Initial Environmental Examination

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India: Supporting Human Capital Development in Meghalaya (Phase 2)

(Package No. CW-01- Design and Build of Meghalaya Skills and Innovation Hub at New Shillong)

Prepared by the Government of Meghalaya for the Asian Development Bank.

CURRENCY EQUIVALENTS

(As of 2 September 2024)

Currency unit – Indian rupee (₹)
₹1.00 = US $0.0119
US $1.00 = ₹ 83.87

ABBREVIATIONS

ADB	-	Asian Development Bank
ASI	-	Archaeological Survey of India
CPCB	-	Central Pollution Control Board
DDMA	-	District Disaster Management Authority
DIET	-	District Institute of Education and Training
DLF	-	District Level Forum
DPIPSD	-	Department of Planning, Investment Promotion, and Sustainable Development
DSC	-	design and supervision consultant
EA	-	executing agency
EIA	-	environmental impact assessment
EMP	-	environmental management plan
GOI	-	Government of India
GoM	-	Government of Meghalaya
IEE	-	initial environmental examination
IIM	-	Indian Institute of Management
ITI	-	industrial training institute
MOEFCC	-	Ministry of Environment, Forest and Climate Change
MSIH	-	Meghalaya Skills Innovation Hub
MSPCB	-	Meghalaya State Pollution Control Board
MSSDS	-	Meghalaya State Skills Development Society
NIFT	-	National Institute of Fashion Technology
NMA	-	National Monument Authority
NSTDA	-	New Shillong Township Development Agency
PIU	-	project implementation unit
PMC	-	project management consulting firm
PMU	-	project management unit
SEIAA	-	State Environment Impact Assessment Authority
SHCDM- II	-	Supporting Human Capital Development in Meghalaya- II
SPS	-	Safeguard Policy Statement 2009

WEIGHTS AND MEASURES

dB (A) A	–	weighted decibel
ha	–	hectare
km^2	–	square kilometer
µg	–	microgram
m	–	meter
m^2	–	square meter
MW	–	megawatt

NOTES

(i) The fiscal year (FY) of the Government of India ends on 31 March. “FY” before a calendar year denotes the year in which the fiscal year ends, e.g., FY2024 ends on 31 March 2024. Delete this note if the text does not refer to FYs.

(ii) In this report, "$" refers to United States dollars.

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EXECUTIVE SUMMARY

1. The Supporting Human Capital Development in Meghalaya (Phase 2) (SHCDM-II) Project aims to enhance the employability of Meghalaya's youth by (a) improving the quality and delivery of school education with an emphasis on secondary and higher secondary levels, and (b) facilitating market-relevant technical and vocational education and skills training. The project's interventions seek to contribute to enhancing the economic competitiveness of Meghalaya's youth. The expected outcome will be improved quality and effectiveness of schooling and skills development systems in the state. This will be achieved through the following outputs:

(i) Output 1: Learning environment in government secondary and higher secondary schools enhanced.
(ii) Output 2: Quality of teaching and learning in government schools improved.
(iii) Output 3: Access to and relevance of skilling system enhanced.
(iv) Output 4: Institutional capacity to deliver effective schooling and skills training strengthened.

2. **Environment Categorization**. The Project is categorized as 'B' for environment in accordance with ADB's Safeguard Policy Statement (SPS), 2009. The interventions support (i) upgrading of safe, climate-resilient, gender responsive, and inclusive infrastructure in over 50% of government schools at the secondary and higher secondary (SHS) school levels (under output 1); (ii) upgrading of training infrastructure in three District Institute of Education and Training (DIET) (under output 2); and (iii) establishing a residential Meghalaya Skills Innovation Hub (MSIH), including establishing hostels in selected industrial training institutes (ITIs) and in the MSIH (under output 3) infrastructure pertaining to new or upgraded residential facilities, redesigning workshops, workshops and classrooms for new trades. Any project site that qualifies as category "A" for environment safeguards will not be financed under the project. The environmental impacts caused by the proposed building construction, expansion, or modernization works are expected to be less significant, minor, and reversible. They will also be site-specific and temporary in nature and can be easily mitigated with environmental management measures. All infrastructure will integrate climate and disaster-resilient and disability-friendly features.

3. **Project site Description**. The development of MSIH in Shillong is one of the project sites under output 3. MSIH will expand skill development opportunities in Meghalaya through value added top-up professional courses (National Skill Qualification Framework (NSQF) level 5[1] and above), sector specific top up courses to enhance employability and long-term training in selected trades. It will offer aspirational skills development opportunities and provide a conducive space for youth and young entrepreneurs to pursue innovation.

4. The MSIH will be a campus with 7 building components, varying from G+2 to G+5[2] with basements. The total built-up area is proposed to be 10,354 sq.m on a plot area of 22,990 sq.m. A sewage treatment plant (STP) with a capacity of 30 KLD is planned to treat wastewater. Rooftop solar panels with a 3 kVA capacity will be installed to supply electricity to a water heating system with a capacity of 4,000 liters per day. Ramps and specially designed toilets will be provided to make the campus accessible for people with disabilities. An adequate number of modern sanitation and drinking water facilities will also be provided. Rainwater gutters at the end of steel sheeting roofs will direct rainwater to underground rainwater harvesting tanks with a total capacity of 50,000 liters.

[1] Level 5 National Skill Qualification Framework aims to prepare learners to become skillful and take a job of their choice and work in a familiar environment.
[2] G+2 means ground floor plus two more floors above it; G+5 means ground floor plus five more floors above it.

5. **Description of the Environment**. The MSIH site is proposed in the New Shillong Township (NST). The NST is an area being developed by the Government of Meghalaya (GoM) to relieve urban congestion and shift the administrative and commercial activities to the township. The site is in open area and there is no protected or reserved forest area nearby. There are sparse institutional premises in the vicinity of the project site including National Bank for Agriculture and Rural Development (NABARD)[3] new campus, English & Foreign University Shillong campus, Indian Institute of Management (IIM) Shillong, and National Institute of Fashion Technology (NIFT) campuses, etc. There is a tuberculosis (TB) hospital at 0.30 km aerial distance from the site. This hospital is not functional at present. It was used as a COVID-19 center to isolate and treat COVID-19 affected persons and is now proposed to be used for some other purposes by the Health Department. All the institutes are located at a sufficient distance and no impact to the project is foreseen on any including the hospital. The proposed MSIH site is located beside urban road of the New Shillong Township and no inconvenience related to access/approach road is foreseen. There is no body of water in proximity to the site. The nearest lake, the Umiam lake, is 6.3 km from the site. The general terrain of the area is hilly and undulating. There are no protected areas (national parks, wildlife and bird sanctuaries, tiger reserves, etc.), wetlands, mangroves, or estuaries in or near the project site location. Therefore, MSIH site is neither partly nor fully in core, buffer or eco-sensitive zones of the above-mentioned protected areas including those covered under the Indian Regulations and International Treaties to which India is a signatory. The nearest notified eco-sensitive zone (Nongkhyllem Wildlife Sanctuary) is at 31 km from the MSIH site. Riat Khwan - Umiam Lake Key Biodiversity Area (KBA) is located at about 6 km from MSIH site. The site is beside the urban road of NST which has less traffic. However, with the proposed developments in the township, the traffic shall increase. There are no industrial or commercial activities close to MSIH site, therefore, there is no ambient air quality and noise level issue at present. There are no archaeologically protected and/or historically important monuments and/or structures within the aerial distance of 300 m from the project site (the nearest one is the Manipur Memorial at 7.6 km).

6. **Potential Environmental Impacts and Mitigation Measures**. Potential negative environmental impacts during the pre-construction, construction, and operation phases of the project site were identified. Design measures such as proper site selection and following relevant seismic codes in structural design to mitigate risks from natural disasters such as earthquakes and landslides will be adopted and are incorporated in the environmental management plan (EMP). Since the MSIH building will not cover a large area, construction of MSIH building and its operations are unlikely to cause any significant impacts. Usual construction-related impacts such as noise, dust generation, silt generation, soil contamination from chemicals spills and leaks, construction waste generation, and occupational and community health and safety risks, among others, will be localized, temporary, and avoidable with the implementation of mitigation measures as per the EMP. Operation impacts including wastewater generation, solid waste generation, etc., can be addressed through mitigation measures specified in the EMP. The clean rainwater runoff can be reused for horticultural purposes and recharging the ground water. Any contaminated rainwater (such as from parking area) will not be diverted to ground water recharge pit without appropriate treatment (such as passing it through oil water separator cum sedimentation tank). Materials containing asbestos will not be used. Any waste generated on account of operation and maintenance of solar PV cell will be collected and disposed of responsibly (re-use and/or recycle) by the supplier, who will also be maintaining the PV cell.

7. **Environmental Management Plan (EMP)**. An EMP has been developed and included as part of this initial environmental examination (IEE), which outlines the following: mitigation

3 NABARD is a development bank with a mandate for providing and regulating credit for the development of agriculture, small-scale industries, cottage and village industries, handicrafts and other allied economic activities in rural areas to promote prosperity of rural areas.

measures for environmental impacts during implementation; environmental monitoring program, cost estimates and the institutional arrangements for implementation. In accordance with this EMP, the Contractor will be required to prepare a site-specific environmental management plan (SEMP). Contractor will submit its SEMP for approval to the project implementation unit (PIU) or regional project management unit. The EMP and SEMP will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (ii) provide a proactive, feasible, and practical working tool to enable the measurement and monitoring of environmental performance on site; (iii) guide and control the implementation of findings and recommendations of the environmental assessment conducted for the project site; (iv) detail specific actions deemed necessary to assist in mitigating the environmental impact of the project site; and (v) ensure that safety recommendations are complied with. Copies of the EMP and SEMP shall be kept on-site during the construction phase. The contractor will be responsible for the organization, direction, and execution of environmental management related activities during construction of the proposed project site. The contractor will also undertake all activities in accordance with the relevant environmental requirements, including consent documentation and other regulatory and/or statutory and contractual requirements.

