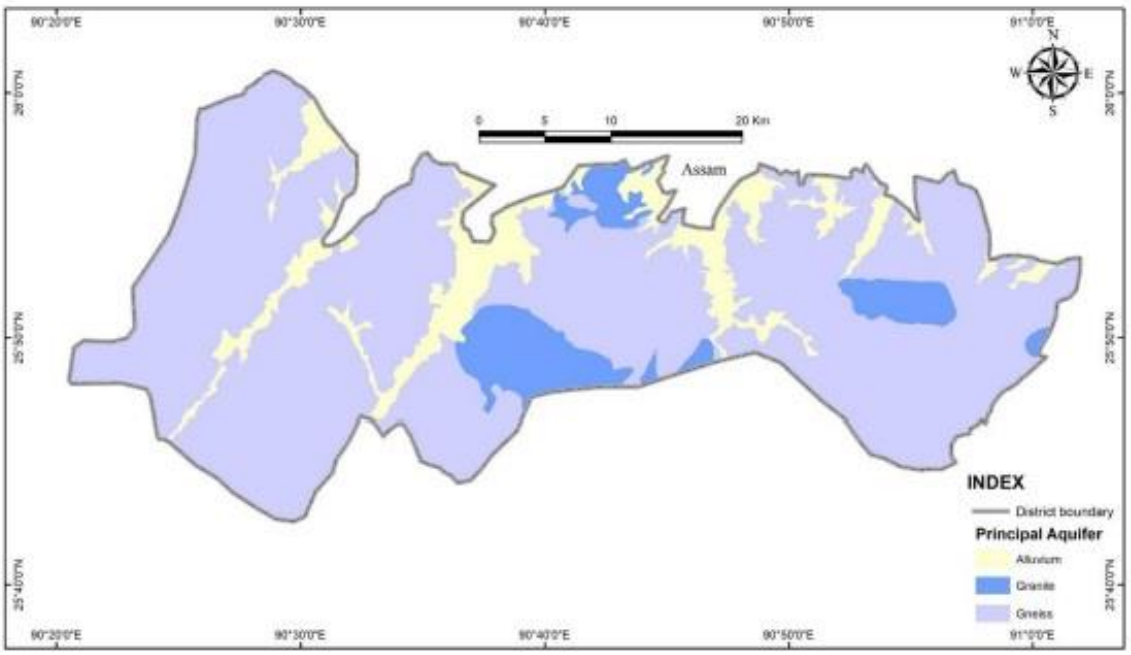


Figure 4.7: Hydrogeological map of North Garo Hills district

Baseline Scenario in RMA Road

Water bodies in the RMA project area of 22 kms stretch are mainly, Ildek River Ch 42+300 River which was observed during the field study. Several small perennial and seasonal streams intersect or run adjacent to the Rongjeng – Mangsang Adokgre (RMA) Road corridor in North and East 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

The surface water quality in the Rongjeng and Kharkutta blocks is generally observed to be good and suitable for domestic as well as agricultural use. The region is endowed with numerous rivers and streams such as the Rongal, and Renggin Ronga in Rongjeng, and the Damring, Didram, and Ildek in Kharkutta, which maintain perennial flow throughout most of the year due to high rainfall. The physico-chemical characteristics of these surface water bodies typically fall within permissible limits prescribed by CPCB Class C standards for surface water, indicating their suitability for irrigation and fisheries after minimal treatment. However, during the monsoon season, the water often becomes turbid due to runoff and siltation from eroded hill slopes and agricultural catchments. In localized areas, organic loading from domestic effluents and washing activities near settlements has been observed to slightly increase BOD and coliform levels, though not at levels indicating severe contamination. Overall, the surface water quality reflects the predominantly rural and forested nature of the catchment, with limited anthropogenic pollution sources. Continuous monitoring and catchment protection measures such as vegetative buffers, silt traps, and regulated washing zones are recommended to maintain and improve the existing water quality conditions.

03 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 included samples from rivers in the month of October. Location details of the surface water samples are presented in Table 3 and shown in Figure 2 of **Annexure 4.4**. Results of the surface water quality are presented in Table 4 of **Annexure 4.4**.

The water quality at all three locations (SW-1, SW-2, and SW-3) meets the IS:2296 Class-C standards. pH values (6.92–7.15) remain within the acceptable range, and dissolved oxygen levels (6.42–7.65 mg/L) indicate good oxygenation suitable for aquatic life. BOD levels (4.6–5.1 mg/L) are well below the permissible limit of 30 mg/L, reflecting low organic pollution.

Major ions such as chlorides (25–30 mg/L), sulphates (28–33 mg/L), and fluoride (0.46–0.52 mg/L) are recorded far below the prescribed limits. TDS concentrations (198–218 mg/L) indicate low mineralization. Nutrients including nitrate (2.6–3.1 mg/L), TKN (1.9–2.4 mg/L), and phosphate (4.6–5.2 mg/L) are within expected natural levels.

Heavy metals such as arsenic, mercury, cadmium, selenium, and phenolic compounds are either not detected or present only in trace quantities well within permissible limits. Concentrations of lead, chromium, copper, zinc, and

manganese are also within acceptable thresholds. Microbial load, as indicated by total coliforms (760–1180 MPN/100 ml), remains below the Class-C limit of 5000 MPN/100 ml.

Overall, the monitored surface water sources exhibit good quality with no signs of contamination, making them suitable for fisheries, recreation, and other designated best-use classifications under Class-C standards.

4.4.3 GROUND WATER

As per the Central Ground Water Board (CGWB)'s Annual Groundwater Quality Report 2024, the groundwater quality in Meghalaya, including areas like Rongjeng and Kharkutta, is generally safe for drinking and agricultural use. The report, based on analysis from 15,259 monitoring locations across India, indicates that 100% of the groundwater samples from Meghalaya met the Bureau of Indian Standards (BIS) drinking water quality norms.

The parameters assessed include Electrical Conductivity (EC), Fluoride, Arsenic, Nitrate, and heavy metals. In Meghalaya, the groundwater samples showed no exceedance of permissible limits for these parameters, suggesting that the groundwater is chemically safe for consumption and irrigation. This is consistent with the state's overall groundwater quality, which is among the best in the country.[5]

01 Ground water sample has been selected from sources present along the project roads to ascertain the baseline conditions of the ground water quality. The ground water sample was collected in the month of October. Location details of the ground water sample are presented in Table 4 and shown in Figure 3 of **Annexure 4.4**. Results of the ground water quality are shown in Table 5 of **Annexure 4.4**.

The groundwater quality at location GW-1 indicates good potability, with a pH of 7.28, TDS of 232.8 mg/L, and total hardness of 118 mg/L, all well within the desirable limits of IS 10500:2012. Major ions such as chlorides, sulphates, calcium, and magnesium are present in low concentrations and comply with drinking water standards. Heavy metals including iron, chromium, arsenic, lead, cadmium, and mercury are either below detectable limits or within permissible levels, indicating no contamination concerns. Overall, the groundwater quality at GW-1 is satisfactory and suitable for drinking and domestic use.

4.5 AIR ENVIRONMENT

The prime objective of the baseline air quality study was to assess the existing air quality of the project area. This will also be useful for assessing the conformity to standards of ambient air quality during the construction and operation phase.

4.5.1 AIR QUALITY

This section presents the relevant air quality standards and the existing ambient air quality conditions. Ambient Air Quality Monitoring Standards (NAAQ Standards) is presented in **Table 4.5**.

Table 4.5: National Ambient Air Quality Monitoring Standards (NAAQ Standards)

Parameter (In µg/m3)	Time weighted average	NAAQ standard
Particulate matter (PM_{10})	24 hrs.	100
Particulate matter ($PM_{2.5}$)	24 hrs.	60
Sulphur dioxide (SO_2)	24 hrs.	80
Nitrogen oxide (NO_2)	24 hrs.	80
Carbon monoxide (CO)	8 hrs.	2000

NAAQ – National Ambient Air Quality Standards

[5] Ground Water Information Booklet East Garo Hills

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. Therefore, a detailed assessment of air quality is included and scoped within the ESIA Report.

Residential areas and other sensitive receptors located close to the project road corridor were considered as key criteria for selecting ambient air quality (AAQ) monitoring stations (Table 6 and Figure 4 of **Annexure 4.4**). A total of three (04) monitoring locations were identified for baseline air quality assessment. Monitoring was carried out in the month of October, covering key parameters such as Particulate Matter (PM_{10} and $PM_{2.5}$), Sulphur Dioxide (SO_2), Nitrogen Dioxide (NO_2), and Carbon Monoxide (CO). The monitoring locations are shown in Figure 4, and the detailed analytical results are provided in Table 7 of **Annexure 4.4**.

The monitored air quality results indicate that overall pollutant levels across the project area remain well within the National Ambient Air Quality Standards (NAAQS). PM_{10} concentrations ranged between 41.3–42.6 µg/m³, and $PM_{2.5}$ values ranged from 16.9–18.4 µg/m³, both significantly below their respective standards, reflecting low particulate pollution. SO_2 concentrations were observed between 5.2–5.7 µg/m³, indicating minimal sulfur-based emissions. NO_2 levels generally remained low, between 5.6–5.9 µg/m³, except at one location where a comparatively higher value of 56.3 µg/m³ was recorded; however, this value also complies with the prescribed limits and may be attributed to localized vehicular or combustion-related emissions. CO levels, ranging from 0.190–0.210 mg/m³, were far below the allowable limit, indicating negligible carbon monoxide pollution.

Overall, the monitored corridor exhibits clean ambient air quality, with no evident environmental or public health concerns during the monitoring period. These favorable conditions can be attributed to the area's low industrial activity, limited vehicular density, and extensive green cover. However, as air quality can fluctuate due to seasonal variations and local anthropogenic activities, continued periodic monitoring is recommended to ensure sustained environmental compliance and protection of public health.

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).

The assessment of construction noise has been included in the ESIA Report, as noise generated from project activities is expected to be continuous.

To compute the average noise level in dB(A), continuous 24-hour noise monitoring was carried out by an NABL-accredited laboratory. Noise monitoring was conducted at four (04) locations during the month of October, as shown in Figure 5 of **Annexure 4.4**, and the details of monitoring locations are provided in Table 8 of **Annexure 4.4**. The analytical results of the monitored noise levels are presented in Table 9 of **Annexure 4.4**.

The monitoring results indicate that ambient noise levels across all four locations are within the permissible limits prescribed for residential and rural areas. During the daytime, the equivalent noise levels (Leq) range between 40–51 dB(A), with the highest value recorded at Ildek Akong Village (51 dB(A)), likely due to localized community movement and minor traffic activity. Noise levels at the other locations—Nongkongkil Village, Remagittim Village, and Memillam Modipara Village—remain within 40–43 dB(A), reflecting generally quiet surroundings.

During the night-time, noise levels decrease substantially and range between 31–36 dB(A), indicating very low human or vehicular activity during late hours. All four locations—NQ1 through NQ4—remain well within the acceptable night-time limits for residential zones.

Overall, the observed day and night ambient noise levels along the monitored corridor do not pose any significant noise pollution concerns for nearby communities. Considering the predominantly rural setting, sparse settlement pattern, and absence of major noise-generating sources, noise barriers are not required along the project road. The existing acoustic environment is stable and compliant with CPCB guidelines.

4.7 BIOLOGICAL ENVIRONMENT

4.7.1 BIODIVERSITY IN EAST and NORTH GARO HILLS DISTRICT

Along the roadside, common plantation trees include Jackfruit, Arecanut etc. In some stretches, Banana, Bamboo, and Betel 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 Cynodon and Mint, Wild Ginger, Turmeric, Centella and Broom grass, etc.

A primary biodiversity survey was conducted during the field visit in August 2025. The survey recorded a total of 200 species of flora and 18 species of aquatic biodiversity, comprising 68 tree species, 10 shrubs, 23 herbs, 11 ferns, and 7 grass species. In addition, 6 mammal species, 45 bird species, 6 reptile species, 4 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 East and 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 zoo therapeutic remedies. Robust, site-level documentation from East 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 East 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 RMA 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 4.6**.

Table 4.6: Biodiversity and critical habitat assessment-based on field survey and GIS analysis for the Direct Impact Area (500 m buffer)

Sl. No.	Habitat (includes natural or modified)	Observation	Remarks
I.	(a) Habitats protected by national and state legal regulations		
	(i) PAs - Wildlife Sanctuary, National Park, conservation reserve or community reserve, Tiger reserve and corridor and Eco-sensitive zone (As notified under the Wildlife Protection Act, 1972)	Not present	
	(ii) Reserve Forest (As notified under India Forest Act, 1927)	Not Present	
	(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 Wildlife (Protection) Act, 2022	Not Present	Schedule I species are not observed during the field survey.
	(ii) Species listed under Schedule III of the Wildlife (Protection) Act, 2022	Not present	Schedule III species are not observed during the field survey
	(ii) Species notified as "threatened species" by the Govt. of Meghalaya under the Meghalaya Biodiversity Rules 2010	Not Present	"Threatened species" are not observed during the field survey.
	(iii) Critically Endangered/Endangered species as listed by the IUCN Red List of Threatened species	Not Present	Critically Endangered/Endangered species are observed during the field survey.
III.	c) Habitats of significant importance to endemic or restricted-range species d) Habitats that support globally or nationally significant concentrations of migratory or congregatory species e) Highly threatened or unique ecosystems		

Sl. No.	Habitat (includes natural or modified)	Observation	Remarks
	(i) Biosphere Reserve (Core Area)	Not present	
	(ii) Ramsar Site	Not present	
	(iii) Important fish & Key Biodiversity Area	Yes, present	Ildek River @chainage 42+300. The Ildek River and adjoining water bodies in North Garo Hills and East Garo Hills support a diverse freshwater fish community, including economically and ecologically important species such as carps (Labeo rohita, Catla catla), barbs (Puntius sophore, Raiamas bola), and native species like the Garo Stone Loach (Aborichthys garoensis) and Garo Spineless Eel (Garo khajuriai). These species inhabit a range of environments, from fast-flowing hill streams to rivers, ponds, and reservoirs, and are currently classified as Least Concern in terms of conservation status. (Rec.Zool.Surv.India.72 Page 1-22 1977)
	(iv) Habitat of Appendix I – Endangered migratory species as per the Convention on the Conservation of Migratory Species (CMS)	Not present	No such species were observed during the field survey.
	(v) Notified Elephant Reserve and Corridor	Not present	No Govt. notified Elephant reserve and corridor present
	(vi) Natural habitats	Not Present	The habitats in the project area are modified for agricultural purposes, and the degraded forest is primarily dominated by bamboo species, Banana 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) and are not included in Schedule I or Schedule III of the Wildlife Protection Act, 2022.

Field surveys, consultations with local communities, and studies by the Forest Department indicate the absence of critical habitats, endangered fauna, or hunting threats within the Direct Impact Area. Based on the biodiversity assessment, the proposed RMA road works are not expected to cause significant, adverse, or irreversible impacts; therefore, the preparation of a detailed Biodiversity Management Plan (BMP) is not deemed necessary.

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.

East Garo Hills District, situated in the eastern part of the Garo Hills in Meghalaya, was officially upgraded from a sub-division to a full-fledged district on 23rd October 1976. The district shares its boundaries with Goalpara district of Assam to the north, West Khasi Hills district to the east, West Garo Hills district to the west, and South Garo Hills district to the south. Williamnagar serves as the district headquarters, which also acts as the administrative and commercial hub.

Geographically, the district lies between 25°24'05" and 26°00'57" North latitudes and 90°08'42" and 91°02'00" East longitudes, encompassing a total area of 2,603 square kilometers. The terrain is predominantly hilly, with numerous rivers, streams, and dense forest cover contributing to its rich biodiversity and scenic landscapes. The district is part of the Garo Hills region, which is known for its unique matrilineal tribal society, traditional practices, and cultural heritage.

East Garo Hills is well connected by road. The district can be approached via NH-62 from Dudhnoi in Goalpara district, Assam, covering a distance of 84 km via Nengkra-Rongjeng. From Shillong, the state capital, it is approximately 285 km via this route and about 246 km via Nongstoin. These connectivity routes facilitate movement of people, goods, and services, although internal roads within the hilly terrain may vary in quality and accessibility.

According to the provisional 2011 census, East Garo Hills has a total population of 317,618, with 161,372 males and 156,246 females. The rural population is dominant, totaling 273,378, while the urban population accounts for around 44,240. The district comprises 1,110 villages, reflecting a dispersed settlement pattern typical of hilly regions. Agriculture remains the primary occupation of the population, with most households engaged in subsistence farming, shifting cultivation (jhum), and horticulture. Other economic activities include small-scale trade, handicrafts, and collection of forest products.

The district's socio-cultural fabric is deeply influenced by the Garo tribes, whose traditions, festivals, and governance through village councils continue to play a significant role in local administration and community life. The hilly terrain, coupled with the traditional lifestyle of the people, presents both opportunities for eco-tourism and challenges for infrastructure development, healthcare, and education.

Overall, East Garo Hills is a district of strategic importance in Meghalaya, combining natural beauty, cultural richness, and a predominantly agrarian economy, with growing potential for sustainable development and connectivity improvements.

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

East Garo Hills District is administered under the Government of Meghalaya and functions in accordance with the Sixth Schedule of the Indian Constitution. Under this framework, the Garo Hills Autonomous District Council (GHADC) exercises authority over matters related to land, forests, and customary practices of the tribal

communities, while law enforcement, revenue administration, and other major state functions remain under the direct purview of the Meghalaya Government.

The district is divided into five Community and Rural Development (C&RD) Blocks, including Williamnagar, Rongjeng, Samanda, Chokpot, and Songsak. The district headquarters is located at Williamnagar, which serves as the primary center for administration, governance, and coordination of developmental activities. Each block is managed by a Block Development Officer (BDO) who oversees the implementation of government schemes, rural infrastructure projects, and welfare programs at the local level.

At the village level, administration is further strengthened by village councils, which function as grassroots institutions to address local governance, customary laws, and community development. This dual system of modern administrative machinery and traditional tribal councils ensures participatory governance while preserving the socio-cultural identity of the Garo people.

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 RMA Roads 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 13 villages namely Masang Imtra Gittim (Imtra-Apal (Mangsang Imtra-Gittim), Ronga Apal (Agal), Nengkram, Rongchong, Nongkongkil, Gandil gittim (Gandilgittim), Rema Gittim (Remagittim), Gajil gittim (Jajilgittim), Mite gittim (Mittegittim), Memillam Modipara (Mawdipara), Memillam, Tingba, Ildek Akong. Based on the population size, it may be mentioned that includes smaller rural settlements such as Gandilgittim (109) and Gajilgittim (Jajilgittim) (134), which have significantly lower populations. Gender distribution is generally balanced, although some areas—such as Nengkram, Mittegittim, and Gandilgittim—have more females than males. Larger settlements like Ronga Apal (Agal) (647) and Nengkram (526) play a key role in the region's demographics, reflecting the varied population density across the corridor. The population distribution of the sub-project affected villages is presented in **Table 4.7**.

Table 4-7: Population distribution of the sub-project affected villages

Total Population			
Village Name	**Male**	**Female**	**Total**
Masang Imtra Gittim (Imtra-Apal (Mangsang Imtra-Gittim)	258	254	512
Ronga Apal (Agal)	351	296	647
Nengkram	254	272	526
Rongchong	158	158	316
Nongkongkil (Nengkongkil)	108	109	217
Gandil gittim (Gandilgittim)	51	58	109
Rema Gittim (Remagittim)	134	109	243
Gajil gittim (Jajilgittim)	63	71	134
Mite gittim (Mittegittim)	166	182	348
Memillam Modipara (Mawdipara)	131	126	257

Total Population			
Village Name	**Male**	**Female**	**Total**
Memillam	98	89	187
Tingba	227	199	426
Ildek Akong	191	168	359

Source: Census 2011

4.8.2.2 SEX RATIO

The sex ratio across the surveyed villages shows considerable variation according to Census 2011. Villages such as Nengkram (1071), Nongkongkil (1009), Rongchong (1000), Gandilgittim (1137), Jajilgittim (1127), and Mittegittim (1096) reflect a favorable sex ratio, with females outnumbering males. On the other hand, villages like Ronga Apal (843), Rema Gittim (813), Tingba (877), and Ildek Akong (880) report lower sex ratios, indicating fewer females compared to males. Moderately balanced ratios are observed in Masang Imtra Gittim (984), Memillam Modipara (962), and Memillam (908), where the gender distribution is closer to parity. Overall, while some villages demonstrate encouraging trends of gender balance, others reflect disparities that may need further attention in demographic and social analysis. Detailed sex ratio data for the project-affected villages and two towns are presented in **Table 4.8**.

Table 4-8: Sex ratio in the villages along the sub-project road

Village Name	Sex Ratio
Masang Imtra Gittim (Imtra-Apal (Mangsang Imtra-Gittim)	984
Ronga Apal (Agal)	843
Nengkram	1071
Rongchong	1000
Nongkongkil	1009
Gandil gittim (Gandilgittim)	1137
Rema Gittim (Remagittim)	813
Gajil gittim (Jajilgittim)	1127
Mite gittim (Mittegittim)	1096
Memillam Modipara (Mawdipara)	962
Memillam	908
Tingba	877
Ildek Akong	880

Source: Census 2011

4.8.2.3 SCHEDULED TRIBE POPULATION

The district is predominantly inhabited by the Scheduled Tribe (ST) population. Their settlements along the project road corridor are primarily concentrated in smaller rural villages, with Ronga Apal (Agal) (645) and Nengkram (509) recording the highest ST populations. Medium-sized settlements such as Masang Imtra Gittim (Imtra-Apal / Mangsang Imtra-Gittim) (503) and Tingba (424) also have a significant ST presence. In contrast, smaller villages like Gandilgittim (109) and Gajilgittim (Jajilgittim) (126) have comparatively lower ST populations. Gender distribution is generally balanced, although some areas such as Nengkram (265), Gandilgittim (58), and Gajilgittim (68) have more females than males. A detailed distribution of the ST population along the project corridor is provided in **Table 4.9**.

Table 4-9: Population distribution of the sub-project affected villages

ST Population				
Village Name	**Male**	**Female**	**Total**	**Percentage**
Masang Imtra Gittim (Imtra-Apal (Mangsang Imtra-Gittim)	254	249	503	98.24

Ronga Apal (Agal)	350	295	645	99.69
Nengkram	244	265	509	96.77
Rongchong	156	156	312	98.73
Nongkongkil	97	95	192	88.48
Gandil gittim (Gandilgittim)	51	58	109	100
Rema Gittim (Remagittim)	134	109	243	100
Gajil gittim (Jajilgittim)	58	68	126	94.03
Mite gittim (Mittegittim)	156	168	324	93.10
Memillam Modipara (Mawdipara)	131	126	257	100
Memillam	98	89	187	100
Tingba	225	199	424	99.53
Ildek Akong	185	159	344	95.82

Source: Census 2011

4.8.2.4 WORKFORCE POPULATION

The workforce distribution in the region highlights rural areas like Ronga Apal (Agal) (455 workers) and Nengkram (284 workers) as economic hubs, with strong female participation in Ronga Apal (Agal). The detailed workforce of the project affected villages is given in **Table 4.10**.

Table 4-10: Workforce Population in the Project road corridor area

Area	Main Workers (No.)			Marginal Workers (No.)			Total Workforce (No.)			
	Male	Female	Total	Male	Femal	Total	Male	Female	Total	Percentage
Masang Imtra Gittim (Imtra-Apal (Mangsang Imtra-Gittim)	89	80	169	18	27	45	107	107	214	41.80
Ronga Apal (Agal)	123	134	257	104	94	198	227	228	455	70.32
Nengkram	91	19	110	50	124	174	141	143	284	53.99
Rongchong	57	3	60	0	0	0	57	3	60	18.99
Nongkongkil	50	11	61				55	46	101	46.54
Gandil gittim (Gandilgittim)	19	7	26	13	26	39	32	33	65	59.63
Rema Gittim (Remagittim)	46	37	83	1	0	1	46	38	84	34.57
Gajil gittim (Jajilgittim)	28	35	63	0	0	0	28	35	63	47.01
Mite gittim (Mittegittim)	70	12	82	3	12	15	73	24	97	27.87
Memillam Modipara (Mawdipara)	46	51	97	22	25	47	68	76	144	56.03
Memillam	39	43	82	8	3	11	47	46	93	49.73
Tingba	8	6	14	31	19	50	39	25	64	15.02
Ildek Akong	85	81	166	0	0	0	85	81	166	46.24

Source: Census 2011

4.8.3 EDUCATION

The educational scenario in the project corridor reveals notable variations in literacy levels across rural areas. Ronga Apal (Agal) and Masang Imtra Gittim (Imtra-Apal / Mangsang Imtra-Gittim) lead in literacy rates, while villages like Gandilgittim and Nongkongkil show minimal literacy levels. Gender imbalances persist, with males generally exhibiting higher literacy rates; however, some villages such as Tingba and Nengkram demonstrate more balanced gender participation. The detailed distribution of literate populations in the sub-project affected villages is provided in **Tables 4-11**.

Table 4-11: Literate Population in the Project road corridor area

Literate Population				
Village Name	**Male**	**Female**	**Total**	**Percentage**
Masang Imtra Gittim (Imtra-Apal (Mangsang Imtra-Gittim)	173	156	329	64.26
Ronga Apal (Agal)	257	227	484	74.81
Nengkram	125	121	246	46.77
Rongchong	53	44	97	30.70
Nongkongkil	48	25	73	33.46
Gandil gittim (Gandilgittim)	17	21	38	34.86
Rema Gittim (Remagittim)	58	24	82	33.74
Gajil gittim (Jajilgittim)	42	52	94	70.15
Mite gittim (Mittegittim)	89	65	154	44.25
Memillam Modipara (Mawdipara)	78	59	137	53.31
Memillam	51	29	80	42.78
Tingba	156	113	269	63.15
Ildek Akong	141	120	261	72.70

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 RMA road, the settlement area has recently emerged as a popular tourist destination due to its scenic natural beauty, pleasant climate, and proximity to important cultural and ecological sites in the Garo Hills region. The road provides improved connectivity to picturesque villages, rolling hills, waterfalls, and dense forest areas that attract visitors seeking eco-tourism and rural tourism experiences.

Local communities have also begun to engage in small-scale tourism activities such as homestays, local handicraft sales, and guided nature walks, which contribute to livelihood diversification and promote the local economy. Additionally, the improvement of road infrastructure has made travel more convenient, encouraging greater tourist inflow from nearby towns and states. However, the rising tourism potential also necessitates the development of basic amenities such as sanitation facilities, waste management systems, and accommodation infrastructure to ensure sustainable and environmentally responsible tourism growth along the RMA road corridor.

4.8.6 POVERTY

In Corridor-2, 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 2, 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.

4.8.7.3 GENDER BASED VIOLENCE

According to records from the Rongjeng and Kharkutta Blocks, no general Gender-Based Violence (GBV) cases have been reported in Corridor 2, indicating a relatively safe environment for women. Additionally, cases under the Protection of Children from Sexual Offences (POCSO) Act have been registered over the years. Consultations in Corridor 2 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. (We can clearly mention here that the number of households affected is 40. So that this number can be reflected upon as we go on through the chapter.)

4.9.1 DEMOGRAPHY

The **Table 4.12** below summarizes the gender distribution of the head of the Household. In Corridor 2, out of 5 individuals, 4 are male (80%) and 1 are female (20%), showing a clear male predominance.

Table 4.12: Gender Distribution of PAHs

Gender	Corridor 2 (RMA Road)	Percentage
Male	4	80
Female	1	20
Total	**5**	100

Source: EIS primary survey – 2025

4.9.1.1 GENDER DISTRIBUTION OF PROJECT-AFFECTED PERSONS

Out of a total of 14 Project Affected Persons (PAPs), 8 are male (57.14%) and 6 are female (42.85%), indicating an almost equal distribution between male and female beneficiaries. Details are given in **Table 4.13.**

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

	Project Affected Persons	Percentage
Male	8	57.14
Female	6	42.85

Total	**14**	**100**

Source: EIS primary survey – 2025

4.9.1.2 ETHNICITY

The detailed distribution of ethnic groups in corridor wise is given in **Table 4.14** below. In Corridor 2, a total of 5 individuals belong to Garo Community.

Table 4.14: Community Wise Distribution of PAHs

Communities	Corridor 2	Percentage
Garo	5	100
Rabha	0	0
Muslim	0	0
Total	**5**	**100**

Source: EIS primary survey – 2025

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 4.15** below describes the distribution pattern of vulnerable group in the study area.

Table 4.15: Distribution of Vulnerable Group

Vulnerable Category	PAHs	Percentage
Schedule Tribe	5*	100
Aged persons above 60 years	1	20
Below Poverty Line	0	00
Woman Headed Household	1	20
Other Backward Classes	0	0
Physically Challenged	0	0

Source: EIS primary survey – 2025

*All 5 households are vulnerable and out of 5, 1 is aged more than 60 years and 1 are woman headed.

4.9.3 ECONOMIC PROFILE

EMPLOYMENT PATTERNS

4.9.3.1 Private Business/ Entrepreneurship

Among the 5 Project Affected Households (PAHs), the all are engaged in private business. Details are provided in **Table 4.16.**

Table 4.16: Occupation pattern of PAHs in sub-project area

Sl. No.	Occupation	PAHs
1	Agriculture	0
2	Private Business	5
3	Service (Govt / Pvt.)	0
4	Others (Non-Working)	0
Total		**5**

Source: EIS primary survey – 2025

4.9.3.2 INCOME

In Corridor 2, none of the households fall in the annual income range below ₹50,000. A majority of 3 households (60%) income between ₹50,000 and ₹1,00,000 annually, while 2 households (40%) have an more than ₹1,00,000, indicating relatively higher income levels among the affected families. Details are provided in **Table 4.17.**

Table 4.17: Annual Income Range of PAHs

Sl. No.	Annual Income Range of HH	Corridor 2	
		No. of PAHs	Percentage
1	less than 25000	0	0
2	25000- 50000	0	0
3	50000-100000	3	60
4	More than 100000	2	40
Total		**5**	**100**

Source: EIS primary survey – 2025

4.9.4 EDUCATION

In Corridor 2, out of a total population of 18 persons. The majority have studied up to high school (6 persons), followed by 3 with primary education and 2 with higher secondary education. A smaller group of 3 individuals are graduates or above, while 1 is illiterate. Overall, male (12) and female 6 participation across education levels is nearly equal. Details are provided in **Table 4.18.**

Table 4.18: Education Level of PAPs

Sl. No	Education	Corridor 2		
		Male	Female	Total
	Children below 6 years	2	1	**3**
1	Primary (Class 1 to 4)	2	1	3
2	High School (Class 5-10)	4	2	6

3	Higher Secondary (Class 11-12)	1	1	2
4	Graduate and above	2	1	3
5	Illiterate	1	0	1
	Total	**12**	**6**	**18**

Source: EIS primary survey – 2025

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, RMA 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.

Rongjeng and Kharkutta PHC serves as the primary healthcare facility, supported by Kharkutta PHC and CHC within the Project Influence Area (PIA),

4.9.6 IMPACT TO STRUCTURES

The project corridor wise details of the impacted structures[6]. are given in below **Table 4.19**. Chainage wise details are provided in **Annexure 4.3**.

Table 4.19: Type of Impact on Project Affected Household

Type of Impacts	Corridor 2	%
Residential (Major)	0	0
Commercial (Major)	0	0
Res. Cum Comm. (Major)	0	0
Other Minor Structures	3	60
Temporary Encroachment	2	40
Total	**5**	**100**

4.9.7 LOSS OF TREES

Approximately 20 trees are situated within the existing Right of Way (RoW) on both sides of the road. To mitigate the ecological impact of tree felling, compensatory afforestation should be carried out, in accordance with applicable environmental regulations and guidelines. These measures, along with their implementation strategies, are comprehensively detailed in the Environmental and Social Management Plan (ESMP).

4.9.9 COMMON PROPERTY RESOURCES

[6] "Majorly affected" refers to persons who experience involuntary resettlement due to significant impacts such as loss of residence, commercial shops, livelihoods, or permanent access to land or other assets essential for their life and income.

The Common Property Resources (CPR) assessment classifies structures into government and community/public facilities. Government structure including compound walls (CWs) of government buildings, schools, and community halls comprise 0 minor structures that may be affected during construction. Detailed sub-project-wise information on partially impacted CPRs during the construction period is provided in **Table 4.20**.

Table 4.20: Common Property Resources

Sl. No.	Type of CPR Structures	Chainage	Distance from the PROW	Impact and mitigation Measures
1.	Community Centre	Ch. 24+600	20 m from center line RHS	No direct impact; design speed reduced to 20 km/h with improved signage to enhance road safety.
2.	Tingba post office	Ch 42+200	20 m from center line LHS	
3.	Church	Ch 39+200	30 m from center line LHS	
4.	Nongkalkil LP School	Ch 31 +100	20 m from center line RHS	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)
5.	Mittesonggital LP School	Ch 33+270	25 m from center line LHS	

Illustrative view of the road features in Corridor 2 is given in **Figure 4.8**.

New Ch No	LHS/RHS with distance from center line	Structure	Pictures
24+600	RHS, 20m from Centre line	Community Centre	

31 +100	RHS, 20m from Centre line	School	
33+270	LHS, 25m from Centre line	School	
39+200	LHS, 30m from Centre line	Church	
42+200	LHS, 20m from Centre line	Post Office	

Figure 4.:8 Ilustrative view of the road features in Corridor 2

4.10 HAZARD AND VULNERABILITY PROFILE

The Hazard and Vulnerability profile of the RMA Road area and East 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 East Garo Hills & North Garo Hills District[7] is given in **Table 4-21** below.

Table 4.21: Hazard analysis

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

4.10.1 EARTHQUAKE ZONES

The project road stretches fall under Zone – V, which is at Very High risk and intensity is IX. Seismic Zone details of East Garo Hills is presented in **Table 4.22**

Table 4.22: Seismic Zone details of East Garo Hills & North Garo Hills

District	Seismic Zone	Notable Faults	Recent Earthquakes
East Garo Hills	Zone V (highest risk)	Major lineaments/faults such as Rongrenggiri–Songsak and nearby dislocations linked to Dauki fault system	Moderate tremors occasionally felt, no major recent events reported
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 RMA Road are given below.

[7] District Disaster Management Plan for Meghalaya, 2024

1. **High Vulnerability:**

There are no major reported natural disasters specifically for the " Kharkutta and Rongjeng block. Existing road is in poor condition—mostly earthen up to 18.5 km, only 3.5 km is paved. Geological conditions: 2–3 m overburden, 5–8 m weathering, and rest is rock. Road passes through partially plain and hilly terrain. Facing serious problem of water logging during monsoon season.

During the Environmental and Social Impact Assessment (ESIA), several landslide and landslip-prone zones were identified along the road alignment, particularly in hilly sections. These areas pose significant risks to road safety, structural integrity, and long-term sustainability. Recognizing the increased vulnerability due to climate change and past disaster occurrences, the DPR consultant has been directed to work in close consultation with geotechnical specialists to develop a comprehensive landslide treatment plan.

This plan will include site-specific engineering solutions such as retaining walls, slope regrading, installation of rock bolts, drainage control systems, use of geotextiles, and vegetation restoration to ensure slope stability. The design interventions will be guided by the latest geotechnical data and best practices in climate-resilient infrastructure. Additionally, the consultant has been advised to consider real-time monitoring and early warning systems in particularly high-risk zones, ensuring both proactive and reactive landslide management during and after construction.

2. **Moderate Vulnerability:**

Soil erosion was observed at chainage 42+100 near a proposed major bridge location, where protection work is required to stabilize the section. Major bridge is proposed at this location.

Critical Hotspots:

There is no any critical hotspot.

