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DRAFT

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

**Improvement and Widening of Rongrenggre-Simsanggre-Nengkhra(RSN) Road
including Conversion of weak Bridges to Permanent RCC bridges**

Meghalaya Logistics and Connectivity Improvement Project (MLCIP)



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ACRONYMS

ASI	: Archaeological Survey of India
BIS	: Bureau of Indian Standards
BMC	: Biodiversity Management Committee
CESMP	: Contractor's Environmental and Social Management Plan
CGWB	: Central Ground Water Board
Col	: Corridor of Impact
CPR	: Common Property Resources
CTE/CTO	: Consent To Establish/Consent to Operate
CW	: Carriageway
DG	: Diesel Generator
DPR	: Detailed Project Report
E&S	: Environment and Social
EHS	: Environment Health and Safety
EIA	: Environmental Impact Assessment
ESF	: Environmental and Social Framework
ESIA	: Environmental and Social Impact Assessment
ESMP	: Environmental and Social Management Plan
E&S Cell	: Environment& Social Cell, MPWD
ESMF	: Environmental and Social Management Framework
ESRS	: Environmental and Social Review Summary
ESS	: Environmental and Social Standards
ESZ	: Eco-Sensitive Zone
FPIC	: Free, Prior, and Informed Consent
GBV	: Gender-Based Violence
GIS	: Geographic Information System
GoM	: Government of Meghalaya
GRM	: Grievance Redress Mechanism
GHADC	: Garo Hills Autonomous District Council
HIV	: Human Immunodeficiency Virus
IBA	: Important Bird Area
IBAT	: Integrated Biodiversity Assessment Tool
IDP	: Internally Displaced Persons
IEC	: Information, Education, and Communication
IFC	: International Finance Corporation
IRC	: Indian Road Congress
ISFR	: India State of Forest Report
IUCN	: The International Union for Conservation of Nature
KBA	: Key Biodiversity Area
LHS	: Left Hand Side
LULC	: Land Use Land Cover
MDF	: Moderately Dense Forest

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MDR/ SH	: Major District Roads/State Highways
MoEF&CC	: Ministry of Environment, Forest and Climate Change
MLCIP	: Meghalaya Logistics and Connectivity Improvement Project
MSPCB	: Meghalaya State Pollution Control Board
MSDMA	: Meghalaya State Disaster Management Authority
NATMO	: National Atlas and Thematic Mapping Organization
NBSAP	: National Biodiversity Strategy and Action Plan
NGO	: Non-Governmental Organization
NH	: National Highway
NOC	: No Objection Certificate
NO _x	: Oxides of Nitrogen
NTFP	: Non-timber forest product
OF	: Open Forest
OHS	: Occupational Health and Safety
OIP	: Other Interested Parties
PAP	: Project Affected Person
PBR	: People's Biodiversity Register
PESO	: Petroleum and Explosives Safety Organization
PIA	: Project Influence Area
PID	: Project Information Document
PM	: Particulate Matter
POSH	: Prevention of Sexual Harassment
PPE	: Personal Protective Equipment
PROW	: Proposed Right of Way
PUC	: Pollution Under Control
PWD	: Public Works Department
R&R	: Resettlement and Rehabilitation
RAP	: Resettlement Action Plans
RF	: Reserve Forest
RFCTLARR	: Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013
RHS	: Right Hand Side
RoW	: Right of Way
SBB	: State Biodiversity Board
SEA	: Sexual Exploitation and Abuse
SEIAA	: State Environment Impact Assessment Authority
SEP	: Stakeholder Engagement Plan
SH	: Sexual Harassment
SIA	: Social Impact Assessment
SOP	: Standard Operating Procedures
ST	: Scheduled Tribes
SC	: Scheduled Caste
OBC	: Other Backward Caste
GC	: General Caste
TSG	: Technical Support Group

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VDF : Very Dense Forest
WB : World Bank
WHO : World Health Organization
WPA, 1972 : Wildlife Protection Act, 1972
WPA, 2022 : Wild Life (Protection) Amendment Act, 2022

1. INTRODUCTION

1.1 BACKGROUND

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

Table 1.1: Components of MLCIP

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

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 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 672.499km 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					
East Meghalaya					
1.	Upgradation of Dkhiah - Sutnga - Saipung - Pala upto Semmasi 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 upto Phlangwanbroi	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 23 rd to 44 th Km including construction of a major Bridge at Eldek Akong and Bridge No. 1/6	22.00	East Garo Hill & North Garo Hill	25°38'59.68"N 90°48'18.15"E	25°49'55.69"N 90°58'26.22"E
3.	Upgradation of Rongsai Boijhora Bajengdoba (RBB) Road from single to intermediate lane.	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					

Sl. No.	Name of the Corridors and Proposed Upgradation/ Improvement	Length (Km)	Districts	Start point Coordinate	End Point Coordinate
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	--	--
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	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 Sub-Project road classified as an Other District Road (ODR) with a total length of approximately 22 km, is equipped with several essential utility infrastructures. Electric poles, overhead electric lines, and Optical Fiber (OFR) cables run parallel to the road alignment. These utilities are critical for ensuring uninterrupted power supply and communication services in the project area and will be duly considered during road improvement and construction activities to avoid any disruption or damage.

A total of 349 electric poles, 4 transformers, and 93 electric line crossings are identified along the RSN road sub-project for shifting of these, 227 poles are on the LHS and 122 on the RHS. A total of 09 OFC pillars are identified for shifting along the RSN road corridor, comprising 03 on the LHS and 06 on the RHS. Details of utilities are given in **Annexure1.1**.

1.3 SCOPE FOR CONDUCTING THE ESIA STUDY

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

- Information on the proposed sub-project components and activities to be gathered from DPR and site for each stage of the project cycle (Design, Pre-construction, Construction, and O&M), including location, project design, processes and materials to be used, expected waste generation, etc.
- Literature review and collection of data relevant to the study area.
- Environmental monitoring and Socio-Economic Survey to establish the baseline environmental and social status of the study area.
- Identification of the probable adverse E&S risks and impacts of the sub-project due to the construction and operation of the proposed improvement works.
- Identification of the stakeholders and various groups/institutions who are either affected or have an interest or a stake in the Sub-Project, 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 1.3: Approach adopted for conducting the ESIA

Sl. No.	Stages	Activities Done
1.	Screening and Scoping	Identified key issues through primary and secondary surveys, assessed stakeholders, and analyzed potential impacts considered in the Environmental and Social Impact Assessment, following the Free, Prior, and Informed Consent (FPIC) process to ensure meaningful participation and consent of Indigenous Peoples and affected communities.
2.	Public Consultation for Scoping Report	Identified key issues to understand stakeholder concerns and inform sub-project design and build awareness on the project including the Free, Prior, and Informed Consent (FPIC) process. This involved engaging with Indigenous Peoples and affected communities through meaningful consultations in a transparent and participatory manner. In order to make them aware of the project activities, an attendance sheet was maintained to record the presence of villagers who participated in the consultation meeting including geo tagged photographs as evidence of the same. These were the first round of consultations for FPIC.
3.	Baseline Data Collection	To assess the baseline environment and social conditions, the data has been accessed from authentic and verifiable sources as given in Table 1.2 for collecting the primary data through consultation, field survey, and secondary data.
4.	Impact Assessment	Using baseline data, the RSN 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 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

Sl. No.	Stages	Activities Done
		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 sub-project road and within the direct impact area 500 m from the proposed RoW for sensitive environmental features and 12 m from the proposed RoW for social analysis. Secondary data were collected for a 10 km radius buffer surrounding the project road.
- b. To assess the baseline environment and social conditions, the data has been accessed from authentic and verifiable sources as given in Table 1.4 for collecting the primary data through consultation, field survey and secondary data. A due attempt has been made to source and access only the latest available data from authentic and verifiable sources.

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

Parameters	Secondary Source
	Environment
Air	<p>Primary Survey Primary Monitoring Secondary Source Central pollution control Board (CPCB, https://cpcb.nic.in/) / Meghalaya State Pollution Control Board (MSPCB https://megspcb.gov.in/)</p>
Water	<p>Primary Survey Primary Monitoring Secondary Source 1. District Survey Report, East Garo Hills District, (https://eastgarohills.gov.in/document-category/statistical-report/) 2. CGWB Data 2024 https://cgwb.gov.in/old_website/AQM/NAQUIM_REPORT/Meghalaya/East%20Garo%20Hills%20_report.pdf?utm_source=chatgpt.com</p>
Noise	<p>Primary Survey Primary Monitoring Secondary Source CPCB (https://cpcb.nic.in/regulation-control/)</p>
Soil	<p>Primary Survey Primary Monitoring Secondary Source 1. District Irrigation Plan 2016-2020 (https://pmksy.gov.in/mis/Uploads/2017/20170331050354800-1.pdf) 2. Mapping India's Climate Vulnerability A District Level Assessment (2021) (https://www.ceew.in/sites/default/files/ceew-study-on-climate-change-vulnerability-index-and-district-level-risk-assessment.pdf)</p>
Biodiversity	<p>Primary survey 1. Field observation 2. Vegetation assessment was conducted using Nested Quadrature 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</p>

Parameters	Secondary Source
Hazards and Vulnerability	<p>Primary survey Field observation and Consultation with concerned departments and local community</p> <p>Secondary Source</p> <ol style="list-style-type: none"> District Disaster Management Plan for East Garo Hills, 2024 (https://msdma.gov.in/ddmp/DDMP-Williamnagar.pdf) Meghalaya State Disaster Management Authority (MSDMA) (https://msdma.gov.in/)
Natural Environment	<p>Secondary Source</p> <ol style="list-style-type: none"> Customized Rainfall Information System, Hydromet Division, IMD (https://hydro.imd.gov.in/) District Census Handbook, East Garo Hills (https://censusindia.gov.in/nada/index.php/catalog/861/download/36312/DH_2011_1702_PART_B_DCHB_EAST_GARO_HILLS.pdf) Geological Survey of India(https://www.gsi.gov.in/webcenter/portal/OCBIS) District Irrigation Plan 2016-2020 (https://pmksy.gov.in/mis/Uploads/2017/20170331050354800-1.pdf) Consultant’s Analysis, Source IMD Gridded Data(https://www.imdpune.gov.in/cmpg/Griddata/Rainfall_25_NetCDF.html) State Action Plan on Climate Change (SAPCC), Meghalaya(https://moef.gov.in/uploads/2017/08/Meghalaya.pdf) Statistical Handbook, Meghalaya 2023 (https://des.megplanning.gov.in/documents/SHB2023-as-on-02-05-24.pdf)
Climate	<p>Secondary Source India Meteorological Department – Shillong Climatological Normals, (1991–2020) (https://dsp.imdpune.gov.in/home_normals.php#)</p>
	Land and Livelihood Impact
Land, Livelihood and Common Property Resources	<p>Primary survey</p> <ol style="list-style-type: none"> Census/Household Survey (PAH:40) Focus Group Discussions (3) Key Informants Interviews (25) Field Observations <p>Secondary Source Census 2011 (https://www.census2011.co.in/)</p>
	Other Socio-Economic Parameters

Parameters	Secondary Source
Ethnicity	<p>Primary survey Consultation</p> <p>Secondary Source Census 2011(https://www.census2011.co.in/)</p>
Gender	<p>Primary Survey Focus Group Discussion Interviews</p> <p>Secondary Source Workforce Participation Rate as per Census 2011 (https://www.census2011.co.in/) National Family Health Survey- 5 (https://mohfw.gov.in/files/NFHS-5_Phase-II_0)</p>
Prevalence of GBV	<p>Primary survey Focus Group Discussions with women group</p> <p>Secondary Source Police records National Crime Records Bureau (NCRB) (https://ncrb.gov.in)</p>

1.5 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, sub-project details are described from an environmental and social perspective with salient features including RoW, cross sections, traffic projections, sub-project characteristics, settlements, and resource requirements, etc.
Chapter 4	THE BASELINE ENVIRONMENT chapter describes the existing baseline environmental conditions and the collection of secondary information regarding physical, biological, and socio-economic conditions of the study area, and the environmental quality of the study area – monitoring of air, noise, soil, surface, and groundwater. As part of the targeted assessment, baseline data focuses on the demographic, social, cultural, and political characteristics of indigenous/tribal communities; the land and territories they have traditionally owned, customarily used, or occupied; and the natural resources on which they depend.
Chapter 5	ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS – Describes the potential risks and impacts on valued environmental and social components during various project phases, including pre-construction, construction, and operational phases. As part of targeted assessment for indigenous tribal communities, RAP, IPDP and ESMP includes the measures necessary to avoid adverse impacts, or if such measures are not feasible, measures to minimize, mitigate, or compensate for such impacts, and to ensure that the indigenous/tribal communities receive culturally appropriate benefits under the project, thus overall resulting in community-led development and decision-making in the project-affected tribal areas. This is based on meaningful consultation tailored to indigenous/tribal communities and, where relevant, on Free, Prior, and Informed Consent (FPIC).
Chapter 6	ANALYSIS OF ALTERNATIVES, with project and without project scenario. The mitigation hierarchy approach guided the impact assessment and analysis of alternatives— to explore alternative routes and designs to minimize adverse impacts. Additionally, potential mitigation measures were identified to reduce or eliminate negative effects and enhance positive outcomes.
Chapter 7	STAKEHOLDER CONSULTATION AND INFORMATION DISCLOSURE describes the various stakeholders and the outcome of the stakeholder consultation. As part of targeted assessment for indigenous/tribal communities, the chapter includes the identification of project-affected parties and the elaboration of a culturally appropriate process (FPIC) for involving and consulting with the indigenous/tribal communities in their vernacular medium at each stage of project preparation and implementation;
Chapter 8	ENVIRONMENTAL AND SOCIAL MONITORING & REPORTING PROGRAMME This chapter covers reporting, monitoring, and the project's institutional framework.
Chapter 9	GRIEVANCE REDRESSAL MECHANISM
Chapter 10	CONCLUSION AND RECOMMENDATIONS

2. LEGAL AND INSTITUTIONAL FRAMEWORK

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

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

To understand the scope of the environmental and social assessment for the proposed improvements or road works, the relevant laws, legislation, and policies at the national and state levels were reviewed and summarized in Table 2.1 below, including an examination of the legal and institutional frameworks applicable to indigenous and tribal communities as part of the targeted assessment.

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

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

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
6	Hazardous & Other Wastes (Management and Trans-boundary Movement) Rules, 2016 and March, 2024	Protection against improper handling, storage and disposal of hazardous waste. The rules prescribe the management requirement of hazardous wastes from its generation to final disposal.	Hazardous waste generation from proposed activities like generation of paints waste, used oil/waste oil, bitumen waste, etc.	Contractor to obtain authorization for storage, transport, and disposal of hazardous and other wastes	MSPCB
7	Construction and Demolition Waste Management Rules, 2016	To manage the demolition and construction waste and prevent environmental degradation	Construction and demolition waste will be generated from proposed activities	Permission will be required by Contractor.	Village Council, Municipal Boards
8	Solid Waste management Rules, 2016 and amended thereof	To manage solid waste or semi-solid domestic waste, sanitary waste	Solid Waste will be generated from proposed activities due to influx of labour	Permission will be required Contractor needs to submit plan for reuse or safe disposal	Village Council, Municipal Boards
9	Vehicle Act 1988 Central Motor Vehicle Rules 1989	To minimize the road accidents, penalizing the guilty, provision of compensation to victim and family and check vehicular air and noise pollution.	Transportation of manpower and material will involve vehicular movement. Vehicles must have valid Pollution Under Control (PUC) certificates, Insurance, Fitness Certificate. Driver should have valid Driving License.	PUC and fitness certificates, Insurance. Driving License, Fitness Certificate	State Transport Authorities approved PUC certificate providers
10	The Gas Cylinder Rules 2016	To regulate the storage of gas / possession of gas cylinder more than the exempted quantity.	Gas cylinders may be used during welding and other electromechanical work. Storage within threshold quantity and as per capability analysis. Handling with defined safe practices	Yes, Permission will be required by the Contractor if the storage of gas / possession of gas cylinder is more than the exempted quantity (i.e more than 25 cylinders of total weight 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

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
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	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	No	State Forest Department

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
	Amendment) Act, 1973		communities dependent on forest produce.		
16	Meghalaya Biodiversity Rules, 2010	Conservation of biological diversity, sustainable use of its components and fair and equitable sharing of benefits arising out of the use of biological resources	Provisions of this act will not be applicable since road will not adversely affect any biological diversity	No	Meghalaya State Biodiversity Board
17	Wildlife protection Act 1972, 2022	Protection of wildlife in the state of Meghalaya	Wildlife impact is not anticipated in this project.	No	State Forest Department
18	Eco-sensitive Zone Notifications 2015	The activities in areas around Wildlife Sanctuaries and National Parks are regulated from the 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 25 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	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

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
	Afforestation Fund Act, 2016				
21	Meghalaya Tree (Preservation) Act, 1976, and the Meghalaya Tree Felling (Non-Forest Areas) Rules, 2006	Conservation of forest and controlled felling of trees	Approx. 25 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

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
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 Simsang river can be used for road construction with prior permission from the concerned Irrigation Department/Water Resources Department, East 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	The Act ensures transparent land acquisition with fair compensation,	Yes, as the area falls under 6th schedule	No	Revenue Department, Government of

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
	Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013	rehabilitation, and resettlement. It sets minimum compensation norms, R&R entitlements, and facilities for the displaced, allowing states to enhance benefits. The Act also includes special provisions to protect the interests of Scheduled Castes and Scheduled Tribes.	A review of the legal and institutional framework applicable to indigenous/tribal communities.		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	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

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
	Vendors (Protection of Livelihood and Regulation of Street Vending) Rules, 2016				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

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
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	It mandates every organization having more than ten employees to constitute	Applicable to all implementing agencies	No	District Officer

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
	(Prevention, Prohibition and Redressal) Act, 2013 (POSH Act)	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			(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	Applicable to all implementing agencies	No	Labour Commissioner, Meghalaya

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

Sl. No.	Relevant Acts and Policies	Mandate of the Act/ Policy	Reason for applicability/ non-applicability	Regulatory Clearance Requirement	Authority
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	<i>ESS1 outlines the Borrower's duties for evaluating, handling, and tracking environmental and social risks and impacts at each phase of a project</i> <i>Involves Preparation of ESA, ESIA, ESMF, RAP.</i>	Project may involve potential environmental and social risks due to construction activities under the project.	Yes	ESIA/DPR/MPWD
ESS 2 – Labour and Working Conditions	<i>ESS2 highlights the vital role of job creation and income generation in reducing poverty and fostering inclusive economic growth. Borrowers can improve project outcomes by ensuring fair treatment of workers and providing safe, healthy working conditions.</i> <i>Objectives include promotion of health, safety, equal opportunity at work and to protect vulnerable workers. Aims to prevent forced and child labour and to provide workers with accessible means to raise workplace concerns.</i>	All project construction activities must guarantee the elimination of child labor and forced labor, while ensuring the implementation of operational health and safety standards, as well as a grievance redressal mechanism for the welfare of workers.	Yes	ESIA/MPWD/Contractor/CSC
ESS 3 – Resource Efficiency, Pollution Prevention and Management	<i>ESS3 acknowledges that economic activity and urbanization contribute to pollution and resource depletion, which can harm people, ecosystems, and the environment locally, regionally, and globally.</i> <i>Objectives include promotion of sustainable use of resources, minimize project-related pollution and emissions, minimize</i>	Construction and Demolition activities and provision of support facilities require waste and pollution management during construction and operations; prevention of risks due to chemicals and hazardous material use.	Yes	ESIA/MPWD/Contractor/CSC

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	<i>generation of hazardous and non-hazardous waste and manage the risks and impacts associated with pesticide use</i>	Efficient use of raw material resources Energy, Air, Water, reuse of wastes and ensuring circularity etc. are important for overall sustainability.		
ESS 4 – Community Health and Safety	<p><i>ESS4 acknowledges that project activities, equipment, and infrastructure can heighten community exposure to risks and impacts.</i></p> <p><i>The major objective is to anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle.</i></p>	It is of paramount importance to prioritize community health and safety through the careful design of infrastructure, products, and associated services in road construction projects involving extensive civil works.	Yes	ESIA/DPR/MPWD/Contractor/CSC
ESS 5 – Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement	<p><i>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.</i></p> <p><i>Major objective is to avoid or minimize involuntary resettlement. Other objectives include avoiding forced evictions, mitigate unavoidable adverse social and economic impacts from land acquisition and improve the living conditions of vulnerable persons.</i></p>	Land acquisition might be required as part of the project for road expansion and it is necessary to prioritize the protection of people's rights, ensuring a fair and transparent procedure. Respecting landowners' rights fosters community trust, reduces conflicts, and supports social equity. A rights-based approach guarantees that affected individuals are treated justly and project proceeds smoothly.	Yes	ESIA/DPR/MPWD /RP Implementation Agency
ESS 6 – Biodiversity Conservation, and Sustainable Management of Living Natural Resources	<i>ESS6 acknowledges that safeguarding and conserving biodiversity, along with the sustainable management of living natural resources, are essential for achieving sustainable development.</i>	The assessment and mitigation of impacts and risks to biodiversity and living natural resources, arising from both the implementation and operation	Yes	ESIA/DPR/MPWD/Contractor/CSC

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
	<i>The objectives include protection and conservation of biodiversity and habitats, ensure cautionary approach in project design and implementation which impact biodiversity and promote the sustainable management of living Natural resources.</i>	phases, are crucial for linear projects that traverse extensive and diverse land areas.		
ESS 7 – Indigenous Peoples	<p><i>ESS7 recognizes that Indigenous Peoples are often disadvantaged by traditional models of development and supports poverty reduction and sustainable development by ensuring that projects enable Indigenous Peoples and communities to participate in and benefit from development, while safeguarding their cultural identities and well-being</i></p> <p><i>The major objectives include ensuring that the development process fully respects the human rights, dignity, aspirations, identity, culture, and natural resource-based livelihoods of Indigenous Peoples, while avoiding any adverse impacts on them.</i></p>	The socio-economic assessment and the integration of a management plan for the affected Indigenous communities are essential, given the context through which the project road passes.	Yes	ESIA/DPR/MPWD/CSC/Contractor
ESS 8 – Cultural Heritage	<p><i>ESS8 acknowledges that cultural heritage serves as a link between the past, present, and future, encompassing both tangible and intangible forms. ESS8 outlines measures aimed at protecting cultural heritage throughout the entire project lifecycle.</i></p> <p><i>Its objectives are to protect cultural heritage from adverse impacts of project activities and to address cultural heritage as an integral aspect of sustainable development.</i></p>	Impacts and risks on cultural heritage during the construction and operation periods should be considered to preserve and protect valuable historical, cultural, and archaeological sites. These elements are vital for maintaining cultural identity, community values, and social cohesion. Neglecting to address potential risks can lead to irreversible	Yes	ESIA/DPR/MPWD/Contractor/CSC

WB E&S Standards	ESS Description and Objectives	Relevance and Significance to the Project	Applicability	Responsibility
		damage, loss of heritage, and conflicts with local communities, thereby undermining the sustainability and social acceptance of the project.		
ESS 9 – Financial Intermediaries	<p>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.</p> <p>The major objective is to outline how the FI will assess and manage the environmental and social risks and impacts linked to the subprojects it finances.</p>	<p>ESS9 would not be specifically required because there are no third-party financial intermediaries involved.</p>	No	
ESS 10 – Stakeholder Engagement and Information Disclosure	<p>ESS10 emphasizes the importance of open, transparent engagement between the borrower and project stakeholders as a key element of good practice.</p> <p>Objectives include creating a systematic approach for identifying stakeholders and fostering constructive relationships with them, to assess the level of stakeholder interest and support and to ensure the timely, clear, accessible, and appropriate disclosure of relevant project information on environmental and social risks and impacts to stakeholders.</p>	<p>Effective stakeholder engagement enhances environmental and social sustainability, improves project acceptance, and contributes to successful project design and implementation.</p>	Yes	ESIA/DPR/MPWD/Contractor/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: Details of land procurement mechanisms

Category	Garos
Basis of classification	Ownership of land
Type of land	2 types of ownership
Control and Management	The ancestral head Nokma (head of the clan) manages and allots land to the community. While the Maharis (clan members) look after A-jinma land.
Inheritance	Women inherit and own property: It is usually the youngest daughter who inherits the property.
Records	<i>Pattas</i> are the primary records available in the region, dating from the colonial period. J.D. Walker demarcated the A.king land boundaries and gave the <i>Nokmas</i> settled maps in the late 1920s. The availability of patta documents in the villages part of the study show the colonial legacy which is often the only record of the land. (Marak, 1986). Garo Hill Autonomous District Council (GHADC) is known to have the maps for large parts of the district in the Garo Hills.

Category	Garos
Systems for sale/purchase/ mortgage	<p>Pattas are instrumental in mortgaging land in the bank for loans.</p> <p>Selling of the land in the village required <i>Nokmas</i> presence as witness. Any transactions or inheritance pertaining to the land is recorded in the patta at the District Council, Office</p>
Managing private property	<p>The <i>Nokna</i> (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.</p>
Managing community property	<p>For the community lands, the power to make decisions is vested in the <i>nokma</i> of the village. For the clan land, the <i>nokna</i> (in heiress) along with her husband and the <i>chras</i> (brothers and maternal uncles) decides together. Any such transaction undertaken without prior consent of the wife (<i>nokna</i>) and her <i>Chra</i> is considered null and void (Marak, 1986).</p>

3. PROJECT ROAD DESCRIPTION

3.1 RONGRENGGRE-SIMSANGGRE-NENGGHRA (RSN) Road

The Proposed Road existed before the formation of Meghalaya state and ROW is limited only up to the existing Drain. The proposed RSN project road (Sub-project 1) has a total length of 22 km, commencing from Rongrenggre at chainage 00+000 and terminating at Nengkra Bazar at chainage 22+000.

3.2 Location details of the RSN Road

This stretch traverses a diverse landscape, including hilly terrains, agricultural lands, scrublands, built-up areas, and passes through 7 Villages including 14 habitations. The RSN 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 Sub-Project 1 while Figure 3.1 illustrates the road alignment map.

Table 3.1: Chainage wise RSN Road details

Sl. No.	Starting Chainage	End Chainage	Sub-project No.	Project length as per DPR	Districts
1	00+000	22+000	1	22	East Garo Hills

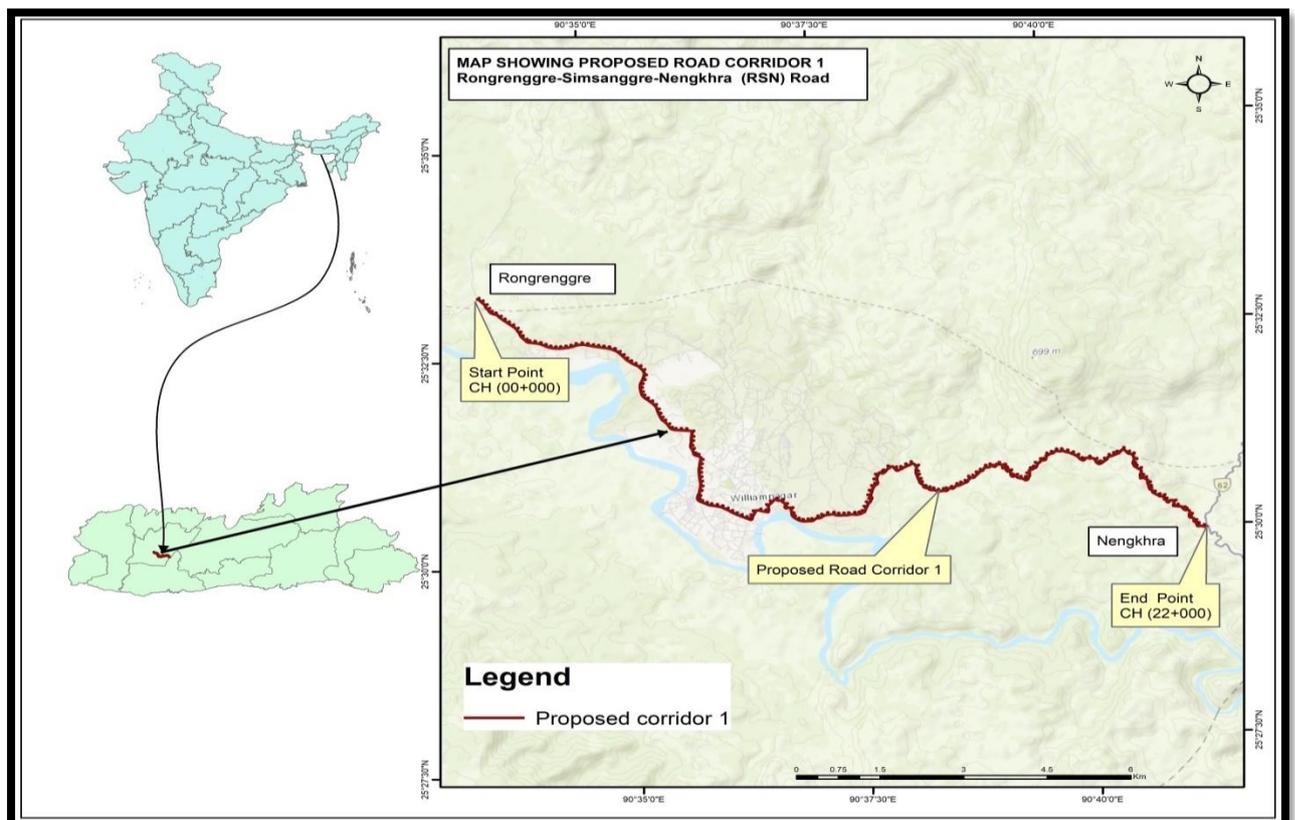


Figure 3.1: Road alignment map for RSN Road

3.3 Project Study Area (Project Influence Area)

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

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

The existing and proposed Right of Way (RoW) of the Sub-Project 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 Eco sensitive Zones w.r.t Project Road is presented in **Figure 3.4**.

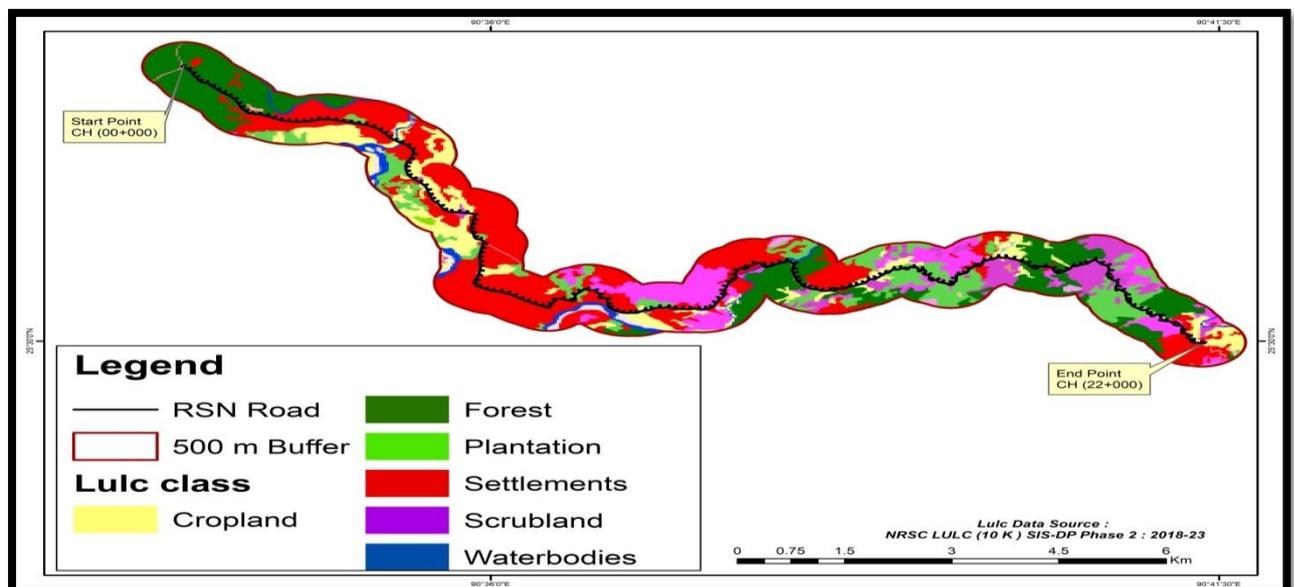


Figure 3.2: The LULC map of the direct impact area

¹ Based on Earlier experiences it was observed that dust, noise and other environmental parameters would get attenuated/diluted to meet existing baseline conditions within 500 m from the source.

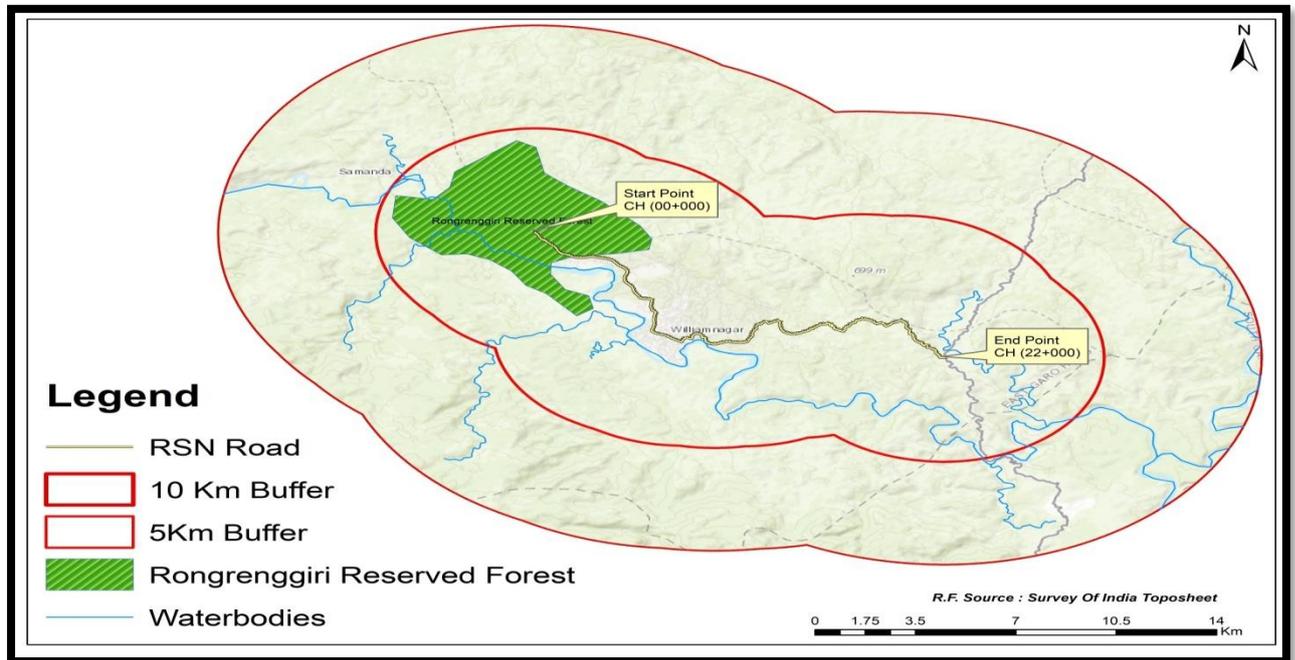


Figure 3.3: 10km Buffer area for project road

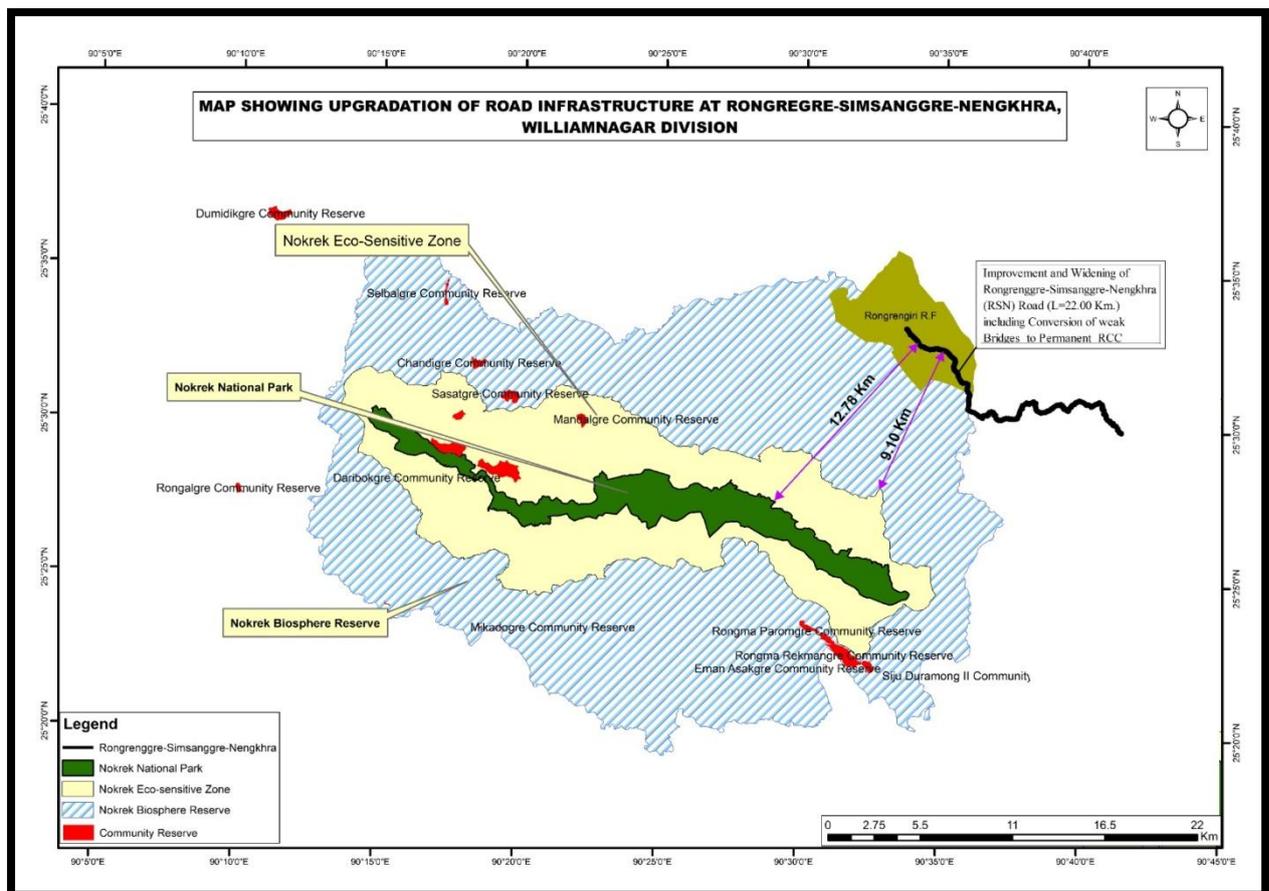


Figure 3.4: Map showing distance from Eco sensitive Zones w.r.t Project Road.

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

3.4 Key Existing Conditions And Proposed Improvements Of The RSN Roads

The key existing conditions and proposed improvements for the RSN 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 *Rongrenggre-Simsanggre-Nengkhra (RSN) Road* is presently a single-lane roadway with a bituminous pavement surface. The existing road conditions are generally good, except with 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 ROW

S.No	Chainages (m)		EROW (in m)
	From	To	
1.	0	100	13
2.	100	200	15
3.	200	300	15
4.	300	400	14.5
5.	400	500	11.5
6.	500	600	12
7.	600	700	13
8.	700	800	13
9.	800	900	12.5
10.	900	1000	12.5
11.	1000	1100	13
12.	1100	1200	12
13.	1200	1300	13
14.	1300	1400	12
15.	1400	1500	12
16.	1500	1600	13
17.	1600	1700	12.5
18.	1700	1800	13
19.	1800	1900	13.5
20.	1900	2000	12.5
21.	2000	2100	13.2
22.	2100	2200	12
23.	2200	2300	13
24.	2300	2400	14
25.	2400	2500	13
26.	2500	2600	13
27.	2600	2700	12
28.	2700	2800	14
29.	2800	2900	13
30.	2900	3000	10.5
31.	3000	3100	11
32.	3100	3200	10

S.No	Chainages (m)		EROW (in m)
	From	To	
33.	3200	3300	8.5
34.	3300	3400	9
35.	3400	3500	9
36.	3500	3600	9.5
37.	3600	3700	8
38.	3700	3800	5
39.	3800	3900	13
40.	3900	4000	8.5
41.	4000	4100	13.5
42.	4100	4200	10
43.	4200	4300	9.5
44.	4300	4400	9.5
45.	4400	4500	11.5
46.	4500	4600	11.5
47.	4600	4700	10.5
48.	4700	4800	8.02
49.	4800	4900	10
50.	4900	5000	10.5
51.	5000	5100	11.5
52.	5100	5200	11
53.	5200	5300	10.5
54.	5300	5400	10.8
55.	5400	5500	9.5
56.	5500	5600	11
57.	5600	5700	12
58.	5700	5800	10.5
59.	5800	5900	11.3
60.	5900	6000	11.5
61.	6000	6100	11.2
62.	6100	6200	10
63.	6300	6400	11
64.	6400	6500	11
65.	6500	6600	13
66.	6600	6700	14
67.	6700	6800	14
68.	6800	6900	12
69.	6900	7000	14
70.	7000	7100	13
71.	7100	7200	12.5
72.	7200	7300	14.5
73.	7300	7400	12.5
74.	7400	7500	10.7
75.	7500	7600	10.7
76.	7600	7700	10.7
77.	7700	7800	10.7
78.	7800	7900	10.7
79.	7900	8000	10.7
80.	8000	8100	10.7
81.	8100	8200	10.7

S.No	Chainages (m)		EROW (in m)
	From	To	
82.	8200	8300	12
83.	8300	8400	14
84.	8400	8500	13.5
85.	8500	8600	11.5
86.	8600	8700	12
87.	8700	8800	12
88.	8800	8900	11.5
89.	8900	9000	12.5
90.	9000	9100	13
91.	9100	9200	12
92.	9200	9300	12
93.	9300	9400	12
94.	9400	9500	11.5
95.	9500	9600	12.5
96.	9600	9700	14
97.	9700	9800	11.5
98.	9800	9900	14
99.	9900	10000	13
100.	10000	10100	11.5
101.	10100	10200	13.25
102.	10200	10300	12.8
103.	10300	10400	13
104.	10400	10500	12
105.	10500	10600	12
106.	10600	10700	12.5
107.	10700	10800	12.5
108.	10800	10900	12.5
109.	10900	11000	12.5
110.	11000	11100	12.5
111.	11100	11200	10.5
112.	11200	11300	12
113.	11300	11400	12
114.	11400	11500	11
115.	11500	11600	12.5
116.	11600	11700	11.5
117.	11700	11800	12.5
118.	11800	11900	13
119.	11900	12000	13
120.	12000	12100	12
121.	12100	12200	10.5
122.	12200	12300	12
123.	12300	12400	12
124.	12400	12500	11
125.	12500	12600	12.5
126.	12600	12700	11.5
127.	12700	12800	12.5
128.	12800	12900	13
129.	12900	13000	13
130.	13000	13100	12

S.No	Chainages (m)		EROW (in m)
	From	To	
131.	13100	13200	11
132.	13200	13300	11.5
133.	13300	13400	12.5
134.	13400	13500	11
135.	13500	13600	10.5
136.	13600	13700	11.3
137.	13700	13800	11.5
138.	13800	13900	11
139.	13900	14000	12
140.	14000	14100	12
141.	14100	14200	11.25
142.	14200	14300	9.75
143.	14300	14400	9
144.	14400	14500	9
145.	14500	14600	11.7
146.	14600	14700	9
147.	14700	14800	9
148.	14800	14900	10.5
149.	14900	15000	9.5
150.	15000	15100	9.5
151.	15100	15200	9.5
152.	15200	15300	9.5
153.	15300	15400	11.25
154.	15400	15500	12
155.	15500	15600	10.3
156.	15600	15700	11
157.	15700	15800	10
158.	15800	15900	9.75
159.	15900	16000	10.75
160.	16000	16100	10.1
161.	16100	16200	9.25
162.	16200	16300	8
163.	16300	16400	8
164.	16400	16500	8.5
165.	16500	16600	7.5
166.	16600	16700	8
167.	16700	16800	9.75
168.	16800	16900	8.5
169.	16900	17000	8.75
170.	17000	17100	8.75

(Source: DPR)

Pavement Details:

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

- Bituminous Concrete (BC): 30 mm
- Dense Bituminous Macadam (DBM): 70 mm

- Wet Mix Macadam (WMM): 250 mm
- Granular Sub-Base (GSB): 200 mm

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

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

Junctions Details:

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

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

S.No	Chainage	Type	Side	Direction	Type of Junction
	0+000	T	Start Point	NH-127B	Major
1.	0+700	Y	LHS	Forest	Minor
2.	0+900	T	LHS	Forest	Minor
3.	1+300	Y	RHS	Village	Minor
4.	1+400	T	RHS	Village	Minor
5.	1+700	T	RHS	Village	Minor
6.	1+900	T	RHS	Village	Minor
7.	2+300	+	-	Village	Minor
8.	2+400	T	LHS	Village	Minor
9.	2+600	Y	RHS	Village	Minor
10.	2+900	+	-	Village	Minor
11.	3+150	+	-	Village	Minor
12.	3+600	Y	LHS	Village	Minor
13.	3+800	+	-	Village	Minor
14.	4+500	T	LHS	Village	Minor
15.	4+750	Y	RHS	Village	Minor
16.	4+850	T	RHS	Village	Minor
17.	5+350	Y	RHS	Village	Minor
18.	5+600	Y	LHS	Village	Minor
19.	5+850	Y	LHS	Village	Minor
20.	6+000	Y	RHS	Village	Minor
21.	6+300	+	-	Williamnagar	Minor
22.	6+500	Y	RHS	Village	Minor
23.	6+540	Y	LHS	Village	Minor
24.	6+700	Y	RHS	Village	Minor
25.	7+000	+	-	Williamnagar	Minor
26.	7+300	+	-	Williamnagar	Minor
27.	7+600	T	LHS	Village	Minor
28.	7+700	T	LHS	Village	Minor

29.	8+000	T	RHS	Village	Minor
30.	8+250	T	LHS	Village	Minor
31.	8+450	T	RHS	Village	Minor
32.	9+600	T	RHS	Village	Minor
33.	9+900	Y	RHS	Village	Minor
34.	10+200	Y	RHS	Village	Minor
35.	10+450	T	RHS	Village	Minor
36.	11+020	Y	RHS	Village	Minor
37.	11+200	+	-	Village	Minor
38.	11+450	Y	LHS	Village	Minor
39.	12+350	Y	LHS	Village	Minor
40.	12+800	Y	RHS	Village	Minor
41.	13+900	Y	RHS	Village	Minor
42.	14+200	Y	LHS	Village	Minor
43.	15+300	Y	RHS	Village	Minor
44.	18+000	Y	RHS	Village	Minor
45.	19+500	Y	RHS	Village	Minor
46.	20+550	T	RHS	Village	Minor

(Source: DPR)

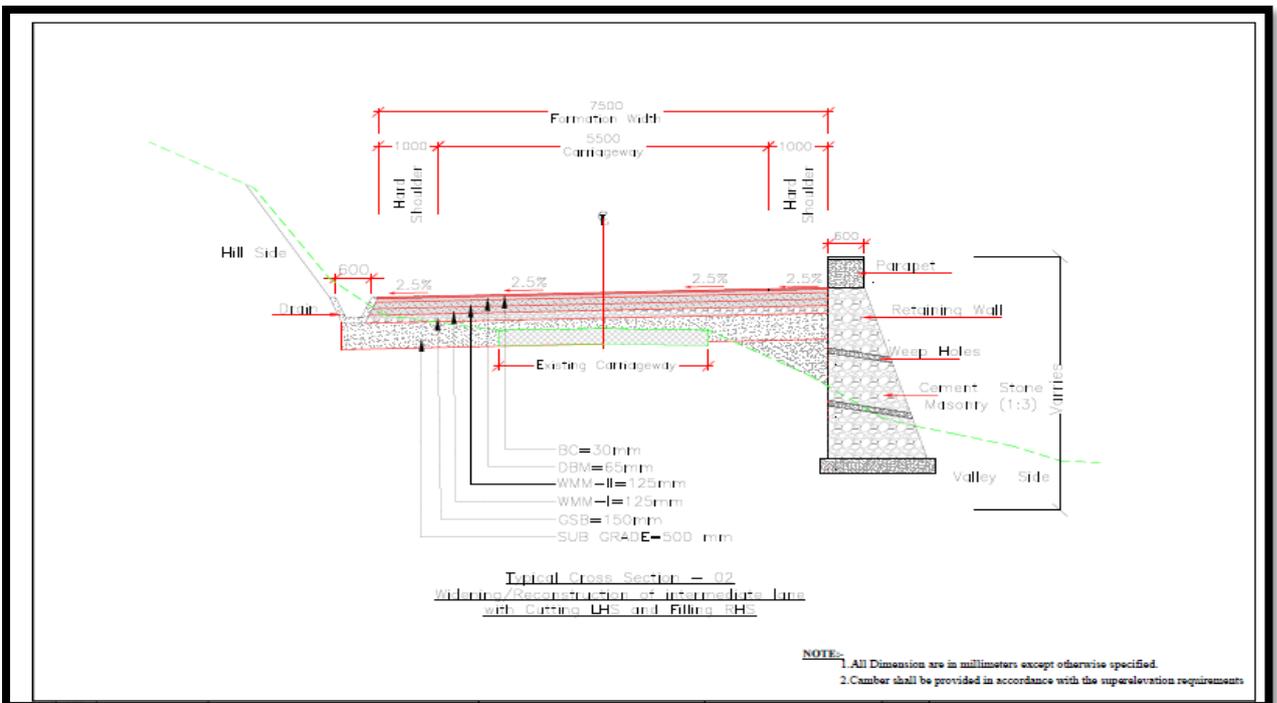
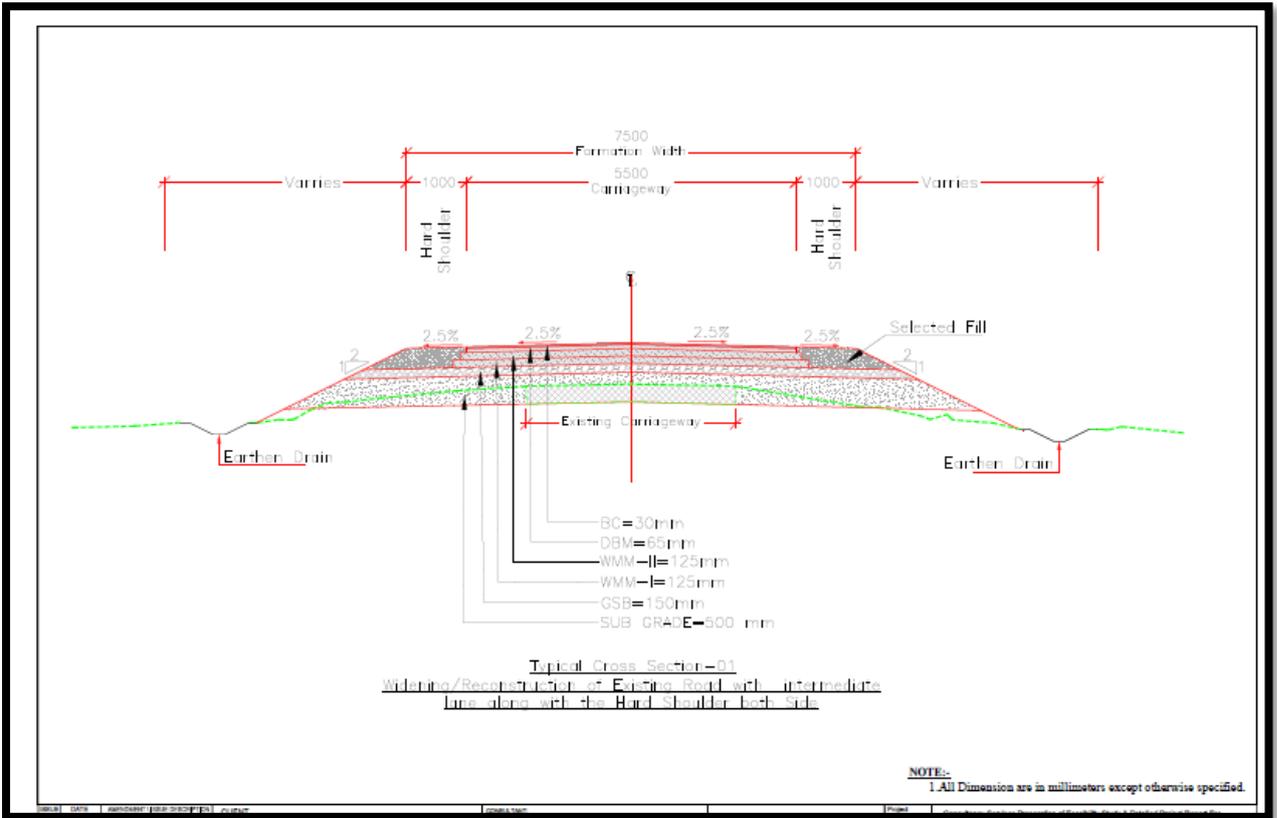
3.4.2 PROPOSED ROAD CROSS SECTIONS