8. **Grievance Redress Mechanism.** A four-tier GRM will be established for the Project. The GRM will provide an accessible platform for receiving and facilitating resolution of affected persons' grievances related to the social and environmental issues of the project.

9. **Information Disclosure and Consultation**. Local stakeholders were involved in developing the IEE through discussions on site and public consultations. Their views and suggestions were incorporated into the IEE, and in the design of the project site. The IEE will be made available at public locations in the town such as Meghalaya State Skills Development Society (MSSDS) office, district administration office, etc. It will be disclosed to a wider audience via the ADB and MSSDS websites.

10. **Implementation Arrangements.** The Department of Planning, Investment Promotion and Sustainable Development (DPIPSD) and MSSDS (PIU-2) will be responsible for overall planning and implementation of the civil works for this project site. The project director, through the project implementation unit (PIU-2), will be responsible for addressing all environment and safeguards issues and will ensure that the IEE and EMP are implemented during the project site implementation. He will be assisted by environmental specialists who will be engaged under the loan as part of the project management consultants (PMC) team and the design and supervision consultants (DSC) team to be supported by the state government's counterpart funding. The environmental specialists of both the PMC and DSC teams will be shortlisted as per qualifications and experience specified in the request for proposal documents for these consultancies. They will also assist MSSDS in (a) preparing the IEE and EMP in line with the environmental assessment and review framework (EARF - for future project sites) and ADB's SPS, 2009; and (b) supervising civil works and ensuring the EMP implementation as per the IEE report cleared by ADB. The PMC will also help the project management unit (PMU) and MSSDS in preparing semi-annual safeguards monitoring reports as required by ADB. PMU (environmental safeguards focal person), with the assistance of PMC environmental specialist, will consolidate the semi-annual reports from monthly reports submitted by the DSC and contractor(s), and submit them to ADB through PMU (the project director's office). ADB will review the semi-annual environmental monitoring reports and disclose them on its website upon acceptance. The PMU will submit these semi-annual environmental monitoring reports until project completion.

11. **Conclusion and Recommendations.** Based on the IEE, it is expected that the proposed MSIH will have only localized, temporary, and less adverse environmental impacts. which can be readily mitigated through the measures indicated in the EMP. This report has not identified any significant adverse environmental impacts that are irreversible, diverse, or unprecedented. Based on the findings of the IEE, the classification of the project site as

Category “B” is confirmed. The project site has less than 20,000 sq.m built-up area and environmental clearance is not applicable as per environmental impact assessment (EIA) notification 2006 and its amendment thereof.

12. This draft IEE with EMP has been prepared based on preliminary design and shall be included in the bidding and contract documents. The required budget for EMP implementation will be included in the contract amount. This IEE will be updated based on final design and submitted to ADB for review and disclosure. No work can commence until the final IEE is approved by ADB and provided to the contractor, and until the SEMP is approved by the PMU/PIU. The draft and updated IEE reports, including EMPs, will be disclosed on ADB website as per ADB’s SPS, 2009 requirements.

I. INTRODUCTION

13. **Purpose of the IEE**. This IEE presents the scope of activities and components under the project site, Construction of Meghalaya Skills and Innovation Hub (MSIH) in Shillong and identifies potential environmental impacts due to project site implementation together with corresponding mitigation measures to ensure that negative impacts are avoided or minimized, and positive impacts are enhanced.

14. **Method.** This IEE report was prepared following the requirements of the ADB SPS, 2009. Rapid Environmental Assessment (REA) checklists were prepared and used to guide the preparation of the draft IEE. Site visits, stakeholder consultations, and secondary data collection were conducted to assess the existing environmental conditions of the project site and the potential environmental impacts that may occur during project implementation. Primary baseline environmental monitoring for air quality, noise level, surface water quality and groundwater quality will be conducted before the start of construction activities.

15. **Report Structure.** This report contains 11 sections including executive summary, (i) introduction; (ii) policy, legal, and administrative framework; (iii) description of the project site; (iv) description of baseline environment; (v) environmental impact and mitigation measures; (vi) analysis of alternatives; (vii) environmental management plan; (viii) public consultation and information disclosure; (ix) findings and recommendations; and (x) conclusions.

II. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

A. Compliance with India’s Environmental Regulatory Framework

16. India’s environmental rules and regulations, as relevant for the MSIH project site, are shown in **Table 1**. The environmental impact assessment (EIA) notification, 2006 by the Ministry of Environment, Forest and Climate Change (MOEFCC, GOI) specifies the requirements for mandatory environmental clearances. All projects and activities are broadly categorized into two categories—category 'A' and category 'B', based on the spatial extent of potential impacts on the environment, human health, and natural and man-made resources [4] However, MOEFCC’s Notification S.O. 5736(E) dated November 15, 2018,

4 All projects or activities included as Category ‘A’ in the Schedule, including expansion and modernization of existing projects or activities and change in product mix, will require prior environmental clearance from the Central Government in the Ministry of Environment, Forests and Climate Change (MoEFCC) on the recommendations of an Expert Appraisal Committee (EAC) to be constituted by the Central Government for the purposes of this notification; All projects or activities included as Category ‘B’ in the Schedule, including expansion and modernization of existing projects or activities as specified in sub paragraph (ii) of paragraph 2, or change in product mix as specified in sub paragraph (iii) of paragraph 2, but excluding those which fulfill the General Conditions stipulated in the Schedule, will require prior environmental clearance from the State/Union territory Environment Impact Assessment Authority (SEIAA). The SEIAA shall base its decision on the recommendations of a State or Union territory level Expert Appraisal Committee (SEAC) as to be constituted for

exempts all building or construction projects, educational institutes (with less than <20,000 m^2) built up area (BUA) from obtaining prior environmental clearance. Since the built-up area (10,354 m^2) of the MSIH is<20,000 $m^2$and the MSIH is meant for educational and training purposes, it will not require any prior environmental clearances according to the environmental rules and regulations of India. Further, as shown in **Table 1**, most other rules pertaining to India's Ancient Monuments and Archaeological Sites and Remains (Amendments and validation) Act, 2010; the Wildlife Conservation Act, 1972, amended in 2003 and 2006; and the Forest (Conservation) Act, 1980, will not apply to MSIH project site. The applicability of environmental rules and regulations is summarized below:

Table 1: Environmental Regulatory Compliance

Environmental Laws/Guidelines/Policies	Applicability
Environment (Protection) Act, 1986 and Environmental Protection Rules 1986 and subsequent amendments thereon.	This is an umbrella act under which several applicable statutes/regulations have been framed. This Act provides general guidelines for the prevention of pollution. Under this Act, rules have been specified for discharge/ emission of effluents and different standards for environmental quality. These include ambient noise standard, general effluent standards, emission standards **Applicable.**
The EIA notification, 2006 (and its subsequent amendments till date) provides for categorization of projects into category 'A' and 'B', based on extent of impacts.	The project site is not covered in the ambit of the EIA notification (amended till date), either as a Category 'A' or Category' B' project. As per the MoEFCC Notification S.O. 5736(E) dated November 15, 2018, building or construction projects, educational institutes with less than 20,000 m^2 built up area are exempted from prior environmental clearance. However, these projects must follow environmental management guidelines (during project implementation) specified in the above-mentioned notification. As a result, the categorization, and the subsequent environmental assessment and clearance requirements, either from the state or the GOI, are not triggered. **Not Applicable**
The Ancient Monuments and Archaeological Sites and Remains (Amendments and validation) Act, 2010, and the rules provide guidance for carrying out activities including conservation, construction, and reuse in and around the protected monuments.	The National Monument Authority (NMA) under the Ministry of Culture, GOI provides protection and preservation of monuments and sites. The Archaeological Survey of India (ASI) is responsible for conducting archaeological surveys, explorations, and excavations in the country. MSIH site is not within 300 m of any monument/site/ buffer/control area protected by the ASI or State of Meghalaya. Hence, no clearance/permission is needed from ASI. **Not Applicable**
Water (Prevention and control of pollution) Act, 1974 and Air (prevention and control of pollution) Act, 1981	Consent To Establish (CTE) and Consent to Operate (CTO) from the State Pollution Control Board will be required during construction for installation of diesel generator set, hot mix plant, concrete batching plant and Sewage Treatment Plant, etc. if installed by the contractor.

in this notification. In addition, General Condition (GC) of the notification specifies that any project or activity specified in Category 'B' will be treated as Category A, if located in whole or in part within 10 km from the boundary of: (i) Protected Areas notified under the Wildlife Protection) Act, 1972, (ii) Critically Polluted areas as notified by the Central Pollution Control Board from time to time, (iii) notified co-sensitive areas, (iv) inter-state boundaries and international boundaries.