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 22 km priority roads in Corridor 2 (RMA Road). 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, additional land requirement, 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 up gradation 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 &	ESS3, ESS4,	N	N	LN	MP	MP	LP	LP	N	N	MP	LP

Bioengineering	ESS6				(Improved Slope Stability)							
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	MP(Improved Connectivity)	LN	LN	MP (Improved Drainage	MP (Improved Road Safety)

							Services)				)	
Transportation of Hazardous Materials	ESS4	MN	LN	LN	LN	MN	HN	HN	MN	HN	MN	HN
Compensatory Plantation	ESS6	HP	N	MP	MP	HP	MP	MP	LP	N	MP	HP
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 Rongjeng – Mangsang Adokgre (RMA) Road. While most construction activities are proposed within the existing Right of Way (RoW), minor land requirement will be required 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 20 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 36 electric poles and 37 electric line crossings are identified along the RMA road corridor for shifting. Of these, 15 poles are on the LHS and 21 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 RMA 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 turfing).
- 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 RMA 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 Rongjeng – Mangsang Adokgre (RMA) Road traverses gently undulating terrain with elevations ranging from 212 m to 932 m amsl, where only minor cutting and filling are required to achieve the desired formation level. The total estimated cut quantity is ***1014408.48***m^3 and fill quantity is ***590854.96***m^3, resulting in a surplus of approximately ***4,23,553.52*** m^3 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 around the total lenget pf 22 Km of the (RMA) road from chainage 0+000 to chainage 42+300 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 and toe walls (from chainage 23+140 to chainage 42+825) to stabilize slopes and prevent erosion.
- Proper drainage management at waterlogged and flood-prone locations (CH 00+000 to 42+300) through new bridges, culverts, and raised embankments to mitigate monsoon submergence.
- Traffic and safety management at critical points near settlements and schools (CH 31+100, 33+270, 24+600, 42+ 200, 39+ 200) with signage, speed regulation, and curve correction.

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 RMA 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 m^3 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 (from chainage 23+140 to chainage 42+825). 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 3.5 a of 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 5.2** below.

Table 5.2: Earthwork details in the project area

Corridor	Fill (m^3)	Cut (m^3)
Corridor-2	590854.96	1014408.48

From the above table it is calculated that after balancing cut and fill, the remaining quantity of 4,23,553.52 cu.m earthwork will be dumped/disposed by the contractor. The details of muck disposal sites are provided in **Table 5.3**. Average height should be 1.5 m to 2 m.

Table 5.3: Details for the muck disposal sites

RMA						
Dumping Location			Coordinate		Area m2	Approx Quantity (m^3)
SL. NO	LOCATION CHAINAGE	SIDE	X	Y		
1	23+300	LHS	294013.96	2846328.85	1500	1,806 m^3
2	27+900	LHS	293718.4	2849274.36	3500	4,391 m^3
3	31+200	RHS	293220.77	2851735	6150	8,142 m^3
4	34+800	RHS	295307.98	2853962.89	9056	14,354m^3
5	37+500	RHS	296904.01	2855899.61	6610	8,398 m^3
6	42+050	RHS	296985.42	2857885.94	6000	7,428 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, aggregate handling, and storage at the on-site asphalt mixing plants along the RMA Road Corridor project are key construction activities. These operations produce considerable dust and noise, especially in ecologically and socially sensitive areas of East and North Garo Hills, due to the mechanical breaking of rocks, movement of heavy machinery, and frequent material transfer processes
- Site leveling 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 SO_2, NO_x and CO

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

The impacts are expected to be temporary (limited to construction period) and confined within construction areas.

Mitigation Measures for Ambient Air Quality (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	Locate plants at least 500 m from settlements and sensitive receptors; install

asphalt plants	dust extraction, bag filters, and stack emission controls. Regularly maintain equipment to minimize emissions.
Site clearing, vegetation removal, and handling of topsoil	Restrict vegetation clearance to the required RoW; immediately stabilize exposed soil using mulching, water spraying, or temporary turfing.
Concrete and asphalt mixing operations	Use pre-mixed bitumen and maintain mixing temperature within permissible limits to reduce hydrocarbon release. Avoid fuel adulteration.
Operation of heavy machinery and transport vehicles	Maintain all equipment and vehicles regularly; prohibit use of old or poorly maintained machinery; use low-sulphur fuel.
Generation of gaseous pollutants (SO_2, NOx, 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, NOx, 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, use of temporary noise barriers, scheduling of high-noise works during daytime, and strict adherence to CPCB noise standards.

The scale of construction required for upgrading the 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, use of noise barriers or temporary screens near sensitive locations, and adherence to CPCB noise standards, the impacts will remain within acceptable limits. Consequently, the overall scale of works and the expected marginal increase in post-construction traffic are not anticipated to result in any significant or lasting adverse impacts on ambient air quality or noise levels.

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

MITIGATION MEASURES

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

DG SET NOISE CONTROL STANDARDS

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

- The contractor must use silent DG sets as prescribed by the Central Pollution Control Board (CPCB).
- If a silent DG set is not available, noise shall be controlled by providing an acoustic enclosure or acoustically treated housing.
- The acoustic enclosure shall be constructed with suitable materials of adequate thickness, supported by a structural or sheet-metal base, and insulated with fire-retardant acoustic foam.
- The acoustic enclosure/acoustic treatment shall be designed to provide a minimum 25 dB(A) insertion loss or to meet ambient noise standards, whichever is higher.
- Each DG set shall be provided with a proper exhaust muffler to further reduce noise emissions.
- The DG set shall be properly sited to minimize its noise impact beyond the premises, ensuring compliance with ambient noise standards at the nearest receptor.

A routine and preventive maintenance schedule shall be prepared and followed in consultation with the DG set manufacturer to ensure that noise levels do not deteriorate with use.

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 RMA Road corridor. Proposed sub project road run parallel to lldek river up to

1 km (Between Chainages 42+200 to 42+300). 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 lldek River, which intersects the RMA 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.

Construction activities may increase turbidity level by increasing the sediment load. There are water bodies observed along the RMA Road. Sometimes contamination of surface water may take place due to accidental spills of construction materials, oil, grease, fuel, and paint. Degradation of water quality is also possible due to accidental

discharges into watercourses from drainage of worker camps and from spillages from vehicle parking area and/or fuel and lubricant storage areas. During the construction phase, if silt is not adequately controlled, it would lead to contamination of water sources especially those close to the Right of Way (RoW).

Fishing is practiced in the water bodies intersecting the RMA Road. Moreover, any extraction of river bed material is regulated by different authorities like State Environmental Impact Assessment Authority, State Pollution Control Board and State Mining Department with an objective to conserve top soil, avoid impact on aquatic biodiversity, hydrological regime etc. by haphazard and unscientific mining of minor minerals. The project may utilize river bed materials from existing licensed quarries, subject to compliance with all stipulated conditions of the aforementioned authorities.

IMPACTS ON NATURAL DRAINAGE AND WATERSHED MANAGEMENT (FLOODING) (ESS3)

Along the rivers and streams crossed by the road, there is a need for bank protection measures to avoid accelerated sedimentation that can affect drainage patterns as well as riverine habitats. The alignment follows the existing topography except for the location of the cross-drainage structure.19 Junction and 3 Minor Bridge exists and 4 proposed in the project area of 22 km road length. Totally 84 culverts are proposed for new construction, reconstruction/retention. Among these, 16 are box culverts and 68 are pipe culverts. Many of the existing culverts present in the project area if not adequately strengthened during the proposed road widening with rehabilitation/up gradation, can lead to structural failures, causing disruptions in water flow, increased flood risk and potential damage to the road. This may also pose safety hazards to the 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. RMA project road stretch will require 63.1 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 Ildek River. The demand for construction is proposed to be met from surface water sources. However, in extreme cases, where surface water is not available, it is proposed to use groundwater resources. The project area is not classified as critical, semi-critical or overexploited by CGWB. It is "safe" area for ground water abstraction.

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

5.4.2.9 CONSTRUCTION AND DEMOLITION WASTE (ESS3)

Construction and demolition (C&D) waste from major demolitions is not expected along the proposed RMA 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:** priorities reuse of intact masonry/brick and concrete as backfill or for temporary access tracks; recover metal and timber for reuse.
- **Designated storage & timely removal:** store debris in covered areas away from drains and surface water; remove to authorized disposal/recycling facilities within agreed short timeframes to prevent runoff and scavenging.
- **Dust control:** dampen stockpiles and vehicle loads, cover trucks during transport, and restrict demolition/dismantling operations during high-wind conditions.
- **Drainage protection:** install silt traps/sediment control (e.g., sandbags, temporary settling pits) at nearby drains and around stockpiles to prevent siltation of water bodies.
- **Traffic & public safety:** schedule dismantling works off-peak where possible, use flaggers and signage, and maintain clear pedestrian/vehicular passage around work areas.
- **Permits & authorised disposal:** ensure waste is transported only to licensed C&D disposal or recycling facilities and that manifests/receipts are retained.
- **Contractor responsibilities & training:** the contractor shall prepare the C&D waste handling plan, train workers on segregation and pollution prevention, and maintain daily records of waste quantities and destinations.

Monitoring & reporting: include C&D waste management in construction supervision checklists; undertake fortnightly inspections and submit waste disposal receipts as part of monthly compliance reports.

5.4.2.10 MUNICIPAL SOLID AND HAZARDOUS WASTE (ESS4)

RMA road corridor will generate approximately 15 to 18 kg of municipal solid waste per day during the construction stage, this is estimated based on approximately 45 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.

a) The camping area should be periodically sprayed with Bleaching powder and other

- disinfectants.

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 Scarified Bituminous waste

Sl. No.	Description	Unit	Quantity
			Corridor-2 (RMA Road)
1.	Scarifying existing bituminous waste	cum	150

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.

5.4.2.11 NATURAL DISASTER (ESS4)

There are no major reported natural disasters specifically for the " Kharkutta and Rongjeng block. Existing road is in poor condition—mostly earthen up to 18.5 km, only 3.5 km is paved. Geological conditions: 2–3 m overburden, 5–8 m weathering, and rest is rock. Road passes through partially plain and hilly terrain. Facing serious problem of water logging during monsoon season.

During the Environmental and Social Impact Assessment (ESIA), several landslide and landslip-prone zones were identified along the road alignment, particularly in hilly sections. These areas pose significant risks to road safety, structural integrity, and long-term sustainability. Recognizing the increased vulnerability due to climate change and past disaster occurrences, the DPR consultant has been directed to work in close consultation with geotechnical specialists to develop a comprehensive landslide treatment plan.

This plan will include site-specific engineering solutions such as retaining walls, slope regrading, installation of rock bolts, drainage control systems, use of geotextiles, and vegetation restoration to ensure slope stability. The design interventions will be guided by the latest geotechnical data and best practices in climate-resilient infrastructure. Additionally, the consultant has been advised to consider real-time monitoring and early warning systems in particularly high-risk zones, ensuring both proactive and reactive landslide management during and after construction.

5.4.2.12 DISRUPTION OF COMMUNITY SERVICES (ESS4)

For the Rongjeng - Mangsang Adokgre (RMA) Road Corridor in East and North Garo Hills, several local infrastructures are likely to be temporarily affected during construction activities. These include small community

water supply lines, roadside drains, and minor irrigation channels that cross or run parallel to the alignment, particularly near agricultural fields and settlements. In addition, village access roads and footpaths connecting habitations to the main road may face temporary obstruction due to earthwork, material storage, or machinery movement.

These facilities play a vital role in supporting domestic water use, crop irrigation, and local connectivity. Therefore, proper identification, protection, and timely restoration of these utilities are essential to avoid disruption of community services. The project design and construction management plan include provisions for relocation or reinstatement of affected utilities in coordination with local departments and village councils, ensuring that road construction progresses without adversely impacting local livelihoods or essential services

5.4.2.13 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.

5.4.2.14 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 inhalation, contact with sharp objects	Injury from collapsing sides, respiratory issues, cuts and bruises	a) Use proper shoring and benching of excavations b) Restrict unauthorized entry- Provide dust masks and PPE c) Regular inspection of slopes and trenches	Contractor / Site Engineer
Operation of heavy machinery (excavator, roller, grader, paver)	Machine entanglement, collision, vibration, noise	Physical injury, hearing loss, fatigue	d) Only trained operators e) Maintain equipment regularly f) Use reverse alarms, lights, and mirrors g) Use ear protection and seat belts	Contractor / Safety Officer
Material handling and lifting (manual or crane	Dropped loads, back injuries, entanglement	Fractures, strains, crushing injury	h) Inspect lifting equipment and slings	Contractor / Safety Supervisor

use)			i) Train workers on safe lifting techniques j) Use tag lines and certified riggers- Prohibit standing under suspended loads	
Asphalt and hot mix plant operation	Burns, inhalation of fumes, fire hazard	Thermal burns, respiratory irritation	k) Use heat-resistant gloves, long sleeves l) Maintain fire extinguishers near site m) Ensure good ventilation- Prohibit smoking near bitumen storage	Plant Operator / Safety Officer
Working near traffic / along existing road	Collision with moving vehicles, poor visibility	Fatal accidents, severe injuries	n) Implement Traffic Management Plan- Install warning signs, cones, and barricades o) 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	p) Use full-body harnesses and guardrails- Provide safety nets and helmets q) 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	r) Provide face shields and gloves s) Ensure proper earthing of welding sets t) Keep fire extinguishers nearby- Maintain distance from flammable material	Contractor / Electrical Supervisor
Fuel and chemical storage / handling	Fire, explosion, spillage	Groundwater contamination, burns, inhalation	u) Store in bunded area with 110% capacity- Provide spill kits and firefighting equipment v) Train staff on spill response- Maintain MSDS	Contractor / Store In-charge

			at site	
Labour camp and sanitation facilities	Poor hygiene, contaminated water, waste mismanagement	Disease outbreak, worker illness	w) Provide potable water (≥5 L/person/day)- Maintain toilets and waste bins x) Regular disinfection and waste removal- Conduct health check-ups	Contractor / Camp Supervisor
Noise and vibration from machinery / DG sets	Prolonged exposure to high noise levels	Hearing loss, stress, fatigue	y) Use silencers and acoustic enclosures- Restrict operation to daytime z) Rotate workers and provide ear protection- Monitor noise levels regularly	Contractor / Environmental Officer
Electrical works (temporary wiring, lighting)	Short-circuit, electrocution	Shock, burns, fire	aa) Use insulated tools and cables- Regular inspection of wiring bb) 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	cc) Schedule work during cooler hours- Provide shaded rest areas dd) 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	ee) Segregate and reuse materials- Dispose at approved sites ff) Cover trucks during transport- Provide gloves and masks	Contractor / Site Engineer

5.4.2.15 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.

5.4.2.16 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.

5.4.2.17 ANTICIPATED IMPACTS ON BIOLOGICAL ENVIRONMENT (ESS6)

The Rongjeng – Mangsang Adokgre (RMA) 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 5.6** 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
Bufoides meghalayanus (Khasi Hill Rock Toad)	EN	Yes	No	Occurs in higher-elevation rocky ravines, moist forest microhabitats	Low	Road works limited to existing ROW; no alteration of rocky ravines or breeding microhabitats	Out
Pseudophilautus shillongensis (Shillong Bush Frog)	CR	Yes	No	Forest-dependent frog with very localized distribution	Low	No new forest clearing; rehabilitation does not change microhabitat conditions	Out
Gyps bengalensis (White-rumped Vulture)	CR	No	Congregatory	Wide-ranging scavenger; occasional presence possible	Low	No significant impact pathways; rehab works do not affect nesting or feeding ecology	Out
Gyps tenuirostris (Slender-billed Vulture)	CR	Yes	Congregatory	Similar to above; generalist scavenger	Low	No creation of new hazard; no critical habitat features within ROW	Out
Neofelis nebulosa (Clouded Leopard)	VU	Yes	No	Requires large, intact forest blocks	Very Low	Existing road already part of landscape; works do not fragment habitat further	Out

CR: Critically Endangered, EN : Endangered

Mitigation Measures for Biodiversity Management

The proposed Rongjeng – Mangsang Adokgre (RMA) 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

- **Biodiversity Awareness and Training:** Conduct orientation and awareness programs for workers and contractors on local biodiversity, wildlife protection, and the importance of avoiding hunting, poaching, or collection of forest products.
- **Tree Inventory and Compensatory Plantation:** Carry out a detailed tree inventory within the RoW before clearance and undertake compensatory plantation at a ratio of **1:3 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.
- **Wildlife Passage and Corridor Connectivity:** In areas of known wildlife movement, adopt measures such as **speed calming (rumble strips, signage, and table-topping)** and **timed movement restrictions at night** if necessary, to ensure safe passage.
- **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.
-

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:** Install 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.

5.4.2.18 IMPACTS ON AQUATIC ECOLOGY

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 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

Soil erosion was observed at chainage 42+100 near a proposed major bridge location, where protection work is required to stabilize the section. Major bridge is proposed at this location.
Environmental impacts such as riverbank erosion (42+200 and 42+300) will be addressed through improved drainage management and erosion control structures. Details are given below:

Chainage (km)	Issue / Environmental Impact	Type of Work Envisaged	Detailed Design Interventions / Description
42+200	Eroding riverbank observed	Riverbank protection works	• Construction of toe wall / bank protection • Provision of riprap or gabion revetment with geotextile underlay • Regrading and stabilization of bank slope • Turfing / vegetative measures for long-term stabilization
42+300	Continued erosion observed on riverbank	Riverbank erosion control works	• Strengthening of eroding left bank using gabion revetment / riprap • Stone apron or toe protection to arrest scour • Drainage improvement to prevent runoff-induced erosion • Vegetative slope stabilization

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.

5.4.2.19 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 RMA 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 heavy 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 RMA road is not expected to have significant social impacts on roadside communities, as 31 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 5 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.

Several environmentally sensitive locations were identified along the road alignment, notably at Chainage 31+100 (Right-Hand Side: LP School), Chainage 33+200 (Left-Hand Side: LP School), and Chainage 39+200 (Left-Hand Side: Church). To address safety concerns and minimize environmental and social impacts in these areas, a range of enhancement measures have been proposed. These include the provision of pedestrian pathways and designated crossings in settlement areas and near sensitive roadside developments. In addition, cautionary signboards, speed limit signage, proper street lighting, and road dividers will be installed at accident-prone stretches to enhance road safety. Specific traffic management measures will be implemented near schools, colleges, and weekly local markets to ensure the safety of students and other vulnerable road users. Furthermore, to improve safety for commuters, elderly persons, and school children, enhanced signage, zebra crossings, and other pedestrian-friendly features will be established, particularly at bus stops, junctions, and densely populated settlement areas.

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

Potential Risks & Impacts

The proposed road alignment will impact only 31 ha of additional land and involves 5 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. 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 RMA 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.

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:

a) Ensure continuous access to essential services, particularly healthcare and educational institutions, through alternate routes or temporary walkways.

b) Provide advance information to communities regarding construction schedules, traffic diversions, and safety measures through local notice boards and community meetings.

c) Establish priority crossing points and temporary access for elderly persons, school children, and differently abled individuals.

d) Engage local women's groups, self-help groups, and village councils in monitoring safety and access conditions during construction.

e) 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 behavior 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. GBV Action Plan is attached as **Annexure 5.4.**

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 improvement 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 East Garo Hills and North Garo Hills have 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 5.5**. Potential impacts of Climate Change trend on road transport infrastructure is provided in **Table 5.7**.

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 (2,020.0 mm in 2020 for East Garo Hills and 1968.5 mm in 2020 for North Garo Hills) 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. - .	• 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 has been adopted. • In terms of floodwater conveyance to prevent stagnation, closed concrete drains in settlement pockets have been considered. • 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	• East Garo Hills-Maximum temperature rising from 22°C to 33 °C • North Garo Hills-Maximum temperature rising	• - Higher temperatures cause thermal expansion of road materials, leading to surface cracks. • - Softening of asphalt during hot	a. An adequate binding layer thickness has been proposed to offset the wear, surface fatigue, and rutting under climate stresses. b. In terms of pavement integrity, the choice of viscosity grade VG30

	from 17.1°C to 29.1 °C	days can cause deformation and rutting.	has been maintained
Landslide Risk	• - Frequent rainfall and runoff events increase landslide susceptibility in the district's terrain	• - Roads in hilly areas may face closures due to landslides. • - Increased repair costs for damaged road sections and disrupted connectivity to remote areas.	

Disclaimer: This is a draft version and is under review by the World Bank

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 Kharkutta and Rongjeng blocks 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	Existing Single/Intermediate lane carriageway

	paved surface is being developed with geometric improvements	with poor geometry
Design Speed	(30-50 kmph for Intermediate lane)	30-40 kmph entire project section.
Congestion in Settlements	Improved carriageway with good surface and separated footpath with railing in built-up area reduces interaction of pedestrians with through traffic resulting in reduction of vehicular emissions, reducing travel time and vehicle operating cost. This in turn contributes to lowering of GHG emission; and may improve people/public health due to no or low exposure period.	Lack of road or lack of good road surface with shoulder and foot path, congestion and frequent vehicle stoppage due to mixing of local, pedestrian and through traffic will increase localized accumulation of vehicular emission with potential impacts on human health and contribute to generation of GHG emission.
Felling of roadside trees	Felling of both old and young trees. Old and weak trees near the road edge shall be a road hazard and shall be felled. Ten times of felled trees, the number of new young and healthy saplings to be planted as 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	These issues remain un-addressed without the project

	adequate hydraulics.	
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 consequent increase in connectivity.	Social development activities are likely to be significantly constrained due to the severe inadequacy of infrastructure.
Financial and Economic Analysis	Project financially viable for upgrading from existing lane configuration to intermediate lane configuration.	The cost of maintenance while catering to the projected higher traffic, accident cost, Vehicle operating cost & travel time cost shall be higher.

6.3 ENVIRONMENTAL AND SOCIAL ALTERNATIVES (TO SPECIFIC ONCE) CONSIDERED FOR THE PROPOSED STRETCH

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

Table 6.2: Alternative considerations for Minimization of Environmental Impacts

Sl. No.	Measures	Observations By EIS Team	Mitigation Inputs By DPR
1.	**Design measures**	Existing road is very poor and mostly earthe up to 18.5 km. only 3.5 km is Paved road. Physically observation for Geological conditions is 2–3 m overburden, 5–8 m weathering and rest is rock. Road is pass through partially plain and partially hill.	• Improvement of road geometry, convex mirror on curves and junction management for road safety. • Provision of cross drainage structure.
2.	**Environmental enhancements**	Environmental sensitive locations are • Chainage 31+100 (RHS: LP School).	• Provision of pedestrian paths and crossings at settlement and sensitive roadside developments.

		• Chainage 33+200 (LHS: LP School). • Chainage 39+200 (LHS: Church).	• Appropriate safety measures such as cautionary sign boards to limit the speed at accident prone stretches along with proper lights and dividers. • Traffic Management measures must be advised near school, colleges and weekly local market. • To enhance safety on road for commuters, students and elderly person, enhanced signage measures, zebra crossing to cross the road particularly at the junctions / bus stop/ Settlement locations.
3.	**Improvement of Landslide Prone Areas**	The landslide/land slip prone areas were observed along the road.	In identified landslide areas, enhance design parameter should be used keeping in mind the changing climate and past disasters DPR consultant has been advised accordingly to consult Geotech specialist and provide landslide treatment plan.
4.	**Construction and Labour Camp design**	Location of Labour Camp will be decided in consultation with the Nokma and local community.	-
5.	**Escape of Polluting Materials**	The main potential source of polluting materials arising from the project is lubricating oil spill/leakage and spoil material from construction activities entering the soil and groundwater either directly or indirectly through the drainage and open streams. Lubricating oil, solvents, and fuel that may be used by the contractor, should be stored within concrete or brick buildings designed for such purposes.	• The oil/fuel storage building should be a well-ventilated, roofed structure, with an impermeable floor. A berm should be integrated into the entranceway, so as to create a shallow holding tank in the event that oil or fuel products are accidentally spilled or released from a drum or tank. Fire extinguishers of the type suitable for fighting an oil or fuel fire should be positioned within and outside of any oil/fuel storage building. • Oil spill clean-up materials (sorbent pads, loose sorbent material, etc.) should be stationed in any oil/fuel storage building in clearly labelled containers. • Liquid waste management systems

			will be installed to ensure that there will be no unacceptable impacts on the surrounding land or water bodies. The labour camp drainage system should be carefully designed to prevent possible flooding of the camp area and should be directed through an oil and grease separator before discharge to the ground outside the site.
6.	**Slope Stabilization**	Existing road is partially hill and poor in condition. Work for slope stabilization will be done from Ch: 26 + 360 to Ch: 42+825.	Since the proposed project is a partially hill project the design measures shall include implementing slope stabilization techniques such as retaining walls, rock bolts, and geotextiles to prevent landslides and erosion.
7.	**Muck Disposal Plan**	Muck is to be generated during construction actives. Muck disposal sites has not identified.	DPR consultant proposed that the Proposed Typical Cross Section accommodated within the Existing Right of Ways (if any Improvement needed as per Geometric Design/Improvement), Additional Land will be taken, the Details of Proposed location, details will be shared within the 10 Working days to Concerned ESIA Consultants for identification of Land Type and Nature etc.
8.	**Noise Assessment**	Noise modeling to be carried out based on baseline conditions.	Assessment to justify the need or avoidance of noise barriers.
9.	**Curve improvement**	Chainage 26+500: Curve improvement may be required for safety.	Improvement of road geometry, convex mirror on curves and junction management for road safety.

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.
- 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.
- Existing road is in poor condition—mostly earthen up to 18.5 km, only 3.5 km is paved. Geological conditions: 2–3 m overburden, 5–8 m weathering, and rest is rock. Road passes through partially plain and hilly terrain. Facing serious problem of water logging during monsoon season.

During the Environmental and Social Impact Assessment (ESIA), several landslide and landslip-prone zones were identified along the road alignment, particularly in hilly sections. These areas pose significant risks to road safety, structural integrity, and long-term sustainability. Recognizing the increased vulnerability due to climate change and past disaster occurrences, the DPR consultant has been directed to work in close consultation with geotechnical specialists to develop a comprehensive landslide treatment plan.

This plan will include site-specific engineering solutions such as retaining walls, slope regarding, installation of rock bolts, drainage control systems, use of geotextiles, and vegetation restoration to ensure slope stability. The design interventions will be guided by the latest geotechnical data and best practices in climate-resilient infrastructure. Additionally, the consultant has been advised to consider real-time monitoring and early warning systems in particularly high-risk zones, ensuring both proactive and reactive landslide management during and after construction.

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

Stakeholder Major Group	Project Stakeholder
Project-Affected Parties	• Village community • Street side Shop Owners • Shop owners (NTH) Residential structure owners Nokma
Government agencies	• Public Works Department (Roads), Meghalaya (MPWD) • 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 (East Garo Hills & North Garo Hills) • District Legal Services Authority • District Child Protection Unit • Office of the Child Development Project Officer • Nokma • Jawahar Navodaya Vidyalaya, Bajengdoba, North Garo Hills.
Civil society organizations	**EAST GARO HILLS** • Kusimkolgre Youth Association • Shg of Kusim Rongmitel Warima Womens SHG • Simsang Narimkol Women SHG • Catholic Church Mendal • Loyola College Williamnagar • Rongjeng Catholic Church

	NORTH GARO HILLS • Impulse NGO Network and Bethany Society, • North Garo Hills Women's Self-Help Group Federations – grassroots women's groups working on livelihood and welfare • Church-based Organizations (Baptist / Catholic Missions) – significant role in education, health, and social services across villages
Community Based Organization	Bio-Diversity Management Committee/Joint Forest Management Committee/Eco Development Committee
Vulnerable groups	▪ 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.

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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
1.	Nong kong kil	20-08-2025	Women	• Participants appreciated the project and acknowledged its positive impact on the community. • Highlighted concerns about extremely poor condions of the road. • Community expressed concerns that present condition of roads are such as narrow carriageway, lack of speed breaker, poor surface condition and lack of road safety and signages. They showed interest in Construction and improvement of road. • Local community expressed concerns that good drainage	• Construct smoother roads to enhance accessibility and improve transportation. • Prioritize immediate repairs to address safety and mobility concerns in the community. • Providide Drainage, Culverts, slope protection.	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
				network system can help in prevention of erosion and land degradation in hilly terrains and therefore increase in agricultural productivities.		
2.	Rema gittim	20-08-2025	Commuter	• Participants raised concerns about the ongoing streetlight problem, emphasizing the need for better illumination for safety. • The current road conditions are poor and not smooth, which impacts accessibility and transportation. • They practice Jhum Cultivation with different kind of vegetables like ginger, with banana and tree bean.	• Ensure the installation of adequate streetlights throughout the village to improve safety and visibility, particularly at night. • Prioritize road maintenance and improvement to address the poor conditions, ensuring smooth and accessible transportation routes for commuters. • Integrate support for sustainable agricultural practices into the project design, including resources for Jhum cultivation, to enhance productivity and diversify crops.	
Key Informant Interview						

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
3.	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.	

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.	▪ Table topping will be done for smooth movement of elephant. Existing RoW should be maintained at community land with vegetation and Elephant passing	

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	▪ Preliminary observations from an18.27km site visit o 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.	▪ 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 affected	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					stretches.	
6.		24/09/2025	Street Vendor	Participants expressed satisfaction with the initiative and recognized its potential to bring meaningful improvements to the community.	Develop improved road surfaces to facilitate smoother travel and strengthen overall connectivity in the area.	
Youth						
7.		23/10/25	Youth (8 No.)	• The community highlighted a shortage of local livelihood opportunities, limited access to vocational training, and the absence of organized platforms for career support and guidance. • Out-migration remains a frequent response to these gaps, often accompanied by difficulties related to social adjustment and economic instability.	• Introduce targeted training and skill-upgradation initiatives aimed at enhancing the capabilities of local community members. • Promote small-scale income-generating activities by facilitating the development and expansion of local microenterprises.	
Women FGD						

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
8.		10.07.2025	Women (5)	• Women have shown interest in engaging in income-generating activities; however, their participation remains limited due to inadequate livelihood options, social constraints, and lack of organized support systems. • The community highlighted the need for targeted interventions that strengthen women's capacity through improved skill training, enterprise development, and better access to services and infrastructure.	• Introduce dedicated livelihood and capacity-building initiatives that focus on improving practical skills among women. • Strengthen the participation of women's Self-Help Groups (SHGs) by engaging them in project-related tasks such as community outreach, supervision activities, and maintenance of created assets.	

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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 4th September 2025 and 9th October 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 (4th September 2025 and 9th October 2025), the first FPIC consultations (04 September 2025), the second FPIC consultation (25 September 2025)and Third round FPIC consultation (09 October 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 04.09.2025 at 1. Nongkongkil LP School. Nongkongkil Village, block- Rongjeng, East Garo Hills at 1.30 PM with a total of 27 participants. 2. at Memillam/Mawdipara Community Hall, Modipara Village block-Kharkutta, North Garo Hills at 4.30 PM with a total of 25 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 miserable condition of road and of increase in road width in case of

improvement of road to intermediate lane. 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 RMA Road was by the ESIA team on **25.09.2025** at 1. *Nongkongkil Community Hall, Nongkongkil Village block- Rongjeng, East Garo Hills at 1*.30 PM with a total of 68 participants, 2.at *Memillam/Mawdipara Community Hall, Modipara Village block-Kharkutta, North Garo Hills at* 4.30 PM with a total of 45 participants. 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), Kharkutta 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, 113 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 on dated 9th October 2025 at 1. Memillam Village at 3:00 pm, 2. Nongkangkil Village at 1:00 pm. 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), Resubelpara 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, 255 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 thorugh 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 summaried 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**.

Details of FPIC 1 Meeting at Nongkongkil LP School.

1. **Project Overview:** The Chair provided a brief overview of the project, including its objectives, scope, and key components. He highlighted the anticipated benefits and strategic relevance of the project in advancing regional development and improving connectivity.
2. **Discussion on Potential Impacts:** A detailed interaction was held with community representatives from surrounding villages to discuss potential social, environmental, and cultural impacts of the project. Key concerns addressed included:
    - **Requirement of private and community-owned land**
    - **Cutting of trees and clearance of vegetation**
    - **Shifting of utilities**
    - **Construction-related disturbances such as noise and dust**
3. **Community Role in Decision-Making:** The meeting highlighted the crucial role of local communities in the planning and implementation stages of the project. Active community engagement and cooperation were acknowledged as essential factors for the project's success.
4. **Explanation of FPIC and Consultation Process: The Standard Operating Procedures (SOPs) for conducting Free, Prior, and Informed Consent (FPIC) were outlined, detailing a three-tier consultation framework:**
    - **First Meeting:** Initial engagement and awareness on FPIC
    - **Second Meeting:** Formal FPIC at the village level, involving village heads, MAC members, NGOs, women's groups, and elders. Discussions focused on project design, anticipated impacts, and gathering community input to shape the Resettlement Action Plan (RAP) and Indigenous Peoples Development Plan (IPDP)

- **Third Meeting:** Presentation of consolidated feedback to the council, leading to a formal declaration. Final FPIC will be undertaken after the completion of the Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), RAP, and IPDP

Additionally, the Environmental and Social Management Framework (ESMF) and ESIA were briefly introduced. It was emphasized that experts would be engaged to facilitate communication between the government and local communities.

5. **Community Feedback:** During the open forum, community members shared their views and offered support:
    - Shri Chanchan Momin, Sordar of Nongkongkil, expressed strong support for the project, affirming the community's willingness to contribute land for development purposes.
    - Smt. Precila Marak, Nokma of Nengkram/Morangga, formally conveyed her community's consent and confirmed there were no objections to the proposed road alignment.
6. **Grievance Redressal Mechanism:**

    Shri Nilberstone Sangma, Assistant Executive Engineer, PWD (R), Kharkutta Sub-Division, elaborated on the Grievance Redressal Mechanism (GRM) designed to address and monitor project-related concerns. The "Rongkongkil Grievances Redressal Mechanism Committee" was officially constituted, with further details provided in Annexure-A.
7. **Conclusion and Vote of Thanks:** The meeting concluded with a vote of thanks by **Shri Nilberstone Sangma**, who acknowledged the active participation, valuable input, and cooperative spirit of all attendees.

Details of the FPIC 1 Meeting at Memillam/Modipara Community Hall

1. **Project Briefing:** Shri Bester Ch. Marak, Executive Engineer, PWD (R), Kharkutta Division, provided a comprehensive overview of the proposed road development project. His presentation included:

    Project Objectives and Scope

    Planned Activities and Implementation Timeline

    Expected Benefits for the Region

    He also addressed potential environmental and social impacts, including:

    Requirement of private and community land

    Tree cutting and vegetation clearance

    Shifting of utilities

    Construction-related disturbances such as noise and dust
2. **Community Engagement and Decision-Making:** The session underscored the pivotal role of local communities in the planning and execution of the project. The discussion focused on:
    - Collaborative and transparent decision-making
    - Respect for indigenous rights and cultural values
    - Ensuring that community voices are integrated at every stage
3. **Explanation of FPIC Process:** Shri Bester Ch. Marak outlined the Standard Operating Procedures (SOPs) for conducting FPIC, structured around a three-tier consultation framework:

- **First Meeting:** Awareness and initial engagement with community leaders and stakeholders
- **Second Meeting:** Formal village-level FPIC, involving village heads, MAC members, NGOs, women's groups, and elders. The session will focus on project design, identified impacts, and community inputs to inform the Resettlement Action Plan (RAP) and Indigenous Peoples Development Plan (IPDP)
- **Third Meeting:** Presentation of consultation outcomes to the council for formal declaration. Final FPIC will follow the completion of the Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), RAP, and IPDP

The Environmental and Social Management Framework (ESMF) and ESIA were also introduced, with emphasis on the involvement of qualified experts to strengthen community-government trust and collaboration.

4. **Community Feedback:** During the open forum, the following community members provided input and support:

Shri Sengbat Momin, Sordar of Modipara/Memillam, expressed strong support, affirming that the community welcomes regional development.

Shri Barmingthon Sangma, representative of the Nokma, confirmed there were no objections to the project and that the community is prepared to contribute land.

Shri Predolin Sohpoh, Secretary of Modipara/Memillam, stated that formal consent has already been granted, and there are no objections to the proposed road alignment.

5. **Grievance Redressal Mechanism:** Shri Nilberstone Sangma presented the structure and function of the Grievance Redressal Mechanism (GRM), highlighting its role in joint monitoring and resolution of project-related concerns in coordination with local stakeholders.
The "Memillam Grievances Redressal Mechanism Committee" was officially formed, with further details provided in Annexure-A.

6. **Conclusion and Vote of Thanks:** The meeting concluded with a vote of thanks from Shri Nilberstone Sangma, who acknowledged the active participation, positive feedback, and ongoing cooperation of all attendees.

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Figure 7.1a: Photograph of 1st FPIC meeting held on 04.09.2025 at *Nongkongkil LP School. Nongkongkil Village, block- Rongjeng at 1*.30 PM


The Nokmas, Sordars, PAPs and the Government Officials interacting during the FPIC

Conducting the formation of Grievances Redressal Mechanism during the FPIC

Figure 7.2b: **Photograph of 1st FPIC meeting held on 04.09.2025 at *Memillam/Mawdipara Community Hall, Modipara Village block-Kharkutta, North Garo Hills at 4.30 PM***

Details of 2nd FPIC at Nongkongkil LP School. *Nongkongkil Village, block- Rongjeng, East Garo Hills*

1. **Project Presentation:**

Shri Neeraj Kumar, DPR Consultant from RODIC, presented the proposed road design, alignment, and technical drawings, highlighting specific sites likely to be impacted during construction. Shri Bester Ch. Marak translated the presentation into the local dialect and reiterated the purpose of the consultation, emphasizing the importance of stakeholder engagement as per World Bank guidelines.