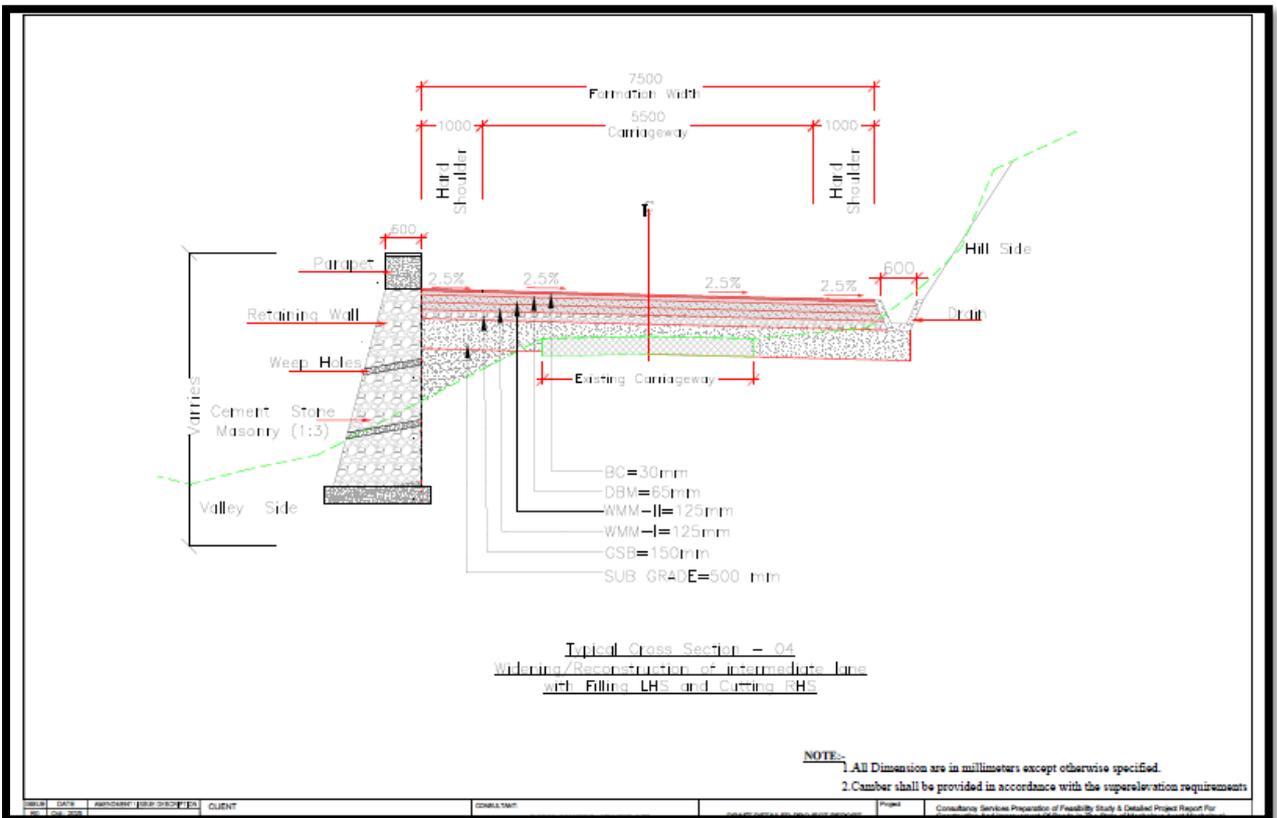
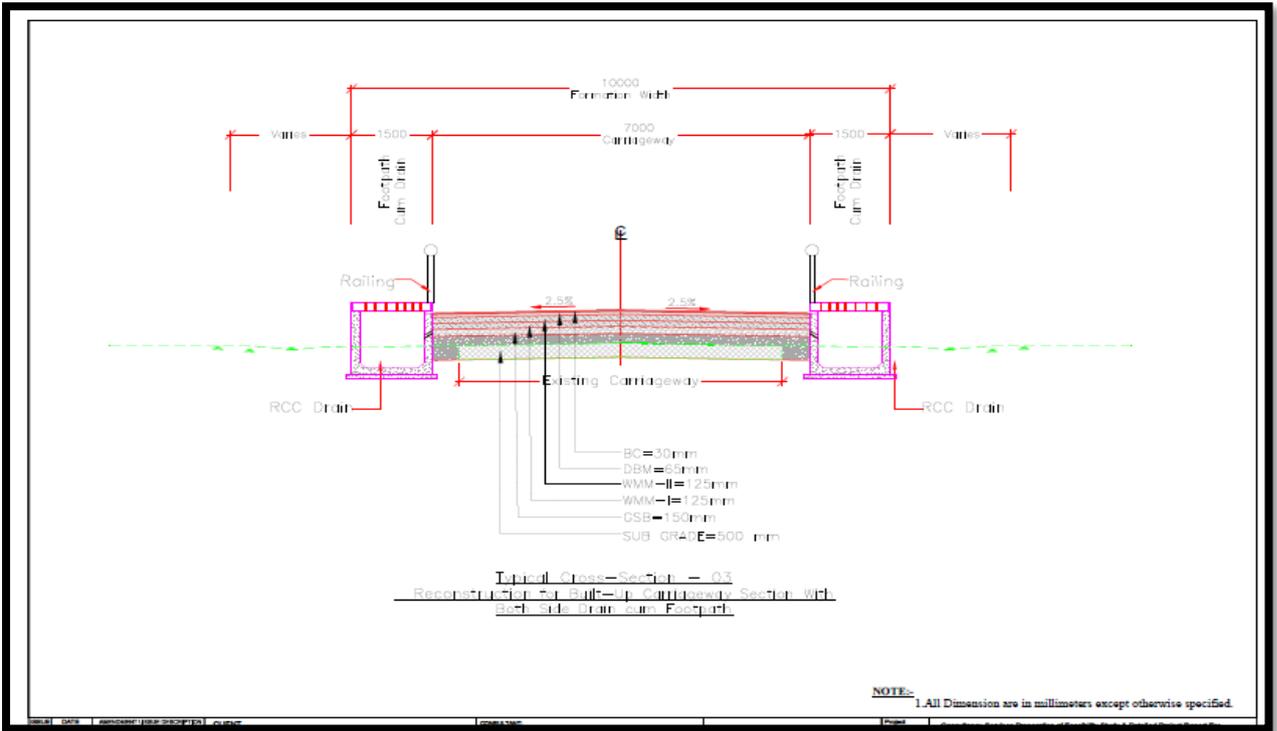
The Rongrenggre-Simsanggre-Nengkhra (RSN) Road traverses gently undulating to moderately rolling terrain with elevations ranging from 212 m to 561 m amsl. The alignment largely follows the natural ground profile, requiring only localized earthwork. Minor cutting is needed between at 6+900 where the road runs close to riverbanks and eroding slopes, necessitating bench cutting and slope protection such as gabion and retaining walls. Embankment raising is proposed at low-lying stretches CH 17+300 to CH 17+340 to prevent flooding and improve drainage. Overall, the Sub-Project requires moderate earthwork, with no major cutting, and incorporates suitable drainage and slope stabilization measures to ensure long-term stability and all-weather connectivity.

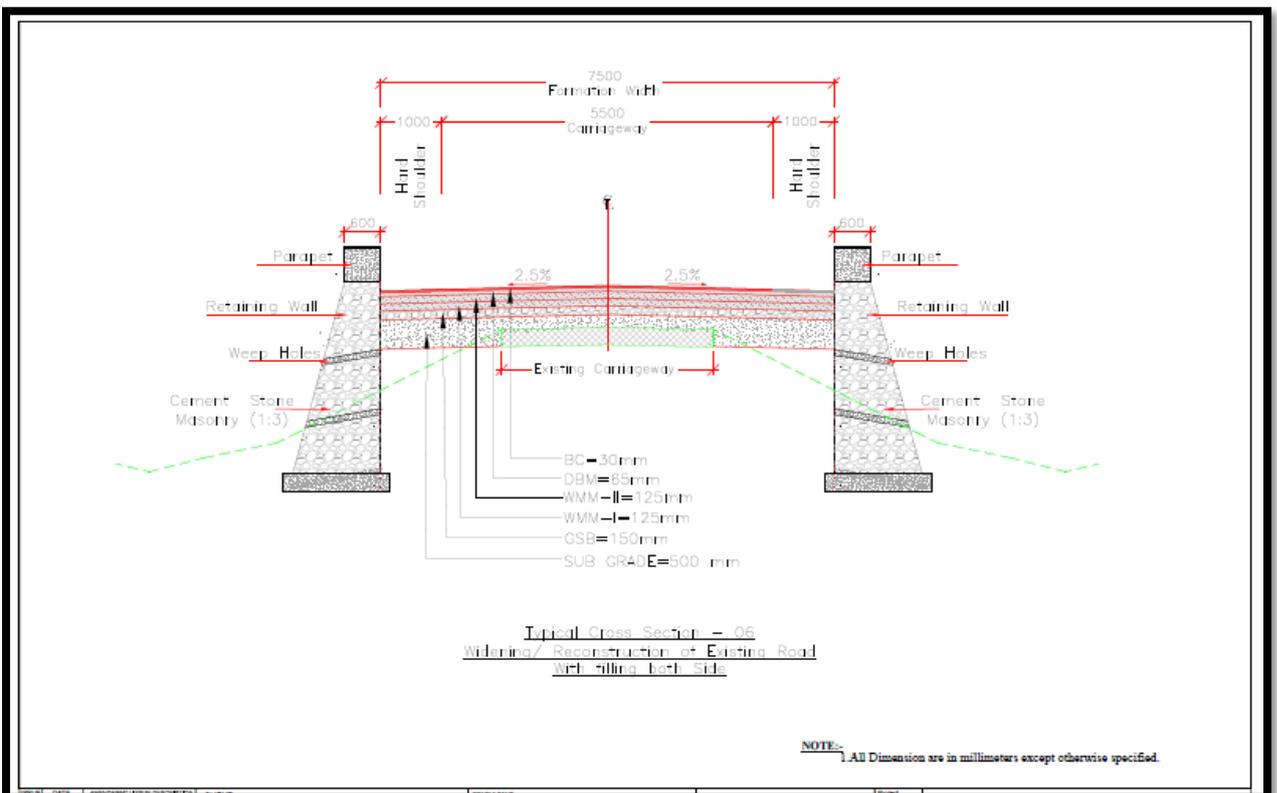
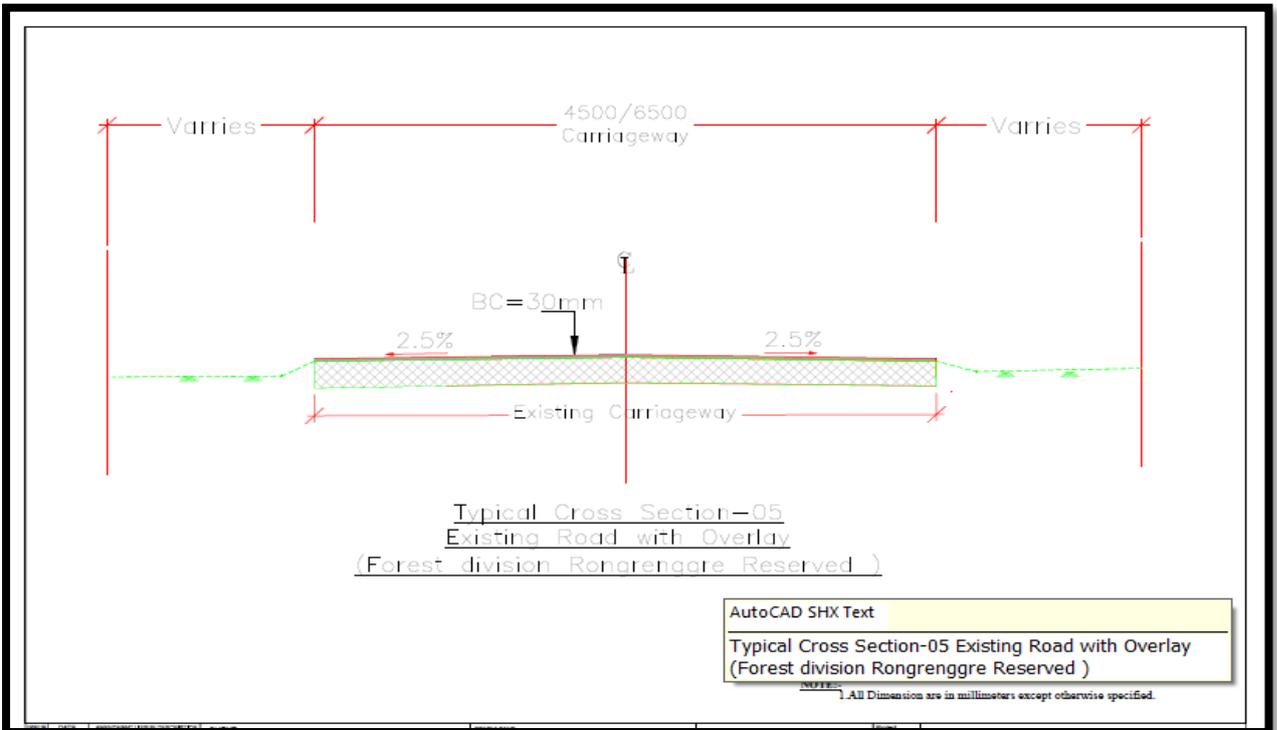
A total of Thirty Two Typical Cross-Sections (TCS) have been proposed in the DPR (**Annexure 3.1**) for the 22 km road stretch. These TCSs vary, with some sections incorporating intermediate lanes, and are specifically designed to address the terrain and infrastructure requirements of the corridor, including 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 seven different cross-sections, along with the chainage-wise designs adopted, are provided in **Annexure 3.1**. Design details are given in **Figure 3.5**.







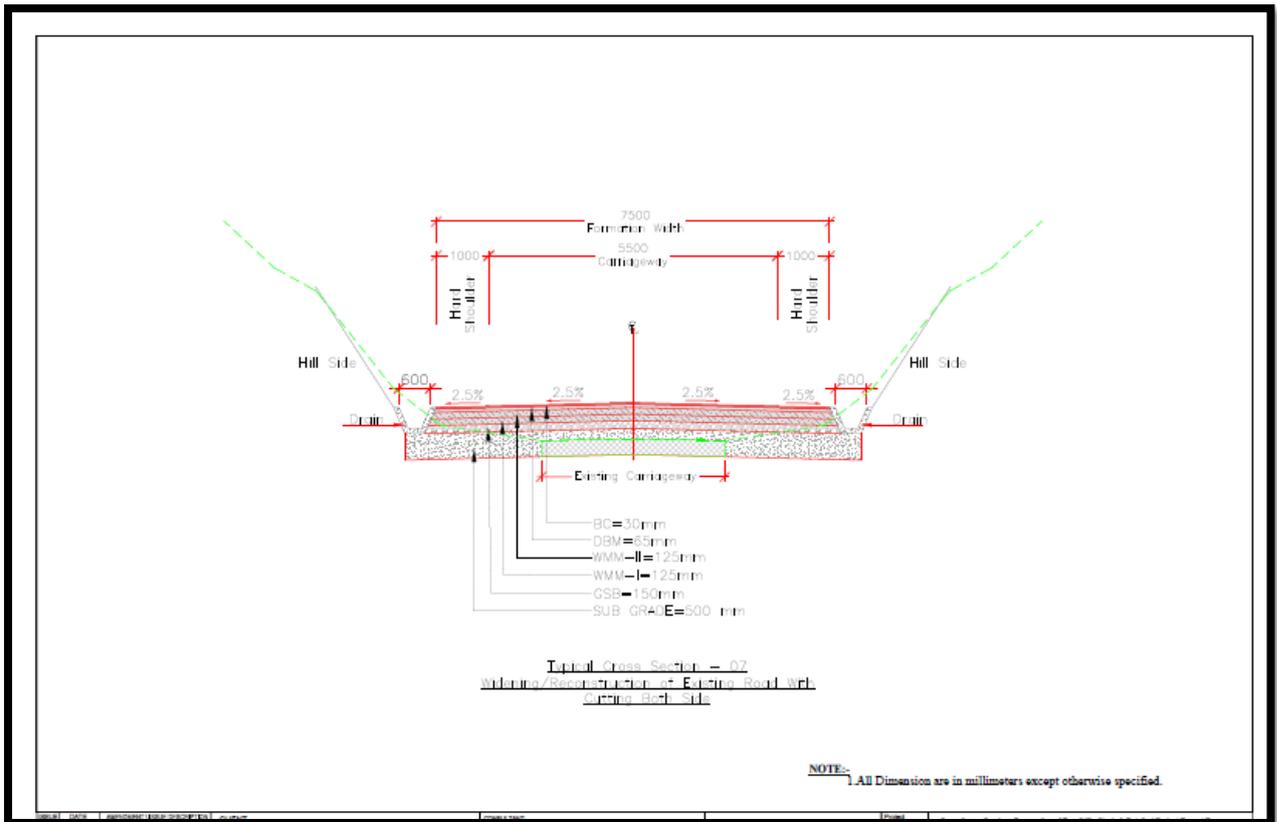


Figure 3.5: Typical Cross Sections

3.4.3 SETTLEMENTS AND SUB-PROJECT CHARACTERISTICS

3.4.3.1 Settlements:

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

Table 3.4: Chainage wise List of 14 Habitations/ 7 villages along the project road

Sl. No.	Chainage		Settlements
1.	0+000	1+000	Rongrengre
2.	1+000	2+000	pper Rongreng Baiza (Abagre)
3.	2+000	3+000	Lower Baiza
4.	3+000	4+000	Chidekgre
5.	4+000	6+000	Rangmal Badim
6.	6+000	9+000	Kusimkolgre
7.	9+000	10+000	TambuA'ding
8.	10+000	11+000	Ampangdamgre
9.	11+000	12+500	Dobetkolgre
10.	12+500	14+500	Dawa Nengjata
11.	14+500	17+000	Dawa Chipitgre
12.	17+000	19+000	Nengkra
13.	19+000	20+500	Chimagre
14.	20+500	22+000	Nengkra Bazar

3.4.3.2 Sub-Project Characteristics

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

Table 3.5: Current Salient features of the RSN Road

Sl. No.	Characteristics	Features
1	Name of Road	Improvement and Widening of Rongrenggre-Simsanggre-Nengkhra (RSN)
2	Project Road Length	22 km
3	District	East Garo Hills
4	Villages/settlements enroute	7 Villages
5	Terrain	Plain/Hilly/Rural
	Existing	<ul style="list-style-type: none"> The road is affected by various surface damages, including potholes, cracks, and other deterioration.
6	Proposed treatment	Intermediate/ configurations, with or without paved shoulders, where required.
7	Bridges	No. of Major Bridge: 0 No. of Minor Bridges – 23
8	Culverts	107
9	Forests / environmentally sensitive areas	<ul style="list-style-type: none"> Passes through reserve forest at chainage 0+000 to 6+200.
10	Religious Structures Affected	Nil
	Impacted Structures (including Temporary Structures)	40
11	Major CPR Impacted	No direct impact on CPR
12	Fifth/Sixth Scheduled Areas	Sixth Schedule Area
13	River crossings	Simsang river
14	Water bodies / ponds	Simsang river
15	Sensitive receptors	1 Church 4 School, 1 community hall, and 1 District Jail. (Chainage details are given in Table 4.22). There is no direct impact on any of these CPR.
16	Transshipment areas/truck parking locations	Nil
17	Other features / issues if any	Nil
18	Land Requirement	2.62 ha

3.4.4 TREES

The vegetation along the project road comprises a diverse mix of trees, shrubs, herbs, climbers, ferns, and grasses. Approximately 25 trees are likely to be impacted or require removal due to the proposed widening. Major trees impacted are Jackfruit, Arecanut, Bamboo, Banana, etc.

Table 3.6: Chainage wise list of Trees

S. No.	Chainage (km)	Common Name	Botanical Name	Girth at Breast Height (cm)	Approx. Height (m)	Remarks
1	0+200	Bamboo (Clump)	<i>Bambusa vulgaris</i>	22	7	Dense clump near roadside
2	0+950	Banana	<i>Musa paradisiaca</i>	30	3.5	Near residential area
3	1+400	Areca Palm	<i>Areca catechu</i>	35	8	Along farm boundary
4	2+100	Betel Nut Palm	<i>Areca catechu</i>	40	9	Clustered plantation
5	2+850	Jackfruit	<i>Artocarpus heterophyllus</i>	85	12	Mature fruit-bearing tree
6	3+600	Bamboo (Clump)	<i>Bambusa tulda</i>	90	10	Natural roadside growth
7	4+200	Coconut Palm	<i>Cocos nucifera</i>	70	10	Near habitation zone
8	5+000	Guava	<i>Psidium guajava</i>	45	6	Homestead planting
9	5+650	Neem	<i>Azadirachta indica</i>	80	10	Near community area
10	6+200	Banana	<i>Musa paradisiaca</i>	35	4	Scattered plantation
11	7+100	Areca Palm	<i>Areca catechu</i>	55	9	Economically important tree
12	8+000	Bamboo (Clump)	<i>Bambusa vulgaris</i>	105	9	Common along field edge
13	8+900	Banana	<i>Musa paradisiaca</i>	55	5	Small plantation
14	9+400	Areca Palm	<i>Areca catechu</i>	30	7	Clustered planting
15	10+200	Banana	<i>Musa paradisiaca</i>	25	3	Scattered plantation
16	11+000	Bamboo (Clump)	<i>Bambusa tulda</i>	28	9	Natural roadside growth
17	12+300	Jackfruit	<i>Artocarpus heterophyllus</i>	95	13	Mature tree near habitation
18	13+050	Coconut	<i>Cocos nucifera</i>	75	10	Near community area
19	14+300	Areca Palm	<i>Areca catechu</i>	33	7	Part of farm boundary
20	15+400	Lemon	<i>Citrus limon</i>	25	4	Homestead planting
21	15+900	Betel Nut Palm	<i>Areca catechu</i>	38	9	Mixed plantation
22	17+250	Banana	<i>Musa paradisiaca</i>	30	3.5	Small cluster
23	18+500	Bamboo (Clump)	<i>Bambusa vulgaris</i>	80	12	Moderate-sized clump

24	20+500	Bamboo (Clump)	<i>Bambusa vulgaris</i>	25	7	Mixed with shrubs
25	21+750	Guava	<i>Psidium guajava</i>	40	5	Common household tree

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 Sub-Project in East Garo Hills, Meghalaya, faces significant challenges due to its rugged terrain characterized by high hills and deep valleys. The topographic profile of the Rongrenggre–Simsanggre–Nengkhra (RSN) Road reveals a gently undulating to moderately rolling landscape, with elevations ranging from 212 m to 561 m above mean sea level (amsl). The alignment passes through a series of low hillocks and intervening valleys typical of the Meghalaya Plateau. Along the 22 km stretch, three prominent elevation peaks and two depressions are observed, indicating alternating cut-and-fill sections. The highest elevations occur near the mid and terminal portions of the corridor, while the lowest points coincide with valley sections characterized by seasonal drainages and stream crossings.

These topographic variations suggest moderate earthwork requirements, especially in areas with steeper gradients. The general slope direction follows the natural drainage pattern toward adjacent valleys, underscoring the need for effective drainage and slope protection systems. Given the district’s susceptibility to landslides and the complex terrain, slope stabilization measures are essential to ensure the safety and resilience of the corridor. The sub-project, therefore, proposes appropriate geotechnical interventions to stabilize both hillside cut slopes and valley-side embankments.

Location wise slope protection works proposed along with project is given in **Table 3.7** below.

Table 3.7: Slope protection works

Chainage	Side	Existing angle (°)	Height of cut / fill (m) (assumed)	Modified angle of repose (°)	Proposed slope protection / notes
6+900	Both / Minor bridge	35.0	3.00	26.57	Localised slope/erosion protection: stone pitching at toe & wingwalls; riprap apron around abutments; short gabion mattress; lined approach drains; vegetative turfing (vetiver) on exposed faces; provide toe trench and subsoil drain to prevent undermining.
12+850–12+900	LHS / RHS (landslide stretch)	35.0	5.00	26.57	Landslide treatment plan (critical stretch): retaining / breast walls and large gabion structures at toe; stone pitching on slope faces; bamboo crib walls in shallow soils; vegetative turfing + deep-rooted shrubs/grasses; subsurface (French) drains and surface cut-off drains; slope benching and geogrid reinforcement where fills/repairs required; monitoring points/inclinometer.
12+900–12+980	Transitional slope	35.0	4.00	26.57	Gabions/stone pitching at toe; intermediate benching; erosion control blanket until vegetation establishes; subsoil drain at bench; check bunds for runoff.

16+500– 16+600	LHS / RHS	35.0	3.00	26.57	Default protection: stone pitching / gabion toe protection; coir logs temporarily; slope regrading to 1V:2H; geotextile filter under rockfill; outlet energy dissipation for drains.
17+300– 17+340	RHS	35.0	2.50	26.57	Raised profile / fill: use tested surplus excavated material in layers (150–300 mm) compaction ≥95% SP; provide filter + geogrid layers where slope exceeds 1V:2H; reinforced toe (gabion / small retaining wall); slope vegetative cover; subsoil drains to relieve seepage.

(Source: DPR)

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 borrows area, disposal sites.
- Operation of vehicles and safety of road users

3.6 RESOURCE REQUIREMENTS

The district of East Garo Hills has come into existence in the year 2012 only. Details of construction material required for this project, their Source and Lead are given in **Table 3.8 & 3.9**.

Table 3.8: Source and Lead of Construction Materials

S.No	Item	Unit	Quantity (for 22 km)
1	PCC M-15	Cum	7,403
2	RCC M-25	Cum	1,114
3	RCC M-30	Cum	279
4	RCC M-35	Cum	1,601
5	RCC M-40	Cum	499
6	RCC M-45	Cum	248
7	RCC M-50	Cum	357
8	TMT Bars	Mt	312
9	HT Strands	Mt	18
10	Cement	Mt	3,270
11	Bitumen	Mt	1,715
12	Emulsion	Mt	134
13	Water	Liter	38,319,900
14	Labour	No	10,161
15	Mate	No	422

(Source: DPR)

Table 3.9: Source and Lead of Construction Materials

S. No.	Item	Unit	Quarry Name	Total Lead up to Plant (Km)
1	Sand	cum	Kusimkolgre,Sand Quarry Sand Quarry13, (Ampangdamgre)	Sand quarry at 1.50 km away from 6th and 11th km of Rongrenggre-Simsanggre-Nengkhra (RSN) road
2	Stone	cum	Stone and Blindage Quarry 4 (Rongkem, Samanda)	Stone quarry at 1 km away from 146th km of NH-127B at Rongkhem

(Source: DPR)

Assessing the availability of suitable construction materials near the project road is crucial for a road project. Surface water from the Simsang river can be used for road construction with prior permission from Water Resources Department, East Garo Hills District, Meghalaya as per Meghalaya water Act 2011.

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 93293.15 m³, and the cut quantity is 248054.7m³. After balancing cut and fill requirements, there remains a surplus of approximately 154761.55 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

2.62 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 2.62 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 3.10**.

Table 3.10: Land Requirement Details

Rongrenggre-Simsanggre-Nengkhra (RSN) Road						
S.N	Chainages		Area (In Sq. Mtr.)		Road width (Dimension in mtr.) PROW	Remarks
	From	To	LHS	RHS		
1	0	6200	0	0	10	
2	6200	6400	0	700.412	10	
3	6400	6600	0	516.273	10	
4	6600	6800	0	532.054	10	
5	6800	7000	0	169.418	10	
6	7000	7200	0	408.895	10	
7	7200	7400	0	504.556	10	

8	7400	7600	0	622.211	10	
9	7600	7800	0	541.445	10	
10	7800	8000	0	1057.753	10	
11	8000	8200	17.69	17.329	10	
12	8200	8400	87.962	0	10	
13	8400	8600	19.944	74.65	10	
14	8600	8800	83.182	194.168	10	
15	8800	9000	12.56	64.824	10	
16	9000	9200	15.663	135.938	10	
17	9200	9400	402.477	0	10	
18	9400	9600	1.984	74.252	10	At Ch-9+500 is Drain
19	9600	9800	0	224.162	10	
20	9800	10000	57.77	3.376	10	
21	10000	10200	8.486	0	10	
22	10200	10400	157.616	0	10	At Ch-10+350 is Drain
23	10400	10600	156.876	0	10	
24	10600	10800	48.994	0	10	
25	10800	11000	12.236	0	10	
26	11000	11200	207.352	0	10	
27	11200	11400	95.782	0	10	
28	11400	11600	98.529	0	10	
29	11600	11800	24.268	30.54	10	
30	11800	12000	0	807.805	10	At Ch-11+800 is Drain
31	12000	12200	0	456.947	10	
32	12200	12400	0.078	82.092	10	
33	12400	12600	0	0.078	10	
34	12600	12800	114.176	0	10	
35	12800	13000	253.376	0	10	
36	13000	13200	130.701	0	10	
37	13200	13400	178.201	0	10	
38	13400	13600	153.853	12.016	10	At Ch-13+580 is Drain
39	13600	13800	27.578	70.456	10	
40	13800	14000	63.491	0	10	
41	14000	14200	252.011	42.006	10	
42	14200	14400	227.471	120.894	10	
43	14400	14600	563.607	68.661	10	
44	14600	14800	404.697	54.15	10	
45	14800	15000	377.505	104.655	10	
46	15000	15200	393.003	0	10	
47	15200	15400	289.23	1.253	10	
48	15400	15600	250.64	0	10	
49	15600	15800	461.978	0	10	
50	15800	16000	530.737	0	10	

51	16000	16200	1156.85	0	10	
52	16200	16400	985.141	0	10	
53	16400	16600	467.375	26.956	10	
54	16600	16800	61.6	297.374	10	
55	16800	17000	38.329	310.062	10	
56	17000	17200	210.433	155.158	10	
57	17200	17400	284.186	48.938	10	
58	17400	17600	81.71	294.899	10	
59	17600	17800	52.448	555.528	10	
60	17800	18000	104.063	192.253	10	
61	18000	18200	75.067	240.771	10	
62	18200	18400	475.129	50.079	10	
63	18400	18600	557.466	421.556	10	
64	18600	18800	528.653	62.199	10	
65	18800	19000	455.474	180.295	10	
66	19000	19200	431.644	29.957	10	
67	19200	19400	318.703	104.238	10	
68	19400	19600	234.938	294.421	10	
69	19600	19800	223.727	434.858	10	
70	19800	20000	203.576	243.095	10	
71	20000	20200	342.667	151.214	10	
72	20200	20400	447.874	0.067	10	
73	20400	20572	507.815	1.051	10	
Total Area in Sq Mtr.			14426.572	11788.238		
Area in Hectare			1.4426572	1.1788238		2.621481

Source: DPR Consultant

3.8 WATER REQUIREMENTS

The overall water requirement of the project is 31.5 KLD; of which 29.5KLD will be used for construction activities and 2 KLD is required for domestic purposes. Source of water is Simsang river. Details of Water requirement is given in Table 3.11.

Table 3.11: Water Requirement for Construction Works

Activity	Daily Demand (Liters/km)	Total for 22 km (Liters/day)	Remarks
Permanent Works	400 – 500	9900	Concrete mixing, compaction, culverts, drains.
Dust Suppression at Work Zone	150 – 250	4400	Reduced further due to frequent rain; apply only on dry days.
Curing	150 – 250	4400	Rainfall may assist, but controlled curing still needed.

Laboratory	Fixed	500	Centralized testing facility.
Haul Roads	150 – 2800	4000	Spraying reduced due to minimized erosion risk.
Crusher	Fixed	4350	For aggregate washing and dust control.
Plant Cleaning & Workshop Washing	Fixed	2000	Includes batching plant and machinery.
Domestic Purpose	Fixed	2000	For 35–50 workers (drinking, cooking, sanitation).
Total		31,550	

(Source: DPR)

3.9 PROJECT COST

The total estimated cost of the project is approximately 184.62 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 accommodated in the construction camp for accommodation purposes. On an average the crew in the construction camp at a time is likely to be around 15 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.

4. BASELINE ENVIRONMENT

4.1 GENERAL

This chapter presents the existing environmental and social conditions of the RSN 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 from 24–26°C, while minimum temperatures can drop to 10–12°C. Summer starts in March, with July and August typically being the hottest months. During summer, maximum temperatures range between 30–33°C, and minimum temperatures are around 22–24°C. The monthly mean maximum and minimum temperatures for the nearest location, Shillong, as recorded by the India Meteorological Department (IMD), are presented in **Table 4.1**.

Table 4.1: Monthly Mean Maximum and Minimum Temperature

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

Source: Climatological Table, 2020

Temperature Projection and Implications for RSN Road

According to the Meghalaya State Action Plan on Climate Change (SAPCC, 2022), the Garo Hills region including the East 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 Rongrenggre-Simsanggre-Nengkhra (RSN) 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 experiences a subtropical monsoon climate with high humidity throughout the year. Pre-monsoon showers occur during April and May, often accompanied by thunderstorms and occasional hailstorms, followed by a brief dry spell. The southwest monsoon typically begins in late May or early June, with peak rainfall occurring between June and August. The hilly terrain, particularly in the southern and central parts of the district, receives the heaviest rainfall, which contributes to slope instability and increases the risk of landslides along the road corridor. The average annual rainfall during 2018-2020 is presented in **Table 4.2**, while **Table 4.3** provides the month-wise relative humidity for the year 2020 (nearest location: Shillong, IMD data).

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

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

Source: Customized Rainfall Information System, Hydromet Division, IMD

Table 4.3: Month-wise Relative Humidity

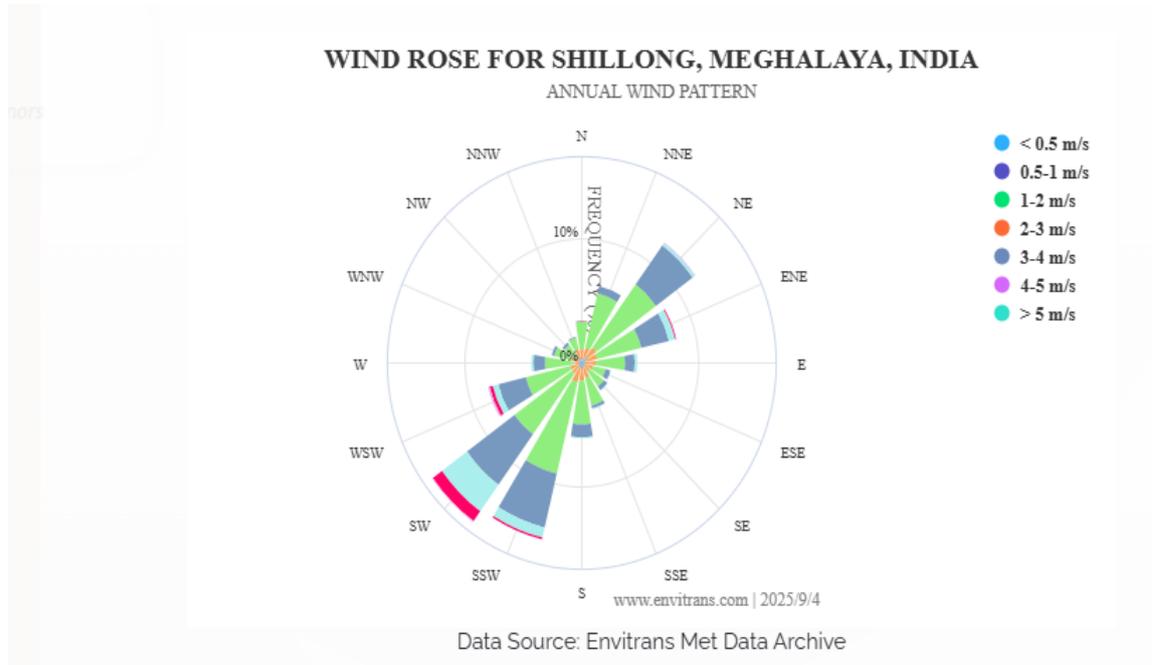
Month	08.30 Hrs	17.30 Hrs
January	88	75
February	85	70
March	80	65
April	82	73
May	87	78
June	93	90
July	92	88
August	90	85
September	88	82
October	85	78
November	83	73
December	87	75

Rainfall Projection and Implications for RSN Road

The Meghalaya State Action Plan on Climate Change (SAPCC, 2022) indicates that the Garo Hills region, including 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 Rongrenggre-Simsanggre-Nengkhra (RSN) Road corridor, particularly in low-lying and hilly sections. To address these risks, the project should incorporate enhanced cross-drainage capacity, lined roadside drains, bioengineering for slope protection, and rainwater outlet management to reduce erosion and flooding. The design must also ensure maintenance-friendly drainage infrastructure capable of handling increased peak flow intensities projected for the mid-century climate scenario.

4.2.4 WIND SPEED AND DIRECTION

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



Source: Envitrans

Figure 4.1: Wind rose Diagram

4.3 LAND ENVIRONMENT

4.3.1 PHYSIOGRAPHY AND ELEVATION

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 transboundary 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 metres 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 landscape².

As per elevation map of East Garo Hills District, the RSN project road stretch lies in the range of 200-561 m. The Sub-Project wise elevation map of the project stretch is given in **Figure 4.2**.

² District Census Handbook, East Garo Hills

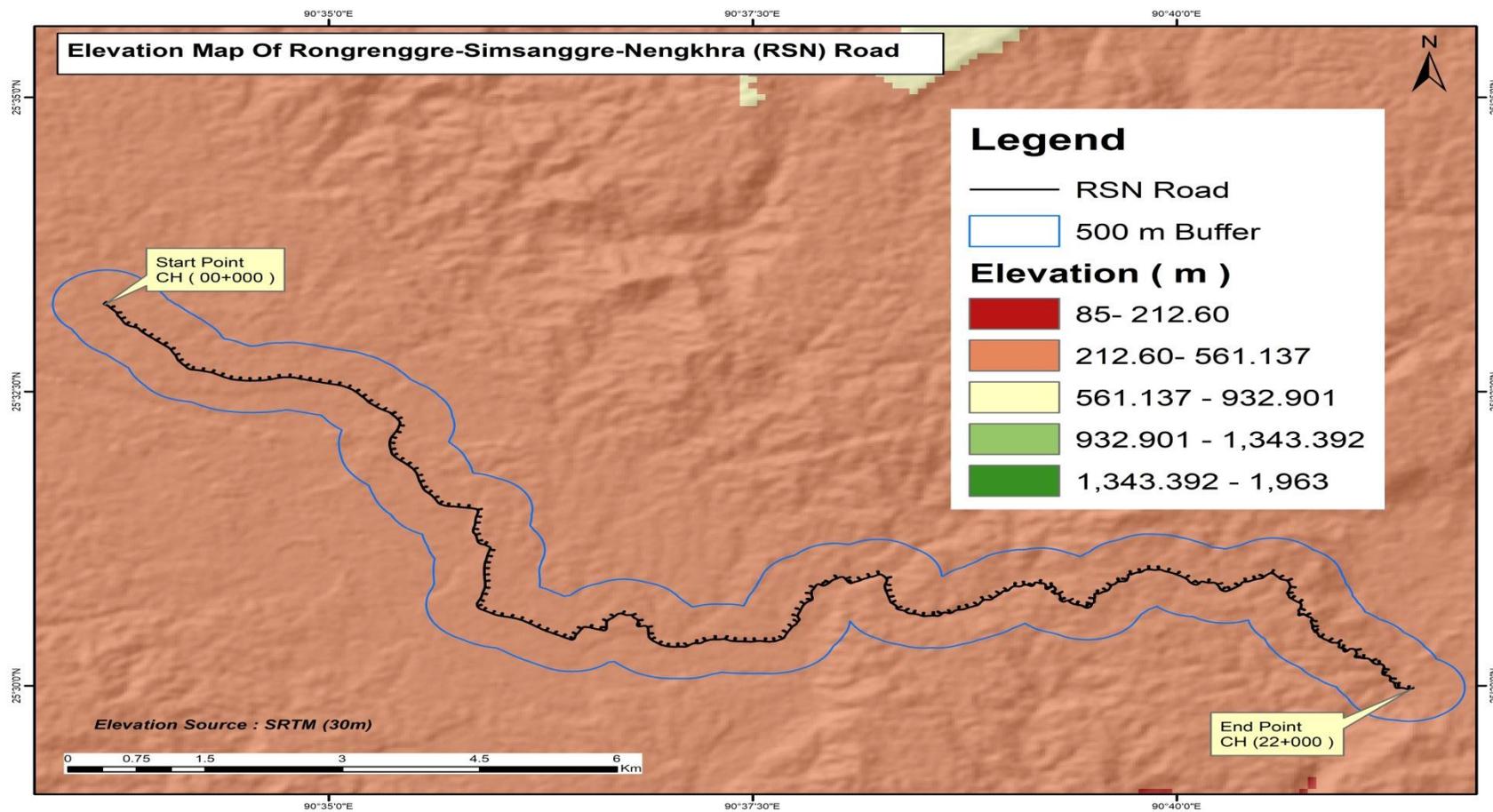


Figure 4.2: Elevation map of the RSN project area (Elevation Source: SRTM (30m))

4.3.2 GEOLOGY

Baseline Scenario for Sub- Project Road

- **Precambrian Basement:** Granite gneiss, schist, quartzite forming the core hilly terrain.
- **Gondwana Rocks:** Found in Rongrenggre–Williamnagar–Songsak areas; mainly sandstone, shale, and coal seams.
- **Tertiary Sediments:** Garo Group (sandstone, siltstone, shale, carbonaceous shale, coal), important for coal deposits.
- **Alluvium:** Present in lower valleys and floodplains of Simsang River.
- **Economic Geology:** Coal mining is significant (Rongrenggre–Nangalbibra–Darugiri belt). Small occurrences of limestone and clay also reported.

Structural Features

- The region is part of the **Shillong Plateau uplift**, bounded by the **Dauki Fault** in the south.
- The terrain is dissected by faults and joints, giving rise to rugged topography.

Major rivers (Dudnai, Krishnai, Simsang, etc.) follow structurally controlled valleys

Hydrogeology

Crystalline rocks: Yield limited groundwater through fractures and weathered zones.

- **Coal-bearing sandstones:** Moderate aquifers.
- **Alluvium:** Good potential for shallow tube wells in foothill plains.

Site Specific Geology

- The RSN Road site in East Garo Hills is underlain predominantly by weathered and lateritic residual soils developed on a basement of Precambrian/early Paleozoic crystalline rocks. The near-surface profile typically consists of an upper zone of lateritic crust and ferruginous gravel (variable thickness), underlain by a clayey to silty lateritic horizon grading into saprolite and intensely weathered bedrock. The competent substratum is formed by fractured and jointed Shillong Group / Garo Hills metamorphic units (schists, phyllites and meta-sediments) and subordinate intrusive lithologies; fresh rock is generally encountered at moderate depths dependent on local slope and erosion exposure. Structural features important for the site include closely spaced joints, shear zones and occasional small-scale faults that control groundwater seepage and preferential weathering; slope angles along the roadside and cut slopes are locally steep and are underlain by colluvial deposits and slope wash. Groundwater is usually shallow in weathered horizons and perched within discontinuous clay lenses; surface drainage follows small seasonal streams and roadside channels and is prone to rapid runoff during monsoon. Geohazards to note are slope instability during heavy rainfall (shallow translational slides and raveling of lateritic caps), erosion of roadside cuttings, and differential settlement where thick saprolite or compressible clay layers occur beneath fills.
- For design and construction: confirm the thickness of laterite/saprolite and the depth to fresh rock by boreholes and standard penetration (SPT) / CPT testing at representative locations; map joint orientations and shear zones during site logging; evaluate seasonal groundwater levels and infiltration; and apply slope stabilization (benching, retaining walls, drainage channels and

revegetation) and suitable foundation options (strip footings on treated laterite, raft foundations, or pile support where deep weathering is present) based on the geotechnical findings.

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

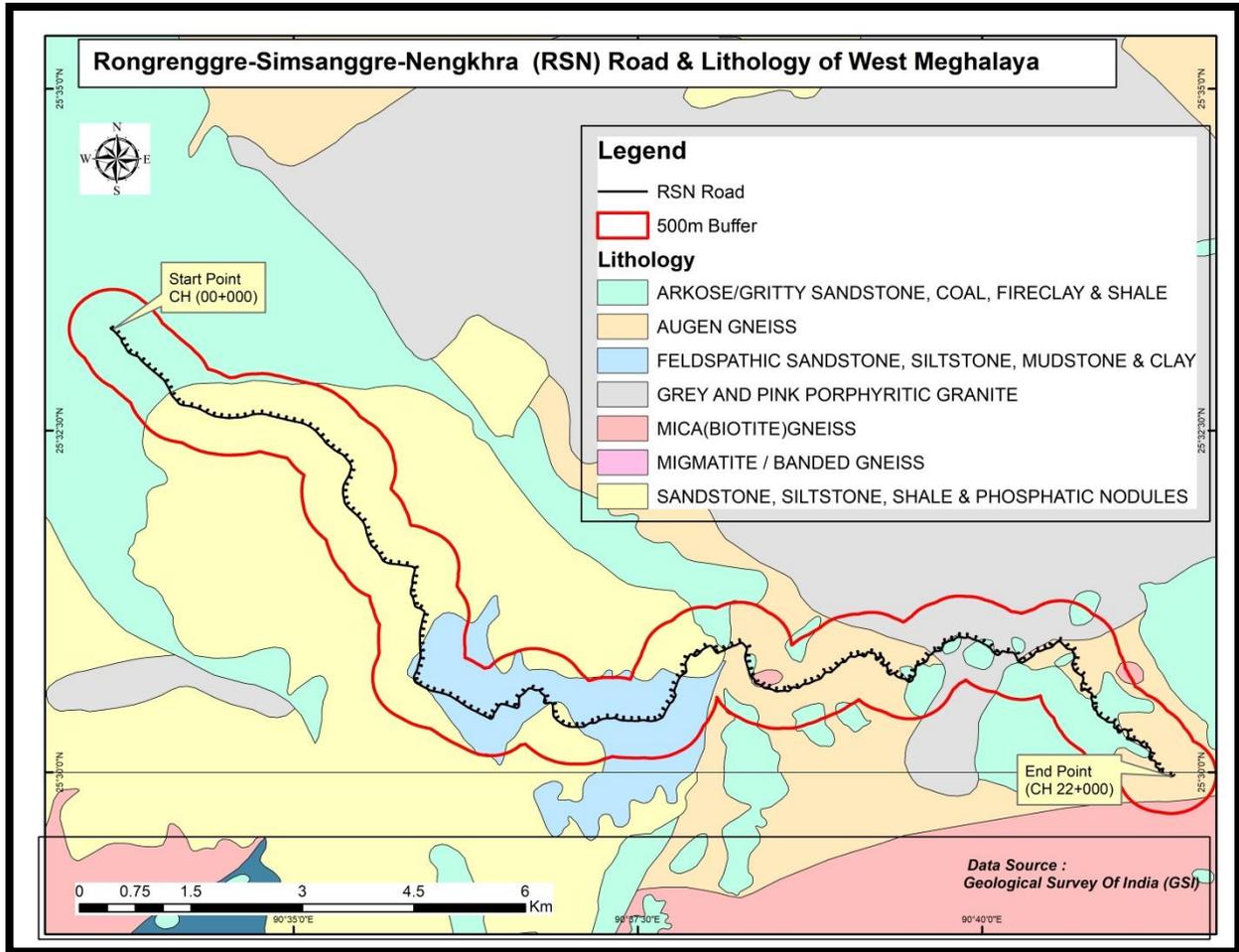


Figure 4.3: Local geology of the road stretch of Sub-Project 1

4.3.3 GEO-MORPHOLOGY AND SOILS

Soils along the project road vary according to the terrain. Lateritic soils, predominant in the northern parts of the district, are characterized by their reddish-brown color, high iron content, and moderate fertility. Red-loamy soils, found mainly in Rongjeng and Songsak areas, are moderately fertile and suitable for cultivating maize, millets, and various horticultural crops. Red and yellow soils, commonly occurring in Samanda and Williamnagar, are acidic in nature with pH values ranging from 4.9 to 5.6. These soils possess moderate organic matter content but are generally deficient in phosphorus and potash.

Given the terrain and soil characteristics, the RSN 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 stability³.