Environmental Laws/Guidelines/Policies	Applicability
	For the operation phase, CTO will be required for the sewage treatment plant and for diesel generator (DG)sets installed for power back up. **Applicable**
The Wildlife (Protection) Act, 1972, amended in 2003 and 2006, provides for protection and management of Protected Areas.	An Act to protect wild animals and birds through the creation of National Parks and Sanctuaries. No wildlife protected areas within 10 km aerial distance from the MSIH site. **Not Applicable**
Forest (Conservation) Act, 1980	This act provides guidelines for conservation of forests and diversion of forest land for non-forest use. It describes the penalties for contravention of the provisions of the Act. If forest land must be acquired for the project, clearance is required from the Forest Department. No forest land is required for the MSIH. Hence, this is not applicable. **Not Applicable**
The Meghalaya Forest Regulation (Application and Amendment) Act, 1973	MSIH site is not located near or within forest area. **Not Applicable**
Meghalaya Tree (Preservation) Act, 1976	An Act to make provisions for regulating the felling of trees for purpose of protection of catchment areas and soil from erosion and to preserve the special characteristics of the hilly areas as regard landscape, vegetal cover and climate and to provide for matters connected there with and incidental thereto. It shall extend to the municipality and cantonment areas of Shillong, provided that the State Government may, by notification, extend the Act to other areas of Meghalaya. As per detailed project report (DPR), no tree cutting is envisaged. If there is a requirement at a later stage, adequate permission shall be taken. There are (around 12) pine shrubs (recently planted saplings) and these have been saved in the layout finalization. **Not Applicable**
Solid Waste (Management) Rules, 2016	These rules have been notified by the MoEFCC for collection, transportation and disposal of municipal waste. In the case of MSIH, these rules will be applicable both during construction and operation. **Applicable**
Hazardous Wastes (Management, Handling and Trans-boundary Movements) Rules 2016	These rules are for safe handling, storage, transportation and disposal of hazardous waste. The hazardous waste discarded fuel and lubricants on account of vehicle, equipment and machinery maintenance during construction. Hence these rules will be applicable during the construction phase and requisite permission shall be obtained by the contractor. **Applicable**
Battery Waste Management Rules, 2020	These rules have been promulgated for safe recycling of lead acid batteries. These will be applicable both during construction and operation phases. The requisite permission shall be obtained. **Applicable**
Noise Pollution (Regulation and Control) Rules, 2000	These rules prescribe ambient noise levels for various land uses. This act will be applicable both during construction and operation phases of MSIH project site. **Applicable**
E- Waste (Management) Rules, 2016	These rules have been formulated to channelize the E-waste to authorized dismantlers for re-use and recycle of

Environmental Laws/Guidelines/Policies	Applicability
	waste. These will be applicable during the operation phase of MSIH project site. **Applicable**
Bio-Medical Waste Management Rules 2016	There will be no generation of any biomedical waste during construction and operation phases of MSIH project site so these will not be applicable. However, if any medical center and /or first aid center is planned in operation phase, then these rules will be applicable if there is bio-medical waste generation. **Not Applicable**
Construction and Demolition Waste Management Rules 2016	The rules have been formulated for safe storage, transportation, and disposal of construction and demolition waste. There will be generation of construction waste during the construction phase. Hence these rules will be applicable during the construction phase. **Applicable**
Building and Other Construction Workers (Regulations of Employment and Conditions of Service) Act, 1996	The rules have been formulated and notified under this Act in 1998 for the regulation of employment and safe working conditions for the construction workers. The workers will be employed by the contractor (s) for the construction and these rules will be applicable during construction phase for proper occupational, health and safety measures at site. **Applicable**
Guidelines to regulate and control ground water extraction in India – Central Ground Water Authority Notification, 24 September 2020	Guidelines have been issued to regulate and control ground water extraction in the country. These guidelines will be applicable if ground water is to be extracted during the construction and operation phases. According to these guidelines, a 'No Objection Certificate' is required to be obtained by the infrastructure projects (current projects will fall in this category) for water extraction. At present, no ground water extraction during the construction and operation phases is planned. **Not Applicable**
The Child Labor (Prohibition and Regulation) Act, 1986 and amendments thereof.	This act is to protect child labor in the country for the safety of children from exploitation and provide the children opportunities for education and other developments. **Applicable**
The Bonded Labour (Abolition) Act 1976	The bonded labour means any labour or service rendered under the bonded labour system. The act states that all forms of bonded labour stand abolished, and every bonded laborer stands freed and discharged from any obligations to render any bonded labor. The contractor and project authorities need to ensure that no bonded labour is practiced at site for construction or operation works either directly or by the contractors/sub-contractors. **Applicable**
The E.P.F. and Miscellaneous Provisions act, 1952	This act aims to provide a kind of social security to the employees and workers. The Act provides retirement or old age benefits, such as Provident Fund, Superannuation Pension, Invalidation Pension, Family Pension and Deposit-Linked Insurance. This norm secures well-being of the employees and will be followed as per applicability **Applicable**

Environmental Laws/Guidelines/Policies	Applicability
Minimum Wages Act, 1948	The Act empowers the Government to fix minimum wages for employees working in specified employments. The Act requires the Government to fix minimum rates of wages and review the rates every 5 years. These are the minimum wages that are to be paid to employees (for construction workers). The project authority needs to ensure the display of wage notice and issue wage slip to workers as prescribed by the regulatory body. **Applicable**
Equal Remuneration Act 1976	As per the Equal Remuneration Act 1976, it is the duty of an employer to pay equal remuneration to men and women workers for same work or work of a similar nature. The contractor and project authority need to ensure the adherence to provision with the Act. **Applicable**
Workmen's Compensation Act, 1923 and amendments thereof.	This act is for the payment of compensation in accordance with the Act's provisions for any injury to workers on site during construction activities. **Applicable**
The inter-state migrant workmen (Regulation of employment and conditions of service) Act, 1979 and amendments thereof	There is a possibility of engaging inter-state migrant workers for the specialized jobs during the construction. This act is for regulation of employment of inter-state labor. Accordingly, contractors will obtain labor licenses from the Department of Labor, GoM. **Applicable**
The Contract Labor (Regulation & Abolition) Act, 1970 and Rules and amendments thereof	This act is for the regulation of local labor and to ensure the welfare of workers. The contractor will obtain labor license from the Department of Labor if workers are more than 20 in which twenty or more workmen, are employed or were employed on any day of the preceding twelve months as contract labor. **Applicable**
Public liability insurance act, 1991	An Act to provide for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling any hazardous substance and for matters connected therewith or incidental thereto. The contractor/ subcontractor needs to obtain insurance policies to cover liabilities from accidents that cause harm or injury to the affected person. **Applicable**
National Building Code (NBC), 2016	The primary requirement of the Code is the Safety of the Occupants, the safe exit of Occupants, restricting fire to a part of the building and the suppression of fire through automatic or manual means. The proposed project will have to comply with fire and life safety considerations (as applicable to) under the NBC. **Applicable**
National Disaster Management Act 2005	Provides for the timely and effective response to disaster. It lays down guidelines to be followed by the State Authorities in drawing up the State Plans. Applicable in case any disaster situation arises. The project will have both onsite and offsite emergency response plan prepared for the construction and operations period.
The Meghalaya Building By-laws 2021	Under the Meghalaya Building by-laws 2021, every new building after completion is required to obtain an 'occupancy certificate' from the authority. The MSIH will

Environmental Laws/Guidelines/Policies	Applicability
	also require a building occupancy certificate after the building's completion. **Applicable**
The Meghalaya Fire and Emergency Services, Act, 2012	Under the Meghalaya Fire and Emergency Services Act, 2012 every building needs to obtain No Objection Certificate (NOC) from the Fire Department. The MSIH building will also need to obtain NOC from the Fire Department. **Applicable**

Note: All the relevant Indian environmental and labor laws and regulations will be followed during project site lifecycle.
EIA = environmental impact assessment, GOI = Government of India, GOM = Government of Meghalaya, MoEFCC = Ministry of Environment, Forest, and Climate Change, MSIH = Meghalaya Skills Innovation Hub.
Source: Secondary research - latest official notifications of Indian National Laws, Regulations, and Policies

B. International Agreements and Commitments of Government of India

17. The Republic of India is party to various international agreements/conventions/treaties for conservation of environment at global level. The construction, development and operations of Meghalaya Skills and Innovation Hub will not trigger most of the convention/agreements including Ramsar Convention on Wetlands, 1971, Convention on World Cultural and Natural Heritage, 1972, Vienna Convention on Protection of Ozone Layer, 1985, and Montreal Protocol on Substances Depleting the Ozone layer, 1987 and Convention on Biological Diversity (CBD), 1992 because Meghalaya Skills and Innovation Hub is not close to any notified wetlands and cultural and natural heritage sites, no production of ozone depleting substances from the project site and no biodiversity rich areas close to the sub- project site. Only convention(s) pertaining to climate change will be triggered. This is explained below.

United Nations Framework Convention on Climate Change (UNFCCC), 1994

18. As per the convention, Green House Gases (GHG) reduction/limitation requirements apply only to developed countries. The only reporting obligation for developing countries relates to the preparation of GHG inventory (GHG sources and sinks, potential vulnerability to climate change, adaptation measures and other steps being taken to address climate change). India acceded to the Kyoto Protocol in 2002 and voluntarily agreed to reduce the GHG emissions in 2018.

19. The MSIH project site activities will not have direct GHG emissions, but on account of construction activities and slight increase in traffic both during construction and operation phases, there will be slight increased carbon dioxide, nitrous oxide, etc. emissions of GHGs. These will be minimized through optimum usage of vehicles and machinery during construction and operation phases.

20. The project site aims to adopt environmentally friendly construction materials (bamboos, fly ash /concrete bricks, recycled rubber, etc.), naturally occurring stones for boundary wall and slope protection, energy conservation measures (energy efficient fixtures, usage of solar energy for water heating and/or campus-lighting), minimization of natural resource consumption (by maximizing construction utilization, usage of fly ash bricks, treated water recycle, etc.) and landscaping and tree plantation.

C. Asian Development Bank's Environmental Safeguard Policy Principles

21. The proposed MSIH in Supporting Human Capital Development in Meghalaya (Phase 2) is being funded by the ADB, it must comply with ADB's SPS, 2009, in addition to the India's environmental laws and regulations. The environmental safeguard policy principles embodied in SPS, 2009 aim to avoid adverse impacts on the environment and on affected people or

communities; minimize, mitigate and/or compensate for adverse project impacts, if unavoidable; help borrowers to strengthen their safeguard systems and to develop their capacity in managing the environmental and social risks. The SPS, 2009 categorizes all projects into 3 environmental categories (A, B or C) based on their potential impacts.[5] ADB's Rapid Environment Assessment (REA) checklist method was used to screen the potential impacts of the project site (**Annex 1**). The project site is category 'B' for environmental safeguards and accordingly, this IEE report has been prepared. Baseline environmental conditions were established based on secondary sources of information and field reconnaissance surveys. Stakeholder consultations at the MSIH site were an integral part of the IEE. An environmental management plan (EMP) outlining the specific environmental measures to be adhered to during implementation of the MSIH project site is included in the IEE.