2. **ESIA Findings and FPIC Protocol**

The Executive Engineer provided a detailed explanation of the FPIC framework and associated procedures, with a focus on environmental and social safeguards.

- **Purpose and Scope:** Highlighted project objectives, expected benefits, and potential impacts
- **FPIC Protocol:** Emphasized inclusive, multi-level consultations involving village heads, MACs, NGOs, women's groups, and elders
- **Environmental and Social Safeguards:**
    - Overview of the Environmental and Social Management Framework (ESMF) including:
        - Environmental and Social Impact Assessment (ESIA)
        - Environmental and Social Management Plan (ESMP)
        - Resettlement Action Plan (RAP)
        - Indigenous Peoples Development Plan (IPDP)
    - Engagement of experts to facilitate community-government dialogue
- **Identified Impacts:**
    - Land: Minor impacts; voluntary donations limited to 10% of household holdings
    - Structures: Potential effects on Common Property Resources (CPRs), boundary walls, staircases, and gates
    - People: Impacts on non-title holders, including street vendors

- Consent Process: Involves both individual and collective community consent. If not achieved in this round, efforts will continue in Round 3
-

3. Positive Impacts of the Project

The Executive Engineer highlighted the potential benefits of the project, including:

- Employment generation during construction
- Enhanced year-round connectivity
- Improved public amenities: bus shelters, toilets, market sheds, etc.

4. Construction-Induced Impacts & Mitigation Measures

Potential adverse impacts and corresponding mitigation strategies were discussed:

- Pollution (air, water, noise, and soil)
- Influx of labor and potential social challenges
- Temporary loss of access to CPRs
- Risks to vulnerable zones

Mitigation measures were explained and feedback from the community was incorporated.

5. Site-Specific Planning (DPR & ESIA)

Discussions were held to identify suitable locations for:

- Labour camps
- Borrow areas (if required)
- Waste disposal sites

Community members were requested to assist in identifying sites that minimize disruption and avoid sensitive zones.

6. Focused Group Discussions (FGDs)

Separate Focused Group Discussions were conducted with male and female participants:

- Men's Group:
  Participants included Shri Xavier Sangma (Bolbillong), Shri Chanchan Momin, Shri Pensinath Sangma, and Shri Gasper Momin (Nongkongkil).
  Key proposals:
  - Construction of a bus waiting shed, kitchen shed, market shed, public toilet, and storage sheds at Nongkongkil
- Women's Group:
  Discussion focused on gender-specific concerns, challenges faced by youth, and proposed interventions

7. Indigenous Peoples Development Plan (IPDP)

The Executive Engineer elaborated on the IPDP within the broader ESMF/ESIA framework:

- Reaffirmed the protection of indigenous rights under World Bank-financed projects
- Invited community inputs on feasible development interventions
- Clarified that all proposals would be assessed for viability but may be subject to project scope and budget limitations

8. Open Discussion

Community members actively contributed, expressing broad support for the project:

- Shri Chanchan Momin, Sordar of Nongkongkil, expressed full support and a willingness to donate land for road widening and curve improvement
- Shri Kynsai Marak raised concerns about marketing challenges due to poor road conditions and requested protective structures (retaining/breast walls) for hillside households.

- The Executive Engineer assured inclusion of these components in the Detailed Project Report (DPR)

- Shri Rongmen Momin, Shri Brewing Sangma, and Shri Borwell Momin (Memillam) shared hardships faced due to the lack of an all-weather road and offered voluntary land donation for road widening under the RMA Road

9. Grievance Redress Mechanism (GRM)

The "Rongkongkil Grievance Redressal Mechanism Committee" was reconstituted under the chairmanship of Shri Nilberstone Sangma, AEE, PWD (R), Kharkutta Sub-Division. Details of the committee's structure and responsibilities are provided in Annexure A.

10. Conclusion and Vote of Thanks

Shri Bester Ch. Marak provided a summary of the proceedings and expressed sincere gratitude to all attendees for their active participation, constructive feedback, and continued support for the project.

Details of 2nd FPIC at Memillam/Mawdipara Community Hall, Modipara Village block-Kharkutta, North Garo Hills

1. Opening Remarks

The meeting began with a welcome address by Shri Nilberstone Sangma, who acknowledged the presence of Nokmas, Sordars, and other community members. He read aloud the minutes of the first FPIC meeting, setting the tone for the current discussion.

2. Project Presentation

Shri Neeraj Kumar, DPR Consultant from RODIC, presented the project design, drawings, and alignment. The presentation was translated into the local dialect by Executive Engineer Shri Bester Marak, who also emphasized the importance of stakeholder consultation as per World Bank guidelines.

3. ESIA Findings and FPIC Process

Shri Bester Marak gave a comprehensive overview covering the following points:

- **Purpose & Scope**:
  Outlined the project's objectives, benefits, and possible impacts on the community.
- **FPIC Protocol**:
  Explained **the Free, Prior, and Informed Consent (FPIC)** process involving three rounds of consultation to ensure full community participation in decision-making.
- **Environmental and Social Management Framework (ESMF)**:
  Discussed components like ESIA, ESMP, RAP, and IPDP, and the role of experts in fostering trust between the government and community.
- **Identified Negative Impacts**:
  - **Land**: Minor impacts, with land donation not to exceed 10% of household holdings.
  - **Structures**: Possible effects on community properties (CPRs), such as boundary walls, gates, and staircases.
  - **People**: Noted impact on **non-title holders**, such as street vendors.
- **Consent Process**:
  The process for individual and community consent will be facilitated by ESIA consultants and PWD. If consent is not secured in this round, it will be pursued during FPIC Round 3.

4. Positive Impacts of the Project

The Executive Engineer highlighted several benefits:

- Employment generation during the construction phase.
- Development of public amenities: bus sheds, market sheds, kitchen sheds, and public toilets.
- Improved connectivity, enabling efficient transportation of agricultural produce to nearby markets, especially across the border to Assam.

5. Construction-Induced Impacts & Mitigation

Potential environmental concerns during construction were discussed:

- Noise pollution, air pollution from machinery and dust, and water/soil contamination due to improper waste disposal.
- The Engineer assured the implementation of appropriate mitigation measures.
- Concerns regarding labour influx due to limited availability of local skilled workers were addressed with proposed strategies.
- Special attention was given to health risks and impacts on vulnerable areas.

6. Site-Specific Planning (DPR & ESIA)

Discussions were held on the need to identify suitable land for:

- **Labour camps**
- **Borrow areas** (if needed)
- **Waste disposal sites**

Villagers agreed to **cooperate fully** in identifying appropriate locations for these purposes.

7. Indigenous Peoples Development Plan (IPDP)

The **Executive Engineer** explained the significance of the **IPDP** under the ESMF/ESIA:

- Stressed the protection of indigenous rights.
- Discussed community needs and possible inclusions.
- Clarified that not all requests can be accommodated due to feasibility constraints.

8. Open Discussion

Community members expressed **strong support** for the road project. Key highlights include:

- **Shri Rongmen Momin, Shri Brewing Sangma, and Shri Borwell Momin (Memillam)**
  Spoke on the longstanding hardships due to the lack of an all-weather road and pledged land donation to support the project.
- **Shri Naman Sangma**
  Requested construction of market sheds and bus waiting sheds, offering free land for these facilities. Also committed to donating land for an RCC bridge at the 30th km to improve road curvature.
- **Shri Kingson Momin**
  Emphasized difficulties in accessing markets and essentials, affirming the community's readiness to submit written consent with joint signatures during FPIC Round 3.
- **Shri Rodin Momin**
  Requested the construction of a bus waiting shed at Memillam.
- **Shri Sengbat Momin**
  Inquired about the project timeline. The Engineer clarified that the schedule is still under process.

9. Grievance Redress Mechanism (GRM)

The previous GRM committee (formed on 4th September 2025) was officially dissolved. A new First-Tier Grievance Redressal Committee for Memillam was constituted. Details of executive members are available in Annexure-A.

10. Conclusion & Vote of Thanks

Shri Bester Marak summarized the key outcomes of the meeting and extended a vote of thanks to all attendees for their active participation and support.

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

Figure 7.3a: **Photograph of II FPIC meeting held on 25.09.2025 at *Nongkongkil Community Hall, Nongkongkil Village block- Rongjeng, East Garo Hills at 1.30 PM***

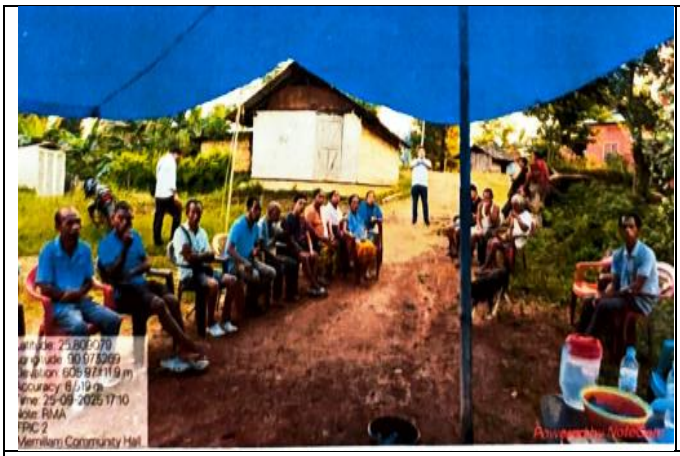

Figure 7.4b: **Photograph of II FPIC meeting held on 25.09.2025 at *Memillam/Mawdipara Community Hall, Modipara Village block-Kharkutta, North Garo Hills at 4.30 PM***

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Summary of Proceedings – Third Round FPIC Meeting

The third FPIC meeting for the proposed upgradation of Rongjeng – Mangsang Adokgre (RMA) Road was chaired by the Assistant Executive Engineer, PWD (Roads), Kharkutta Devision, 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 land requirement 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:

During the consultation meeting, various project-related issues were raised by the community members. The key points discussed included:

- Queries regarding the timeline for commencement of construction activities and issuance of the work order for the proposed improvement and upgradation works.
- Concerns over the quality of previous works along the same road stretch, with expectations that the upcoming project will ensure higher construction standards and improved workmanship.
- Requests for access to a photocopy of the Detailed Project Report (DPR) so that villagers can better understand the proposed designs, alignment, and work components.
- Clarifications sought regarding compensation for any structures that may require dismantling during the widening or construction process.
- Questions related to land donation and implications for both private and community (A'king) land.
- Community demands for additional facilities such as Bus Waiting Sheds, Toilets (separate for male and female), Market Sheds, and an Inspection Bungalow at designated locations along the project corridor.

Written consent for the construction of structures was formally given by:

- Nokma of Nengalang A'king – Smti. Kresbina Sangma
- Nokma of Nongbak Jajil A'king – Smti. Lajush Sangma

They, along with the residents of both A'king lands, agreed to allow construction of:

I. Bus Waiting Shed and Toilet at Mawdipara (37th km)
II. Bus Waiting Shed and Toilet at Memillam (38th km)
III. Bus Waiting Shed and Toilet at Tingba (44th km)
IV. Dumping of debris/earth at chainage 44th km of Rongjeng–Mangsang–Adokgre Road
V. Construction of Inspection Bungalow (IB) at Memillam (38th km)
VI. Bus Waiting Shed and Toilet at Jajil Junction (32nd km)
VII. Market Sheds, Bus Waiting Sheds, and separate male & female Toilets at Memillam Market Area (37th km)

ESIA Findings:

The Environmental and Social Impact Assessment (ESIA) indicated minimal land requirements for the project. Any temporary impacts associated with the civil works were acknowledged, and appropriate mitigation measures were explained to the community.
The project is expected to significantly improve connectivity, enhance road safety, and generate local employment opportunities during the construction phase.

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Project Features and Clarification Provided:

The Assistant Executive Engineer, Shri Nilberstone Sangma, along with the Consultant (RODIC), briefed the participants on project features, alignment plans, and technical details. Key clarifications included:

- The project is funded by the World Bank, and all bridges along the route will follow the intermediate lane width of 5.50 meters.
- Tendering is expected to begin soon, with work orders likely to be issued once all formal approvals are completed, tentatively by June 2026.
- Community members may submit any suggestions, objections, or grievances through the Grievance Redress Mechanism (GRM) during implementation.
- With respect to compensation, only a lump-sum amount may be provided for any dismantled structures, and the community's cooperation through land donation will play a major role in successful project execution.
- Detailed project drawings, surveyed alignment, and technical features were presented, and the community expressed satisfaction with the proposed design

Construction Phase Concerns:

The community was informed of possible impacts during the construction phase, along with mitigation steps to be undertaken:

- Likely impacts such as dust, noise, and road safety risks will be monitored and controlled as per prescribed guidelines.
- The PWD assured that worker behaviour, adherence to safety protocols, and strict site supervision will be enforced throughout the construction period.

Other Key Points:

- The Consultant and the PWD highlighted the importance of continuous cooperation between the community, Contractor, Consultant, and Government authorities to ensure smooth implementation.
- Community members emphasized that improved construction standards should be followed, addressing past concerns regarding workmanship.
- The Consultant reaffirmed that all grievances related to execution can be channelled through the GRM.

.**Conclusion:**

The FPIC-3 consultation concluded on a positive note. Participants confirmed their continued cooperation and support for the project's implementation. The Chairperson expressed gratitude to the Nokmas, village leaders, women's groups, NGOs, elders, and all community members for their active participation and valuable feedback.

Figure 7.5: **Photograph of III FPIC meeting held on 0.11.2025 at *Memillam Village at* 3.00 PM**

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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	➢ 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	➢ 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	➢ 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.	➢ 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	Sourcing materials from	➢ Procurement of construction material	Contractor	EC, Permits,	MPWD/CSC

	Material	unauthorized sources.	only from approved quarries and sites and licensed/ authorized vendors/ manufacturers. Contractor to produce approvals and receipts.		challans, Material source approval copies;	
6	Water	Pollution of surface and groundwater sources.	➢ The Contractor will be responsible for arranging adequate supply of water for the entire construction period. ➢ The contractor will minimize the pollution and wastage of water during construction	Contractor	Permission for Water source; Usage records; Wastewater management measures	MPWD/PMC/CSC
7	Appointment of Environment, Social and Safety Officers	Inefficient and incompetent supervision by contractors may lead to negative impacts on environment, Social, health and safety.	➢ The Contractor would prepare OHS plan and other required plans; as a part of CESMP, as per the WB guidelines. ➢ The contractor will appoint qualified and experienced Environment. Social and Safety personnel to ensure implementation of CESMP and occupational health and safety issues at the camps and construction work sites.	Contractor	To be mobilized before construction; approved OHS plan	MPWD/PMC/CSC
8	Identification of OHS Hazard and Risk Categorization	May cause physical harm, injury, illness, or death to workers.	➢ Conducting workplace inspections to identify hazards and document. ➢ Consulting with workers to identify hazards that may not be obvious to employers or safety professionals. ➢ Reviewing safety data sheets (SDSs) to collect information about the hazards of chemicals and other substances used in the workplace. ➢ Consulting with industry standards and regulations to identify specific hazards that must be addressed in the workplace.	Contractor	OHS hazard register; Inspection reports;	MPWD/CSC

9	Other Construction Vehicles, Equipment and Machinery	Vehicles and equipment not complying with regulations may lead to pollution of environment.	➢ The contractor will maintain records of fitness and Pollution Under Control (PUC) certificates for all vehicles and generators used during the contract period	Contractor	Records of valid PUC / fitness; Inspection log	MPWD/PMC/CSC
10	Tree Cutting	Loss of green cover and biodiversity	➢ Maximum efforts shall be made to minimize the number of trees to be felled. ➢ 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 design/scale/nature of protection measures including the efficacy of enhancement measures suggested in the ESMP. The MPWD shall maintain proper documentation and justifications/reasons in all such cases.	Contractor	Verification reports;	MPWD
12	Damage to existing eco-system due to borrowing activities	Indiscriminate borrowing activities may damage the eco-system and lead to unproductive environment	➢ The Contractor will have to obtain the Environmental Clearance for borrow areas. ➢ The borrow area will be operated as per the MoEFCC guidelines issued by the concerned SEAC and SEIAA.	Contractor	Borrow area EC copy; Approved management and closure plan	MPWD /CSC
13	Identification of construction material transportation route	Inconveniences and safety issues to the public due to the material transport vehicles.	➢ The material transport route through existing network of roads should be planned and approved by the local transport authorities. ➢ The local communities need to be consulted with prior information on	Contractor	Approved route plan; Community consultation record	MPWD/CSC

			any likely inconveniences.			
14	Identification of sites for debris disposal or wastes generated from construction camps and site offices	Pollution due to indiscriminate dumping of wastes. Wastes entering water bodies and groundwater causing pollution	➢ MPWD Division and the Contractor are responsible for identifying a suitable area in consultation with local administration to dispose of the wastes from labour camps, construction sites and site offices.	Contractor	Approved disposal site and its management plan; NOC, Agreement with landowner; Waste disposal records;	MPWD/CSC
15	Relocation of Utility and Common Property Resources (CPR)	Loss of services from utilities and common property resources for the public	➢ When the utilities/ Common Property Resources need to be shifted, they will be shifted in consultation with the communities and with least inconvenience to the public. ➢ If any displacement of Utility/CPRs is required, they will be relocated with prior approval of the concerned agencies. The relocation site identification will be in accordance with the choice of the community.	Contractor/ MPWD Division	Records of Relocation completion.	MPWD/ PMC/CSC
	CONSTRUCTION					
1	Crushers, Hot mix Plants & Batching Plants	Impacts due to establishment and operation of plants and equipment	➢ Crushers, hot-mix and batching plants shall be located at least 1000m (1km) away from residential/ settlements, forests, 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	Contractor	Approved layout plan; Valid NOCs/Consents; Dust suppression records; Air quality monitoring reports	MPWD/PMC/CSC

			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.			
2	Borrow Areas	Impacts due to improper operation and closing of borrow areas	➢ Borrow area should be located at a minimum distance of 300m from the residential/ settlement area. Proper barricading should be provided and access to the borrow areas should be restricted to the unauthorized persons. ➢ The Contractor should submit the EC, a copy of agreement with the landowner, borrow area management and closure plan before initiating any kind of borrowing activities.	Contractor	EC and lease copies; Approved Borrow area restoration and Closure plan	MPWD/PMC/CSC
3	Quarries	Impacts due to improper management, operation and closing of quarries	➢ The Contractor shall identify materials from legally valid quarries with existing NOC from the relevant departments. ➢ No quarry or associated plants can be set-up within 1000m from the residential/ settlement locations ➢ Contractor shall prepare a haul road network for quarry transport and ensure the suitability of such haul roads from the safety of residents, biodiversity and other environment points of views.	Contractor	Quarry permit, EC; Safety inspection report; Haul road maintenance record, dust suppression measure, geotagged photos	MPWD/PMC/CSC
4	Dismantling of Bridges/ Culverts/ Structures	Impacts due to improper dismantling and disposal	➢ All necessary precautions shall be taken while working near cross-drainage channels, to prevent earthwork, stonework, construction	Contractor	Debris disposal/reuse records; Approved Site restoration	MPWD/PMC/CSC

			materials from obstructing cross-drainage at rivers, streams, and drainage systems, or from causing flooding. ➢ Reusable materials (e.g., steel, stones, bricks) shall be segregated and stored properly for reuse or recycling. ➢ Non-recyclable debris and waste materials shall be transported to approved disposal sites identified and approved by the concerned authority. ➢ Disposal sites shall be located away from water bodies, agricultural lands, and other environmentally sensitive areas. ➢ Temporary barriers or silt fences shall be provided to prevent debris from entering watercourses. ➢ Upon completion, the associated disposal sites shall be restored to their original condition or as directed by the Engineer		plan; Photographic documentation.	
5	Bituminous waste disposal	Impacts due to hazardous wastes	➢ 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

			secure landfill sites approved by the concerned government authorities. ➢ No bituminous waste shall be disposed of in water bodies, open lands, agricultural fields, or along the roadside ➢ Periodic inspections shall be carried out to ensure compliance with waste management guidelines. ➢ Where feasible, recycling or reuse of scarified bituminous material in road base or other construction activities shall be promoted, subject to environmental and quality standards.			
6	Contamination of Soil	Soil pollution due to Oil and fuel spills from construction equipment and plants.	➢ 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	Contractor	Spill log; Waste oil disposal records; Fuel storage inspection record. Photographic documentation.	MPWD/PMC/CSC

			available at all fuel storage and handling locations. ➢ Used oil and lubricants shall be collected, stored in labelled, leak-proof containers, and handed over only to authorized aggregators/recyclers for disposal in compliance with applicable hazardous waste regulations. ➢ Records of fuel usage, storage, and waste oil disposal shall be maintained and made available for inspection. ➢ Stormwater runoff from fuel and equipment storage areas shall be 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.	➢ 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

			➢ 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.	➢ 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.	➢ 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	Over extraction or exploitation of	➢ Contractor to ensure optimum and judicious use of water;	Contractor	Water consumption log; Permission for	MPWD/PMC/CSC

	for project	ground/surface water will lead to water scarcity.	➢ 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.		water source; Installation of 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	➢ 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	➢ 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

			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			
13	Blasting	Unmanaged blasting result in health and safety issues and accidents.	➢ 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 requirement, 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.	➢ 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. ➢ Camps and storage yards shall be	Contractor	Tree felling register; Plantation record;	MPWD/PMC/CSC

			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.	➢ 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)	Contractor	Worker awareness attendance; Wildlife sighting log	MPWD/PMC/CSC
16	Aquatic Fauna	Construction activities and workers may cause harm to fauna.	➢ Any works affecting aquatic habitat will be done during low flow (when water depth is less than 5 m) and when banks would be dry. ➢ Where any GI wire mesh gabions are used; all GI wire ends need to be folded inside. ➢ Ensure that no construction activities will be carried out during monsoon and the fish breeding season.	Contractor	Work timing records; Site inspection checklist	MPWD/PMC/CSC
17	Occupational Health and Safety	When Occupational Health and Safety are compromised the associated risks from accidents and incidents could affect health and safety of the workers and others on constriction/ project sites. Improper first aid facilities on the sites could affect health and safety of workers and	➢ The Contractor would prepare OHS plan and other required plans as per the WBs guidelines. ➢ All the laborers to be engaged for construction works shall be screened for health and adequately treated before issue of work permits. ➢ Periodic health check-up of construction workers. ➢ Prevention of mosquito breeding need to be ensured at the project site and other ancillary areas	Contractor	Approved OHS plan; OHS training log; PPE checklist; Awareness programme and Health inspection reports	MPWD/PMC/CSC

		others.	➢ 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 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.	➢ 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 be allowed to any of the risk areas of the project, e.g., excavation sites,	Contractor	Safety signage installed; Community complaint register; Traffic control records	MPWD/PMC/CSC

			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.	➢ 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.	➢ 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 center or hospital for emergency treatment. ➢ Special Measures for COVID 19 should be strictly followed at the camp and construction site.	Contractor	Health screening record; Awareness session log; Medical report; Agreement with nearby hospital	MPWD/PMC/CSC
21	Risk of Natural Hazards	The project area is at risk from floods and Earthquakes.	➢ 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	➢ All reasonable precaution will be taken to prevent danger of the workers and the public from fire, flood, drowning, etc. ➢ All necessary steps will be taken for prompt first aid treatment of all	Contractor	Force majeure preparedness plan; Emergency contact list	MPWD/PMC/CSC

			injuries likely to be sustained during the course of work. ➢ Contractor has to prepare a response plan before start of construction works			
23	Hygiene	Impacts related to unhygienic surroundings	➢ 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.	➢ 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 centers. ➢ The contractor will ensure that the diversion/ detour is always	Contractor	Approved TMP; Signage/barricade checklist; Traffic incident register; geotagged photos	MPWD/PMC/CSC

			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	➢ 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
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	Workplace accidents and	➢ Establish a policy and ensure the	Contractor	Labour law	MPWD/PMC/CSC

	Welfare Laws and reporting	injuries, unsafe working condition, loss of productivity etc.	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.		compliance record; Training attendance record	
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,	➢ Establish a grievance redressal	Contractor	GRM register;	MPWD/PMC/CSC

		conflict and violence; Loss of trust and confidence	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		Grievance resolution records	
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
	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	➢ 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	➢ Regularly inspect slopes and embankments for erosion signs. ➢ Implement bioengineering measures like turfing, hydroseeding, and vegetation planting.	Contractor	Reports on Erosion inspection; implementation of mitigation measures; Drain	MPWD

			➢ Provide stone pitching, retaining walls, or gabions where needed. ➢ Maintain effective drainage systems to reduce concentrated runoff.		maintenance log	
3	Water Pollution from Road Runoff and Drainage into Water Bodies	Deterioration of surface and groundwater quality; Sediment and oil contamination in nearby streams or water bodies	➢ 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	➢ 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	➢ 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	➢ 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	Contractor	Noise monitoring results; Maintenance records	MPWD

			noise due to uneven pavement.			
7	Road Safety and Accident Risks	Traffic congestion; Increased likelihood of road accidents; Risk to pedestrians and local communities	➢ 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	➢ 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 reccords	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 2 consecutive years.		At 3 locations during operation stage where monitoring had been done during construction stage	18	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
Water	Construction	As per Drinking Water	Indian standards for inland surface waters (IS:2296,1982)	(surface water at 2 locations for 3 Seasons for 2 consecutive years.	As per Grab Sampling	Drinking water samples from the labour camps and from hand pumps.	24	Contractor through NABL accredited Laboratory and supervised by

Environmental Attribute	Timing	Parameter	Standards	Frequency	Duration	Location	Total no. of Samples during construction and operation stage.	Implementation
		Standards	and for drinking water (IS:10500-2012)	Gground water at 2 locations for 3 seasons for 2 consecutive years	guidelines	Surface water from the water courses near the work site and River.		Construction Supervision Consultant
	Operation			Surface water 2 locations for 3 Seasons for 1 years. Water (Ground water) at 2 locations for 3 Seasons for 1 years.		At 4 locations during operation stage where monitoring had been done during construction stage	12	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
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

Environmental Attribute	Timing	Parameter	Standards	Frequency	Duration	Location	Total no. of Samples during construction and operation stage.	Implementation
	Operation			3 locations for 3 Seasons for 2 consecutive years.		At 03 locations during operation stage where monitoring had been done during construction stage	18	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 2 consecutive years.		During operation stage where monitoring had been done during construction stage	12	Contractor through NABL accredited Laboratory and supervised by Construction Supervision

Environmental Attribute	Timing	Parameter	Standards	Frequency	Duration	Location	Total no. of Samples during construction and operation stage.	Implementation
								Consultant

*Except Monsoon

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

Table 8.3: Social Monitoring Plan

Indicator Category	Responsibility	Performance Indicators	Data Collection Method	Frequency
Resettlement & Livelihood Restoration	RP Implementation consultant/ MPWD	% of affected households receiving compensation & assistance	Household surveys, payment records	Quarterly
Labour & Working Conditions	Contractor/ CSC/ MPWD	Compliance with fair wages, working hours, safety	Labour camp inspections, interviews	Monthly
		% of local workforce employed in project	Contractor reports	Quarterly
Social Inclusion & Gender	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 8.4**. Reporting formats prepared by the CSC/PMC for the Contractor will serve as the basis for implementation by the Contractor and monitoring by the CSC, E&S Cell - MPWD. The list of reporting formats prepared for the project is presented in **Table 8.5**.

- The reporting system shall start with the Construction Contractor who is the main executor of the implementation activities. The Contractor will report to the 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 (During construction), PMC
- CSC, PMC reporting to the ESMU / MPWD
- ESMU/MPWD reporting to the World Bank

Table 8.4: Reporting System for environmental & social management indicators

Items	Contractor	Project Management Consultant (PMC)		ESMU (MPWD)		World Bank (WB)
	Implementation& Reporting to PMC	Supervision	Reporting to MPWD	Oversee Compliance Monitoring	Report to WB	Desired Supervision
Construction Stage						
Monitoring of Construction Site and Construction Camp	Before start of work	Regular	Monthly		Quarterly	Quarterly
Pollution Monitoring	As required	As required	Quarterly	Quarterly	Quarterly	Quarterly
Debris Disposal Area	Weekly	Regular	Monthly	Quarterly	Quarterly	Quarterly
Monitoring of Enhancements	Implementation	As required	Quarterly	Quarterly	Quarterly	Yearly
Topsoil Preservation	Weekly	As required	Monthly	Quarterly	Quarterly	Yearly
Borrow Area/Quarry Area	Regular	Regular	Monthly	Quarterly	Quarterly	Yearly
Tree Cutting	-	-	-	Quarterly	Quarterly	Yearly
Grievance from construction site	Regular	As required	Monthly	Monthly	Monthly	Yearly
Operation Stage						
Pollution Monitoring	For one year	As required	Quarterly	As per monitoring plan	-	-

Table 8.5: Reporting System for operational performance indicators

Item	Stage	Contractor	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 &	Construction	Monthly	Regular	Quarterly

Pollution Control				
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, MPWD/ESMU, and PMC.

Environmental Monitoring Cost

The environmental monitoring budget has been estimated based on the project's length and the existing environmental conditions along the proposed alignment. A total of INR 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 8.6**

Table 8.6: Environmental Monitoring Cost

S. No.	Environmental Attribute	Stage	Locations / Seasons	Unit	Quantity	Unit Rate (INR)	Cost (INR)
1	Air quality monitoring	Construction	3 locations, 3 seasons, 2 years	No.	18	9,000	1,62,000
2	Air quality monitoring	Operation	3 locations, 3 seasons, 2 years	No.	18	9,000	1,62,000
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 years (For surface and ground water each)	No.	12	7,000	84,000
5	Noise quality	Construction	3 locations, 3 seasons, 2	No.	18	3,000	54,000

	monitoring		years				
6	Noise quality monitoring	Operation	3 locations, 3 seasons, 2 years	No.	18	3,000	54,000
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, 2 years	No.	12	6,000	72,000
	Total						8,28,000

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 ESIAs 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**.

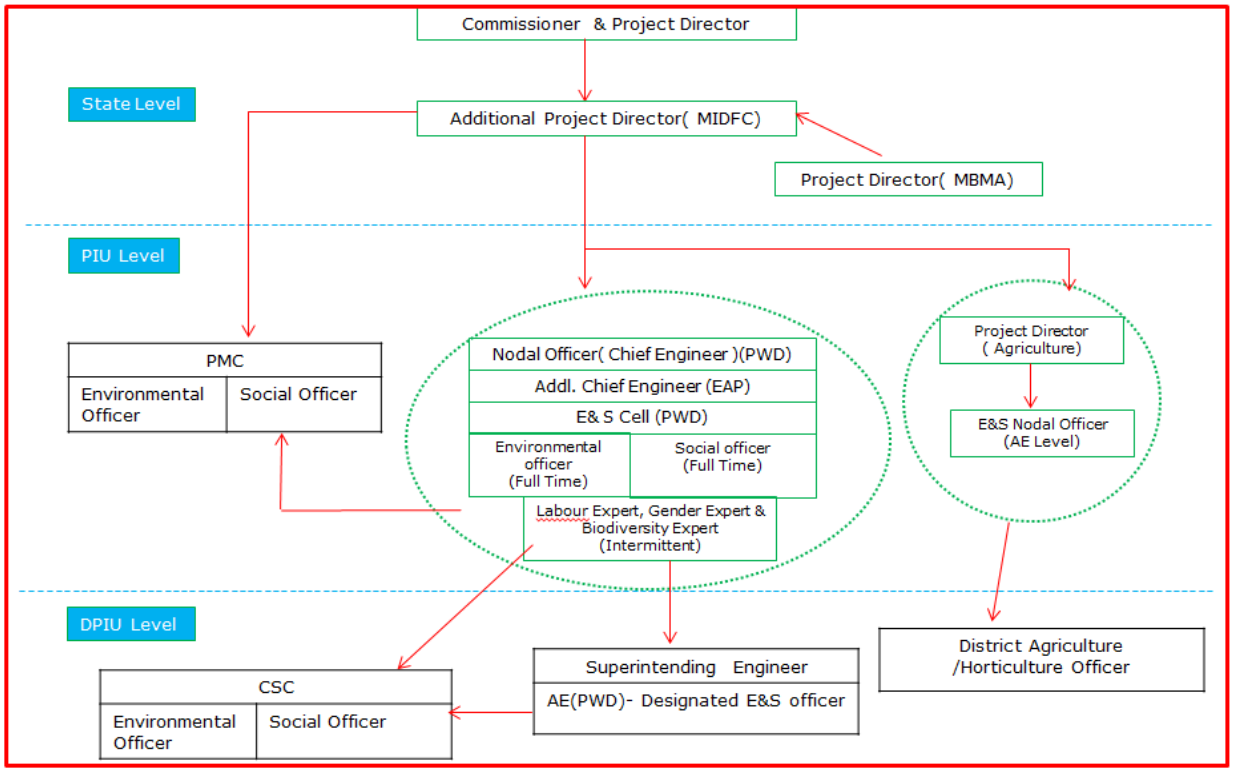

Figure 8.1Project Implementation Organogram

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.

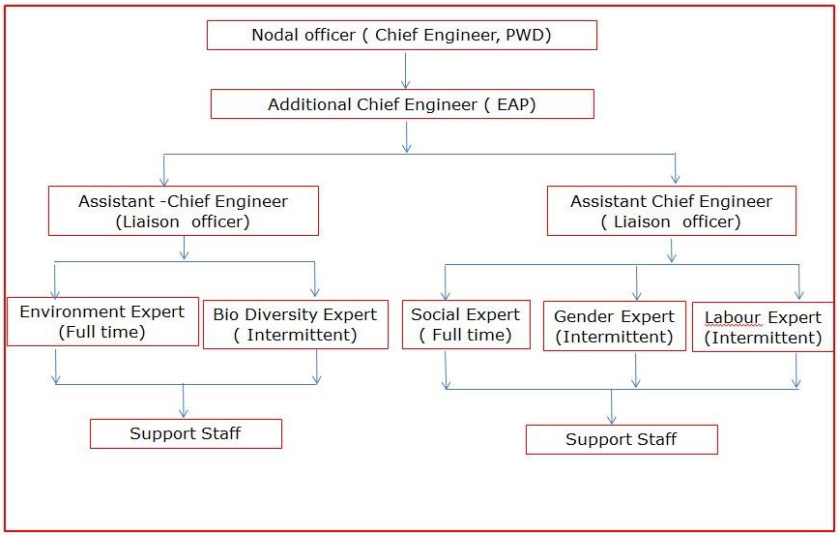

Figure 8.2: Organizational Structure of the E&S Cell

- **8.7.3 ROLES AND RESPONSIBILITIES OF KEY STAFF AND ENTITIES**

The implementation of the Environmental and Social Management Framework (ESMF) under the Meghalaya Logistics Connectivity Improvement Project (MLCIP) will be supported by a multi-disciplinary team across the Project Management Unit (PMU), Project Implementation Units (PIUs), and field divisions. The key responsibilities of staff and entities involved are summarized 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 requirement, 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,	Supervises implementation of ESMF, monitors environmental and	Reports to Commissioner-cum-Project Director; coordinates with PIUs, consultants, and PMU

		coordination, budgeting, and decision-making. Oversees PIUs and ensures timely implementation and reporting.	social safeguard performance, ensures disclosure and grievance redress follow-up.	specialists.
Project Director (MBMA)	Meghalaya Basin Management Agency	Leads agrologistics component implementation, ensures integration of agricultural value chains, market linkages, and climate-resilient infrastructure.	Ensures compliance with ESS5 (Land Acquisition), ESS7 (Indigenous Peoples), and ESS10 (Stakeholder Engagement). Guides community consultations and inclusion of women and tribal groups.	Reports to Additional Project Director, MIDFC; coordinates with Agriculture, Horticulture, and FPOs.
Nodal Officer Cum Project Director (Chief 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 management.	Ensures ESMP implementation, site inspections, contractor environmental performance, and reporting under ESS1 and ESS3.	Reports to Additianal Chief Engineer (EAP) and Nofal Officer/Chief Engineer, PWD.
Social Expert	E&S Cell, PIU (PWD/MBMA)	Conducts social screening, stakeholder consultations, and supervises RAP/IPDP implementation. Ensures fair	Monitors ESS5, ESS7, ESS10 compliance, supports GRM operation, and prepares social audit reports.	Reports to Additianal Chief Engineer (EAP) and Nofal Officer/Chief Engineer, PWD.

		compensation and livelihood restoration.		
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.
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.
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. Prepares Contractor's ESMP (C-ESMP) and maintains OHS measures.	Ensures compliance with ESS2, ESS3, ESS4, and ESS10, manages worker welfare, waste disposal, and safety.	Reports to DPIU/PIU; supervised by Supervision Consultant.