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

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

Major Soil Class	Total Area (ha)	0–3% Slope (ha)	3–8% Slope (ha)	8–25% Slope (ha)	>25% Slope (ha)
Fine Loam	1,38,916	20,070	94,033	53,717	—

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

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

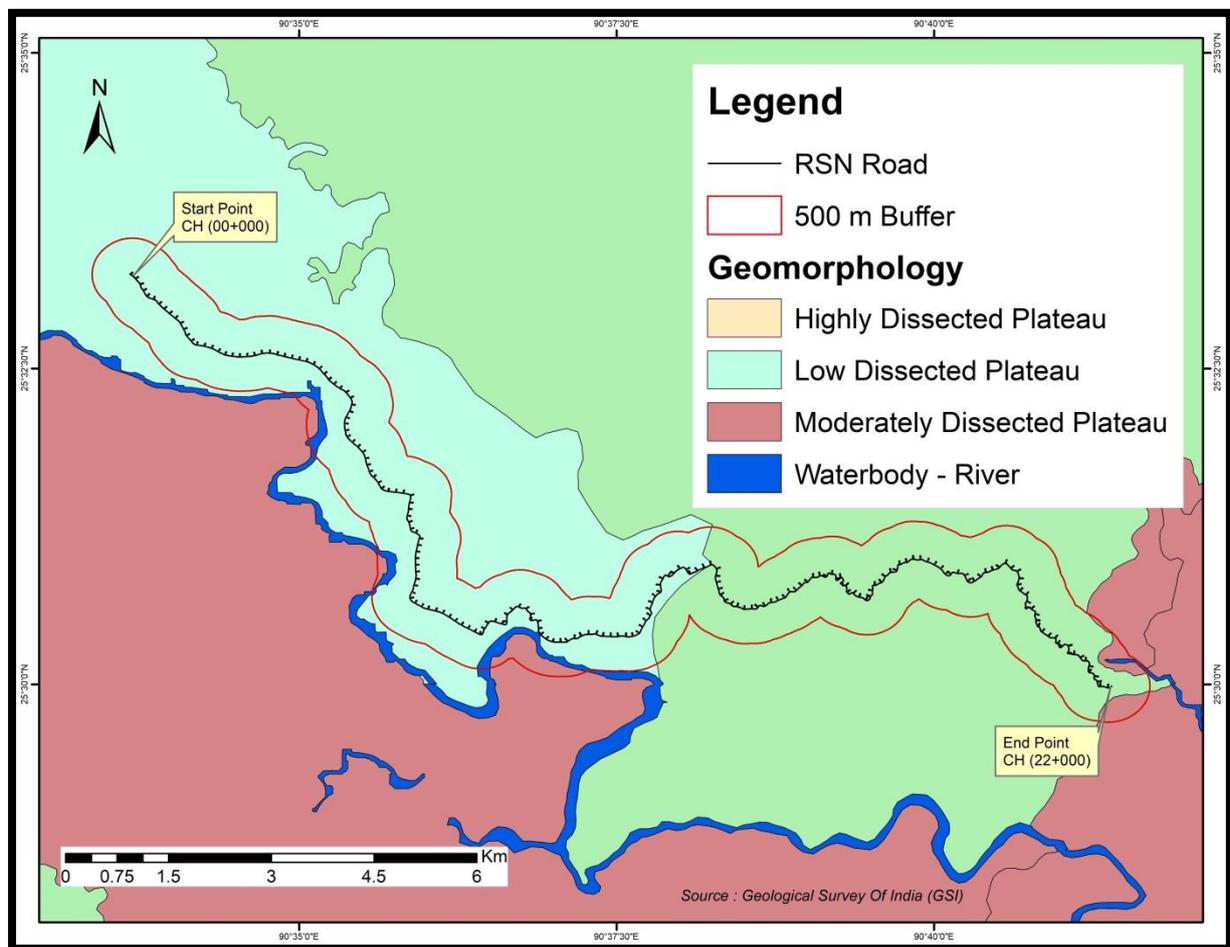


Figure 4.4: Geomorphological map of East Garo Hills district

4.3.4 SOIL QUALITY

The soils of East Garo Hills are predominantly red loamy to sandy loam in texture, 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

⁴DYNAMIC GROUND WATER RESOURCES OF MEGHALAYA, 2024

The soil quality of East Garo Hills, including the Rongrenggre-Simsanggre-Nengkhra (RSN) Road corridor, is generally lateritic to sandy loam well-drained and moderately acidic (pH 5.65–6.55), which is typical for the region's high rainfall conditions. Organic matter levels are moderately high, reflecting good natural leaf-litter enrichment. Major nutrients (N & P) are moderate, whereas Potassium is slightly low due to natural leaching. No heavy metal contamination is observed, indicating the soil is suitable for plantation and greenbelt development. (Source: National Bureau of Soil Survey and Land Use Planning (NBSS&LUP), ICAR – *Soil Series of Meghalaya (NBSS Publication No. 141, 2017)*)

Soil monitoring was conducted at 04 Locations in the month of October. Details of the soil sampling locations are presented in Table 1 & figure 1 of Annexure 4.5. 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 4.5. The soil quality at both sampling locations (SQ1, SQ2, SQ3 and SQ4) indicates sandy loam texture with good organic matter content (≈ 3.18 – 4.69%), mildly acidic pH (≈ 5.65 – 6.55), and moderate levels of primary nutrients (N, P, K). Heavy metal concentrations are low and within normal background levels, indicating no contamination concerns.

4.4 WATER ENVIRONMENT

4.4.1 HYDROGEOLOGY OF EAST GARO HILLS DISTRICT

The hydrogeology of the district is controlled by its geological setting, rainfall distribution, and groundwater movement through primary and secondary porosities such as joints, fissures, and faults. Groundwater occurs in three main hydrogeological units: consolidated, semi-consolidated, and unconsolidated formations.

Consolidated Formation

- **Geology:** Crystalline Archaean Granites and Gneissic Complex, occupying ~ 2460 km² in the northern district.
- **Characteristics:** These oldest rocks form the basement for semi-consolidated and unconsolidated deposits. Subjected to faulting and fracturing, creating structural features like joints and fissures.
- **Groundwater Occurrence:** Limited; primarily in **topographic lows, valleys, and weathered zones**. Water occurs under **unconfined** and **semi-confined conditions** in interconnected fractures.
- **Overburden Thickness:** 20–30 m in depressions; thinner in hilly areas.
- **Depth to Water Level:** 1–5 m.
- **Yield Potential:** Moderate, ranging from 5–15 m³/hr, depending on topography.

Semi-consolidated Formation

- **Geology:** Jaintia Group of rocks (Eocene age), covering ~ 26 km². Alternating beds of shale and sandstone.
- **Groundwater Occurrence:** Under **unconfined to semi-confined conditions**, through both **primary porosity** and **secondary fractures/joints**.
- **Depth to Water Level:** 1–4 m.
- **Yield Potential:** Up to 50 m³/hr, depending on topographic settings.

Unconsolidated Formation

- **Geology:** Gravels, sand, silt, and clay deposits along northern river valleys (Didak, Manda, Damring,

Didram, Rongtak, Kharkutta), covering ~118 km².

- **Groundwater Occurrence:** Phreatic (unconfined) conditions in valleys.
- **Thickness:** Highly variable, controlled by basement topography.
- **Yield Potential:** Above 50 m³/hr, depending on topography.

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

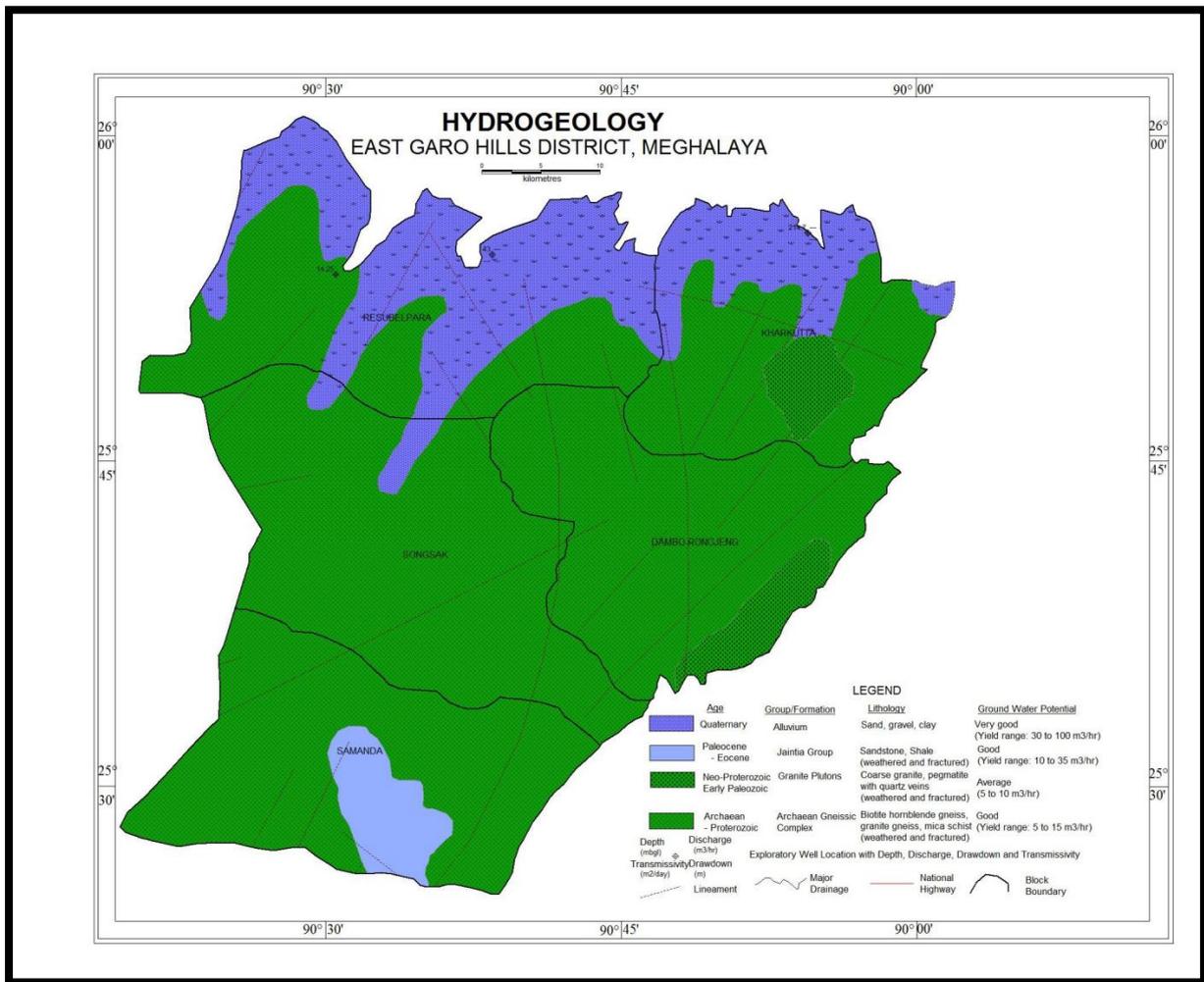


Figure 4.5: Hydrogeological map of East Garo Hills district (Source: CGW, 2020)

Water bodies in the RSN project area of 22 kms stretch are mainly Simsang river was observed during the field study. Several small perennial and seasonal streams intersect or run adjacent to the Rongrenggre-Simsanggre-Nengkhra (RSN) Road Sub-Project in 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 water quality status (WQS) of surface water in East Garo Hills is excellent, as revealed by a study conducted by MSPCB. The analysis of 13 environmental water variables showed that the WQS was better in the midstream and downstream sites compared to the upstream sites across all seasons, except during the monsoon. According to secondary data, pH of the surface water ranges from 6.5 to 7.8 which results alkaline in nature. Surface water quality in general in the Sub-Project complies with CPCB surface water quality standards of classification norms for Class C-Drinking water source after conventional treatment and disinfection.

04 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 Table 3 Figure 2 of Annexure 4.5. Results of the Surface water quality are shown in Table 4 of Annexure 4.5.

The water quality at monitoring locations meets IS:2296 Class-C standards, with good pH values in the surface water samples were observed in the range of 6.7 to 7.6, indicating neutral to slightly alkaline nature. Dissolved Oxygen (DO) levels were found between 7.2 to 7.7 mg/L, showing adequate oxygen availability. The Biochemical Oxygen Demand (BOD) remained low, ranging from 5.1 to 5.6 mg/L, reflecting low organic pollution. Nitrate concentration was recorded between 2.3 to 3.1 mg/L, which is within permissible limits for Class C water quality. Heavy metals (such as Pb, Cd, Cr, Hg) were found below detectable limits, indicating absence of industrial contamination.

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 Samanda Development Block, 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

02 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 of Annexure 4.5. Results of the Surface water quality are shown in Table 5 of Annexure 4.5.

Groundwater samples GW-1 and GW-2 were found to be clear, odourless and with acceptable taste, and turbidity remained below 1 NTU. The pH was within the desirable range (6.9–7.4). Total Hardness (119.6–124.5 mg/L), TDS (268.4–271.1 mg/L), Calcium, Magnesium, Chloride, Sulphate, and Nitrate were all well within desirable limits of IS 10500:2012. Slight Iron exceedance was observed (0.24–0.26 mg/L) compared to the desirable limit of 0.3 mg/L. All heavy metals such as Chromium, Arsenic, Aluminium, and Copper were below

⁵ Ground Water Information Booklet South West Garo Hills Hills

detectable limits, indicating no contamination from industrial or geogenic sources. Overall, the groundwater quality is satisfactory and safely fit for drinking and domestic use.

4.5 AIR ENVIRONMENT

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 $\mu\text{g}/\text{m}^3$)	Time weighted average	NAAQ standard
Particulate matter (PM_{10})	24 hrs.	100
Particulate matter ($\text{PM}_{2.5}$)	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

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 and other sensitive locations proximity to roads were the criteria used for selecting the sample locations (Table 6 and Figure 4 of Annexure 4.5). 04 locations were selected for air quality monitoring. Monitoring was done in the month of October. Parameters like Particulate Matter (PM_{10}), Particulate Matter ($\text{PM}_{2.5}$), 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 of Annexure 4.5.

The monitored air quality data shows that overall pollution levels in the project area are within the National Ambient Air Quality Standards (NAAQS). PM_{10} concentrations range between 42.5–48.2 $\mu\text{g}/\text{m}^3$ and $\text{PM}_{2.5}$ between 17.4–23.4 $\mu\text{g}/\text{m}^3$, both well below their respective limits, indicating low particulate pollution. Sulphur dioxide (SO_2) levels remain low, between 6.3 – 8.2 $\mu\text{g}/\text{m}^3$, suggesting minimal sulfur-based emissions. Nitrogen dioxide (NO_2) values mostly lie in the lower range of 7.2–9.1 $\mu\text{g}/\text{m}^3$, are also significantly lower than the permissible limit of 80 $\mu\text{g}/\text{m}^3$, indicating minimal combustion-related emissions. Carbon monoxide (CO) concentrations, ranging from 0.245–0.290 mg/m^3 , also remain significantly lower than the prescribed limit, indicating negligible CO-related pollution in the area. Overall, the data suggests that ambient air quality in the monitored corridor is generally clean and does not pose environmental or public health concerns.

These favorable conditions are attributed to the region's low industrial activity, limited vehicular emissions, and abundant green cover, which collectively contribute to maintaining good air quality. However, it's important to note that air quality can vary with seasonal changes and local activities, so ongoing monitoring is essential to ensure continued public health safety.

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 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 04 locations for (Figure 5 of annexure 4.5) in the month of October as per Table 8 of Annexure 4.5. Monitoring results are given in Table 9 of Annexure 4.5.

The monitored noise levels at all three locations are found to be well within the CPCB prescribed limits for their respective land-use categories. In Nengkra Bazar (NQ4) and Lower Baiza, categorized as a commercial area, the recorded noise levels are 47.7 dB(A) and 43.1 during the day and 37.3 dB(A) and 30.4 during the night, which remain significantly lower than the commercial limits of 65 dB(A) (day) and 55 dB(A) (night). This indicates that commercial activities and vehicular movement in the market area are moderate and do not create any substantial noise disturbance.

In Lower Baiza (NQ1) and DawaNengjata (NQ3) villages, both classified as residential zones, the recorded daytime noise levels of 43.1 dB(A) and 41.6 dB(A) respectively, and night time levels of 30.4 dB(A) and 31.7 dB(A), are comfortably below the residential limits of 55 dB(A) (day) and 45 dB(A) (night). These results reflect a quiet rural acoustic environment where noise is limited mainly to routine household activities and occasional vehicular movement.

Overall, the baseline acoustic environment in the study area is calm and stable, with no existing noise stress on the community. The present noise scenario does not indicate any adverse impact, and any future rise in noise, if associated with project activities, will need to be managed to maintain the current acceptable noise conditions. Based on the monitored noise levels, the ambient noise in all locations remains well within the CPCB prescribed limits for both day and night, across residential as well as commercial areas. Since the existing noise levels already comply with the permissible standards and do not present any significant adverse impact on the surrounding community, the provision of noise barriers is not required. The data clearly indicate that vehicular movement and project activities are not contributing to excessive noise, and the current environment is already acoustically stable without the need for additional mitigation measures.

4.7 BIOLOGICAL ENVIRONMENT

4.7.1 BIODIVERSITY IN EAST 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 Mint, Wild Ginger,

Turmeric, Broom grass etc.

A primary biodiversity survey was conducted during the field visit in August 2025. The survey recorded a total of 200 species of flora and 16 species of aquatic biodiversity, comprising 68 tree species, 10 shrubs, 23 herbs, 11 ferns, and 7 grass species. In addition, 5 mammal species, 43 bird species, 6 reptile species, 2 amphibian species, 25 butterfly species, and 10 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 Sub-Project road. However, improved connectivity after construction may increase the risk of hunting and illegal wildlife trade

In the East Garo Hills district of Meghalaya, traditional medicine remains central to primary healthcare among Garo communities, and alongside plants, animal by-products are also used for zootherapeutic remedies. While detailed, district-wide inventories are still scarce, evidence from the Garo Hills and neighboring Northeast India indicates that a variety of wild species are targeted for medicinal use and bushmeat, with pangolins and primates among the species of concern. Robust, site-level documentation from 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 RSN 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 4.7**.

Table 4.6: Biodiversity and critical habitat assessment-based on field survey and GIS analysis for the Direct Impact Area (10 km)

Sl. No.	Habitat (includes natural or modified)	Observation	Remarks
I.	(a) Habitats protected by national and state legal regulations		
	(i) Pas – Wildlife Sanctuary, National Park, conservation reserve or community reserve, Tiger reserve and corridor and Eco-sensitive zone (As notified under the Wildlife Protection Act, 1972)	Not present	

Sl. No.	Habitat (includes natural or modified)	Observation	Remarks
	(ii) Reserve Forest (As notified under India Forest Act, 1927)	Present	Project road is passing through Rongrenggiri R.F at change from 0+000 to 6+200
	(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 but it is present as per local consultation and secondary data. A total of 07 species are listed under Schedule I of the Wildlife Protection Act, 2022. Although none of these species were recorded during the field surveys conducted in the study area, their presence has been indicated through secondary information sourced from the IBAT Tool.
	(ii) Species listed under Schedule III of the Wildlife (Protection) Act, 2022	Not Present	Schedule III species are not observed during the field survey.
	(ii) Species notified as "threatened species" by the Govt. of Meghalaya under the Meghalaya Biodiversity Rules 2010	Not Present	No threatened species were observed during the field surveys conducted within the project road corridor
	(iii) Critically Endangered/Endangered species as listed by the IUCN Red List of Threatened species	Present	Field observations confirm the presence of teak, which is categorized as Endangered according to the IUCN Red. One teak tree having girth 150 cm present within ROW but cutting may not be required.
III.	c) Habitats of significant importance to endemic or restricted-range species d) Habitats that support globally or nationally significant concentrations of migratory or congregatory species e) Highly threatened or unique ecosystems		
	(i) Biosphere Reserve (Core Area)	Not present	
	(ii) Ramsar Site	Not present	
	(iii) Important fish & Key Biodiversity Area	Yes, present	<ul style="list-style-type: none"> • Simsang River @12+400 • The Simsang River and adjoining water bodies in East

Sl. No.	Habitat (includes natural or modified)	Observation	Remarks
			Garro 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. A total of 07 species are listed under Schedule I of the Wildlife Protection Act, 2022. Although none of these species were recorded during the field surveys conducted in the study area, their presence has been indicated through secondary information sourced from the IBAT Tool.

A reserve forest falls within the Direct Impact Area of the project road between chainages 00+000 and 6+200. No improvement and reconstruction has been proposed in this section. Based on the biodiversity assessment, the proposed RSN road works are not expected to cause significant, adverse, or irreversible impacts; Although the Biodiversity Management Plan (BMP) is attached as **Annexure -4.3** to protect reserve forest.

4.8 SOCIO ECONOMIC ENVIRONMENT

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

The proposed project site is located in the East Garo Hills District of Meghalaya. East Garo Hills District was upgraded from a sub-division to a full-fledged district in 1976, after the erstwhile Garo Hills District was reorganized with a view to bring the administration closer to the people. In 2012 East Garo Hills District was further reorganized to form a new district, the North Garo Hills District, out of the erstwhile Resubelpara Civil Sub-Division. The District is bounded by South Garo Hills on the south, West Garo Hills on the west, West Khasi Hills on the East and North Garo Hills on the north.

Government and Administration: East 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 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.

4.8.1 SOCIO-ECONOMIC PROFILE OF THE PROJECT ROADS

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

4.8.2 DEMOGRAPHY

4.8.2.1 POPULATION

The Sub-Project encompasses smaller rural settlements such as Dobetkolgre (Dobet Kolgre Apotgittim) (94) and Rongrengre (Rongregre) (129), which have relatively lower populations. Overall, the gender distribution is generally balanced, however, certain settlements—such as Nengkra (Nengkra Awe)— has a higher female-to-male ratio. Larger settlements like Nengkra (Nengkra Awe) (904) and Chidekgre (Chiokgre) (540) play a key role in shaping the region’s demographic profile, highlighting variations in population density along the corridor. The population distribution of the sub-project affected villages is presented in **Table 4.8**.

Table 4.7: Population distribution of the sub-project affected villages

S.No.	Village Name	Male	Female	Total
1.	Rongrengre (Rongregre)	66	63	129
2.	Chidekgre (Chiokgre)	274	266	540
3.	Dobetkolgre (Dobet Kolgre Apotgittim)	52	42	94
4.	Dawa Nengjata (Dawa Nengjata)	75	58	133
5.	Dawa Chipitgre	102	86	188
6.	Nengkra (Nengkra Awe)	449	455	904
7.	Chimagre	198	197	405

Source: Census 2011

4.8.2.2 SEX RATIO

In Sub-Project 1 (RSN Road) the sex ratio shows significant variation across villages. Nengkra (Nengkra Awe) has

the highest sex ratio at 1,013, reflecting a relatively balanced male-to-female population. This is followed by Chimagre and Chidekgre (Chiokgre), with sex ratios of 995 and 971, respectively. Rongrengre (Rongregre) reports a ratio of 955. At the lower end, Dawa Nengjata records the lowest sex ratio at 773, followed by Dobetkolgre (Dobet Kolgre Apotgittim) at 808 and Dawa Chipitgre at 843. Detailed sex ratio data for the project-affected villages and two towns are presented in **Table 4.9**.

Table 4.8: Sex ratio in the villages along the sub-project road

Sl. No.	Village Name	Sex Ratio
1.	Rongrengre (Rongregre)	955
2.	Chidekgre (Chiokgre)	971
3.	Dobetkolgre (Dobet Kolgre Apotgittim)	808
4.	Dawa Nengjata (Dawa Nengjata)	773
5.	Dawa Chipitgre	843
6.	Nengkra (Nengkra Awe)	1013
7.	Chimagre	995

Source: Census 2011

4.8.2.3 SCHEDULED TRIBE POPULATION

The district is predominantly inhabited by the Scheduled Tribe (ST) population, who primarily reside in small rural villages along the project road corridor. Nengkra (Nengkra Awe), with 872 ST residents, and Chidekgre (Chiokgre), with 539, have the highest concentrations of ST population in the area. Medium-sized villages such as Chimagre (396) and Dawa Chipitgre (188) also reflect a significant tribal presence. In contrast, smaller settlements like Dobetkolgre (Dobet Kolgre Apotgittim) and Rongrengre (Rongregre), with ST populations of 94 and 124 respectively, have relatively lower numbers. A detailed distribution of the ST population along the project corridor is provided in **Table 4.10**.

Table 4.9: Population distribution of the sub-project affected villages

Sl. No.	Village Name	ST Population			
		Male	Female	Total	Percentage
1.	Rongrengre (Rongregre)	64	60	124	64
2.	Chidekgre (Chiokgre)	273	266	539	273
3.	Dobetkolgre (Dobet Kolgre Apotgittim)	52	42	94	52
4.	Dawa Nengjata (Dawa Nengjata)	75	58	133	75
5.	Dawa Chipitgre	102	86	188	102
6.	Nengkra (Nengkra Awe)	429	443	872	429
7.	Chimagre	200	196	396	200

Source: Census 2011

4.8.2.4 WORKFORCE POPULATION

The workforce distribution in the region highlights rural areas such as Nengkra (Nengkra Awe) with 278 workers and Chidekgre (Chiokgre) with 215 workers as key economic centers. Notably, Rongrengre (Rongregre) demonstrates strong female participation in the workforce. The detailed workforce of the project affected villages is given in **Table 4.11**.

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	Female	Total	Male	Female	Total	Percentage
Rongregre (Rongregre)	28	25	53	0	4	4	28	29	57	44.19
Chidekgre (Chiokgre)	107	33	140	101	28	129	109	106	215	39.81
Dobetkolgre (Dobet Kolgre Apotgittim)	21	13	34	1	3	4	22	16	38	40.43
Dawa Nengjata (Dawa Nengjata)	29	5	34	4	24	28	33	29	62	46.62
Dawa Chipitgre	39	7	46	5	32	37	44	39	83	44.15
Nengkra (Nengkra Awe)	184	28	212	20	46	66	204	74	278	30.75
Chimagre	88	64	152	2	25	27	90	89	179	44.20

Source: Census 2011

4.8.3 EDUCATION

The educational landscape within the project corridor exhibits significant variation in literacy rates across the rural villages. Dobetkolgre (Dobet Kolgre Apotgittim) leads with a literacy rate of 83.31%, followed by Chidekgre (Chiokgre) at 75.29%. In contrast, villages such as Rongregre (Rongregre) and Dawa Chipitgre have notably lower literacy rates of 57.66% and 60.96%, respectively.

The detailed distribution of literate and illiterate populations in the sub-project affected villages is provided in **Tables 4-12** and **Tables 4-13**.

Table 4.11: Literate Population in the Project road corridor area

Sl. No.	Village Name	Literate Population			
		Male	Female	Total	Percentage
1	Rongregre (Rongregre)	33	31	64	49.61
2	Chidekgre (Chiokgre)	156	173	329	60.93
3	Dobetkolgre (Dobet Kolgre Apotgittim)	37	32	69	73.40
4	Dawa Nengjata	35	26	61	45.86
5	Dawa Chipitgre	48	41	89	47.34
6	Nengkra (Nengkra Awe)	232	211	443	49.00
7	Chimagre	106	77	183	45.19

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 RSN road, the settlement area has recently gained popularity as a tourist destination. However, during the off-season, tourism-related employment declines, resulting in temporary job losses. A significant portion of the population depends on agriculture and allied activities. As most employment opportunities are seasonal, many workers experience periods of unemployment or underemployment outside peak farming seasons, which affects their income stability and financial security.

4.8.6 POVERTY

In Sub-Project-1, 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 Sub-Project-1, most disputes in the villages are resolved locally through traditional mechanisms, with the Nokma (village headman) playing a central role in dispute resolution. Only cases that cannot be settled at the community level or require legal intervention are escalated to and officially recorded by the police. **Table 4-13** presents the major crime cases registered at Samanda Police Station over the years. During consultations with police officials, it was reported that crime levels in Corridor 1 are very low, and no specific crime-related data was shared.

Table 4.12: Crime records over the years (2019-2024) from Samanda Police Station

Year/ Major crime	Crime against property	Robbery	Theft	Murder	Kidnapping	Others	Total cases Register
2019	10	1	8	0	1	17	37
2020	4	0	2	1	1	15	23
2021	6	0	2	1	2	12	23
2022	7	0	0	0	0	3	10
2023	1	0	0	1	1	12	15
2024	1	1	0	1	1	14	18

Source : Field Survey

4.8.7.3 GENDER BASED VIOLENCE

According to records from the Samanda Police Station, no general Gender-Based Violence (GBV) cases have been reported in Corridor 1, 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, including two cases in 2010 and single cases in 2019, 2022, 2023, and 2024. Consultations in Corridor 1 revealed that no such cases were reported in the current year.

4.9 SOCIO-ECONOMIC PROFILE OF PROJECT AFFECTED HOUSEHOLDS

Socio-economic data of project-affected households were collected through census and socio-economic surveys, systematically tabulated and analyzed to assess the extent of adverse impacts on land, structures, and livelihoods. A structured, pretested questionnaire was used as the primary tool for conducting these surveys. The survey has been conducted in September 2025.

4.9.1 DEMOGRAPHY

The total number of project-affected households is 40. The Table 4.14 below summarizes the gender distribution of the head of the Household. In Corridor 1, out of 40 individuals in term of structure, 22 are male (55%) and 18 are female (45%), showing a clear male predominance.

Table 4.13: Gender Distribution of PAHs

Gender	Corridor 3	Percentage
Male	22	55
Female	18	45
Total	40	100

Source: EIS primary survey – 2025

4.9.1.1 GENDER DISTRIBUTION OF PROJECT-AFFECTED PERSONS

Out of a total of 90 Project Affected Persons (PAPs), 49 are male (55.45%) and 41 are female (45.55%), indicating an almost equal distribution between male and female beneficiaries. Gender Distribution of Project-Affected Persons (PAPs) is given in Table 4.15.

Table 4.14: Gender Distribution of Project-Affected Persons (PAPs)

Gender	Project Affected Persons	Percentage
Male	49	55.45
Female	41	45.55
Total	90	100

Source: EIS primary survey – 2025

4.9.1.2 ETHNICITY

The detailed distribution of ethnic groups in corridor wise is given in Table 4.17 below. In Corridor 1, a total of 40 individuals belong to different communities. The majority are Garo (22 persons, 55%), followed by Rabha (12 persons, 30%), Muslims (4 persons, 10%).

Table 4.15: Community Wise Distribution of PAHs

Communities	Corridor 3	Percentage
Garos	22	55
Rabha	12	30

Communities	Corridor 3	Percentage
Muslim	4	10
Total	40	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 4.17** below describes the distribution pattern of vulnerable group in the study area.

Table 4.16: Distribution of Vulnerable Group

Vulnerable Category	PAHs	Percentage
Schedule Tribe	36*	90
Aged persons above 60 years	7	17.5
Below Poverty Line	0	0
Woman Headed Household	18	45
Other Backward Classes	0	0
Physically Challenged	0	0

Source: EIS primary survey – 2025

*Among 40, 36 households are vulnerable and out of 40, 7 are aged more than 60 years and 18 are woman headed.

4.9.3 ECONOMIC PROFILE

EMPLOYMENT PATTERNS

4.9.3.1 PRIVATE BUSINESS/ ENTREPRENEURSHIP DOMINANCE

Among the 40 Project Affected Households (PAHs), the majority (22) are engaged in private business, while 6 depend on agriculture and another 4 fall under other occupations. Only 8 households are involved in government or private service. Details are provided in **Table 4.18**.

Table 4.17: Occupation pattern of PAHs in sub-project area

Sl. No.	Occupation	PAHs
1	Agriculture	6
2	Private Business	22
3	Service (Govt./Pvt.)	8
4	Others (Non-Working)	4
Total		40

Source: EIS primary survey – 2025

4.9.3.2 INCOME

In Sub-Project 1, none of the households fall in the annual income range below ₹50,000. A majority of 28 households (70%) earn between ₹50,000 and ₹1,00,000 annually, while 12 households (30%) have an income of more than ₹1,00,000, indicating relatively higher income levels among the affected families. Details are provided

in Table 4.19.

Table 4.18: Annual Income Range of PAHs

Sl. No.	Annual Income Range of HH	Sub-Project-1	
		No. of PAHs	Percentage
1	less than 25000	0	0
2	25000- 50000	0	0
3	50000-100000	28	70
4	More than 100000	12	30
Total		40	100

Source: EIS primary survey – 2025

4.9.4 EDUCATION

In Sub-Project 1, out of a total population of 90 persons, education levels show a balanced distribution across genders. The majority have studied up to high school (37 persons), followed by 15 with primary education and 22 with higher secondary education. A smaller group of 14 individuals are graduates or above, while 2 are illiterate. Overall, male (51) and female 39 participation across education levels is nearly equal. Details are provided in Table 4.20.

Table 4.19: Education Level of PAPs

Sl. No	Education	Sub-Project-1		
		Male	Female	Total
1	Primary (Class 1 to 4)	8	7	15
2	High School (Class 5-10)	21	16	37
3	Higher Secondary (Class 11-12)	12	10	22
4	Graduate and above	8	6	14
5	Illiterate	2	0	2
6	Total	51	39	90

4.9.5 HEALTH STATUS

The predominant waterborne diseases in the study area include as diarrhea, typhoid, cholera, and malaria are commonly reported, particularly during the monsoon season when water contamination and stagnant water breeding increase. Hepatitis A and jaundice have also been observed in areas with poor sanitation and unsafe drinking water sources. In addition, dengue fever and respiratory infections such as influenza and tuberculosis are prevalent due to changing climatic conditions and limited access to consistent healthcare services. Although sanitation coverage has improved in recent years, the lack of proper sewage systems and public toilet facilities continues to contribute to the spread of these communicable diseases in certain villages of Samanda Block.

In Samanda Block, notable improvements have been achieved in sanitation coverage under various government initiatives. However, a section of households still lacks well-constructed toilets and proper sewage disposal systems. The absence of public toilets and washroom facilities poses additional difficulties, particularly for individuals working in open areas, markets, or other shared spaces, highlighting the need for enhanced sanitation infrastructure and hygiene awareness.

Songsak and Samanda PHC serves as the primary healthcare facility, supported by Rongjeng CHC within the

Project Influence Area (PIA),

4.9.6 IMPACT TO STRUCTURES

The project corridor wise details of the impacted structures are given in below **Table 4.21**. Chainage wise details are provided in **Annexure 4.4**.

Table 4.20: Type of Impact on Project Affected Household

Type of Impacts	Sub-Project 1	%
Residential (Major)	0	0
Commercial (Major)(Pucca boundary along with pucca shop, Bamboo fencing of residential structure along with temporary shop)	7	17.5
Res. Cum Commercial. (Major) (Bamboo fencing of residential structure, Tin fencing of residential structure)	5	12.5
Other Minor Structures	0	0
Temporary Encroachment (Kiosk)	28	70
Total	40	100

4.9.7 LOSS OF TREES

Approximately 25 trees are situated within the existing Right of Way (RoW) on both sides of the road. To mitigate the ecological impact of tree felling, compensatory afforestation should be carried out, in accordance with applicable environmental regulations and guidelines. These measures, along with their implementation strategies, are comprehensively detailed in the Environmental and Social Management Plan (ESMP).

4.9.8 COMMON PROPERTY RESOURCES

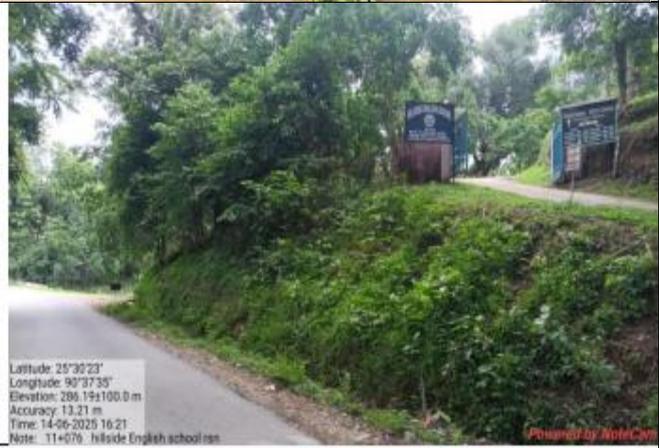
The Common Property Resources (CPR) assessment classifies structures into government and community/public facilities. Government structure including compound walls (CWs) of government buildings, schools, and community halls comprise 09 minor structures that may be affected during construction. A summary of CPRs is provided in **Table 4.22**.

Table 4.21: Common Property Resources located within 50 m of the ROW

Sl. No.	Type of CPR Structures	Chainage	Distance from the PROW
1.	District Jail, Williamnagar	Ch. 11+878	8 m from center line LHS
2.	St. Mary's School		9 m from center line LHS
3.	SSA & LP School	Ch 02+220	10 m from center line LHS
4.	Hill Side English School	Ch 4+800	20 m from center line RHS
5.	Dobetkolgre LP School	Ch 11+076	7 m from center line RHS
6.	St. Mary's Church	Ch 11+700	9 m from center line LHS
7.	Church	Ch 02+294	10 m from Centre line RHS

8.	Co-Operative Society Community hall	Ch 02+220	10 m from Centre line RHS
9.	Sacred Site Kosi Ampang Damgre Sacred Site	Ch. 17+272	20 m from Centre line LHS

An illustrative view of the CPRs / Other important locations, along with their respective distances from the centerline, is presented in **Figure 4.7** below.

Chainage	Side		Structure	Geo tagged photos
	LHS	RHS		
02+220 – 02+294	1+1		St. Mary's School & Church LHS	 <p>Latitude: 25.543566 Longitude: 90.578122 Elevation: 272.89±5.3 m Accuracy: 7.442 m Time: 21-08-2025 13:13 Note: RSN Powered by NoteCam</p>
4+800	1		SSA & LP School LHS	 <p>Latitude: 25.510167 Longitude: 90.629664 Elevation: 285.55±2.5 m Accuracy: 3.79 m Time: 21-08-2025 12:17 Note: RSN Powered by NoteCam</p>
11+076		1	Hill Side English School LHS	 <p>Latitude: 25°30'23" Longitude: 90°37'35" Elevation: 286.19±100.0 m Accuracy: 13.21 m Time: 14-06-2025 16:21 Note: 11+076 Hillside English school rsn Powered by NoteCam</p>
11+700		1	Dobetkolgre LP School RHS	 <p>Latitude: 25.516545 Longitude: 90.665699 Elevation: 370.19±9.9 m Accuracy: 8.186 m Time: 21-08-2025 11:28 Note: RSN Powered by NoteCam</p>

11+878	1		District Jail, Williamnagar LHS	 <p>Latitude: 25.511648 Longitude: 90.630088 Elevation: 282.22±14.9 m Accuracy: 27.06 m Time: 21-06-2025 12:12 Note: RSN</p>
17+272		1	Co-Operative Society Community hall RHS	 <p>Latitude: 25.513391 Longitude: 90.739154 Elevation: 293.3±237.8 m Accuracy: 127.1 m</p>
Ch 10+000	1		Kosi Ampang Damgre Sacred Site	 <p>Latitude: 25.515069 Longitude: 90.634265 Elevation: 296.39±12.2 m Accuracy: 78.44 m Time: 21-08-2025 12:07 Note: RSN</p>
Ch 02+220		1	Church	 <p>Latitude: 25.545562 Longitude: 90.577656 Elevation: 275.15±3.04 m Accuracy: 8.804 m Time: 21-08-2025 13:15 Note: RSN</p>
Total	5	4		

Figure 4.6: Illustrative view of the road features in Sub-Project-1

4.10 HAZARD AND VULNERABILITY PROFILE

The Hazard and Vulnerability profile of the RSN Road area and East 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 District⁶ is given in **Table 4.23** below:

Table 4.22: 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 4.24**.

Table 4.23: Seismic Zone details of East 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	—

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 RSN Road are given below.

1. High Vulnerability:

Roads in hilly areas, particularly other district road and its connecting roads, are highly vulnerable to landslides and debris slides during extreme rainfall events. Lack of proper drainage system exacerbates waterlogging, leading to structural damage. Along the project stretch, issues of water accumulation and submergence are observed at multiple locations. On the project road, at chainage 17+300 to 17+340, pavement damage accompanied by water logging has been observed. Landslide-prone sections have been observed at several

⁶ District Disaster Management Plan for Meghalaya, 2024

locations along the Sub-Project. At chainage 11+900, a landslide section is present on the Right-Hand Side (RHS). Additional landslide-prone areas are located between chainages 12+850 to 12+900 on the RHS and 12+900 to 12+980 on the Left-Hand Side (LHS). Another landslide section has been observed between chainages 16+500 to 16+600 on the LHS. These sections indicate the vulnerability of the terrain to slope instability and potential road hazards.

2. Moderate Vulnerability:

Temperature fluctuations and high wind velocity contribute to gradual deterioration of road surfaces, especially asphalt roads. Over time, these conditions increase maintenance costs. Riverbank erosion is a significant concern along the stretch. Soil erosion has been observed at the minor bridge location around chainage 6+900. This indicates that the section is vulnerable to surface runoff and sediment displacement, which could affect the stability of the bridge foundations and the adjoining road embankment.

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 1. This chapter analyzes the potential impacts arising from the implementation of project activities. The impacts differ in type, nature, magnitude, extent, timing, duration, certainty, and reversibility.

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

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

5.2 IMPACTS IDENTIFICATION AND EVALUATION

The potential impacts were identified in three main steps:

1. Identification of project activities/aspects causing impacts;
2. Establishing affected environmental and social components (valued receptors). These were determined to include vegetation, water bodies, soil, land stability, water quality and quantity, ambient air quality, employment and livelihoods, vulnerable groups, infrastructure, public safety and occupational health and safety;
3. Determining potential environmental and social impacts in an impact Identification Matrix

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

5.3 IMPACT ANALYSIS USING LEOPOLD MATRIX (MAGNITUDE/IMPORTANCE CLASSIFICATION)

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

5.3.1 IMPACT EVALUATION MATRIX

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

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

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

Table 5.1: Impact Evaluation Matrix

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

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

Sites, Plants, Labour Camps	ESS3											
Operational Phase												
Operational Traffic Flow	ESS4, ESS10	LN	LN	LN	LN	LN	MP (Improved Access to Health Services)	MP (Improved Connectivity)	LN	LN	MP (Improved Drainage)	MP (Improved Road Safety)
Transportation of Hazardous Materials	ESS4	MN	LN	LN	LN	MN	HN	HN	MN	HN	MN	HN
Compensatory 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 RSN 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 Rongrenggre-Simsanggre-Nengkhra (RSN) Road. While most construction activities are proposed within the existing Right of Way (RoW), minor land 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 25 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 349 electric poles, 4 transformers, and 93 electric line crossings have been identified along the RSN corridor for relocation—of which 227 poles are located on the Left-Hand Side (LHS) and 122 poles on the Right-Hand Side (RHS). Additionally, 9 Optical Fiber Cable (OFC) pillars will require shifting, comprising 3 on the LHS and 6 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,

and 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 RSN 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 RSN 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 Rongrenggre-Simsanggre-Nengkhra (RSN) Road traverses gently undulating terrain with elevations ranging from 212 m to 561 m amsl, where only minor cutting and filling are required to achieve the desired formation level. The total estimated cut quantity is 248054.7m³ and fill quantity is 93293.15m³, resulting in a surplus of approximately 154761.55 m³ of excavated material to be disposed of at MPWD-designated sites. Borrow areas and quarry sites for the RSN road project have been identified to ensure a reliable and sustainable supply of construction materials such as sand and stone. Sand will be sourced from Kusimkolgre and Ampangdamgre quarries, located approximately 1.5 km away from the 6th and 11th km stretches of the RSN road. Similarly, stone and blindage materials will be obtained from the Rongkhem quarry in Samanda, situated about 1 km from the 146th km point of NH-127B. The proximity of these borrow areas and quarries minimizes transportation distance and cost, ensuring efficient material supply while reducing environmental impact associated with long-distance hauling.

5.4.2 IMPACTS DURING CONSTRUCTION PHASE

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

Construction Phase

The construction phase involves earthworks, grading, drainage works, slope protection, and culvert installation, which are expected to cause significant short-term adverse impacts on air quality, noise, water resources, and soil stability (ESS2, ESS3, ESS4). Occupational health and safety (OHS) risks including accidents, exposure to dust and noise, handling of heavy machinery, and potential landslides require robust safety protocols.

Mitigation measures under the C-ESMP include:

- Engineering and bioengineering controls such as retaining walls, gabion works, toe walls, (notably at chainages 6+900) to stabilize slopes and prevent erosion.
- Proper drainage management at waterlogged and flood-prone locations (17+300 to 17+340) through new bridges, culverts, and raised embankments to mitigate monsoon submergence.
- Traffic and safety management at critical points near settlements and schools (CH 0+000, 6+300, 8+000) 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 RSN Road will require different materials such as earth, aggregate, boulders, and sand that occur naturally and whose formation process is slow and takes years. Minimizing the construction footprint on natural resources is a fundamental design principle for pavement and structures.

With an estimated surplus of approximately 154761.55 m³ of excavated material after balancing cut and fill, the DPR emphasizes reuse of suitable cut and excavated earth for embankment formation, slope dressing, and construction of protection works such as toe walls, gabion retaining walls, and river training structures at critical erosion-prone locations, particularly near chainage 12+900, 16+500 and 17+300. 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 turving 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 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 5.3** below.

Table 5.2: Earthwork details in the project area

Corridor	Fill (m ³)	Cut (m ³)
Corridor-1	93293.15	248054.7

From the above table it is calculated that after balancing cut and fill, the remaining quantity of 154761.55 cu.m earthwork will be dumped/disposed by the contractor only at a place designated and authorized by the MPWD. The details of muck disposal sites are provided in **Table 5.3**. Average height should be 1.5 m to 2 m.

Table 5.3: Details for the muck disposal sites

RSN					
Dumping Location			Coordinate		Area m ²
SL. NO	LOCATION CHAINAGE	SIDE	X	Y	
1	4+300	LHS	257815.41	2826161.78	6600
2	6+800	LHS	259086.1	2824341.27	1800
3	8+000	RHS	259725.32	2823339.46	2500
4	10+800	LHS	261722.06	2823522.96	1600
5	12+600	LHS	262632.01	2823748.51	3500
6	14+900	LHS	264389.2	2823748.67	2500
7	16+200	RHS	265296.33	2824220.1	5000
8	18+400	LHS	266710.22	2823495.42	4000

Mitigation Measures

- For sitting location of a muck disposal site include selecting a location with stable topography, away from water bodies and agricultural land, to prevent environmental contamination.
- Muck disposal sites shall be located on stable, non-erodible terrain away from water bodies and agricultural land.
- Dumping will be done in compacted layers (≤ 1 m thick) with retaining walls, drainage channels, and slopes maintained within the natural angle of repose (30° – 35°).
- Each site will be protected with toe walls, sediment traps, and vegetative cover for stabilization.
- The contractor shall operate only at approved locations under supervision and maintain the site until full rehabilitation is achieved.

- The site should incorporate proper retaining structures, such as toe walls and catch drains, to prevent sliding and erosion.
- Adequate drainage must be provided through surface and subsurface channels to control runoff.
- Muck should be deposited in layers, compacted, and stabilized using vegetation or geo-textiles to minimize dust and erosion.
- Access roads should be provided to ensure safe transport of muck, and the site should be fenced and clearly demarcated.
- Environmental safeguards, including periodic monitoring and rehabilitation plans, must be integrated into the design to ensure long-term stability and ecological compliance.

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

5.4.2.5 AMBIENT AIR QUALITY (ESS3)

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

Impacts from Generation of dust

- Transportation and tipping of cut material - while the former will occur over the entire stretch between the cutting location and disposal site, the latter is more location specific and more intense;
- Transportation of raw materials from quarries and borrow sites
- Stone crushing, handling, and storage of aggregates at on-site asphalt mixing plants are integral to the RSN Road Corridor project. These activities generate significant dust and noise.
- Site levelling and vegetation clearing, including the removal of trees and topsoil, are being carried out along the alignment to prepare for subgrade laying. These operations are critical but environmentally impactful, especially near forested or community areas.
- Concrete batching plants and asphalt mix plants are being set up along the corridor to support continuous construction. These facilities involve the mixing of aggregates with bitumen, releasing particulate matter, hydrocarbons, and heat, which may affect local air quality and nearby settlements
- Construction of structures and allied activities

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

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

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

Mitigation Measures for Ambient Air Quality (ESS3)

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

5.4.2.6 NOISE (ESS3)

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

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

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

The scale of construction required for upgrading the RSN Road is moderate and confined mostly within the existing

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

Ambient noise level may increase temporarily in the close vicinity of various construction activities, maintenance workshops, and vehicles and earthmoving equipment. These construction activities are expected to generate noise levels in the range of 80 – 95 dB(A) at about 5m 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 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 RSN Road corridor. Proposed sub project road run parallel to Simsang river Chainages, 12+400. Earth Runoff from exposed soil surfaces, stockpiles, and construction zones can carry suspended solids, oils, and debris into nearby streams or drainage channels, leading to increased turbidity and siltation. Additionally, improper disposal of construction wastewater or accidental spills of fuels and lubricants may also contribute to localized water pollution. Fishing is practiced in the Simsang River, which intersects the RSN Road corridor. Construction activities such as bridge works, river training, and slope protection may temporarily increase turbidity and sediment load in the river, potentially affecting local fish habitats and water quality. These effects are expected to be localized and short-term, primarily during active construction near the river crossing.

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

Mitigation measures

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

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

- **Site Selection:** Locate material and pile storage yards at least 100 m away from water bodies, wells, or natural drainage channels. Avoid low-lying or flood-prone areas.
- **Impervious Flooring:** Provide impermeable flooring (e.g., compacted clay or concrete base with HDPE lining) in storage areas for materials such as bitumen, fuel, cement, and chemicals to prevent seepage into soil and groundwater.
- **Stormwater Management:** Construct peripheral drains around storage yards to collect and divert runoff to sedimentation pits before discharge. Prevent mixing of clean stormwater with contaminated runoff.
- **Spill Prevention and Control:** Store fuel and lubricants in bunded areas (110% capacity of the largest container) with proper spill kits (sand, absorbents). Immediately clean up any spills or leaks.
- **Topsoil and Excavated Material:** Store topsoil separately on raised and covered platforms to prevent erosion and sediment-laden runoff into groundwater recharge zones.
- **Waste and Debris Management:** Prohibit dumping of construction waste, oils, or concrete slurry on bare ground. Dispose of waste only at approved sites.
- **Regular Inspection:** Conduct routine checks for leakages, cracks, or improper containment in fuel and chemical storage zones.

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

Along the rivers and streams crossed by the road, 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. 47 Junction and 23 Minor Bridge exists in the project area of 22 km road length. Totally 107 culverts are proposed for new construction, reconstruction/retention. Among these, 2 is slab culvert, 13 are box culvert, 88 pipe culverts and 4 Proposed Pipe culvert. Proposed pipe culverts are 4.

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

5.4.2.8 GROUND WATER QUALITY (ESS3)

The road construction projects are water intensive and demand a large volume of water during the entire project's construction period however in this project the works are rehabilitation in nature, the quantum of water required will be minimal. However surface water RSN project road stretch will require 31.5 Cum/day. Although the actual water requirement may vary depending on the contractor's construction methodology and equipment usage. As discussed with the DPR team, the primary source of water for construction will be the Simsang River. The availability of surface water is sufficient. Hence demand for the construction is proposed to be met from the surface water sources. The demand for construction is proposed to be met from surface water sources. The project area is not classified as critical, semi-critical or overexploited by CGWB. It is "safe" area for ground water abstraction.

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

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5.4.2.9 CONSTRUCTION AND DEMOLITION WASTE (ESS3)

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

Key mitigation measures

- **Avoidance & minimization:** limit removals to only those temporary walls/structures that are unavoidable for construction; explore minor realignments or temporary protection works to retain structures where possible.
- **Segregation on site:** separate inert masonry/brick, concrete, metal, wood and mixed waste at designated temporary collection points to maximize reuse/recycling.
- **Reuse & recycling:** prioritize reuse of intact masonry/brick and concrete as backfill or for temporary access tracks; recover metal and timber for reuse.
- **Designated storage & timely removal:** store debris in covered areas away from drains and surface water;

remove to authorized disposal/recycling facilities within agreed short timeframes to prevent runoff and scavenging.

- **Dust control:** dampen stockpiles and vehicle loads, cover trucks during transport, and restrict demolition/dismantling operations during high-wind conditions.
- **Drainage protection:** install silt traps/sediment control (e.g., sandbags, temporary settling pits) at nearby drains and around stockpiles to prevent siltation of water bodies.
- **Traffic & public safety:** schedule dismantling works off-peak where possible, use flaggers and signage, and maintains clear pedestrian/vehicular passage around work areas.
- **Permits & authorized 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)

RSN 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.
- The camping area should be periodically sprayed with Bleaching powder and other
- Disinfectants.