D. Applicable Environmental Standards

22. Following requirements of ADB SPS, the project site shall apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in EHS Guidelines. When the government regulations differ from these levels and measures, the project site shall achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project site circumstances, full and detailed justification for any proposed alternatives consistent with the requirements presented in ADB SPS, 2009 shall be provided.

III. DESCRIPTION OF THE PROJECT SITE

A. Project site Location and Area

23. The MSIH will be constructed at New Shillong Township in East Khasi Hills district of Meghalaya. The northern portion of the district is bounded by the plain of Ri-Bhoi District, the Jaintia Hills District to the east and the West Khasi Hills District to the west.

5 As per SPS 2009, projects are assigned to one of the following four categories: (i) Category A: A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required. (ii) Category B: A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination is required. (iii) Category C: A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed (iv) Category FI. A proposed project is classified as category FI if it involves investment of ADB funds to or through a FI.

Figure 1: Geographic Location of Project Site

Source: https://www.mapsofindia.com/.

24. The nearest rail head from the MSIH site is Guwahati Railway Station at about 105 km. The New Shillong Township is well connected to important destinations such as Cherrapunji, Guwahati, and Kolkata. There is an airstrip suitable for small aircraft at Umroi which is 40 km from Shillong. The agricultural and other products are transported by trucks, jeeps, and tractors. Shillong is well connected with other parts of the State by motorable roads. Similarly, all the block headquarters in the district are also connected by roads. The distances of important destinations are given below:

Project Component	Altitude (m)	District	Distance from site (km)
Meghalaya Skills and Innovation Hub, East Khasi Hills district	1460m	East Khasi Hill	Shillong Town : 12 km Cherrapunji (Sohra) : 62 km Guwahati : 103 km Siliguri : 527 km Silchar : 207 km Kolkata : 1070 km New Delhi : 1868 km Guwahati Railway Station: 105 km Kamakhya Railway Station :116 km Shillong Airport : 40 km Guwahati Airport : 127 km

km = kilometer, m = meter.

Source: ADB TA consultant's field work.

25. The MSIH component is proposed in vacant open land in possession of MSSDS. The elevation of the site is 1,460 m. The site is about 12 km from Shillong town. Land is vacant and there are no permanent or temporary structures on the site. There is no vegetation on the site. The latitude and longitude of the proposed MSIH site are given below:

Sl. No.	Name of Facility	Latitude	Longitude
1	Meghalaya Skills and Innovation Hub	25.610531°	91.940423°

Source: Primary data collection by TA consultant.

26. The MSIH site is on a hilly undulating terrain. The New Shillong Township Development Agency (Government of Meghalaya) has transferred 5 acres of land to the MSSDS, Department of Labor, GoM. The photographs of MSIH site are shown below in **Figure 2**.

Figure 2: Site Photographs

View of MSIH Institution Block

Another View of MSIH Residential facility area

View of Residential facility area (Hostel Block)
Requirement of Vegetation Clearance at Site

Another View of Residential facility area (Hostel Block)

Source: ADB TA consultant's field work.

27. The location of the proposed MSIH site and surroundings is shown in **Figure 3. Table 2** summarizes the need for the project site and its proposed components.

Figure 3: Location of Meghalaya Skills and Innovation Hub Site at New Shillong

Source: ADB TA consultant's field work.

Table 2: Description of the Project site Components

Proposed Main Project site Components
The MSIH will be a campus with 7 building components, varying from G+2 to G+5[6] with basements. The total built-up area is proposed to be 10,354 sq.m on a plot area of 22,990 sq.m. Ramps and specially designed toilets will be provided to make the campus accessible for people with disabilities. Rainwater gutters at the end of steel sheeting roofs will direct rainwater to underground rainwater harvesting tanks. The MSIH will have the following spaces/offices: innovation and startup space - 3,211 sq.m; skills, events and co-working - 871 sq.m; skills and training facilities - 2,899 sq.m; industry co-locator building - 995 sq.m; MSIH admin - 865 sq.m; hostel - 1,073 sq.m and guest house - 440 sq.m. This covers a built-up area of 10,354 sq.m. The following facilities will be provided: (i) Sanitation facilities (separate toilets for male and female). (ii) A hostel facility for 100 people (50 girls and 50 boys).

[6] G+2 means ground floor plus two more floors above it; G+5 means ground floor plus five more floors above it.

(iii) Sewage treatment plant (STP) of 30 KLD for wastewater treatment.
(iv) Rooftop solar panels with capacity of 3 kVA for solar water heating system of 4,000 liters per day capacity.
(v) Underground rainwater harvesting tank 50,000 liters
(vi) The total electricity load is estimated at 25 kW.
(vii) Drinking water facilities

Water consumption is estimated at 33,750 liters per day (say 34 KLD). The water source will be from the municipal supply for the New Shillong Township.

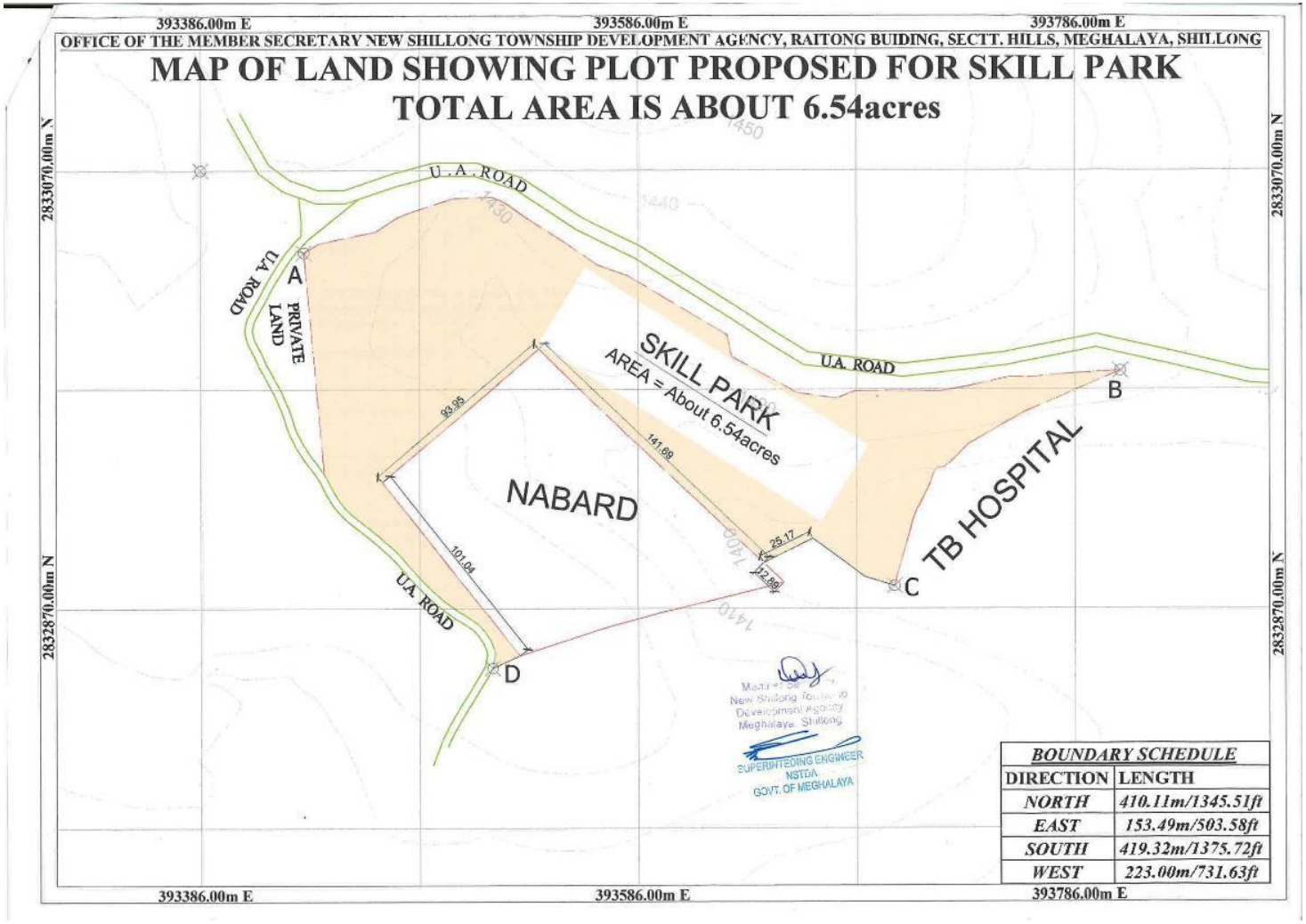
The solid waste generated will be integrated with the waste disposal system of New Shillong township.

The estimated cost for MSIH Shillong is US$9.5 million.

KLD = kiloliter per day, kVA = kilovolt amperes, kW = kilowatt, MSIH = Meghalaya Skills Innovation Hub, MSSDS = Meghalaya State Skills Development Society, sq.m = square meter, STP = sewage treatment plant.