Under the institutional arrangement for MLCIP, strict enforcement mechanisms ensure accountability in environmental and social (E&S) compliance. 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 thirty (30) days from the date of submission, the matter shall be escalated to the Project Management Unit (PMU)/ State Level for further review and mediation.

Tier II: If the aggrieved person is not satisfied with the decision of the site-level Grievance Cell, the grievance may be escalated to the PMU/State-level Grievance Redress Cell (Tier II). The Tier II Cell shall be chaired by the Secretary, Department of Planning, and shall include the Chief Engineer, Project Director, and Social Development Expert of the Project as members. The State-level Grievance Redress Cell shall review the case and provide its decision or recommendations within thirty (30) 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 30 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 30 days

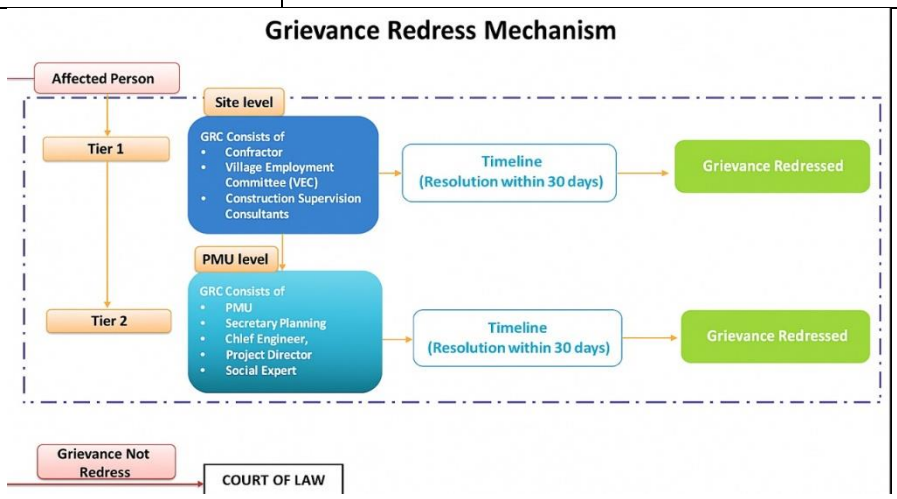

Figure 9.1: Grievance redressal Mechanism

(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.

- **Autonomous District Councils (ADCs)**

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

9.2.3 Communication Strategy

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

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

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

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

9.2.4 Monitoring and Evaluation

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

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

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

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

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

9.2.5 Capacity Building

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

9.3 INTEGRATION WITH PROJECT MANAGEMENT

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

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

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

By implementing these detailed procedures, communication strategies, monitoring mechanisms, and capacity-building initiatives, the project can ensure that the grievance redressal mechanism is effective, accessible, and responsive to the needs of the community. This will contribute to building trust, promoting social harmony, and ensuring the long-term sustainability of the project. The Grievance Submission Form is given as **Annexure -5**

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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 East Garo Hills & 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.
- The proposed project alignment does not pass through any Wildlife Sanctuary/National Park/Biosphere Reserve/Tiger Reserve.
- No ASI Protected monuments found within 0.5 km from the project site.
- Approximately 20 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 afforestation 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

Sl. No.	Measures	Observations By EIS Team	Mitigation Inputs By DPR
10.	**Design measures**	Existing road is very poor and mostly earthe up to 18.5 km. only 3.5 km is Paved road. Physically observation for Geological conditions is 2–3 m overburden, 5–8 m weathering and rest is rock. Road is pass through partially plain and partially hill.	• Improvement of road geometry, convex mirror on curves and junction management for road safety. • Provision of cross drainage structure.
11.	**Environmental enhancements**	Environmental sensitive locations are • Chainage 31+100 (RHS: LP School). • Chainage 33+200 (LHS: LP School). • Chainage 39+200 (LHS: Church).	• Provision of pedestrian paths and crossings at settlement and sensitive roadside developments. • Appropriate safety measures such as cautionary sign boards to limit the speed at accident prone stretches along with proper lights and dividers. • Traffic Management measures must be advised near school, colleges and weekly local market. • To enhance safety on road for commuters, students and elderly person, enhanced signage measures, zebra crossing to cross the road particularly at the junctions / bus stop/ Settlement

Sl. No.	Measures	Observations By EIS Team	Mitigation Inputs By DPR
			locations.
12.	**Improvement of Landslide Prone Areas**	The landslide/land slip prone areas were observed along the road.	In identified landslide areas, enhance design parameter should be used keeping in mind the changing climate and past disasters DPR consultant has been advised accordingly to consult Geotech specialist and provide landslide treatment plan.
13.	**Construction and Labour Camp design**	Location of Labour Camp will be decided in consultation with the Nokma and local community.	-
14.	**Escape of Polluting Materials**	The main potential source of polluting materials arising from the project is lubricating oil spill/leakage and spoil material from construction activities entering the soil and groundwater either directly or indirectly through the drainage and open streams. Lubricating oil, solvents, and fuel that may be used by the contractor, should be stored within concrete or brick buildings designed for such purposes.	• The oil/fuel storage building should be a well-ventilated, roofed structure, with an impermeable floor. A berm should be integrated into the entranceway, so as to create a shallow holding tank in the event that oil or fuel products are accidentally spilled or released from a drum or tank. Fire extinguishers of the type suitable for fighting an oil or fuel fire should be positioned within and outside of any oil/fuel storage building. • Oil spill clean-up materials (sorbent pads, loose sorbent material, etc.) should be stationed in any oil/fuel storage building in clearly labelled containers. • Liquid waste management systems will be installed to ensure that there will be no unacceptable impacts on the surrounding land or water bodies. The labour camp drainage system should be carefully designed to prevent possible flooding of the camp area and should be directed through an oil and grease separator before discharge to the ground outside the site.

Sl. No.	Measures	Observations By EIS Team	Mitigation Inputs By DPR
15.	**Slope Stabilization**	Existing road is partially hill and poor in condition. Work for slope stabilization will be done from Ch: 26 + 360 to Ch: 42+825.	Since the proposed project is a partially hill project the design measures shall include implementing slope stabilization techniques such as retaining walls, rock bolts, and geotextiles to prevent landslides and erosion.
16.	**Muck Disposal Plan**	Muck is to be generated during construction actives. Muck disposal sites has not identified.	DPR consultant proposed that the Proposed Typical Cross Section accommodated within the Existing Right of Ways (if any Improvement needed as per Geometric Design/Improvement), Additional Land will be taken, the Details of Proposed location, details will be shared within the 10 Working days to Concerned ESIA Consultants for identification of Land Type and Nature etc.
17.	**Noise Assessment**	Noise modeling to be carried out based on baseline conditions.	Assessment to justify the need or avoidance of noise barriers.
18.	**Curve improvement**	Chainage 26+500: Curve improvement may be required for safety.	Improvement of road geometry, convex mirror on curves and junction management for road safety.

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 to conduct required consultations regularly/periodically at Preliminary assessment, ESIA preparation , Before and after ESIA disclosure, Preparation of RAP and IPDP or when required with all the stakeholders, including local residents, village councils and public representatives and maintain the record of each consultation and meeting;
- MPWD to 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 RMA 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.

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ANNEXURES

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT

For

Improvement of Rongjeng - Mangsang Adokgre (RMA) road from 23rd to 44th Km including construction of a major Bridge at Eldek Akong and Bridge No. 1/6 –

Meghalaya Logistics and Connectivity Improvement Project (MLCIP)

Submitted To

Meghalaya Infrastructure Development & Finance Corporation Ltd

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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Disclaimer: This is a Draft Version and is under review by the World Bank

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Annexure 2.1: IRC and MoRTH Codes Applicable to the Project

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

Sl. No.	IRC Code/MoRTH	IRC Code Theme
		Indian Roads
25	IRC:SP-108-2015	Guidelines on Preparation and Implementation of Environment Management Plan
26	IRC:SP-113-2018	Guidelines on Flood Disaster Mitigation for Highway Engineers
27	IRC:SP:130-2022	Guidelines on Design and Installation of Noise Barriers for Roads
28	IRC:SP:133-2022	Guidelines on Reducing Carbon Footprint of Road Projects
29	MoRTH	Manual for Maintenance of Roads, 1983

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

Annexure 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	Borrowing of the minor minerals (earth, sand, aggregates, etc.) for embankments, bridges, approach roads, trucks and bus halts, etc. will require permissions from SEIAA 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

WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
	The payment of gratuity rules Meghalaya 1972 Employees Provident Fund and Miscellaneous Provision Act, 1952 Maternity Benefit Act, 1951 Meghalaya Maternity benefit Rules 1965 Payment of Bonus Act, 1965 The Payment of Bonus Rules Meghalaya 1975 The Bonded Labour (Abolition) Act 1976 Bonded Labour System (Abolition) Rules 1976 The Trade Union Act, 1926	that the World Bank ESMF 2018 requirements are integrated in the document with adequate monitoring provisions. The consultant has to ensure relevant penalty clauses are integrated in the ESMP document to be attached to the bidding documents. The MPWD will ensure implementation of ESMP prepared by the consultants by the contractors and it have to be monitored by the MPWD Divisions/ E&S consultants. The concerned Labour Officers will also be monitoring these.
Resource Efficiency and Pollution Prevention and Management	The Mines and Minerals (Development and Regulation) Act, 1957 Meghalaya Minor Mineral Concession Rules 2013 Meghalaya Mineral Regulation and Dealers Rules 2020 Air (Prevention and Control of Pollution) Act, 1981, 1987 Water Prevention and Control of Pollution) Act, 1974, 1988 Noise Pollution (Regulation and Control Act) 2000 and amendments till date Hazardous & Other Waste (Management and Trans-boundary Movement) Rules, 2016 Manufacture, Storage & imports of Hazardous Chemicals (MSIHC) Rules, 1989 as amended till date The Batteries (Management and Handling) Rules 2001 Construction and Demolition Waste Management Rules, 2016 Vehicle Act 1988 Central Motor Vehicle Rules	The majority of World Bank ESMF 2018 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. 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/ consultants. The MSPCB will also be monitoring these.

WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
	1989	
Community Health and Safety	The Gas Cylinder Rules 2016 Hazardous & Other Waste (Management and Trans-boundary Movement) Rules, 2016 Disaster Management Act, 2005 Meghalaya State Disaster Management Policy 2010 Solid Waste management Rules, 2016 Plastic waste management Rules, 2016 E-Waste Management Rules, 2016 Air (Prevention and Control of Pollution) Act, 1981, 1987 Water Prevention and Control of Pollution) Act, 1974, 1988 Noise Pollution (Regulation and Control Act) 2000 and amendment till date Manufacture, Storage & imports of Hazardous Chemicals (MSIHC) Rules, 1989 as amended till date The Batteries (Management and Handling) Rules 2001 Construction and Demolition Waste Management Rules, 2016 Vehicle Act 1988 Central Motor Vehicle Rules 1989	These existing laws and rules are to protect community health and safety. Hence, these laws and rules fulfill 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 implemented by the contractors, keeping community health and safety in mind. 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. This policy gap highlights the need for clear regulatory guidance, mandatory site assessments prior to excavation, and integration of contamination risk management into project planning to prevent exposure, ensure worker safety, and protect public health. 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.
LA, Restriction on Land Use and Involuntary Resettlement	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 Meghalaya Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules, 2017 Street Vendors (Protection of Livelihood and	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. Consultants preparing ESIA and ESMP will ensure relevant provision are integrated in these documents. Bidding documents

WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
	Regulation of Street Vending) Act, 2014 & Meghalaya Street Vendors (Protection of Livelihood and Regulation of Street Vending) Rules, 2016 The Meghalaya Highways Act, 1972	too shall be integrated with the relevant provisions and this will be monitored by the MPWD Divisions/E&S Specialists of MPWD/ consultants.
Biodiversity Conservation and Sustainable Management of Living Natural Resources	The Forest (Conservation) Act, 1980 and Amendments and The Forest (conservation) Rules 1981 and Amendments National Forest Policy 1988 Biological Diversity Act, 2002 Meghalaya Biodiversity Rules, 2010 Eco-sensitive Zone Notifications 2015 State Compensatory Afforestation Fund Management and Planning Authority Forest (Conservation) Amendment Rules, 2014 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) EIA Notification 14th Sep 2006 and subsequent amendments	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 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. 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. The Environmental Impact Assessment (EIA) process, governed by the Environment Impact Assessment Notification, 2006

WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
		addresses mitigation measures for projects that may have environmental and habitat implications. A significant policy gap exists in India, as there is no specific comprehensive law that explicitly mandates a 'net gain' standard for biodiversity or habitat conservation across the country. To bridge this gap and to align with the World Bank Environmental and Social Standards (particularly ESS6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources), project-specific ESMPs should incorporate habitat treatment standards and apply net gain principles through a systematic and integrated approach to environmental and social management. In addition, the ESMP should address the presence and movement of wildlife outside protected areas and within the project road corridor, including critical habitats, by incorporating measures to identify, mitigate, and manage potential project impacts on these sensitive ecosystems through a dedicated Biodiversity Management Plan. The MPWD will ensure that the World Bank ESMF 2018 provisions are implemented through them and contractors and monitored by the PWD Divisions/ E&S Specialists of PWD/ 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.	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 World Bank ESF 2018 including FPIC.

WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
	Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006	The MPWD will ensure that the World Bank ESMF 2018 provisions are implemented through them and monitored by the PWD Divisions/E&S Specialists of PWD/ consultants. The concerned Tribal Development Councils will monitor these provisions.
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 PWD will ensure that the World Bank ESMF 2018 provisions are implemented through them and contractors and monitored by the PWD Divisions/ E&S Specialists of PWD/ 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. Forest rights, and eco system services of the community shall be captured during engagement by the consultants. The PWD will ensure that the World Bank ESMF 2018

WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
		provisions are implemented through them and contractors and monitored by the PWD Divisions/E&S Specialists of PWD/ consultants.

Annexure 3.1: Proposed Road Cross Sections

(a) Typical road cross sections for Corridor 2

SL. No	From	To	Length	TCS Type	TCS Description
1	23000	23180	180	TCS-1	Widening/Reconstruction of Existing Road into intermediate lane
2	23180	24060	880	TCS-2	Widening/Reconstruction of existing Road into intermediate lane with Cutting on both Side
3	24060	24300	240	TCS-3	Widening/Reconstruction of existing Road into intermediate lane with cutting Right Side
4	24300	24690	390	TCS-4	Widening/Reconstruction of existing Road into intermediate lane with cutting left Side
5	24690	25360	670	TCS-1	Widening/Reconstruction of Existing Road into intermediate lane
6	25360	25840	480	TCS-3	Widening/Reconstruction of existing Road into intermediate lane with cutting Right Side
7	25840	26470	630	TCS-1	Widening/Reconstruction of Existing Road into intermediate lane
8	26470	28080	1610	TCS-3	Widening/Reconstruction of existing Road into intermediate lane with cutting Right Side
9	28080	31200	3120	TCS-1	Widening/Reconstruction of Existing Road into intermediate lane
10	31200	31950	750	TCS-4	Widening/Reconstruction of existing Road into intermediate lane with cutting left Side
11	31950	32260	310	TCS-1	Widening/Reconstruction of Existing Road into intermediate lane
12	32260	32510	250	TCS-2	Widening/Reconstruction of existing Road into intermediate lane with Cutting on both Side
13	32510	33280	770	TCS-5	Widening/Reconstruction of existing Road into intermediate lane with filling on both Side
14	33280	34210	930	TCS-2	Widening/Reconstruction of existing Road into intermediate lane with Cutting on

SL. No	From	To	Length	TCS Type	TCS Description
					both Side
15	34210	34500	290	TCS-5	Widening/Reconstruction of existing Road into intermediate lane with filling on both Side
16	34500	34730	230	TCS-2	Widening/Reconstruction of existing Road into intermediate lane with Cutting on both Side
17	34730	37760	3030	TCS-1	Widening/Reconstruction of Existing Road into intermediate lane
18	37760	38060	300	TCS-2	Widening/Reconstruction of existing Road into intermediate lane with Cutting on both Side
19	38060	40520	2460	TCS-1	Widening/Reconstruction of Existing Road into intermediate lane
20	40520	40960	440	TCS-2	Widening/Reconstruction of existing Road into intermediate lane with Cutting on both Side
21	40960	42320	1360	TCS-4	Widening/Reconstruction of existing Road into intermediate lane with cutting left Side
22	42320	42390	70	TCS-2	Widening/Reconstruction of existing Road into intermediate lane with Cutting on both Side
23	42390	42886	496	TCS-1	Widening/Reconstruction of Existing Road into intermediate lane

Annexure 3.2: Environment and Social Management Plan

S. No.	Environmental Aspects	Requirement/ Impacts	Mitigation/ Management Measures	Implementation	Supervision/ Monitoring
PRE-CONSTRUCTION					
1.	Consents/ Permits/ Approvals/ Compliances	Non-compliance with environmental regulatory requirements related to the proposed project could result in legal implications for the Contractor, CSC/PMC, and MPWD.	Contractor shall be responsible for obtaining all the permissions which may be required for carrying out the work at site and shall include but will not be limited to the following: • Tree Cutting permission • Permission for working on or near the water bodies and for Withdrawal of water from Surface Water bodies • Consent to Establish and Consent to operate for hot Mix Plant, Batching Plant, Quarries, and Stone Crushers etc. • Pollution Under Control Certificate Other permission form Centre/State/Local bodies for execution of works as required	Contractor	CSC/MPWD
2.	Contractor ESMP (C-ESMP) Preparation and Implementation	Inadequate preparation and implementation of C-ESMP by Contractor can leave environmental and social issues unattended	• C-ESMP to be prepared before civil/ construction work commences and approved by the CSC/PMC under the guidance of the MPWD. • C-ESMP to incorporate the following plans/measures: Traffic Management Plan, Emergency Response Management, Construction Safety and OHS Plan, Hazardous Waste and Materials management. • Contractor's ESH staff to be deployed on the site	Contractor	MPWD/PMC/CSC to approve the C-ESMP within 15 days from the submission of C-ESMP by the contractor

			before the work starts.		
3.	Identification of land for material storage yard/ construction camp/ labour camp	Discharges from Yards/ Camps to pollute the surroundings and lead to social tension.	• Labour camps shall be established with requisite approvals (NOC/MoUs) from the Village Councils as per the labour camp management plan. • Camp locations should be carefully selected to avoid the land use categories: residential, sensitive and Eco sensitive areas (which also include notified as well as community forest sacred grove, river and flood plains), Monoliths. Distance of minimum 1 km shall be maintained between the said land use and labour camp locations. Camps sites shall preferably be established on waste and barren land so as the vegetation removal and tree cutting can be minimized. • Camps shall also be established at approx. 1 km distance from the water bodies to prevent any impact on the water body. • No discharge from the camp site should lead to any water body and or agriculture field. • NOC shall be obtained from the landowner and the concerned authority prior establishment of the labour camp. • Land shall be restored back to its original condition immediately after the completion of construction works and prior handing over the land back to the landowner. All waste materials, temporary/permanent structures etc. shall be removed from the camp site and the site shall be re-vegetated with the native species of trees. • Training and awareness shall be provided to the	Contractor	MPWD/PMC/ CSC – shall approve the labour camp site prior to setting up of the camp

			labour to not indulge in the unfair practices • Labour camp should be enclosed with boundary wall and all structures should be secured and bolted in areas prone to storm. • Submit to the CSC/PMC the requisite approvals (NoCs/MoUs) along with the Lay out Plan and Rehabilitation Plan.		
4.	Supply of Construction Material	Excavations, and transportation of equipment, site workers and debris and movement of heavy equipment may pose a safety risk to the general public	• Materials shall be procured only from licensed and authorized supplier. • Suppliers shall be in possession of the valid environmental and other clearance/ NOC documents for extraction and supplying of the material being procured from them	Contractor	CSC/PMC//MPWD – should ensure to check the appropriateness of the documents submitted by the contractor during periodic compliance
5.	Water	• Impact on rivers/tributaries, ponds and lake due to construction activities near banks and construction pier inside the water bodies • Siltation of water bodies	• Contractor should estimate daily water requirement for the construction and domestic needs (labour camps) and identify the surface water source for construction and domestic supply for potable needs. Priority shall be given to use surface water wherever surface water source is available. • Necessary permissions for use of surface and or ground water should be obtained from the respective Government authorities. • Statutory permits must be obtained from the Central Ground Water Authority and concerned State Irrigation Departments and Water resource department as applicable. • Minimizing water requirement by using water	Contractor	MPWD/PMC/ CSC to monitor implementation as per C-ESMP

			conservation measures such as covering the water tanks, providing visual notice for water conservation, low flow taps in toilets, roof top rain water harvesting at the camp etc. • Regular inspection to detect leakage in water pipelines and water tanks.		
6.	Appointment of Environment Officers, Safety Officer and adequate number of Safety Supervisors	Inefficient and incompetent supervision by contractors may lead to negative impacts on environment, health and safety.	• Contractor shall appoint an environment officer and a health and safety officer to implement and monitor EMP and prevent any occupational accidents and report on incidents • Contractor shall implement workers health awareness and surveillance program including health check-ups, regular health monitoring systems for the workers, vaccination drives for prevention of diseases and awareness program	Contractor	MPWD/PMC/ CSC to monitor implementation as per C-ESMP and Labour Management Plan
7.	Identification of OHS Hazard and Risk Categorization	Stagnant pools of water can develop in pits, holes, and excavated ditches, providing ideal breeding grounds for disease-carrying insects like mosquitoes. Additionally, various hazardous activities may impact the health and environment of the workers or staff involved.	Prevent the accumulation of stagnant water in depressions, pits, holes, and excavated ditches, as these can serve as breeding grounds for disease-carrying insects like mosquitoes, which are responsible for diseases like malaria. Implement appropriate measures to mitigate this risk, adhering to established standards and conducting a thorough risk assessment when necessary.	Contractor	MPWD/ PMC/ CSC to monitor implementation as per C-EMP, Labour Management Plan, OHS plan
		People may fall in ditches and be injured	• Mark all dangerous areas (Deep excavation, Pond, SWM site etc.) and fence them off. Restrict access to work areas by unauthorized persons		

		The proposed construction activities are expected to increase the noise levels mainly due to plying of construction vehicles, pumping machines, use of portable generators, mechanical machinery such as cranes, riveting machines, hammering etc. These activities will occur round the clock and the noise pollution thus created may affect human habitations, particularly during the night time. Increase of noise level at night may produce disturbances, causing sleeplessness in people in the vicinity of the site in case construction activity is extended into the night hours.	• Ensuring equipment is maintained to manufacturers' standards and that noise baffles are fitted. • Reducing exposure times for people working near noisy machinery; as well as all necessary measures in compliance with the national and International standard should be followed.		
8.	Construction Vehicles, Equipment and Machinery	Excavations, and transportation of equipment, site workers and debris and movement of heavy equipment may pose a safety risk to the general public	• Ensure that work sites (especially excavation works), have proper protection with clear marking of safety borders and signals and fence off all dangerous areas. • Inform neighbors about the construction programme in advance – 10 days prior to start of work • Implement appropriate traffic plans with the help of local police/authorities when (partial) closure of	Contractor	MPWD/ PMC/ CSC to monitor implementation as per C-ESMP and Traffic Management Plan

			roads is required as per the Traffic Management Plan.		
9.	Tree Cutting	Loss of green cover and biodiversity	• Where trees felling is envisaged, works should be carried out in lean season. • Minimize the number of trees proposed to be felled by adopting suitable on the spot adjustment of engineering designs. • Tree transplantation shall be tried wherever possible in consultation with Forest Department/ Community/ Village Authority. • Trees shall be removed before the commencement of construction. Prior Permission shall be obtained from the Divisional Forest officer concerned for the felling of trees.	Contractor in consultation with the Forest Department and for tree transplantation with the community/ village authorities	MPWD/ PMC/ CSC to monitor implementation as per C-ESMP
10.	Damage to existing ecosystem due to borrowing activities	Land degradation if borrowing and quarrying areas are not restored or maintenance.	• All the borrow areas shall be opened and closed only after approval from the engineer. • All borrow areas shall be restored back after borrowing is complete • Borrow area shall be reclaimed and restored to acceptable standards by the landowner, in compliance with the MoEFCC March 2025 notification and the prescribed SOP, and with prior Environmental Clearance (EC) wherever applicable.	Contractor	MPWD/ PMC/ CSC to monitor implementation
11.	Identification of construction material transportation route	Inconveniences and safety issues to the public due to the material transport vehicles.	• Proper identification of transportation route as per transportation management plan prepared by contactor	Contractor	MPWD/ PMC/ CSC to monitor implementation

12.	Identification of sites for debris disposal or wastes generated from construction camps and site offices	C&D waste Hazardous waste	• C&D waste shall be handled as per the Guidelines of C&D Waste Management Rules 2016. • Permission will be obtained from local bodies for disposal of C&D waste. • Authorization shall be obtained from SPCB for storage handling and disposal of hazardous waste • Hazardous waste shall be disposed off only through authorized vendor	Contractor	MPWD/ PMC/ CSC to monitor implementation
13.	Relocation of Utility	utilities to be shifted	• Utilities shall be shifted through concerned dept. by paying the required fee. • New facilities shall be provided prior disturbing the existing utilities as possible • Alternate facility shall be provided in case new facility cannot be provided prior disturbing the existing utility and concerned users shall be pre informed about the same	Contractor	MPWD
14.	Identification of GBV Hotspots	There is possibility of GBV during civil work near isolated houses.	• Capacity building of the contractors staff/workers/ displacement of IEC material / workers Code of Conduct / coordination with line Departments. • Undertake gender-responsive project design	Contractor	MPWD
CONSTRUCTION					
1.	Soil erosion	Soil erosion from exposure of soil to rain and wind	• Topsoil from excavated areas/borrow pits to be saved, reused in re-vegetating the areas/pits and in road embankment slope protection. • Land clearing and grubbing to be conducted during dry season. • Erosion control measures like silt screens may be installed along rivers/streams • Avoid removal of vegetation and trees to the extent	Contractor	MPWD/ PMC/ CSC to monitor implementation

			possible. • Protect all vegetation not required to be removed against damage. • Apply best/ bio engineering practices to minimize soil structure damage and adhere strictly to design specifications. • Work on exposed areas and re-vegetate quickly.		
2.	Slope protection	Slope failures	• Bio-engineering solutions should be tried wherever possible • Rip-rap structures, grass turfing of embankments to protect and stabilize slopes • Slope protection by providing frames, dry stone pitching, masonry retaining/ toe/ breast walls, planting of grass and trees. • Side slopes of all cut and fill areas will to be graded and covered with stone pitching, grass and shrub as per design specifications.	Contractor	MPWD/ PMC/ CSC to monitor implementation
3.	Clearing of vegetation	Vegetation loss	• Minimize tree cutting to the extent possible. • Roadside trees to be removed with prior approval of competent authority. • Provision of LPG in construction camp as fuel source to avoid tree cutting, wherever possible	Contractor	MPWD/ PMC/ CSC to monitor implementation
4.	Bituminous waste disposal	Generation of Hazardous waste	• Hazardous waste shall be disposed off only through authorized vendor • Hazardous waste shall be stored in covered HDPE containers on the paved surfaces	Contractor	MPWD/ PMC/ CSC to monitor implementation
5.	Contamination of Soil	Soil pollution due to Oil and fuel spills from construction	• Construction equipment/ vehicles should be routinely maintained to prevent leakage of fuels/ lubricants; • Construction equipment/ vehicles should be parked and maintained in designated areas on hard stand	Contractor	MPWD/ PMC/ CSC to monitor implementation

		equipment and plants.	having perimeter drains to collect spilled liquids; • Fuels and other liquid chemicals should be stored in designated storage areas with drip trays to collect leaked materials, if any. • The Contractors shall ensure the use of a relatively new, well maintained hot mix plant (batch type) and maintenance of hot mix plants and batching plants should be regular and periodic to prevent any kind of oil leakage on soil surface. • Septic tank will be constructed for safe disposal of waste. • Strict enforcement of the Guidelines of "Hazardous waste (management and handling) rules, 1989.		
6.	Generation of Debris	Generation of C&D waste	• C&D waste shall be handled as per the Guidelines of C&D Waste Management Rules 2016. • Permission will be obtained from local bodies for disposal of C&D waste	Contractor	MPWD/ PMC/ CSC to monitor implementation
7.	Air Pollution - Dust Generation	Impacts on worker and nearby habitation	• Identified dust-generating plants and machinery such as batching plants shall be placed at a minimum distance of 500 m from residential and sensitive areas in a downwind direction as far as possible • Vehicles delivering materials should be covered to reduce spills and dust blowing off the load. • Road slopes shall be promptly covered after construction using mulch, temporary soil-binding mats, or fast-growing grass/turf to prevent dust generation and soil erosion, thereby reducing air pollution and sediment runoff. • Ensure that all vehicles, equipment and machinery used for construction works are regularly maintained and confirm that pollution emission levels comply	Contractor	MPWD/ PMC/ CSC to monitor implementation

			with the relevant requirements of CPCB and/Motor Vehicles Rules.		
8.	Emissions	Gaseous Pollution	• Vehicles and machineries will be regularly maintained to conform to the emission standards • Construction camps and casting yards sites should be preferably sited more than 500 m away from residential and sensitive area • Use of mask by workers engaged in construction. • Submit PUC certificates for all vehicles/ equipment/machinery used for the project. • DG is set to be provided with vertical opening chimney of adequate height as per CPCB guidelines. • LPG shall be used as fuel for cooking of food, instead of fuel wood.	Contractor	MPWD/ PMC/ CSC to monitor implementation
9.	Water requirement for project	Requirement of water for drinking, cleaning, fire fighting and landscaping purpose	• Water shall be preferably procured from surface water sources alternatively ground water in case of surface water not available, pipelines etc. only after obtaining permission from concerned agency. Conditions of the permission shall strictly be followed. • Water demand shall be reduced through the use of water-efficient fixtures and the implementation of rooftop rainwater harvesting systems.	Contractor	MPWD/ PMU/ CSC to monitor implementation
10.	Noise from vehicles, plants and equipment	Generation of high noise and vibration from construction activities and transportation	• Noise barriers should be erected at appropriate locations such as residential areas and sensitive receptors adjacent to the project alignment. • Noise monitoring shall be conducted along the project site as per the proposed environment monitoring plan. • Construction operations should be undertaken primarily during daytime, i.e., 6:00 am-6:00 pm only	Contractor	MPWD/ PMC/ CSC to monitor implementation

			to minimize noise impacts. • Equipment shall strictly conform to the MoEF&CC/ CPCB noise standards.		
11.	Blasting (If applicable)	Increased noise and vibration level	• Temporary noise barriers shall be provided near the residential and sensitive areas. • Ear plugs and muffs will be provided to workers as per requirement during construction activities. • Noise control measures shall be implemented as per the approved blasting plan, including covering the blasting area, controlling hole arrangements, and regulating the quantity of explosives. All blasting activities shall be conducted only after obtaining necessary permissions, including approvals from the Meghalaya State Pollution Control Board, Directorate General of Mines Safety, and the District Magistrate, ensuring compliance with environmental and safety regulations	Contractor	MPWD/ PMC/ CSC to monitor implementation
12.	Aquatic Fauna	Contamination of water	• Precautions will be taken to avoid leakage of chemicals, any hazardous materials due to construction activities. • River training works to be carried out in lean season	Contractor	MPWD/ PMC/ CSC to monitor implementation
13.	Occupational Health and Safety	Associated risks from accidents and incidents could affect health and safety of the workers and others on constriction/ project sites.	• Safe and convenient passage for vehicles and pedestrians will be arranged during construction work. • All workers shall be provided with PPEs • Workers shall be provided with proper trainings to handle the machinery and manage the emergency if any • Should follow the applicable laws/rules of OHS of GoI and GoM and maintained the ISO 45001: 2018 standard for OHS management.	Contractor	MPWD/ PMU/ CSC to monitor implementation

			• Contractor shall establish occupational health centres and ensure availability of adequate first aid kits, first aiders, nurses, occupational officers at OHC 24 X 7 as per the National and International guidelines whichever is stringent as applicable		
14.	OHS Risk Assessment	Inadequate risk assessment would lead to inadequate safety measures	• Contractor will arrange all safety measures for workers as per laws/rules of OHS of GoI and GoM and maintained the ISO 45001: 2018 standard for OHS management as well the contractor will arrange all safety measures for workers as per factories Act, BOCWA and BOCWR.	Contractor	MPWD/ PMC/ CSC to monitor implementation
15.	Measuring performance of OHS	In adequate weightage of management	• Contractor will arrange all safety measures for workers as per factories Act, BOCWA and BOCWR.	Contractor	MPWD/ PMC/ CSC to monitor implementation
16.	Community Health and Safety	Potential risks and impacts on communities that may be affected by project activities such as transportation of material to project sites through village roads, labour colony housing migrant workers near the project sites and in close proximity to communities, pollution	• No access should be denied to sites providing emergency services. If required, alternative safe access should be provided. • Works at market areas/ front of the schools/ churches/ hospital should be avoided during the day time. Market areas should not be blocked during the market day. Works in front of school should be preferably done during school holidays. At hospital zones, adequate precautions should be taken to avoid/ mitigate noise and air pollution.	Contractor	MPWD/ PMC/ CSC to monitor implementation

		generation from construction affecting local communities, access blockage/ diversion during construction, for locals, etc.			
17.	Risk of Natural Hazards and Force Majeure	Risk from floods, storm and earthquakes.	• The mitigation measures should be adopted as per norms of Meghalaya State Disaster Management Authority, Government of Meghalaya. • All reasonable precaution to be taken to prevent danger of the workers and the public from fire, flood, drowning, etc.	Contractor	MPWD/ PMC/ CSC to monitor implementation
18.	GBV-SEA/SH Risks	There is possibility of GBV during civil work near isolated houses.	• Capacity building of the contractor's staff and workers shall include training on worker safety, Environmental and Social Code of Conduct, dissemination of IEC materials, and coordination with line departments. A Contractor-level Internal Complaints Committee (ICC) shall be formed to address GBV grievances and ensure compliance with workplace and social safeguards • Ensure increased women's participation in industrial labour force • Engage women workers in construction and rehabilitation work, ensuring implementation of core labour standards such as equal pay for work of equal value, and protection of women from discrimination	Contractor	CSC/PMC/MPWD

			and other forms of harassment		
19.	Chance Finds	Impact on artefacts during excavation or construction activities	• If remains of geologic or archaeological interest are found, local government shall be immediately informed of such discovery, excavation shall be stopped until identification of cultural relics by the authorized institution, and clearance is given for proceeding with work. Permission from ASI / NMA to be taken for construction	Contractor	MPWD/ PMC/ CSC to monitor implementation
20.	Compliance to Labour Welfare Laws and reporting	Non-compliance to statutory requirements could lead to legal Implications to Contractor/ PMU/ PWD Division	• Labour camps shall be provided with all the facilities as per BOCWA, BOCWR including drinking water facility, sanitation facility, waste management facility, bedding, ventilation, lighting, drainage, toilets etc. • Labour camps shall be inspected on monthly & quarterly basis • All the non-compliances pointed out during the inspections shall be closed at the earliest	Contractor	MPWD
21.	Labour Influx	There will be migrant labors, especially skilled and semi-skilled.	• Labor Management Plan is required to avoid conflict.	Contractor	MPWD
22.	Tribal Communities (For Sixth Schedule - FPIC and IPDP required)	Local tribal community will be benefitted after the construction of road. Increase in livelihood , Business opportunities, smooth and fast transportation	• Inform the affected persons/community about the planned activities and their impacts of the proposed project. • Organize consultations and obtain FPIC as per the requirements of the World Bank safeguards instrument ESS 7.	Consultants	MPWD
23.	Monitoring and Reporting (Monthly/	Non-compliance to monitoring and	• Conduct monitoring and reporting on the environmental and social performance of the	Contractor	CSC/PMC/MPWD

	Quarterly)	reporting could lead to inadequate mitigation measures or in cases of regulatory requirements could lead to legal Implications to Contractor/ PMU/ PWD Division	project against the ESSs. • Monitoring parameters and its frequency, duration and monitoring locations will be as per the Monitoring Plan prepared for the sub – project.		
24.	GRM	There will be issues at community/workers	Establishment of Workers grievance redressal mechanism as the requirement of the LMP.	Contractor	CSC/PMC/MPWD
25.	Continuous Community Participation	Noncompliance may lead to community distrust, sub project resistance, misinformation , and delays in sub-project implementation	• Continuous interactions with local people to ensure that the construction activities are not causing undue inconvenience to the locals residing in the vicinity of sub-project site under construction due to noise, dust or disposal of debris etc. • Stakeholder engagement plan will be followed for community participation procedures.	Contractor	CSC/PMC/MPWD
	Contractor's Demobilisation				
26.	Environmental conditions	Noncompliance may lead to unmonitored environmental pollution, health risks.	• The Contractor will undertake seasonal monitoring of air, water, noise and soil quality through NABL accredited laboratories. • The parameters to be monitored, frequency and duration of monitoring as well as the locations to be monitored will be as per the Monitoring Plan prepared.	Environment al officer and Project Manager of the Contractor	CSC/PMC/MPWD
27.	Clean – up operations, Restoration and	Non compliance may lead to environmental	• Contractor will prepare 'Site Restoration Plans', which will be approved by the Environmental Specialist of CSC/PMC. The clean-up and	Environment al officer, Social	CSC/PMC/MPWD

	Rehabilitation	degradation, contamination, health risks, and improper waste disposal.	restoration operations are to be implemented by the Contractor prior to demobilization. The Contractor will clear all temporary structures; dispose all garbage, night soils and POL (Petroleum, Oil and Lubricants) wastes as per Waste Management Plan and as approved by CSC/PMC. • All disposal pits or trenches will be filled in and effectively sealed off. Residual topsoil, if any will be distributed on adjoining/ proximate barren land or areas identified by the Contractor and approved by the Environmental Specialist of CSC/PMC in a layer of thickness of 75 mm -150 mm. • All construction zones and facilities including culverts, road-side areas, camps, Hot Mix plant sites, Crushers, batching plant sites and any other area used/affected due to the sub-project operations will be left clean and tidy, at the Contractor's expense, to the entire satisfaction to the Environmental Specialist of CSC/PMC.	Health and safety officer and Project Manager of the Contractor	

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

On-Boarding Phase

a. **Induction Training**

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

b. **Specialized Training**

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

Implementation Phase

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

Table: Given below is the specialized training outline for contractor

Sl. No.	Training Title	Content Summary	Target Group	Purpose	Schedule / Stage
1	Code of Conduct Induction	Sensitization on local issues, introduction to the Code of Conduct,	All workers	Ensure awareness of expected behavior, local	Onboarding (before

		labor camp management		sensitivities, and compliance with regulations	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	All workers	Protect workers from	Onboarding and

		Personal Protective Equipment (PPE)		occupational hazards	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

A. Penalty Clause for Non – Compliance

Penalties for non-compliance of ESMP
Contractor's Responsibilities: • 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
• Any non-compliance in implementing the above responsibilities will attract penalties as detailed in the clause. • **Major non-compliances** 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 wok 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**

Penalty for lapses:

- A penalty amount of Rs. 5,000 per day or otherwise fixed by the MPWD for each minor non-compliance with CESMP
- A penalty amount of Rs. 10,000 per day or otherwise fixed by the MPWD for each all-major non-compliance with CESMP. The amount shall be released only if the identified non-compliances are rectified within the duration specified by the MPWD/CSC/PMC. Duration specified shall consider the environmental and social damage/risks associated with non-compliances. Such specified duration shall not be more than 15 days.
- Reoccurrence of the minor non compliances shall be treated as major lapses • Reoccurrence of all major non compliances, a penalty of Rs. 50,000 shall be levied for each such non - compliance.