Approximately 150 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
			Sub-Project-1
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)

Along the RSN Road, issues of water logging and submergence are observed at 17+300 to 17+340, instances of pavement damage and water logging have been observed. The accumulation of water in these locations leads to weakening of the pavement structure, deterioration of riding quality, and potential safety risks for road users. Moreover, prolonged submergence can accelerate pavement failure and cause erosion along the road shoulders, further endangering the stability of the carriageway. To address these issues, suitable protection works are proposed on the right-hand side, along with raising of the road profile to ensure effective drainage and minimize the risk of water stagnation in the future.

Landslide-prone sections were observed at chainage 11+900 on the RHS, where a landslide treatment plan is proposed. Further landslide sections were identified from 12+850 to 12+900 on the RHS and 12+900 to 12+980 on the LHS, with treatment plans recommended for both. Another landslide-prone area was observed from 16+500 to 16+600 on the LHS, where a landslide treatment plan is also required.

5.4.2.12 DISRUPTION OF COMMUNITY SERVICES (ESS4)

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

5.4.2.13 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. Electrocutation, work at heights, slips, trips, and falls, as well as tree cutting and vegetation clearance, further contribute to potential safety concerns. Proper use of personal protective equipment (PPE), adherence to standard operating procedures (SOPs), traffic and work-zone safety management, and regular safety training will be critical to prevent accidents and ensure worker well-being throughout the construction period.

Table 5.5 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	<ul style="list-style-type: none"> Use proper shoring and benching of excavations Restrict unauthorized entry- Provide dust masks and PPE Regular inspection of slopes and trenches 	Contractor / Site Engineer
Operation of heavy machinery (excavator, roller, grader, paver)	Machine entanglement, collision, vibration, noise	Physical injury, hearing loss, fatigue	<ul style="list-style-type: none"> Only trained operators Maintain equipment regularly Use reverse alarms, lights, and mirrors Use ear protection and seat belts 	Contractor / Safety Officer
Material handling and lifting (manual or crane use)	Dropped loads, back injuries, entanglement	Fractures, strains, crushing injury	<ul style="list-style-type: none"> Inspect lifting equipment and slings Train workers on safe lifting techniques Use tag lines and certified riggers- Prohibit standing under suspended loads 	Contractor / Safety Supervisor
Asphalt and hot mix plant operation	Burns, inhalation of fumes, fire hazard	Thermal burns, respiratory irritation	<ul style="list-style-type: none"> Use heat-resistant gloves, long sleeves Maintain fire extinguishers near site Ensure good ventilation- Prohibit smoking near bitumen storage 	Plant Operator / Safety Officer

Working near traffic / along existing road	Collision with moving vehicles, poor visibility	Fatal accidents, severe injuries	<ul style="list-style-type: none"> Implement Traffic Management Plan- Install warning signs, cones, and barricades Assign flagmen with high-visibility vests- Restrict work to off-peak hours 	Contractor / Traffic Marshal
Construction at height (culverts, retaining walls, bridges)	Fall from height, falling tools or materials	Fractures, head injuries, fatalities	<ul style="list-style-type: none"> Use full-body harnesses and guardrails- Provide safety nets and helmets Secure tools with lanyards- Supervise work at height 	Contractor / Safety Officer
Welding, cutting, and concreting works	Electric shock, eye injury from sparks, burns	Eye irritation, electrocution, burns	<ul style="list-style-type: none"> Provide face shields and gloves Ensure proper earthing of welding sets Keep fire extinguishers nearby- Maintain distance from flammable material 	Contractor / Electrical Supervisor
Fuel and chemical storage / handling	Fire, explosion, spillage	Groundwater contamination, burns, inhalation	<ul style="list-style-type: none"> Store in bunded area with 110% capacity- Provide spill kits and firefighting equipment Train staff on spill response- Maintain MSDS at site 	Contractor / Store In-charge
Labour camp and sanitation facilities	Poor hygiene, contaminated water, waste mismanagement	Disease outbreak, worker illness	<ul style="list-style-type: none"> Provide potable water (≥5 L/person/day)- Maintain toilets and waste bins Regular disinfection and waste removal- Conduct health check-ups 	Contractor / Camp Supervisor
Noise and vibration from machinery / DG sets	Prolonged exposure to high noise levels	Hearing loss, stress, fatigue	<ul style="list-style-type: none"> Use silencers and acoustic enclosures- Restrict operation to daytime 	Contractor / Environmental Officer

			<ul style="list-style-type: none"> • Rotate workers and provide ear protection- Monitor noise levels regularly 	
Electrical works (temporary wiring, lighting)	Short-circuit, electrocution	Shock, burns, fire	<ul style="list-style-type: none"> • Use insulated tools and cables- Regular inspection of wiring • Provide ELCB protection- Only certified electricians to handle work 	Contractor / Electrical Supervisor
Extreme weather conditions (rain, heat)	Slippery surfaces, heat stress, dehydration	Falls, injuries, fatigue	<ul style="list-style-type: none"> • Schedule work during cooler hours- Provide shaded rest areas • Supply drinking water and electrolyte drinks- Stop work during heavy rainfall 	Site Engineer / Safety Officer
Waste and debris disposal	Sharp objects, dust, unstable mounds	Cuts, respiratory irritation	<ul style="list-style-type: none"> • Segregate and reuse materials- Dispose at approved sites • Cover trucks during transport- Provide gloves and masks 	Contractor / Site Engineer

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

Table 5.6: Critical Habitat analysis

Scientific Name	IUCN Status	Restricted Range	Migratory / Congregatory	Habitat & Distribution	Likelihood of Occurrence in Project Area	Rationale for Critical Habitat Screening	Screened Out / Out
<i>Aceros nipalensis</i> (Rufous-necked Hornbill)	Vulnerable	Yes (Eastern Himalaya)	No	Forests of NE India including Meghalaya	High	Known regional flagship species; IBAT-listed trigger species for Eastern Himalaya KBAs	Screened Out
<i>Hoolock hoolock</i> (Western Hoolock Gibbon)	Endangered	Yes (NE India to Bangladesh)	No	Tropical evergreen forests including Garo Hills	Medium–High	Listed as globally endangered; habitat present in Garo Hills; potential distribution overlap	Screened Out
<i>Manis pentadactyla</i> (Chinese Pangolin)	Critically Endangered	No	No	Occurs in forested landscapes of NE India	Medium	Confirmed regional presence; high conservation concern	Screened Out
<i>Neofelis nebulosa</i> (Clouded Leopard)	Vulnerable	No	No	Tropical forests with dense cover across NE India	Medium	Possible occurrence in intact forest patches	Screened Out
<i>Sus salvanius</i> (Pygmy Hog)	Critically Endangered	Yes (Assam–Foothill range)	No	Terai and grasslands of NE India	Low	Not a habitat match for RSN corridor	Screened Out
<i>Gyps bengalensis</i> (White-rumped Vulture)	Critically Endangered	No	Congregatory	Widely distributed in NE states	Medium	High conservation concern; potential fly-over species	Screened Out
<i>Grus antigone</i> (Sarus Crane)	Vulnerable	No	Congregatory	Wetlands, marshes, agricultural fields of India	Low	Habitat absence in hilly terrain	Screened Out

Mitigation Measures for Biodiversity Management

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

PRE-CONSTRUCTION PHASE

- **Tree Inventory and Compensatory Plantation:** Carry out a detailed tree inventory within the RoW before clearance and undertake compensatory plantation at a ratio of **1:3 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.
- **Noise and Vibration Control:** Restrict high-noise activities (e.g., blasting, piling) near forested stretches and avoid construction during early morning or night hours.
- **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.
- **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:

- 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 6+900 near a minor bridge location, where protection work is required to stabilize the section. Additionally, at chainage 17+300 to 17+340, pavement damage and water logging were noted on the RHS, indicating associated soil erosion problems, for which protection work and profile raising are proposed.

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 RSN project road being mostly located adjacent to open agricultural land and un-classed forest, adequate dispersion of gaseous pollutants is expected.

5.4.3.3 Impact on Noise Quality

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

5.4.3.4 Accidents Involving Hazardous Materials

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

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

5.5 SOCIAL RISKS & IMPACTS (ESS2, ESS4, ESS5 ESS7 and ESS10)

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

The construction of the RSN road is not expected to have significant social impacts on roadside communities, as 2.62 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 40 structures are expected to be affected by the project and they are present within RoW, including seven temporary shops and residential-related structures, a semi-pucca commercial shed, a staircase, and compound walls. FPic was carried out as the project will result in loss of asset and cause relocation of IP's.

The road alignment requires minimal additional land (2.62 Ha), as most mitigation and improvement works are confined within the existing paved road. Key interventions along the alignment include:

- **6+350** – Building structure on RHS; will be protected by slightly shifting the alignment to LHS. no impact. After change in Geometric Design
- **6+450** – Culvert; no impact.
- **7+100** – Building structure on RHS; will be protected by slightly shifting the alignment to LHS. no impact. After change in Geometric Design
- **11+400** – Culvert (half new, half old); no impact As no improvement is proposed as culvert is in good condition.
- **11+700** – Building structure on RHS, boundary wall may be impacted; mitigation by alignment shift to LHS and speed limit measures. After changing the geometry design, it will not be impacted
- **12+020** – School; retaining wall required on LHS from km 12+020 to 12+040. After providing retaining wall in the geometry design, it will not be impacted

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

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

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

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

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

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

Potential Risks & Impacts

The proposed road alignment requires 2.62 ha of additional land and involves 40 structures. Details of the project affected households have been discussed in section 4.9 of Chapter 4. The culverts, drains, and toe walls are carefully planned to minimize environmental and social impacts. Certain stretches of the road are prone to waterlogging, submergence, soil erosion, and sharp curves; these risks will be effectively managed through mitigation measures such as road raising, drainage improvements, protective walls, curve corrections, and safety signage.

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

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

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

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

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

5.5.2 SOCIAL COMPONENT ISSUES: TEMPORARY RESTRICTION TO ACCESS

Potential Risks & Impacts

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

5.5.3 SOCIAL COMPONENT ISSUES: DISRUPTION TO ACCESS ECOSYSTEM SERVICES

Potential Risks & Impacts

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

5.5.4 SOCIAL COMPONENT ISSUES: IMPACT ON VULNERABLE PEOPLE

Potential Risks & Impacts

Construction projects can disproportionately affect vulnerable and disadvantaged populations such as women-headed households, below-poverty-line families, and the elderly population (60+ years). This has been discussed in Table 4.17 of Chapter 4. These groups may face increased difficulties related to mobility, access to essential services, and overall safety during construction activities. Failure to adequately address their unique needs can exacerbate existing inequalities and lead to additional social and economic challenges. There can be difficulty for the community to reach the nearby hospital when road construction is on-going.

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

- Ensure continuous access to essential services, particularly healthcare and educational institutions, through alternate routes or temporary walkways.
- Provide advance information to communities regarding construction schedules, traffic diversions, and safety measures through local notice boards and community meetings.
- Establish priority crossing points and temporary access for elderly persons, school children, and differently abled individuals.
- Engage local women's groups, self-help groups, and village councils in monitoring safety and access conditions during construction.
- Maintain a functional Grievance Redress Mechanism (GRM) to ensure that concerns from vulnerable groups are addressed promptly and effectively.

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

regular disclosure of project information, and responsive community feedback mechanism.

5.5.5 SOCIAL COMPONENT ISSUES: INFLUX OF MIGRANT LABOR

Impact of Labor Influx

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

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

Gender based violation

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

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

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

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

Although the road spans over hilly terrain, regular supervision can be done during the construction phase which reflects a positive perspective of the project. Also, during the construction phase, access to the schools would be provided. The project would be equipped with monitoring indicators for GBV and SEA/SH risks along with the avoidance of proximity of female workers with the male workers mandated to be implemented by the contractors. This is outlined in the site specific ESMP and the SEA/SH Action Plan.

5.5.6 SOCIAL COMPONENT ISSUES: LABOR AND WORKING CONDITIONS

Challenges may arise in finding workers while balancing community expectations for local employment opportunities. Local communities may oppose hiring external workers, preferring that job opportunities remain within the local population. Further, there may be risks related to working conditions, terms and conditions of employment, occupational health and safety, discrimination and equal opportunity of all employees. The project level Labour Management Procedure (LMP) and Work site safety plan (OHS Plan) outlines strategies for managing these risks. Labour Management Plan is attached as attached as **Annexure 5.2**. Occupational Health and Safety plan is attached

as **Annexure 5.3**.

5.5.7 SEA/SH IMPACTS

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

According to the World Bank's GBV risk categorization, the "Moderate" risk category falls within a score range of 13 to 16. **Annexure 5.4** illustrates the project's risk categorization as "Moderate," with Corridor 1. GBV Action Plan is attached as **Annexure 5.5**.

5.5.8 POSITIVE SOCIAL/COMMUNITY IMPACTS

Overall, the proposed road project is expected to have a significantly positive impact on the socio-economic environment. The project will strengthen the existing road through widening, construction of new sections, paved shoulders, and improved drainage. Enhanced access to connecting roads and uninterrupted traffic flow on wider roads will serve as a major stimulus for economic growth, particularly in the rural areas within the sub-project corridor.

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

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

Given these challenges, it is essential to integrate climate mitigation and adaptation strategies into development planning. This approach will help minimize the long-term economic costs of adaptation and capitalize on potential opportunities arising from climate-resilient development. A detailed preliminary assessment of climate disaster risks has been undertaken, with further information provided in **Annexure 5.6**. Potential impacts of Climate Change trend on road transport infrastructure is provided in **Table 5.7**.

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	- Extreme monthly rainfall (2,020.0 mm in 2020) i. Impact on soil	- Increased risk of flooding leading to submersion of roads. - Erosion of road embankments and landslides in hilly terrains.	<ul style="list-style-type: none"> Certain critical sections affected by overland flooding of the road raised (vertical alignment, embankment improvement) to be free from the onslaught of

<p>annual average rainfall</p>	<p>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</p>	<p>-Structural damage to culverts and bridges.-</p>	<p>flooding events under intense precipitation.</p> <ul style="list-style-type: none"> • 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
<p>Rising Temperatures</p>	<p>- Maximum temperature rising from 22°C to 33 °C</p>	<p>- Higher temperatures cause thermal expansion of road materials, leading to surface cracks. - Softening of asphalt during hot days can cause deformation and rutting.</p>	<p>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</p>

6. ANALYSIS OF ALTERNATIVES

6.1 INTRODUCTION

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

6.2 WITH AND WITHOUT PROJECT ALTERNATIVES

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

6.2.1 WITHOUT PROJECT SCENARIO

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

Roadside Amenities	Appropriate roadside amenities to be provided at various locations along the corridor.	Not adequate in the present scenario.
Wayside Facilities	Wayside facilities are proposed at several locations, where necessary like rest areas, with appropriate facilities for recreation, road public toilets, telephones etc.	Not of adequate standards, quality and number in present scenario.
Environmental Enhancement	Enhancement of landslides/water bodies, community and cultural properties	No enhancement measures involved.
Social Development	Higher potential for social development due to improvement in access and 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

Chainage (km)	Proposed / Mitigation Measure Adopted	Purpose / Environmental Consideration
0+000	Junction improvement required	To ensure smooth traffic flow and reduce congestion and accident risk at intersection.
0+000 to 6+200	Forest Area (Both Side) of the existing Road.	To replace submerging causeway and maintain uninterrupted connectivity during monsoon; improve hydraulic capacity and safety.
6+300	Speed restriction on junction location needed.	To enhance safety by reducing speeds at the junction and preventing accidents.
6+350	Building Structure at this section on RHS will be protected by slightly shifting the alignment LHS	To minimize impact on the building structure and improve road safety.
6+900	Soil Erosion found at Minor Bridge Location, Protection work required at this Section.	To prevent soil erosion and ensure the structural integrity of the bridge.
7+100	Building Structure at this section on RHS will be protected by slightly shifting the alignment LHS	To protect the building from structural damage while maintaining road alignment.

7+280	Traffic island with Proper road safety sign required for this Section (Bus Stand Section).	To improve pedestrian safety and facilitate orderly traffic flow around the bus stand.
8+000	Traffic island with Proper road safety sign required for this Section. (Junction Location). Proposal for the Junction improvement due to Poor Geomerty of the Road.	To improve safety, prevent accidents, and better handle traffic flow at the junction.
11+700	<ul style="list-style-type: none"> Building Structure at this section on RHS will be protected by slightly shifting the alignment LHS Speed limit measure. 	To prevent damage to building structures and reduce speed-related accidents.
11+900	Landslide treatment plan	To prevent landslides and maintain the stability of the road in this area.
12+020	Retaining wall required LHS from km 12+020 to 12+040	To prevent erosion and maintain slope stability.
12+850 to 12+900	Landslide treatment plan	To stabilize the slope and prevent further landslide risks.
12+900 to 12+980	Landslide treatment plan	To reduce risk of soil erosion and landslides, ensuring road safety.
16+500 to 16+600	Landslide treatment plan	To stabilize the slopes and prevent landslides affecting road safety.
17+300 to 17+340	Protection work required RHS, Raising of profile	To prevent road deterioration and ensure the stability of the roadway.

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.
- Reserve forest (Ch.00+000 to 6+200) forest falls under this location. The Existing Road Blacktop is covered only with no further improvement.
- Curves and Bends will be smoothed out to improve geometric design. Where adjustments may affect local settlements, realignment of the road has been proposed.
- Paved shoulders will be provided wherever possible to accommodate non-motorized traffic.
- Unnecessary displacement will be avoided by adjusting the alignment, narrowing the impact zone, or

tailoring designs to meet both rural and urban cross-section requirements.

- Design speed will be reduced in densely populated areas to enhance safety.
- Impacts on existing shrines and places of worship will be minimized.
- Safety features, including speed control measures near schools and healthcare facilities, will be incorporated.
- Road elevation in settlement areas will be minimized to prevent water seepage into adjacent properties.
- Ensure continuous access to businesses and residential properties throughout the construction period.
- Minimize land clearance to reduce the loss of public and private assets, including wells, tree plantations, and other community resources within the project area.
- Landslide-prone sections at chainages 11+900, 12+850–12+980, and 16+500–16+600 will be stabilized using retaining walls, slope grading, and surface protection with vegetation or geotextiles, combined with drainage measures to prevent water accumulation and regular monitoring for slope stability.

7. STAKEHOLDER CONSULTATION AND INFORMATION DISCLOSURE

This chapter provides an overview of the stakeholder consultations carried out as part of the Environmental and Social Impact Assessments (ESIA) for the proposed Meghalaya Logistics and Connectivity Improvement Project (MLCIP). These consultations were aimed at ensuring a participatory approach to identifying and addressing potential environmental and social impacts associated with the project.

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

Table 7.1: List of relevant stakeholders

Category of stakeholder	Type of stakeholder
Project-Affected Parties	<ul style="list-style-type: none"> • Village community • Street side Shop Owners • Shop owners (NTH) • Residential structure owners <p>Nokma</p>
Interested Parties	<p>A. Government agencies</p> <ul style="list-style-type: none"> ▪ Public Works Department (Roads), Meghalaya (PWD-R) ▪ Garo Hills Autonomous District Council (GHADC) ▪ Meghalaya Forests & Environment Department ▪ Meghalaya State Pollution Control Board (MSPCB) ▪ Meghalaya State Biodiversity Board (MSBB) ▪ Land Records & Revenue Department, Meghalaya ▪ Meghalaya State Disaster Management Authority (MSDMA) ▪ Meghalaya Energy Corporation Limited (MeECL) (for electricity & power supply) ▪ Public Health Engineering (PHE) Department (Water supply & sanitation) ▪ Agriculture Department, Meghalaya ▪ Irrigation Department, Meghalaya ▪ Transport Department, Meghalaya ▪ Urban Affairs Department, Meghalaya (instead of Town Committee) ▪ Health & Family Welfare Department, Meghalaya (including AIDS Control Society functions) ▪ Department of Arts & Culture, Meghalaya (instead of Directorate of Archaeology, Meghalaya) ▪ District Social Welfare Office (East Garo Hills) ▪ District Legal Services Authority ▪ District Child Protection Unit ▪ Office of the Child Development Project Officer ▪ Nokma <p>B. Civil society organizations: Local NGOs such as</p> <ul style="list-style-type: none"> ▪ Rongjeng Catholic Church– Engages in education & literacy, rural development, vocational training, child welfare in Rongjeng area ▪ Ampangdamgre Women’s SHG – Home processing unit: jam, jelly, RTS; skill training by ATMA (Agriculture Training) <p>Samanda Prapgre Women’s Multipurpose Cooperative Society Ltd– It works primarily</p>

Category of stakeholder	Type of stakeholder
	<p>on micro-savings and credit services, helping members access small loans and reduce dependence on moneylenders. The society also supports women’s livelihood activities.</p> <p>C. Community based Organization</p> <ul style="list-style-type: none"> ▪ Bio-Diversity Management Committee
Vulnerable groups	<ul style="list-style-type: none"> ▪ Women Headed Household (WHH), ▪ PAPs falling under Below Poverty Line (BPL), ▪ Scheduled Tribe (ST) categories, ▪ Persons with disabilities

During ESIA, consultations were conducted with representatives from all three categories of stakeholders. The consultations conducted with government agencies, communities, & other organizations with representation from vulnerable groups were undertaken. Special attention was given to engaging with communities from sub-project locations that are likely to experience significant impacts, such as impact on residential and commercial structures, impact on common property resources etc. Specific common property resources identified includes religious structures, public utilities, and other community assets critical to local livelihoods and cultural heritage.

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

Through public participation in consultations, stakeholder’s viewpoints and suggestions were captured as an input to the technical design, which were duly considered, and all the suggestions were incorporated in the project design to the extent feasible and /or warranted.

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

The project has prepared a project level Stakeholder Engagement Plan (SEP) which details out the procedures of stakeholder engagement during the project cycle. The SEP outlines the process, methods and frequency of engagement with various stakeholders and will be accordingly implemented during the project period.

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

7.1 Public Consultation

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

7.1.1 STAKEHOLDER CONSULTATIONS

Stakeholder consultations formed an integral part of the Environmental and Social Impact Assessment (ESIA) process. These consultations were carried out to ensure that the perspectives, concerns, and expectations of all relevant stakeholders particularly the project-affected persons, IPs, and vulnerable groups were effectively captured and integrated into project planning and decision-making. A total of five consultations were conducted as part of the Environmental and Social Impact Assessment (ESIA) process for the proposed road project. These included two preliminary public consultations, two Focus Group Discussions (FGDs) with youth and one Focus Group Discussions (FGDs) with women.

The details of consultations along the project road is presented in **Table 7.2**.

Table 7.2: Summary of consultations

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1.	Nengkhra	21-	Male	<ul style="list-style-type: none"> Participants appreciated the project and acknowledged its positive impact on the community. Highlighted concerns about non-functional streetlights Requested fair compensation and support in case of any demolitions affecting their properties or livelihoods. They also mentioned that their children education is hampering due to poor road condition. 	<ul style="list-style-type: none"> Construct smoother roads to enhance accessibility and improve transportation. Prioritize immediate repairs to address safety and mobility concerns in the community. Ensure fair compensation and support for individuals affected 	 <p>Latitude: 25.510289 Longitude: 90.612003 Elevation: 269.08±11.5 m Accuracy: 8.19 m Time: 21-08-2025 12:30 Note: RSN Powered by NoteCam</p>
2.	Rongrenggre	21-	Women & man	<ul style="list-style-type: none"> Local communities, who overwhelmingly support strengthening and constructing the road as soon as possible. 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. They also mentioned that their children education is hampering due to poor road condition 	<ul style="list-style-type: none"> 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. 	 <p>Latitude: 25.51646 Longitude: 90.663649 Elevation: 372.78±6.73 m Accuracy: 3.79 m Time: 21-08-2025 11:37 Note: RSN Powered by NoteCam</p>

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
Preliminary consultation						
Key Informant Interview						
3.	DFO	21-08-2025	DFO	Existing RoW should be maintained at Community forest and Elephant passing	While designing the road through community forest areas and identified elephant passing locations, it is recommended that the existing Right of Way (RoW) be maintained without any additional widening, so as to minimize forest clearance and habitat disturbance. The road should be strengthened and upgraded within the available formation width, with slope protection measures such as bio-engineering and turfing instead of concrete structures to retain the natural landscape. At critical elephant crossing points, suitable wildlife-friendly structures such as underpasses or overpasses should be incorporated, along	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					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.	
4.	Forest ranger office	23-08-2025	Forest ranger and Forest Gard	Community land with vegetation: Issues and processes related to management, access, and dependency on community forest resources. Floral Diversity: Presence of floral species, including		 <p>Latitude: 25.993825 Longitude: 90.457013 Elevation: 57.85±3.8 m Accuracy: 4.289 m Time: 23-08-2025 13:51 Note: RBB</p>

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

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
6.	DPR Consultant	26-08-2025	DPR Consultants	<ul style="list-style-type: none"> Preliminary observations from 22 km site visit were presented, along with information requirements. Current data for Existing Right of Way (EroW) and Proposed Right of Way (ProW) is unavailable. ProW will be considered as 12 meters, in accordance with relevant codes for state highways. <p>A topographic survey has been conducted within a 60-meter width.</p>	<ul style="list-style-type: none"> Incorporate the 12-meter Proposed Right of Way (ProW) into the design to ensure compliance with relevant codes for state highways. Utilize the data from the topographic survey conducted within a 60-meter width to inform the design process and address any topographical challenges. Develop flexible design options that can accommodate variations in the ProW, ensuring that any potential adjustments can be made without significant delays. Integrate drainage solutions into the design to manage water runoff effectively, particularly in areas prone to landslides or flooding. Consider the inclusion of safety features such as guardrails and proper signage to enhance road safety along the newly proposed road alignment. Plan for ecological assessments to ensure that the road design minimizes environmental impacts, especially in sensitive areas identified during the site visit. Allow for future expansion possibilities in the design to accommodate potential increases 	 <p>Latitude: 25.58179 Longitude: 91.884458 Elevation: 1510.9±2.04 m Accuracy: 286.1 m Time: 25-08-2025 16:48 Note: Discuss/review</p> <p>Powered by NoteCam</p>

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					<ul style="list-style-type: none"> 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. 	
7.		18/09/2025	Street Vendor	<ul style="list-style-type: none"> Street vendors acknowledged that improved road connectivity will help increase footfall and provide more opportunities to reach customers. They expressed that a cleaner and well-managed roadside environment would support safer vending operations. However, they also requested proper waste disposal arrangements and temporary space management during construction to ensure their livelihoods are not disrupted. 	<ul style="list-style-type: none"> Designate formal vending zones along the corridor with sufficient width to avoid interference with moving traffic. Provide raised platforms or marked vending spaces to organize vending activities and improve safety for both vendors and customers. Integrate waste collection points and bins within vending zones to maintain cleanliness in the commercial stretch. Ensure temporary vending areas are identified and provided during construction phases so that livelihoods are not disrupted. Add common facilities such as public drinking water points and sanitation facilities near vending zones to support a hygienic environment. 	
8.		18/09/2025	Shop keeper	<ul style="list-style-type: none"> Shopkeepers along the RSN Road shared 	<ul style="list-style-type: none"> Provide continuous and paved footpaths in commercial stretches 	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
		5		that the proposed road development will greatly benefit their businesses by improving customer access and increasing market visibility. Better and smoother roads will facilitate easier transport of goods, reduce delays, and enhance the overall commercial environment. They also highlighted the need for proper drainage systems to prevent flooding in front of shops, which often disrupts business activities.	<p>to allow customers safe and easy access to shops.</p> <ul style="list-style-type: none"> ▪ Ensure the design includes covered or appropriately graded drainage systems to prevent waterlogging in front of shops during rains. ▪ Allocate designated roadside loading–unloading bays so that goods can be transported without obstructing traffic flow. ▪ Install adequate streetlighting in market areas to improve visibility and support longer business hours. ▪ Ensure clear signages and pedestrian crossings near market clusters for safe and smooth movement of customers. 	
	Youth					

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
9.		15./09./25	Youth (8 No.)	<ul style="list-style-type: none"> • Limited local opportunities, inadequate skill development platforms, and lack of structured guidance • Migration remains a major coping strategy, but often comes with social and economic risks 	<ul style="list-style-type: none"> • Integrate capacity-building and skill development components • Encourage microenterprise development by promoting small-scale livelihood opportunities 	
10.		23.09.2025	Youth (5 nos.)	<ul style="list-style-type: none"> • Promote skill-building, entrepreneurship, • Better road connectivity for transportation of goods and services 	<ul style="list-style-type: none"> • Establish feedback and monitoring mechanisms through the Stakeholder Engagement Plan (SEP) • Integrate capacity-building and skill development components 	 <p>Latitude: 25.500413 Longitude: 90.689164 Elevation: 256.01m Accuracy: 3.8m Time: 23-09-2025 16:47 Note: FPIC 2.0 meeting at Nengkhra</p>
	Women FGD					

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
11.		19.09.2025	Women (5)	<ul style="list-style-type: none"> • Women are eager to contribute economically but are constrained by limited opportunities, social barriers, and lack of structured support • There is a pressing need for inclusive, women-centric interventions that promote local entrepreneurship, skills, and connectivity 	<ul style="list-style-type: none"> • Integrate women-focused skill development initiatives • Strengthen participation of women's Self-Help Groups (SHGs) in project-related awareness, monitoring, and plantation maintenance programs. 	
12		23.09.2025	women	<ul style="list-style-type: none"> • During the consultation, gender-related issues and concerns were discussed in detail with the women participants from the local community. The discussion emphasized the importance of women's participation and empowerment in project-related activities. 	<ul style="list-style-type: none"> • The Assistant Executive Engineer, PWD (Roads), William Nagar Division informed the participants that women engaged in any project-related work will be entitled to equal pay for equal work, in compliance with statutory norms. • He further assured that the project will ensure gender-sensitive facilities, including provision of separate sanitation units for women and adequate accommodation wherever required. The womenfolk appreciated the discussion and expressed their support for the project highlighting the need for continued attention to safety, privacy, and equal employment opportunities during implementation. 	

7.1.2 FPIC PROCESS

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

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

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

The FPIC process was carried out in a phased and participatory manner, beginning with preliminary stakeholder mapping and engagement with the local Nokmas (Village Head).

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

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

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

Information related to the proposed road project was disseminated in a culturally appropriate and accessible manner to ensure full understanding and participation of Indigenous communities. Project details including road alignment maps, typical cross-sections, and environmental and social management measures were presented using simple visual aids such as diagrams, maps, and posters. These materials were translated into the local Garo language and explained

verbally during meetings to accommodate all literacy levels. The consultation sessions were facilitated by local interpreters and community mobilizers familiar with local customs and communication practices, ensuring clarity and mutual understanding. Frequently Asked Questions (FAQs) like project objectives, timelines, expected benefits, and potential risks were addressed during each session. Meetings were conducted in familiar community spaces, allowing both men and women, including elders and youth, to freely participate and express their views. This culturally sensitive approach ensured that the FPIC process was inclusive, transparent, and fully aligned with the traditional decision-making systems of the Garo community.

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

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

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

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

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

Official Invitations to Stakeholders – The Village Council agreed to call a meeting with village heads, traditional leaders, elders, women's groups, affected persons, and youth representatives to facilitate the consultation process. A mutually agreed-upon schedule was developed to ensure that community members had ample time to participate in discussions. The schedule outlined the sequence and timing of pre-consultation meetings, FPIC rounds, and focus group discussions covering initial one-on-one meetings (25–30 August 2025), the first FPIC consultations (15 September 2025), the second FPIC consultation (23 September 2025) and Third round FPIC consultation (11 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 **15.09.2025** at *Nengkara Bazar, East Garo Hills* at 3.30 PM with a total of 38 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 RSN Road was by the ESIA team on 23.09.2025 at Nengkara Bazar, East Garo Hills at 3.30 PM 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), Simsanggre sub division William Nagar 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, 38 participants engaged actively in the discussions, reflecting the community's genuine interest in the proposed infrastructure development.
 - The meeting was organized in a structured manner to cover all key aspects. It commenced with the chairperson reading out the minutes of the first FPIC meeting to maintain continuity and transparency. This was followed by a detailed presentation of the Detailed Project Report (DPR), a comprehensive session on the Environmental and Social Impact Assessment (ESIA), and an informative discussion on the Grievance Redress Mechanism (GRM). To encourage active and inclusive participation, two parallel group discussions were held: one dedicated to women participants to capture their specific perspectives, and another with the youth group to gather their insights and suggestions. This structured approach ensured that diverse viewpoints were acknowledged and documented, thereby strengthening the participatory nature of the FPIC process.
 - The third round of consultations for FPIC for the *project road* was subsequently convened at Nengkra Bazar on dated 10th October 2025. The third round of FPIC consultation was conducted to reconfirm and document the communities' consent to the proposed project interventions following the disclosure of detailed design, mitigation measures, and findings from the Environmental and Social Impact Assessment (ESIA). It also served to validate the outcomes of the previous FPIC meetings. The session provided an opportunity for stakeholders to review the commitments made by the implementing agency, discuss the finalized mitigation and benefit-sharing measures, and formally reaffirm community consent before the project's implementation phase.
- The proceedings were presided over by the Executive Engineer (EE), William Nagar division, with active participation from the representatives of key consultancy firms including Enviro Infra Solutions (ESIA Consultants), Rodic Engineering Services Pvt. Ltd. (DPR Consultants), and Satra Consultancy (ESMF Consultants). Local stakeholders, including village headmen, women, and youth representatives, also took part, ensuring broad-based and inclusive participation. In total, 50 local stakeholders participants engaged actively in the discussions, reflecting the community's genuine interest in the proposed infrastructure development. The signed mom of the FPIC proceedings are enclosed in Annexure 7.3 of this report.

Sufficient time and Information to enable Informed Consent – Consultations were conducted in Garo, the local

language, to ensure informed participation. A prior notice was issued to inform communities about the meeting schedules. During the FPIC meeting, the project team provided detailed information on project impacts, benefits, mitigation measures, and grievance mechanisms. The indigenous communities were given adequate time to discuss, ask questions, and deliberate before providing or withholding consent for the project.

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

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

Table 7.3: Summary of the FPIC 1 Meeting

Topic	Details
Road Widening Plan	The Assistant Executive Engineer explained that in certain stretches, the existing carriageway is only 3.75 m wide and will be improved to 5.5 m (intermediate lane). Portions already double-lane, especially in town areas, will remain unchanged.
Land Requirement	Limited land may be needed for works such as retaining walls, though mostly within the existing ROW. He requested cooperation of local people wherever minor land support might be required.
Project Importance	The RSN Road is the only route connecting NH-127B and NH-62 to the East Garo Hills District Headquarters. The road provides access to key public services including health centers, college, and administrative offices (e.g., birth & death registration). Improvement is therefore critical for better connectivity, access to public services, and regional development.
Stakeholder Feedback – General	- Shri Arthen N. Marak (Nengkhra village): Strongly welcomed the project, noted the miserable current condition of the road, highlighted dependence on it for accessing district HQ, raised no objection, and appealed to all villagers to cooperate for timely completion. - Nokma (traditional leader): Expressed happiness, acknowledged benefits for the locality and wider region, and encouraged cooperation with the authorities. - Other villagers: Echoed similar views, expressing support for the project.

Stakeholder Feedback – Women	Two women participants raised queries regarding the extent of increase in road width under the intermediate lane proposal. Their concern centered on whether widening would extend beyond the ROW and impact nearby land or properties.
Engineer’s Response	The Executive Engineer clarified that in most stretches, widening would remain within the existing ROW. The exact width will be determined only after the survey is complete and will be communicated in the next FPIC meeting.
Community Sentiment	The overall response from the community was supportive. Residents, including women and the Nokma, expressed willingness to cooperate with the authorities for successful implementation. The project was seen as essential for social and economic betterment.
Grievance Redressal Mechanism	The Executive Engineer announced the formation of a Grievance Redressal Mechanism (GRM). This platform will allow joint monitoring of project-related issues, ensuring transparency and providing space to address local concerns during implementation.



Figure 7.1: Photograph of 1st FPIC meeting held on 15th September 2025 at Nengkhara Bazar, East Garo Hills at 3.30 PM

FPic II. Details

The Second FPIC meeting was chaired by Shri Satjira A. Sangma, AEE, PWD (Roads), Simsanggre Sub-Division, East Garo Hills. He welcomed the stakeholders to the meeting and read out the minutes of the first FPIC, which were accepted by the stakeholders through a show of hands. Shri K.M.G. Momin, Executive Engineer, PWD (Roads), Williamnagar Division, then took the floor and briefly explained the previous meeting's discussions. He further elaborated on the purpose of the second FPIC, informing the house that the draft DPR for the project has been prepared and is now open for revision and discussion. He clarified that the draft DPR is only preliminary and will undergo examination before finalization.

Shri Neeraj Kumar, DPR Consultant from RODIC, presented the draft DPR and informed that the project length is 20.500 km. The stretch from 0.00 km to 5.00 km falls under the State Forest Reserve, where no improvement work would be carried out, while the remaining stretch from 6.00 km to 20.500 km would be improved as necessary. He apprised that the draft DPR proposes widening of the existing 3.75 m carriageway to 5.50 m, upgrading it to an intermediate lane. The road formation would extend up to 5.00 m from the centre line of the existing roadway to accommodate shoulders and side drains as per IRC specifications. This may require minor deviations from the existing ROW in certain stretches, although in most cases, the ROW is sufficient for intermediate lane standards.

Shri Pangteson N. Marak, (Nokma Chra) and a resident of the area, spoke about the importance of the RSN road, which connects Williamnagar, the District Headquarters of East Garo Hills. He stressed that widening the road from 3.75 m to 5.50 m with shoulders and side drains is crucial, and most stretches have sufficient width to accommodate the upgrade. In stretches that fall short of the standard, he assured cooperation from villagers to meet the requirements. He emphasized that road improvement is of utmost importance for the region and reminded residents of their earlier agreement to provide land for the project. He also stressed the need for good construction practices to meet public expectations. Shri Marak further raised queries on the provision of culverts, side drains, and other structures at necessary locations to prevent negative impacts. He also sought clarification on whether stakeholders would have the right to raise objections or demand rectification in cases of unsatisfactory work. In response, the Executive Engineer stated that a Grievance Redressal Mechanism has been established for this very purpose.

The discussion further included the need to physically verify the location of additional requirements, such as retaining walls, and to present them in the next meeting. The DPR consultant also mentioned that community amenities like bus waiting sheds may be considered, provided landowners are willing to part with their land. The Executive Engineer added that such amenities could be managed by the landowners themselves or through a community body, which could generate income and support sustainable livelihoods.

The AEE informed the stakeholders that a detailed site inspection would soon be conducted to consider additional requirements for retaining walls, drainage works, and other mitigation measures for inclusion in the DPR.

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

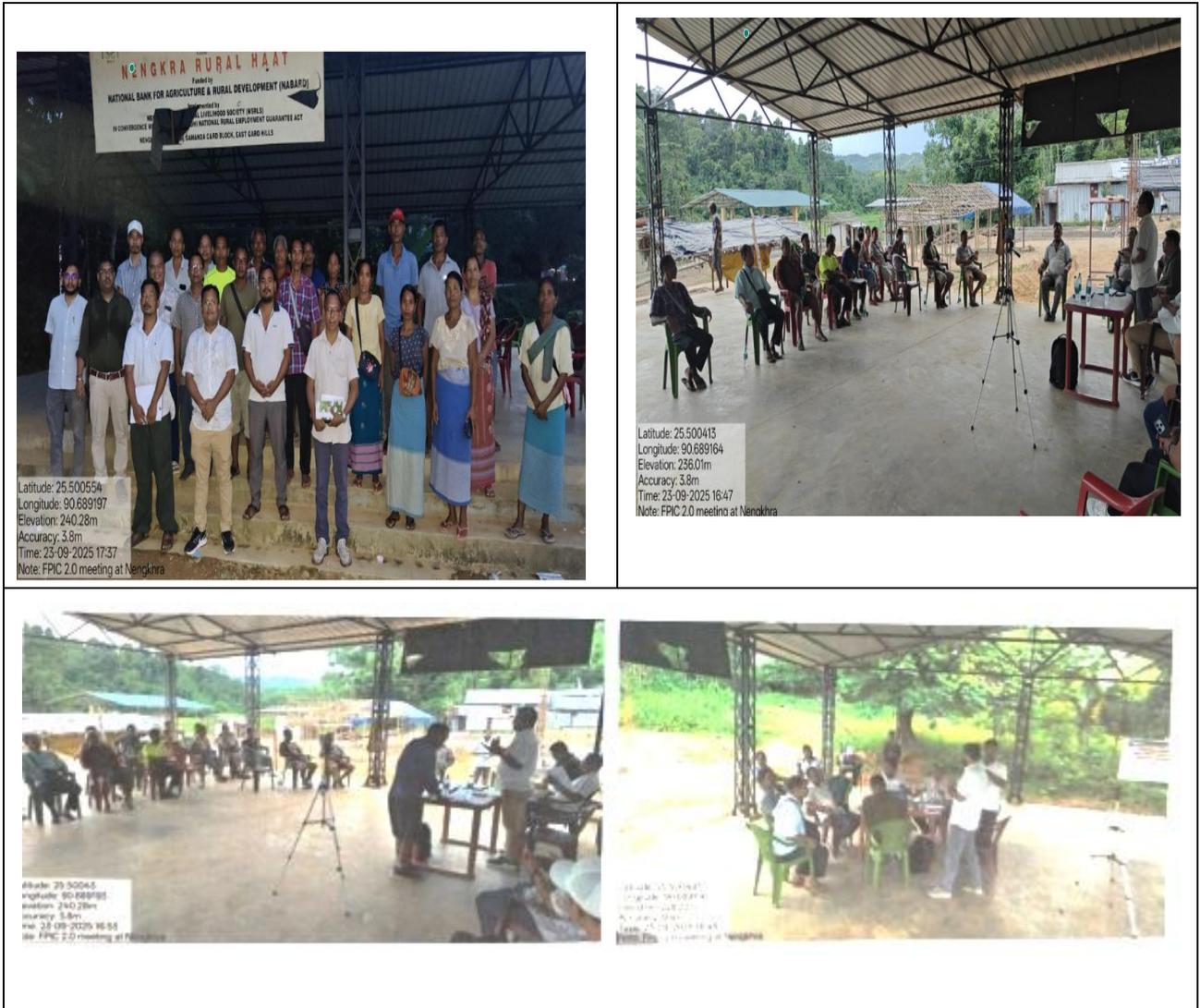


Figure 7.2: Photograph of IInd FPIC meeting held on 23rd September 2025 at Nengkhara Bazar, East Garo Hills at 3.00 PM

Summary of Proceedings – Third Round FPIC Meeting

The third FPIC meeting for the proposed Improvement and Widening of Rongrenggre-Simsanggre-Nengkhra (RSN) Road was chaired by the Executive Engineer, PWD (Roads), Williamnagar Division, 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 Improvement and Widening 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:

Communities requested site-specific improvements such as:

- Construction of public toilets and bus waiting sheds at identified locations (At chainage 13+500 (public toilet), 21+820 (public toilet), 11+900 (public toilet & bus waiting shed), 17+208 (public toilet & Bus waiting shed) and 18+800 (public toilet & Bus waiting shed)).
- Retaining walls in landslide-prone areas.
- Safety measures near schools and perennial streams and vulnerable slopes.
- Protection works to prevent impact on local households and paddy fields.
- Review and inclusion of concerns from previous FPIC meetings regarding social and environmental impacts.

ESIA Findings:

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

Construction Phase Concerns:

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

Other Key Points:

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

Conclusion:

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



Figure 7.3: Photograph of Illrd round of FPIC meeting held on 10th October 2025 at Nengkra Bazar.

8. ENVIRONMENTAL AND SOCIAL MANAGEMENT, MONITORING AND REPORTING PROGRAMME

8.1 GENERAL

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

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

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

8.2 ENVIRONMENT AND SOCIAL MANAGEMENT PLAN

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

Table 8.1: Environment and Social Management Plan

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

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ The land will be handed back to the owner in the same condition as it was prior to the commencement of project activities, once the project is completed. ➤ Contractor to produce the lease agreements, NOC etc. for these lands. 			
5	Supply of Construction Material	Sourcing materials from unauthorized sources.	<ul style="list-style-type: none"> ➤ Procurement of construction material only from approved quarries and sites and licensed/ authorized vendors/ manufacturers. Contractor to produce approvals and receipts. 	Contractor	EC, Permits, challans, Material source approval copies;	MPWD/CSC
6	Water	Pollution of surface and groundwater sources.	<ul style="list-style-type: none"> ➤ The Contractor will be responsible for arranging adequate supply of water for the entire construction period. ➤ The contractor will minimize the pollution and wastage of water during construction 	Contractor	Permission for Water source; Usage records; Wastewater management measures	MPWD/PMC/CSC
7	Appointment of Environment, Social and Safety Officers	Inefficient and incompetent supervision by contractors may lead to negative impacts on environment, Social, health and safety.	<ul style="list-style-type: none"> ➤ The Contractor would prepare OHS plan and other required plans; as a part of CESMP, as per the WB guidelines. ➤ The contractor will appoint qualified and experienced Environment. Social and Safety personnel to ensure implementation of CESMP and occupational health and safety issues at the camps and construction work sites. 	Contractor	To be mobilized before construction; approved OHS plan	MPWD/PMC/CSC
8	Identification of OHS Hazard and Risk Categorization	May cause physical harm, injury, illness, or death to workers.	<ul style="list-style-type: none"> ➤ Conducting workplace inspections to identify hazards and document. ➤ Consulting with workers to identify hazards that may not be obvious to employers or safety professionals. 	Contractor	OHS hazard register; Inspection reports;	MPWD/CSC

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			<ul style="list-style-type: none"> ➤ 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. 			
9	Other Construction Vehicles, Equipment and Machinery	Vehicles and equipment not complying with regulations may lead to pollution of environment.	<ul style="list-style-type: none"> ➤ The contractor will maintain records of fitness and Pollution Under Control (PUC) certificates for all vehicles and generators used during the contract period 	Contractor	Records of valid PUC / fitness; Inspection log	MPWD/PMC/CSC
10	Tree Cutting	Loss of green cover and biodiversity	<ul style="list-style-type: none"> ➤ Maximum efforts shall be made to minimize the number of trees to be felled. ➤ Tree cutting and disposal shall be done as per the Forest Dept. 	Contractor	Records of trees cut and saved.	MPWD/CSC
11	Joint field verification	The impacts may not have been identified in time.	<ul style="list-style-type: none"> ➤ The MPWD and the Contractor shall carry out joint field verification to ascertain the local complaints/suggestions and to confirm the need for additional protection measures or changes in 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	<ul style="list-style-type: none"> ➤ The Contractor will have to obtain the Environmental Clearance for borrow areas. 	Contractor	Borrow area EC copy; Approved	MPWD /CSC

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		eco-system and lead to unproductive environment	➤ The borrow area will be operated as per the MoEFCC guidelines issued by the concerned SEAC and SEIAA.		management and closure plan	
13	Identification of construction material transportation route	Inconveniences and safety issues to the public due to the material transport vehicles.	<ul style="list-style-type: none"> ➤ The material transport route through existing network of roads should be planned and approved by the local transport authorities. ➤ The local communities need to be consulted with prior information on any likely inconveniences. 	Contractor	Approved route plan; Community consultation record	MPWD/CSC
14	Identification of sites for debris disposal or wastes generated from construction camps and site offices	Pollution due to indiscriminate dumping of wastes. Wastes entering water bodies and groundwater causing pollution	➤ MPWD Division and the Contractor are responsible for identifying a suitable area in consultation with local administration to dispose of the wastes from labour camps, construction sites and site offices.	Contractor	Approved disposal site and its management plan; NOC, Agreement with landowner; Waste disposal records;	MPWD/CSC
15	Relocation of Utility and Common Property Resources (CPR)	Loss of services from utilities and common property resources for the public	<ul style="list-style-type: none"> ➤ When the utilities/ Common Property Resources need to be shifted, they will be shifted in consultation with the communities and with least inconvenience to the public. ➤ If any displacement of Utility/CPRs is required, they will be relocated with prior approval of the concerned agencies. The relocation site identification will be in accordance with the choice of the community. 	Contractor/ MPWD Division	Records of Relocation completion.	MPWD/ PMC/CSC
CONSTRUCTION						
1	Crushers, Hot mix Plants & Batching Plants	Impacts due to establishment and operation of plants and equipment	➤ Crushers, hot-mix and batching plants shall be located at least 1000m (1km) away from residential/ settlements, forests, wildlife movement areas, and	Contractor	Approved layout plan; Valid NOCs/Consents; Dust suppression	MPWD/PMC/CSC

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			<p>commercial establishments, preferably in the downwind direction.</p> <ul style="list-style-type: none"> ➤ The Contractor shall submit a detailed layout plan for all such sites and seek prior approval before entering into a formal agreement with a landowner for setting-up such sites. ➤ Specifications of crushers, hot mix plants, and batching plants shall comply with the technical requirements of the contract and prior Consent / NOC for all such plants shall be obtained. ➤ No such installation by the Contractor shall be allowed till all the required legal clearances are obtained from the competent authority. 		records; Air quality monitoring reports	
2	Borrow Areas	Impacts due to improper operation and closing of borrow areas	<ul style="list-style-type: none"> ➤ Borrow area should be located at a minimum distance of 300m from the residential/ settlement area. Proper barricading should be provided and access to the borrow areas should be restricted to the unauthorized persons. ➤ The Contractor should submit the EC, a copy of agreement with the landowner, borrow area management and closure plan before initiating any kind of borrowing activities. 	Contractor	EC and lease copies; Approved Borrow area restoration and Closure plan	MPWD/PMC/CSC
3	Quarries	Impacts due to improper management, operation and closing of quarries	<ul style="list-style-type: none"> ➤ The Contractor shall identify materials from legally valid quarries with existing NOC from the relevant departments. ➤ No quarry or associated plants can be set-up within 1000m from the residential/ settlement locations 	Contractor	Quarry permit, EC; Safety inspection report; Haul road maintenance record, dust suppression	MPWD/PMC/CSC

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			<ul style="list-style-type: none"> ➤ 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. 		measure, geotagged photos	
4	Dismantling of Bridges/ Culverts/ Structures	Impacts due to improper dismantling and disposal	<ul style="list-style-type: none"> ➤ All necessary precautions shall be taken while working near cross-drainage channels, to prevent earthwork, stonework, construction materials from obstructing cross-drainage at rivers, streams, and drainage systems, or from causing flooding. ➤ Reusable materials (e.g., steel, stones, bricks) shall be segregated and stored properly for reuse or recycling. ➤ Non-recyclable debris and waste materials shall be transported to approved disposal sites identified and approved by the concerned authority. ➤ Disposal sites shall be located away from water bodies, agricultural lands, and other environmentally sensitive areas. ➤ Temporary barriers or silt fences shall be provided to prevent debris from entering watercourses. ➤ Upon completion, the associated disposal sites shall be restored to their original condition or as directed by the Engineer 	Contractor	Debris disposal/reuse records; Approved Site restoration plan; Photographic documentation.	MPWD/PMC/CSC
5	Bituminous waste disposal	Impacts due to hazardous wastes	<ul style="list-style-type: none"> ➤ The contractor shall maintain records of quantities generated, transported, and 	Contractor	Records of Waste reused/disposed;	MPWD/PMC/CSC