28. The layout plans of various components of MSIH are shown below in **Figure 4**.

Figure 4: Layout Plan of MSIH Shillong




Site Gate 1
Site Gate 2
Site Gate 3
Site Gate 4
Road (6m)
Road (6m)
Road (6m)
Road (6m)
Parking + Drop-off
Innovation, Start-up space
(600 sqm) x 5 floors
Cafeteria
(134 sqm) x 3
Skills, Events and
Co-working space
(250 sqm) x 5 floors
Skills and training facility
(600 sqm) x 5 floors
Parking + Drop-off
Bridge
Bridge
OAT
Water reservoir
Industry co-locator
space
(400 sqm) x 5 floors
Parking
+
Drop-off
MSSDC office/
Admin/ Counselling
(300 sqm) x 5 floors
Area of future expansion
3600 sqm
Basketball court
Badminton court
Hostel
(400 sqm) x 2 floors
(200 sqm)
x
2 floors
(400 sqm) x 2 floors
Parking
+
Drop-off
Guest house
(250sqm) x 3
Proposed Pine
Plantation

B. Executing and Implementing Agencies

29. The Department of Planning, Investment Promotion and Sustainable Development, Meghalaya will be the executing agency (EA) for the overall SHCDM-II project. MSSDS is the implementing agency (PIU-2) for the proposed MSIH project site. They will ensure that the IEE and EARF are adhered to during project implementation. The project management consulting (PMC) firm to be engaged under the project loan and Design Supervision Consultants (DSC) engaged under State Fund will have academically qualified and professionally experienced Environment and Social Safeguards specialists. They will assist PMU and MSSDS (PIU-2) in supervising the civil works, ensuring that the IEEs and EMPs are prepared for all project sites (identified in the future), and preparing semi-annual safeguards monitoring reports. PMU (with the support of the environmental safeguards focal person) will consolidate the semi-annual reports (from the monthly and quarterly reports submitted by the contractor(s) through DSC), with the assistance of PMC environmental specialist, and submit them to ADB as part of loan covenants compliance as well as for disclosure purposes. The semi-annual safeguards monitoring reports shall be submitted till PCR is issued by ADB. The reports will be submitted to ADB through the Project Director's office.

C. Implementation Schedule

30. The implementation period for the MSIH project site is 36 months. The preliminary drawings for MSIH project site have been prepared for approval by the chief executive officer (CEO)/team leader (PIU-2), MSSDS and these are in the approval process. The bidding process for the project site is in progress. The construction is expected to start by January 2025. The project site construction is expected to be completed by Q4 2027.

D. Required Resources

31. Reinforcing steel, gravel, sand, and aggregate will be required for civil works, most of which are available in the district. Construction materials will be sourced from legitimate entities authorized by the government.

IV. DESCRIPTION OF BASELINE ENVIRONMENT

32. This section presents a brief description of the existing environment around the MSIH project site at Shillong including its physical resources, ecological resources, socio-economic development, and social and cultural resources. Secondary information was collected from the official websites and reports of relevant government agencies like the Forest Department, ASI, State Pollution Control Board, Central Ground Water Board, and meteorological data from web sources.

A. Environmental Profile

Air and Noise Quality

33. No major air pollution sources were seen in the project influence area (within 3 km) of MSIH project site. The site is a vacant land in the New Shillong Township. The project site is adjacent to an urban road of 7.5m width. The site is accessible by road. Presently, the surrounding traffic on the road connecting to the site is low. Hence, insignificant vehicular emission is expected. During construction of MSIH about 5-10 trucks and 10-15 cars and medium tonnage vehicles (MTV) will move for the facilitation of construction of the MSIH building. During the

operation, the number of vehicles, passenger cars of about 50 are likely to increase as hostel facility and staff residential facilities are planned at the MSIH campus. There is no industrial area close to the site and surroundings. The ambient air quality and noise data for the MSIH site is not available. The data for the nearby locations is also not available. To establish baseline, the contractor shall complete baseline environmental monitoring immediately after the mobilization.

34. The Meghalaya State Pollution Control Board is monitoring the Ambient Air Quality in the state under the National Air Monitoring Programme (NAMP) sponsored by CPCB. The frequency of monitoring is twice a week. Based on the data published for the last week of February 2024 the air quality index (AQI) at most of the locations is satisfactory (Table-3). The nearest location of monitoring station to MSIH during the construction site (about 3 km aerial distance) is Lumpyngngad and this has moderate AQI. Better air quality is anticipated at site as the site is in an open area.

Table 3: Ambient Air Quality Index at Shillong

Location	Air Quality Index (AQI)	Rating
Lumpyngngad, Shillong	51	Satisfactory
Dawki	49	Good
Nongstoin	55	Satisfactory
Tura	55	Satisfactory
Khliehriat	58	Satisfactory
4 1/2 Mile, Upper Shillong	56	Satisfactory
Barik, Shillong	70	Satisfactory
Polo, Shillong	58	Satisfactory
Umiam (Industrial Area)	102	Moderate
Byrnihat Town (Average of 3 sampling locations)	112	Moderate

Note: AQI calculation is as per standard procedures prescribed by Central Pollution Control Board (CPCB), New Delhi.

Rating Scale:

Good: 0-50; Satisfactory: 51-100; Moderate: 101-200; Poor: 201-300; Very Poor: 301-400; Severe: >400

Source: Meghalaya State Pollution Control Board (https://megspcb.gov.in/wk_airindex.html).

35. Noise levels data is not available for the MSIH site. To have site specific baseline data the contractor will complete baseline monitoring immediately after mobilization. Since the site is open and there is no habitation and very lean traffic in the surroundings noise levels are expected to be low. The baseline vibration levels are also not available. Vibration issue is not likely as no blasting or rock cutting is planned at the site. There are no houses/structures/commercial establishments within the 300 m aerial distance from the boundary of MSIH plot. The nearest one is a non-functional Tuberculosis (TB) hospital at an aerial distance of 300m.

Climate.

36. The project site and its surroundings fall in humid sub-tropical climate zone of Meghalaya. The humid subtropical climate of Shillong is characterized by moderately warm wet summers and cool dry winters. The average maximum and minimum temperature are around 20°C and 12°C, respectively. The city experiences a prolonged rainy season with intermittent rains throughout the year. Two-thirds of the rainfall occurs in the months of June to September, from the south-west monsoon originating from the Bay of Bengal and the Arabian Sea with relative humidity being highest during the rainy season (above 80%). The average humidity is more than 50% for all

throughout the year (except May). The East Khasi Hills district has the unique distinction of having the wettest place on earth, i.e., Mawsynram with an average annual rainfall of about 12,270 mm. This is followed by the 2nd wettest place called Cherrapunjee with an average annual rainfall of 11,600 mm. The climate data is useful for the climate resilient design of the MSIH building. The monthly climate variation is shown in **Figure 5.**

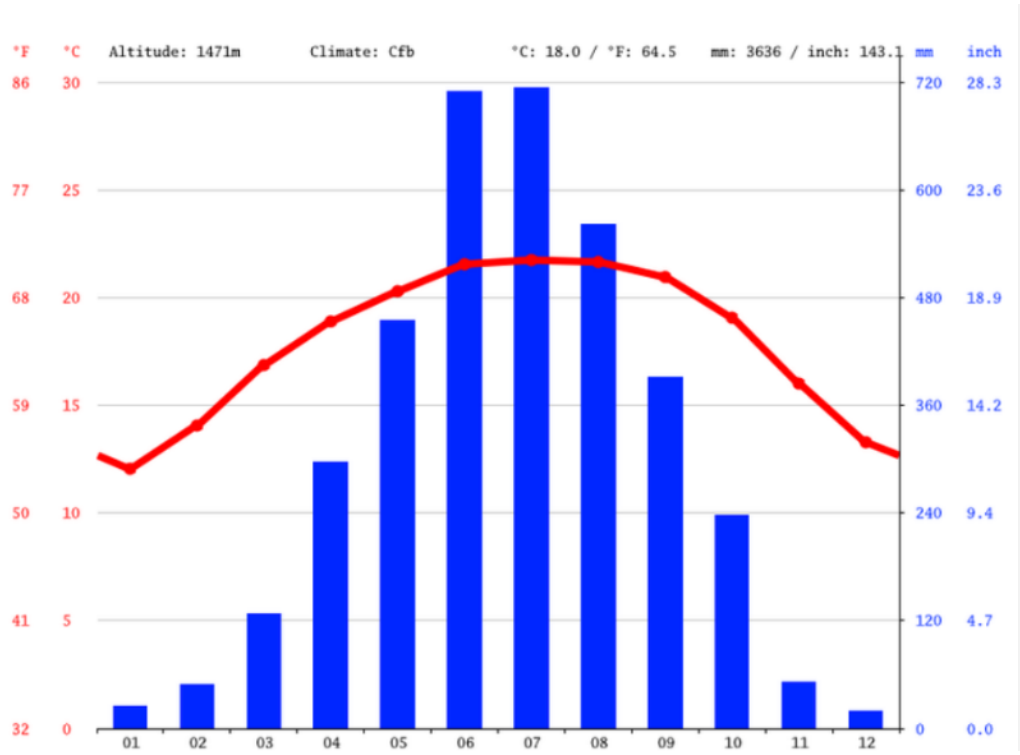
37. **Temperature.** The temperature exhibits seasonal variation, lowest during the winter, and higher during the summer. The months of June, July and August have the highest temperature readings while January, February, and December have the lowest temperature readings. **Table 4** shows monthly temperature variation at Shillong. These temperatures show that extreme temperature variations do not occur in the project site region.

Table 4: Monthly Temperature Variations at Shillong

Month	Day	Rain days
January	12.1^{o} c	4
February	14.1^{o} c	6
March	16.9^{o} c	12
April	18.9^{o} c	19
May	20.3^{o} c	21
June	21.5^{o} c	21
July	21.7^{o} c	21
August	21.7^{o} c	22
September	21^{o} c	20
October	19.1^{o} c	15
November	16^{o} c	6
December	13.3^{o} c	2

Source: https://weatherspark.com

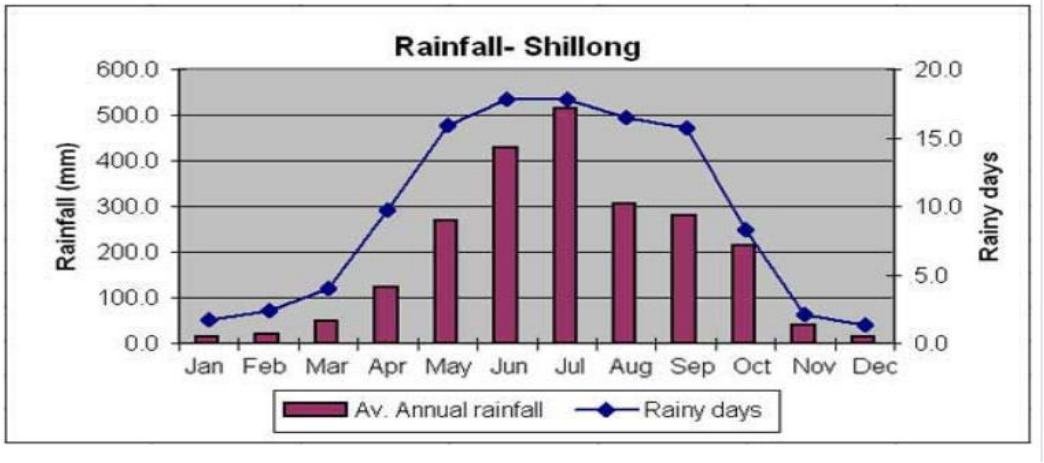
Figure 5: Climate Graph/Monthly Weather Variations at Meghalaya



Source: https://weatherspark.com

38. **Rainfall**. The project site area experiences maximum rainfall during Monsoon season from June to September while minimum rainfall is received in November and December. There is no snow fall in the project site district. The rainfall variations for Shillong have been depicted in **Figure 6** below. The construction schedule is to be prepared considering peak monsoon months of June to September.