Annexure 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 East Garo Hills & North Garo Hills. 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 East Garo Hills & North Garo Hills.
   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

Sl 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	Protected Wetland of Meghalaya	State Notification (2023)	Wetlands (Conservation and Management) Rules, 2017
6	Ramsar Site	Ramsar Sites Information Services	https://rsis.ramsar.org/
7	Key Biodiversity Area/Important Bird Area	Key Biodiversity Area	https://www.keybiodiversityareas.org/sites/search

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

Primary data collection:

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 quadrate 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	*Ficus recemosa*	NL	Moraceae
2.	Japanese Raisin Tree	*Hovenia dulcis*	LC	Rhamnaceae
3.	Subabul	*Leucaena leucocephala*	NL	Fabaceae
4.	Sonajhuri	*Acacia auriculiformis*	LC	Fabaceae
5.	Amla	*Phyllanthus emblica*	LC	Phyllanthaceae
6.	Amoora	*Aglaia spectabilis*	LC	Meliaceae
7.	Areca palm	*Areca catechu*	LC (Decreasing)	Arecaceae
8.	Arjun tree	*Terminalia arjuna*	NL	Combretaceae
9.	Baheda	*Terminalia bellirica*	LC	Combretaceae
10.	Bamboo	*Bambusa tulda*	NL	Poaceae
11.	Bamboo	*Dendrocalamus hamiltonii*	NL	Poaceae
12.	Banana	*Musa balbisiana*	LC	Musaceae
13.	Banana	*Musa paradisiaca*	NL	Musaceae
14.	Bando lata	*Spatholobus parviflorus*	LC	Fabaceae
15.	Bhelu	*Tetrameles nudiflora*	LC	Tetramelaceae
16.	Black catechu	*Senegalia catechu*	LC	Fabaceae
17.	Black Plum	*Syzygium cumini*	LC	Myrtaceae
18.	Black Siris	*Albizia odoratissima*	LC	Fabaceae

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
19.	Bonsum	*Phoebe goalparensis*	NL	Lauraceae
20.	Burflower-tree	*Neolamarckia cadamba*	LC	Rubiaceae
21.	Chamkathal	*Artocarpus chaplasha*	LC	Moraceae
22.	Cashew	*Anacardium occidentale*	LC	Anacardiaceae
23.	China berry	*Melia azedarach*	LC	Meliaceae
24.	Chorai	*Vitex peduncularis*	LC	Lamiaceae
25.	Climbing wattle	*Senegalia pennata*	LC	Fabaceae
26.	Cluster fig tree	*Ficus racemosa*	NL	Moraceae
27.	Coconut palm	*Cocos nucifera*	NL	Arecaceae
28.	Common jujube	*Ziziphus jujuba*	LC	Rhamnaceae
29.	Cotton tree	*Bombax ceiba*	LC	Malvaceae
30.	Dog Teak	*Dillenia pentagyna*	LC	Dilleniaceae
31.	Dotted fig	*Ficus geniculata*	NL	Moraceae
32.	Drumstick tree	*Moringa oleifera*	LC	Moringaceae
33.	Dulloo bamboo	*Schizostachyum dullooa*	NL	Poaceae
34.	East Himalayan Dalbergia	*Dalbergia stipulacea*	LC	Fabaceae
35.	Elephant rope tree	*Sterculia villosa*	LC	Malvaceae
36.	False ashoka tree	*Polyalthia longifolia*	LC	Annonaceae
37.	Forest red gum	*Eucalyptus tereticornis*	LC	Myrtaceae
38.	Gamhar	*Gmelina arborea*	LC	Lamiaceae
39.	Ghora neem	*Melia azedarach*	LC	Meliaceae
40.	Golden shower	*Cassia fistula*	LC	Fabaceae
41.	Guava	*Psidium guajava*	LC	Myrtaceae

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
42.	Gulmohor	*Delonix regia*	LC	Fabaceae
43.	Hairy fig	*Ficus hispida*	NL	Moraceae
44.	Hibiscus	*Hibiscus rosa-sinensis*	LC	Malvaceae
45.	Hog Creeper	*Deguelia scandens*	LC	Fabaceae
46.	Indian ash tree	*Lannea coromandelica*	LC	Anacardiaceae
47.	Indian Bael tree	*Aegle marmelos*	NT	Rutaceae
48.	Indian gooseberry	*Phyllanthus emblica*	LC	Phyllanthaceae
49.	Indian mahogany	*Cedrela toona*	LC	Meliaceae
50.	Indian sandalwood	*Santalum album*	VU	Santalaceae
51.	Indian trumpet flower	*Oroxylum indicum*	LC	Bignoniaceae
52.	Jackfruit	*Artocarpus heterophyllus*	NL	Moraceae
53.	Kassod	*Senna siamea*	LC	Fabaceae
54.	Khasi pine	*Pinus kesiya*	LC	Pinaceae
55.	Lantana	*Lantana camara*	NL	Verbenaceae
56.	Lychee	*Litchi chinensis*	VU	Sapindaceae
57.	Mango	*Mangifera indica*	DD	Anacardiaceae
58.	Mohaneem	*Azadirachta indica*	LC	Meliaceae
59.	Night-blooming jasmine	*Nyctanthes arbor-tristis*	LC (Stable)	Oleaceae
60.	Orchid tree	*Bauhinia tomentosa*	LC	Fabaceae
61.	Peepal tree	*Ficus religiosa*	LC	Moraceae
62.	Pongam Tree	*Pongamia pinnata*	LC (Stable)	Fabaceae
63.	Teak	*Tectona grandis*	EN	Lamiaceae
64.	Tamarind tree	*Tamarindus indica*	LC (Stable)	Fabaceae

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
65.	Tree bean	*Parkia timoriana*	LC	Fabaceae
66.	Wild guava	*Careya arborea*	LC	Lecythidaceae
67.	Woolly Dyeing Rosebay	*Wrightia arborea*	LC	Apocynaceae
68.	Zinghal	*Stereospermum colais*	LC	Bignoniaceae

Source: District working plan

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	*Clerodendrum buchananii*	Not Listed	Lamiaceae
2.	Orange Chinese hat plant	*Holmskioldia sanguinea*	Not Listed	Lamiaceae
3.	Siam Weed	*Eupatorium odoratum*	Not Listed	Asteraceae
4.	Lantana	*Lantana camara* L.	Not Listed (Invasive)	Verbenaceae
5.	Indian rhododendron	*Melastoma malabathricum* L.	Not Listed	Melastomataceae
6.	Wild Nongmangkha	*Phlogacanthus curviflorus*	Not Listed	Acanthaceae
7.	Ronga bahak	*Phlogacanthus thyrsiformis*	Not Listed	Acanthaceae
8.	Castor bean	*Ricinus communis* L.	LC	Euphorbiaceae
9.	Indian Snakeweed	*Stachytarpheta indica* (L.) Va	Not Listed	Verbenaceae
10.	Congo jute	*Clerodendrum indicum*	Not listed	Lamiaceae

Source: District working plan

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	*Acmella* (Kunth)	NL	Asteraceae
2.	Marsh para cress	*Acmella uliginosa*	NL	Asteraceae
3.	Sticky snakeroot	*Ageratina adenophora*	NL (Invasive)	Asteraceae
4.	Chick weed	*Ageratum conyzoides* L.	NL (Invasive)	Asteraceae
5.	Bluemink	*Ageratum houstonianum*	NL	Asteraceae
6.	Alligator weed	*Alternanthera philoxeroides*	NL (Invasive)	Amaranthaceae
7.	Pineapple	*Ananas comosus* (L.)	LC	Bromeliaceae
8.	Beggar Tick	*Bidens pilosa* L.	LC	Asteraceae
9.	Feather celosia	*Celosia argentea* L.	LC	Amaranthaceae
10.	Siam weed	*Chromolaena odorata* (L.)	NL (Invasive)	Asteraceae
11.	Redflower ragleaf	*Crassocephalum crepidioides*	NL	Asteraceae

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
		(Benth.)		
12.	Gallant soldier	*Galinsoga parviflora*	LC	Asteraceae
13.	Fringed quickweed	*Galinsoga quadriradiata*	NL	Asteraceae
14.	Pennsylvania cudweed	*Gamochaeta pensylvanica*	LC	Asteraceae
15.	Jom lakhut	*Hellenia speciosa*	LC	Costaceae
16.	Cogon grass	*Imperata cylindrica*	LC	Poaceae
17.	Durun bon	*Leucas aspera*	LC	Lamiaceae
18.	Staghorn clubmoss	*Lycopodiella cernua*	LC	Lycopodiaceae
19.	Sensitive plant	*Mimosa pudica* L.	NL	Fabaceae
20.	Congress grass	*Parthenium hysterophorus* L.	NL (Invasive)	Asteraceae
21.	Stinking cassia	*Senna tora*	LC	Fabaceae
22.	Arrowleaf sida	*Sida rhombifolia* L.	LC	Malvaceae
23.	Asian broom grass	*Thysanolaena latifolia*	LC	Poaceae

Source: District working plan

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	*Adiantum philippense*	NL	Pteridaceae
2.	Tree fern	*Alsophila latebrosa*.	NL	Cyatheaceae
3.	Bird's nest fern	*Asplenium nidus* L.	LC	Aspleniaceae
4.	Creeping Fern	*Bolbitis heteroclita*	NL	Dryopteridaceae
5.	Ardisia	*Ardisia solanacea*	LC	Primulaceae
6.	Indigo Plant	*Strobilanthes cusia*	LC	Athyriaceae
7.	Dhekia	*Diplazium esculentum*	NL	Athyriaceae
8.	Staghorn clubmoss	*Lycopodiella cernua*	LC	Lycopodiaceae
9.	Lace fern	*Odontosoria chinensis*	NL	Lindsaeaceae
10	Giant Vine Fern	*Stenochlaena tenuifolia*	NL	Blechnaceae
11	Downy maiden fern	*Thelypteris dentata*	NL	Thelypteridaceae

Source: District working plan

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	*Cynodon dactylon*	Least Concern (LC)	Poaceae
2.	Giant reed	*Arundo donax* L.	NL (Invasive)	Poaceae
3.	Mint / Pudina	*Mentha arvensis*	Least Concern (LC)	Lamiaceae
4.	Wild Ginger	*Zingiber zerumbet*	Least Concern (LC)	Zingiberaceae
5.	Turmeric / Haldi	*Curcuma longa*	Data Deficient (DD) in IUCN; widely	Zingiberaceae

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
			cultivated	
6.	Gotu kola / Indian Pennywort	*Centella asiatica*	Least Concern (LC)	Apiaceae
7.	Broom Grass / Tiger Grass	*Thysanolaena maxima*	Least Concern (LC)	Poaceae

Source: District working plan

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	*Dicrurus macrocercus*	Least Concern	IV	R
Blue-throated Barbet	*Psilopogon asiaticus*	Least Concern	IV	R
Common Myna	*Acridotheres tristis*	Least Concern	IV	R
Common Tailorbird	*Orthotomus sutorius*	Least Concern	IV	R
Emerald Dove	*Chalcophaps indica*	Least Concern	IV	R
Great Barbet	*Psilopogon virens*	Least Concern	IV	R
House Sparrow	*Passer domesticus*	Least Concern	IV	R
Indian Pond Heron	*Ardeola grayii*	Least Concern	IV	R
Jungle Myna	*Acridotheres fuscus*	Least Concern	IV	R
Red-vented Bulbul	*Pycnonotus cafer*	Least Concern	IV	R
Shikra	*Accipiter badius*	Least Concern	IV	R
Spotted Dove	*Spilopelia chinensis*	Least Concern	IV	R
White-throated Kingfisher	*Halcyon smyrnensis*	Least Concern	IV	R

Oriental White-eye	*Zosterops palpebrosus*	Least Concern	IV	R
Asian Koel	*Eudynamys scolopaceus*	Least Concern	IV	R
Common Hoopoe	*Upupa epops*	Least Concern	IV	WM
Rufous Woodpecker	*Micropternus brachyurus*	Least Concern	IV	R
Common Iora	*Aegithina tiphia*	Least Concern	IV	R
Scarlet Minivet	*Pericrocotus flammeus*	Least Concern	IV	R
Bronzed Drongo	*Dicrurus aeneus*	Least Concern	IV	R
Black-hooded Oriole	*Oriolus xanthornus*	Least Concern	IV	R
Rufous Treepie	*Dendrocitta vagabunda*	Least Concern	IV	R
Barn Swallow	*Hirundo rustica*	Least Concern	IV	WM
Asian Pied Starling	*Gracupica contra*	Least Concern	IV	R
Paddy Field Pipit	*Anthus rufulus*	Least Concern	IV	R
Oriental Turtle Dove	*Streptopelia orientalis*	Least Concern	IV	R
Red-collared Dove	*Streptopelia tranquebarica*	Least Concern	IV	R
Green Bee-eater	*Merops orientalis*	Least Concern	IV	R
White Wagtail	*Motacilla alba*	Least Concern	IV	WM
Grey Wagtail	*Motacilla cinerea*	Least Concern	IV	WM
Citrine Wagtail	*Motacilla citreola*	Least Concern	IV	WM
Common Stonechat	*Saxicola torquatus*	Least Concern	IV	R
Crimson Sunbird	*Aethopyga siparaja*	Least Concern	IV	R
Purple Sunbird	*Cinnyris asiaticus*	Least Concern	IV	R

Jungle Owlet	*Glaucidium radiatum*	Least Concern	IV	R
Jungle Babbler	*Turdoides striata*	Least Concern	IV	R
Greater Necklaced Laughing Thrush	*Garrulax pectoralis*	Least Concern	IV	R
Black-throated Sunbird	*Aethopyga saturata*	Least Concern	IV	R
Green-tailed Sunbird	*Aethopyga nipalensis*	Least Concern	IV	R
Purple-rumped Sunbird	*Leptocoma zeylonica*	Least Concern	IV	R
Ruby-cheeked Sunbird	*Chalcoparia singalensis*	Least Concern	IV	R
Scarlet-backed Flowerpecker	*Dicaeum cruentatum*	Least Concern	IV	R
Plain Prinia	*Prinia inornata*	Least Concern	IV	R
White-rumped Vulture	*Gyps bengalensis*	Critically Endangered	I	C
Slender-billed Vulture	*Gyps tenuirostris*	Critically Endangered	I	C

- **R = Resident**
- **WM = Winter Migrant**
- **SV = Seasonal Visitor**
- **C=Congregatory**

Source: District working plan

Species observed during Primary Survey are highlighted with Blue colour

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

Sl. No.		Scientific name	IUCN status	Schedule status (WPA 2022)
Mammals				
1.	Rehsus Macaque	*Macaca mulata*	LC	NS
2.	Boro endur	*Cannomis badius*	LC	NS
3.	Large Indian Civet	*Viverra zibetha*	LC	II
4.	Masked Palm Civet	*Paguma larvata*	LC	II
5.	Irrawaddy Squirrel	*Callosciurus pygerythrus*	LC	NS

Sl. No.		Scientific name	IUCN status	Schedule status (WPA 2022)
6.	Clouded Leopard	*Neofelis nebulosa*	VU	I
		Reptiles		
1.	Common Garden Lizard	*Calotes versicolor*	NE	NS
2.	Bronze Skink	*Eutropis macularia*	LC	NS
3.	White-spotted Supple Skink	*Lygosoma albopunctata*	LC	NS
4.	Banded Krait	*Bungarus fasciatus*	LC	NS
5.	Common Kukri Snake	*Oligodon arnensis*	LC	NS
6.	Snail-eater	*Pareas monticola*	LC	NS
		Amphibians		
1.	Indian Bullfrog	*Hoplobatrachus tigerinus*	LC	II
2.	Baibung Small Treefrog	*Theloderma baibungense*	LC	NS
3.	Hill Rock Toad	*Bufoides meghalayanus*	EN	NS
4.	Shillong Bush Toad	*Pseudophilautus shillongensis*	CR	NS
		Butterflies		
1.	Teinopalpus imperialis	*Byasa dasarada*	NT	NS
2.	Bhutanitis lidderdalii	*Graphium aggamemnon*	LC	NS
3.	Troides helena	*Delias descombesi*	LC	NS
4.	Papilio bianor	*Hypolimnas bolina*	LC	NS
5.	Papilio paris	*Moduza procris*	LC	NS
6.	Papilio memnon	*Charaxes bharata*	LC	NS
7.	Papilio polytes	*Graphium cloanthus*	LC	NS
8.	Papilio clytia	*Kallima inachus*	LC	NS
9.	Graphium sarpedon	*Papilio polytes*	LC	NS
10.	Graphium doson	*Junonia almana*	LC	NS
11.	Graphium agamemnon	*Junonia iphita*	LC	NS
12.	Atrophaneura varuna	*Acraea issoria*	LC	NS
13.	Lamproptera curius	*Troides helena*	LC	NS
14.	Pachliopta aristolochiae	*Pachliopta aristolochiae*	LC	NS
15.	Kallima inachus	*Papilio eurypylus*	LC	NS
16.	Hypolimnas bolina	*Elymnias patna*	LC	NS
17.	Elymnias hypermnestra	*Cyrestis thyodamas*	LC	NS
18.	Junonia atlites	*Troides aeacus*	LC	NS
19.	Junonia lemonias	*Papilio helenus*	LC	NS
20.	Danaus chrysippus	*Graphium macareus*	LC	NS

Sl. No.		Scientific name	IUCN status	Schedule status (WPA 2022)
21.	Tirumala limniace	*Danaus chrysippus*	LC	NS
22.	Parantica aglea	*Graphium doson*	LC	NS
23.	Euploea core	*Junonia orithya*	LC	NS
24.	Neptis hylas	*Prosotas nora*	LC	NS
25.	Ypthima baldus	*Heliophorus epicles*	LC	NS

Source: District working plan

Species observed during Primary Survey are highlighted with Blue colour

Aquatic Biodioversity

List of Fish

Order	Scientific Name	Common Name	Local Name	IUCN Status	Habitat Type
Cypriniformes	*Puntius sophore*	Pool Barb	Na Patchi / Puti	LC	Rivers, floodplains, ponds
Cypriniformes	*Puntius chola*	Barb	Na Patchi / Puti	LC	Rivers, floodplains
Cypriniformes	*Gudusia chapra*	Indian River Shad	Na Patchi / Puti	LC	Rivers, reservoirs
Cypriniformes	*Raiamas bola*	Trout Barb	–	LC	Clear hill streams
Cypriniformes	*Labeo rohita*	Rohu	Khabaw	LC	Rivers, ponds, floodplains
Cypriniformes	*Catla catla*	Catla	–	LC	Rivers, reservoirs
Other Cypriniformes	*Cyprinus carpio*	Common Carp	–	VU	Lakes, still waters, reservoirs
Perciformes	*Channa stewartii*	Snakehead	Na Chi	LC	Streams,

					ponds, slow waters
Nemacheilidae	*Aborichthys garoensis*	Garo Stone Loach	–	VU	Hill streams, bottoms in Garo Hills
Synbranchidae	*Garo khajuriai*	Garo Spineless Eel	–	NT	Freshwater demersal, hill streams / bottoms

(Source : Primary and Secondary data)

List of Phytoplanktons

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

(Source Secondary and Primary)
Secondary source reference: Working Plan of East and North Garo Hills Tura Division

Annexure 4.3: Structure Details Table 1: List of Structures

S. No.	LHS/RHS	Chainage and distance	Distance from centre line in m	Type of Impact	Photo
1.	LHS	22+900	5.7	Temproary House along the road	

2.	LHS	24+610	5	Temproary House along the road	
3.	LHS	37+400	5.8	Temproary House along the road	

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4.	RHS	28+000	5.5	Temproary House along the road	
5.	LHS	29+200	5.6	Temproary House along the road	

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Annexure 4.4: Monitoring Results in the Project Area

Soil

Soil monitoring was conducted at 03 Locations in the month of October. Details of the soil sampling locations are presented in Table **1** and shown in **Figure 1**. The collected soil samples were analyzed for various parameters in an NABL-accredited laboratory. The soil monitoring results are presented in the **Table 2**

Table 1. Soil sampling locations

Sl. No.	Project Area	Monitoring Location	Sample Code	Geographical Coordinate	
				Latitude	Longitude
1	Corridor 2	Rongchong Village Agricultural Field	SQ1	25°43'0.83"N	90°56'55.40"E
2		Gajilgittim Agricultural Field	SQ2	25°45'14.04"N	90°56'23.98"E
3		Memillam Modipara Agricultural Field	SQ3	25°46'27.74"N	90°56'42.52"E

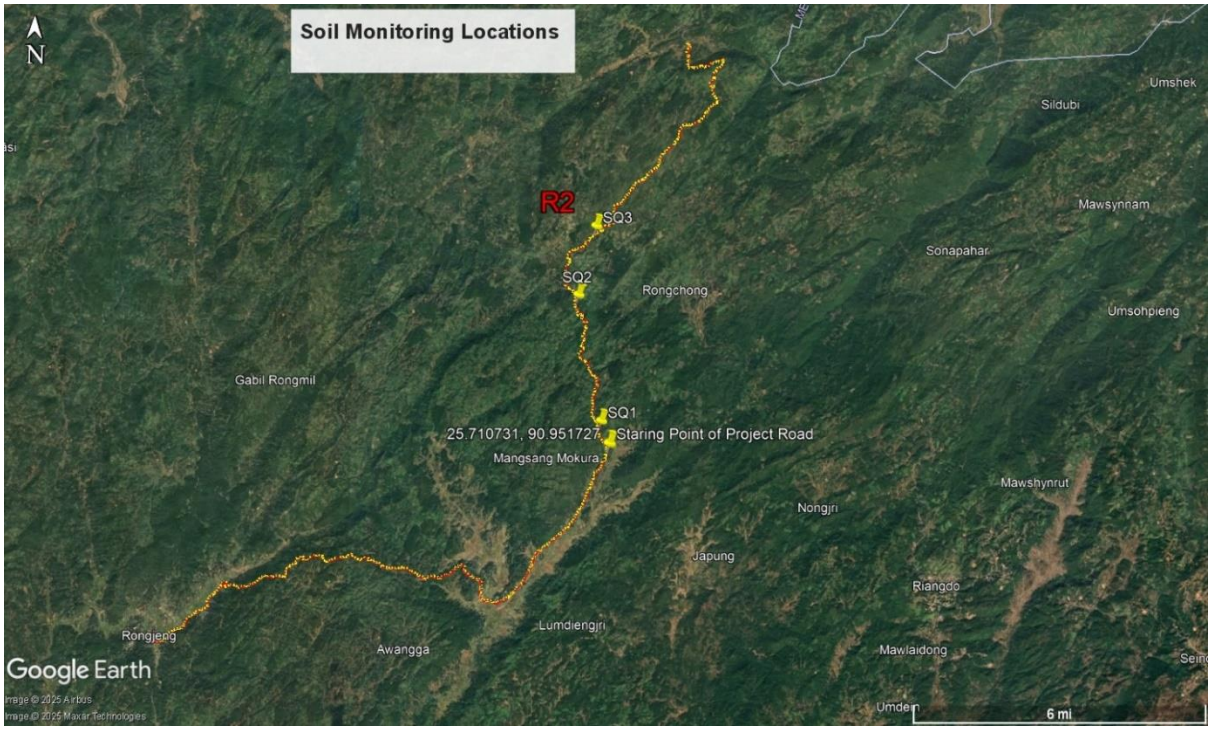

Figure 1: Soil Sampling locations

Table 2. 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	1.24	1.28	1.31	IS 14765: 2000, RA 2010
4	Water Holding Capacity	%	31.8	33.2	29.6	STRL/STP/SOIL/01
5	Sand	%	57.2	49.6	52.8	IS2720 (P-4),1985 (Reaff: 2015)
6	Silt	%	24.5	30.1	25.4	IS2720 (P-4),1985 (Reaff: 2015)
7	Clay	%	18.3	20.3	21.8	IS2720 (P-4),1985 (Reaff: 2015)
8	pH (1:2 Suspension)	-	5.45	5.62	5.88	IS:2720 (P-26), 1987 (Reaff:2011)
9	Electrical Conductivity(1:2)	µmhos/cm	198.4	212.6	235.2	IS: 14767(2000), RA 2016
10	Organic Matter	%W/W	3.85	4.12	3.54	STRL/STP/SOIL/01
11	Exchangeable Calcium	mg/kg	1186.2	1235.8	1294.3	IS 2720 (Part 24): 1976, RA 2010
12	Exchangeable Magnesium	mg/kg	462.5	498.7	521.4	IS 2720 (Part 24): 1976, RA 2010
13	Copper	mg/kg	8.4	10.2	9.1	IS 2720(Part-27): 1977
14	Nickel	mg/kg	6.8	7.9	8.5	IS 2720(Part-27): 1977
15	Chromium	mg/kg	9.1	10.3	11.2	IS 2720(Part-27): 1977
16	Iron	mg/kg	92.4	105.6	113.8	IS 2720(Part-27): 1977
17	Lead	mg/kg	0.4	0.3	0.5	IS 2720(Part-27): 1977
18	Sulphate	mg/kg	14.6	17.9	19.3	IS 2720(Part-27): 1977
19	Nitrogen (as N)	Kg/Ha	274.2	288.6	269.1	IS:10158:1982, RA 2009
20	Phosphorous	Kg/Ha	88.5	94.3	81.2	IS:10158:1982, RA 2009
21	Exchangeable Potassium	Kg/Ha	72.8	84.6	79.4	STRL/STP/SOIL/01

Surface water

03 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 included samples from river in the month of October. Location details of the surface water samples are presented in Table 3 and shown in Figure 2. Results of the Surface water quality are shown in Table 4.

Table 3. Surface Water Monitoring Locations

S. No	Source of Sample	Sample Code	Geographical Coordinate	
			Latitude	Longitude
1		SW1	25°44'55.47"N	90°56'33.83"E
2		SW2	25°49'31.81"N	90°58'51.26"E
3	Ildek River	SW3	25°49'54.02"N	90°58'27.70"E

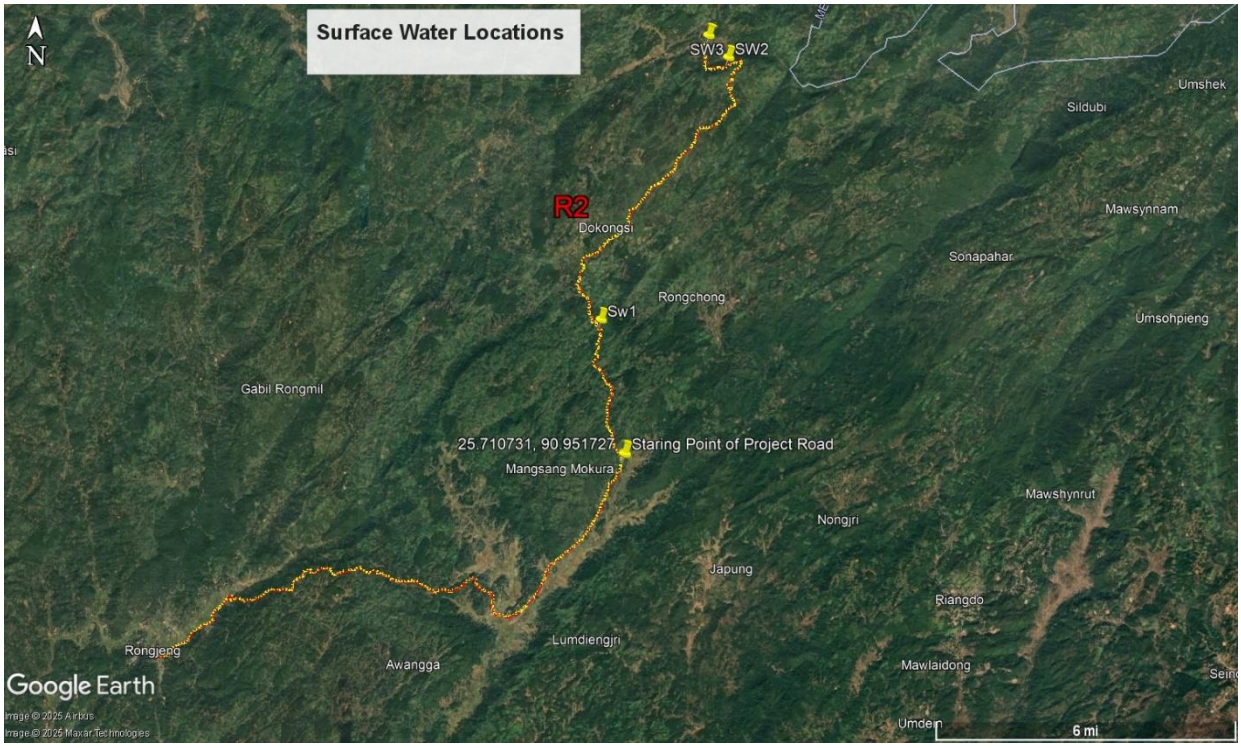

Figure 2: Surface Water monitoring locations

Table 4 : Surface Water Quality Monitoring results in the project area

Sl. No.	Parameters	Unit	IS: 2296 -1992 (Class C) Tolerance Limit	SW-1	SW-2	SW-3	Test method
1	pH	-	6.5 -8.5	7.08	6.92	7.15	IS: 3025(Pt-11)1983, RA. 2002
2	Temperature	°C	-	19.1	18.6	17.9	APHA 23nd Edn.2017-2550 B
3	D.O	mg/l	Minimum -4	7.65	6.98	6.42	IS 3025(Part-38): 2006
4	BOD	mg/l	30	4.80	5.10	4.60	IS 3025(Part-44):1993, RA 2009
5	Colour	Hazen	300	7	8	6	IS: 3025 (Pt-4) 1983, RA 2017
6	Odour	-	-	Agreeable	Agreeable	Agreeable	IS: 3025(Pt-5)

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Sl. No.	Parameters	Unit	IS: 2296 -1992 (Class C) Tolerance Limit	SW-1	SW-2	SW-3	Test method
7	TDS	mg/l	1500	205.4	218.1	197.6	IS 3025(Part-16): 1984, RA 2006
8	TSS	mg/l	-	18.6	24.2	20.7	IS 3025(Part-17)
9	TKN	mg/l		1.9	2.4	2.1	IS: 3025(Pt-34)1988, RA. 2003
10	Ammonical Nitrogen	mg/l		0.38	0.42	0.35	IS: 3025(Pt-34)1988, RA. 2003
11	Nitrate (as NO_3)	mg/l	50	2.8	3.1	2.6	IS: 3025(Pt-34)1988, RA. 2003
12	Free Ammonia	mg/l		<0.1	<0.1	<0.1	IS: 3025(Pt-34)1988, RA. 2003
13	Chlorides (as Cl)	mg/l	600	27.6	30.1	25.4	IS 3025(Part-32): 1988
14	Sulphates (as SO_4)	mg/l	400	28.2	32.6	31.5	IS 3025(Part-24):1986, RA 2003
15	Fluoride (as F)	mg/l	1.5	0.46	0.52	0.49	APHA 21st Ed., 4500F(D)
16	Oil & Grease	mg/l	0.1	<0.1	<0.1	<0.1	IS 3025(Part-39):1991, RA 2009
17	Phenolic Compound (as C_6H_5OH)	mg/l	0.005	<0.001	<0.001	<0.001	5530-B, C&E, APHA 23nd 2017
18.	Arsenic	mg/l	0.2	<0.01	<0.01	<0.01	3110- B, APHA 23nd Ed. 2017 (AAS)
19	Mercury (as Hg)	mg/l	-	<0.001	<0.001	<0.001	3110- B, APHA 23nd Ed.2017
20	Lead (as Pb)	mg/l	0.1	0.018	0.020	0.017	3110- B, APHA 23nd Ed. 2017 (AAS)
21	Cadmium (as Cd)	mg/l	0.01	0.001	0.001	0.002	3110- B, APHA 23nd Ed. 2017 (AAS)
22.	Chromium (as Cr^{+6})	mg/l	0.05	0.018	0.026	0.027	IS 3025(Part-52): 200
23.	Copper (as Cu)	mg/l	1.5	0.11	0.15	0.14	3110- B, APHA 23nd Ed. 2017 (AAS)
24.	Zinc (as Zn)	mg/l	15	0.20	0.26	0.22	3110- B, APHA 23nd Ed. 2017 (AAS)
25	Selenium (as Se)	mg/l	-	<0.01	<0.01	<0.01	IS: 3025 (P- 56)
26.	Anionic detergents (as MBAS)	mg/l	1.0	<0.1	<0.1	<0.1	Annexure K Of IS 13428
27.	Iron (as Fe)	mg/l	50	0.35	0.41	0.28	3500-Fe- B, APHA 23nd Ed. 2017
28.	Sulphide (as H_2S)	mg/l	-	0.12	0.19	0.15	IS-3025 (P-29)
29.	Phosphate (as PO_4)	mg/l	-	4.62	5.18	4.84	APHA 22nd Edn.2012-4500-P C
30.	Cyanide (as CN)	mg/l	0.05	<0.01	<0.01	<0.01	4500-CN-B, C & E, APHA 23nd Ed.2017
31.	Manganese (as Mn)	mg/l	-	0.04	0.05	0.03	3110- B, APHA 23nd Ed.2017
32.	COD	mg/l	-	18.4	21.2	17.6	IS 3025(Part-58): 2006

Sl. No.	Parameters	Unit	IS: 2296 -1992 (Class C) Tolerance Limit	SW-1	SW-2	SW-3	Test method
33.	Total Coli form	MPN/100ml	5000	920	1180	760	IS: 1622-1981

Ground water

01 Ground water samples have been selected from sources present along the project roads to ascertain the baseline conditions of the ground water quality. The Ground water samples collected included samples in the month of October. Location details of the surface water samples are presented in Table 4 and shown in Figure 3. Results of the Surface water quality are shown in Table 5.