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

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			<ul style="list-style-type: none"> ➤ All fuel and lubricant storage tanks shall be placed on impermeable platforms or within bunded (contained) areas. ➤ Regular maintenance and inspection of construction equipment and vehicles shall be carried out to prevent leakage of oil, fuel, or hydraulic fluids. ➤ Spill control kits (absorbent pads, sand, and containment booms) shall be available at all fuel storage and handling locations. ➤ Used oil and lubricants shall be collected, stored in labelled, leak-proof containers, and handed over only to authorized aggregators/recyclers for disposal in compliance with applicable hazardous waste regulations. ➤ Records of fuel usage, storage, and waste oil disposal shall be maintained and made available for inspection. ➤ Storm water runoff from fuel and equipment storage areas shall be directed through oil-water separators before discharge. 			
7	Air Pollution - Dust Generation	Dust generation will cause air pollution and will have impacts on health and safety.	<ul style="list-style-type: none"> ➤ Vehicles delivering materials should be covered to reduce spills and dust blowing off the load. ➤ Water should be sprinkled regularly on the work sites. ➤ Road slopes to be covered immediately after completion. ➤ Speed limits shall be enforced for construction vehicles within and near 	Contractor	Air quality monitoring reports; Dust suppression log; PPE compliance records	MPWD/PMC/CSC

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			<p>project sites to reduce dust generation.</p> <ul style="list-style-type: none"> ➤ Personal protective equipment (PPE) such as masks shall be provided to all workers exposed to dusty environments. ➤ Air quality monitoring shall be conducted periodically to ensure compliance with prescribed air quality standards. ➤ Community complaints related to dust shall be recorded, and addressed promptly. 			
8	Emissions	The emissions from vehicles and construction equipment will pollute the air causing health and safety issues as well.	<ul style="list-style-type: none"> ➤ Fitness and PUC of the vehicles and equipment's need to be ensured. ➤ LPG shall be used as fuel for cooking of food at construction labour camp instead of fuel wood. ➤ Dust extraction, collection and control systems shall be installed at batching plants, crushers, and material handling areas to minimize particulate emissions. 	Contractor	Valid PUC certificates; Equipment maintenance log; Emission test results	MPWD/PMC/CSC
9	Contamination of Surface / Ground Water	Discharges from construction activities and construction camps/labour will lead to surface/groundwater pollution.	<ul style="list-style-type: none"> ➤ All the debris resulting from construction activities and labour camp shall be removed from the site and disposed at approved sites away from water bodies, on a regular basis to prevent them from getting into surface runoff. ➤ Adequate sanitation and waste management facility to be provided in construction camp. 	Contractor	Water quality monitoring report; Waste disposal records; Camp inspection records. Photographic documentation.	MPWD/PMC/CSC

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

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

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			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.			
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 located in the areas already devoid of vegetation or having little vegetation	Contractor	Tree felling register; Plantation record;	MPWD/PMC/CSC
15	Terrestrial Flora and Fauna	Construction activities and workers may cause harm to flora and fauna.	➤ All the workers will need to be oriented and monitored by the contractor so as not to cause any harm to the flora and fauna. ➤ Hunting and fuel wood collection will be strictly prohibited	Contractor	Worker awareness attendance; Wildlife sighting log	MPWD/PMC/CSC
16	Aquatic Fauna	Construction activities and workers may cause harm to fauna.	➤ 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

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17	Occupational Health and Safety	When Occupational Health and Safety are compromised the associated risks from accidents and incidents could affect health and safety of the workers and others on construction/ project sites. Improper first aid facilities on the sites could affect health and safety of workers and others.	<ul style="list-style-type: none"> ➤ The Contractor would prepare OHS plan and other required plans as per the WBS guidelines. ➤ All the laborers to be engaged for construction works shall be screened for health and adequately treated before issue of work permits. ➤ Periodic health check-up of construction workers. ➤ Prevention of mosquito breeding need to be ensured at the project site and other ancillary areas ➤ The contractor's Environment and Safety personnels, shall ensure 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. 	Contractor	Approved OHS plan; OHS training log; PPE checklist; Awareness programme and Health inspection reports	MPWD/PMC/CSC

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

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>construction vehicles. In case of negligent driving, suitable action will be taken.</p> <ul style="list-style-type: none"> ➤ Speed restrictions shall be imposed on project vehicles to control speeding. ➤ Installation of temporary speed bumps to control speed near designated pedestrian crossing areas/school areas/ market places/ religious places/ human habitations. ➤ The general public/ residents shall not be allowed to any of the risk areas of the project, e.g., excavation sites, construction sites and areas where heavy equipment is in operation. ➤ In the consideration of risk at civil works, each labour should be covered under ECA 1923 insurance until completion of work. 			
19	Emergency Response system	Absence may result to increased incidents, injury, economic loss etc.	<ul style="list-style-type: none"> ➤ Develop and implement ERS ➤ Train personnel and Establish communication channels ➤ Systematic planning and training for emergencies. 	Contractor	Approved ERP; Emergency drill and training report; Incident response record	MPWD/PMC/CSC
20	Health Management – Communicable Diseases	The water fringe areas provide suitable habitats for the growth of vectors of various diseases, which is likely to increase the incidence of water-borne diseases.	<ul style="list-style-type: none"> ➤ There would be possibility of the transmission of communicable diseases due to migration of labour population from other areas at the construction site. ➤ Agreement shall be made with nearby health center or hospital for emergency treatment. 	Contractor	Health screening record; Awareness session log; Medical report; Agreement with nearby hospital	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ Special Measures for COVID 19 should be strictly followed at the camp and construction site. 			
21	Risk of Natural Hazards	The project area is at risk from floods and Earthquakes.	<ul style="list-style-type: none"> ➤ Protection of Agriculture Land near roads/ bridges. ➤ The mitigation measures should be adopted as per norms of State Disaster Management Authority, Government of Meghalaya. 	Contractor	Site assessment report; Record of Compliance with SDMA norms	MPWD/PMC/CSC
22	Risk of Force Majeure Combine with previous	These unforeseen risks can have both adverse environmental and social impacts	<ul style="list-style-type: none"> ➤ All reasonable precaution will be taken to prevent danger of the workers and the public from fire, flood, drowning, etc. ➤ All necessary steps will be taken for prompt first aid treatment of all injuries likely to be sustained during the course of work. ➤ Contractor has to prepare a response plan before start of construction works 	Contractor	Force majeure preparedness plan; Emergency contact list	MPWD/PMC/CSC
23	Hygiene	Impacts related to unhygienic surroundings	<ul style="list-style-type: none"> ➤ At every workplace, good and sufficient water supply shall be maintained to avoid waterborne diseases to ensure the health and hygiene of workers. ➤ Adequate drainage, mobile toilets shall be provided at workplace. ➤ Preventive Medical care shall be provided to workers. ➤ Proper Hygiene shall be maintained 	Contractor	Sanitation inspection record; Hygiene logbook	MPWD/PMC/CSC
24	Traffic Management	Unplanned and unmanaged traffic diversion and detours can result in public nuisance.	<ul style="list-style-type: none"> ➤ Before start of the construction, proper traffic management plan will be prepared and submitted to MPWD for approval. Secure assistance from 	Contractor	Approved TMP; Signage/barricade checklist; Traffic	MPWD/PMC/CSC

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			<p>local police for traffic control during the construction.</p> <ul style="list-style-type: none"> ➤ Necessary signage and barricading will be provided for safety of road users. ➤ Contractor will ensure that no construction materials and debris are lying on the road. It will be collected and disposed of properly. ➤ Unnecessary parking and sound pollution to be strictly avoided near settlements and sensitive receptor such as schools, hospital and cultural centers. ➤ The contractor will ensure that the diversion/ detour is always maintained in running conditions, particularly during the monsoon to avoid disruption to traffic flow. 		incident register; geotagged photos	
25	GBV-SEAH Risks	GBV-SEAH risks may arise due to labor influx	<ul style="list-style-type: none"> ➤ Ensure labor camps are away from settlement areas ➤ Ensure that every worker working in the project has been given an orientation on the Worker’s Code of Conduct, especially on GBV and SEAH, and has signed the Code of Conduct. ➤ Conduct periodic awareness programs targeted at women laborers and women and children of communities residing close to the work sites for reporting incidents of GBV- SEAH ➤ Ensure complaints of GBV- SEAH are recorded and addressed with urgency. Ensure that name(s) of complainant(s) 	Contractor	Signed CoC register; GBV training log; GBV complaint record	MPWD/PMC/CSC

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			<p>are kept in confidence and enable anonymous reporting of complaints.</p> <ul style="list-style-type: none"> ➤ Activate GBV Grievance Redressal Committee immediately on receipt of any GBV- SEAH complaint. Take action on recommendation of the GBV Grievance Redressal Committee within 24 hours of submission of the report. 			
26	Chance Finds	There is a possibility of Cultural relics, Chance finds at the construction sites. Without proper plan these artefacts may be misused by contractor/ workers.	<ul style="list-style-type: none"> ➤ If any cultural remains of geologic or archaeological interest are found, CSC and MPWD shall be immediately informed of such discovery and carry out the instructions for dealing with the same. 	Contractor	Chance find report; Notification records	MPWD/PMC/CSC
27	Compliance to Labour Welfare Laws and reporting	Workplace accidents and injuries, unsafe working condition, loss of productivity etc.	<ul style="list-style-type: none"> ➤ Establish a policy and ensure the compliance within the organization, from the top to the lowest-level employee, understands the importance of 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. 	Contractor	Labour law compliance record; Training attendance record	MPWD/PMC/CSC

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			<ul style="list-style-type: none"> ➤ Employees should be kept updated on the organization's compliance with labour laws. This could be done through regular training sessions, newsletters, or other communication channels. 			
28	Labour Influx	Strain on infrastructure, such as housing, healthcare, and education; social tension, as new arrivals compete with locals for jobs and resources.	<ul style="list-style-type: none"> ➤ Proper plan for labour influx by investing in infrastructure and social services. ➤ Governments can regulate the flow of labour to ensure that it is orderly and sustainable. ➤ Local communities can engage with new arrivals to help them understand the local culture and customs. ➤ Maximum use of local labours 	Contractor	Labour License and registration records; Local labour hiring records.	MPWD/PMC/CSC
29	GRM	Increased impunity, conflict and violence; Loss of trust and confidence	<ul style="list-style-type: none"> ➤ Establish a grievance redressal mechanism ➤ Ensure that the mechanism is impartial and independent ➤ Provide adequate support to people who use the mechanism ➤ Communicate effectively with people about the mechanism 	Contractor	GRM register; Grievance resolution records	MPWD/PMC/CSC
30	Monitoring and Reporting (Monthly/ Quarterly)	Monitoring environmental attributes like (Air, Water, Noise & soil microbiology) and proper reporting are important for the successful ESMP implementation	<ul style="list-style-type: none"> ➤ The parameters to be monitored, frequency and duration of monitoring as well as the locations to be monitored will be as per Monitoring Plan prepared. ➤ Regular submission of CESMP implementation monitoring report 	Contractor	Monthly/quarterly ESMP compliance report; Monitoring data records	MPWD/PMC/CSC
	Operation Phase					

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

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
4	Dust Generation from Vehicular Movement	Deterioration of ambient air quality; Nuisance to roadside residents and vegetation; Reduced visibility	<ul style="list-style-type: none"> ➤ Establish and maintain roadside plantation to serve as dust barriers. ➤ Maintain smooth road surfaces to minimize dust generation. ➤ Install signage discouraging over-speeding, which increases dust levels. 	Contractor	Air quality results; Plantation survival record	MPWD
5	Air Pollution from Vehicular Emissions	Increased levels of NOx, SO ₂ , CO, and PM; Health impacts on local population; Deterioration of roadside vegetation	<ul style="list-style-type: none"> ➤ Conduct ambient air quality monitoring at sensitive locations. ➤ Maintain green buffers along the corridor. ➤ Organize awareness campaigns for drivers on emission reduction and vehicle maintenance. 	Contractor	Air quality results; Plantation survival record ; Awareness records	MPWD
6	Noise Pollution from Increased Traffic Movement	Noise nuisance to residents; Disturbance to schools, hospitals, and wildlife	<ul style="list-style-type: none"> ➤ Conduct periodic noise level monitoring. ➤ Provide noise barriers, dense plantation near sensitive receptors. ➤ Enforce "No Horn" zones near schools and hospitals. ➤ Maintain road surface to minimize noise due to uneven pavement. 	Contractor	Noise monitoring results; Maintenance records	MPWD
7	Road Safety and Accident Risks	Traffic congestion; Increased likelihood of road accidents; Risk to pedestrians and local communities	<ul style="list-style-type: none"> ➤ Install and maintain proper signage, reflectors, and road markings. ➤ Ensure adequate lighting at intersections and pedestrian zones. ➤ Provide speed control measures and pedestrian crossings in settlement areas. ➤ Conduct community road safety awareness programs. 	Contractor	Accident record; Safety audit report; Awareness records	MPWD
8	Maintenance Waste from Roadside	Soil and water contamination from indiscriminate disposal;	<ul style="list-style-type: none"> ➤ Collect and dispose of maintenance waste at designated locations. 	Contractor	Waste logbook; Disposal records	MPWD

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
	Maintenance, Drain Cleaning, or Repairs	Visual pollution and clogging of drains	<ul style="list-style-type: none"> ➤ Prohibit dumping into drainage channels or low-lying areas. ➤ Reuse or recycle suitable materials (e.g., asphalt, concrete, metal). 			

8.3 PERFORMANCE INDICATORS

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

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

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

8.4 MONITORING PLAN FOR ENVIRONMENTAL CONDITIONS

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

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

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

8.5 MONITORING PLAN FOR SOCIAL CONDITIONS

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

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

Environmental Attribute	Timing	Parameter	Standards	Frequency	Duration	Location	Total no. of Samples during construction and operation stage.	Implementation
Air	Construction	CO, NOx, PM10, PM2.5 and SO2	CPCB Guidelines (NAAQMS/ Volume- I/2013-14)	3 locations for 3 Seasons* for 2 consecutive years	24 hours sampling	3 locations (Construction Plant Sites, settlements and Work Zones)	18	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
	Operation			3 locations for 3 Seasons for 1 Year		At 3 locations during operation stage where monitoring had been done during construction stage	9	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
Water	Construction	As per Drinking Water Standards	Indian standards for inland surface waters (IS:2296,1982) and for drinking water (IS:10500-2012)	(surface water at 2 locations for 3 Seasons for 2 consecutive years. Ground water at 2 locations for 3 seasons for 2 consecutive years	As per Grab Sampling guidelines	Drinking water samples from the labour camps and from hand pumps. Surface water from the water courses near the work site and River.	24	Contractor through NABL accredited Laboratory and supervised by Construction Supervision Consultant
	Operation			Surface water 2		At 4 locations	12	Contractor through

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

Environmental Attribute	Timing	Parameter	Standards	Frequency	Duration	Location	Total no. of Samples during construction and operation stage.	Implementation
						During operation stage where monitoring had been done during construction stage		Laboratory and supervised by Construction Supervision Consultant

*Except Monsoon

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

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

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

Table 8.4: Reporting System for environmental & social management

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

Operation Stage						
Pollution Monitoring	For one year	As required	Quarterly	As per monitoring plan	-	-

Table 8.5: Reporting System for operational performance indicators

Item	Stage	Contractor	Project Management Consultant (PMC)	
		Implementation & reporting to PMC	Supervision	Reporting to ESMU
Approval of Construction Camp/Plant Site and its Management Plan	Pre-Construction	One Time	One Time	One Time
Approval of Borrow Management Plan (General & Specific)	Pre-Construction	General –One Time Specific re- development plan - one for each borrow area	Regular	Quarterly
Construction Camp and Plant Site Management	Construction	Monthly	Regular	Quarterly
Topsoil Management	Construction	Monthly	Regular	Quarterly
Pollution Control and Construction Plants	Construction	Monthly	Regular	Quarterly
Pollution Monitoring	Construction and Operation	-		Quarterly
Vehicles and Pollution Control	Construction	Monthly	Regular	Quarterly
Details of the DG Sets and Pollution Control	Construction	Monthly	Regular	Quarterly
Details of Oil Storage	Construction	Monthly	Regular	Quarterly
Working at Water Courses & Pollution Control	Construction	Monthly	Regular	Quarterly
Details of Water Extraction	Construction	Monthly	Regular	Quarterly
Details of Personal Protective Equipment	Construction	Monthly	Regular	Quarterly
Status of Consent for Water Extraction	Construction	Quarterly	Quarterly	Quarterly
Deviations and Corrective Actions	Construction	—	Monthly	Quarterly
Implementation of Enhancement Measures for Cultural Properties, Water Harvesting Structures	Construction	Monthly	Regular	Quarterly
Debris generated by the hill ward side widening, cutting of hill slopes	During construction	Throughout the construction period	Regular	Quarterly
Grievance Redressal Mechanism during Construction	During Construction	Monthly	Regular	Monthly
Work Force Management	During Construction	Monthly	Regular	Quarterly
Occupational Health Safety Measures	During Construction	Monthly	Regular	Quarterly
Road Safety Measures	During	Monthly	Regular	Quarterly

	Construction			
Accidents Reporting	During Construction	Monthly	Regular	Quarterly

During regular monthly meetings, environmental and social aspects should be discussed, with the staff responsible for implementing the Environmental and Social Management Plan from the Contractor, CSC, PMC and MPWD/ESMU

Environmental Monitoring Cost

The environmental monitoring budget has been estimated based on the project's length and the existing environmental conditions along the proposed alignment. A total of INR 8,28,000 has been projected to cover environmental monitoring activities during both the construction and operation stages. Detailed cost estimates of Environmental Monitoring are provided in **Table 8.6**.

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

8.6 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 ESIA for DPRs and other E&S documents.

8.6.1 Governance and Overall Institutional Structure of The Project

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

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

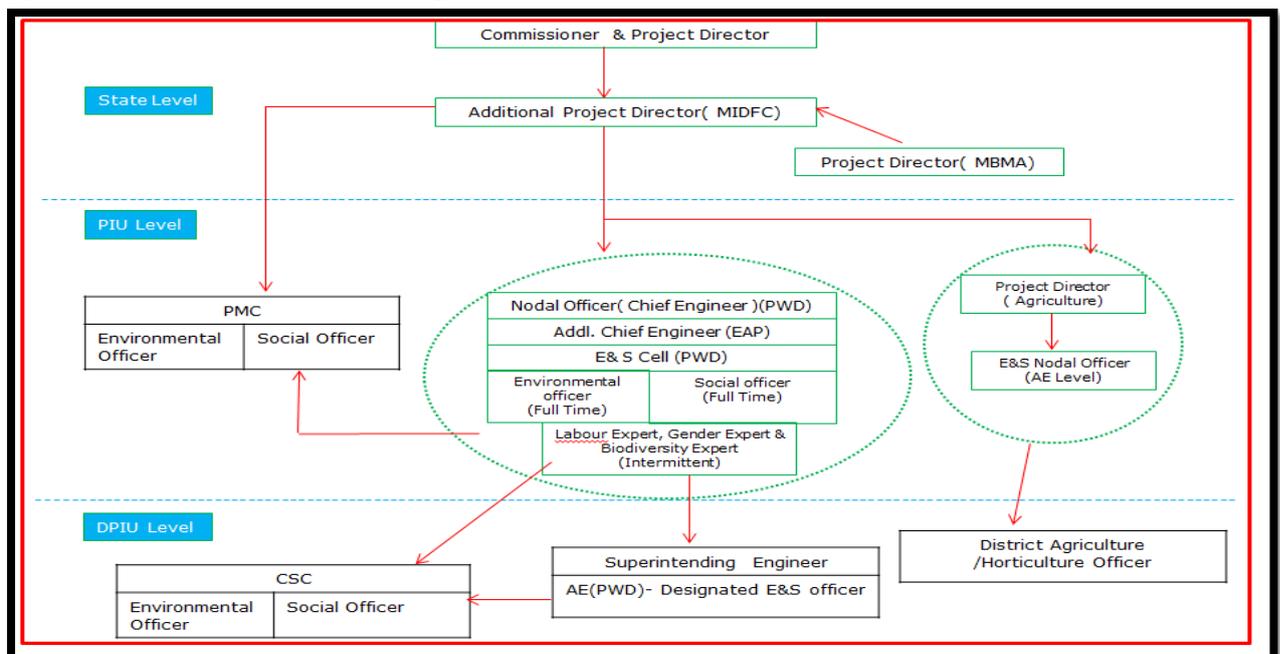


Figure 8.1: Project Implementation Arrangement

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

Divisional Project Implementation Units (DPIU – PWD)

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

District Project Implementation Unit (DPIU –DoA / MBMA)

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

Project Management Consultant (PMC)

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

Supervision Consultant:

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

Project implementation will be guided by a comprehensive Project Operations Manual (POM), to be prepared by the PMU with support from the Project Management Consultant (PMC). Each implementing entity will provide its respective inputs, and the POM will be finalized within three months of the project's effectiveness date. The Project Operations Manual (POM) will be closely aligned with the Environmental and Social Management Framework (ESMF) to ensure that environmental and social safeguard processes are fully integrated into project planning, implementation, and reporting. It will include detailed operational guidance on screening, risk categorization, preparation of Environmental and Social Impact Assessments (ESIAs), and implementation of Environmental and Social Management Plans (ESMPs). The POM will also define roles and responsibilities of the PMU, PIUs, and DPIUs in environmental and social compliance, outline reporting formats, and specify timelines for monitoring and audits. This alignment will ensure uniform application of safeguard measures across all project components, promote accountability, and strengthen the overall monitoring and evaluation (M&E) system under MLCIP.

8.6.2 Institutional Arrangement for E&S Management

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

The implementation structure for the environmental and social management has been aligned to the institutional structure of the project. The E&S institution would help integrate the sustainability principle in the ESMF into the construction of roads, bridges, ropeways, and Agrologistics systems, and the use of infrastructure in agriculture and logistics interventions planned under this project. The PMU, PIUs, PMC, CSC, and the organizations supporting this project would ensure the effective engagement of stakeholders and handhold them through the project cycle to ensure that the project makes positive environmental and social benefits. The Institutional structure for implementation of the Environmental and Social Safeguard is presented in Figure 8-2.

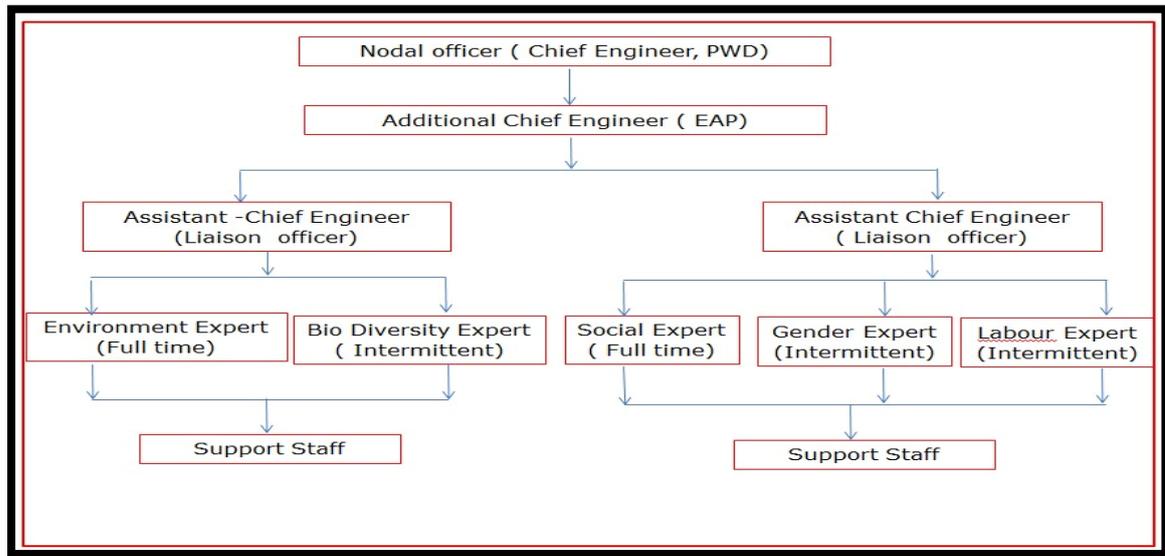


Figure 8.2: Organizational Structure of the E&S Cell

8.6.3 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	Responsible for ensuring full ESF compliance, approval of ESMPs, oversight of land acquisition, labour management, stakeholder	Reports to Chief Secretary, GoM; Coordinates with PWD, MBMA, and World Bank.

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

		tendering.		
Additional Chief Engineer (EAP)	PWD (Externally Aided Projects Wing)	Supports coordination with contractors and consultants for schedule, budget, and compliance.	Monitors contractor adherence to ESMP and safety standards. Provides quality assurance and periodic technical audits.	Reports to Chief Engineer; liaises with PMU and supervision consultants.
Environmental Expert	E&S Cell, PIU (PWD/MBMA)	Leads environmental screening, scoping, and monitoring of subprojects. Advises on mitigation measures, pollution control, and natural resource management.	Ensures ESMP implementation, site inspections, contractor environmental performance, and reporting under ESS1 and ESS3.	Reports to Additional Chief Engineer (EAP) and Nodal Officer/Chief Engineer, PWD.
Social Expert	E&S Cell, PIU (PWD/MBMA)	Conducts social screening, stakeholder consultations, and supervises RAP/IPDP implementation. Ensures fair compensation and livelihood restoration.	Monitors ESS5, ESS7, ESS10 compliance, supports GRM operation, and prepares social audit reports.	Reports to Additional Chief Engineer (EAP) and Nodal Officer/Chief Engineer, PWD.
Gender Expert (Intermittent)	E&S Cell (PIU/PMU Shared)	Provides technical input on gender inclusion, women's employment, and gender-based violence prevention strategies.	Implements Gender Action Plan (GAP) and ensures compliance with ESS2 and ESS10.	Advises and reports to E&S Cell, PIU

Labour Expert (Intermittent)	E&S Cell (PIU/PMU Shared)	Advises on labour welfare, OHS standards, and contractor compliance. Conducts periodic labour audits and site safety training.	Ensures compliance with ESS2, BOCW Act 1996, and national labour codes. Supports management of worker grievances.	Advises and reports to E&S Cell, PIU
Biodiversity Expert (Intermittent)	E&S Cell (PIU/PMU Shared)	Provides expertise on ecological sensitivity, biodiversity conservation, and compensatory afforestation plans.	Ensures compliance with ESS6 (Biodiversity Conservation), screens sites for ecological risk, and develops mitigation strategies.	Advises and reports to E&S Cell, PIU and coordinates with Forest Department.
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	Implements safeguard measures locally, supervises labour conditions, safety, and community	Reports to PIU Project Director and PMU.

		community liaison. Ensures field-level compliance with ESMPs.	consultations.	
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	Ensures environmentally sustainable operations and	Reports to E&S Nodal Officer (Agrologistics) and MBMA.

		FPOs, and supervises sustainability practices.	equitable access for smallholders and women farmers.	
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 fifteen (15) days from the date of submission, the matter shall be escalated to the Project Management Unit (PMU)/ State Level for further review and mediation.

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

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

9.2 GRIEVANCE REDRESSAL MECHANISM (GRM) FLOWCHART

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

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

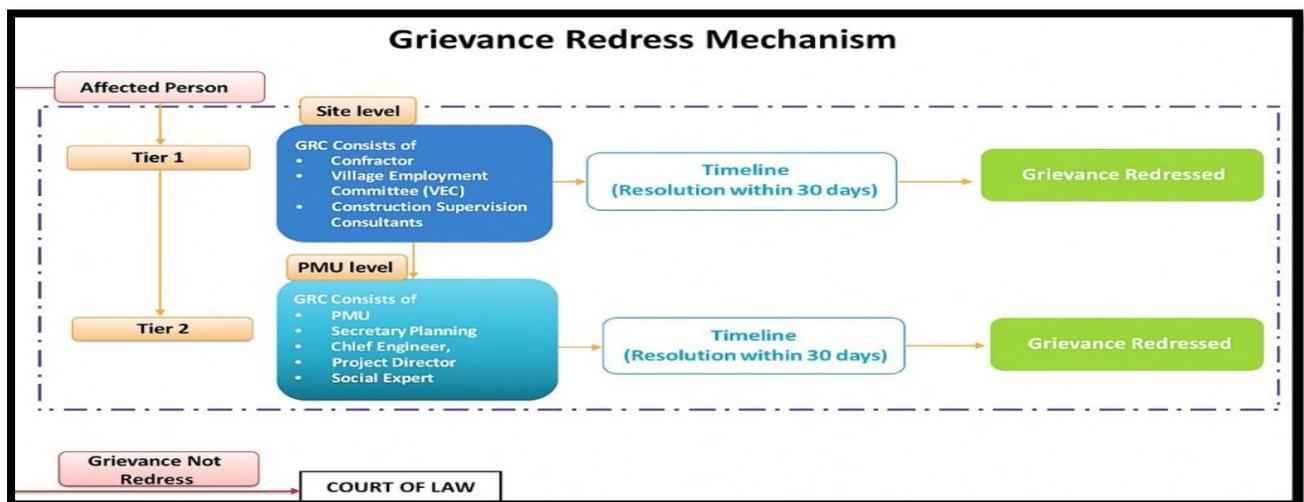


Figure 9.1: Grievance redressal Mechanism

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

9.2.1 Expanded Grievance Redressal Mechanism Details

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

1. Multiple Channels for Grievance Submission:

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

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

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

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

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

Details of contact for Grievances

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

2. Grievance Logging and Acknowledgment:

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

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

3. Grievance Screening and Assessment:

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

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

4. Grievance Investigation:

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

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

5. Grievance Resolution:

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

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

6. Grievance Closure:

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

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

9.2.2 World Bank Grievance Redressal System

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

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

By the late twentieth century, relations between ethnic communities showed relative improvement. While interactions between indigenous tribes and settler communities have largely stabilized, emerging tensions have

shifted to dynamics among indigenous tribes themselves. This evolving context highlights the importance of a responsive grievance redress system, such as the GRS, that is sensitive to inter-tribal dynamics and ensures that all affected individuals can safely report concerns related to development projects.

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

➤ **Conflict Resolution through Grassroots Institutions**

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

9.2.3 Communication Strategy

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

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

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

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

9.2.4 Monitoring and Evaluation

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

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

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

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

- Number of grievances received
- Percentage of grievances resolved within the target timeframe

- Complainant satisfaction rate
- Number of grievances escalated to higher tiers

9.2.5 Capacity Building

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

9.3 INTEGRATION WITH PROJECT MANAGEMENT

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

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

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

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

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.
- 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.
- Rongrenggre Reserve forest is located along the project road corridor at chainages 6+000 to 6+200. However, as all construction activities will remain confined within the existing Right of Way (RoW), no adverse impact is anticipated.
- 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 25 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

Chainage	EIS observation	Proposed/Mitigation measure adopted
0+000	Observed Traffic at Junction	Junction improvement required
0+000 to 6+200	Observed reserve forest area	Forest Area (Both Side) of the existing Road.
6+300	Traffic at junction	Speed restriction on junction location needed.
6+350	Observed Building Structure at this section on RHS	Building Structure at this section on RHS will be protected by slightly shifting the alignment LHS
6+450	Culvert, no impact	
6+900	Observed Soil Erosion found at Minor Bridge Location	Soil Erosion found at Minor Bridge Location, Protection work required at this Section.
7+100	Observed Building Structure at this section on RHS	Building Structure at this section on RHS will be protected by slightly shifting the alignment LHS
7+280	Observed Bus Stand Section	Traffic island with Proper road safety sign required for this Section (Bus Stand Section).
8+000	Observed Junction with traffic movement	Traffic island with Proper road safety sign required for this Section. (Junction Location). Proposal for the Junction improvement due to Poor Geomerty of the Road.

11+400	Culver, Half is new, half is old, No Impact	
11+700	Building Structure at this section on RHS, Boundary wall may impacted	<ul style="list-style-type: none"> • Building Structure at this section on RHS will be protected by slightly shifting the alignment LHS • Speed limit measure.
11+900	Observed Landslide section at RHS	Landslide treatment plan
12+020	Observed School	Retaining wall required LHS from km 12+020 to 12+040
12+850 to 12+900	Observed Landslide section at RHS	Landslide treatment plan
12+900 to 12+980	Observed Landslide section at LHS	Landslide treatment plan
16+500 to 16+600	Observed Landslide section at LHS	Landslide treatment plan
17+300 to 17+340	Pavement damaged, water logging	Protection work required RHS, Raising of profile
20+637 (End of Project)	A cluster of temporary houses has been established near the connecting road.	-

10.2 RECOMMENDATIONS

- The Contractor should prepare a site-specific contractor's Environmental and Social Management Plan called as C-ESMP based on final design and identifications of locations of construction camps, quarries and borrow areas etc. within one month from the date of entering into the contract.
- MPWD 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 (PAPs) as per RAP prepared for the RSN 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.

ANNEXURES

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT

For

Improvement and Widening of Rongrenggre-Simsanggre-Nengkhra(RSN) Road including Conversion of weak Bridges to Permanent RCC bridges



**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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Annexure 1.1 Utility Details of RSN Road

Chainage		Electric Pole		Transformer		EP CROSSING LINE
From	To	LHS	RHS	LHS	RHS	
0+000	1+000	1	0	0	0	0
1+000	2+000	0	0	0	0	0
2+000	3+000	0	0	0	0	0
3+000	4+000	0	0	0	0	0
4+000	5+000	0	0	0	0	0
5+000	6+000	0	0	0	0	0
6+000	7+000	18	5	0	0	8
7+000	8+000	22	6	0	0	13
8+000	9+000	9	15	1	0	7
9+000	10+000	5	9	0	2	6
10+000	11+000	0	6	0	1	10
11+000	12+000	4	6	0	0	10
12+000	13+000	8	1	0	0	7
13+000	14+000	4	14	0	0	6
14+000	15+000	8	0	0	0	2
15+000	16+000	8	20	0	0	8
16+000	17+000	16	29	0	0	6
17+000	18+000	21	8	0	0	3
18+000	19+000	26	0	0	0	0
19+000	20+000	57	0	0	0	2
20+000	20+564	20	3	0	0	5
Total		227	122	1	3	93

Chainage		OFC Pillar	
From	To	LHS	RHS
0+000	1+000	0	0
1+000	2+000	0	0
2+000	3+000	0	0
3+000	4+000	0	0
4+000	5+000	0	0
5+000	6+000	0	0
6+000	7+000	0	0
7+000	8+000	0	0

8+000	9+000	0	0
9+000	10+000	0	0
10+000	11+000	1	0
11+000	12+000	0	0
12+000	13+000	0	0
13+000	14+000	0	2
14+000	15+000	0	0
15+000	16+000	0	0
16+000	17+000	0	1
17+000	18+000	1	3
18+000	19+000	1	0
19+000	20+000	0	0
20+000	20+564	0	0
Total		3	6

Annexure 2.1: IRC & MoRTH Codes Applicable to the project

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

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

Annexure 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 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 National And State legal provisions cover all requirements of ESF. A Labour Management Procedures is prepared for MPWD to regulate working conditions and management of labour relations including worker specific GRM, terms and conditions of employment, code of conduct, non-discrimination and equal opportunities, protection of labour force, prohibition of child/force labour and provision of OHS requirements. The main gap that LMP will cover is the OHS requirements of direct and contracted workers. The other gaps that the LMP fills are the provision of Code of Conduct for workers, GBV prevention measures, GRM for workers, etc., compliance to applicable labour laws, documentation on labour management by contractors and orientation training of civil work contractors and workers. The ESMP being prepared by the consultant need to ensure that the World Bank ESF 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

WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
	The Payment of Bonus Rules Meghalaya 1975 The Bonded Labour (Abolition) Act 1976 Bonded Labour System (Abolition) Rules 1976 The Trade Union Act, 1926	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 1989	The majority of World Bank ESF 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.
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	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.

WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
	The Batteries (Management and Handling) Rules 2001 Construction and Demolition Waste Management Rules, 2016 Vehicle Act 1988 Central Motor Vehicle Rules 1989	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 Regulation of Street Vending) Act, 2014 & Meghalaya Street Vendors (Protection of Livelihood and Regulation of Street Vending) Rules, 2016 The Meghalaya Highways Act, 1972	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 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	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

WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
	amendments	<p>vital role of habitats in the well-being of wildlife species, the act underscores the importance of declaring certain areas as protected zones to safeguard biodiversity.</p> <p>The Environmental Impact Assessment (EIA) process, governed by the Environment Impact Assessment Notification, 2006 addresses mitigation measures for projects that may have environmental and habitat implications.</p> <p>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.</p> <p>The MPWD will ensure that the World Bank ESF 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.</p>
Indigenous Peoples	<p>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.</p> <p>Scheduled Tribes and Other Traditional Forest Dwellers</p>	<p>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 RCTLAR&R mandates FPIC in Scheduled areas. Thus, the legislation meets the requirements of World Bank ESF 2018 including FPIC.</p> <p>The MPWD will ensure that the World Bank ESF 2018 provisions are</p>

WB Environment and Social standards	Equivalent National and State Environment/ Social Policy/ Regulation	Policy Gaps, Remedies and Redressal
	(Recognition of Forest Rights) Act, 2006	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	<p>The legislation meets the requirements of ESF, 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.</p> <p>The PWD will ensure that the World Bank ESF 2018 provisions are implemented through them and contractors and monitored by the PWD Divisions/ E&S Specialists of PWD/ consultants.</p>
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	<p>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.</p> <p>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.</p> <p>Forest rights, and eco system services of the community shall be captured during engagement by the consultants.</p> <p>The PWD will ensure that the World Bank ESF 2018 provisions are implemented through them and contractors and monitored by the PWD Divisions/E&S Specialists of PWD/ consultants.</p>

Annexure 3.1: Proposed Road Cross-Sections

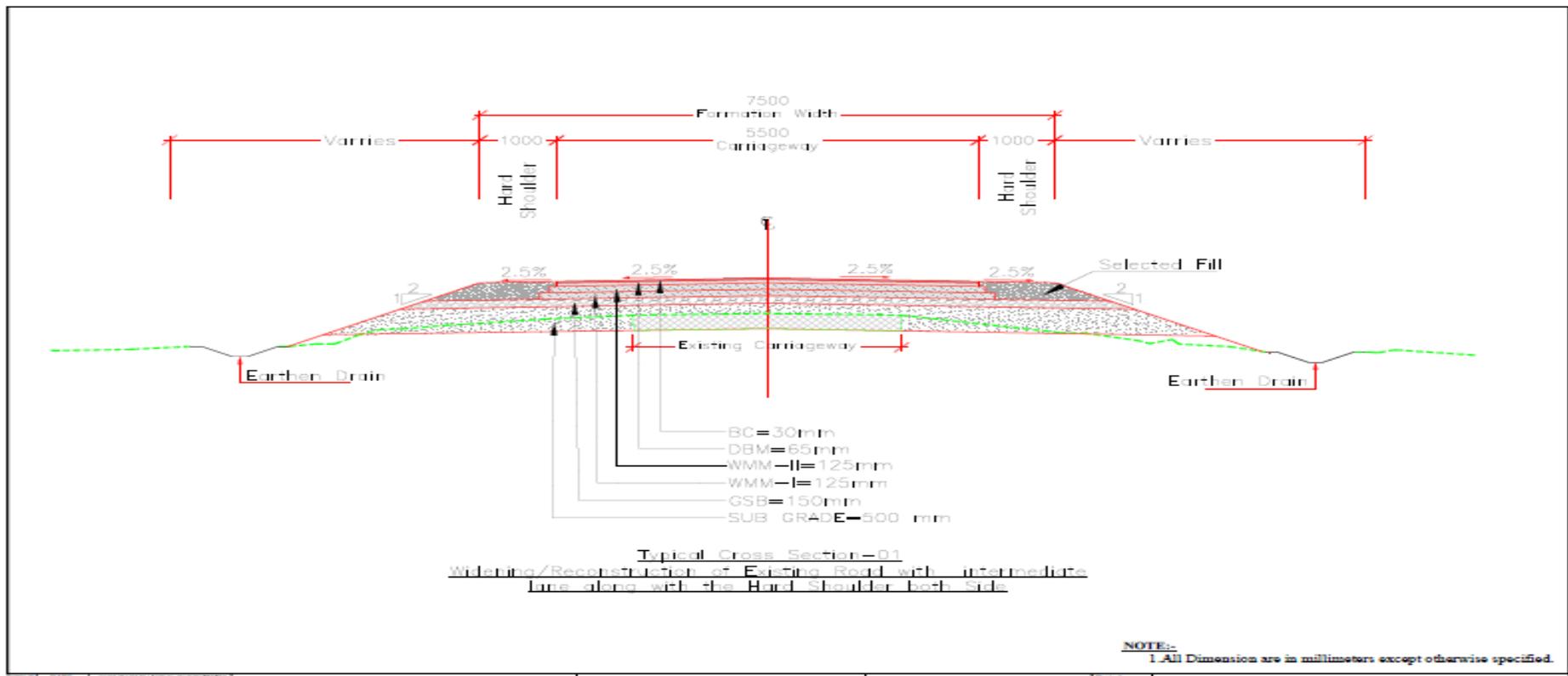
(a) Typical road cross sections for Corridor 1

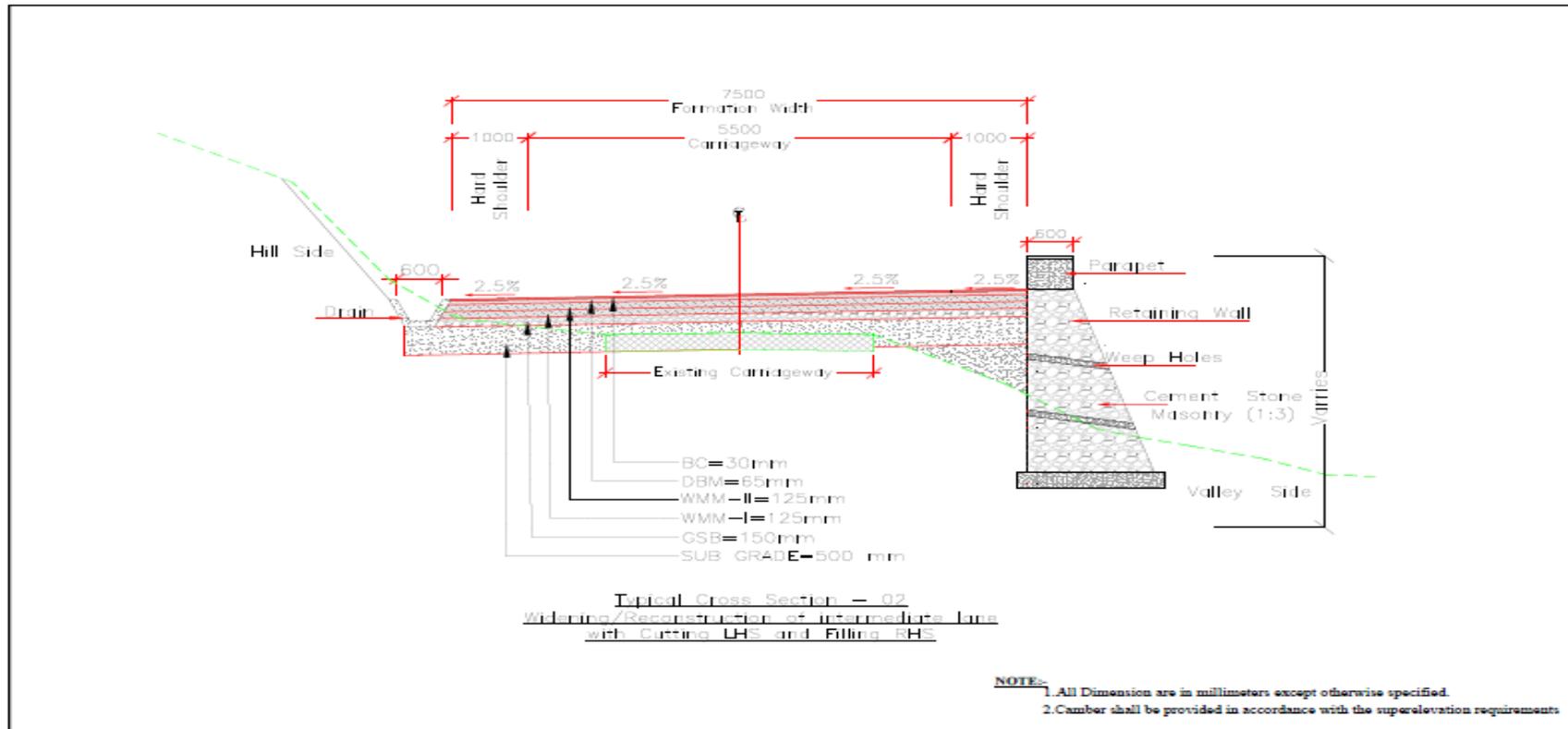
SL. No	From	To	Length	TCS Type	TCS Description
1	0	6200	6200	TCS-5	Existing Road with Overlay
2	6200	6320	120	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane along with the Earthen Shoulder both Side
3	6320	6500	180	TCS-3	Typical Cross-Section For intermediate Lane Built-Up Carriageway Section With Both Side Drain cum Footpath
4	6500	6950	450	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane along with the Earthen Shoulder both Side
5	6950	7700	750	TCS-3	Typical Cross-Section For intermediate Lane Built-Up Carriageway Section With Both Side Drain cum Footpath
6	7700	8110	410	TCS-6	Widening/Reconstruction of Existing Road With filling both Side
7	8110	8210	100	TCS-7	Widening/Reconstruction of Existing Road With Cutting Both Side
8	8210	9610	1400	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane along with the Earthen Shoulder both Side
10	9610	9770	160	TCS-2	Widening/Reconstruction of intermediate lane with Cutting LHS and Filling RHS

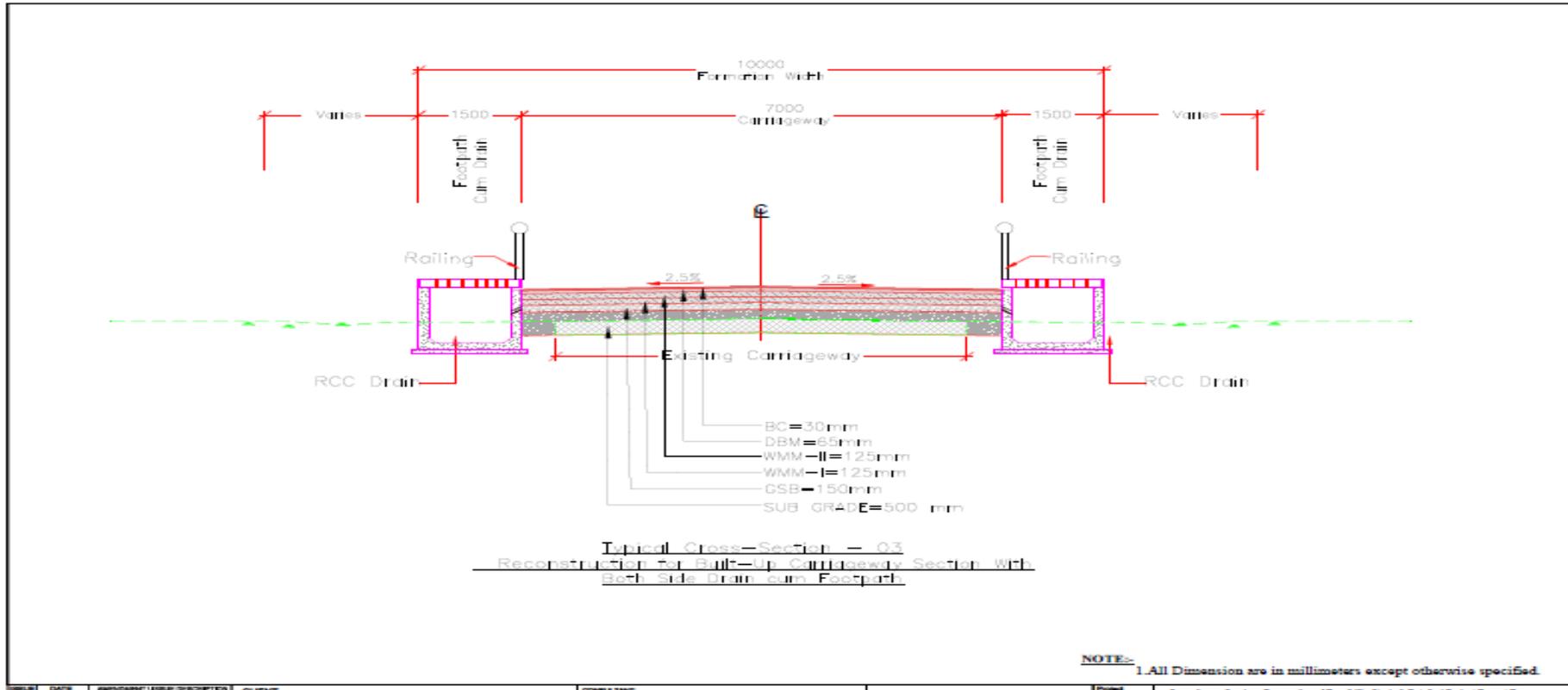
SL. No	From	To	Length	TCS Type	TCS Description
11	9770	10250	480	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane along with the Earthen Shoulder both Side
12	10250	11070	820	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane along with the Earthen Shoulder both Side
13	11070	11200	130	TCS-6	Widening/Reconstruction of Existing Road With filling both Side
14	11200	12270	1070	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane along with the Earthen Shoulder both Side
15	12270	12430	160	TCS-6	Widening/Reconstruction of Existing Road With filling both Side
16	12430	13140	710	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane along with the Earthen Shoulder both Side
17	13140	13480	340	TCS-2	Widening/Reconstruction of intermediate lane with Cutting LHS and Filling RHS
18	13480	14060	580	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane along with the Earthen Shoulder both Side
19	14060	14220	160	TCS-4	Widening/Reconstruction of intermediate lane with Filling LHS and Cutting RHS
20	14220	14750	530	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane along with the Earthen Shoulder both Side