Figure 6: Graph Showing Monthly Average Rainfall at Shillong



Source: https://weatherspark.com

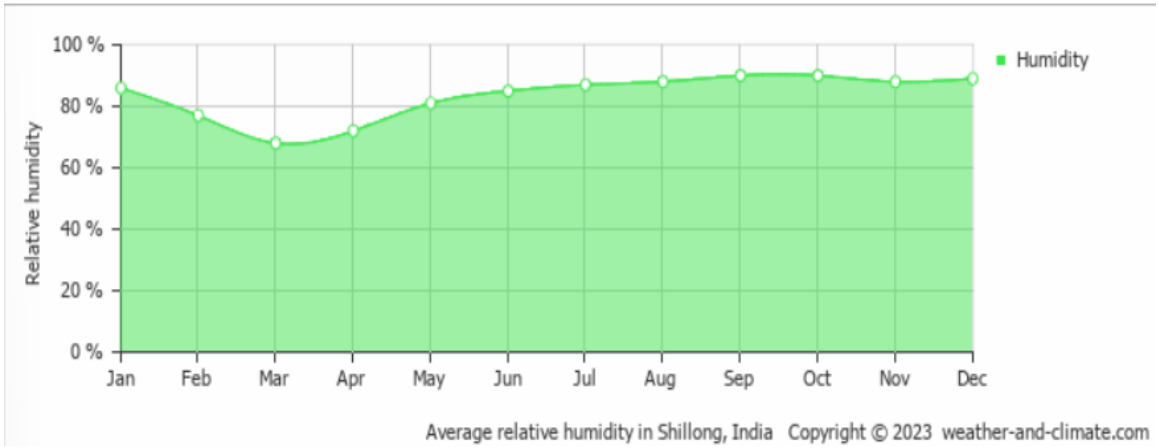
39. **Humidity.** The average relative humidity of Shillong is around 67% although it may vary from around 40% during Summer (May) to 88% during the monsoon (August). The most humid month of the year is August with humidity variation from 62.0% to 100.0%. The least humid month of the year is May, with humidity variation from 13.1% to 85.0%. The monthly humidity variation for project area is given below in **Figure 7 and 8**.

Figure 7: Humidity Variation in Shillong

Parameter	Relative Humidity, %			
	Minimum	Maximum	Average	Stantard Deviation
January	25.3	99.7	66.4	± 15.5
February	26.9	95.9	67.7	± 14.0
March	30.5	94.7	62.1	± 15.5
April	23.6	89.3	51.9	± 15.0
May	13.1	85.0	39.9	± 15.5
June	27.4	98.5	63.6	± 17.8
July	53.3	99.3	84.7	± 10.0
August	62.0	100.0	87.9	± 8.0
September	52.3	97.6	81.4	± 10.4
October	38.4	88.5	69.3	± 12.7
November	28.7	92.4	67.4	± 14.5
December	30.1	91.9	66.2	± 14.3

Source: https://weather-and-climate.com/average-monthly-Humidity-perc,shillong-meghalaya-in,India

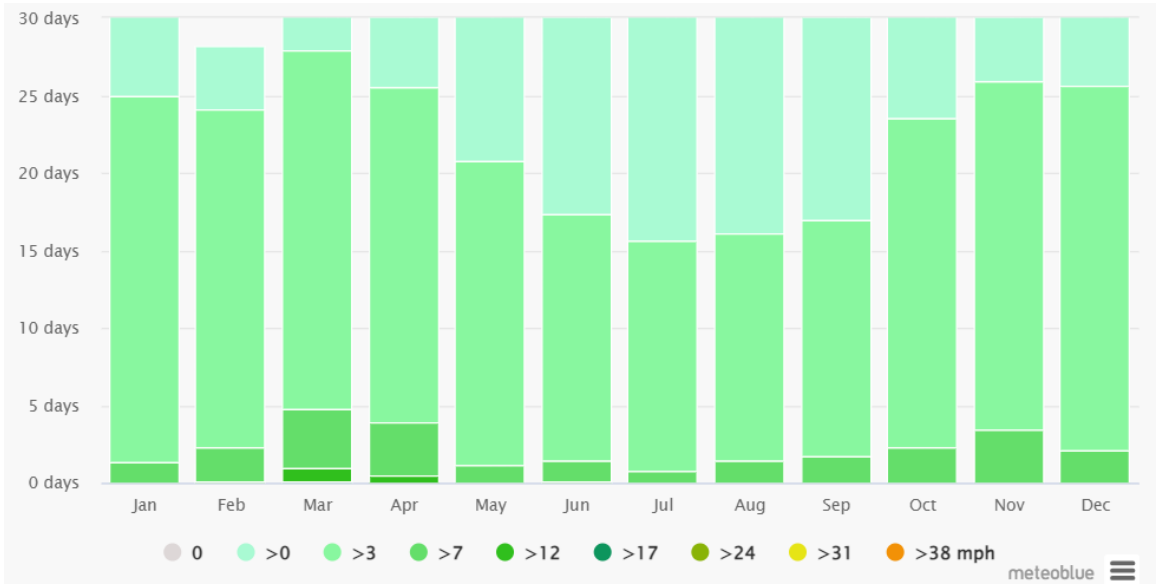
Figure 8: Average Humidity in Shillong



Source: https://weather-and-climate.com/average-monthly-Humidity-perc,shillong-meghalaya-in,India

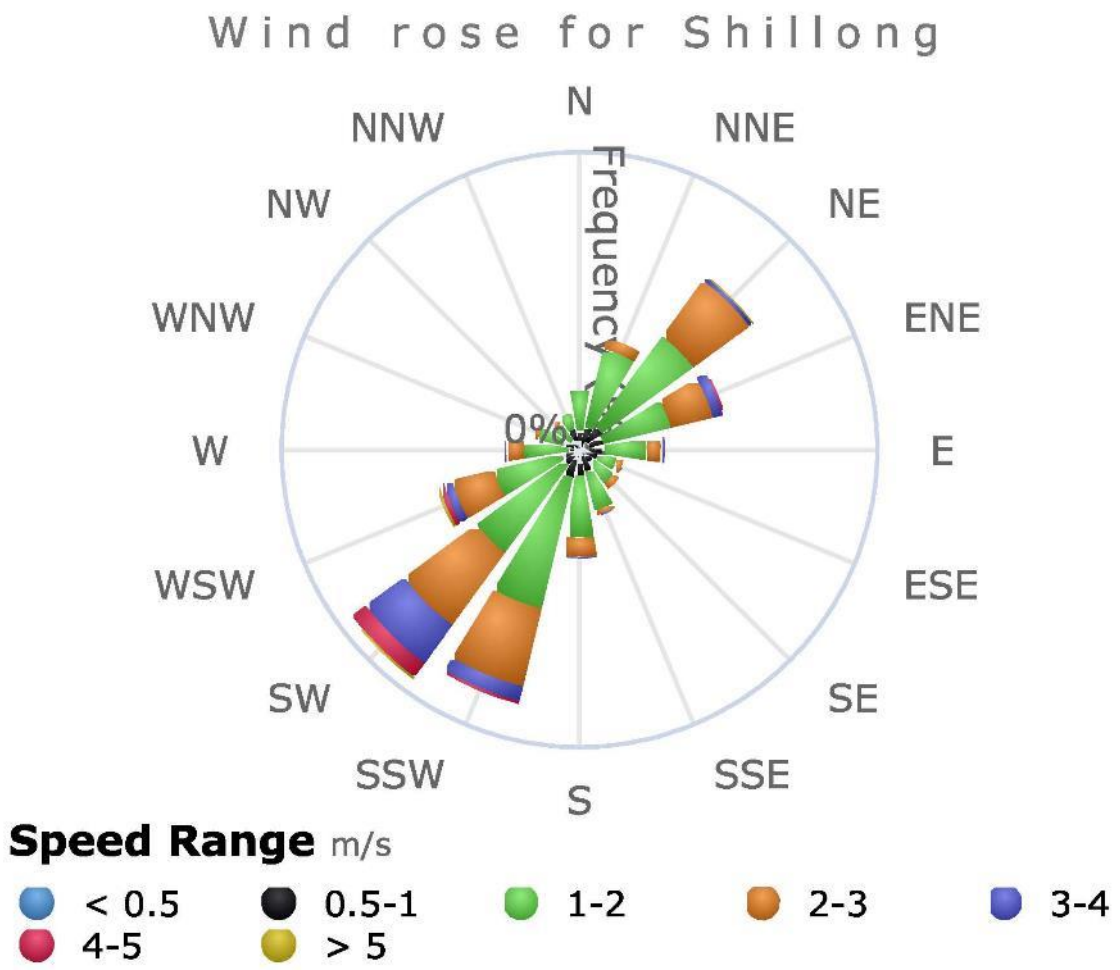
40. **Wind Speed and Directions.** The average wind speed in Shillong is 1.7 m/s with a maximum wind speed of around 6 m/s. The station pressure varies from 947 hPa to 932 hPa, averaging around 958 hPa. The pressure is lower than an average atmospheric pressure of 1013 hPa because Shillong is at a height of 1400-1900 m above mean sea level. Windrose of Shillong shows that wind blows from the SW - about 15.85% of all wind directions. The graph showing wind speed, and the wind rose diagram is shown in **Figures 9 and 10** below. The emissions during the construction will travel towards NE direction during the construction and operation. Accordingly, residential areas (hostels, guest house, accommodation, etc.) in MSIH are planned upwind.