Table 4: Ground Water Sample Locations in the sub-project area

Sl. No	Project Area	Monitoring Location	Sample Code	Geographical Co-ordinates	
				Latitude	Longitude
1	Corridor 2	Nongkongkil Community Hall	GW1	25°43'53.56"N	90°56'52.80"E

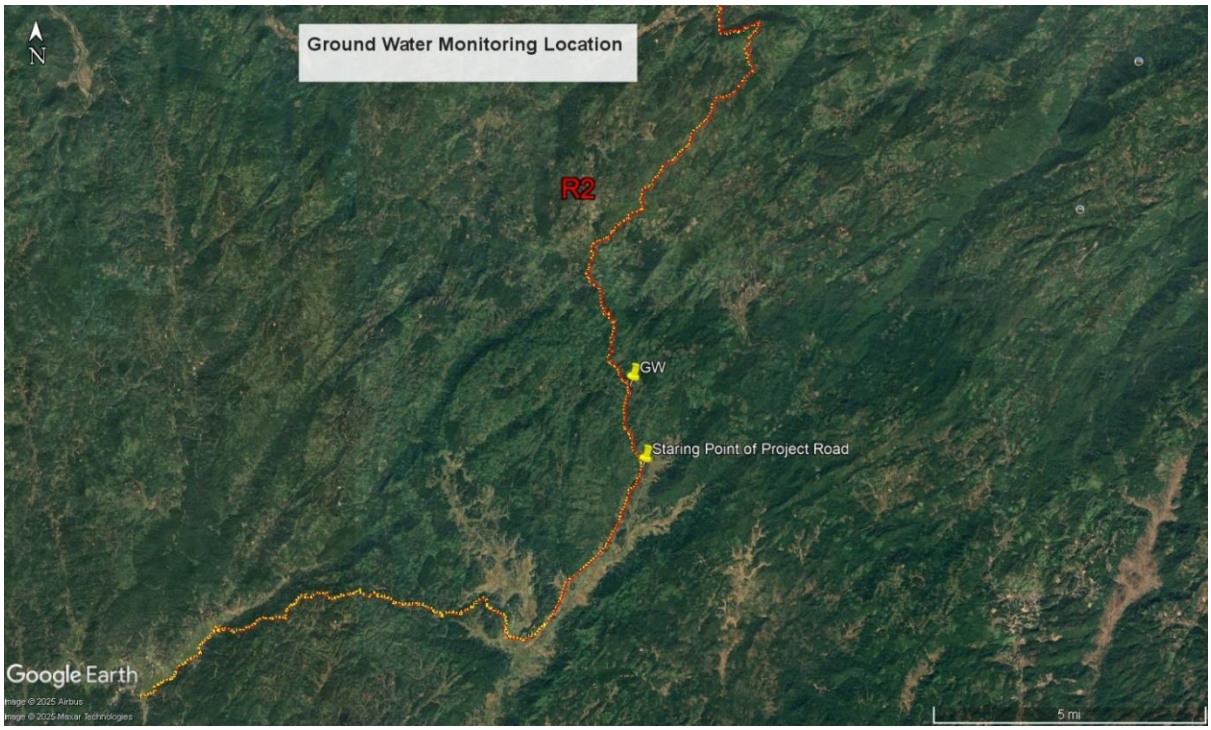

Figure 3: Ground Water monitoring locations

Table 5: Ground Water monitoring results in the project area

S. No.	Parameters	Unit	Limit (IS-10500:2012)		GW-1	GW-2	Test method
			Desirable Limit	Permissible Limit			
1	Color	Hazen	5	15	<4	<5	IS: 3025(Pt-4)
2	Odour	-	Agreeable	Agreeable	Agreeable	Agreeable	IS: 3025(Pt-5)
3	Taste	-	Agreeable	Agreeable	Agreeable	Agreeable	IS: 3025(Pt-8)
4	Turbidity	NTU	1	5	0.6	0.7	IS 3025(Part-10)
5	pH	-	6.5-8.5	No Relaxation	7.28	7.21	IS: 3025(Pt-11)
6	Total Hardness (as $CaCO_3$)	mg/l	200	600	118	126	IS 3025(Part-21)
7	Iron (as Fe)	mg/l	0.3	No Relaxation	0.24	0.29	3500-Fe- B, APHA 23nd Ed.2017
8	Chlorides (as Cl)	mg/l	250	1000	20.4	23.1	IS 3025(Part-32)
9	Fluoride (as F)	mg/l	1	1.5	0.41	0.38	4500-F-(D), APHA 23st Ed.2017
10	TDS	mg/l	500	2000	232.8	247.6	IS 3025(Part-16)
11	Calcium (as Ca^{2+})	mg/l	75	200	25.8	24.1	IS 3025(Part-40)
12	Magnesium (as Mg^{2+})	mg/l	30	100	13.0	14.7	3500- Mg B, APHA 23nd Ed.2017
13	Sulphate (as SO_4)	mg/l	200	400	11.9	14.1	IS 3025(Part-24)
14	Nitrate (as NO_3)	mg/l	45	No Relaxation	10.8	9.2	IS: 3025(Pt-34)
15	Total Chromium (as Cr)	mg/l	0.05	No Relaxation	<0.01	<0.01	3110- B, APHA 23nd Ed.2017
16	Alkalinity as $CaCO_3$	mg/l	200	600	132.4	137.8	IS 3025(Part-23)
17	Aluminium (as Al)	mg/l	0.03	0.2	<0.01	<0.01	IS 3025(Part-55)
18	Total Arsenic (as As)	mg/l	0.01	No Relaxation	<0.01	<0.01	3110- B, APHA 23nd Ed2017
19	Copper (as Cu)	mg/l	0.05	1.5	<0.05	<0.05	3110- B, APHA 23nd Ed2017
20	Manganese (as Mn)	mg/l	0.1	0.3	0.015	0.012	3110- B, APHA 23nd Ed2017
21	Zinc (as Zn)	mg/l	5	15	0.22	0.19	3110- B, APHA 23nd Ed2017
22	Ammonia (as NH_3-N)	mg/l	0.5	No Relaxation	<0.1	<0.1	4500-NH_3-B &C, APHA 23rd ED2017
23	Anionic Detergents (as MBAS)	mg/l	0.2	1	<0.1	<0.1	Annexure K of IS-13428

S. No.	Parameters	Unit	Limit (IS-10500:2012)		GW-1	GW-2	Test method
			Desirable Limit	Permissible Limit			
24	Boron (as B)	mg/l	0.5	1	<0.5 (BDL)	<0.5 (BDL)	IS: 3025(Pt-57)
25	Mineral Oil	mg/l	0.5	No Relaxation	<0.1	<0.1	IS 3025(Part-39)
26	Phenolic Compound (as C_6H_5OH)	mg/l	0.001	0.002	<0.001	<0.001	IS 3025(Part-44)
27	Cadmium (as Cd)	mg/l	0.003	No Relaxation	<0.002	<0.002	3110- B, APHA 23nd Ed2017
28	Cyanide (as CN)	mg/l	0.05	No Relaxation	<0.1	<0.1	4500- CN-B, C & E, APHA 23nd Ed2017
29	Lead	mg/l	0.01	No Relaxation	<0.01	<0.01	3110- B, APHA 23nd Ed2017
30	Mercury (as Hg)	mg/l	0.001	No Relaxation	<0.001	<0.001	3110- B, APHA 23nd Ed.2017
31	Nickel (as Ni)	mg/l	0.02	No Relaxation	<0.02	<0.015	3110- B, APHA 23nd Ed.2017
32	Residual Free Chlorine	mg/l	0.2	1.0	0.12	0.05	4500-Cl-B, APHA 23nd Ed2017
33	Molybdenum (Mo)	mg/l	<0.05	0.07	<0.05	<0.05	3110- B, APHA 23nd Ed.2017
34	Polynuclear Aromatic Hydrocarbons	mg/l	<0.0001	0.0001	Not Detectable	Not Detectable	APHA 6440,23nd Ed.2017
35	Poly chlorinated biphenyl	mg/l	<0.0001	0.0005	Not Detectable	Not Detectable	APHA 6430,23nd Ed.2017
36	Total Coli form	MPN/ 100ml	Shall not be detectable in any 100 ml of sample		<1	<1	IS: 1622-1981
37.	E.Coli	E.Coli/ 100ml	Shall not be detectable in any 100 ml of sample		Absent	Absent	IS: 1622-1981

Ambient Air Quality

Residential and other sensitive locations proximity to roads were the criteria used for selecting the sample locations (Table 6).04 locations were selected for air quality monitoring. Monitoring was done in the month of October. Parameters like Particulate Matter (PM_{10}), Particulate Matter ($PM_{2.5}$), Sulphur dioxide (SO_2), Nitrogen dioxide (NO_2) and Carbon Monoxide (CO) were monitored. Map showing monitoring locations are given in Figure 4. Ambient air quality results are given in Table 7.

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Table 6: Ambient Air Quality Monitoring Locations

Sl. No.	Monitoring Location	Sample Code	Geographical Coordinate	
			Latitude	Longitude
1	Nongkongkil Village	AQ1	25°43'53.55"N	90°56'51.48"E
2	Remagittim Village	AQ2	25°45'59.70"N	90°56'15.27"E
3	MemillamModipara Village	AQ3	25°48'39.01"N	90°58'49.42"E
4	IldekAkong Village	AQ4	25°49'48.95"N	90°58'28.93"E

Figure 4. Ambient Air quality Monitoring Locations

Table 7: Ambient Air Quality Monitoring Results within project influence area

Sl. No.	Project Area	Location	Sample Code	Latitude (North)	Longitude (East)	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	Sulphur Dioxide (SO_2) ($\mu g/m^3$)	Nitrogen Dioxide (NO_2) ($\mu g/m^3$)	Carbon Monoxide (CO) ($\mu g/m^3$)
1	Corridor	Nongkongkil Village	AQ 1	25°43'53.55"N	90°56'51.48"E	42.2	17.6	5.4	7.2	0.250
2		Remagittim Village	AQ 2	25°45'59.70"N	90°56'15.27"E	41.4	18.2	5.9	7.6	0.230
3		MemillamModipara Village	AQ 3	25°48'39.01"N	90°58'49.42"E	42.6	18.4	6.4	7.3	0.270
4		IldekAkong Village	AQ 4	25°49'48.95"N	90°58'28.93"E	43.6	17.8	5.8	7.2	0.260
National Ambient Air Quality Standards, Central Pollution Control Board, 2009						100	60	80	80	2000
Test Methods						IS:5182 (P-23): 2006	SOP1/STRL/ Ambient Air/ Gravimetric method	IS:5182 (P-2): 2006	IS:5182 (P-6): 2006	IS:5182 (P-10):1999, RA-2003

Average Ambient Noise Monitoring Results

This section describes the noise quality standards and the existing ambient noise levels, including the locations of the monitoring stations.

To compute the average Noise Level dB (A), noise level is monitored over a period of 24 hour by the authorized NABL laboratory. The noise monitoring has been conducted for determination of noise levels at 03 locations for (Figure 5) in the month of October as per Table 8 below. Results are given in Table 9.

Table 8: Ambient Noise Monitoring Locations

S. No.	Location	Sample Code	Latitude (North)	Longitude (East)
1	Nongkongkil Village	NQ1	25°43'53.63"N	90°56'51.41"E
2	Remagittim Village	NQ2	25°45'59.83"N	90°56'15.17"E
3	MemillamModipara Village	NQ3	25°48'38.93"N	90°58'49.41"E
4	IldekAkong Village	NQ4	25°49'48.89"N	90°58'28.85"E

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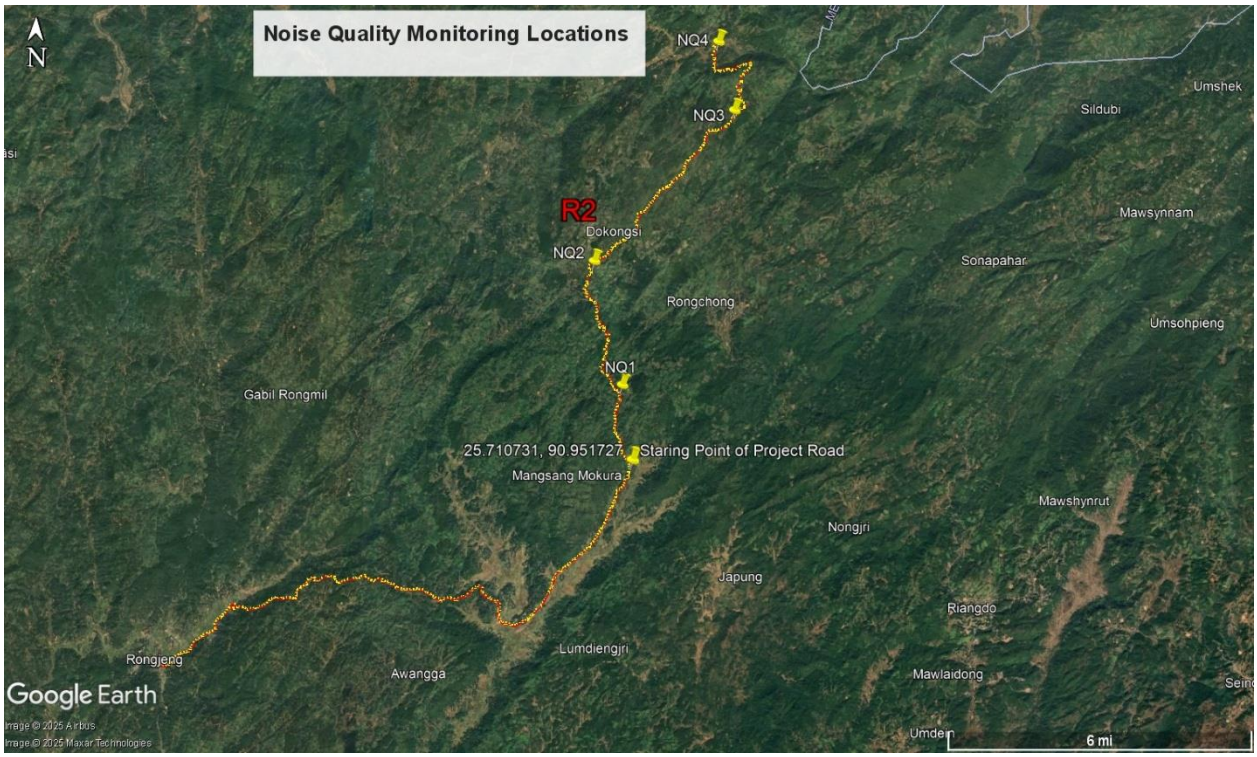

Figure 5: Noise quality monitoring locations

Table 9: Average Ambient Noise Monitoring Results in the sub-project area

Sl. No.	Project Area	Location	Sample Code	Latitude (North)	Longitude (East)	Equivalent Noise Level, Leq (Day*)	Equivalent Noise Level, Leq (Night**)
						dB (A)	dB (A)
1	Corridor	Nongkongkil Village	NQ1	25°43'53.63"N	90°56'51.41"E	40	31
2		Remagittim Village	NQ2	25°45'59.83"N	90°56'15.17"E	43	33
3		MemillamModipara Village	NQ3	25°48'38.93"N	90°58'49.41"E	41	31
4		IldekAkong Village	NQ4	25°49'48.89"N	90°58'28.85"E	51	36
*Day Time means from 6:00am to 10:00pm **Night Time means from 10:00pm to 6:00am							

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 1014408.48 m^3 and a fill volume of 590854.96 m^3. The Maximum Cutting about 4.42 m accordingly, the Protection works will be proposed as per Nature/Class of Rocks/Soil Strata. This indicates that the excavation requirement is nearly double the filling requirement, resulting in a surplus of approximately 4,23,553.52 cu.m 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 MPWD/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

RMA					
Dumping Location			Coordinate		Area m2
SL. NO	LOCATION CHAINAGE	SIDE	X	Y	
1	23+300	LHS	294013.96	2846328.85	1500
2	27+900	LHS	293718.4	2849274.36	3500
3	31+200	RHS	293220.77	2851735	6150
4	34+800	RHS	295307.98	2853962.89	9056
5	37+500	RHS	296904.01	2855899.61	6610
6	42+050	RHS	296985.42	2857885.94	6000

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 ≤ 30°.
- 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.

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.

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): _____
For

Meghalaya Logistics and Infrastructure Connectivity Project (MLICP)

1. Introduction:

The Labour Management Plan (LMP) outlines the framework for managing labour-related issues in the Meghalaya Logistics and Infrastructure Connectivity Project (MLICP). The objective is to ensure compliance with applicable national labour laws, safeguard worker rights, prevent exploitation, and promote safe, fair, and equitable working conditions. The plan applies to direct workers, contracted workers, community workers, and primary supply workers engaged under the project.

2. Objectives:

- Ensure fair treatment, non-discrimination, and equal opportunity for all workers.
- Protect workers' rights as per Indian legislations and international standards (World Bank ESS2).
- Provide safe and healthy working conditions.
- Prevent the use of child labour and forced labour.
- Establish a functional grievance redressal mechanism (GRM) for workers.
- Strengthen capacity of contractors and sub-contractors for compliance.

3. Applicable Legal Framework:

The project will comply with the following labour laws:

1. Payment of Wages Act, 1936 – timely and fair wage payment.
2. Minimum Wages Act, 1948 – ensure minimum wages for construction workers.
3. Equal Remuneration Act, 1976 – equal wages and non-discrimination.
4. Contract Labour (Regulation & Abolition) Act, 1970 – registration, welfare measures, and licensing for contractors.
5. Payment of Gratuity Act, 1972 – terminal benefits after minimum service.
6. Employees' Provident Fund & Miscellaneous Provisions Act, 1952 – PF contributions and benefits.
7. Payment of Bonus Act, 1965 – bonus to eligible workers.
8. Maternity Benefit Act, 1961 – leave and benefits for women employees.
9. Child Labour (Prohibition & Regulation) Act, 1986 – prohibition of child labour below 14 years.
10. Inter-State Migrant Workmen (Regulation of Employment & Conditions of Service) Act, 1979 – facilities for migrant workers.

11. Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 – welfare, safety, health, and cess collection.

4. Labour Use in the Project:

The project will engage different categories of labour:

- Direct Workers: Staff hired by the Project Implementing Unit (PIU), PMU, and consultants.
- Contracted Workers: Workers engaged by civil works contractors and sub-contractors.
- Primary Supply Workers: Labour involved in material supply (stone, sand, cement, bitumen, etc.).
- Community Workers (if applicable): Local villagers engaged in small-scale work or maintenance.

5. Labour Influx and Local Norms:

- Most labour will be drawn from local communities.
- Limited skilled/semi-skilled labour may migrate from outside Meghalaya.
- Contractors must ensure registration of inter-state migrant workers as per law.
- Customary land and village institutions will be consulted to ensure harmony with local governance and community values.
- Peak manpower requirement: ~45 personnel.
- Skilled workers (machine operators, concrete casting crew) mainly migrant workers.
- ~60–70% of workforce to be sourced locally; remaining skilled workers, supervisors, and engineers from outside.
- Workers accommodated in construction camp.
- Manpower mobilization aligned with construction schedule.

6. Key Labour Risks:

- Influx of outside labour creating pressure on local resources.
- Occupational Health and Safety (OHS) risks due to construction activities.
- Risk of child labour or bonded labour.
- Gender-based violence (GBV), sexual exploitation, and harassment (SEAH).
- Wage disputes and delayed payments.
- Lack of access to grievance redressal for contract workers.

7. Labour Management Procedures:

7.1 Recruitment and Employment:

- Priority to local labour as per community norms.
- Transparent recruitment through contractors, avoiding middlemen.
- Maintain worker registers with demographic and employment details.
- Written contracts/appointment letters for all workers.

7.2 Wages and Benefits:

- Payment of wages electronically/bank transfer wherever feasible.
- Equal pay for equal work for men and women.
- Wage slips issued monthly.
- Contribution to PF/ESI as per eligibility.

7.3 Working Conditions and Hours:

- Working hours not to exceed 8 hours/day and 48 hours/week.
- Weekly rest, overtime payment as per law.
- Rest shelters and drinking water at worksites.

7.4 Occupational Health & Safety (OHS):

- Compliance with Building and Other Construction Workers Act, 1996.
- Provision of PPE (helmets, gloves, masks, boots, safety harnesses).
- First aid kits and trained personnel on-site.
- Mandatory safety induction and periodic training.
- Accident reporting and compensation mechanism.

7.5 Prohibition of Child and Forced Labour:

- Contractors must certify non-engagement of child labour below 18 years in hazardous work.
- Forced or bonded labour is strictly prohibited.

7.6 Gender and Inclusion Measures:

- Equal wages and opportunities for women workers.
- Provision of separate toilets, changing rooms, and crèche facilities (if >50 female workers).
- Sensitization on gender-based violence (GBV), harassment, and zero-tolerance policy.

7.7 Worker Grievance Redressal Mechanism (GRM):

- A separate Workers' GRM within the project GRM.
- Accessible to all categories of workers (direct, contracted, supply).
- Confidential handling of complaints, especially GBV/SEAH.
- Multiple channels: complaint box at site, hotline, community liaison officer.
- Timely resolution and feedback to complainants.

8. Roles and Responsibilities:

- PIU / PMU: Overall monitoring of LMP compliance, reporting to funding agency/World Bank.
- Contractors: Implementation of labour welfare and OHS measures; maintain registers; ensure legal compliance.
- Supervision Consultants: Monitor contractor compliance, conduct site inspections.
- Village Institutions: Support monitoring of labour influx, community safety, and conflict resolution.

9. Training and Capacity Building:

- Induction training on workers' rights, OHS, GBV/SEAH, and GRM.
- Regular refresher training for workers and supervisors.
- Awareness campaigns in collaboration with local institutions.

10. Monitoring and Reporting:

- Contractors to submit monthly reports on labour use, wage payments, accidents, grievances.
- PIU/PMC to carry out quarterly compliance monitoring.
- Labour audits to verify adherence to laws and LMP provisions.

11. Code of Conduct (CoC):

All workers will sign a Code of Conduct, covering:

- Prohibition of sexual harassment, exploitation, and abuse.
- Respect for local culture and customs.
- Zero tolerance for alcohol/drug use at work sites.
- Respectful behaviour with community members.

12. Budget:

Contractors shall include costs for labour welfare, OHS, training, and GRM in the bid. PIU will allocate resources for monitoring and capacity-building.

Disclaimer: This is a draft version and is under review by the World Bank

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

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

3. Roles and Responsibilities

- Project Implementation Unit (PIU):

✓ Ensure contractor compliance with OHS requirements.

✓ Monitor safety performance through site inspections and audits.

- Contractor:

✓ Prepare and implement site-specific OHS plans.

✓ Appoint a Safety Officer for each package.

✓ Provide Personal Protective Equipment (PPE) to all workers.

✓ Maintain records of accidents, near misses, and corrective actions.

- Construction Supervision Consultant (CSC):

✓ Verify contractor compliance.

✓ Conduct joint safety inspections with PIU and Contractor.

✓ Provide training and awareness sessions.

- Workers:

✓ Follow safety protocols and wear PPE at all times.

✓ Report unsafe conditions and accidents immediately.

4. Hazard Identification and Risk Management

- Key Occupational Hazards:

✓ Working at height (bridges, culverts, hill slopes).
✓ Roadside excavation, tunneling, and blasting in hilly terrain (If applicable).
✓ Exposure to dust, noise, and vibrations.
✓ Manual handling and lifting of heavy materials.
✓ Vehicle and machinery movement.
✓ Electrical hazards from temporary connections.
✓ Extreme weather conditions (heavy rainfall, landslides).

- Risk Control Measures (Hierarchy of Controls):

✓ Elimination – Avoid hazardous practices where possible.
✓ Substitution – Use less hazardous materials/processes.
✓ Engineering Controls – Guardrails, barricades, warning signs.
✓ Administrative Controls – Work permits, job rotation, shift planning.
✓ PPE – Helmets, safety shoes, gloves, ear plugs, masks, reflective jackets.

5. Health and Safety Procedures

- General Site Safety:

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

- Personal Protective Equipment (PPE):

✓ Mandatory: Safety helmet, safety shoes, reflective jacket.
✓ Task-based: Gloves, ear protection, eye protection, dust masks, harness.
✓ Contractor responsible for supply, training, and replacement.

- Traffic and Road Safety:

✓ Prepare a Traffic Management Plan (TMP).
✓ Warning signs, flagmen, and speed limits near work zones.
✓ Separate entry/exit for construction vehicles.
✓ Awareness campaigns for communities and school children.

- Machinery and Equipment Safety:

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

- Emergency Preparedness and Response:

✓ Emergency contact numbers displayed at site.
✓ Site-specific Emergency Response Plan (ERP).
✓ Fire extinguishers at key locations.
✓ First Aid kits with trained first aiders.
✓ Tie-ups with nearest Primary Health Centre (PHC)/hospital.

- Occupational Health:

✓ Pre-employment and periodic medical check-ups.
✓ Health awareness on communicable diseases (TB, HIV/AIDS, COVID-19).
✓ Separate facilities for men and women workers.
✓ Safe accommodation (if labor camps are established).

6. Training and Capacity Building

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

7. Incident Reporting and Monitoring

- All incidents (accidents, near misses, unsafe acts) must be reported within 24 hours.
- Contractor maintains Incident Register.
- CSC/PIU investigates major accidents and ensures corrective action.
- Monthly OHS performance reports submitted to PIU.

8. Monitoring Indicators

Indicator	Monitoring Method
Number of accidents and near misses	Incident Register & Reports
Percentage of workers provided with PPE	Site Inspections
Number of safety trainings/tool-box talks	Training Records

conducted	
Number of safety audits and inspections	Audit Reports
Compliance with OHS standards	Monthly Reports

9. Budgetary Provision

Contractor must allocate a specific budget for OHS, covering PPE, signage, first aid, training, and worker insurance.

10. Documentation and Record Keeping

- OHS Policy and Procedures.
- Worker orientation and training records.
- Medical check-up reports.
- Accident/incident investigation reports.
- OHS monthly compliance checklists.

Annexures: OHS Forms and Checklists:

Annexure 1: Accident / Incident Reporting Form:

Date & Time of Incident	
Location of Incident	
Name(s) of Injured Person(s)	
Nature of Injury / Illness	
Description of Incident	
Immediate Action Taken	
Witness Name(s) & Contact	
Reported By / Signature	

Annexure 2: Safety Audit Checklist

Checklist Item	Yes/No	Remarks
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: _____

Disclaimer: This is a draft version and is under review by the World Bank

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	Cumulativ
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): _____

	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.				
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 MSDS's kept nearby.				
2.10	Dust control measures in place.				
2.11	Construction site watered to minimize dust generated				
2.12	Stockpiles of dusty materials covered or watered				
2.13	All vehicles carrying dust materials covered or watered.				
2.14	Proper management of excavated soils.				
2.15	Adequate odor control measures taken.				
2.16	Are plant and equipment well maintained? (any black smoke observed, please indicate the plant/equipment)				
3.00	**Site clean and tidy**				
3.01	Chemical waste properly stored and labelled				
3.02	Separate labelled containers/areas provided for facilitating recycling and waste segregation				
3.03	Waste removed offsite regularly				

3.04	Is there any waste burnt on site?				
3.05	Are proper measures to control oil spillage during maintenance or to control other chemicals spillage? (e.g. provide drip trays)				
3.06	Are drip trays free of oil and water?				
3.07	Are oil drums and plants/equipment provided with drip trays?				
4.00	**Excavation and Trenches**				
4.01	All construction and emergency signs posted				
4.02	Barricades present				
4.03	Other underground utility lines mark out				
4.04	Protective systems in place i.e., shoring, shielding and sloping where applicable				
4.05	Proper Ladder available in excavations				
4.06	Excavated soils and equipment away from cut trenches at least one meter away				
5.00	**Electrical Safety**				
5.01	Do electrical devices have a current inspection and coding?				
5.02	Is electrical equipment properly maintained?				
5.03	Is equipment properly grounded?				
5.04	Are fuses provided?				
5.05	Are electrical dangers posted?				
5.06	Are proper fire extinguisher(s) provided?				
5.07	Are terminal boxes equipped with required covers, and is the cover used?				
5.08	Are circuits labelled in terminal boxes?				
5.09	Are all electrical distribution boards IP rated.				
5.10	LOTO system in place				
5.11	Do electrical circuit has ELCB in place				
6.00	**Scaffolding**				
6.01	Is erecting the scaffold properly supervised?				

6.02	Are all structural members free from defects, and do they meet safety factors?				
6.03	Are all scaffold connections secured?				
6.04	Are scaffolds erected on solid footing?				
6.05	Is scaffold tied to structure?				
6.06	Are working areas free of dirt, debris, snow, ice, and grease?				
6.07	Are employees protected from falling objects?				
6.08	Is scaffold plumb and square, with cross-bracing?				
6.09	Are guard rails, intermediate rails, and toe boards in place?				
6.10	Is the work platform is 100% Covered				
6.11	Are ropes and cables in good condition?				
6.12	Is fall protection available and in use?				
7.00	**Demolition**				
7.01	Is an engineering survey provided in writing?				
7.02	Does documentation show operations planned ahead?				
7.03	Is shoring of adjacent structures complete?				
7.04	Are utilities marked and shut off?				
7.05	Are hazardous materials or chemicals removed from any pipes, tanks, or equipment?				
8.00	**Fire prevention**				
8.01	Are an adequate number and types of fire extinguisher(s) available at labour camps, construction camps, etc?				
8.02	Is fire prevention/extinguisher training performed?				
8.03	Are inspections of fire extinguishers performed periodically?				
8.04	Is the telephone number of the fire department posted?				
8.05	Are fire extinguisher(s) provided on appropriate equipment?				
8.06	Are flammable liquids stored in approved containers and correctly labelled?				
8.07	Are flammable liquids properly stored?				

8.08	Is a fire alarm available?				
8.09	Is a fire evacuation plan established?				
8.10	Are fuel supplies protected from accidental impact?				
8.11	Is fire training given to appropriate personnel?				
8.12	Is equipment shut down prior to refueling?				
8.13	Is equipment properly grounded to fuel trucks before refueling?				
8.14	Are no-smoking signs posted and enforced?				
8.15	Are hydrants clear and access to public thoroughfare open?				
9.00	**Hoists, Cranes, and Derricks**				
9.01	Are annual inspections completed?				
9.02	Have operators been properly tested, and are their physical exams current?				
9.03	Are daily inspections completed by operators?				
9.04	Are outriggers used?				
9.05	Are power lines deactivated or removed, or are warning signs posted with at least 3M of clearance from overhead power lines				
9.06	Are hoists designed by a competent professional engineer?				
9.07	Is proper loading for capacity at lifting radius?				
9.08	Is equipment operated in accordance with the manufacturer's instructions?				
9.09	Does a competent person inspect the crane?				
9.10	Is equipment properly lubricated and maintained?				
9.11	Is load testing accomplished?				
9.12	Are signal workers properly trained and placed where needed?				
9.13	Are alarms working and audible?				
10.00	**Welding and cutting**				
10.01	Are all welding and cutting operators qualified?				
10.02	Are screens and shields in place?				

10.03	Is oxygen and acetylene stored properly?				
10.04	Are bottles not in use secured with caps in place?				
10.05	Is proper eye protection and PPE used?				
10.06	Are fire extinguisher(s) located near operations?				
10.07	Is a "hot work" permit completed and posted in areas requiring a permit?				
10.08	Are valves shut off and regulators backed off each night?				
10.09	Are flashback arresters placed on hoses (O2 and fuel gas)?				
10.10	Is electrical equipment grounded?				
10.11	Is the area inspected for fire hazards?				
10.12	Are gas lines and power cables protected and in good				
10.13	Is proper ventilation ensured?				
10.14	Is there a welding permit program?				
11.00	**Power Tools**				
11.01	Is proper housekeeping conducted where tools are used?				
11.02	Are inspections and proper maintenance of tools performed?				
11.03	Are tools grounded properly or double-insulated?				
11.04	Are tool guards in place and used correctly?				
11.05	Are damaged or malfunctioning tools tagged out until repaired or replaced?				
11.06	Are tools in compliance with local laws and ordinances?				
11.07	Are all operators qualified?				
11.08	Are tools protected from unauthorized use?				
11.09	Is competent instruction and supervision provided?				
11.10	Are cords included in electrical inspection?				
12.00	**Traffic Management**				
12.01	Area Traffic Management plan is documented and implemented				
12.02	Are traffic signage properly posted and adequate				
12.03	Are there trained personnel i.e., flag men to direct traffic				
12.04	Is there proper delineation of the work front				

12.05	Area traffic diversion signals well luminated during night time				
13.00	**Barricades**				
13.01	Placed for work site perimeter				
13.02	Placed for all excavations				
13.03	Placed for swing radius of crane or other equipment				
13.04	Placed for drop areas of construction materials				
14.00	**Hygiene and Sanitation**				
14.01	Drinking water is provided in clean vessels				
14.02	Toilets are available and adequate				
14.03	Hand washing facilities available with soap				
14.04	Toilet range between 1 unit per 6 persons to 1 unit for 15 persons				
14.05	1 urinal units to 15 persons				
14.06	Shower/ Bathroom facilities – 1 unit to 15 persons to 1 unit per 6 persons				
14.07	Separate kitchen facilities. No cooking in living room				
15.00	**HIV, AIDS and STIs**				
15.01	**Awareness campaigns conducted**				
15.02	**Covid 19 prevention measures implemented**				
15.03	**Condoms being distributed**				
15.04	**Employees showing signs and symptoms of covid 19 are allowed to seek medical assistance**				
16.00	**Policies and Procedures**				
16.01	Contractors' health and safety Management Plan is available on site				
16.02	All employees are aware of safe systems of work and the incident management procedure				
16.03	Method statements are available				
17.00	**First Aid**				
17.01	First Aid kit is available and adequately stocked				
17.02	There is at least one trained first aider on site				

17.03	First aid kit inspection is being conducted				
18.00	**Incident Management**				
18.01	Incident Management Procedure is available				
18.02	All incidents are reported, documented and investigated accordingly				
18.03	CAPA (Corrective Action and Preventive Action) is being implemented accordingly				
18.04	Emergency contact numbers i.e., health centers/ambulance, safeguards team, first aiders, utility providers, police etc. are available on site				
19.00	**Trainings**				
19.01	Employees received HSE induction training				
19.02	Training records are available and properly documented				
19.03	Employees involved in high risks activities have received special training				

Disclaimer: This is a draft version and is under review by the World Bank

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

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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 Garto English.
- Zero tolerance of child labour; child protection protocols.

Survivor-Centred Response

- **Trained GBV focal persons** at PIU and contractor level.
- Immediate safety, psychological first aid, and confidential referrals.
- Referral network mapped (health, police, legal aid, NGOs, shelters).
- Costs for emergency medical, psychosocial support, and safe shelter covered by project budget.

SEA/SH-Sensitive Grievance Redress Mechanism (GRM)

- Multiple safe channels (toll-free phone, WhatsApp, boxes, female-only options).
- Confidential handling, no retaliation.
- Secure case records, anonymised reporting.
- Independent audits annually.

Capacity Building

- Training for PIU, contractors, workers, and community leaders.
- Refreshers every 6–12 months and during staff turnover.

Monitoring & Indicators

- % workers signing CoC and trained.
- Number of GBV/SEA/SH cases reported and referred within 72 hours.
- Functional GRM response times.
- Availability of gender-sensitive WASH and lighting at worksites.
- Community awareness sessions held.
- Quarterly reporting to PIU and World Bank; immediate notification of severe cases.

Institutional Roles & Resourcing

- PIU: Overall coordination, monitoring, reporting.
- Contractors: Site-level implementation, compliance, training.
- NGOs/Service Providers: Support for referral services and survivor care.
- Authorities (Police, Health, Legal Services): Provide statutory response.
- Budget lines: Training, IEC, focal staff, survivor support, safe infrastructure, monitoring/audits.