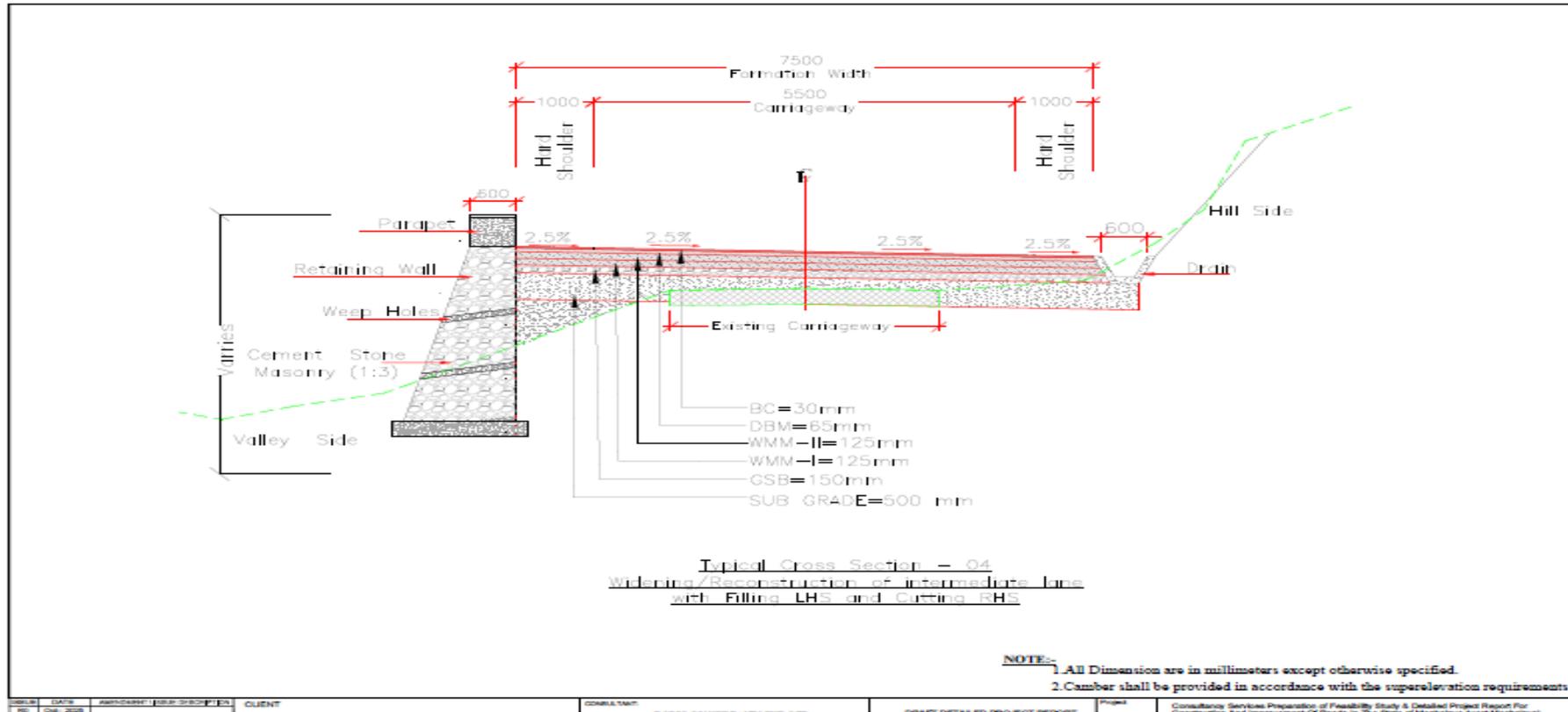
SL. No	From	To	Length	TCS Type	TCS Description
21	14750	14890	140	TCS-7	Widening/Reconstruction of Existing Road With Cutting Both Side
22	14890	15900	1010	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane along with the Earthen Shoulder both Side
23	15900	16040	140	TCS-6	Widening/Reconstruction of Existing Road With filling both Side
24	16040	16480	440	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane along with the Earthen Shoulder both Side
25	16480	16650	170	TCS-6	Widening/Reconstruction of Existing Road With filling both Side
26	16650	17000	350	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane along with the Earthen Shoulder both Side
27	17000	17140	140	TCS-6	Widening/Reconstruction of Existing Road With filling both Side
28	17140	18030	890	TCS-1	Widening/Reconstruction of Existing Road with intermediate lane along with the Earthen Shoulder both Side
29	18030	18560	530	TCS-4	Widening/Reconstruction of intermediate lane with Filling LHS and Cutting RHS
30	18560	18760	200	TCS-7	Widening/Reconstruction of Existing Road With Cutting Both Side

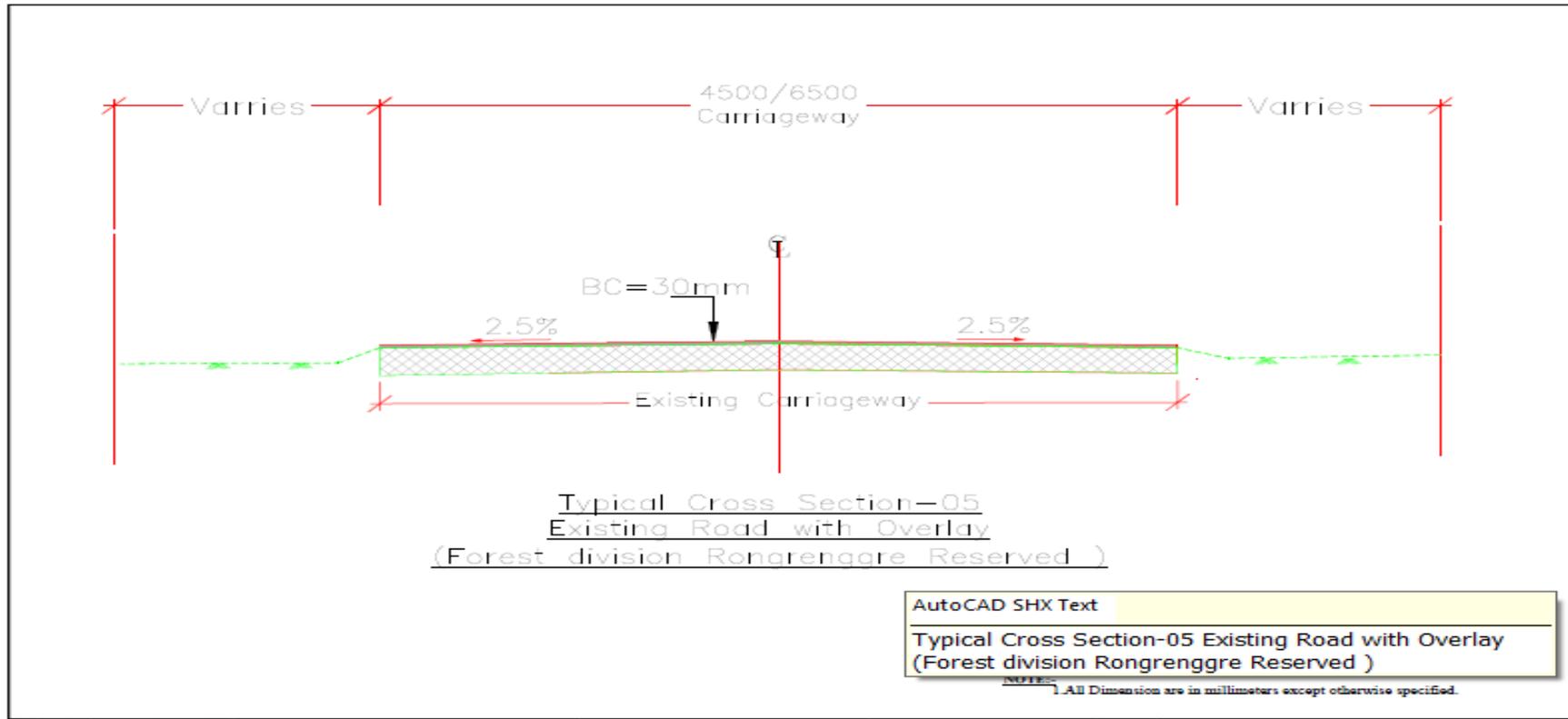
SL. No	From	To	Length	TCS Type	TCS Description
31	18760	19740	980	TCS-4	Widening/Reconstruction of intermediate lane with Filling LHS and Cutting RHS
32	19740	20565	825	TCS-7	Widening/Reconstruction of Existing Road With Cutting Both Side

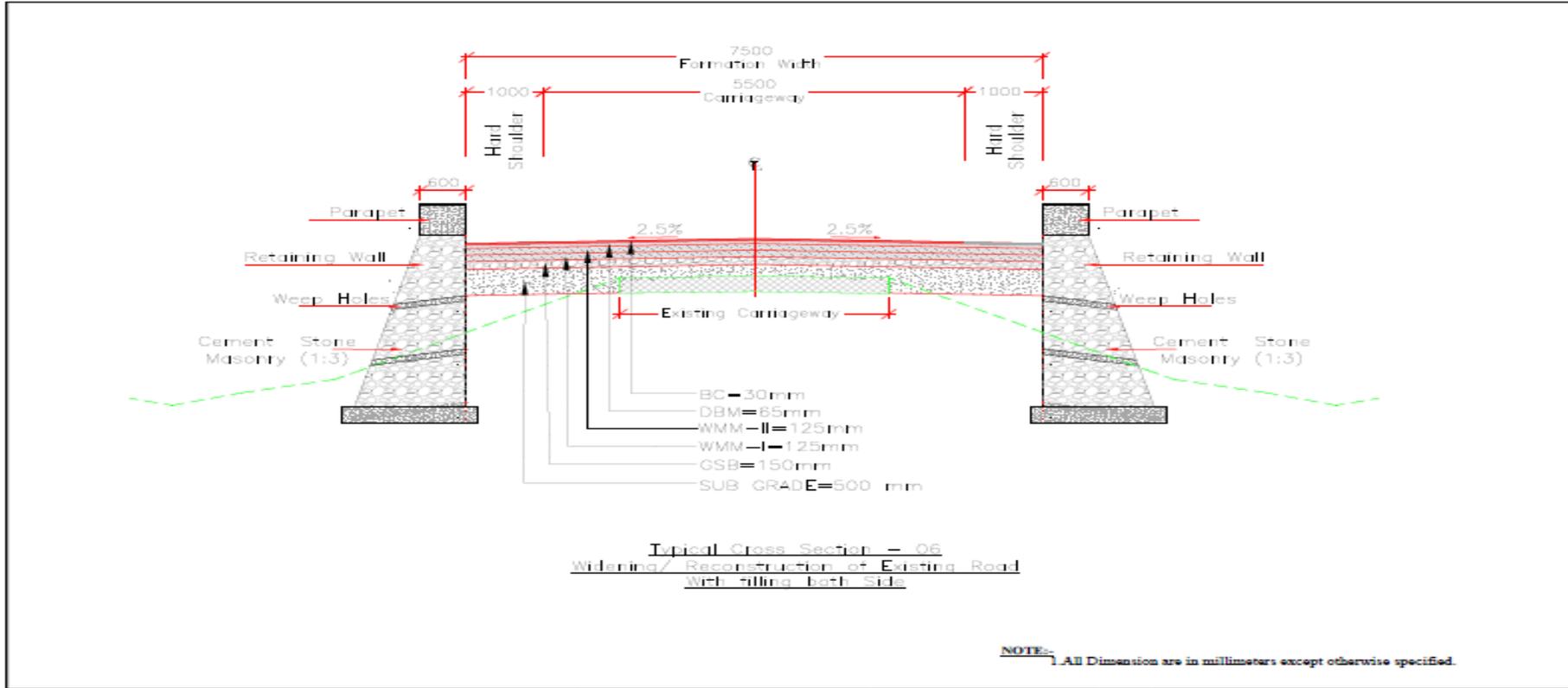


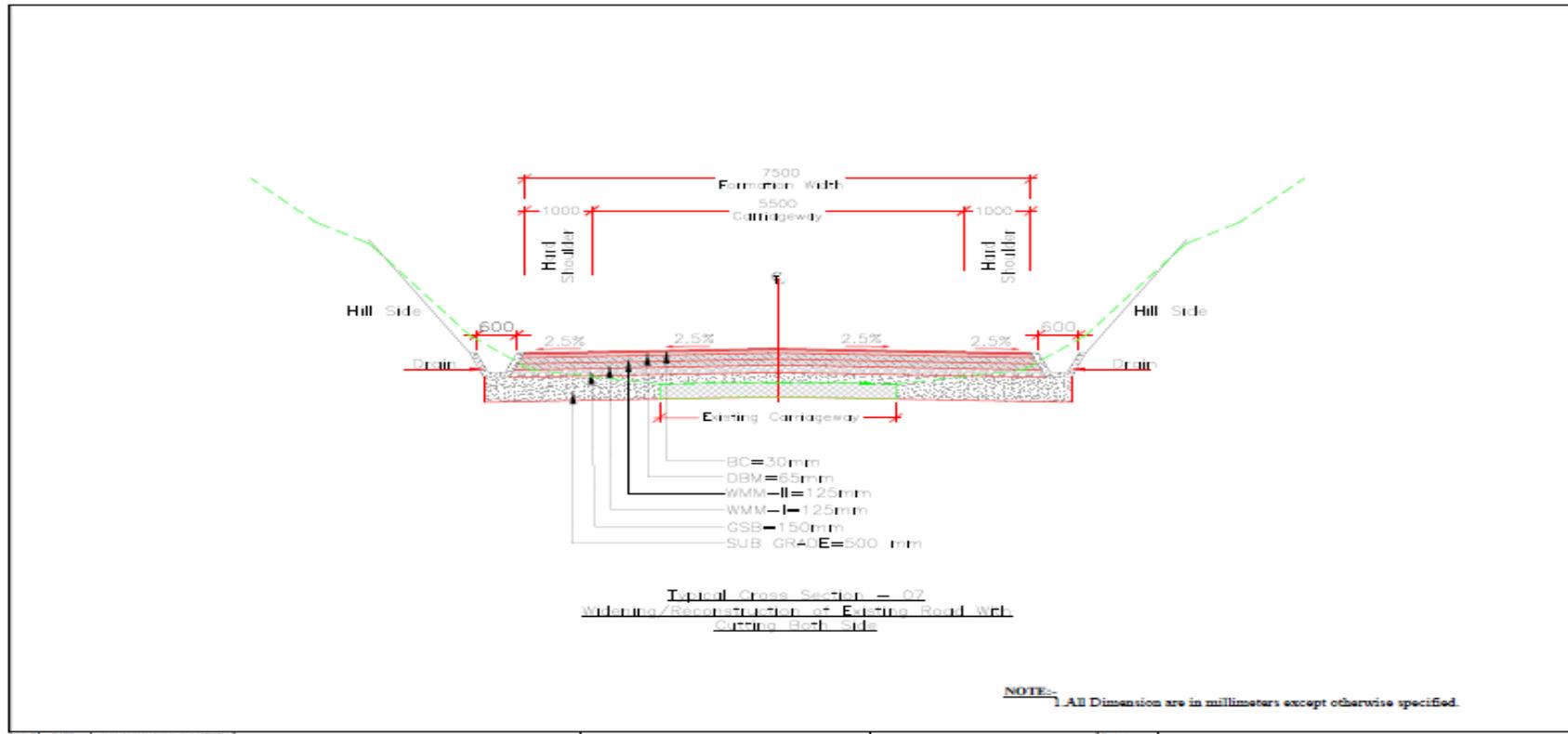












Annexure 3.2: Environment and Social Management Plan

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

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			manufacturers. Contractor to produce approvals and receipts.			
6	Water	Pollution of surface and groundwater sources.	<ul style="list-style-type: none"> ➤ The Contractor will be responsible for arranging adequate supply of water for the entire construction period. ➤ The contractor will minimize the pollution and wastage of water during construction 	Contractor	Permission for Water source; Usage records; Wastewater management measures	MPWD/PMC/CSC
7	Appointment of Environment, Social and Safety Officers	Inefficient and incompetent supervision by contractors may lead to negative impacts on environment, Social, health and safety.	<ul style="list-style-type: none"> ➤ The Contractor would prepare OHS plan and other required plans; as a part of CESMP, as per the WB guidelines. ➤ The contractor will appoint qualified and experienced Environment. Social and Safety personnel to ensure implementation of CESMP and occupational health and safety issues at the camps and construction work sites. 	Contractor	To be mobilized before construction; approved OHS plan	MPWD/PMC/CSC
8	Identification of OHS Hazard and Risk Categorization	May cause physical harm, injury, illness, or death to workers.	<ul style="list-style-type: none"> ➤ Conducting workplace inspections to identify hazards and document. ➤ Consulting with workers to identify hazards that may not be obvious to employers or safety professionals. ➤ Reviewing safety data sheets (SDSs) to collect information about the hazards of chemicals and other substances used in the workplace. ➤ Consulting with industry standards and regulations to identify specific hazards that must be addressed in the workplace. 	Contractor	OHS hazard register; Inspection reports;	MPWD/CSC
9	Other Construction Vehicles, Equipment and Machinery	Vehicles and equipment not complying with regulations may lead to pollution of environment.	<ul style="list-style-type: none"> ➤ The contractor will maintain records of fitness and Pollution Under Control (PUC) certificates for all vehicles and generators used during the contract period 	Contractor	Records of valid PUC / fitness; Inspection log	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
10	Tree Cutting	Loss of green cover and biodiversity	<ul style="list-style-type: none"> ➤ Maximum efforts shall be made to minimize the number of trees to be felled. ➤ Tree cutting and disposal shall be done as per the Forest Dept. 	Contractor	Records of trees cut and saved.	MPWD/CSC
11	Joint field verification	The impacts may not have been identified in time.	<ul style="list-style-type: none"> ➤ The MPWD and the Contractor shall carry out joint field verification to ascertain the local complaints/suggestions and to confirm the need for additional protection measures or changes in design/scale/nature of protection measures including the efficacy of enhancement measures suggested in the ESMP. The MPWD shall maintain proper documentation and justifications/reasons in all such cases. 	Contractor	Verification reports;	MPWD
12	Damage to existing eco-system due to borrowing activities	Indiscriminate borrowing activities may damage the eco-system and lead to unproductive environment	<ul style="list-style-type: none"> ➤ The Contractor will have to obtain the Environmental Clearance for borrow areas. ➤ The borrow area will be operated as per the MoEFCC guidelines issued by the concerned SEAC and SEIAA. 	Contractor	Borrow area EC copy; Approved management and closure plan	MPWD /CSC
13	Identification of construction material transportation route	Inconveniences and safety issues to the public due to the material transport vehicles.	<ul style="list-style-type: none"> ➤ The material transport route through existing network of roads should be planned and approved by the local transport authorities. ➤ The local communities need to be consulted with prior information on any likely inconveniences. 	Contractor	Approved route plan; Community consultation record	MPWD/CSC
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	<ul style="list-style-type: none"> ➤ MPWD Division and the Contractor are responsible for identifying a suitable area in consultation with local administration to dispose of the wastes 	Contractor	Approved disposal site and its management plan; NOC, Agreement with landowner;	MPWD/CSC

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

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
2	Borrow Areas	Impacts due to improper operation and closing of borrow areas	<ul style="list-style-type: none"> ➤ Borrow area should be located at a minimum distance of 300m from the residential/ settlement area. Proper barricading should be provided and access to the borrow areas should be restricted to the unauthorized persons. ➤ The Contractor should submit the EC, a copy of agreement with the landowner, borrow area management and closure plan before initiating any kind of borrowing activities. 	Contractor	EC and lease copies; Approved Borrow area restoration and Closure plan	MPWD/PMC/CSC
3	Quarries	Impacts due to improper management, operation and closing of quarries	<ul style="list-style-type: none"> ➤ The Contractor shall identify materials from legally valid quarries with existing NOC from the relevant departments. ➤ No quarry or associated plants can be set-up within 1000m from the residential/ settlement locations ➤ Contractor shall prepare a haul road network for quarry transport and ensure the suitability of such haul roads from the safety of residents, biodiversity and other environment points of views. 	Contractor	Quarry permit, EC; Safety inspection report; Haul road maintenance record, dust suppression measure, geotagged photos	MPWD/PMC/CSC
4	Dismantling of Bridges/ Culverts/ Structures	Impacts due to improper dismantling and disposal	<ul style="list-style-type: none"> ➤ All necessary precautions shall be taken while working near cross-drainage channels, to prevent earthwork, stonework, construction materials from obstructing cross-drainage at rivers, streams, and drainage systems, or from causing flooding. ➤ Reusable materials (e.g., steel, stones, bricks) shall be segregated and stored properly for reuse or recycling. ➤ Non-recyclable debris and waste materials shall be transported to 	Contractor	Debris disposal/reuse records; Approved Site restoration plan; Photographic documentation.	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<p>approved disposal sites identified and approved by the concerned authority.</p> <ul style="list-style-type: none"> ➤ Disposal sites shall be located away from water bodies, agricultural lands, and other environmentally sensitive areas. ➤ Temporary barriers or silt fences shall be provided to prevent debris from entering watercourses. ➤ Upon completion, the associated disposal sites shall be restored to their original condition or as directed by the Engineer 			
5	Bituminous waste disposal	Impacts due to hazardous wastes	<ul style="list-style-type: none"> ➤ The contractor shall maintain records of quantities generated, transported, and disposed of, along with details of the disposal site and approvals obtained. ➤ Bituminous waste shall be collected and stored temporarily in impermeable, lined containers or areas to prevent leaching or contamination of soil and groundwater. ➤ The disposal of bituminous wastes shall be carried out by the Contractor at secure landfill sites approved by the concerned government authorities. ➤ No bituminous waste shall be disposed of in water bodies, open lands, agricultural fields, or along the roadside ➤ Periodic inspections shall be carried out to ensure compliance with waste management guidelines. ➤ Where feasible, recycling or reuse of scarified bituminous material in road base or other construction activities 	Contractor	Records of Waste reused/disposed; Details of approved disposal site; Photographic documentation.	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
6	Contamination of Soil	Soil pollution due to Oil and fuel spills from construction equipment and plants.	<p>shall be promoted, subject to environmental and quality standards.</p> <ul style="list-style-type: none"> ➤ Construction plants, workshops, and fuel storage areas shall be located at least 500 m away from any surface water body and environmentally sensitive locations. ➤ Oil interceptors shall be installed at construction camps, vehicle parking, and washing areas to trap oil and grease before wastewater is discharged. ➤ All fuel and lubricant storage tanks shall be placed on impermeable platforms or within bunded (contained) areas. ➤ Regular maintenance and inspection of construction equipment and vehicles shall be carried out to prevent leakage of oil, fuel, or hydraulic fluids. ➤ Spill control kits (absorbent pads, sand, and containment booms) shall be available at all fuel storage and 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. ➤ Storm water runoff from fuel and equipment storage areas shall be directed through oil-water separators before discharge. 	Contractor	Spill log; Waste oil disposal records; Fuel storage inspection record. Photographic documentation.	MPWD/PMC/CSC

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

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
		labour will lead to surface/groundwater pollution.	<p>and disposed at approved sites away from water bodies, on a regular basis to prevent them from getting into surface runoff.</p> <ul style="list-style-type: none"> ➤ 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. 		records; Camp inspection records. Photographic documentation.	
10	Water requirement for project	Over extraction or exploitation of ground/surface water will lead to water scarcity.	<ul style="list-style-type: none"> ➤ Contractor to ensure optimum and judicious use of water; ➤ Discourage labour from wastage of water and applicable prior approvals shall be obtained from concerned authorities. ➤ Rainwater harvesting structures shall be installed at construction camps and plant sites to promote sustainable use of water. ➤ Awareness programs shall be conducted for laborers and staff on responsible water use and conservation practices. ➤ Records of daily water consumption shall be maintained as part of regular reporting. 	Contractor	Water consumption log; Permission for water source; Installation of Rainwater harvesting structure	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
11	Coffer dam to make dry working space for bridge work	Change in the flow pattern and quality of water, effect on local habitat	<ul style="list-style-type: none"> ➤ Selecting the right location for the cofferdam to minimize its impact on the environment. ➤ Using environmentally friendly materials to construct the cofferdam eg. Biodegradable/ reusable materials can be used instead of concrete. ➤ Restoring the environment after construction. This may involve replanting vegetation and removing any debris. 	Contractor	Worksite inspection record; Restoration completion record	MPWD/PMC/CSC
12	Noise from vehicles, plants and equipment	Noise from construction vehicles, plant and equipment will lead to noise pollution and cause health and safety issues	<ul style="list-style-type: none"> ➤ Construction operations should be undertaken primarily during day time to minimize noise impacts. ➤ Fitness and PUC of the vehicles and equipment's need to be ensured. ➤ No noisy construction activities will be permitted around educational institutions/ health centers (silence zones) and up to 100 m from other sensitive receptors. ➤ Noise level monitoring shall be carried out as per the monitoring schedule. In case there is increase in noise level, preventive measures should be taken to reduce the noise level. ➤ Noise barriers and Hearing Protection devices (earplugs or earmuffs) should be provided 	Contractor	Noise level test report; PPE usage record; Complaint register; vehicles, plants and equipment maintenance records.	MPWD/PMC/CSC
13	Blasting	Unmanaged blasting result in health and safety issues and accidents.	<ul style="list-style-type: none"> ➤ The Contractor will inform well in advance and obtain permission as is required from all Government Authorities, public bodies and private parties; 	Contractor	Approved Blasting management Plan; Blasting permission; Incident log. Geotagged photos.	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ Blasting will be carried out only with permission of Engineer-in-charge. All the statutory laws and regulations, rules etc., pertaining to acquisition, transport, storage, handling, and use of explosives will be strictly followed. ➤ Blasting management plan shall be developed and should be approved by the concerned authority. The same shall be strictly followed by the contractor. 			
14	Loss of trees and Plantation works	Cutting of trees can lead to loss of biodiversity.	<ul style="list-style-type: none"> ➤ Clearing and uprooting should be avoided beyond that which is directly required for construction activities. ➤ Kerosene / LPG should be preferably used to avoid felling of the trees or provide community kitchen for the labour camps for cooking. ➤ Camps and storage yards shall be located in the areas already devoid of vegetation or having little vegetation 	Contractor	Tree felling register; Plantation record;	MPWD/PMC/CSC
15	Terrestrial Flora and Fauna	Construction activities and workers may cause harm to flora and fauna.	<ul style="list-style-type: none"> ➤ All the workers will need to be oriented and monitored by the contractor so as not to cause any harm to the flora and fauna. ➤ Hunting and fuel wood collection will be strictly prohibited 	Contractor	Worker awareness attendance; Wildlife sighting log	MPWD/PMC/CSC
16	Aquatic Fauna	Construction activities and workers may cause harm to fauna.	<ul style="list-style-type: none"> ➤ Any works affecting aquatic habitat will be done during low flow (when water depth is less than 5 m) and when banks would be dry. ➤ Where any GI wire mesh gabions are used; all GI wire ends need to be folded inside. 	Contractor	Work timing records; Site inspection checklist	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ Ensure that no construction activities will be carried out during monsoon and the fish breeding season. 			
17	Occupational Health and Safety	When Occupational Health and Safety are compromised the associated risks from accidents and incidents could affect health and safety of the workers and others on construction/ project sites. Improper first aid facilities on the sites could affect health and safety of workers and others.	<ul style="list-style-type: none"> ➤ The Contractor would prepare OHS plan and other required plans as per the WBs guidelines. ➤ All the laborers to be engaged for construction works shall be screened for health and adequately treated before issue of work permits. ➤ Periodic health check-up of construction workers. ➤ Prevention of mosquito breeding need to be ensured at the project site and other ancillary areas ➤ The contractor's Environment and Safety personnels, shall ensure 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. 	Contractor	Approved OHS plan; OHS training log; PPE checklist; Awareness programme and Health inspection reports	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ 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.	<ul style="list-style-type: none"> ➤ Plants and equipment will be installed sufficiently away from the settlements. ➤ Proper caution signage, barricading, delineators, lightings etc. will be installed at construction zone and temporary diversions. ➤ Hard barricading will be provided at construction zone near habitation area and public roads, and the same will be maintained throughout the construction period. ➤ Proper traffic management will be ensured near roads of the Construction zone. 	Contractor	Safety signage installed; Community complaint register; Traffic control records	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ Road safety education will be imparted to drivers running construction vehicles. In case of negligent driving, suitable action will be taken. ➤ Speed restrictions shall be imposed on project vehicles to control speeding. ➤ Installation of temporary speed bumps to control speed near designated pedestrian crossing areas/school areas/ market places/ religious places/ human habitations. ➤ The general public/ residents shall not be allowed to any of the risk areas of the project, e.g., excavation sites, construction sites and areas where heavy equipment is in operation. ➤ In the consideration of risk at civil works, each labour should be covered under ECA 1923 insurance until completion of work. 			
19	Emergency Response system	Absence may result to increased incidents, injury, economic loss etc.	<ul style="list-style-type: none"> ➤ Develop and implement ERS ➤ Train personnel and Establish communication channels ➤ Systematic planning and training for emergencies. 	Contractor	Approved ERP; Emergency drill and training report; Incident response record	MPWD/PMC/CSC
20	Health Management – Communicable Diseases	The water fringe areas provide suitable habitats for the growth of vectors of various diseases, which is likely to increase the incidence of water-borne diseases.	<ul style="list-style-type: none"> ➤ There would be possibility of the transmission of communicable diseases due to migration of labour population from other areas at the construction site. ➤ Agreement shall be made with nearby health center or hospital for emergency treatment. 	Contractor	Health screening record; Awareness session log; Medical report; Agreement with nearby hospital	MPWD/PMC/CSC

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ Special Measures for COVID 19 should be strictly followed at the camp and construction site. 			
21	Risk of Natural Hazards	The project area is at risk from floods and Earthquakes.	<ul style="list-style-type: none"> ➤ Protection of Agriculture Land near roads/ bridges. ➤ The mitigation measures should be adopted as per norms of State Disaster Management Authority, Government of Meghalaya. 	Contractor	Site assessment report; Record of Compliance with SDMA norms	MPWD/PMC/CSC
22	Risk of Force Majeure Combine with previous	These unforeseen risks can have both adverse environmental and social impacts	<ul style="list-style-type: none"> ➤ All reasonable precaution will be taken to prevent danger of the workers and the public from fire, flood, drowning, etc. ➤ All necessary steps will be taken for prompt first aid treatment of all injuries likely to be sustained during the course of work. ➤ Contractor has to prepare a response plan before start of construction works 	Contractor	Force majeure preparedness plan; Emergency contact list	MPWD/PMC/CSC
23	Hygiene	Impacts related to unhygienic surroundings	<ul style="list-style-type: none"> ➤ At every workplace, good and sufficient water supply shall be maintained to avoid waterborne diseases to ensure the health and hygiene of workers. ➤ Adequate drainage, mobile toilets shall be provided at workplace. ➤ Preventive Medical care shall be provided to workers. ➤ Proper Hygiene shall be maintained 	Contractor	Sanitation inspection record; Hygiene logbook	MPWD/PMC/CSC
24	Traffic Management	Unplanned and unmanaged traffic diversion and detours can result in public nuisance.	<ul style="list-style-type: none"> ➤ Before start of the construction, proper traffic management plan will be prepared and submitted to MPWD for approval. Secure assistance from local police for traffic control during the construction. 	Contractor	Approved TMP; Signage/barricade checklist; Traffic incident register; geotagged photos	MPWD/PMC/CSC

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

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

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
28	Labour Influx	Strain on infrastructure, such as housing, healthcare, and education; social tension, as new arrivals compete with locals for jobs and resources.	<ul style="list-style-type: none"> ➤ Proper plan for labour influx by investing in infrastructure and social services. ➤ Governments can regulate the flow of labour to ensure that it is orderly and sustainable. ➤ Local communities can engage with new arrivals to help them understand the local culture and customs. ➤ Maximum use of local labours 	Contractor	Labour License and registration records; Local labour hiring records.	MPWD/PMC/CSC
29	GRM	Increased impunity, conflict and violence; Loss of trust and confidence	<ul style="list-style-type: none"> ➤ Establish a grievance redressal mechanism ➤ Ensure that the mechanism is impartial and independent ➤ Provide adequate support to people who use the mechanism ➤ Communicate effectively with people about the mechanism 	Contractor	GRM register; Grievance resolution records	MPWD/PMC/CSC
30	Monitoring and Reporting (Monthly/ Quarterly)	Monitoring environmental attributes like (Air, Water, Noise & soil microbiology) and proper reporting are important for the successful ESMP implementation	<ul style="list-style-type: none"> ➤ The parameters to be monitored, frequency and duration of monitoring as well as the locations to be monitored will be as per Monitoring Plan prepared. ➤ Regular submission of CESMP implementation monitoring report 	Contractor	Monthly/quarterly ESMP compliance report; Monitoring data records	MPWD/PMC/CSC
Operation Phase						
1	Debris and Waste from Clearing/ Closure of Construction Site, Labor Camps, Disposal Sites, and Borrow Areas	Land and soil contamination due to improper waste disposal; Aesthetic degradation; Health risks to nearby communities	<ul style="list-style-type: none"> ➤ Contractor shall prepare and implement a Site Restoration Plan approved by the Engineer. ➤ On completion of works, all temporary structures, debris, and wastes shall be cleared. ➤ Disposal pits and sanitation trenches shall be filled, compacted, and sealed. 	Contractor	Site clearance restoration records and closure NOC; Geotagged photos	MPWD

Sl. No.	Environmental/ Social Aspects	Impacts	Mitigation/ Management Measures	Implementation	Indicator	Supervision/ Monitoring
			<ul style="list-style-type: none"> ➤ Topsoil removed during construction shall be re-spread to aid vegetation regrowth. ➤ Native grass or trees shall be planted to stabilize restored areas and improve aesthetics. 			
2	Soil Erosion due to Runoff over Steep Slopes and Embankments	Loss of fertile topsoil; Siltation of nearby water bodies; Slope instability or road damage	<ul style="list-style-type: none"> ➤ Regularly inspect slopes and embankments for erosion signs. ➤ Implement bioengineering measures like turfing, hydroseeding, and vegetation planting. ➤ Provide stone pitching, retaining walls, or gabions where needed. ➤ Maintain effective drainage systems to reduce concentrated runoff. 	Contractor	Reports on Erosion inspection; implementation of mitigation measures; Drain maintenance log	MPWD
3	Water Pollution from Road Runoff and Drainage into Water Bodies	Deterioration of surface and groundwater quality; Sediment and oil contamination in nearby streams or water bodies	<ul style="list-style-type: none"> ➤ Conduct regular water quality monitoring during operation phase. ➤ If pollutants exceed prescribed limits, install silt traps, or sedimentation chambers. ➤ Ensure roadside drains are cleaned and desilted regularly. ➤ Conduct public awareness to discourage waste disposal into water bodies. 	Contractor	Water quality monitoring results; Drain cleaning records	MPWD
4	Dust Generation from Vehicular Movement	Deterioration of ambient air quality; Nuisance to roadside residents and vegetation; Reduced visibility	<ul style="list-style-type: none"> ➤ Establish and maintain roadside plantation to serve as dust barriers. ➤ Maintain smooth road surfaces to minimize dust generation. ➤ Install signage discouraging over-speeding, which increases dust levels. 	Contractor	Air quality results; Plantation survival record	MPWD
5	Air Pollution from Vehicular Emissions	Increased levels of NOx, SO ₂ , CO, and PM; Health impacts on local population; Deterioration	<ul style="list-style-type: none"> ➤ Conduct ambient air quality monitoring at sensitive locations. ➤ Maintain green buffers along the corridor. 	Contractor	Air quality results; Plantation survival record ; Awareness records	MPWD

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

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

On-Boarding Phase

a. Induction Training

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

b. Specialized Training

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

Implementation Phase

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

Table: Given below is the specialized training outline for contractor

Sl. No.	Training Title	Content Summary	Target Group	Purpose	Schedule / Stage
1	Code of Conduct Induction	Sensitization on local issues, introduction to the Code of Conduct, labor camp management	All workers	Ensure awareness of expected behavior, local sensitivities, and compliance with regulations	Onboarding (before deployment)
2	Health, Safety, and Environmental Hygiene	Safety procedures, first aid, environmental hygiene practices	All workers	Reduce occupational hazards and promote safe practices	Onboarding

Sl. No.	Training Title	Content Summary	Target Group	Purpose	Schedule / Stage
3	Health and Safety Induction	Special focus on road safety, occupational health, and safety concerns	All workers	Educate on health and safety requirements	Onboarding and as needed
4	Toolbox Sessions	Task-specific safety measures and procedures for work environments	All workers	Reinforce safety protocols and reduce risks	Daily / Weekly
5	Equal Employment	Emphasis on equal employment opportunities and non-discrimination	All workers and management	Ensure ethical and fair employment practices	Onboarding and as needed
6	Social and Cultural Norms of Tribal Communities	Orientation on local cultural practices, traditions, and norms	Workers	Promote respect and awareness of tribal culture	Ongoing / as part of Code of Conduct
7	SEA/SH Prevention	Awareness on Gender-Based Violence (GBV), Sexual Exploitation, Abuse, Harassment, unsafe migration, and human trafficking	All workers	Prevent and address SEA/SH incidents	Induction / Toolbox Talks / Ongoing
8	HIV/AIDS & STD Awareness	Programs on HIV/AIDS, STDs, and links to SEA/SH risks	All workers and local communities	Promote awareness and prevention of health risks	Ongoing
9	Safe Handling of Hazardous Materials	Safety procedures for handling, storage, and disposal of hazardous substances	Workers involved in hazardous tasks	Ensure safe handling and reduce chemical risks	Onboarding and as needed
10	PPE Usage	Correct selection and use of Personal Protective Equipment (PPE)	All workers	Protect workers from occupational hazards	Onboarding and as needed
11	GRM and SEA/SH Reporting	Mechanisms for grievance redressal and confidential SEA/SH incident reporting	All workers and local communities	Ensure accessible, safe, and effective grievance mechanisms	Ongoing

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

A. Penalty Clause for Non – Compliance

Penalties for non-compliance of ESMP
<p>Contractor’s Responsibilities:</p> <ul style="list-style-type: none"> • Implement all assigned mitigation measures as per the ESMP and contract documents • Address grievances raised by the public during project implementation

- Undertake regular reporting to the CSC/PMC and E&S

- 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 work until safety is ensured, significant degradation of environment and continuous disturbances in settlements as determined by CSC/PMC/E&S
- d) Reoccurrence of any minor non-compliances

- **All non-compliances, which are not major lapses, will be categorized as minor lapses**

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 **North Garo Hill**. The approach included:
 2. Literature Reviews and Consultations:
 - a. Reviewed peer-reviewed articles, biodiversity reports, and government publications relevant to the region.
 - b. Consulted databases such as the IUCN Red List, ZSI records, and previous Environmental Impact Assessments (EIAs) conducted in nearby areas.
 3. Use of Historical Biodiversity Records:
 - a. Incorporated species data from earlier surveys and studies conducted in **North Garo Hill**.
 - b. Verified and updated records based on field observations to ensure data accuracy.
4. Subsequently, comprehensive tools such as IBAT-Alliance, Web-Based Sources and the following list (Below Table) of sources are used for the secondary data collection.

Table 1: Tools/Sources for identifying critical habitats

SI No.	Indicators	Tools	References
1	Natural Habitat/ Modified Habitat	Global Forest Watch Land Cover Layer	https://www.globalforestwatch.org/
2	Land Use Land Cover	Land Cover data by ESRI and Impact Observatory	Environmental Systems Research Institute, California
3	PAs, Conservation Reserve, Community Reserve, Reserve Forest & Eco-sensitive Zone	Parivesh portal	https://stgdev.parivesh.nic.in/kya-dev/#/
4	Tiger Reserve & Corridor	Download boundary file and overlay the project area	https://ntca.gov.in/dss/#decision-support-system
5	Elephant Reserve	Elephant Reserves of India: An Atlas	https://moef.gov.in/wp-content/uploads/2023/11/PE-Elephant-Reserve-of-India-an-atlas.pdf
6	Protected Wetland of Meghalaya	State Notification (2023)	Wetlands (Conservation and Management) Rules, 2017
7	Ramsar Site	Ramsar Sites Information Services	https://rsis.ramsar.org/
8	Key Biodiversity Area/Important Bird Area	Key Biodiversity Area	https://www.keybiodiversityareas.org/sites/search
9	Schedule Species (I-IV), Wildlife (Protection) Act, 1972	List of schedule species list (I - IV)	Wild Life (Protection) Amendment Act, 2022

Primary data collection:

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

Table 2: Primary data collections methods and indicators

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

Meetings with Local government officials:

6. Various interactions and meetings were conducted with, Environmental expert of MPWD & other officials of MPWD responsible for the project road. Meetings with forest department officials were done to request information about their working plan circles and their management of protected areas and to discuss about animal corridors if present in the vicinity of the project road.

7. Additionally, discussions were held with inhabitants near the project site, engaging various individuals to understand the current status of fauna along the road and nearby protected areas. The conversations focused on gathering information about the presence of wildlife, the frequency of sightings along the roadside, and in nearby community forests.

8. Data Analysis Methods

Collected data was analyzed using the following methods:

Species Categorization:

- c. Species were classified based on their taxonomic groups for Flora (Trees, Herbs, shrubs, Climbers and Grasses and Fauna (mammals, birds, amphibians, reptiles, etc.).
- d. Conservation statuses were assigned using IUCN Red List categories and Wildlife Protection Act (WPA) schedules.

Threat Assessment:

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

Habitat Mapping:

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

Annexure 4.2: Detailed List of Flora, Fauna, and Aquatic Biodiversity, Along with their Conservation Status

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

List of trees (Source : Primary and Secondary data)

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
1.	Cluster Fig	<i>Ficus recemosa</i>	NL	Moraceae
2.	Japanese Raisin Tree	<i>Hovenia dulcis</i>	LC	Rhamnaceae
3.	Subabul	<i>Leucaena leucocephala</i>	NL	Fabaceae
4.	Sonajhuri	<i>Acacia auriculiformis</i>	LC	Fabaceae
5.	Amla	<i>Phyllanthus emblica</i>	LC	Phyllanthaceae
6.	Amoora	<i>Aglaia spectabilis</i>	LC	Meliaceae
7.	Areca palm	<i>Areca catechu</i>	LC (Decreasing)	Arecaceae
8.	Arjun tree	<i>Terminalia arjuna</i>	NL	Combretaceae
9.	Baheda	<i>Terminalia bellirica</i>	LC	Combretaceae
10.	Bamboo	<i>Bambusa tulda</i>	NL	Poaceae
11.	Bamboo	<i>Dendrocalamus hamiltonii</i>	NL	Poaceae
12.	Banana	<i>Musa balbisiana</i>	LC	Musaceae
13.	Banana	<i>Musa paradisiaca</i>	NL	Musaceae
14.	Bando lata	<i>Spatholobus parviflorus</i>	LC	Fabaceae
15.	Bhelu	<i>Tetrameles nudiflora</i>	LC	Tetramelaceae
16.	Black catechu	<i>Senegalia catechu</i>	LC	Fabaceae
17.	Black Plum	<i>Syzygium cumini</i>	LC	Myrtaceae
18.	Black Siris	<i>Albizia odoratissima</i>	LC	Fabaceae
19.	Bonsum	<i>Phoebe goalparensis</i>	NL	Lauraceae
20.	Burflower-tree	<i>Neolamarckia cadamba</i>	LC	Rubiaceae
21.	Chamkathal	<i>Artocarpus chaplasha</i>	LC	Moraceae

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
22.	Cashew	<i>Anacardium occidentale</i>	LC	Anacardiaceae
23.	China berry	<i>Melia azedarach</i>	LC	Meliaceae
24.	Chorai	<i>Vitex peduncularis</i>	LC	Lamiaceae
25.	Climbing wattle	<i>Senegalia pennata</i>	LC	Fabaceae
26.	Cluster fig tree	<i>Ficus racemosa</i>	NL	Moraceae
27.	Coconut palm	<i>Cocos nucifera</i>	NL	Arecaceae
28.	Common jujube	<i>Ziziphus jujuba</i>	LC	Rhamnaceae
29.	Cotton tree	<i>Bombax ceiba</i>	LC	Malvaceae
30.	Dog Teak	<i>Dillenia pentagyna</i>	LC	Dilleniaceae
31.	Dotted fig	<i>Ficus geniculata</i>	NL	Moraceae
32.	Drumstick tree	<i>Moringa oleifera</i>	LC	Moringaceae
33.	Dulloo bamboo	<i>Schizostachyum dullooa</i>	NL	Poaceae
34.	East Himalayan Dalbergia	<i>Dalbergia stipulacea</i>	LC	Fabaceae
35.	Elephant rope tree	<i>Sterculia villosa</i>	LC	Malvaceae
36.	False ashoka tree	<i>Polyalthia longifolia</i>	LC	Annonaceae
37.	Forest red gum	<i>Eucalyptus tereticornis</i>	LC	Myrtaceae
38.	Gamhar	<i>Gmelina arborea</i>	LC	Lamiaceae
39.	Ghora neem	<i>Melia azedarach</i>	LC	Meliaceae
40.	Golden shower	<i>Cassia fistula</i>	LC	Fabaceae
41.	Guava	<i>Psidium guajava</i>	LC	Myrtaceae
42.	Gulmohor	<i>Delonix regia</i>	LC	Fabaceae
43.	Hairy fig	<i>Ficus hispida</i>	NL	Moraceae
44.	Hibiscus	<i>Hibiscus rosa-sinensis</i>	LC	Malvaceae
45.	Hog Creeper	<i>Deguelia scandens</i>	LC	Fabaceae

Sl. No.	Common Name	Scientific Name	IUCN Status	Family
46.	Indian ash tree	<i>Lannea coromandelica</i>	LC	Anacardiaceae
47.	Indian Bael tree	<i>Aegle marmelos</i>	NT	Rutaceae
48.	Indian gooseberry	<i>Phyllanthus emblica</i>	LC	Phyllanthaceae
49.	Indian mahogany	<i>Cedrela toona</i>	LC	Meliaceae
50.	Indian sandalwood	<i>Santalum album</i>	VU	Santalaceae
51.	Indian trumpet flower	<i>Oroxylum indicum</i>	LC	Bignoniaceae
52.	Jackfruit	<i>Artocarpus heterophyllus</i>	NL	Moraceae
53.	Kassod	<i>Senna siamea</i>	LC	Fabaceae
54.	Khasi pine	<i>Pinus kesiya</i>	LC	Pinaceae
55.	Lantana	<i>Lantana camara</i>	NL	Verbenaceae
56.	Lychee	<i>Litchi chinensis</i>	VU	Sapindaceae
57.	Mango	<i>Mangifera indica</i>	DD	Anacardiaceae
58.	Mohaneem	<i>Azadirachta indica</i>	LC	Meliaceae
59.	Night-blooming jasmine	<i>Nyctanthes arbor-tristis</i>	LC (Stable)	Oleaceae
60.	Orchid tree	<i>Bauhinia tomentosa</i>	LC	Fabaceae
61.	Peepal tree	<i>Ficus religiosa</i>	LC	Moraceae
62.	Pongam Tree	<i>Pongamia pinnata</i>	LC (Stable)	Fabaceae
63.	Teak	<i>Tectona grandis</i>	EN	Lamiaceae
64.	Tamarind tree	<i>Tamarindus indica</i>	LC (Stable)	Fabaceae
65.	Tree bean	<i>Parkia timoriana</i>	LC	Fabaceae
66.	Wild guava	<i>Careya arborea</i>	LC	Lecythidaceae
67.	Woolly Rosebay Dyeing	<i>Wrightia arborea</i>	LC	Apocynaceae
68.	Zinghal	<i>Stereospermum colais</i>	LC	Bignoniaceae

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

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	<i>Acmella</i> (Kunth)	NL	Asteraceae
2.	Marsh para cress	<i>Acmella uliginosa</i>	NL	Asteraceae
3.	Sticky snakeroot	<i>Ageratina adenophora</i>	NL (Invasive)	Asteraceae
4.	Chick weed	<i>Ageratum conyzoides</i> L.	NL (Invasive)	Asteraceae
5.	Bluemink	<i>Ageratum houstonianum</i>	NL	Asteraceae
6.	Alligator weed	<i>Alternanthera philoxeroides</i>	NL (Invasive)	Amaranthaceae
7.	Pineapple	<i>Ananas comosus</i> (L.)	LC	Bromeliaceae
8.	Beggar Tick	<i>Bidens pilosa</i> L.	LC	Asteraceae
9.	Feather celosia	<i>Celosia argentea</i> L.	LC	Amaranthaceae
10.	Siam weed	<i>Chromolaena odorata</i> (L.)	NL (Invasive)	Asteraceae
11.	Redflower ragleaf	<i>Crassocephalum crepidioides</i> (Benth.)	NL	Asteraceae
12.	Gallant soldier	<i>Galinsoga parviflora</i>	LC	Asteraceae
13.	Fringed quickweed	<i>Galinsoga quadriradiata</i>	NL	Asteraceae
14.	Pennsylvania cudweed	<i>Gamochaeta pensylvanica</i>	LC	Asteraceae
15.	Jom lakhut	<i>Hellenia speciosa</i>	LC	Costaceae
16.	Cogon grass	<i>Imperata cylindrica</i>	LC	Poaceae
17.	Durun bon	<i>Leucas aspera</i>	LC	Lamiaceae
18.	Staghorn clubmoss	<i>Lycopodiella cernua</i>	LC	Lycopodiaceae
19.	Sensitive plant	<i>Mimosa pudica</i> L.	NL	Fabaceae
20.	Congress grass	<i>Parthenium hysterophorus</i> L.	NL (Invasive)	Asteraceae
21.	Stinking cassia	<i>Senna tora</i>	LC	Fabaceae
22.	Arrowleaf sida	<i>Sida rhombifolia</i> L.	LC	Malvaceae
23.	Asian broom grass	<i>Thysanolaena latifolia</i>	LC	Poaceae

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

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	<i>Cynodon dactylon</i>	Least Concern (LC)	Poaceae
2.	Giant reed	<i>Arundo donax L.</i>	NL (Invasive)	Poaceae
3.	Mint / Pudina	<i>Mentha arvensis</i>	Least Concern (LC)	Lamiaceae
4.	Wild Ginger	<i>Zingiber zerumbet</i>	Least Concern (LC)	Zingiberaceae
5.	Turmeric / Haldi	<i>Curcuma longa</i>	Data Deficient (DD) in IUCN; widely cultivated	Zingiberaceae
6.	Gotu kola / Indian Pennywort	<i>Centella asiatica</i>	Least Concern (LC)	Apiaceae
7.	Broom Grass / Tiger Grass	<i>Thysanolaena maxima</i>	Least Concern (LC)	Poaceae

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)

Sl. No.	Common Name	Scientific Name	IUCN Status	WPA 1972 Schedule	Migration / Resident Status
1.	Black Drongo	<i>Dicrurus macrocercus</i>	Least Concern	IV	R
2.	Blue-throated Barbet	<i>Psilopogon asiaticus</i>	Least Concern	IV	R
3.	Common Myna	<i>Acridotheres tristis</i>	Least Concern	IV	R

Sl. No.	Common Name	Scientific Name	IUCN Status	WPA 1972 Schedule	Migration / Resident Status
4.	Common Tailorbird	<i>Orthotomus sutorius</i>	Least Concern	IV	R
5.	Emerald Dove	<i>Chalcophaps indica</i>	Least Concern	IV	R
6.	Great Barbet	<i>Psilopogon virens</i>	Least Concern	IV	R
7.	House Sparrow	<i>Passer domesticus</i>	Least Concern	IV	R
8.	Indian Pond Heron	<i>Ardeola grayii</i>	Least Concern	IV	R
9.	Jungle Myna	<i>Acridotheres fuscus</i>	Least Concern	IV	R
10.	Red-vented Bulbul	<i>Pycnonotus cafer</i>	Least Concern	IV	R
11.	Shikra	<i>Accipiter badius</i>	Least Concern	IV	R
12.	Spotted Dove	<i>Spilopelia chinensis</i>	Least Concern	IV	R
13.	White-throated Kingfisher	<i>Halcyon smyrnensis</i>	Least Concern	IV	R
14.	Oriental White-eye	<i>Zosterops palpebrosus</i>	Least Concern	IV	R
15.	Asian Koel	<i>Eudynamys scolopaceus</i>	Least Concern	IV	R
16.	Common Hoopoe	<i>Upupa epops</i>	Least Concern	IV	WM
17.	Rufous Woodpecker	<i>Micropternus brachyurus</i>	Least Concern	IV	R
18.	Common Iora	<i>Aegithina tiphia</i>	Least Concern	IV	R
19.	Scarlet Minivet	<i>Pericrocotus flammeus</i>	Least Concern	IV	R
20.	Bronzed Drongo	<i>Dicrurus aeneus</i>	Least Concern	IV	R
21.	Black-hooded Oriole	<i>Oriolus xanthornus</i>	Least Concern	IV	R
22.	Rufous Treepie	<i>Dendrocitta vagabunda</i>	Least Concern	IV	R
23.	Barn Swallow	<i>Hirundo rustica</i>	Least Concern	IV	WM
24.	Asian Pied Starling	<i>Gracupica contra</i>	Least Concern	IV	R
25.	Paddy Field Pipit	<i>Anthus rufulus</i>	Least Concern	IV	R
26.	Oriental Turtle Dove	<i>Streptopelia orientalis</i>	Least Concern	IV	R

Sl. No.	Common Name	Scientific Name	IUCN Status	WPA 1972 Schedule	Migration / Resident Status
27.	Red-collared Dove	<i>Streptopelia tranquebarica</i>	Least Concern	IV	R
28.	Green Bee-eater	<i>Merops orientalis</i>	Least Concern	IV	R
29.	White Wagtail	<i>Motacilla alba</i>	Least Concern	IV	WM
30.	Grey Wagtail	<i>Motacilla cinerea</i>	Least Concern	IV	WM
31.	Citrine Wagtail	<i>Motacilla citreola</i>	Least Concern	IV	WM
32.	Common Stonechat	<i>Saxicola torquatus</i>	Least Concern	IV	R
33.	Crimson Sunbird	<i>Aethopyga siparaja</i>	Least Concern	IV	R
34.	Purple Sunbird	<i>Cinnyris asiaticus</i>	Least Concern	IV	R
35.	Jungle Owlet	<i>Glaucidium radiatum</i>	Least Concern	IV	R
36.	Jungle Babbler	<i>Turdoides striata</i>	Least Concern	IV	R
37.	Greater Necklaced Laughing Thrush	<i>Garrulax pectoralis</i>	Least Concern	IV	R
38.	Black-throated Sunbird	<i>Aethopyga saturata</i>	Least Concern	IV	R
39.	Green-tailed Sunbird	<i>Aethopyga nipalensis</i>	Least Concern	IV	R
40.	Purple-rumped Sunbird	<i>Leptocoma zeylonica</i>	Least Concern	IV	R
41.	Ruby-cheeked Sunbird	<i>Chalcoparia singalensis</i>	Least Concern	IV	R
42.	Scarlet-backed Flowerpecker	<i>Dicaeum cruentatum</i>	Least Concern	IV	R
43.	Plain Prinia	<i>Prinia inornata</i>	Least Concern	IV	R
44.	Rufous-necked Hornbill	<i>Aceros nipalensis</i>	Vulnerable	I	R
45.	White-rumped Vulture	<i>Gyps bengalensis</i>	Critically Endangered	I	R
46.	Sarus Crane	<i>Grus antigone</i>	Vulnerable	I	R

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

Source: District working plan

Species observed during Primary Survey are highlighted with Blue colour

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

Sl. No.	Common Name	Scientific name	IUCN status	Schedule status (WPA 2022)
Mammals				
1.	Rehsus Macaque	<i>Macaca mulata</i>	LC	NS
2.	Boro endur	<i>Cannomis badius</i>	LC	NS
3.	Large Indian Civet	<i>Viverra zibetha</i>	LC	II
4.	Masked Palm Civet	<i>Paguma larvata</i>	LC	II
5.	Irrawaddy Squirrel	<i>Callosciurus pygerythrus</i>	LC	NS
6.	Western Hoolock Gibbon	<i>Hoolock hoolock</i>	EN	I
7.	Chinese Pangolin	<i>Manis pentadactyla</i>	CR	I
8.	Clouded Leopard	<i>Neofelis nebulosa</i>	EN	I
9.	Pygmy Hog	<i>Sus salvanius</i>	VU	I
Reptiles				
1.	Common Garden Lizard	<i>Calotes versicolor</i>	NE	NS
2.	Bronze Skink	<i>Eutropis macularia</i>	LC	NS
3.	White-spotted Supple Skink	<i>Lygosoma albopunctata</i>	LC	NS
4.	Banded Krait	<i>Bungarus fasciatus</i>	LC	NS
5.	Common Kukri Snake	<i>Oligodon arnensis</i>	LC	NS
6.	Snail-eater	<i>Pareas monticola</i>	LC	NS
Amphibians				
1.	Indian Bullfrog	<i>Hoplobatrachus tigerinus</i>	LC	II
2.	Baibung Small Treefrog	<i>Theloderma baibungense</i>	LC	NS
Butterflies				
1.	Teinopalpus imperialis	<i>Byasa dasarada</i>	NT	NS
2.	Bhutanitis lidderdalii	<i>Graphium aggamemnon</i>	LC	NS
3.	Troides helena	<i>Delias descombesi</i>	LC	NS
4.	Papilio bianor	<i>Hypolimnas bolina</i>	LC	NS
5.	Papilio paris	<i>Moduza procris</i>	LC	NS
6.	Papilio memnon	<i>Charaxes bhārata</i>	LC	NS
7.	Papilio polytes	<i>Graphium cloanthus</i>	LC	NS
8.	Papilio clytia	<i>Kallima inachus</i>	LC	NS
9.	Graphium sarpedon	<i>Papilio polytes</i>	LC	NS
10.	Graphium doson	<i>Junonia almana</i>	LC	NS
11.	Graphium agamemnon	<i>Junonia iphita</i>	LC	NS
12.	Atrophaneura varuna	<i>Acraea issoria</i>	LC	NS
13.	Lamproptera curius	<i>Troides helena</i>	LC	NS
14.	Pachliopta aristolochiae	<i>Pachliopta aristolochiae</i>	LC	NS
15.	Kallima inachus	<i>Papilio eurypylus</i>	LC	NS
16.	Hypolimnas bolina	<i>Elymnias patna</i>	LC	NS

Sl. No.	Common Name	Scientific name	IUCN status	Schedule status (WPA 2022)
17.	Elymnias hypermnestra	<i>Cyrestis thyodamas</i>	LC	NS
18.	Junonia atlites	<i>Troides aeacus</i>	LC	NS
19.	Junonia lemonias	<i>Papilio helenus</i>	LC	NS
20.	Danaus chrysippus	<i>Graphium macareus</i>	LC	NS
21.	Tirumala limniace	<i>Danaus chrysippus</i>	LC	NS
22.	Parantica aglea	<i>Graphium doson</i>	LC	NS
23.	Euploea core	<i>Junonia orithya</i>	LC	NS
24.	Neptis hylas	<i>Prosotas nora</i>	LC	NS
25.	Ypthima baldus	<i>Heliophorus epicles</i>	LC	NS

Source: District working plan

Species observed during Primary Survey are highlighted with Blue colour

**Aquatic Biodiversity
List of Fish**

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

(Source : Primary and Secondary data)

List of Phytoplanktons

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

(Source Secondary and Primary)

Secondary source reference: Working Plan of East and North Garo Hills Tura Division

Annexure 4.3: Budget for Biodiversity Mitigation and Management Measures

To mitigate the potential effects on biodiversity, a dedicated budget has been allocated for various activities aimed at preserving the area's ecological integrity, specifically targeting the local biodiversity.