Figure 9: Average and Maximum Wind Speed at Shillong



Source: https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/shillong_india_1256523.

Figure 10: Wind Rose Diagram for Shillong



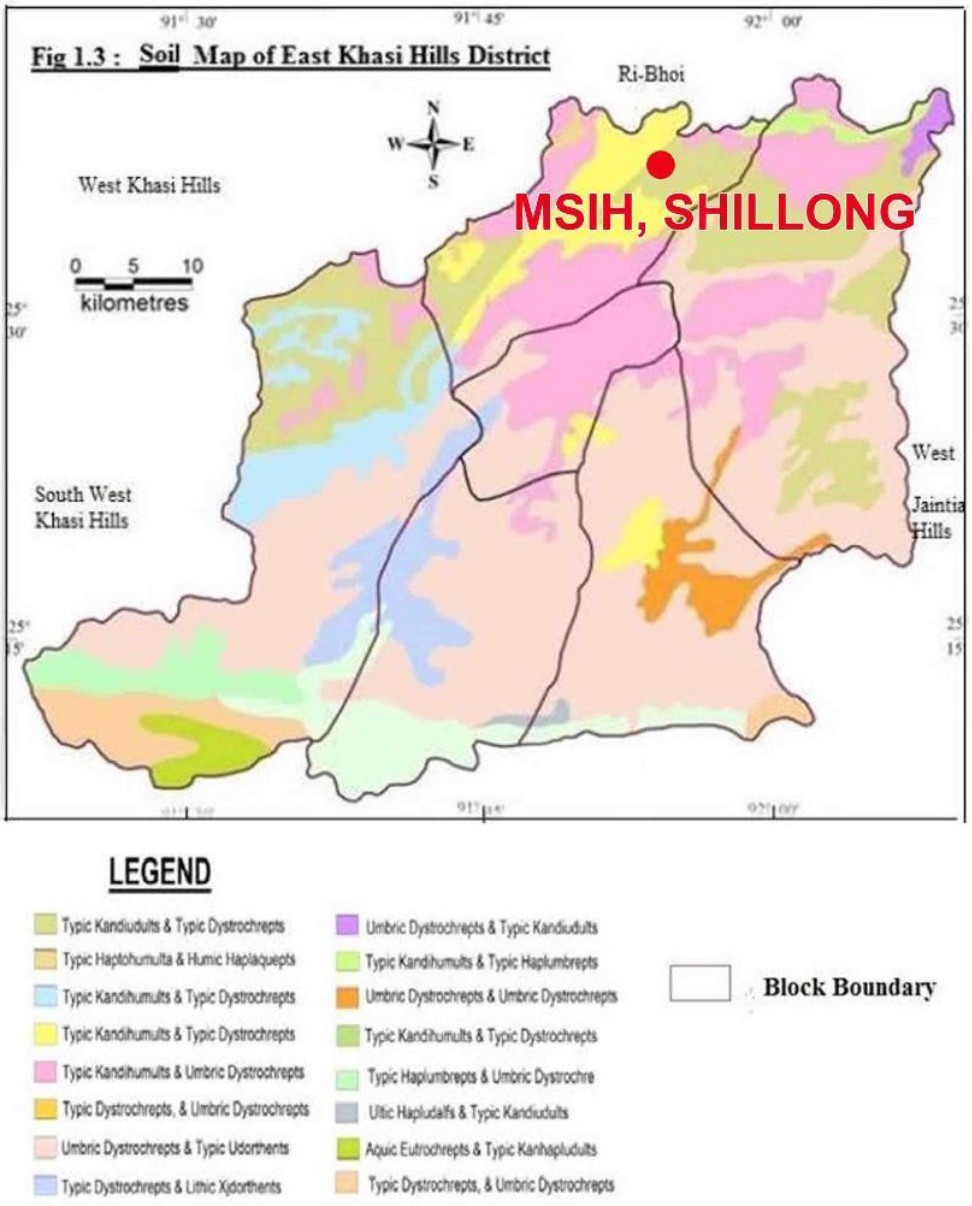
Source: https://www.indianclimate.com/show-data.php?request=84WHABA2AM

Topography and Soils

41. The East Khasi Hills district is mostly hilly with deep gorges and ravines in the southern portion. The most important physiographic feature of the district is the Shillong Plateau interspersed with river valley, then fall sharply in the southern portion forming deep gorges and ravine in Mawsynram and Shella-Bholaganj bordering Bangladesh. Shillong falls on the deeply dissected central upland of the Meghalaya Plateau. The relief of the city varies from 1400 to 1900m above mean sea level (MSL). The Khasi Hills range in the south descends at a slope of 200+ towards the city and acts as a water divide. This means elevation towards Shillong city from the site increases. The slope within the city ranges from 5% to 10%, except at the locations such as Happy Valley, Pynthomukhrah and Polo Ground area, where slopes are gentle within the range of up to 5%. Wah Umkhrah, Wah Umshyrpi and Wah Umkhen are the three main streams draining the city through several second and third order tributaries. The project site is in undulating terrain. The site elevation is 1460 m above mean sea level.

42. The soil in Shillong is laterite soil, deficient in phosphorus and potash content but rich in nitrogen and organic matter. The soil is mildly acidic in nature. pH ranges from 4.8 to 6.2. Some areas have alluvial fills, which are heavy loams and contain larger amounts of organic matter. The thickness of the soil varies from 1 to 10 meters. The soil map of the district is shown in **Figure 11.** The soils at site are also laterite. There are no alluvial fills/soils at site. Keeping this nature in mind soil testing and other Geotech investigations (soil strata) is carried out for the MSIH site for building design.

Figure 11: Soil Map of East Khasi Hills District



Source: Report on Aquifer Mapping and Management Plan of East Khasi Hills district, Meghalaya, (AAP 2018-2019), CGWB

Drainage

43. The drainage pattern is structurally controlled and parallel to sub-parallel in nature. The drainage pattern shows annular, trellis, sub-dendritic types, which also indicate structural control. The important rivers include the Umtrew, Umiam, Umkhen, Myntang and Umngot Rivers. The river basin map of Meghalaya is shown in **Figure-12**. The drainage of the site is swift as the site is undulating. The Umiam River is closest to the site at about 6 km. Storm water drainage system design of the MSIH is being finalized considering the slope and topography of the site.

Surface water and Ground water

44. The state of Meghalaya is blessed with bountiful water resources. Hydrologically, the State comprises of two basins, viz., the Left Bank of Brahmaputra Basin (11220.11 km^2) and the Brahmaputra Tributaries Basin (11208.89 km2), three catchments viz., Kalang to Dhansiri Confluence (about 4499.61 km^2), Bangladesh Border to Kalang Confluence (about 6720.50 km^2) and South Flowing Drainage of Meghalaya (11208.89 km^2), eight sub catchments with a size range of 2.08 to 2.46 lakh hectare and 35 watersheds with a size range of 0.03 to 0.22 lakh hectare. Umtrew, Umiam, Umkhen, Myntang and Umngot and a good number of other turbulent streams that drain out all over the district exhibits gentle gradients with sinuosity on the plain areas. The river drainage system exhibits eight patterns viz. (i) Radial (ii) Centrifugal (iii) Parallel (iv) Dendritic (v) Deranged (vi) Trellised (vii) Annual and (viii) Rectangular. Of these two patterns i.e., Parallel and Dendritic can be witnessed in the catchment areas of the rivers in this district. The city of Shillong lies in the Umiam river basin. As mentioned earlier, there is no surface water source in the immediate vicinity of MSIH site. The water quality of Umiam River (nearest one and at about 6 km from site) is provided in **Table-5.** The Umiam lake is also around 6.3 km from the project site.

Figure 12: River Basin Map of Meghalaya

Source: Report on Aquifer Systems of Meghalaya.

Table 5: Water Quality of Umiam River

Name of the monitoring station	**Umiam Mawphlang at Shella**				**STATUS**
State	**Meghalaya**				
District	**East Khasi Hills**				
Geographical Location	Latitude - 25°10'48.57"N				
	Longitude- 91°38'11.09"E				
Seasonal Sampling	**Spring**	**Summer**	**Autumn**	**Winter**	
Type of water body	**River**				*The water quality with respect to pH, Dissolved Oxygen, Biochemical Oxygen Demand and Total Coliform Count meet the Water Quality Criteria for 'A' class indicating that the water can be used as drinking water source without conventional treatment but after disinfection.*
pH	7.0	7.2	7.1	7.1	
Dissolved Oxygen mg/L	7.0	7.8	7.6	8.1	
BOD mg/L	1.7	1.5	1.5	1.4	
Total Coliform (MPN/100ml)	56	27	24	74	

Source: Meghalaya State Pollution Control Board, 2023

45. As per the study conducted by Central Groundwater Board (CGWB), the net annual ground water availability of the district works out to be 20210.66 Hectare Metre (Ham). The annual allocation for domestic uses has been estimated as 673.59 ham based on the population data which has been projected up to year 2025. The over-all stage of ground water development of the East Khasi Hills district is 2.84% and is categorized as '**SAFE.'**

46. As part of the routine groundwater quality monitoring, Central Ground Water Board (CGWB) has collected water samples from rivers in the East Khasi Hills district in 2013 and published data in the year 2019. The outcome of the ground water analysis is given in the following **Table 6.**

Table 6: Ground Water Quality in Project site Area

Parameter	**pH**	**EC µS/cm at 25°C**	**HCO_3**	**Cl**	**SO_4**	**NO_3**	**F**	**Ca**	**Mg**	**Na**	**Iron**	**K**	**Total Hardness as $CaCO_3$**
Minimum	8.02	280	12	10	1	2	Tr	30	11	7.5		0.6	120
Maximum	8.17	360	153	125	85	22	0.16	48	17	14.0		5.8	165
Iron	1. Springs- BDL-0.24 mg/l, 2. Shallow Aquifer – BDL-1.52, 3. Deeper Aquifer -BDL-8.4												

Source: Ground Water Information Booklet Published in 2019, Based on 2013 Data (Latest available data).