Conclusion

The GBV Action Plan provides a comprehensive framework to prevent, mitigate, and respond to gender-based violence, sexual exploitation, and harassment. By integrating prevention measures, victim-cantered response mechanisms, grievance redress systems, capacity building, and robust monitoring, the plan ensures that both workers and project-affected communities are protected. Overall, the GBV-action plan strengthens social safeguards, enhances project accountability, and fosters a safe, inclusive, and equitable environment for all stakeholders involved in the MLCIP.

1. PURPOSE & SCOPE:

This GBV Action Plan (GBV-AP) sets out mandatory prevention, mitigation and response measures for road construction works in Meghalaya where World Bank financing (or Bank-aligned safeguards) and Indian law apply. It covers project-affected communities, workers (contractor staff, labour camps), subcontractors, service providers and other project stakeholders across all civil works packages.
Key objectives:

- Prevent and reduce GBV (including Sexual Exploitation and Abuse — SEA — and Sexual Harassment — SH) associated with civil works and associated influx.
- Provide survivor-cantered, 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 (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 and in the Project's ESMF. Key indicators:

- Number of GBV/SEA/SH incidents reported (disaggregated by type, sex, age).
- Number of reported incidents receiving referral and services within 72 hours.
- Number of staff/contractor workers trained on GBV (by sex).
- Number of worksites with adequate lighting and gender-segregated WASH facilities.
- GRM response times and case closure rates.
- Number of community awareness events and participants (disaggregated by sex/age).

Reporting: Quarterly summary to PIU and World Bank task team; immediate reporting (within 72 hours) of severe incidents to the Bank in accordance with ESF/World Bank requirements.

9. INSTITUTIONAL RESPONSIBILITIES & RESOURCING

9.1 Roles

- Project Implementing Unit (PIU) (Social/GBV focal point): overall GBV-AP coordination, disclosure, oversight of contractors, GRM management, monitoring & reporting.
- Contractor: implement site-level prevention & mitigation measures; maintain confidential incident log; ensure accommodation and transport safety; train workers.
- Third-party service providers/NGOs: provide PSS, legal aid and referrals where government services are limited.
- District Authorities / Police / Health Facilities: receive referrals and provide medico-legal, police investigation and protection services.

9.2 Budgeting

Allocate dedicated GBV budget lines in each package for:

- Training and IEC materials;
- Staffing (GBV focal points; helpdesk);
- Survivor support (medical, PSS, temporary shelter, legal aid);
- Site infrastructure improvements (lighting, WASH);
- Monitoring, third-party audits and rapid response contingency (emergency funds).

10. CONFIDENTIAL RECORDKEEPING & DATA PROTECTION:

- Store GBV case records on secure servers with restricted access; anonymise data used for monitoring.
- No identifying information to be shared in public disclosure documents.
- Follow applicable Indian privacy/data protection rules; obtain survivor consent before sharing any case details except where mandatory reporting applies.

11. COMMUNITY ENGAGEMENT & CULTURALLY SENSITIVE MEASURES:

- Engage customary institutions, village councils, women's self-help groups and local NGOs early — co-design awareness and mitigation measures in 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 14 Project Affected Persons (PAPs), 8 are male (57.14%) and 6 are female (42.85%), indicating an almost equal distribution between male and female beneficiaries. The gender distribution of PAPs is presented in **Table** below.

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

	Project Affected Persons	Percentage
Male	8	57.14
Female	6	42.85
Total	**14**	**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 Rongjeng - Mangsang Adokgre (RMA) 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: East Garo Hills and North Garo Hills are 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.
- Local GBV prevalence: Underreporting is common due to stigma and reliance on traditional dispute mechanisms. Women's SHGs and church-based groups are active but formal services are limited.
- Children & adolescents: Vulnerable to risks from worker interaction near schools/market areas; risk of exploitation in exchange for money, gifts, or alcohol.

2. Risk Rating

- SEA/SH risk: High (due to labour influx, weak formal services, low reporting).
- Workplace sexual harassment risk: Moderate (few women workers expected, but risks exist).
- Child protection risk (POCSO): High (schools located near worksites, children often present on roadsides).
- Community backlash/stigma: Moderate–High (fear of reputational damage leads to underreporting).

3. Mitigation Priorities

- Mandatory Codes of Conduct and repeated training for all workers.
- Strong community awareness in Garo language on GBV/SEA/SH risks and reporting channels.
- Safe camp design (segregated sanitation, lighting, no alcohol zones).
- Engagement of women's SHGs, and church leaders as community allies.
- Partnership with NGOs in East Garo Hills for survivor support; emergency transport for referrals.
- SEA/SH-sensitive Grievance Redress Mechanism (confidential, female focal points).

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

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

Service Type	Institution/Provider	Location & Contact	Notes
Police (Women/Child Protection)	**Kharkutta Police Station**. Rongjeng Police Station	In-charge: Shri G.R. Boro, Sub-Inspector — **Mobile: 9366347201**. In-charge: Shri Everest D. Sangma, Sub-Inspector — **Mobile: 7005753540**.	
Child Protection (POCSO, Juvenile Unit)	ICDS Office (Kharkutta ICDS Project ICDS Office (Rongjeng ICDS Project): District Child Protection Unit (DCPU) North Garo Garo Hills Child Welfare Committee (CWC) North Garo Hills (for Kharkutta):	CDPO: Smt. E. W. Momin— Mobile: 7641901013; CDPO: Smt. M. G. Momin-Mobile: 9862063626 DCPO: **Mobile: 8731910344**; email: dcpuresubelpara[@]gmail.com. CWC: **Mobile**: 7005647956 email: cwcnghresu@gmail.com.	Emergency: 100.
Health – Emergency & Medico-Legal	State / District helplines	**Women Helpline: 181**; **Child Helpline: 1098**; Police emergency: **100** Medical Superintendent, General Medicine 9436113108 State Ambulance/Emergency: 108 (24x7)	For medico-legal: Refer to CHC or Ganesh Das Government Hospital (Shillong) for forensic support.
Psychosocial Support & Counselling	Special Cell for Women (Shillong Police	Social Welfare Dept: 0364-2500195.	
Legal Aid	Meghalaya State Legal Services Authority (MSLSA):	Helpline: 15100 (toll-free). Address: Shillong	Entitled groups include women, children, SC/ST; apply via district offices.
Shelter / Safe Home	Iohlynti One Stop Centre (Shillong):	Swadhar Greh (Social Welfare): Shelter for distressed women/children; short/long-term stay. Contact via Dept: 0364-2500195.	
Women Helpline (24x7)	National Women Helpline: 181 (toll-free, multilingual support).	Shillong	
Childline (24x7)	Childline India: 1098	Through the DCPU	Women

	(toll-free, nationwide).		Helpline: 181; Child Helpline: 1098; Police emergency: 100

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 Hospital or NGO services.
- Regularly update phone numbers and verify service availability.

Annexure C: GBV Incident Intake Form & Triage Checklist:

(Confidential – Do not disclose without survivor consent, except where legally mandated)

Section 1: Survivor Safety & Immediate Needs (Triage)

(To be completed as soon as a survivor discloses an incident)

- Is the survivor in immediate danger? ☐Yes ☐No
- Does the survivor need urgent medical attention (within 72 hours)? ☐Yes ☐No
- Is the survivor under 18 years old (POCSO Act applies – mandatory police reporting)? ☐Yes ☐No
- Does the survivor require emergency shelter? ☐Yes ☐No
- Is safe and confidential transport available? ☐Yes ☐No

Immediate Action Taken (tick):

☐ Survivor referred to hospital
☐ Survivor referred to police
☐ Survivor referred to psychosocial counsellor
☐ Survivor provided temporary safe accommodation
☐ Survivor given information on rights and options

Section 2: Basic Incident Details

(Record only minimum necessary information. Do NOT pressure survivor for details.)

- Date of disclosure: ____ / ____ / _____
- Location of disclosure: _____
- Name of focal person receiving disclosure: _____
- Survivor sex/age: ☐ Female ☐ Male ☐ Other | Age: _____

- Survivor consent to referral? ☐ Yes ☐ No (explain options)
- Type of incident (tick all that apply, per survivor's words):
  ☐ Sexual Harassment
  ☐ Sexual Exploitation / Abuse (SEA)
  ☐ Physical Assault
  ☐ Child Sexual Abuse (POCSO)
  ☐ Domestic Violence
  ☐ Other (specify): _____
- Alleged perpetrator: ☐ Worker (contractor) ☐ Community Member ☐ Other
- Incident date (if provided): ____ / ____ / _____
- Incident location (general, no detail): _____

Section 3: Survivor's Choices & Consent

- Survivor wants to:
  ☐Report to Police
  ☐Seek medical care
  ☐Seek counselling
  ☐Request safe shelter
  ☐Take no action now
- Survivor consent for information sharing (tick):
  ☐Health facility
  ☐Police
  ☐NGO counsellor
  ☐Legal aid
  ☐None

Signature/thumbprint of survivor (if willing): _____
Signature of GBV focal person: _____

Section 4: Referral Actions Taken

- Referred to: _____
- Referral date/time: ____ / ____ / _____ at _____ hrs
- Escort/transport provided: ☐Yes ☐No
- Costs covered from emergency fund: ☐Yes ☐No
- Follow-up scheduled: ____ / ____ / _____

Section 5: Confidential Recordkeeping

- Case ID (non-identifying code): _____
- File kept in: ☐Locked cabinet ☐Secure digital (password protected)
- Access restricted to: PIU GBV focal person + authorised personnel only.
- Survivor informed of confidentiality? ☐Yes ☐No

Guidance Notes for Focal Persons

- Use survivor's own words; avoid judgment.
- Do not probe or force details.
- Always prioritise safety, confidentiality, and informed consent.
- If survivor is a minor (<18), you are legally obliged to report to police under the POCSO Act (2012).
- Share only with relevant referral service providers.
- Provide emotional support: listen, believe, and reassure.

Annexure D: Sample Contract Clauses on GBV/SEA/SH

1. Contractor Obligations

- The Contractor shall adopt and implement the GBV Action Plan as part of the project Environmental & Social Management Plan (ESMP).
- The Contractor shall designate at least one trained GBV/SEA/SH focal person at site level.
- The Contractor shall ensure that all workers (including subcontractors and labour suppliers) sign and adhere to the Code of Conduct (Annex A).

2. Worker Training & Awareness

- All workers must attend mandatory GBV/SEA/SH induction training prior to commencing work.
- The Contractor shall conduct quarterly refresher sessions on:
    - Zero tolerance for SEA/SH
    - Workers' rights under Indian law (POSH Act, POCSO, IPC, Labour Codes)
    - Reporting and referral pathways (Annex B & C).

3. Prohibited Conduct

The Contractor shall ensure that all workers refrain from:

- Sexual harassment, exploitation, or abuse of any person.
- Engaging in sexual activity with persons under 18 years (irrespective of consent – strict liability under POCSO Act).
- Sexual relations with project-affected persons in exchange for money, goods, or services.
- Any form of violence, coercion, or intimidation against workers, community members, or survivors.

4. Reporting & Response

- The Contractor shall establish a confidential grievance redress mechanism (GRM) with channels for anonymous reporting.
- The Contractor shall immediately notify the PIU/Employer's GBV focal person of any reported incident, while safeguarding survivor confidentiality.
- The Contractor shall facilitate survivor referral to medical, psychosocial, legal, and protection services as per the Referral Pathway (Annex B).

5. Accountability & Sanctions

- Failure of Contractor or subcontractor staff to comply with the Code of Conduct or GBV clauses will result in disciplinary measures, including:
    - Formal warning
    - Suspension without pay
    - Immediate termination of employment
    - Reporting to police authorities where legally required.
- The Employer may impose financial penalties for each confirmed GBV/SEA/SH case linked to Contractor personnel, up to 10% of contract value, in addition to legal liability.
- Repeated non-compliance may result in contract termination.

6. Employer Oversight

- The Employer (PIU/Project Authority) shall:
    - Monitor Contractor's compliance with GBV Action Plan during site supervision.
    - Include GBV performance in monthly and quarterly progress reviews.
    - Require Contractor to submit confidential GBV compliance reports.
- Independent audits of GBV measures may be conducted at any stage.

7. Budget Provisions

The Contractor shall allocate sufficient budget to cover:

- Worker training sessions
- Translation and dissemination of Codes of Conduct
- Engagement of GBV focal persons
- Support for safe transport and survivor referral
- Emergency funds for immediate survivor needs (within ethical guidelines).

8. Legal Compliance

- All Contractor actions shall comply with Indian Legislations:
    - POSH Act, 2013 (Sexual Harassment of Women at Workplace Act)
    - POCSO Act, 2012 (Protection of Children from Sexual Offences)
    - IPC Sections 354, 376, 509 (sexual offences)
    - Bonded Labour and Child Labour (Prohibition & Regulation) Acts
    - Relevant Meghalaya state labour laws.

- In case of conflict between national law and World Bank requirements, the higher standard shall prevail.

Annexure E: GBV Risk Monitoring Framework

1. Objectives

- Track implementation of the GBV Action Plan at package level.
- Ensure accountability of Contractor, PIU, and stakeholders.
- Provide early warning of risks and gaps in prevention/response.
- Report compliance to the World Bank, PIU, and State Authorities.

2. Roles & Responsibilities

Agency	Responsibility
Contractor GBV Focal Person	Maintain records, conduct worker training, track Code of Conduct compliance, report incidents (confidential).
PIU GBV Specialist	Verify contractor reports, conduct site audits, coordinate with service providers, report to World Bank.
Third-Party Monitor / NGO Partner	Independent verification, community consultations, survivor support follow-up.
World Bank Task Team	Oversight, compliance checks, technical guidance.

3. Monitoring Indicators

Domain	Indicator	Frequency	Source of Verification
Contractor Compliance	% of workers who signed Code of Conduct	Monthly	Contractor HR records, random checks
	% of subcontractors oriented on GBV	Quarterly	Training registers
	Number of GBV focal persons appointed & trained	Quarterly	Appointment letters, training reports
Capacity Building	% of workers receiving induction on GBV/SEA/SH	Monthly	Training attendance sheets
	Number of community awareness sessions conducted	Quarterly	PIU/NGO reports
Incident Reporting & Response	Number of GBV complaints received via GRM (disaggregated by type)	Monthly	GRM register (confidential)
	% of cases referred to health, police, legal, or counselling services within 24–48 hrs	Quarterly	Referral Contact Sheet (Annex B)
	% of survivors who report satisfaction with support	Semi-annual	NGO surveys

	services (anonymous feedback)		
Accountability & Sanctions	Number of workers sanctioned for GBV violations	Quarterly	Contractor HR disciplinary records
	Amount of financial penalties imposed for GBV non-compliance	Annual	PIU reports
Community Engagement Audit & Oversight	% of community members aware of GRM and referral pathways	Semi-annual	Focus group discussions, surveys
	Number of PIU site inspections including GBV monitoring	Quarterly	PIU field visit reports
	Independent audit findings on GBV Action Plan implementation	Annual	Third-party audit report

4. Reporting Framework

- Contractor GBV focal person → submits monthly GBV compliance note to PIU.
- PIU GBV Specialist → consolidates into quarterly GBV report for World Bank.
- Third-party monitor/NGO → provides independent verification reports twice a year.
- Annual consolidated report → submitted to World Bank including lessons learned and corrective actions.

5. Risk Levels & Triggers

Risk Level	Trigger Examples	Required Action
Low	No incidents reported, >80% workers trained, CoC signed	Routine monitoring
Moderate	1–2 minor cases of harassment reported; gaps in training coverage	Corrective Action Plan by Contractor within 30 days
High	>2 confirmed SEA/SH incidents; repeated contractor non-compliance	Financial penalties, management review, intensified monitoring
Critical	Systemic cover-ups, failure to report, survivor backlash	Suspension of contract payments, possible termination, legal escalation

6. Confidentiality & Ethics

- Survivor data must never be disclosed without consent.
- Reports should contain aggregated data only (no personal identifiers).
- Monitoring team must be trained on Do No Harm, GBV principles, and survivor-cantered approach.

Annexure 5.5: Climate Disaster Risks Assessment of Sub-Project Areas

1. **Changing Rainfall Patterns**

- Extreme rainfall events are increasing in East and North Garo Hills, consistent with regional climate trends, intensifying risks of flash floods and landslides.
- Despite its high rainfall, variability is emerging: erratic monsoon events threaten agriculture, water availability, and infrastructure.
- Local rainfall trends indicate occasional deficits during peak monsoons, affecting traditional jhum cultivation and water-dependent livelihoods.

2. **Forest Vulnerability & Biodiversity**

- A significant portion of East and North Garo Hills' forests show high vulnerability to climate and human pressures, with NDVI analyses indicating localized forest degradation.
- Key concerns include loss of forest cover, declining carbon stocks, and pressures on biodiversity hotspots, particularly in high-altitude and northern areas.

3. **Localized Vulnerability Hotspots**

- Block-level analysis in East and North Garo Hills identifies several highly vulnerable areas, driven by limited rural credit, low household incomes, constrained health and education services, and dependence on forest resources.
- These vulnerabilities compound exposure to climate-induced hazards, particularly landslides and soil erosion in steep terrain.

4. **Socioeconomic and Ecological Impacts**

- Agriculture, largely rain-fed, faces crop failures due to erratic rainfall and shifting monsoon patterns.
- Water resources, including streams and catchments, are under stress, affecting hydropower potential and domestic supply.
- Forest-dependent livelihoods and eco-tourism are disrupted due to forest degradation, biodiversity loss, and changing climatic conditions

5. **Potential impacts of Climate Change trend on road transport infrastructure**

Due to the uneven climatic behaviour, it is essential that climate mitigation and adaptation plans to combat the impacts of climate change are factored in the development process to avoid economic burden of adaptation in the long run, and gain from new opportunities that will be thrown up along the way. The Potential impacts of Climate Change trend on road transport infrastructure are provided in Table below

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

Climate Trend / Parameter	Observed Pattern	Impact on Road Infrastructure	Adaptation measures
• High Rainfall • Changes in the seasonal and annual average rainfall	-- Extreme monthly rainfall (2,020.0 mm in 2020 for East Garo Hills and 1968.5 mm in 2020 for North Garo Hills) 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.	-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 has 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 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	East Garo Hills- Maximum temperature rising from 22°C to 33 °C North Garo Hills- Maximum temperature rising from 17.1°C to 29.1 °C	-Higher temperatures cause thermal expansion of road materials, leading to surface cracks. - Softening of asphalt during hot days can cause deformation and rutting.	a. An adequate binding layer thickness has been proposed to offset the wear, surface fatigue, and rutting under climate stresses. b. In terms of pavement integrity, the choice of viscosity grade VG30 has been maintained
Landslide Risk	- Frequent rainfall and runoff events increase landslide susceptibility in the district's terrain	- Roads in hilly areas may face closures due to landslides. - Increased repair costs for damaged road sections and disrupted connectivity to remote areas.	

6. Adaptation and Mitigation Measures

To build resilience and protect communities and ecosystems in project area, the following measures are recommended:

- **Slope and Road Stabilization:** Retaining walls, bioengineering techniques, and slope stabilization to prevent landslides.
- **Infrastructure Resilience:** Use of geotextiles, reinforced pavements, and climate-resilient road materials to withstand heavy rainfall.
- **Drainage and Flood Management:** Construction of culverts, roadside drains, and floodwater channels in low-lying areas to manage runoff.
- **Water Resource Management:** Catchment restoration, rainwater harvesting, and climate-resilient irrigation systems.
- **Monitoring & Early Warning:** Regular maintenance, periodic inspection of roads, and landslide early warning systems.
- **Sustainable Livelihood Support:** Promotion of climate-resilient farming practices, biodiversity-friendly land use, and financial inclusion measures for local communities.

Annexure 7.1: Summary Of Consultations

Table 1: Suggestions from stakeholders for design input in DPR

Sl. No.	Key issues from stakeholder on existing road condition	Suggestions from stakeholders for Incorporation in project
1	**Insufficient Road Width:** The current road network is too narrow, making it difficult for vehicles, particularly large ones like buses and trucks. This leads to congestion, delays, and increased accident risks, especially in hilly regions where sharp turns and steep inclines exacerbate the problem. Emergency vehicles also face difficulties in reaching remote areas due to road congestion.	**Road Expansion and Traffic Regulation:** Where feasible, widen the roads and introduce traffic management measures such as one-way systems, designated passing zones, and controlled vehicle movement in high-risk areas. Implement lane discipline through clear road markings and enforce speed limits to ensure safe and smooth traffic flow. Explore alternative routes for heavy vehicles to ease congestion in densely populated areas.
2	**Deteriorating Road Conditions:** Many road stretches suffer from potholes, uneven terrain, and partial pavement, making driving hazardous. These poor conditions worsen during heavy rains, leading to vehicles skidding, accidents, and increased maintenance costs for drivers. The lack of proper road foundation in some areas leads to premature deterioration.	**Resilient Road Construction:** Utilize high-quality, weather-resistant materials such as reinforced asphalt or concrete to improve durability. Implement a preventive maintenance program that includes periodic road resurfacing, pothole repairs, and regular inspections.
3	**Absence of Traffic-Calming Measures:** High-speed driving through densely populated zones such as schools, marketplaces, and residential areas significantly increases the risk of pedestrian accidents. The lack of speed bumps, zebra crossings, and designated pedestrian walkways further endangers people, particularly children and the elderly.	**Speed Control Strategies:** Install speed bumps, rumble strips, and designated pedestrian crossings in high-traffic zones. Place traffic signs warning drivers to slow down near schools, hospitals, and marketplaces. Conduct community awareness programs on road safety and responsible driving. Deploy traffic enforcement personnel in high-risk areas to ensure compliance.
4	**Lack of Proper Signage and Road Markings:** Many critical road sections such as intersections, curves, pedestrian crossings, and accident-prone zones lack clear signage, leading to confusion among drivers and pedestrians. Poorly visible or missing lane markings result in erratic driving behavior and unsafe road conditions, especially at night.	**Improved Road Signage:** Deploy reflective and highly visible road signs indicating speed limits, pedestrian crossings, sharp turns, and road hazards. Clearly mark lanes and install guiding arrows at intersections to ensure proper navigation. Place electronic or solar-powered signboards where visibility is low. Conduct periodic maintenance to ensure signs remain visible and intact.
5	**Ineffective Drainage Infrastructure:** The absence of a proper drainage system results in waterlogging, road erosion, and hazardous driving conditions during the	**Storm water Drainage Development:** Construct well-planned drainage channels along roads to prevent water stagnation.

Sl. No.	Key issues from stakeholder on existing road condition	Suggestions from stakeholders for Incorporation in project
	monsoon season. Standing water on roads damages road surfaces and creates a breeding ground for mosquitoes, increasing health risks.	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	▪ 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?	▪ 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	▪ 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	▪ 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.

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Sl. No.	Summary of Issues	Suggestions / Responses provided
	modern agricultural practices to sustain the sector.	
3	▪ The land governance system of villages restricts non-tribals from buying land or settling permanently	▪ No steps will be taken up which disturbs the socio-economic fabric of the community during project implementation. Every decision regarding land requirement and other related matters will be taken up jointly in consultation with the council.
4	▪ Absence of local land records register makes resolving disputes challenging.	▪ 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 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	▪ Community raised the point that Land issues in East Garo Hills are entirely at the discretion of the council. They should also be made part of the land requirement process during project implementation.	▪ 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.

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Sl. No.	Summary of Issues	Suggestions / Responses provided
6	▪ 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?	▪ 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	▪ 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?	▪ 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 3: Summary of Consultation

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1.	Nongkongkil	20-08-2025	Women	• Participants appreciated the project and acknowledged its positive impact on the community. • Highlighted concerns about extremely poor condions of the road. • Community expressed concerns that present condition of roads are such as narrow carriageway, lack of speed breaker, poor surface condition and lack of road safety and signages. They showed interest in Construction and improvement of road. • Local community expressed concerns that good drainage network system can help in prevention of erosion and land degradation in hilly terrains and therefore increase in agricultural	• Construct smoother roads to enhance accessibility and improve transportation. • Prioritize immediate repairs to address safety and mobility concerns in the community. • Providide Drainage, Culverts, slope protection.	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
				productivities.		
2.	Rema gittim	20-08-2025	Commuter	• Participants raised concerns about the ongoing streetlight problem, emphasizing the need for better illumination for safety. • The current road conditions are poor and not smooth, which impacts accessibility and transportation. • They practice Jhum Cultivation with different kind of vegetables like ginger, with banana and tree bean.	• Ensure the installation of adequate streetlights throughout the village to improve safety and visibility, particularly at night. • Prioritize road maintenance and improvement to address the poor conditions, ensuring smooth and accessible transportation routes for commuters. • Integrate support for sustainable agricultural practices into the project design, including resources for Jhum cultivation, to enhance productivity and diversify crops.	
Key Informant Interview						

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Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
3.	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	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					plantations, and developing alternative fodder sources will help ensure that road development is balanced with ecological conservation and long-term sustainability.	
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.	▪ Table topping will be done for smooth movement of elephant. Existing RoW should be maintained at community land with vegetation and Elephant passing	

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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	▪ Preliminary observations from an18.27km site visit o 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.	▪ 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	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					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 affected stretches.	
6.		24/09/2025	Street Vendor	Participants expressed satisfaction with the initiative and recognized its potential to bring meaningful improvements to the community.	Develop improved road surfaces to facilitate smoother travel and strengthen overall connectivity in the area.	
Youth						

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
7.		23 /10 /25	Youth (8 No.)	• The community highlighted a shortage of local livelihood opportunities, limited access to vocational training, and the absence of organized platforms for career support and guidance. • Out-migration remains a frequent response to these gaps, often accompanied by difficulties related to social adjustment and economic instability.	• Introduce targeted training and skill-upgradation initiatives aimed at enhancing the capabilities of local community members. • Promote small-scale income-generating activities by facilitating the development and expansion of local microenterprises.	
Women FGD						

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
8.		10.07.2025	Women (5)	• Women have shown interest in engaging in income-generating activities; however, their participation remains limited due to inadequate livelihood options, social constraints, and lack of organized support systems. • The community highlighted the need for targeted interventions that strengthen women's capacity through improved skill training, enterprise development, and better access to services and infrastructure.	• Introduce dedicated livelihood and capacity-building initiatives that focus on improving practical skills among women. • Strengthen the participation of women's Self-Help Groups (SHGs) by engaging them in project-related tasks such as community outreach, supervision activities, and maintenance of created assets.	

Annexure 7.2: Stakeholder Engagement Plan (SEP)

For

Road Projects under the Meghalaya Logistics and Infrastructure Connectivity Project (MLICP)

1. Introduction:

The Meghalaya Logistics and Infrastructure Connectivity Project (MLICP), supported by the World Bank, aims to strengthen road infrastructure for improved connectivity, disaster resilience, and inclusive growth in Meghalaya. Road projects under MLICP will upgrade existing networks, rehabilitate damaged corridors, and develop bypasses to reduce congestion and enhance safety.

Given Meghalaya's unique context—high forest cover, predominantly indigenous communities, and fragile ecosystems—stakeholder engagement is critical to ensure inclusive, transparent, and culturally appropriate participation in project planning, design, and implementation.

This SEP outlines the systematic process of engaging stakeholders throughout the project cycle, consistent with ESS10, ensuring timely disclosure, participatory decision-making, and a functional grievance mechanism.

2. Objectives of the SEP:

- Establish a structured, inclusive, and culturally appropriate approach for stakeholder engagement.
- Identify and map all relevant stakeholders, including vulnerable and disadvantaged groups.
- Ensure disclosure of relevant project information in a timely and accessible manner.
- Facilitate meaningful consultations with stakeholders during all phases of the project.
- Incorporate stakeholder feedback into project design and implementation.
- Strengthen accountability through monitoring, reporting, and responsive grievance redress.

3. Guiding Principles:

- Purposeful – Engagement linked to project decisions and outcomes.
- Inclusive – Special focus on women, youth, elderly, PwDs, and indigenous groups.
- Culturally appropriate – Engagement in Garo,, respecting customary institutions.

- Timely & Transparent – Early information disclosure and open communication.
- Respectful – Recognition of local traditions, customs, and community knowledge.

4. Stakeholder Identification & Categorization:

(a) Primary Stakeholders (Directly Affected Parties):

- Project-Affected Households – landowners, tenants, shopkeepers, transport users.
- Vulnerable Groups – women-headed households, elderly, PwDs, STs (Garo, etc.).
- Users of Common Property Resources (CPRs) – community forest users, water sources, grazing areas.

(b) Secondary Stakeholders:

- CBOs/SHGs – local associations, cooperatives.
- NGOs/CSOs – working on gender, indigenous rights, livelihoods, and environment.
- Academic institutions – universities and research bodies.

(c) Institutional Stakeholders:

- Government Departments – PWD, Forests, Land Revenue, Tribal Affairs, Disaster Management.
- Local Authorities – Autonomous District Councils (ADCs), Dorbars, Nokmas, Jaintia Doloiship, traditional councils.
- Funding Agency – World Bank.

(d) Private Sector:

- Contractors, consultants, local businesses, transport operators, logistics companies.

(e) Wider Stakeholders:

- Road users, media, and environmental advocates.

5. Engagement Methods & Consultation Approach:

Information Disclosure:

- Languages: Garo, English, Hindi.
- Channels: Dorbar meetings, community notice boards, radio, local newspapers, social media, PMU website.

- Accessible formats: Audio-visual materials for illiterate groups, braille/audio for PwDs.

Consultation Methods:

- Key Informant Interviews (KIIs) with government and traditional institutions.
- Focus Group Discussions (FGDs) with women, youth, traders, transport unions.
- Community Meetings / Dorbar for FPIC and collective decision-making.
- Household Surveys for PAPs during RAP/IPP preparation.
- Separate sessions for vulnerable groups to ensure voices are heard.

Documentation:

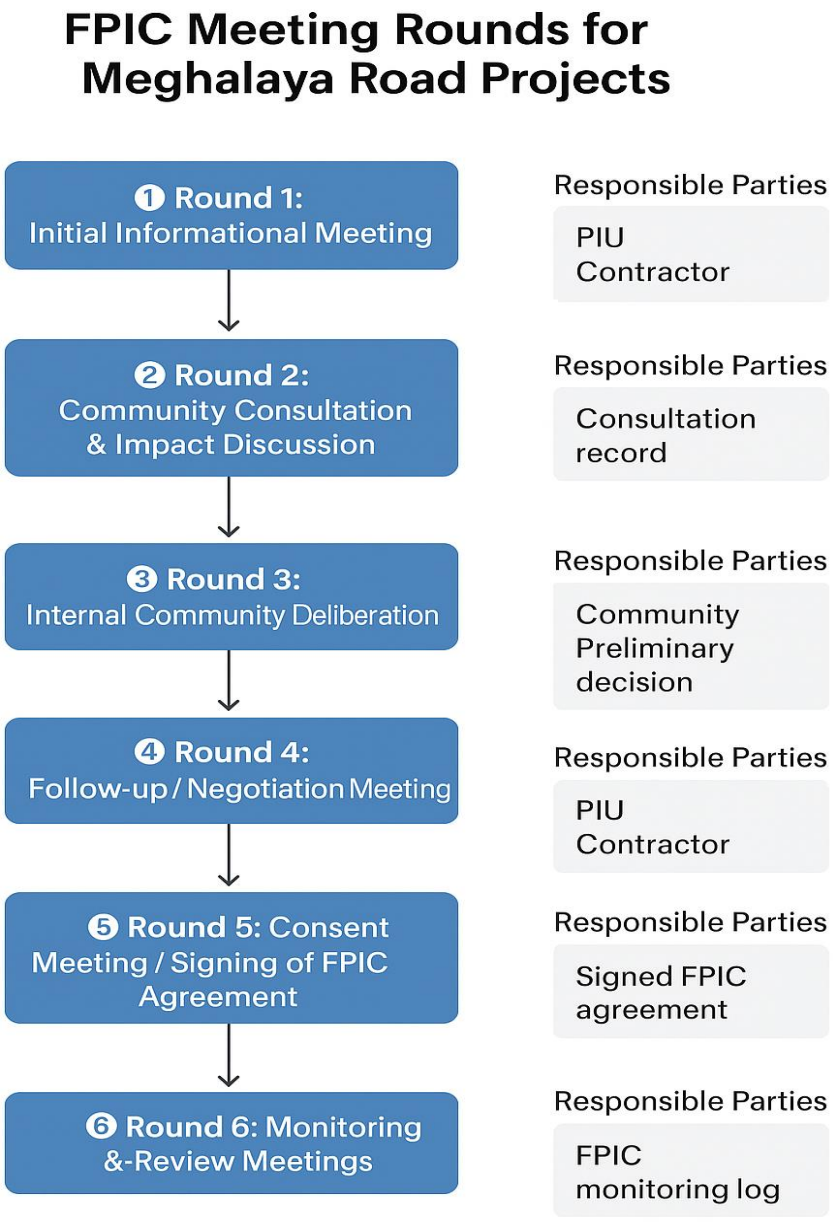
- Attendance registers, minutes, resolutions, geo-tagged photos.

6. Free, Prior and Informed Consent (FPIC):

- Applicability check in tribal areas.
- Stepwise process: Prior information → disclosure in local language → free deliberation → community consent.
- Community endorsement documented through traditional institutions (Dorbar, Nokma).

FPIC Process:

- FPIC process will be led through Dorbars/Nokmas/ADCs for all tribal communities.
- Documentation (minutes, attendance, photos) mandatory for each consultation.
- Grievance Redress contacts to be displayed at all project sites in Garo, Hindi, and English.
- Monitoring Indicators: % of women/youth/PwDs participation, number of consultations, % of grievances resolved within timeline.



7. Grievance Redress Mechanism (GRM):

- Village Level – Entry point with Dorbar / community GRM cell.
- PIU Level – Social specialist to register and resolve grievances (walk-in, phone, email, web portal).
- PMU Level – Appeals and SEA/SH-sensitive confidential pathway.
- Resolution Timeline – 15–30 days with escalation if unresolved.
- Disclosure – GRM contacts widely publicized in local languages.

8. Roles and Responsibilities:

- PMU/PIU Social Specialists – Lead SEP implementation, coordinate consultations, operate GRM.
- ADCs & Traditional Institutions – Facilitate engagement and FPIC processes.
- NGOs/CSOs – Mobilization, awareness generation, and independent monitoring.
- Contractors – Ensure labour/community consultations on safety, employment, and camp management.

9. Timeline of Engagement:

- Pre-Construction – Baseline surveys, ESIA/RAP/IPP disclosure, FPIC, consultations.
- Construction Phase – Regular consultations, safety campaigns, labour/community awareness, GRM reporting.
- Post-Construction – Feedback sessions on restoration, evaluation of livelihood measures, benefit-sharing mechanisms.

10. Monitoring, Evaluation & Reporting:

- Indicators:
    - Number of consultations held.
    - % of women, youth, PwDs, and vulnerable participants.
    - Number of grievances received and resolved.
    - Timeliness of disclosure.
- Frequency – Quarterly monitoring, semi-annual reporting to World Bank, community disclosure.
- Independent Validation – Third-party audits, community scorecards.

11. Disclosure of SEP

- SEP to be disclosed in English and translated into Garo,.
- Available at PMU/PIU offices, ADC offices, village notice boards, and online portal.

Periodic updates during implementation

Disclaimer: This is a draft version and is under review by the World Bank

Stakeholder Engagement Action Plan – Road Projects under MLICP

Stakeholder Category	Engagement Method	Information to be Shared	Frequency	Responsible Agency	Timeline (Project Phase)
Project-Affected Households (PAPs)	Community meetings, household consultations, door-to-door visits.	Project scope, land requirement process, RAP entitlements, construction impacts, livelihood measures.	Pre-construction (monthly), Construction (quarterly).	PIU Social Specialist, Contractors, Local NGOs.	Pre-construction → Construction → Post-construction.
Vulnerable Groups (Women, Elderly, PwDs, STs, Youth)	Separate FGDs, women-only/youth-only consultations, targeted outreach.	Rights and entitlements, GRM, safety awareness, livelihood opportunities.	Pre-construction (monthly), Construction (quarterly), post-construction (annual feedback).	PIU Social Specialist, NGOs, Traditional Leaders (Dorbar/Nokmas).	Throughout project cycle.
Local Authorities (Dorbar, Nokmas, Jaintia Doloiship, ADCs)	Nokma meetings, key informant interviews.	Project design, FPIC process, land management, local employment opportunities.	Pre-construction (bi-monthly), Construction (quarterly).	PIU, PMU, ADC Representatives.	Throughout project cycle.
Government Departments (PWD, Forest, Land Revenue, Pollution Control Board, etc.)	Technical consultations, coordination meetings, workshops.	Design approval, permits, environmental/social safeguards, compliance requirements.	Pre-construction (quarterly), Construction (as needed).	PMU, Line Departments.	Pre-construction & Construction.
Community-Based Organizations (SHGs, Cooperatives, Traders' Associations)	FGDs, public meetings.	Business opportunities, road safety, labour issues, women's participation.	Pre-construction (semi-annual), Construction (quarterly).	PIU Social Specialist, NGOs.	Pre-construction → Construction.
NGOs/CSOs	Partnership meetings, monitoring workshops.	Project implementation support, RAP/IPP monitoring, GBV/SEA-SH	Semi-annual.	PMU/PIU Social Specialists.	Throughout project cycle.