Since appropriate mitigation measures for wildlife protection and biodiversity conservation have already been suggested and planned for implementation in EMP. Biodiversity monitoring will continue under the Environmental Management Plan (EMP), with dedicated oversight by an environmental expert to ensure compliance with conservation strategies and to mitigate any unforeseen ecological impacts. The budget for environmental expert has already been estimated in EMP budget.

The stretch (00+000 to 22+000) of Corridor-1 RSN Road passes through segments of Rongrenggre reserve forest and IBA It is listed under the IBA Code: IN-ME-07, and forms part of the Nokrek National Park and Biosphere Reserve complex. The area is significant for the conservation of several key and endemic species such as the Grey Peacock-Pheasant (*Polyplectron bicalcaratum*), Great Hornbill (*Buceros bicornis*), and Hoolock Gibbon (*Hoolock hoolock*), among others. Given the ecological significance of these areas, there is a possibility of small to medium-sized mammals crossing the road in these segments. However, the cross-drainage structures at stream crossings, such as box culverts, will facilitate their safe movement. The design includes appropriately spaced box culverts that may serve as wildlife crossings, minimizing habitat fragmentation and the risk of roadkill. Budget for the same has been estimated in BOQ of civil works by the DPR consultant.

Additionally, targeted mitigation measures will be implemented to reduce project-related disturbances. Speed reduction zones will be designated in areas with dense forest cover, and clear signage will be installed to alert drivers about wildlife presence. In the vicinity of the Important Bird Area, "No Horn" signage will be placed to limit noise pollution and reduce stress on avian species. Budget for the signages has been estimated in BOQ of civil works by the DPR consultant.

To ensure the effectiveness of these mitigation strategies, comprehensive training and awareness programs will be conducted for workers on biodiversity conservation and emergency wildlife response. These programs will be implemented during the pre-construction and construction phases to enhance workers' understanding of ecological sensitivity and their role in minimizing environmental impacts. The awareness sessions will cover key topics such as identifying and mitigating potential impacts on local wildlife, best practices for habitat preservation, and emergency protocols for responding to wildlife encounters. Budget for the awareness workshops is estimated and given in the following table.

Although no officially designated wildlife crossing zones are present, the cross-drainage structures, such as box culverts, have been designed to function as underpasses, facilitating the safe movement of these mammals and reducing the risk of roadkill. Therefore, no additional wildlife crossing structures have been proposed. However, to enhance mitigation efforts, appropriate signage will be installed throughout the entire stretch, particularly in the vicinity of the Barail Range. These will include speed reduction signs, wildlife crossing alerts, and "No Horn" zones near the IBA to minimize disturbances to avian species. Budget for the same has been estimated in BOQ of civil works by the DPR consultant.

To ensure the effectiveness of these mitigation strategies, comprehensive training and awareness programs will be conducted for workers on biodiversity conservation and emergency wildlife response. These programs will be implemented during the pre-construction and construction phases to enhance workers' understanding of ecological sensitivity and their role in minimizing environmental impacts. Budget for the awareness workshops is estimated and given in the following table-2.

Budget for the **Biodiversity Management Plan** is estimated and given in the following table-.

Table: Budget for Biodiversity Management Plan

S.No.	Activity	Cost	Budget allocated (INR)
RSN Road			

S.No.	Activity		Cost	Budget allocated (INR)
1	Tree cutting (CAMPA)	Estimated and included in EMP		estimated and included in EMP
2	Awareness and Workshop (Local Community)	2 activities per site (one before construction and one during construction)	@17000/activity	34,000.00
3	Signage	Wildlife Warning, No Horn and Speed Reductions (average 1 signage/2km road)14	@4000/signage	56,000.00
Total				90,000.00

Annexure 4.4: Structure Details

TABLE 1: LIST OF STRUCTURES

S. No.	LHS/RHS	Chainage and distance	Distance from center line	Type of Impact	Photo
1.	RHS	13+820	4.5 m	Bamboo fencing of residential structure	
2.	RHS	16+200	4.5 m	Tin fencing of residential structure & of private field	
3.	RHS	11+400	4.5	Tin fencing of residential structure	
4.	RHS	11+700	5	Bamboo fencing of residential structure	

S. No.	LHS/RHS	Chainage and distance	Distance from center line	Type of Impact	Photo
5.	RHS	9+950	5.1	Pucca boundary along with pucca shop	 <p>Latitude: 25.506589 Longitude: 90.625619 Elevation: 246.56±2.54 m Accuracy: 10.68 m Time: 28-09-2025 17:21 Note: RSN 6</p>
6.	RHS	8+000	4.5	Tin fencing of residential structure	 <p>Latitude: 25.507965 Longitude: 90.609819 Elevation: 202.01±6.08 m Accuracy: 4.531 m Time: 28-09-2025 16:34 Note: RSN 7</p>
7.	RHS	20+300	5.2	Bamboo fencing of residential structure along with temporary shop	 <p>Latitude: 25.500512 Longitude: 90.688021 Elevation: 240.42±6.06 m Accuracy: 4.425 m Time: 28-09-2025 12:42 Note: RSN 1</p>
8.	RHS	10+000	5.3	Minor impact will be on shop though the owner details not available	 <p>Latitude: 25.506316 Longitude: 90.622904 Elevation: 279.9±13.6 m Accuracy: 6.167 m Time: 28-09-2025 17:22 Note: RSN</p>

S. No.	LHS/RHS	Chainage and distance	Distance from center line	Type of Impact	Photo
9.	RHS	9+700	5.0	Tin fencing of residential structure along with temporary shop	 <p>Latitude: 25.506635 Longitude: 90.621263 Elevation: 279.64195 m Accuracy: 7.776 m Time: 28/09/2025 17:02 Note: RSN 8</p>
10.	RHS	10+030	5.0	Bamboo fencing of residential structure along with private land & vegetation	 <p>Latitude: 25.508283 Longitude: 90.624477 Elevation: 277.09±3.52 m Accuracy: 3.841 m Time: 28/09/2025 17:37 Note: RSN 10</p>
11.	RHS	20+470	5.4	Temporary shop	 <p>Latitude: 25.499654 Longitude: 90.688471 Elevation: 260.43±12.4 m Accuracy: 3.825 m Time: 27/09/2025 14:09 Note: RSN RHS 3</p>
12.	LHS	20+480	5.4	Temporary shop	 <p>Latitude: 25.499627 Longitude: 90.688483 Elevation: 239.32±6.88 m Accuracy: 5.509 m Time: 27/09/2025 14:07 Note: RSN LHS 5</p>

TABLE 2: DETAILS OF TEMPORARY ENCROACHMENT (LHS)

Sl. No	Chainage		Bamboo Shops
	From	To	1
1	0+000	1+000	0
2	1+000	2+000	0
3	2+000	3+000	1
4	3+000	4+000	0
5	4+000	5+000	0
6	5+000	6+000	0
7	6+000	7+000	0
8	7+000	8+000	0
9	8+000	9+000	1
10	9+000	10+000	0
11	10+000	11+000	1
12	11+000	12+000	2
13	12+000	13+000	4
14	13+000	14+000	1
15	14+000	15+000	0
16	15+000	16+000	0
17	16+000	17+000	0
18	17+000	18+000	2
19	18+000	19+000	0
20	19+000	20+000	0
21	20+000	20+638	7
		Total	19

TABLE 3: DETAILS OF TEMPORARY ENCROACHMENT (RHS)

Sl. No	Chainage		Bamboo Shops(RHS)
	Chainage		
	From	To	1
2	0+000	1+000	0
3	1+000	2+000	0
4	2+000	3+000	1

5	3+000	4+000	0
6	4+000	5+000	0
7	5+000	6+000	0
8	6+000	7+000	1
9	7+000	8+000	0
10	8+000	9+000	0
11	9+000	10+000	0
12	10+000	11+000	0
13	11+000	12+000	1
14	12+000	13+000	1
15	13+000	14+000	1
16	14+000	15+000	1
17	15+000	16+000	0
18	16+000	17+000	0
19	17+000	18+000	0
20	18+000	19+000	0
21	19+000	20+000	0
22	20+000	20+638	3
Total			9

Annexure 5.1: Dumpsite Stabilization Plan

1. Introduction

The MLCIP road project involves widening, cutting, slope trimming, excavation for retaining walls, and construction of culverts/bridges. These activities will generate excavated soil, rock fragments, and construction spoils (collectively referred to as muck). Proper muck management is crucial in Meghalaya due to steep terrain, fragile geology, and high rainfall that increase erosion and landslide risks.

2. Quantity & Sources of Muck

Excavation will mainly occur along road cuttings, drainage works, and foundations for retaining/breast walls. The proposed road construction activity will involve a cut volume of 101540.6 m³ and a fill volume of 25506.16 m³. This indicates that the excavation requirement is nearly double the filling requirement, resulting in a surplus of approximately 15351.56 cu.m m³ of excavated material.

3. Criteria for Muck Disposal Site Selection

The following criteria shall guide the selection of muck disposal sites:

- **Proximity to Work Sites** – Disposal sites should be located within 2–3 km of the excavation area to minimize fuel consumption, traffic congestion, and road safety risks from muck transport.
- **Slope Stability** – Sites shall be located on naturally stable and gently sloping terrain (preferably <25°) and away from landslide-prone or erosion-prone areas.
- **Distance from Water Sources** – A minimum buffer of 50 m from streams/drains and 100 m from rivers/lakes shall be maintained to prevent siltation and contamination.
- **Avoidance of Habitation & Agriculture** – Disposal shall not be carried out near settlements, schools, or agricultural land to avoid livelihood and health impacts.
- **Non-Forest/Non-Encroachment Land** – Sites should preferably be on barren, community, or government land, avoiding forest land unless prior approval is obtained.
- **Approval & Community Consent** – All disposal sites must be approved by the Village Employment Council (VEC) / traditional institutions under KHADC/JHADC/GHADC, and endorsed by the State PWD/PIU.
- **Accessibility & Safety** – Sites should be accessible by haul roads without requiring major additional cutting, and safe for vehicle maneuvering.

The details for the muck disposal sites are presented in Table below:

Table: Details for the muck disposal site

RSN					
Dumping Location			Coordinate		Area m ²
SL. NO	LOCATION CHAINAGE	SIDE	X	Y	
1	4+300	LHS	257815.41	2826161.78	6600
2	6+800	LHS	259086.1	2824341.27	1800
3	8+000	RHS	259725.32	2823339.46	2500
4	10+800	LHS	261722.06	2823522.96	1600
5	12+600	LHS	262632.01	2823748.51	3500
6	14+900	LHS	264389.2	2823748.67	2500
7	16+200	RHS	265296.33	2824220.1	5000
8	18+400	LHS	266710.22	2823495.42	4000

4. Methodology of Muck Disposal

Utilization priority: Maximum use of excavated material in road embankment, shoulder filling, and construction of retaining/breast walls.

Disposal management include:

- Dumping muck in designated sites at slope $\leq 30^\circ$.
- Layer-wise compaction using machinery.
- Retaining walls or gabion walls constructed at toe of disposal sites.
- Drainage channels with weep holes for safe water passage.
- Temporary fencing to prevent spillage and encroachment.

5. Rehabilitation of Muck Disposal Sites

- **Engineering Measures**

- Construction of breast walls/retaining walls.
- Compaction of dumped muck in layers (500–700 mm).
- Surface levelling and provision of drainage.

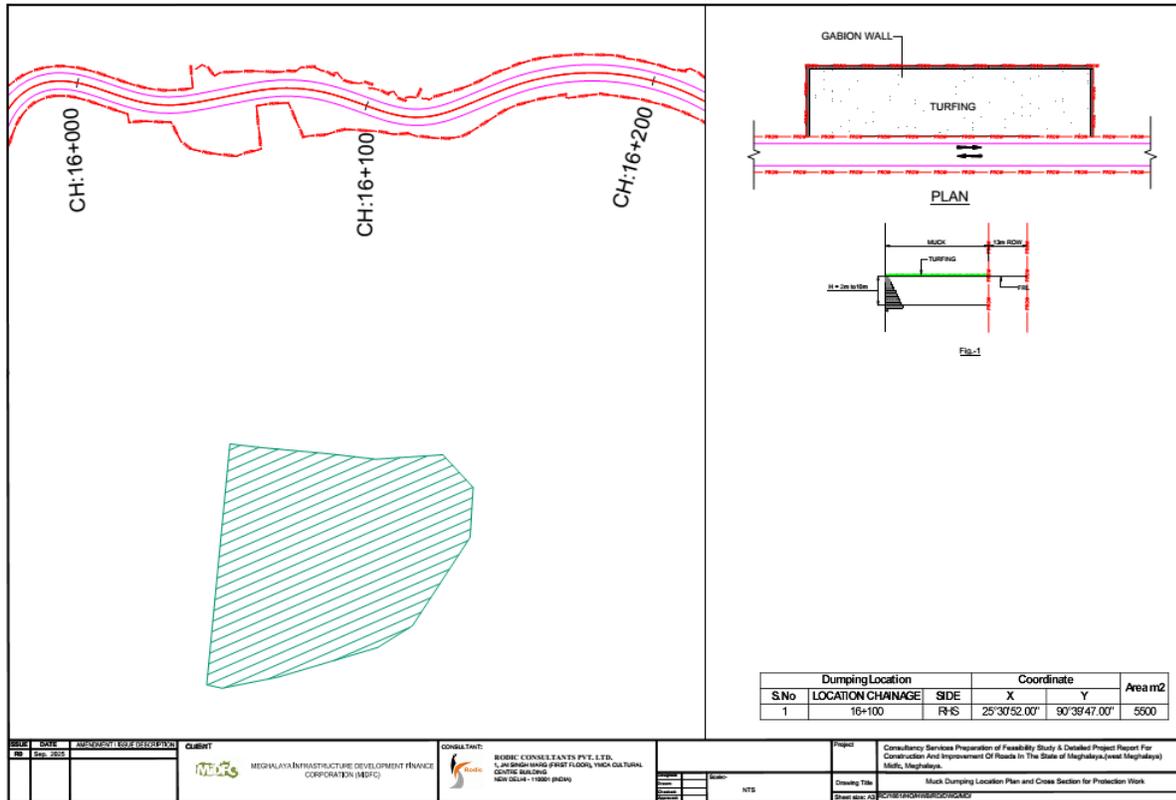
- **Biological Measures**

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

6. Monitoring & Compliance

Regular monitoring will be conducted by PIU/PMC to ensure muck disposal is done only at designated sites. Compliance will be ensured with Meghalaya State Pollution Control Board (MSPCB) and MoRTH/IRC environmental guidelines. Geo-tagging of muck disposal sites under MLCIP will also be carried out.

Drawing of Muck disposal is given below



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:

12. Payment of Wages Act, 1936 – timely and fair wage payment.
13. Minimum Wages Act, 1948 – ensure minimum wages for construction workers.
14. Equal Remuneration Act, 1976 – equal wages and non-discrimination.
15. Contract Labour (Regulation & Abolition) Act, 1970 – registration, welfare measures, and licensing for contractors.
16. Payment of Gratuity Act, 1972 – terminal benefits after minimum service.
17. Employees' Provident Fund & Miscellaneous Provisions Act, 1952 – PF contributions and benefits.
18. Payment of Bonus Act, 1965 – bonus to eligible workers.
19. Maternity Benefit Act, 1961 – leave and benefits for women employees.
20. Child Labour (Prohibition & Regulation) Act, 1986 – prohibition of child labour below 14 years.
21. Inter-State Migrant Workmen (Regulation of Employment & Conditions of Service) Act, 1979 – facilities for migrant workers.
22. 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.

Annexure – 1: Standard Contract Clauses for Labour Management and Compliance:

1. General Provisions:

- The Contractor shall comply with all applicable labour laws of India and World Bank's ESS2 on Labour and Working Conditions.
- The Contractor shall ensure fair treatment, non-discrimination, and equal opportunity for all workers, including women, persons with disabilities, and socially vulnerable groups.
- No child labour (below 18 years in hazardous work) or forced labour shall be employed.

2. Recruitment and Employment:

- Priority shall be given to hiring local workers from within the project area in consultation with traditional institutions.
- All workers shall be registered with complete demographic details.
- Written employment contracts shall be issued to all workers, specifying wages, working hours, benefits, and conditions.

3. Wages and Benefits:

- The Contractor shall pay wages not less than those prescribed under the Minimum Wages Act, 1948, and as notified by the Government of Meghalaya.
- Wages shall be paid at least once every month, preferably through bank transfers.
- Equal pay for equal work shall be ensured for men and women workers.
- Wage slips shall be provided to workers with details of payments and deductions.
- Mandatory contributions (EPF, ESI, Bonus, etc.) shall be made in accordance with applicable laws.

4. Working Conditions:

- No worker shall be required to work for more than 8 hours per day and 48 hours per week, except with overtime compensation as per law.
- Workers shall be entitled to one day of rest every seven days.
- The Contractor shall provide:
 - Adequate drinking water, sanitation facilities (separate for men and women), and rest shelters.
 - Proper accommodation for migrant workers, where applicable.
 - Medical facilities including first aid, doctor-on-call, and emergency transport.

5. Occupational Health and Safety (OHS):

- The Contractor shall comply with the Building and Other Construction Workers Act, 1996 and other safety regulations.
- All workers shall be provided with Personal Protective Equipment (PPE) such as helmets, gloves, boots, safety belts, and masks at no cost.
- Safety induction and regular training shall be provided to workers.
- Accident/incident registers shall be maintained, and accidents shall be reported immediately to the Engineer/PIU.
- Compensation for injury or death shall be provided in line with the Employees' Compensation Act, 1923.

6. Gender Equality and Inclusion:

- Women workers shall not be discriminated against in wages, work allocation, training, or promotions.
- Separate toilets, washing facilities, and changing rooms shall be provided for women.
- Where more than 50 female workers are employed, the Contractor shall provide crèche facilities as per the Maternity Benefit Act, 1961.
- Sensitization programs on Gender-Based Violence (GBV), Sexual Exploitation and Abuse (SEA), and Sexual Harassment at Workplace shall be conducted.

7. Grievance Redressal Mechanism (GRM):

- The Contractor shall establish a workers' grievance mechanism at the site with multiple options (complaint box, helpline, community liaison officer).
- Grievances shall be resolved within 7 working days and escalated to PIU if unresolved.
- Special confidential channels shall be available for GBV/SEA-related complaints.

8. Code of Conduct (CoC):

- All workers (including sub-contractors and suppliers) shall sign a Code of Conduct covering:
 - Prohibition of sexual harassment, exploitation, and abuse.
 - Respect for local customs, culture, and community norms.
 - No alcohol, drugs, or violence at worksites.
 - Zero tolerance for child labour and forced labour.

9. Monitoring and Reporting:

- The Contractor shall submit **monthly labour reports** including:
 - Number of workers employed (by category, gender, origin – local/migrant).
 - Wage payments and deductions.
 - OHS compliance, accidents/incidents.
 - Grievances received and resolved.
- The PIU/Supervision Consultant shall have unrestricted access to worksites, labour camps, and records for monitoring compliance.

10. Sanctions for Non-Compliance:

- Non-compliance with these provisions shall attract penalties, including:
 - Withholding of payments.
 - Deduction of costs incurred by PIU in ensuring compliance.
 - Termination of contract for repeated violations.

Annexure – 2: Sample Code of Conduct (CoC) for Workers and Supervisors:

Purpose:

This Code of Conduct sets standards of behaviour expected from all workers, supervisors, contractors, and sub-contractors engaged in the Meghalaya Road Projects. Compliance is mandatory.

Commitments of All Workers:

9. Compliance with Laws and Rules:

- I will comply with all Indian labour laws, project labour management rules, and site safety regulations.

10. 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.

11. 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.

12. 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.

13. 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.

14. 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.

15. 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.

16. Grievance Reporting:

- I will raise concerns and grievances through the established Worker Grievance Redress Mechanism (GRM).
- I will cooperate in resolving grievances fairly.

Acknowledgement:

I, the undersigned, have read and understood this Code of Conduct. I agree to comply with it throughout my employment on the Road Projects. I understand that violations may result in disciplinary action, including termination of employment or legal action.

Worker's Name: _____

Designation/Role: _____

Signature/Thumbprint: _____

Date: _____

Contractor's Representative (Witness): _____

Annexure 5.3: 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 conducted	Training Records
Number of safety audits and inspections	Audit Reports
Compliance with OHS standards	Monthly Reports

9. Budgetary Provision

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

10. Documentation and Record Keeping

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

Annexures: OHS Forms and Checklists:

Annexure 1: Accident / Incident Reporting Form:

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

Annexure 2: Safety Audit Checklist:

Checklist Item	Yes/No	Remarks
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-	Findings / Remarks	Doctor's Signature

		employment/Periodic)		

Annexure 5: Training Attendance Sheet:

Date	Training Topic	Trainer's Name	Worker Name	Signature

Annexure 6: Monthly OHS Performance Reporting Format:

Contractor: _____

Package No.: _____

Reporting Month: _____

Submitted To: PIU (through CSC)

Date of Submission: _____

Section A: Workforce Details:

Indicator	This Month	Cumulative (Project to Date)
Total number of workers employed		
Number of new workers inducted with safety orientation		
Number of skilled operators/drivers licensed		

Section B: Training and Awareness:

Indicator	This Month	Cumulative
Number of safety inductions conducted		
Number of toolbox talks conducted		
Number of safety trainings/workshops conducted		
Number of awareness campaigns (HIV/AIDS, GBV, Road Safety)		

Section C: Health and Medical:

Indicator	This Month	Cumulative
Number of pre-employment medical check-ups		
Number of periodic health check-ups		
Number of health awareness sessions conducted		

Section D: Incidents and Accidents:

Indicator	This Month	Cumulative
Number of fatal accidents		
Number of non-fatal accidents		
Number of near misses reported		
Number of lost workdays due to injury		

Section E: Safety Compliance:

Indicator	This Month	Cumulative
Percentage of workers provided with PPE		
Number of safety inspections conducted		
Non-compliance issues identified		
Corrective actions implemented from previous inspections		

Section F: Summary:

- Key Safety Achievements: _____
- Major Issues/Challenges: _____
- Corrective Actions Planned for Next Month: _____

Prepared By (Contractor Safety Officer): _____

Verified By (CSC Safety Specialist): _____

Reviewed By (PIU): _____

	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.				

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

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

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

	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
7.01	Is an engineering survey provided in writing?				
7.02	Does documentation show operations planned ahead?				
7.03	Is shoring of adjacent structures complete?				
7.04	Are utilities marked and shut off?				
7.05	Are hazardous materials or chemicals removed from any pipes, tanks, or equipment?				
8.00	Fire prevention				
8.01	Are an adequate number and types of fire extinguisher(s) available at labour camps, construction camps, etc?				
8.02	Is fire prevention/extinguisher training performed?				
8.03	Are inspections of fire extinguishers performed periodically?				
8.04	Is the telephone number of the fire department posted?				
8.05	Are fire extinguisher(s) provided on appropriate equipment?				
8.06	Are flammable liquids stored in approved containers and correctly labelled?				
8.07	Are flammable liquids properly stored?				
8.08	Is a fire alarm available?				
8.09	Is a fire evacuation plan established?				
8.10	Are fuel supplies protected from accidental impact?				
8.11	Is fire training given to appropriate personnel?				
8.12	Is equipment shut down prior to refueling?				

	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
8.13	Is equipment properly grounded to fuel trucks before refueling?				
8.14	Are no-smoking signs posted and enforced?				
8.15	Are hydrants clear and access to public thoroughfare open?				
9.00	Hoists, Cranes, and Derricks				
9.01	Are annual inspections completed?				
9.02	Have operators been properly tested, and are their physical exams current?				
9.03	Are daily inspections completed by operators?				
9.04	Are outriggers used?				
9.05	Are power lines deactivated or removed, or are warning signs posted with at least 3M of clearance from overhead power lines				
9.06	Are hoists designed by a competent professional engineer?				
9.07	Is proper loading for capacity at lifting radius?				
9.08	Is equipment operated in accordance with the manufacturer's instructions?				
9.09	Does a competent person inspect the crane?				
9.10	Is equipment properly lubricated and maintained?				
9.11	Is load testing accomplished?				
9.12	Are signal workers properly trained and placed where needed?				
9.13	Are alarms working and audible?				

	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
10.00	Welding and cutting				
10.01	Are all welding and cutting operators qualified?				
10.02	Are screens and shields in place?				
10.03	Is oxygen and acetylene stored properly?				
10.04	Are bottles not in use secured with caps in place?				
10.05	Is proper eye protection and PPE used?				
10.06	Are fire extinguisher(s) located near operations?				
10.07	Is a "hot work" permit completed and posted in areas requiring a permit?				
10.08	Are valves shut off and regulators backed off each night?				
10.09	Are flashback arresters placed on hoses (O2 and fuel gas)?				
10.10	Is electrical equipment grounded?				
10.11	Is the area inspected for fire hazards?				
10.12	Are gas lines and power cables protected and in good				
10.13	Is proper ventilation ensured?				
10.14	Is there a welding permit program?				
11.00	Power Tools				
11.01	Is proper housekeeping conducted where tools are used?				
11.02	Are inspections and proper maintenance of tools performed?				
11.03	Are tools grounded properly or double-insulated?				

	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
11.04	Are tool guards in place and used correctly?				
11.05	Are damaged or malfunctioning tools tagged out until repaired or replaced?				
11.06	Are tools in compliance with local laws and ordinances?				
11.07	Are all operators qualified?				
11.08	Are tools protected from unauthorized use?				
11.09	Is competent instruction and supervision provided?				
11.10	Are cords included in electrical inspection?				
12.00	Traffic Management				
12.01	Area Traffic Management plan is documented and implemented				
12.02	Are traffic signage properly posted and adequate				
12.03	Are there trained personnel i.e., flag men to direct traffic				
12.04	Is there proper delineation of the work front				
12.05	Area traffic diversion signals well luminated during night time				
13.00	Barricades				
13.01	Placed for work site perimeter				
13.02	Placed for all excavations				
13.03	Placed for swing radius of crane or other equipment				
13.04	Placed for drop areas of construction materials				

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

	Inspection Items	Implemented?		N/A	Actions to be Taken
		Yes	No		
16.03	Method statements are available				
17.00	First Aid				
17.01	First Aid kit is available and adequately stocked				
17.02	There is at least one trained first aider on site				
17.03	First aid kit inspection is being conducted				
18.00	Incident Management				
18.01	Incident Management Procedure is available				
18.02	All incidents are reported, documented and investigated accordingly				
18.03	CAPA (Corrective Action and Preventive Action) is being implemented accordingly				
18.04	Emergency contact numbers i.e., health centers/ambulance, safeguards team, first aiders, utility providers, police etc. are available on site				
19.00	Trainings				
19.01	Employees received HSE induction training				
19.02	Training records are available and properly documented				
19.03	Employees involved in high risks activities have received special training				

Annexure 5.4: Gender-Based Violence (GBV) Action Plan

Meghalaya Logistics and Connectivity Improvement Project (MLCIP) Corridor funded by the World Bank



**Meghalaya Infrastructure Development Finance Corporation (MIDFC) Ltd.
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Gender-Based Violence (GBV) Action Plan for Road Projects under the Meghalaya Logistics and Infrastructure Connectivity Project (MLICP)

■ EXECUTIVE SUMMARY

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-centered response mechanisms, grievance redress systems, capacity building, and robust monitoring, the plan ensures that both workers and project-affected communities are protected. Overall, the GBV-action plan strengthens social safeguards, enhances project accountability, and fosters a safe, inclusive, and equitable environment for all stakeholders involved in the MLCIP.

▪ 1. PURPOSE & SCOPE

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

Key objectives:

- Prevent and reduce GBV (including Sexual Exploitation and Abuse — SEA — and Sexual Harassment — SH) associated with civil works and associated influx.
- Provide survivor-centered, timely and safe response and referrals.
- Ensure compliance with World Bank Good Practice Notes on GBV/SEA/SH and with Indian legislation (POSH, POCSO, Domestic Violence Act, IPC provisions).

▪ 2. APPLICABLE POLICY & LEGAL FRAMEWORK

- World Bank: Good Practice Note — Addressing Gender-Based Violence in Investment Project Financing involving Major Civil Works (GPN, 2018) and related ESF/SEA-SH guidance (2022). These set out risk-based requirements for assessment, mitigation, monitoring, and survivor-centered response.

India (national law):

- Sexual Harassment of Women at Workplace (Prevention, Prohibition & Redressal) Act, 2013 (POSH) — obligations for workplace prevention and redress (Internal Complaints Committee etc.).
- Protection of Children from Sexual Offences (POCSO) Act, 2012 — mandatory reporting and child-sensitive procedures for offences against minors.
- Protection of Women from Domestic Violence Act, 2005 — civil remedies and support services for survivors.
- Indian Penal Code (notably sections on rape, sexual assault and trafficking), and Criminal Law (Amendment) Acts which expanded definitions and penalties.

These laws, together with World Bank guidance, require a survivor-centred, confidential, timely response and preventive measures such as codes of conduct, worker training, and site/community mitigation measures.

▪ 3. RISK PROFILE

- Influx of outside workers and truckers increased SEA/SH and tensions with local communities.
- Remote construction sites and night works with poor lighting elevated risk of assault.
- Male-dominated workforce and lack of female facilities sexual harassment and unsafe sanitation access.
- Child exposure near camps and worksites risk under POCSO.
- Weak/no confidential reporting channels or fear of retaliation under-reporting.
- Limited local referral services (health, psychosocial, medico-legal) in remote areas.

▪ 4. PREVENTION & MITIGATION MEASURES (MINIMUM REQUIRED MEASURES)

4.1 Project-wide (Owner / PIU responsibilities)

- GBV-AP adoption: PIU to adopt and publicly disclose this GBV-AP and ensure contract clauses require contractor compliance. (Incorporate into ESMF/ESCP).
- Codes of Conduct (CoC): Mandatory CoC for all project staff, contractors, suppliers and visitors that prohibit GBV/SEA/SH and set out sanctions. All staff sign before mobilisation. (Annex A: sample CoC).
- Contractual obligations: All construction contracts must include GBV-AP obligations: training, safe accommodation, gender-segregated sanitation, GRM accessible to survivors, and reporting obligations. Contractors' non-compliance leads to sanctions/disqualification per World Bank practice.

4.2 Site-level (Contractor responsibilities)

- **Worker management & workplace safeguards:**
 - Pre-employment checks, code of conduct acknowledgement, worker induction covering GBV/SEA/SH and local cultural sensitivity.
 - Establish workplace sexual harassment redress mechanisms in line with POSH for female employees (Internal Complaints Committee or facility-level arrangement).
 - Gender parity in recruitment where feasible; recruit female staff for site safety focal roles.
 - **Accommodation & camp management**
 - Separate, lockable sleeping quarters for women and men; separate WASH (toilet/shower) facilities with lighting and locks; secure water and food distribution; supervision to prevent exploitation.
 - No unauthorised visitors; visitor sign-in and buddy system for movement at night.
 - **Infrastructure & site security:**
 - Safe access routes, adequate lighting around camps, work sites, access roads and public toilets; secure fencing where needed.
 - Safe transport to/from work with driver CoC and seat allocation that prevents isolated travel of women at night.
 - **Community risk mitigation:**
 - Time-constrained works (limit night work near villages), work scheduling to reduce congregation of workers near sensitive community areas (schools, markets).
 - Community awareness campaigns on GBV risks, rights and available services; engagement with women's groups, panchayats and customary leaders.
 - **Child protection:**
 - Zero-tolerance for child labour; protocols to prevent children's access to worksites; community awareness regarding POCSO obligations and reporting.
- #### **4.3 Information, Education & Communication (IEC)**
- Visible IEC materials in local languages (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 RECORD KEEPING & 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 Garoand English.
- Use local female mobilisers and translators for outreach to women and girls.
- Respect local cultural protocols while aligning with survivor rights and legal obligations.

▪ 12. INCIDENT MANAGEMENT WORKFLOW

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

12.1 Next steps / actions required from PIU (checklist)

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

▪ 13. GENDER DISTRIBUTION OF PROJECT-AFFECTED PERSONS:

The gender distribution of Project-Affected Persons (PAPs) of 10 project-affected households shows a nearly balanced composition, with a slightly higher proportion of males. Out of a total of 66 PAPs, 37 individuals (56%) are male, while 29 individuals (44%) are female. The gender distribution of PAPs is presented in **Table** below.

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

Gender	Corridor 1	Percentage
Male	22	55
Female	18	45
Total	40	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 Weiloi-Mawsynram-Phlangwanbroi 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 is a predominantly rural, hilly, and forested area with scattered villages and limited road connectivity. Road works will involve camp-based labour near remote settlements.
- Labour influx risk: Medium–High. Contractors are likely to bring in male-dominated workforces from outside Meghalaya (Assam, Bihar, UP, etc.), increasing the risk of SEA/SH and community tensions.
- Demographics & social norms: High proportion of indigenous Garo population, matrilineal system but still strong male decision-making in public domains.
- 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 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)	Williamnagar Police Station Rongjeng Police Station Williamnagar Women Police Station	Superintendent of Police, East Garo Hills (Williamnagar) 03658-220313 Williamnagar Police Station +91-7085095039 Rongjeng Police Station +91-7005753540 Williamnagar Women Police Station +91-9774160338	
Child Protection (POCSO, Juvenile Unit)	Special Juvenile Police Unit (SJPU), East Garo Hills (Williamnagar)	CI / Smt. Kennedy R Marak Special Juvenile Police & Child Unit (SJPU), Welfare Officer (Williamnagar) Smt. Nitu I Sangma District Child Protection Unit, East Garo Hills (Williamnagar) DCPO, Smti D.Ch. Marak 8974395741 Child Helpline (Meghalaya / India) Toll-Free 24x7 1098 State Commission for Protection of Child Rights, Meghalaya (Shillong) Chairperson, 0364-2500175 etc.	Emergency: 100.
Health – Emergency & Medico-Legal	Williamnagar Civil Hospital (District Hospital)	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 (toll-free, nationwide).	Through the DCPU	

Advices for Contractors & PIU

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

4. Reporting Framework

- Contractor GBV focal person → submits monthly GBV compliance note to PIU.
- PIU GBV Specialist → consolidates into quarterly GBV report for World Bank.

- Third-party monitor/NGO → provides independent verification reports twice a year.
- Annual consolidated report → submitted to World Bank including lessons learned and corrective actions.

5. Risk Levels & Triggers

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

6. Confidentiality & Ethics

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

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

1. Changing Rainfall Patterns

- Extreme rainfall events are increasing in East 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 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 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
<ul style="list-style-type: none"> • High Rainfall • Changes in the seasonal and annual average rainfall 	<p>-- Extreme monthly rainfall (2,020.0 mm in 2020)</p> <p>i. Impact on soil moisture levels, affecting the structural integrity of roads, culverts, bridges standing water on the road base</p> <p>ii Risk of flood from runoff, landslides, slope failures and damage to roads if changes occur in the precipitation pattern</p>	<ul style="list-style-type: none"> - Increased risk of flooding leading to submersion of roads. - Erosion of road embankments and landslides in hilly terrains. - Structural damage to culverts and bridges. 	<ul style="list-style-type: none"> • Certain critical sections affected by overland flooding of the road raised (vertical alignment, embankment improvement) to be free from the onslaught of flooding events under intense precipitation. • Road asset survey has considered certain critical road sections where the sub-grade strength and integrity were found to be compromised; the sub-grade strength specification meeting the recent-most IRC specifications has been adopted. • The highest assessment of design discharge for sizing culverts and bridges from among the several discharge methods as outlined in recent IRC guidelines 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	- Maximum temperature rising from 22°C to 33 °C	- Higher temperatures cause thermal expansion of road	a. An adequate binding layer thickness has been proposed to offset the wear, surface fatigue, and rutting under climate stresses.

Climate Trend / Parameter	Observed Pattern	Impact on Road Infrastructure	Adaptation measures
		materials, leading to surface cracks. - Softening of asphalt during hot days can cause deformation and rutting.	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.	<ul style="list-style-type: none"> • Conduct detailed slope stability analysis and hazard mapping. • Use bioengineering measures vetiver grass, bamboo crib walls, jute geotextiles, and turfing for slope protection. • Construct retaining walls, gabion structures, and surface drainage channels. • Install early warning systems for rainfall-triggered landslides.

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.
- Rongrengre forest is located along the project road corridor at chainages 0.000+.6+200 However, as all construction activities will remain confined within the existing Right of Way (RoW), no adverse impact on this community forest is anticipated.

Annexure 7.1: Summary of Consultations

Table 1: Suggestions from stakeholders for design input in DPR

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

Table 2: Summary of consultations with Project Affected Parties from local community

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

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

Table 3: Summary of Consultation

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1	Nengkhra	21-08-2025	Male	<ul style="list-style-type: none"> • Participants appreciated the project and acknowledged its positive impact on the community. • Highlighted concerns about non-functional streetlights • Requested fair compensation and support in case of any demolitions affecting their properties or livelihoods. • They also mentioned that their children education is hampering due to poor road condition. 	<ul style="list-style-type: none"> • Construct smoother roads to enhance accessibility and improve transportation. • Prioritize immediate repairs to address safety and mobility concerns in the community. • Ensure fair compensation and support for individuals affected 	 <p>Latitude: 25.510289 Longitude: 90.612003 Elevation: 269.08±11.5 m Accuracy: 8.19 m Time: 21-08-2025 12:30 Note: RSN</p> <p>Powered by NoteCam</p>

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
13	Rongrenggre	21-08-2025	Women & man	<ul style="list-style-type: none"> Local communities, who overwhelmingly support strengthening and constructing the road as soon as possible. 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. They also mentioned that their children education is hampering due to poor road condition 	<ul style="list-style-type: none"> 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. 	

SUMMARY OF CONSULTATION WITH INSTITUTIONS

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
3	DPR Consultant	26-08-2025	DPR Consultants	<ul style="list-style-type: none"> ▪ Preliminary observations from an 22km 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 12 meters, in accordance with relevant codes for state highways. ▪ A topographic survey has been conducted within a 60-meter width. 	<ul style="list-style-type: none"> ▪ Incorporate the 6-15 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, 	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					<p>particularly in areas prone to landslides or flooding.</p> <ul style="list-style-type: none"> ▪ Consider the inclusion of safety features such as guardrails and proper signage to enhance road safety along the newly proposed road alignment. ▪ Plan for ecological assessments to ensure that the road design minimizes environmental impacts, especially in sensitive areas identified during the site visit. ▪ Allow for future expansion possibilities in the design to accommodate potential increases in traffic volume and road usage over time. ▪ Engage with local communities to gather input and address concerns 	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					<p>regarding the design, particularly in relation to access and land.</p> <ul style="list-style-type: none"> ▪ Treatment of land slide in land slide affected stretches. 	
4	DFO East and North Garo Hills	21-08-2025	DFO Rimse K Sangma Mobile no. 7005899306 DFO ASCH Sangma, Wildlife Tura	<ul style="list-style-type: none"> ▪ Existing RoW should be maintained at Community forest and Elephant passing 	<ul style="list-style-type: none"> ▪ While designing the road through Reserve forest areas, 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. 	

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

Annexure 7.2: Stakeholder Engagement Plan

Prepared for:

MLCIP - Improvement and Widening of Rongrenggre-Simsanggre-Nengkhra (RSN) Road including Conversion of weak Bridges to Permanent RCC bridges

November 2025

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▪ INTRODUCTION/PROJECT DESCRIPTION

Meghalaya stands as a vital gateway in India's northeastern landscape, stitching together the Barak and Brahmaputra Valleys like a lush green bridge of hills and clouds. Road transport forms the lifeline of this mountainous state, carrying more than 80 percent of its freight and virtually all passenger movement. Yet, for nearly half of its people, reliable all-weather roads remain a distant promise, and aging timber bridges continue to restrict mobility, like weary sentinels struggling under modern demands.

To address the challenges mentioned above holistically, the Government of Meghalaya, with financing and technical support from the World Bank, has conceptualized a project titled the Meghalaya Logistics and Corridor Improvement Project (MLCIP). MLCIP aims to provide efficient, resilient, and safe connectivity to key regional, rural corridors, and economic centers in Meghalaya by applying best practices in resource management, reducing greenhouse gas (GHG) emissions, improving road safety, and implementing an asset management system. The state aims to significantly increase agriculture's economic contribution and per capita income by improving market access through an efficient, all-weather transport and logistics infrastructure and services network. The improved network will enhance market access and logistics efficiency, reduce average cost/time for select agriculture and horticulture products along key economic corridors, and strengthen institutional capacity for managing efficient, climate-resilient, and safe transport and logistics infrastructure.

The project envisions:

- Upgrading existing roads to intermediate standards, with context-appropriate paved shoulders.
- Reconstructing and strengthening culverts and bridges to ensure durability and safety.
- Constructing new bridges and cross-drainage structures to secure all-weather connectivity and climate resilience.

▪ PROJECT DEVELOPMENT OBJECTIVE (PDO)

The Project Development Objective (PDO) is to enhance the climate and disaster resilience of critical public infrastructure specifically roads and bridges and strengthen agro-logistics infrastructure and services.

▪ PROJECT COMPONENTS

The MLCIP will be implemented in Meghalaya and comprises the following components

Component 1. Climate-Resilient Roads, Bridges and Road Safety: Upgrading of selected 740 km roads and 347.5 m of bridges with climate-resilient features against flooding and landslides, including: (i) upgradation of damaged road sections to intermediate lane width; (ii) stabilizing hillside slopes by providing weep holes and applying civil and bio-engineering solutions; (iii) enhancing the resilience of side drains, culverts and bridge structures; protecting valley-side slopes; and widening the road formation; (iv) constructing innovative, climate-resilient bridge structures.

Component 2. Agro-Logistics Infrastructure and Service: Developing a green rural freight and public transportation system including: (a) establishing rural transportation hubs, including truck bays, loading and unloading ramps, container bays, sheds, container yards, offices, refreshment areas, taxi/bus bays, and installing solar panels within the compound of the hubs; (b) establishing a freight terminal integrated with a district logistics park; (c) establishment of ropeways for transporting farm products from hills; (d) geo-referenced multipurpose bus/taxi/truck stops at farm-product collection points and habitation clusters; (e) high-speed internet/fiber optics connectivity to hubs and multipurpose bus/taxi stops at collection points; and (f) provision of roadside amenities and marketplaces.

Component 3. Institutional Strengthening: Training programs, workshops, and exposure visits; development of technical manuals, SOPs, and guidelines; inclusion of local knowledge and traditional practices; building the

institutional capacity of line departments and community organizations.

Component 4. Contingent Emergency Response Component (CERC) The CERC will support PWD/MIDFC in case of an Eligible Crisis or Emergency in responding promptly and effectively to it as per the Contingent Emergency Response Manual. Following an eligible crisis or emergency, the Recipient may request the Bank to re-allocate project funds to support emergency response and reconstruction.

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

■ OBJECTIVE/ DESCRIPTION OF SEP

The overall objective of this SEP is to define a program for stakeholder engagement, including public information disclosure and consultation throughout the entire project cycle. The SEP outlines the ways in which the implementing agencies (Public Works Department, Department of Agriculture, Meghalaya Basin Development Authority) will communicate with stakeholders and includes a mechanism by which people can raise concerns, provide feedback, or make complaints about project activities or any activities related to the project. The details are given in *Annexure -I*

Stakeholder Identification And Analysis

Stakeholder identification is the process of determining all individuals, groups, or institutions that may be directly or indirectly affected by the project or that may influence its outcomes. **Categorization** ensures that stakeholders are grouped according to their level of impact, interest, and influence, which helps design tailored engagement strategies.

○ Methodology

In order to meet best practice approaches, the project will apply the following principles for stakeholder engagement:

- **Openness and life-cycle approach:** Public consultations for the sub projects will be arranged during the whole life cycle, carried out in an open manner, free of external manipulation, interference, coercion, or intimidation.
- **Informed participation and feedback:** Information will be provided to and widely distributed among all stakeholders in an appropriate format; opportunities are provided for communicating stakeholder feedback, and for analyzing and addressing comments and concerns.
- **Inclusiveness and sensitivity:** Stakeholder identification is undertaken to support better communications and build effective relationships. The participation process for the projects is inclusive. All stakeholders at all times are encouraged to be involved in the consultation process. Equal access to information is provided to all stakeholders. Sensitivity to stakeholders' needs is the key principle underlying the selection of engagement methods. Special attention is given to vulnerable groups that may be at risk of being left out of project benefits, particularly women, the elderly, persons with disabilities, displaced persons, and migrant workers and communities, and the cultural sensitivities of diverse ethnic groups.

For the MLCIP, the following stakeholders have been identified and analyzed per project component. These stakeholders include affected parties, other interested parties and disadvantaged/vulnerable individuals or groups.

○ Affected Parties

Project-Affected People (PAPs): Individuals, households, and communities residing in the project area who may be positively or negatively impacted (e.g., landowners, tenants, shopkeepers, transport users). **Affected parties** are local communities, community members, and other individuals or groups who may experience direct impacts

from the project i.e. families residing in areas where project interventions (e.g., road construction, corridor development) are planned; Khasi, Jaintia (Pnar), and Garo communities whose land, resources, or livelihoods may be affected, Women, elderly, persons with disabilities, and marginalized households who may face disproportionate impacts; Village councils, clan leaders, and traditional authorities involved in local governance and decision making, Individuals or groups dependent on forests, rivers, or other natural resources in the project area for livelihood, cultural, or religious purposes; Traders, transport operators, and service providers whose activities may be affected during construction or operation.