Disclaimer: This is a draft version and is under review by the World Bank

Stakeholder Category	Engagement Method	Information to be Shared	Frequency	Responsible Agency	Timeline (Project Phase)
		prevention.			
Contractors & Workers	Contractor briefings, toolbox talks, joint monitoring.	Labour laws, Code of Conduct, safety protocols, grievance redress.	Monthly.	Contractors, PIU Engineers, Labour Welfare Officer.	Construction phase.
Road Users / General Public.	Awareness campaigns, radio/TV announcements, signage, social media updates.	Road safety, detour plans, construction schedules, grievance channels.	Construction (monthly), post-construction (annual safety awareness).	PIU Communication Specialist, Contractors.	Construction & post-construction.
Media (local press, digital, radio)	Press releases, press briefings, media kits.	Project progress, safeguards, grievance redress.	Quarterly.	PMU/PIU Communication Team.	Throughout project cycle.
World Bank / Development Partners	Progress reports, review missions, virtual consultations.	Semi-annual SEP implementation report, E&S compliance status.	Semi-annual & as required.	PMU.	Throughout project cycle.

Preliminary consultations for the Sub Project

Preliminary consultations were conducted on 20.08.2025 at two locations along the project road. A summary of these consultations is presented in **Table** below.

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1.	Nongkongkil	20-08-2025	Women	• Participants appreciated the project and acknowledged its positive impact on the community. • Highlighted concerns about extremely poor condions of the road. • Community expressed concerns that present condition of roads are such as narrow carriageway, lack of speed breaker, poor surface condition and lack of road safety and signages. They showed interest in Construction and improvement of road. • Local community expressed concerns that good drainage network system can help in prevention of erosion and	• Construct smoother roads to enhance accessibility and improve transportation. • Prioritize immediate repairs to address safety and mobility concerns in the community. • Providide Drainage, Culverts, slope protection.	

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Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
				land degradation in hilly terrains and therefore increase in agricultural productivities.		
2.	Remagittim	20-08-2025	Commuter	• Participants raised concerns about the ongoing streetlight problem, emphasizing the need for better illumination for safety. • The current road conditions are poor and not smooth, which impacts accessibility and transportation. • They practice Jhum Cultivation with different kind of vegetables like ginger, with banana and tree bean.	• Ensure the installation of adequate streetlights throughout the village to improve safety and visibility, particularly at night. • Prioritize road maintenance and improvement to address the poor conditions, ensuring smooth and accessible transportation routes for commuters. • Integrate support for sustainable agricultural practices into the project design, including resources for Jhum cultivation, to enhance productivity and diversify crops.	

FPIC consultations undertaken for the project stretch are explained below:

FPIC consultations undertaken for the project stretch are explained below:

- The first round of consultations was conducted by the ESIA team on **04.09.2025** at 1. Nongkongkil LP School. Nongkongkil Village, block- Rongjeng, East Garo Hills at 1.30 PM with a total of 27 participants. 2. at Memillam/Mawdipara Community Hall, Modipara Village block-Kharkutta, North Garo Hills at 4.30 PM with a total of 25 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 miserable condition of road and of increase in road width in case of improvement of road to intermediate lane. 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 RMA Road was by the ESIA team on **25.09.2025** at 1. Nongkongkil Community Hall, Nongkongkil Village block- Rongjeng, East Garo Hills at 1.30 PM with a total of 68 participants, 2.at Memillam/Mawdipara Community Hall, Modipara Village block-Kharkutta, North Garo Hills at 4.30 PM with a total of 45 participants. 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), Kharkutta 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, 113 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.

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.

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**.

Annexure 7.3: MoM of FPIC

MINUTES OF THE FIRST ROUND OF FPIC

Project Title: Improvement/Upgradation to intermediate lane of a RMA Road from 22.00 to 44.00 Km
Date: 4th September 2025
Time: 4:30 PM
Venue: Memillam/Modipara Community Hall
Presiding Officer: Shri Nilberstone Sangma, AEE, PWD (R), Kharkutta Sub-Division
Facilitator: Shri Bester Ch. Marak, Executive Engineer, PWD (R), Kharkutta Division

Members Present: Attendance Sheet enclosed

1. **Opening Remarks**

The meeting commenced with Shri Nilberstone Sangma welcoming the Nokmas, Sordars, and all community members present. He outlined the purpose of the consultation, emphasizing the importance of Free, Prior, and Informed Consent (FPIC) in ensuring inclusive and transparent project implementation. The Officer 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.

2. **Project Briefing**

Shri Bester Ch. Marak, Executive Engineer, PWD (R), Kharkutta Division, provided a detailed overview of the proposed road development project. His presentation covered:

- Project objectives and scope
- Planned activities and implementation timeline
- Anticipated benefits for the region

He also elaborated on the potential environmental and social impacts, including:

- Requirement of private and community land
- Tree cutting and vegetation clearance
- Utility shifting

- Construction-related disturbances (e.g., noise, dust)

3. **Community Engagement and Decision-Making**

The role of local communities in project planning and execution was discussed. Emphasis was placed on collaborative decision-making, transparency, and respect for indigenous rights and cultural values.

4. **Explanation of FPIC Process**

Shri Bester Ch. Marak outlined the Standard Operating Procedures (SOPs) for conducting FPIC and how these meetings will be structured.

- **First Meeting:** Initial FPIC awareness and engagement with community leaders and stakeholders
- **Second Meeting:** Formal FPIC at the village level involving village heads, MAC members, NGOs, women's groups, and elders. This session will focus on project design, potential impacts, and community inputs.
- **Third Meeting:** Presentation of consultation findings to the council for formal declaration. Final FPIC will be conducted post-finalization of the Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), RAP, and IPDP
- Additional meetings (if required) will also be held on the request of the indigenous communities through the Nokma/ Sordar.

The Environmental and Social Management Framework (ESMF) and ESIA were briefly introduced, highlighting the engagement of experts to foster trust between the community and government institutions.

5. **Community Feedback**

During the open discussion:

- Shri Sengbat Momin, Sordar of Modipara/Memillam, expressed strong support for the project, stating that the community welcomes development in the region
- Shri Barmingthon Sangma, representative of the Nokma, affirmed that there are no objections to the project and that the community is willing to contribute land for its implementation
- Shri Predolin Sohpoh, Secretary of Modipara/Memillam, confirmed that formal consent has already been provided and that there are no objections to the proposed road alignment

6. **Grievance Redressal Mechanism**

Shri Nilberstone Sangma explained the structure and purpose of the Grievance Redressal Mechanism, which will enable joint monitoring of project-related issues in coordination with community representatives.

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.

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 PIU 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.

The "Memillam Grievances Redressal Mechanism Committee" was officially constituted, as detailed in Annexure-A.

7. **Conclusion and Vote of Thanks**

The meeting concluded with a vote of thanks from Shri Nilberstone Sangma, acknowledging the active participation and constructive feedback from all attendees.

Note: Photographs and the attendance sheet are enclosed as per SOP documentation guidelines.

(Shri. Bester Ch. Marak)
Executive Engineer, PWD (Roads),
Kharkutta Division, Kharkutta

Disclaimer: This is a draft version and is under review by the World Bank

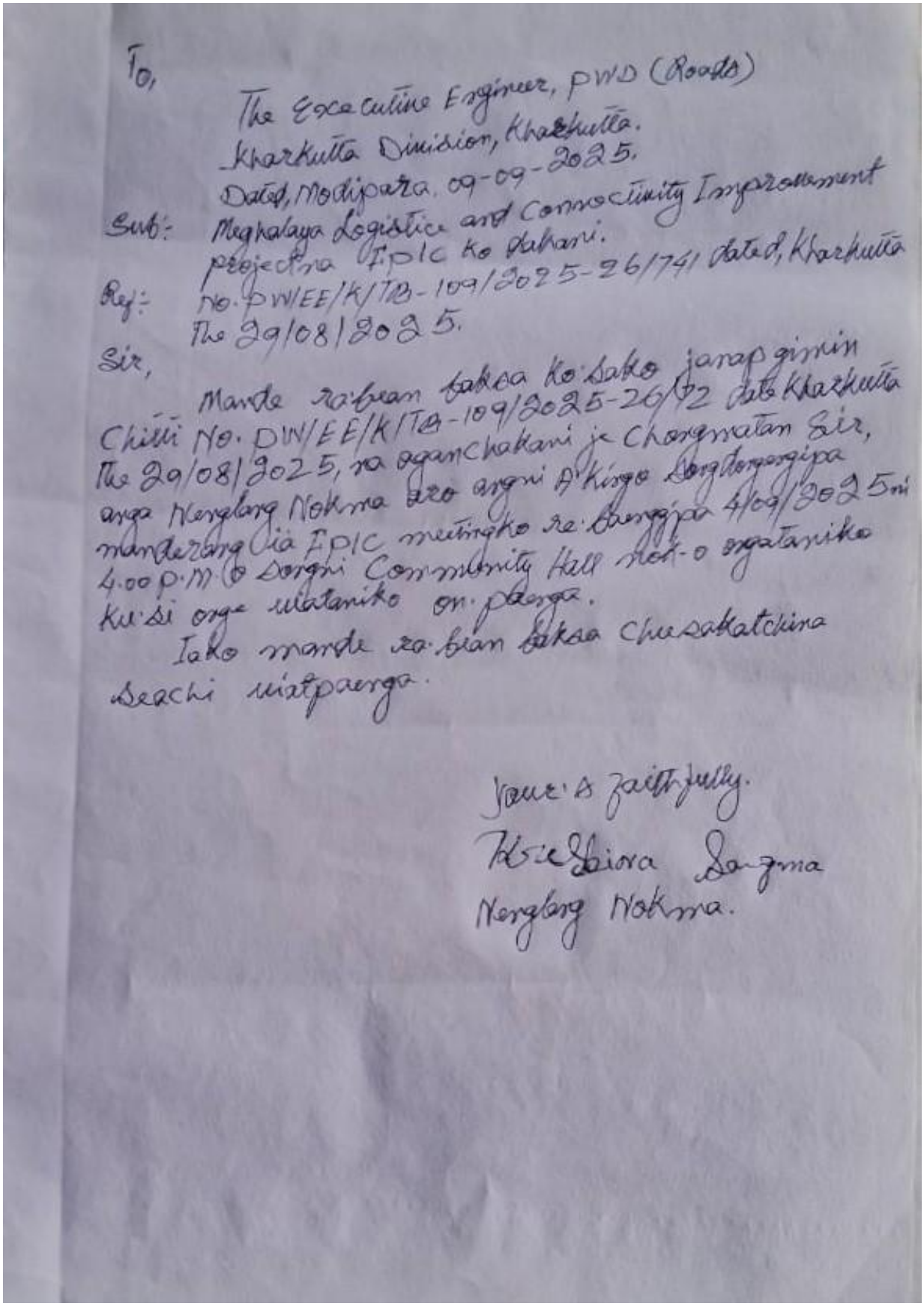
FORMATION OF MEMILLAM GRIEVANCES REDRESSAL MECHANISM COMMITTEE
DATE: 4TH SEPTEMBER 2025
VILLAGE: MEMILLAM/MODIPARA
DISTRICT: NORTH GARO HILL
STATE: MEGHALAYA

MEMILLAM GRIEVANCES REDRESSAL MECHANISM COMMITTEE

PRESIDENT: SMT. KRESBINA SANGMA
NOKMA OF NENGLANG/MEMILLAM/MODIPARA
SECRETARY: SHRI. PREDOLIN SOHPOH
VILLAGE SECRETARY OF MEMILLAM
MEMBER: SHRI. PLINDER MOMIN
SORDAR OF MITTE VILLAGE
MEMBER: SHRI. LOWSING MOMIN
SORDAR OF MEMILLAM VILLAGE
MEMBER: SHRI. SENGBAT MOMIN
SORDAR OF MAWDIPRA VILLAGE EXECUTIVE
MEMBER: SHRI. BAITHY R. MARAK,
JUNIOR ENGINEER ADOKGRE SECTION, KHARKUTTA SUB DIVISION C/NO-8787798286

(Shri. Bester Ch. Marak)
Executive Engineer, PWD (Roads),
Kharkutta Division, Kharkutta

Disclaimer: This is a draft version and is under review by the World Bank



To,

The Executive Engineer, PWD (Roads)
Kharkutta Division, Kharkutta.
Dated, Modipara. 09-09-2025.

Sub: Meghalaya Logistics and Connectivity Improvement project-na EPIC ko dahani.

Ref: No. PW/EE/K/TB-109/2025-26/741 dated, Kharkutta the 29/08/2025.

Sir,

Marde ra-bran bakaa ko-bako janap-ginin Chitti No. DW/EE/K/TB-109/2025-26/42 dated Kharkutta the 29/08/2025, ra aganchakani je Chongnatan Sir, anga Nengkang Nokma aro angni A'kingo Songdongsipa manderang dia EPIC meting-ko re-baengjipa 4/09/2025ni 4.00 p.m to Songni Community Hall mot-o ogatanko ku-si onga ulatanko on-paenga.

Iako marde ra-bran bakaa Chusakatchina deachi ustpaenga.

Yours faithfully.

Kushbira Sangma
Nengkang Nokma.

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MINUTES OF THE FIRST ROUND OF FPIC

Project Title: Improvement/Upgradation to intermediate lane of a RMA Road from 22.00 to 44.00 Km
Date: 4th September 2025
Time: 1:30 PM
Venue: Nongkongkil L.P School.
Presiding Officer: Shri Bester Ch. Marak, Executive Engineer, PWD (R), Kharkutta Division

Members Present: Attendance Sheet enclosed

1. Welcome and Opening Remarks

The meeting commenced with a warm welcome by Shri Bester Ch. Marak, who greeted the Nokmas, Sordars, and all attendees. He outlined the purpose of the gathering, emphasizing the importance of community participation and consent for the proposed road development project.

2. Project Overview

The Chair briefly presented the project's objectives, scope, and key activities. He highlighted the anticipated benefits and the strategic importance of the initiative for regional development.

3. Discussion on Potential Impacts

A detailed discussion was held with community members from surrounding villages regarding potential social, environmental, and cultural impacts. Topics included:

- Requirement of private and community land
- Tree cutting and vegetation clearance
- Utility shifting
- Construction-related disturbances (e.g., noise, dust)

4. Community Role in Decision-Making

The meeting underscored the vital role of local communities in the decision-making process and implementation of the project. Their inputs and cooperation were deemed essential for successful execution.

4. **Explanation of FPIC Process**

Shri Bester Ch. Marak outlined the Standard Operating Procedures (SOPs) for conducting FPIC and how these meetings will be structured.

- **First Meeting:** Initial FPIC awareness and engagement with community leaders and stakeholders

- **Second Meeting:** Formal FPIC at the village level involving village heads, MAC members, NGOs, women's groups, and elders. This session will focus on project design, potential impacts, and community inputs.
- **Third Meeting:** Presentation of consultation findings to the council for formal declaration. Final FPIC will be conducted post-finalization of the Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), RAP, and IPDP
- Additional meetings (if required) will also be held on the request of the indigenous communities through the Nokma/ Sordar.

The Environmental and Social Management Framework (ESMF) and ESIA were briefly introduced, highlighting the engagement of experts to foster trust between the community and government institutions.

5. **Community Feedback**

During the open discussion:

- Shri Sengbat Momin, Sordar of Modipara/Memillam, expressed strong support for the project, stating that the community welcomes development in the region
- Shri Barmingthon Sangma, representative of the Nokma, affirmed that there are no objections to the project and that the community is willing to contribute land for its implementation
- Shri Predolin Sohpoh, Secretary of Modipara/Memillam, confirmed that formal consent has already been provided and that there are no objections to the proposed road alignment

6. **Grievance Redressal Mechanism**

Shri Nilberstone Sangma explained the structure and purpose of the Grievance Redressal Mechanism, which will enable joint monitoring of project-related issues in coordination with community representatives.

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.

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.

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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 PIU 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.

The "Rongkongkil Grievances Redressal Mechanism Committee" was officially constituted, as detailed in Annexure-A.

8. Conclusion and Vote of Thanks

The meeting concluded with a vote of thanks delivered by Shri Nilberstone Sangma, acknowledging the active participation and support of all attendees.

Note: Photographs and the attendance sheet are enclosed as per SOP documentation guidelines.

(Shri. Bester Ch. Marak)
Executive Engineer, PWD (Roads),
Kharkutta Division, Kharkutta

Disclaimer: This is a draft version and is under review by the World Bank

FORMATION OF NONGKONGKIL GRIEVANCES REDRESSAL MECHANISM COMMITTEE
DATE: 4TH SEPTEMBER 2025
VILLAGE: MEMILLAM/MODIPARA
DISTRICT: NORTH GARO HILL
STATE: MEGHALAYA

NONGKONGKIL GRIEVANCES REDRESSAL MECHANISM COMMITTEE

PRESIDENT: SHRI. CHANCHAN MOMIN
SORDAR OF NONGKONGKIL M.NO- 8798641698
SECRETARY: SMT. PRECILLA MARAK
NOKMA OF MORANGGA/NENGKRAM
MEMBER: SHRI. JACKIUS SANGMA
NONGKONGKIL VILLAGE
MEMBER: SHRI. TIKKIL SANGMA
NONGKONGKIL VILLAGE
MEMBER: SHRI NAGRANG SANGMA
SORDAR OF BOLBILONG VILLAGE M.NO-9233746828
MEMBER: SHRI. XAVIER SANGMA
BOLBILONG VILLAGE M.NO-6798641617

MEMBER: SHRI. BAITHY R. MARAK,
JUNIOR ENGINEER ADOKGRE SECTION, KHARKUTTA SUB DIVISION, M.NO-8787798286

(Shri. Bester Ch. Marak)
Executive Engineer, PWD (Roads),
Kharkutta Division, Kharkutta

MINUTES OF THE FIRST ROUND OF FPIC

Project Title: Improvement/Upgradation to intermediate lane of a RMA Road from 22.00 to 44.00 Km
Date: 4th September 2025
Time: 1:30 PM
Venue: Nongkongkil L.P School.
Presiding Officer: Shri Bester Ch. Marak, Executive Engineer, PWD (R), Kharkutta Division

Members Present: Attendance Sheet enclosed

1. Welcome and Opening Remarks
   The meeting commenced with a warm welcome by Shri Bester Ch. Marak, who greeted the Nokmas, Sordars, and all attendees. He outlined the purpose of the gathering, emphasizing the importance of community participation and consent for the proposed road development project.
2. Project Overview
   The Chair briefly presented the project's objectives, scope, and key activities. He highlighted the anticipated benefits and the strategic importance of the initiative for regional development.
3. Discussion on Potential Impacts
   A detailed discussion was held with community members from surrounding villages regarding potential social, environmental, and cultural impacts. Topics included:
   - Requirement of private and community land
   - Tree cutting and vegetation clearance
   - Utility shifting
   - Construction-related disturbances (e.g., noise, dust)
4. Community Role in Decision-Making
   The meeting underscored the vital role of local communities in the decision-making process and implementation of the project. Their inputs and cooperation were deemed essential for successful execution.

4. **Explanation of FPIC Process**

Shri Bester Ch. Marak outlined the Standard Operating Procedures (SOPs) for conducting FPIC and how these meetings will be structured.

- **First Meeting:** Initial FPIC awareness and engagement with community leaders and stakeholders

- **Second Meeting:** Formal FPIC at the village level involving village heads, MAC members, NGOs, women's groups, and elders. This session will focus on project design, potential impacts, and community inputs.

- **Third Meeting:** Presentation of consultation findings to the council for formal declaration. Final FPIC will be conducted post-finalization of the Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), RAP, and IPDP

- Additional meetings (if required) will also be held on the request of the indigenous communities through the Nokma/ Sordar.

The Environmental and Social Management Framework (ESMF) and ESIA were briefly introduced, highlighting the engagement of experts to foster trust between the community and government institutions.

5. **Community Feedback**

During the open discussion:

- Shri Sengbat Momin, Sordar of Modipara/Memillam, expressed strong support for the project, stating that the community welcomes development in the region
- Shri Barmingthon Sangma, representative of the Nokma, affirmed that there are no objections to the project and that the community is willing to contribute land for its implementation
- Shri Predolin Sohpoh, Secretary of Modipara/Memillam, confirmed that formal consent has already been provided and that there are no objections to the proposed road alignment

6. **Grievance Redressal Mechanism**

Shri Nilberstone Sangma explained the structure and purpose of the Grievance Redressal Mechanism, which will enable joint monitoring of project-related issues in coordination with community representatives.

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.

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 PIU 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.

The "Rongkongkil Grievances Redressal Mechanism Committee" was officially constituted, as detailed in Annexure-A.

8. Conclusion and Vote of Thanks

The meeting concluded with a vote of thanks delivered by Shri Nilberstone Sangma, acknowledging the active participation and support of all attendees.

Note: Photographs and the attendance sheet are enclosed as per SOP documentation guidelines.

(Shri. Bester Ch. Marak)
Executive Engineer, PWD (Roads),
Kharkutta Division, Kharkutta

FORMATION OF NONGKONGKIL GRIEVANCES REDRESSAL MECHANISM COMMITTEE
DATE: 4TH SEPTEMBER 2025
VILLAGE: MEMILLAM/MODIPARA
DISTRICT: NORTH GARO HILL
STATE: MEGHALAYA

NONGKONGKIL GRIEVANCES REDRESSAL MECHANISM COMMITTEE

PRESIDENT: SHRI. CHANCHAN MOMIN
SORDAR OF NONGKONGKIL M.NO- 8798641698
SECRETARY: SMT. PRECILLA MARAK
NOKMA OF MORANGGA/NENGKRAM
MEMBER: SHRI. JACKIUS SANGMA
NONGKONGKIL VILLAGE
MEMBER: SHRI. TIKKIL SANGMA
NONGKONGKIL VILLAGE
MEMBER: SHRI NAGRANG SANGMA
SORDAR OF BOLBILONG VILLAGE M.NO-9233746828
MEMBER: SHRI. XAVIER SANGMA
BOLBILONG VILLAGE M.NO-6798641617

MEMBER: SHRI. BAITHY R. MARAK,
JUNIOR ENGINEER ADOKGRE SECTION, KHARKUTTA SUB DIVISION,
M.NO-8787798286

(Shri. Bester Ch. Marak)
Executive Engineer, PWD (Roads),
Kharkutta Division, Kharkutta

MINUTES OF THE THIRD ROUND OF FPIC CONSULTATION

Subject: Construction of RCC Bridges No. 44/10 & 54/3 on Rongjeng–Mangsang–Adokgre (RMA) Road
Date: 9th October 2025
Venue: Adokgre Village
Block: Kharkutta Block
District: North Garo Hills
State: Meghalaya
Chairperson
Shri Nilberstone Sangma
Assistant Executive Engineer, PWD (Roads), Kharkutta Sub-Division
Proceedings
The third round of Free, Prior and Informed Consent (FPIC) consultation was held at Adokgre Village on 9th October 2025 under the chairmanship of Shri Nilberstone Sangma, Assistant Executive Engineer, PWD (Roads), Kharkutta Sub-Division. The meeting was attended by A'king Nokmas, Sordars, Village Secretaries, representatives of NGOs, women's groups, elders, and other community members.
The Chairperson welcomed all participants and provided a detailed overview of the FPIC process, emphasizing its role in ensuring inclusive and transparent engagement between the Government and the local communities. He informed the gathering that the first and second rounds of FPIC had been conducted at Memillam, covering both the improvement of the RMA Road and the proposed construction of RCC Bridges No. 44/10 and 54/3. However, due to the remote location and poor road conditions, participation from villages near the proposed bridge sites was limited. Hence, the third round of FPIC was organized specifically at Adokgre to ensure adequate representation and consent from the directly affected communities.
The consultation included a comprehensive presentation on the project's purpose, scope, and potential impacts—both positive and negative. Key components discussed were:

- Environmental and Social Impact Assessment (ESIA)
- Environmental and Social Management Framework (ESMF)
- Indigenous Peoples Planning Framework (IPPF)

Experts from SATRA Consultancy participated in the discussions, addressing concerns related to land requirement, environmental safeguards, and social implications. Their involvement reinforced the Government's commitment to building trust and ensuring community participation.
Community Consents Granted
The Nokmas and villagers expressed their appreciation that the long-pending construction of RCC bridges over the Ildek and Pakrek rivers is finally being initiated. They shared the challenges faced due to the absence of these bridges, particularly in transporting agricultural produce and essential goods. Recognizing the benefits of the proposed infrastructure, the community willingly agreed to part with the required land and provided written consent for the following:

1. RCC Bridge Br No-44/10 at Ildek A'kong, Tingba (across Ildek River)

- **Reking Side:** Consent provided by A'king Nokma Smt. Teraji R. Marak and villagers
- **Tingba Side:** Consent provided by Shri Prodinit Sangma

2. RCC Bridge Br No-54/3 at Adokgre (across Pakrek River)
   - **Adokgre Side:** Consent provided by landowner Smt. Dipashree R. Marak

Formal agreements for the above-mentioned bridge constructions were signed between the respective landowners and officials of the Government of Meghalaya.

Conclusion

The meeting concluded with a vote of thanks from the Chairperson, acknowledging the active participation, cooperation, and support of all stakeholders.

Enclosures

1. Attendance sheet of members presents
2. Photographic Documentation (as per SOP guidelines)
3. Written consent for construction of RCC Bridge Br No-44/10 at Ildek A'kong, Tingba
4. Written consent for construction of RCC Bridge Br No-54/3 at Adokgre

(Shri. Bester Ch. Marak)
Executive Engineer, PWD (Roads),
Kharkutta Division, Kharkutta

MINUTES OF THE THIRD ROUND OF FPIC

Project Title: Improvement/Upgradation to intermediate lane of a RMA Road from 22.00 to 44.00 Km
Date: 9th October 2025
Venue: Nongkongkil Community Hall
District: East Garo Hills
State: Meghalaya
Presiding Officer
Shri Jimbu G. Momin
Junior Engineer, PWD (Roads), Rongjeng Sub-Division
Facilitator
Smt Francie N.A. Sangma
Assistant Executive Engineer, PWD (Roads), Rongjeng Sub-Division
Members Present
As per the enclosed attendance sheet
Proceedings
The meeting commenced with a welcome address by the Presiding Officer, Shri Jimbu G. Momin, who greeted the officials from PWD, representatives from RODIC Consultancy, and community members. He outlined the purpose of the meeting and emphasized its role in facilitating Free, Prior and Informed Consent (FPIC) for the proposed road improvement project.
Smt Francie N.A. Sangma, AEE, PWD (Roads), reiterated the principles of FPIC and read out the minutes of the second FPIC meeting. She highlighted the importance of community engagement and transparent decision-making.
Shri Neeraj Kumar, DPR Consultant from RODIC, presented the proposed road design and alignment. He informed the gathering that certain portions of community land may be required for the project and the details of which will be shared with the communities once the DPR and ESIA documents are finalised.
Site Planning and Community Coordination
Discussions were held regarding potential locations for labour camps and other amenities. PWD officials committed to conducting joint site verifications with community members and sharing the chainage details with the consultants for planning and implementation.
Grievance Redressal and Risk Awareness
The AEE informed the community that suggestions and grievances could be submitted through the Grievance Redress Mechanism (GRM) during the execution phase. She also sensitized attendees to possible challenges such as noise, air and water pollution, labour influx, and social risks including safety concerns for women and children, and potential exploitation of workers.

Community Consents Granted:
During the course of the discussion, the villagers expressed their collective demand for the construction of Bus Waiting Sheds, separate Toilets for both male and female, and Community store room at various designated locations. Community representatives expressed their support

and willingness to contribute land for the development. Shri Kynsai Marak (Nokma Secretary) and Shri Chanchan Momin (Sordar) submitted a petition on behalf of the residents along the RMA Road, outlining the following community demands:

- **Rongchong Village:** Construction of a bus shed and public toilets (separate for male and female)
- **Nongkongkil Village:** Construction of a community storeroom, bus shed, public toilets, and provision of pipe connections from the local water source
- **Mogru Village:** Construction of a bus shed and public toilets (separate for male and female)

In support of these proposals, the Nokma of Nongbak A'ding A'king, Smt Vincent R Marak, and the Nokma of Marengga A'king, Smt Presilla N Marak, along with the villagers from both A'king lands, have formally provided written consent for the construction of the following structures.

Conclusion
The meeting concluded with a vote of thanks from the Chairperson, expressing gratitude to all participants for their active involvement and constructive contributions.
Enclosures:

1. Attendance sheet of members presents
2. Photographic Documentation (as per SOP guidelines)
3. Written consent from the Nokma of Nongbak A'ding A'king, Smt Vincent R Marak and the villagers.
4. Written consent from the Nokma of Marengga A'king, Smt Presilla N Marak and the villagers.

(Shri. Bester Ch. Marak)
Executive Engineer, PWD (Roads),
Kharkutta Division, Kharkutta

MINUTES OF THE THIRD ROUND OF FPIC CONSULTATION

Project Title: Improvement/Upgradation to intermediate lane of a RMA Road from 22.00 to 44.00 Km
Date: 9th October 2025
Venue: Memillam Village
Block: Kharkutta Block
District: North Garo Hills
State: Meghalaya

The third round of Free, Prior and Informed Consent (FPIC) consultation was convened at Memillam village on 9th October 2025. The meeting was chaired by Shri Nilberstone Sangma, Assistant Executive Engineer, PWD (R), Kharkutta Sub-Division.

Shri Sangma welcomed the Nokmas, Sordars, Village Secretaries, representatives of NGOs, women's groups, elders, and other community members. He commenced the session by reading the minutes of the second FPIC meeting and proceeded to elaborate on the FPIC process, emphasizing its significance in ensuring transparent and participatory decision-making between the Government and local communities.

He provided a detailed overview of the proposed project, including its objectives, scope, anticipated benefits, and potential impacts—both positive and negative. The Standard Operating Procedures (SOPs) for conducting FPIC consultations were explained, highlighting the necessity of consultative engagement and the critical role of community participation in shaping project outcomes.

The importance of the third FPIC round was underscored, particularly in relation to consolidating community feedback and presenting findings to the council for formal declaration. Key components such as the Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Framework (ESMF), and Indigenous Peoples Planning Framework (IPPF) were discussed. Issues pertaining to land requirements, environmental safeguards, and social inclusion were addressed, with emphasis on building trust through expert engagement and transparent communication.

Public Interaction and Technical Briefing:

An open discussion session was held, allowing community members to raise queries and share feedback. Shri Neeraj Kumar, Consultant from RODIC (DPR), presented the project drawings, design features, and alignment plans. The community expressed satisfaction with the proposed designs. He further clarified that the project is expected to commence post completion of all formalities and final approval from the Government of Meghalaya, tentatively by June 2026.

Community Consents Granted:

During the course of the discussion, the villagers expressed their collective demand for the construction of Bus Waiting Sheds, separate Toilets for both male and female, and Market Sheds at various designated locations. Additionally, they requested the establishment of an Inspection Bungalow at Memillam. In support of these proposals, the Nokma of Nengalang A'king, Smti Kresbina Sangma, and the Nokma of Nongbak Jajil A'king, Smt Lajush Sangma, along with the villagers from both A'king lands, have formally provided written consent for the construction of the following structures.:

1. Construction of Bus Waiting Shed and Toilet at Mawdipara (37th km)

2. Construction of Bus Waiting Shed and Toilet at Memillam (38th km)
3. Construction of Bus Waiting Shed and Toilet at Tingba (44th km)
4. Dumping of debris and earth at chainage 44th km of Rongjeng–Mangsang–Adokgre Road
5. Construction of Inspection Bungalow (IB) at Memillam (38th km)
6. Construction of Bus Waiting Shed and Toilet at Jajil Junction (32nd km)
7. Construction of Marketing Sheds, Bus Waiting Sheds, and Toilets (separate for male and female) at Memillam Market Area (37th km)

Conclusion

The meeting concluded with a vote of thanks from the Chairperson. He summarized the proceedings and expressed gratitude to all participants for their active engagement and valuable inputs.

Enclosures:

1. Attendance sheet of members presents
2. Photographic Documentation (as per SOP guidelines)
3. Land consent documents for project construction
4. Consent for Bus Waiting Sheds
5. Consent for Toilets
6. Consent for Marketing Sheds/Huts
7. Consent for Inspection Bungalow at Memillam

(Shri. Bester Ch. Marak)
Executive Engineer, PWD (Roads),
Kharkutta Division, Kharkutta

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.

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Table 1: Performance Indicators

Sl. No.	Description of Item	Indicator	Stage	Responsibility
1	• No. of sites for which Restoration Plans have been prepared • No. of Site Restored and Rehabilitated • No. of Sites handed over	Quarries	Pre-Construction	Contractor/CSC/PMC
2	Quantity of Debris and Spoils to be disposed off • No. of locations Approved for Debris disposal • Quantity disposed off at each location • No. of locations for which Rehabilitation works have been completed	Disposal sites	Construction	Contractor/CSC/PMC
3	• No. of location/s identified for the Construction camp and Construction Plant sites • No. of location/ s approved • Lay-out/s Approved • No. of sites for which Site Restoration and Rehabilitation has been completed	Construction Camps and Plant Sites	Pre-Construction and Construction	Contractor/CSC/PMC
4	• 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/CSC/PMC
6	Implementation of enhancement measures for Noise Barrier at sensitive locations	Enhancements	Construction	Contractor/CSC/PMC
7	Drainage • Length (by type) No. of Locations	Work sites	Construction	Contractor/CSC/PMC
8	Safety Provisions • Signage (by type and no.)	Work sites	Construction	Contractor/CSC/PMC

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Sl. No.	Description of Item	Indicator	Stage	Responsibility
	• Crash barriers • Footpath			
9	Soil erosion prevention measures • Construction of retaining walls • Downstream at culvert locations (No. of Locations & length)	Work sites	Construction	Contractor/CSC/PMC
10	No. of HIV awareness sessions conducted	Registers/Reports/Geotagged Photos	Construction	Contractor/CSC/PMC
11	No. of safety awareness sessions conducted	Registers/Reports/Geotagged Photos	Construction	Contractor/CSC/PMC
12	Accidents/Incidents • No of accidents/incidents recorded	Along sub-project road	During construction	Contractor/CSC/PMC
13	Environmental parameter monitoring in accordance with the frequency and duration of monitoring as well as the locations as per the Monitoring Plan	Air Quality Noise Quality Soil Quality Water Quality Report and geotagged photos.	Construction and Operation stage	Contractor through NABL Accredited agency.
14	No. of Training Sessions Organized for • Departmental Staff • Contractors • Combined No. of People Trained • Departmental Staff Contractors	Training Imparted	Construction /Operational stage	CSC/PMC/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	CSC/PMC/MPWD
16	No. of Trees Planted (Total) • No. of Trees Planted along Roadsides • No. of Trees planted at other locations (such as camps, debris disposal sites and plant areas) • No. of trees planted at enhancement sites	Roadside and other plantation areas	Post construction stage	Contractor/MPWD
17	Survival Rate Trees Planted (Average)	Roadside and other	Post	Contractor/CSC/PMC/MPWD

Disclaimer: This is a draft report and is being reviewed by the World Bank

Sl. No.	Description of Item	Indicator	Stage	Responsibility
	• Compensatory Afforestation • Roadside Plantation • Other locations (such as camps, debris disposal sites and plant areas Enhancement sites)	plantation areas	construction stage	
18	Land, structure & Livelihood compensations paid	Number of PAPs compensated; amount disbursed as per RAP/IPDP	Construction stage	MPWD/ Village Councils as per existing Customary Laws.
19	Vulnerable groups	Type of consultations undertaken; Compensations paid in time.	Construction stage	MPWD/ Village Councils as per existing Customary
20	Grievance Mechanism	Number of complaints resolved within stipulated time; No of RTI applications filed; SEA/SH complaints filed.	Construction stage	Project Grievance Committee/ Site Grievance committee/CSC/PMC/MPWD
21	Stakeholder Engagement and Meaningful Consultations	Number and frequency of consultations held at different project stages. Level of participation from diverse stakeholder groups, Extent to which stakeholder concerns and suggestions have been integrated into decision-making, mitigation measures, Documentation.	Continuous	Contractor/CSC/PMC/MPWD