Table 1: List of affected parties

<p>Component 1: Climate-Resilient Roads, Bridges and Road Safety</p>	<ul style="list-style-type: none"> • Titleholders, including residential owners, commercial property owners, and tenants whose assets or land may be affected. • Non-titleholders such as squatters, encroachers, and street vendors along the right of way (RoW) whose properties or incomes may be temporarily or permanently affected by land procurement or construction activities. • Land users with cultivated land or other uses along the existing RoW who may be impacted. • Rural road users, pedestrians, residents, and communities that may face temporary inconvenience or restricted access due to construction works • Village Councils (, Nokmas etc) whose community owned lands or assets may be affected. • Religious and Indigenous Faith Institutions whose religious structures or land may be affected.
<p>Component 2: Agro-Logistics Infrastructure and Service</p>	<ul style="list-style-type: none"> • Marginal and small farmers, entrepreneurs, Self-Help Groups (SHGs), and Farmer Producer Groups (FPGs) who are expected to benefit from the agricultural development initiatives. • Rural road users, residents and communities that may be temporarily inconvenienced by construction works.
<p>Component 3: Institutional Strengthening</p>	<ul style="list-style-type: none"> • Exposure visits to similar projects, institutions, or regions to exchange knowledge, share best practices, and adopt innovative approaches. • Preparation of standardized manuals, operating procedures, and guidelines to ensure consistency, efficiency, and sustainability in project planning, implementation, and monitoring.

○ **Other Interested Parties**

- Local associations, cooperatives, self-help groups, and civil society organizations/NGOs working on environmental protection, social inclusion, human rights, and indigenous peoples' welfare;
- Academic and research institutions, universities, and think tanks providing technical expertise;
- Religious and cultural institutions;
- Line departments and agencies such as the Revenue Department, Meghalaya State Pollution Control Board, Forest Department, Horticulture Department, Social Welfare Department, Labour Department, District Child Protection Unit, MBMAetc.;
- Industries, traders, and businesses along the corridors;
- NGOs and CBOs working in the project areas;
- Media
- The general Public.

Stakeholders in Community Development

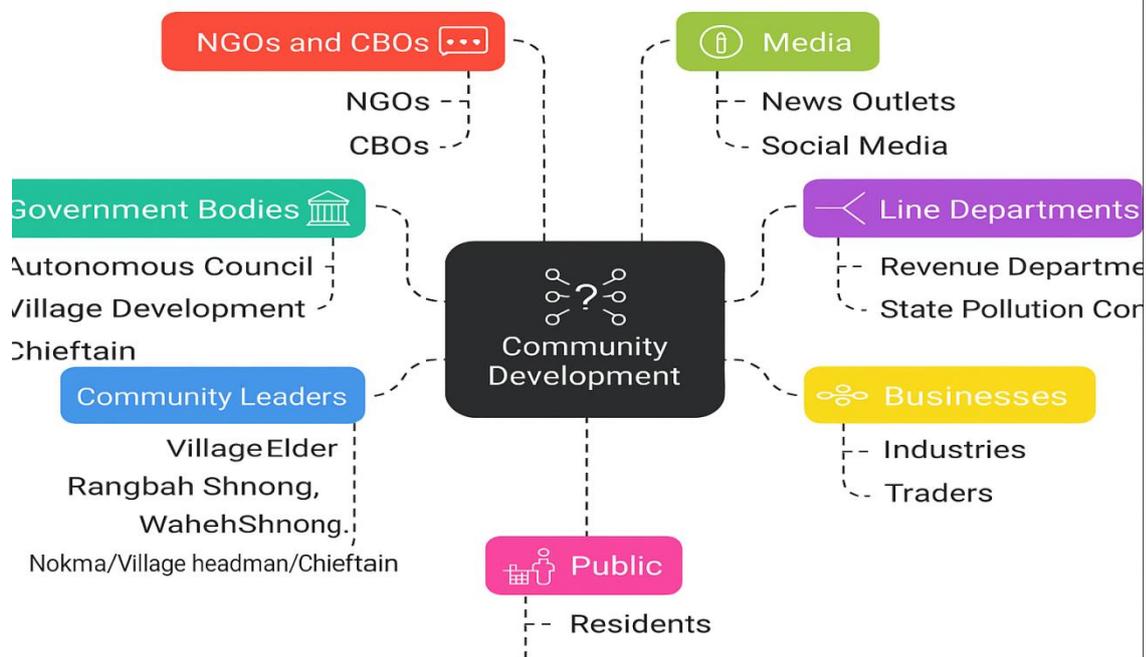


Figure 1: Stakeholders in Community Development

- Disadvantaged/vulnerable individuals or groups

Within the Project, the vulnerable or disadvantaged groups may include but are not limited to the following:

Table - 2: Vulnerable Groups

<p>Component 1: Climate-Resilient Roads, Bridges and Road Safety</p>	<ul style="list-style-type: none"> • Affected parties that belong to the vulnerable category: elderly people, persons with disabilities, ethnic and religious minorities, children, and refugees, Women headed households, scheduled caste, scheduled tribe, and below poverty line (BPL) category—who may be disproportionately impacted due to land procurement. • Persons with disabilities (PwD), elderly who are likely to be affected due to temporary restriction in access. • Indigenous communities (Khasi, Jaintia, Garo) whose customary lands, traditional territories, and natural resources may be affected, requiring FPIC procedures under ESS7
<p>Component 2: Agro-Logistics Infrastructure and Service</p>	<ul style="list-style-type: none"> • Rural women and girls: Often primary users of public transport for market access, education, or healthcare; they may face safety risks, harassment, or exclusion from new green systems • Low-income farmers and small-scale traders: Rely on freight for goods transport; vulnerable to increased costs or disruptions during transition • Indigenous or ethnic minority communities: In rural project areas, they could be displaced or lose traditional access routes
<p>Component 3: Institutional Strengthening</p>	<ul style="list-style-type: none"> • Women in technical or institutional roles: Often underrepresented in transport/rural development sectors; training may exclude them due to childcare burdens, location biases, or gender norms, perpetuating inequities in manual/SOP creation. • Ethnic minorities or indigenous staff/community representatives: May face language/cultural barriers in training; guidelines could

	<p>ignore their traditional knowledge, leading to non-inclusive policies.</p> <ul style="list-style-type: none">• Persons with disabilities in institutional teams: Training formats (e.g., in-person workshops) might not accommodate mobility or accessibility needs, excluding them from skill-building and manual development.
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Vulnerable groups within the communities affected by the project will be further confirmed and consulted through dedicated means, as appropriate. Description of the methods of engagement that will be undertaken by the project is provided in the following sections.

a. Summary of stakeholder engagement done during project preparation

During project preparation, the following public consultation meetings were conducted:

Table 3: Stakeholder Consultation Summary

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
1	Nengkhra	21-	Male	<ul style="list-style-type: none"> • Participants appreciated the project and acknowledged its positive impact on the community. • Highlighted concerns about non-functional streetlights • Requested fair compensation and support in case of any demolitions affecting their properties or livelihoods. • They also mentioned that their children education is hampering due to poor road condition. 	<ul style="list-style-type: none"> • Construct smoother roads to enhance accessibility and improve transportation. • Prioritize immediate repairs to address safety and mobility concerns in the community. • Ensure fair compensation and support for individuals affected 	 <p>Latitude: 25.510289 Longitude: 90.612003 Elevation: 269.08±11.5 m Accuracy: 8.19 m Time: 21-08-2025 12:30 Note: RSN</p>

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
2.	Rongrengre	21-	Women & man	<ul style="list-style-type: none"> Local communities, who overwhelmingly support strengthening and constructing the road as soon as possible. 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. They also mentioned that their children education is hampering due to poor road condition 	<ul style="list-style-type: none"> 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. 	

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

The Stakeholder Engagement Plan below outlines the engagement process, methods, including sequencing, topics of consultations and target stakeholders. The World Bank and the Borrower do not tolerate reprisals and retaliation against project stakeholders who share their views about Bank-financed projects.

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
Preliminary consultation						
Key Informant Interview						
3.	DFO East and North Garo Hill	21-08-2025	DFO	Existing RoW should be maintained at Community forest and Elephant passing	While designing the road through community forest areas and identified elephant passing locations, it is recommended that the existing Right of Way (RoW) be maintained without any additional widening, so as to minimize forest clearance and habitat disturbance. The road should be strengthened and upgraded within the available formation width, with slope protection measures such as bio-engineering and turfing instead of concrete structures to retain the natural landscape. At critical elephant crossing points, suitable wildlife-friendly structures such as underpasses or overpasses should be incorporated, along with appropriate signage, speed calming measures, and solar-powered warning systems to alert drivers. Natural drainage patterns must be preserved to avoid waterlogging,	 <p>Latitude: 26.509677 Longitude: 90.599502 Elevation: 286.95±1.04 m Accuracy: 15.03 m Time: 21-08-2025 14:43</p>

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					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.	
4.	Forest ranger office	23-08-2025	Forest ranger and Forest Gard	Community land with vegetation: Issues and processes related to management, access, and dependency on community forest resources.		 <p>Latitude: 25.995825 Longitude: 90.457013 Elevation: 57.85±3.8 m Accuracy: 4.289 m Time: 23-08-2025 13:51 Note: RBB</p>

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
				<p>Floral Diversity: Presence of floral species, including ecologically important and dominant species.</p> <p>Medicinal Plants: Availability and traditional use of medicinal plant species by the local community.</p>		
5.	PCCF, Shillong	28/8/25	Harish Chaudhry	<p>key issues related to community forest management and local dependency were highlighted. The seasonal frequency of elephant movement in the project area was discussed, along with potential risks of human-wildlife conflict. The need</p>	<ul style="list-style-type: none"> Table topping will be done for smooth movement of elephant. <p>Existing RoW should be maintained at Community forest and Elephant passing</p>	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
				for appropriate mitigation measures, such as road safety provisions and conservation-friendly design features, was emphasized.		
6.	DPR Consultant	26-08-2025	DPR Consultants	<ul style="list-style-type: none"> ▪ Preliminary observations from 22 km site visit were presented, along with information requirements. ▪ Current data for Existing Right of Way (EroW) and Proposed Right of Way (ProW) is unavailable. ▪ ProW will be considered as 12 meters, in accordance with relevant codes for state highways. A topographic survey has been 	<ul style="list-style-type: none"> ▪ Incorporate the 12-meter Proposed Right of Way (ProW) into the design to ensure compliance with relevant codes for state highways. ▪ Utilize the data from the topographic survey conducted within a 60-meter width to inform the design process and address any topographical challenges. ▪ Develop flexible design options that can accommodate variations in the ProW, ensuring that any potential adjustments can be made without significant delays. 	 <p>Latitude: 25.58179 Longitude: 91.884458 Elevation: 1510.9±2.04 m Accuracy: 286.1 m Time: 25-08-2025 16:48 Note: Discuss/review Powered by NoteCam</p>

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
				conducted within a 60-meter width.	<ul style="list-style-type: none"> ▪ Integrate drainage solutions into the design to manage water runoff effectively, particularly in areas prone to landslides or flooding. ▪ Consider the inclusion of safety features such as guardrails and proper signage to enhance road safety along the newly proposed road alignment. ▪ Plan for ecological assessments to ensure that the road design minimizes environmental impacts, especially in sensitive areas identified during the site visit. ▪ Allow for future expansion possibilities in the design to accommodate potential increases in traffic volume and road usage over time. ▪ Engage with local communities to gather input and address concerns regarding the design, particularly in relation to access and land. 	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
					<ul style="list-style-type: none"> ▪ Treatment of land slide in land slide affected stretches. 	
7.		18/09/2025	Street Vendor	<ul style="list-style-type: none"> ▪ Street vendors acknowledged that improved road connectivity will help increase footfall and provide more opportunities to reach customers. They expressed that a cleaner and well-managed roadside environment would support safer vending operations. However, they also requested proper waste disposal arrangements and temporary space management during construction to ensure their livelihoods are not disrupted. 	<ul style="list-style-type: none"> ▪ Designate formal vending zones along the corridor with sufficient width to avoid interference with moving traffic. ▪ Provide raised platforms or marked vending spaces to organize vending activities and improve safety for both vendors and customers. ▪ Integrate waste collection points and bins within vending zones to maintain cleanliness in the commercial stretch. ▪ Ensure temporary vending areas are identified and provided during construction phases so that livelihoods are not disrupted. ▪ Add common facilities such as public drinking water points and sanitation facilities near vending zones to support a hygienic environment. 	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
8.		18/09/2025	Shop keeper	<ul style="list-style-type: none"> Shopkeepers along the RSN Road shared that the proposed road development will greatly benefit their businesses by improving customer access and increasing market visibility. Better and smoother roads will facilitate easier transport of goods, reduce delays, and enhance the overall commercial environment. They also highlighted the need for proper drainage systems to prevent flooding in front of shops, which often disrupts business activities. 	<ul style="list-style-type: none"> Provide continuous and paved footpaths in commercial stretches to allow customers safe and easy access to shops. Ensure the design includes covered or appropriately graded drainage systems to prevent waterlogging in front of shops during rains. Allocate designated roadside loading–unloading bays so that goods can be transported without obstructing traffic flow. Install adequate streetlighting in market areas to improve visibility and support longer business hours. Ensure clear signages and pedestrian crossings near market clusters for safe and smooth movement of customers. <p>2.</p>	
Youth						

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
9.		15.09.25	Youth (8 No.)	<ul style="list-style-type: none"> Limited local opportunities, inadequate skill development platforms, and lack of structured guidance Migration remains a major coping strategy, but often comes with social and economic risks 	<ul style="list-style-type: none"> Integrate capacity-building and skill development components Encourage microenterprise development by promoting small-scale livelihood opportunities 	
10.		23.09.25	Youth (5 nos.)	<ul style="list-style-type: none"> Promote skill-building, entrepreneurship, Better road connectivity for transportation of goods and services 	<ul style="list-style-type: none"> Establish feedback and monitoring mechanisms through the Stakeholder Engagement Plan (SEP) Integrate capacity-building and skill development components 	 <p>Latitude: 25.500413 Longitude: 90.689164 Elevation: 256.01m Accuracy: 3.8m Time: 23-09-2025 16:47 Note: FPIC 2.0 meeting at Nengkhra</p>
	Women FGD					

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
11.		19.09.2025	Women (5)	<ul style="list-style-type: none"> • Women are eager to contribute economically but are constrained by limited opportunities, social barriers, and lack of structured support • There is a pressing need for inclusive, women-centric interventions that promote local entrepreneurship, skills, and connectivity 	<ul style="list-style-type: none"> • Integrate women-focused skill development initiatives • Strengthen participation of women's Self-Help Groups (SHGs) in project-related awareness, monitoring, and plantation maintenance programs. 	

Sl. No.	Area	Date	Name of stakeholder	Outcomes of consultation	Suggestions (from consultations) for integration into project design	Photograph
12		23.09.2025	women	<ul style="list-style-type: none"> During the consultation, gender-related issues and concerns were discussed in detail with the women participants from the local community. The discussion emphasized the importance of women's participation and empowerment in project-related activities. 	<ul style="list-style-type: none"> The Assistant Executive Engineer, PWD (Roads), William Nagar Division informed the participants that women engaged in any project-related work will be entitled to equal pay for equal work, in compliance with statutory norms. He further assured that the project will ensure gender-sensitive facilities, including provision of separate sanitation units for women and adequate accommodation wherever required. The womenfolk appreciated the discussion and expressed their support for the project highlighting the need for continued attention to safety, privacy, and equal employment opportunities during implementation. 	

Table: 4 Stakeholder Engagement Plan

Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
Preparation and Implementation stage	During Environmental and Social Impact Assessment (ESIA) and thereafter quarterly	<ul style="list-style-type: none"> - Present the project and receive feedback on project activities, timelines of civil works, and physical restrictions, if any. - Consult on key risks and impacts - Prior information on Workplan and Work schedules - Share details on GBV/ SEA/SH prevention and mitigation measures. <p>Give information on Grievance Redressal Mechanism</p>	<ul style="list-style-type: none"> • Community consultations • Public Meetings • Site visits 	General Public	MPWD and ESIA Consultant
Preparation stage	During ESIA, and thereafter monthly till disbursement is completed.	<ul style="list-style-type: none"> - Present the project and receive feedback on project activities, - Consult on key risks and impacts - Seek Free, Prior, and Informed Consent (FPIC) as per the World Bank ESS7 (Annex 4) - Compensation and R&R provisions as per the Entitlement matrix including payment modalities and disbursement status. <p>Give information on Grievance Redressal Mechanism</p>	<ul style="list-style-type: none"> • Meaningful consultations (Refer to 4.3) • Surveys • Focus Group Meetings/ Discussions • Village level meetings • Site visits 	Affected Parties	MPWD and ESIA Consultant
Preparation stage	During ESIA and Detailed Project Report (DPR) preparation	<ul style="list-style-type: none"> - Present the project and receive feedback on key risks and challenges related to activities - Propose special provisions in place for vulnerable groups. E.g. Additional assistance for ST, BPL and WHH under entitlement matrix. - Measures to address temporary restriction to access during construction period. - Specific design interventions for persons with disabilities, 	<ul style="list-style-type: none"> • Focus Group Meetings/ Discussions • One-on-one interviews <p>(Using tools and methods to ensure accessibility and</p>	<p>Vulnerable groups</p> <p>BPL, Women headed households, Persons with disabilities,</p>	<p>ESIA Consultant</p> <p>MPWD</p>

Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
		<p>women, children and elderly to ensure universal accessibility.</p> <ul style="list-style-type: none"> - Benefits provided under the project for small and marginal farmers and women entrepreneurs. <p>Give information on Grievance Redressal Mechanism in an accessible manner.</p>	full participation)	elderly, Children along with their guardians	
Preparation and Implementation stage	During ESIA and thereafter twice a year	<ul style="list-style-type: none"> - Present the project design, scope, approach, benefits, timelines, progress - Process related to public engagement and entitlements prior to alignment of land for developmental activities - Seek Free, Prior, and Informed Consent (FPIC) as per the World Bank ESS7 for initiating the activities. <p>Give information on Grievance Redressal Mechanism</p>	Consult with Heads of Traditional Institutions, Village Elders, Executive Members of the Village Councils (, Nokmas, etc).	Autonomous District Council, Village Development Council (, Nokmas, etc).	MPWD
Preparation stage	During ESIA, and thereafter monthly till disbursement is completed.	<ul style="list-style-type: none"> - Present the project design, scope, approach, benefits, timelines, progress - Process related to land requirement for the project - Disbursement of compensation and R&R - Any prior permission required for initiating the activities <p>Give information on Grievance Redressal Mechanism</p>	<ul style="list-style-type: none"> - One-on-one interviews - Official letter or notification - Approvals by the district administration - Workshops and trainings 	District Administration	MPWD
Preparation stage	During ESIA	<ul style="list-style-type: none"> - Present the project design, scope, approach, benefits, timelines, progress - Any prior permission required for initiating activities in tribal areas <p>Give information on Grievance Redressal Mechanism</p>	<ul style="list-style-type: none"> - One-on-one interview - Official letter or notification - Approvals by 		MPWD

Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
			<ul style="list-style-type: none"> the department - Workshops and trainings 		
Implementation stage	During construction phase on monthly basis, till completion of civil works	<ul style="list-style-type: none"> - Compliance on relevant labour norms applicable for construction related activities 	<ul style="list-style-type: none"> - Site inspections Compliance reports and records submission Workshops and trainings 	Contractor	MPWD
Implementation stage	Prior to commencement of civil works and thereafter as and when reports are required.	<ul style="list-style-type: none"> - Compliance on relevant environmental norms applicable for construction related activities Required permissions, certificates, etc. to be sought 	<ul style="list-style-type: none"> - Official letter or notification - Compliance reports and records submission and approvals by MSPCB Workshops and trainings 	Meghalaya State Pollution Control Board	MPWD
Preparation stage	During ESIA	<ul style="list-style-type: none"> - Present project information and planned activities - Give information on Grievance Redressal Mechanism 	<ul style="list-style-type: none"> - Face to face and virtual meetings Workshops and trainings 	Other Line departments- Social Welfare, Police and transport officials	MPWD

Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
Implementation stage	During construction phase on daily basis, till completion of civil works	<ul style="list-style-type: none"> - Occupational and community health and safety requirements as per ESMP and LMP - Workers' code of conduct and other measures to manage SEA/SH risks <p>Give information on workers' Grievance Redressal Mechanism</p>	<ul style="list-style-type: none"> - Face to face trainings - Toolbox trainings for workers <p>Signages in construction sites and camps</p>	Labor Contractors and workers	Supervision Consultants and Contractors
Preparation and Implementation stage	During ESIA and thereafter twice a year.	<ul style="list-style-type: none"> - Present project information and planned activities - Give information on workers' Grievance Redressal Mechanism - Feedback and support in SEA/SH risk management 	<ul style="list-style-type: none"> - One on one interviews - Face-to-face or virtual meetings, webinars, seminars and workshops 	Autonomous District Council, Village Development Council (Nokmas, etc).	MPWD
Preparation and Implementation stage	As and when required.	<ul style="list-style-type: none"> - Present project information and planned activities - Outputs and outcomes of the project - Role and support required from media <p>Success stories</p>	<ul style="list-style-type: none"> - Press Release/ Notes - Monthly Health Bulletins - Inputs for OpEds - Short films/ Reels/Posts for social media <p>Social Media</p>	Media	MPWD

Project Stage	Estimated Date/Time Period	Topic of consultation / message	Method used	Target Stakeholders	Responsibilities
			platforms of Meghalaya Government		

▪ STRATEGY TO INCORPORATE THE VIEW OF VULNERABLE GROUPS

The project will implement differentiated engagement measures for groups requiring special attention including women-headed households, persons with disabilities, elderly persons, economically disadvantaged families, and all indigenous communities. Engagement will ensure accessibility through sign language interpretation, large print materials, accessible meeting venues, flexible timing to accommodate care responsibilities, and culturally appropriate protocols respecting traditional governance structures. These targeted consultations will ensure that the perspectives, concerns, and priorities of vulnerable groups are meaningfully incorporated into project planning and decision-making.

To ensure that all stakeholders especially vulnerable groups can participate meaningfully and access information, the project will adopt the following measures:

Table 5: Strategy to incorporate the views of vulnerable groups

Vulnerable Group	Measures
Women headed households, and women entrepreneurs	<ul style="list-style-type: none"> Ensuring gender balance in engagement teams is critical to fostering trust and creating an environment where all participants, particularly women, feel comfortable sharing their perspectives. Surveys as well as other stakeholder engagement activities, will be designed to accommodate women in unpaid care work, ensuring that they have the opportunity to participate fully in discussions. Flexible scheduling, accessible formats, and supportive measures such as childcare or safe transport will be provided to enable their meaningful engagement. For all in-person community engagement activities, provisions will be made for childcare, safe transport, and secure meeting venues to ensure that participants—particularly women and caregivers—can attend and participate fully. These measures aim to remove practical barriers and create a safe, accessible, and enabling environment for engagement. Gender-segregated consultations and other targeted approaches will be employed to provide women and girls with safe and enabling spaces for participation. These measures aim to encourage open dialogue, ensure that their perspectives are freely expressed, and promote equitable inclusion in project decision-making.
Affected parties belonging to BPL categories	<ul style="list-style-type: none"> All consultations will be scheduled during non-business or off-hours to accommodate participants' availability, ensuring that community members, particularly women and those engaged in work or care giving, can participate fully in the engagement process.
Elderly and people with existing medical conditions	<ul style="list-style-type: none"> The project will identify stakeholders with specific needs who may be at higher risk of being excluded or adversely affected, including women-headed households, persons with disabilities, the elderly, marginalized farmers, and economically disadvantaged groups. Information will be provided in an accessible and user-friendly manner to ensure that all stakeholders, including those with literacy or visual challenges, can understand and engage with project-related content. Measures will

Vulnerable Group	Measures
	include - large print materials and clear, legible fonts; plain and simple local languages <ul style="list-style-type: none"> • All consultations will be conducted in comfortable, accessible, and well-lit venues to ensure participants can engage effectively. Venues will be chosen to accommodate persons with disabilities, the elderly, and other vulnerable groups, providing safe and welcoming environments for open dialogue.
Persons with disabilities	<ul style="list-style-type: none"> • Information will be provided in accessible formats to ensure inclusion of persons with disabilities and those using assistive technologies. Ensuring accessibility measures are implemented where needed, based on the specific requirements of participants • All stakeholder engagement activities will consider and account for gender, age, disability, socio-economic status, and other dimensions of identity and vulnerability. This ensures that consultations are inclusive, that the perspectives of marginalized groups are captured, and that project design and mitigation measures address the needs of those most at risk of exclusion or adverse impacts.
Indigenous Communities	<ul style="list-style-type: none"> • FPIC procedures conducted through traditional institutions following customary protocols <ul style="list-style-type: none"> · Consultations in local languages (Khasi/Jaintia/Garo) with cultural interpreters · Respect for traditional decision-making timelines and consensus-building processes · Integration of customary law and traditional knowledge systems · Consultation with Village Councils, Rangbah Shnong/ Nokmas, and Village Elders

1. The project road has Garo community, governed by customary laws and traditional institutions. FPIC ensures that their collective rights and decision-making processes are respected; Constitutional protections (Sixth Schedule) also require consultation and consent from Autonomous District Councils and local communities; World Bank ESS7 (Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities) mandates FPIC when projects may affect customary lands, cultural heritage, or cause relocation. Therefore meaningful consultations will be conducted with affected tribal households, Heads of Traditional Institutions, Nokma/village headmen, and Village Development Committee (VDC) chairpersons in a culturally appropriate manner and will include FPIC procedures where project activities affect customary lands or traditional territories. These consultations will take into account the following factors:

- a) **Early Engagement** – Consultations will begin early in the project planning process to gather initial views on the project proposal and inform project design.
- b) **Encouraging Feedback** – Stakeholder input will be actively solicited to inform project design and identify and mitigate environmental and social risks and impacts.
- c) **Ongoing Process** – Engagement will be continuous throughout the project lifecycle.
- d) **Prior Disclosure of Information** – Relevant, transparent, objective, meaningful, and easily accessible information will be shared in advance, in culturally appropriate formats and the relevant local language, ensuring stakeholders have adequate time for meaningful consultation.

- e) **Responsive Approach** – Feedback from stakeholders will be considered and addressed systematically.
- f) **Inclusive Engagement** – Efforts will be made to support active and inclusive participation of all project-affected parties.
- g) **Free from Manipulation or Coercion** – Consultations will be conducted without external interference, discrimination, intimidation, or coercion.
- h) **Documentation and Disclosure** – All consultations will be documented and disclosed by the Meghalaya Public Works Department (MPWD) to ensure transparency and accountability.

▪ **REPORTING BACK TO STAKEHOLDERS**

Stakeholders will be kept informed as the project develops, including reporting on project environmental and social performance and implementation of the stakeholder engagement plan and Grievance Mechanism, and on the project’s overall implementation progress.

- **Internal Reporting: The Project Management Unit (PMU) and implementing agencies will maintain comprehensive records of all stakeholder engagement activities, including meeting minutes, attendance sheets, feedback received, and grievances addressed.**
- **External Reporting: Periodic reports on stakeholder engagement will be shared with government authorities, funding agencies, and local communities, highlighting consultation activities, issues raised, and actions taken.**
- **Public Disclosure: Summaries of stakeholder engagement outcomes will be made available through community notice boards, offices of the DPIUs, and digital platforms to ensure transparency.**

▪ **RESOURCES AND RESPONSIBILITIES FOR IMPLEMENTING STAKEHOLDER ENGAGEMENT ACTIVITIES RESOURCES**

The **Meghalaya Public Works Department (MPWD)** will have overall responsibility for overseeing stakeholder engagement activities. The day-to-day implementation of these activities will be carried out by the **Environmental and Social Cell (E&S Cell)**, which is part of the MPWD’s Project Implementation Unit.

The **MPWD** holds ultimate responsibility for the implementation of the Stakeholder Engagement Framework and Plans, ensuring that engagement activities are conducted in a timely, inclusive, and culturally appropriate manner, and that feedback is integrated into project planning and decision-making.

Table 6: Stakeholder Engagement Activities

Agency/ Individual	Role and Responsibility
MPWD	<ul style="list-style-type: none"> • Mobilization of External Expertise - Engage external consultants for conducting Environmental and Social Impact Assessments (ESIAs) and preparing site-specific Environmental and Social Management Plans (ESMPs), Resettlement Action Plans (RAPs), and Indigenous Peoples Development Plans (IPDPs). Undertake Free, Prior, and Informed Consent (FPIC) processes based on meaningful consultations with relevant stakeholders.

Agency/ Individual	Role and Responsibility
	<ul style="list-style-type: none"> • Technical Expertise for Vulnerable Groups - Mobilize technical expertise to ensure safe and culturally appropriate consultations with vulnerable groups or on sensitive topics, as required. • Approval and Oversight of Stakeholder Engagement Plan - Review and approve the content of the draft Stakeholder Engagement Plan (SEP), including any revisions. • Approval of Information, Education, and Communication (IEC) Materials - Approve all IEC materials prior to release, including communication materials, PowerPoint presentations, posters, leaflets, brochures, and media inserts (TV, radio, or online). • Authorization of Stakeholder Engagement Events - Approve and authorize all stakeholder engagement events and the disclosure of materials required to support these events, ensuring alignment with the SEP and cultural appropriateness.
MPWD	<ul style="list-style-type: none"> • Provide overall guidance, oversight, and monitoring of the Stakeholder Engagement Plan (SEP) to ensure that engagement activities are conducted effectively, inclusively, and in a culturally appropriate manner. This includes tracking progress, addressing gaps, ensuring compliance with project policies and safeguards, and providing technical and operational support to the implementing teams. • Prepare and provide appropriate Information, Education, and Communication (IEC) and other communication materials tailored to different stakeholder categories. These materials will ensure that relevant project information is clearly and effectively conveyed, taking into account stakeholders' literacy levels, languages, cultural contexts, and specific information needs. • Finalize the timing, duration, and sequence of all SEP-related information disclosure and stakeholder engagement activities. This ensures that consultations and information sharing are conducted at times that maximize stakeholder participation and allow sufficient time for meaningful feedback, particularly for vulnerable and marginalized groups. • Organize orientation and capacity-building sessions for MPWD staff to ensure a clear understanding of the Stakeholder Engagement Plan (SEP) and the requirements for its operationalization. This will enable staff to effectively implement engagement activities, follow culturally appropriate consultation practices, and respond to stakeholder feedback in line with project policies and safeguards.
CSC/ PMC/ MPWD	<ul style="list-style-type: none"> • Participate directly in all face-to-face stakeholder meetings or identify suitable representatives to ensure effective engagement. This ensures that stakeholders have a direct point of contact, that consultations are properly facilitated, and that feedback is accurately recorded and addressed. • Review and sign off on the minutes of all stakeholder engagement events to ensure accuracy and completeness. They will also maintain an up-to-date stakeholder database, capturing details of participants, feedback received, and follow-up actions, to support monitoring, reporting, and continuous improvement of stakeholder engagement activities. • Ensure the active participation and inclusion of stakeholders from vulnerable groups, such as women-headed households, persons with disabilities, the elderly, marginalized farmers, and economically disadvantaged households. Special efforts

Agency/ Individual	Role and Responsibility
	will be made to remove barriers to their engagement and ensure their perspectives are meaningfully considered in project planning and decision-making.

2. The stakeholder engagement activities will be documented through:
 - a) During the ESIA, a record of stakeholder engagement carried out with — description of the stakeholders consulted, a summary of the feedback received, and a brief explanation of how the feedback was taken into account, or the reasons why it was not— will be documented in the ESIA, ESMP, RAP, IPDP and other E&S instruments prepared.
 - b) During implementation, stakeholder engagement activities will be documented in the MIS tool prepared under MLCP project for E&S risk management.

The budget for the SEP is as follows.

Table 7: The budget for SEP

Budget Category	Quantity	Unit Cost (INR)	Duration	Total (INR)	Remarks
1. Staff & Field Support					
Community Liaison Officers (3 persons)	3	50,000/month	36 months	54,00,000	Slight salary optimization
Social/Communication Consultant	1	60,000/month	24 months	14,40,000	Consultant only during active implementation
Staff Travel & Local Transport	24 months	15,000/month	24 months	3,60,000	Only during engagement phases
Subtotal:				72,00,000	
2. FPIC Meetings & Community Consultations					
FPIC I, II, III (combined logistics)	3 meetings	35,000/meeting	One-time	1,05,000	Hall, refreshments, PA
Cluster Village Consultations	18 events	5,000/event	24 months	90,000	Only priority villages
Subtotal:				1,95,000	
3. Information & Awareness Materials					
Posters & GRM Leaflets	6,000 copies	60/copy	One-time	3,60,000	Key locations, not mass printing
Community Radio & Social Messaging	18 months	15,000/month	18 months	2,70,000	Phased messaging only
Subtotal:				6,30,000	
4. Trainings & Capacity Building					

Budget Category	Quantity	Unit Cost (INR)	Duration	Total (INR)	Remarks
ESMP + Worker Safety + GRM Training	6 sessions	35,000/session	24 months	2,10,000	PIU + Contractor combined
Women SHG & Youth Livelihood Orientation	6 sessions	15,000/session	24 months	90,000	Targeted groups only
Subtotal:				3,00,000	
5. Monitoring & Feedback					
Mid-Term & Endline Survey (Combined Effort)	1 package	3,50,000	Project-wide	3,50,000	One consultant, not two
6. GRM Implementation					
GRC Training	6 sessions	30,000/session	24 months	1,80,000	Reduced frequency
Suggestion Boxes	50 units	2,500/unit	One-time	1,25,000	Only strategic points
GRM Signages & Hotline Info Boards	Lump sum	—	One-time	1,50,000	
Subtotal:				4,55,000	
7. Contingency / Miscellaneous	Lump sum	—	—	2,00,000	Capped & controlled
Revised Grand Total:				92,30,000	≈ INR 9.23 million

Note: *Salary costs can be indicative.

■ MANAGEMENT FUNCTIONS AND RESPONSIBILITIES

MPWD will be responsible to carry out the Stakeholder Engagement activities. At the same time the PMC supports the Project Management Unit (PMU) in overall coordination, planning, and supervision of the project. Preparing and reviewing designs, drawings, DPRs, and bid documents. Ensuring compliance with environmental and social safeguard instruments (ESMF, ESMP, RAP, SEP, LMP, etc.). Where as The CSC provides field-level supervision, quality assurance, and compliance monitoring during construction. Supervising contractor's performance and ensuring adherence to technical specifications and timelines. Monitoring implementation of Environmental, Health, Safety, and Social (EHS&S) measures on-site. Supporting the Environmental and Social Cell and PIUs in verifying ESMP and labour management compliance.

The stakeholder engagement activities will be documented through:

- During the ESIA, a record of stakeholder engagement carried out with — description of the stakeholders consulted, a summary of the feedback received, and a brief explanation of how the feedback was taken into account, or the reasons why it was not — will be documented in the ESIA, ESMP, RAP-IPDP and other E&S instruments prepared.
- During implementation, stakeholder engagement activities will be documented through

MoMs, written consents, videography, geo tagged photos, attendance sheets and the monitoring app prepared by E&S Cell of the MPWD.

▪ GRIEVANCE REDRESSAL MECHANISM

A Grievance Redressal Mechanism is a system that allows not only grievances, but also queries, suggestions, positive feedback, and concerns of project-affected parties related to the environmental and social performance of a project to be submitted and responded to in a timely manner. The main objective of a Grievance Redressal Mechanism is to assist to resolve complaints and grievances in a timely, effective, and efficient manner that satisfies all parties involved. For Sexual Exploitation Abuse/ Sexual Harassment (SEA/SH): The MPWD has setup an Internal Complaints Committee (ICC) for addressing any SEA/SH-related complaints at the workplace. The committee is constituted as per the requirements of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act).

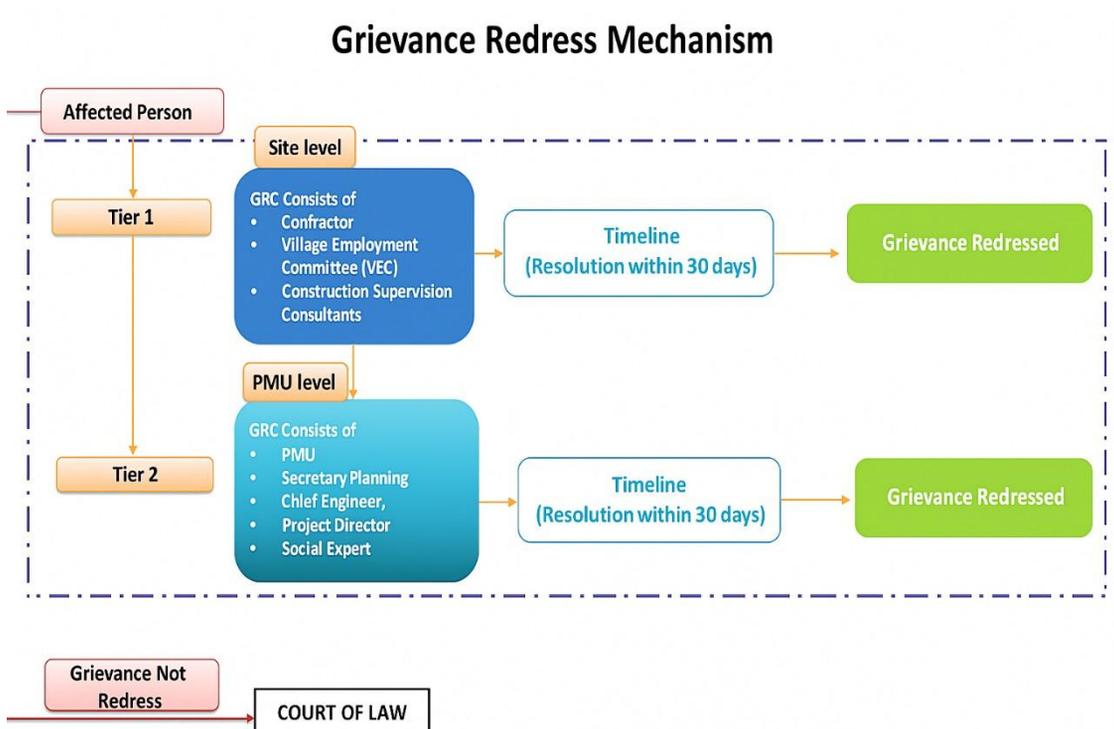


Figure 2: Grievance Redressal Mechanism

Annexure 7.3: MoM of 1st and 2nd FPIC meeting

Minutes of the 1st FPIC Meeting with stakeholders

Venue: Nengkra Bazaar, East Garo Hills

Date: Held on 11th September, 2025.

At the outset of the meeting Shri Salgira A. Sangma, AEE, PWD (Roads), Simsanggre Sub-Division, Williamnagar, welcomed all who attended the meeting and briefed about the purpose of the meeting and then handed over the floor to Shri K.M.G. Momin, Executive Engineer, PWD (Roads), Williamnagar Division, East Garo Hills.

Executive Engineer took over the floor and outlined the purpose of the consultation, and emphasized the importance of Informed Consent before taking up such projects. Such Free and Prior discussion would remove any unwanted hindrances and ensure smooth implementation. He introduced the Free, Prior and Informed Consent (FPIC), stressing the importance of the FPIC processes in ensuring community voices are heard and respected. He referenced the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), adopted on September 13, 2007, which champions the rights of indigenous communities to have a say in decisions impacting their lands and resources. The EE explained the FPIC framework as a way to empower communities, avoid any undue pressure, and build fair partnerships.

The key FPIC principles were outlined as follows:

- **Free:** Consent is given willingly, without any coercion, manipulation, or pressure, allowing communities to decide freely.
- **Prior:** Consent is sought well ahead of project activities, giving communities enough time to discuss and decide through their traditional processes, like village meetings or dorbar.
- **Informed:** Communities are provided with clear, easy-to-understand, and complete information about the project's scope, its potential benefits and challenges (including whether impacts can be reversed), alternatives, and mitigation plans. To ensure everyone understands, discussions were held in Garo language, for clarity and inclusivity.
- **Consent:** The process ensures communities have the power to approve or reject project activities affecting their lands or resources, promoting a community-driven approach to decision-making.

The EE stressed that FPIC is an ongoing dialogue, not a one-off event, meant to foster trust, address concerns, and weave community input into the project's planning and execution. He highlighted the project's alignment with World Bank Environmental and Social Standards, particularly ESS7 (Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities), to safeguard community rights, cultural heritage, and the environment. This meeting was the first step in a series of consultations to create a collaborative framework, and the EE urged everyone to actively participate.

He then apprised that improvement of the existing Rongrenggre-Simsanggre-Nengkhra (RSN) road from existing carriage way of 3.75 m to 5.5 m width with shoulder and pucca side drain is being taken up through World Bank -funded fund. He informed in projects such as this, it is necessary that it is transparent, the community is involved, indigenous rights and cultural values are respected.

He informed that components of the project would mainly be:

- Improvement of road from 1st Km of RSN road to Nengkra Bazaar.
- Widening of pavement or existing carriage way of narrow strips from 3.75 m to 5.5 m .
- Construction of CC drains at both sides where necessary.
- Construction or replacement of Timber Bridge to RCC Bridge.
- Construction of Converts and Retaining walls etc.

Again, He apprised that since the existing width of the carriage way is only 3.75 m in certain stretches, it would be to improve it to 5.5 m or intermediate lane, but portions which are already double lane

especially in town areas, would be retained. Therefore, there may be requirement of land in some portions which will be mostly within the ROW but cooperation of the people wherever there might be requirement of land for retaining wall etc.

He further explained economic importance of project that the RSN Road will be the only road linking NH 127-B and NH-62 to the District Headquarter of East Garo Hills, where all the public service centers like health center, college, birth & death register office etc. Hence improvement of this road is of utmost necessity for providing better connectivity and to access to common public services as well for general development. He then gave the floor to the stakeholders to raise queries regarding the upcoming project.

One of the stakeholders, Shri Arthen N. Marak, a resident of Nengkhra village said that since the condition of the road is already in a state of misery and the RSN is the only road which connects district head quarter for which the residents of that area have to visit the head quarter to access any public services, he welcomes the upcoming project and has no objection at all, and asked all his fellow residents to cooperate with the department so that project can be completed for betterment of the society as a whole.

Other residents including two women also put their queries regarding the extend of increase in road width in case of improvement of road to intermediate lane, to which Executive Engineer replied that mostly it will be within the ROW but actual width would be known once survey is complete and can be confirmed in the next FPIC meeting.

Nokma also expressed his happiness and encouraged the people to cooperate with the authorities as commencement of this road construction would benefit the locality in particular and the region as a whole. As more and more people echoed the same view expressed by Nokma, Executive Engineer informed about the formation of Grievance Redressal Mechanism that this will enable joint monitoring of project-related issues which is why it is important while implementing the project.

The EE then introduced the Grievance Redressal Mechanism (GRM), explaining that it will serve as the first point of contact for community grievances related to the project. The GRM will involve community representatives, women, youth, contractors, and government officials to address concerns efficiently.

The Tier I Grievance Redress Cell shall operate under the Chairmanship of the Village Head or any representative nominated by the Village Councils and will include the Resident Engineer (representing the Engineer), Environmental and Social (E&S) Experts of Construction Supervision Consultant (CSC), Environmental/Social Officers and Assistant Engineers from the department, and representatives from local institutions.

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

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

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

As there was no item to discussed, the meeting was concluded with vote of thanks by Assistant Executive Engineer with informing the GRM members that FPIC meeting shall be held again on a date fixed by the community members and subsequently informed to the office of the Executive Engineer.


(K. M. G. Momin.)

Executive Engineer PWD
(Roads)
Williamnagar Division,
Williamnagar

Minutes of the 2nd FPIC Meeting with stakeholders

Venue: Nengkra Bazaar, East Garo Hills

Date: Held on 23rd September, 2025.

The Second FPIC meeting was chaired by Shri Salgira A. Sangma, AEE, PWD (Roads) Simsanggre Sub- Division, East Garo Hills. He welcomed the stakeholders who attended the meeting, followed by reading-out the First FPIC's minutes by Shri Taiba Rossy Rema Marak, J.E and the minutes have been accepted by the stakeholders by raising their hands.

Shri K.M.G. Momin, Executive Engineer, PWD (Roads), Williamnagar Division, East Garo Hills, took over the floor and briefly explained previous meeting's minute to the stakeholders in local language. He further explains the purpose of the second FPIC and also apprised that the draft DPR for the project has been ready for revision and open discussion. He further informed that the draft DPR is only preliminary and due for examining before preparation of final DPR.

Shri Neeraj Kumar, DPR Consultant, RODIC, presented the draft DPR and informed that the total length of the project is 20.500 Km, where 0.00 Km to 5.00 Km stretch falls under State Forest Reserve and improvement work in that stretch would not be carried out, only remaining portion from 6.00km to 20.500 Km would be improved wherever necessary. Again, he apprised that the draft DPR is to improve the existing carriageway of 3.75 m width to 5.50 m and that if improvement is made to an intermediate lane, width of road formation would be up to 5.00 m from centre line of the existing roadway on both sides to accommodate shoulders and side drains as per IRC specification. This would involve minor deviation from the existing ROW in certain stretches which is otherwise enough for Intermediate lane.

Shri Pangteson N. Marak (Nokma Chra) and resident of Nengkhra stood up and said that RSN road is a very important road which connects Williamnagar, the District Head Quarter of East Garo Hills. In order to improve the existing carriageway that is 3.75m width to 5.50 m with shoulders and side drain, there is enough width in most of the stretches. If few stretches fail short to meet the required standard, he requested all his fellow residents and clan to cooperate to fulfill the required criteria. He reiterated that, improvement of road is of utmost importance and eagerly awaits good road in the region.

On enquiry of Neeraj Kumar, DPR consultant, whether there would be any obstruction if improvement of road entails going beyond ROW but within 10 m Roadway width in stretches wherever required for retaining walls etc. For which he said that he would like to remind the fellow residents about the agreement they have made to give land in written for the betterment of the region and that getting better road connectivity was their priority. But he also reminded that assurance of good practices in construction should be given as there is much expectation from public at large.

He raised queries, whether they can ask the department to put culverts, side drain etc at necessary location so that proper planning can prevent negative impacts, also if the construction of work is not satisfactory during the time of execution, whether the stakeholders have the right to raise objection or ask them to rectify the unsatisfactory works. Executive Engineer replied that for that very purpose the Grievance Redressal Mechanism has been formed from Nengkrha village and he read out the nominated members of the GRM.

Shri Arthen N. Marak (Nokma Chra) also raised query that, if cross drainage works, retaining walls are left out in locations wherever necessary, it could be problematic and may lead to soil erosion, soil siltation and may even damage agricultural land. For this EE and AEE replied that this is the reason why meeting with stakeholders is being conducted for consultation and better understanding of the site of work. DPR consultant also asked the stakeholders to come up with suggestions and that they are ready to incorporate the same in the final DPR provided it is found necessary for better implementation of the project.

Some even asked about the construction of drain across the approaches leading to their roadside buildings as this would disrupt their passage. EE clarified that any structure needing dismantling would be informed, seek permission and only then executed. He also asked the DPR consultant to note such chainages and provide cc slab drain cover to mitigate such places wherever the drain cuts through the

private approaches. DPR consultant also requested the stakeholders to give the location of such cases upon which they have requested to first check it physically and give the location in the next meeting.

DPR consultant also mentioned consideration for bus waiting shed and other amenities can also be suggested provided the land owners are ready to part with their land for such construction. EE also expounded that such amenities can be managed by the owner themselves or the community can form a local body which can help them generate income thus helping them in sustainable livelihood.

AEE informed that detailed site inspection for consideration of additional retaining walls, drain works and other mitigation measures would be conducted in short time again by the department and suggest them to be considered in the DPR.

As there was no item left to discuss, meeting concluded with vote of thanks by chair informing that next FPIC meeting shall be called again for further necessary discussion.



(K. M. G. Momin.)

Executive Engineer PWD (Roads)
Williamnagar Division, Williamnagar

Annexure 8.1: performance indicators

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

- Environmental condition indicators to determine efficacy of environmental management measures in control of air, noise, water and soil pollution.
- Environmental and social management indicators to determine compliance with the suggested environmental and social management measures.
- Social monitoring indicators such as payment of compensation/assistance, no. of grievances resolved, no. of women engaged in livelihood activities, no. of local workforce employed etc.
- Operational performance indicators have also been devised to determine efficacy and utility of the proposed mitigation measures.
- Stakeholder Engagement and Consultation Indicators will evaluate the effectiveness of meaningful consultations conducted throughout the project lifecycle to ensure the transparency and accountability of the project.

The performance indicators and monitoring plans prepared for the road section are presented in **Table 1**.

Details of the performance indicative parameters for each of the component have to be identified and reported during all stages of the implementation.

Table 1: Performance Indicators

Sl. No.	Description of Item	Indicator	Stage	Responsibility
1	<ul style="list-style-type: none"> No. of sites for which Restoration Plans have been prepared No. of Site Restored and Rehabilitated No. of Sites handed over 	Quarries	Pre-Construction	Contractor/CSC/PMC
2	Quantity of Debris and Spoils to be disposed off <ul style="list-style-type: none"> No. of locations Approved for Debris disposal Quantity disposed off at each location No. of locations for which Rehabilitation works have been completed 	Disposal sites	Construction	Contractor/CSC/PMC
3	<ul style="list-style-type: none"> No. of location/s identified for the Construction camp and Construction Plant sites No. of location/ s approved Lay-out/s Approved No. of sites for which Site Restoration and Rehabilitation has been completed 	Construction Camps and Plant Sites	Pre-Construction and Construction	Contractor/CSC/PMC
4	<ul style="list-style-type: none"> No. of Trees to be Cut No. of Trees cut % 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 <ul style="list-style-type: none"> Length (by type) No. of Locations 	Work sites	Construction	Contractor/CSC/PMC
8	Safety Provisions <ul style="list-style-type: none"> Signage (by type and no.) Crash barriers 	Work sites	Construction	Contractor/CSC/PMC

Sl. No.	Description of Item	Indicator	Stage	Responsibility
	<ul style="list-style-type: none"> Footpath 			
9	Soil erosion prevention measures <ul style="list-style-type: none"> Construction of retaining walls Downstream at culvert locations (No. of Locations & length) 	Work sites	Construction	Contractor/CSC/PMC
10	No. of HIV awareness sessions conducted	Registers/Reports/Geotagged Photos	Construction	Contractor/CSC/PMC
11	No. of safety awareness sessions conducted	Registers/Reports/Geotagged Photos	Construction	Contractor/CSC/PMC
12	Accidents/Incidents <ul style="list-style-type: none"> No of accidents/incidents recorded 	Along sub-project road	During construction	Contractor/CSC/PMC
13	Environmental parameter monitoring in accordance with the frequency and duration of monitoring as well as the locations as per the Monitoring Plan	Air Quality Noise Quality Soil Quality Water Quality Report and geotagged photos.	Construction and Operation stage	Contractor through NABL Accredited agency.
14	No. of Training Sessions Organized for <ul style="list-style-type: none"> Departmental Staff Contractors Combined No. of People Trained <ul style="list-style-type: none"> 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) <ul style="list-style-type: none"> No. of Trees Planted along Roadsides No. of Trees planted at other locations (such as camps, debris disposal sites and plant areas) No. of trees planted at enhancement sites 	Roadside and other plantation areas	Post construction stage	Contractor/MPWD
17	Survival Rate Trees Planted (Average)	Roadside and other	Post	Contractor/CSC/PMC/MPWD

Sl. No.	Description of Item	Indicator	Stage	Responsibility
	<ul style="list-style-type: none"> 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