47. According to Bureau of Indian Standards (BIS: IS: 10500, 1991), the chemical constituents present in the ground water of the district is all within the desirable limit set for drinking and irrigation water standards except for Fe which exceeds the limits prescribed for drinking purpose. Thus, the water of the district is good and is fit for drinking as well as irrigation point of view. In pockets where high concentration of Fe is detected, the water can be treated by adopting iron

removal procedures for domestic use. The contractor after mobilization will take ground water sample from the available source close to the site to establish baseline. There will be regular drinking water testing during the construction.

Geology and Seismology

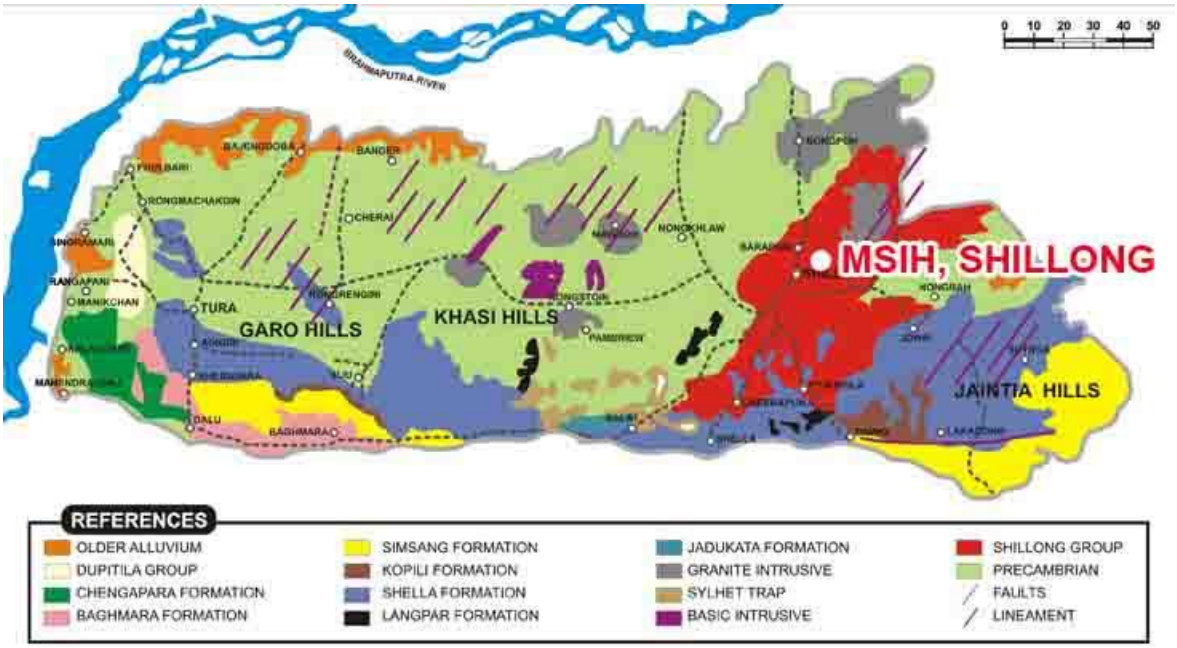
48. Shillong lies on low-grade metamorphic rocks of Shillong Group. The rock types are of quartzite with subordinate of phyllites and slates followed by schist and gneisses. The Quartzite band dips at 200 to 400 m in North-Northeast to South-Southwest direction. The rock band is found at a depth of one to three metres from the topsoil level, except at places where the crusted Quartzite bands are exposed. Four sets of joints have been noted in this quartzite, which have rendered them splintery at places where all the sets are intensely developed. The quartzite exhibits broad open folds. The geological map of Meghalaya is shown in **Figure 13**. It is clear from this figure that the MSIH site also falls in area occupied by the rocks of Shillong Group. Geological formations of project site region are explained in **Table 7** below:

Table 7: Geological Formations in Project site Region

Type of material	Nature of material	Depth of Occurrence
Topsoil	Sandy and micaceous	0 m-1.5m
Weathered rock/debris	Unconsolidated, saturated with water	1.5 m-4/6 m
Weathered quartzite interbanded with metabasic	Hard and fresh bed rock	6m-20/30m
Hard and fresh quartzite interbanded with metabasic rocks	Hard and fresh rock	30m-35m

Source: Formulation of Risk Informed GIS based Master Plan for Shillong Planning Area, Meghalaya
https://megurban.gov.in/notifications/RiskInformedMasterPlans/Finalised%20Report%20-%20Shillong.pdf

Figure 13: Geological and Tectonic Map of Meghalaya

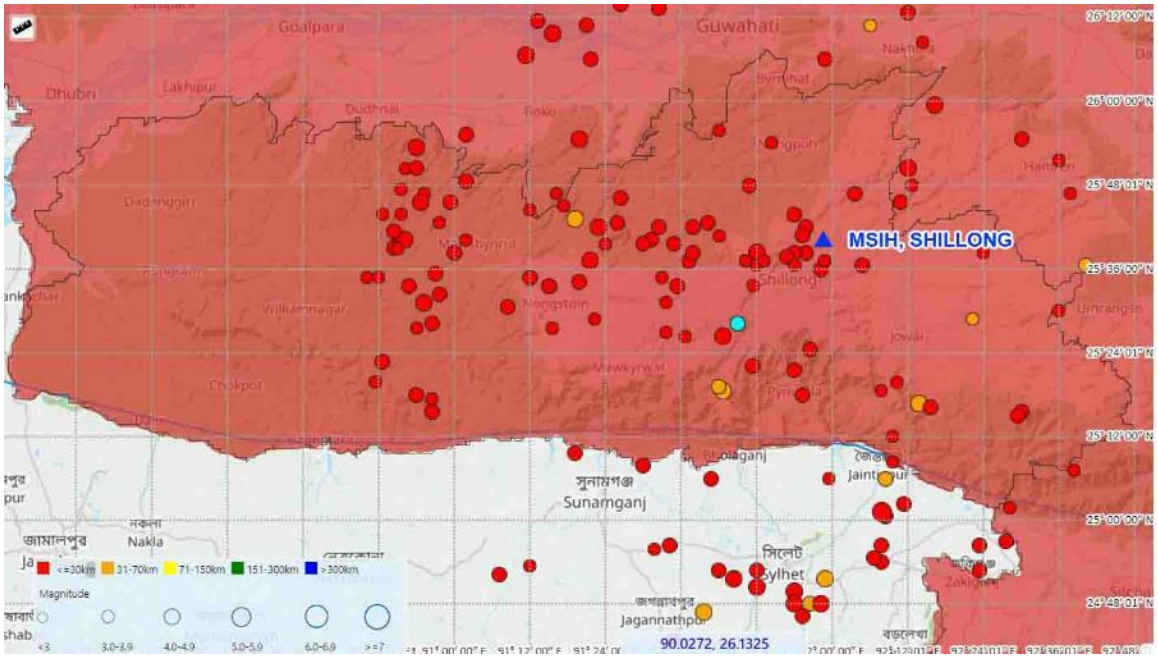


Source: Directorate of Mineral Resource, Department of Mining & Geology, Government of Meghalaya. (https://megdmg.gov.in/features.html).

49. All districts, including East Khasi Hills in the state of Meghalaya lie in Zone V. According to Global Seismic Hazard Assessment Program (GSHAP) data, the state of Meghalaya falls in a region of high to very high seismic hazard. The seismic map of Meghalaya is depicted in the **Figure 14.**

50. Shillong city is prone to various hazards because of its geo-ecological fragility, the eastern Himalayan landscape, its trans-boundary river basins, and its inherent socio-economic instabilities. The city is vulnerable to both natural hazards such as earthquakes, landslides, heavy rainfall, floods, extreme wind, and thunderstorms, and to rapid growth of urbanisation and improper and uncontrolled construction. **Table 8** shows the history of disasters in Shillong City. It is clear from this table that no earthquake has occurred after 1951, and other hazards (flash floods, landslides, extreme winds/thunderstorms, and incessant rains) have not occurred since 2013.

Figure 14: Seismic Map of Meghalaya



Source: National Center of Seismology, Ministry of Earth Science, GOI.
https://riseq.seismo.gov.in/riseq/nearby_seismicity/index/MjdSSklmMmwxckV6TVVkcXFlWk51Zz09/Reviewed

Table 8: History of Disasters in Shillong City

Type of Hazards	Year of Occurrence	Frequency of Occurrence	Impact on			
			Population	Life	Livelihood	Livestock
Earthquake	1897, 1897, 1923, 1930, 1932, 1945, 1950, 1951	8	□	□	□	□
Extreme winds/ Thunderstorms	2000, 2001, 2002, 2003, 2004, 2005, 2006, 2008, 2009, 2010, 2011, 2012, 2013	13	□	No data available	□	□
Flash Floods	1999, 2001, 2002, 2003, 2004, 2005, 2006, 2008, 2009, 2010, 2011, 2012, 2013	13	□	□	□	□
Landslides	1999, 2001, 2002, 2003, 2004, 2005,2006, 2008, 2009, 2010, 2011, 2012, 2013	13	□	□	□	□
Incessant Rainfall	1999, 2001, 2002, 2003, 2004, 2005, 2006, 2008, 2009, 2010, 2011, 2012, 2013	13	□	□	□	□

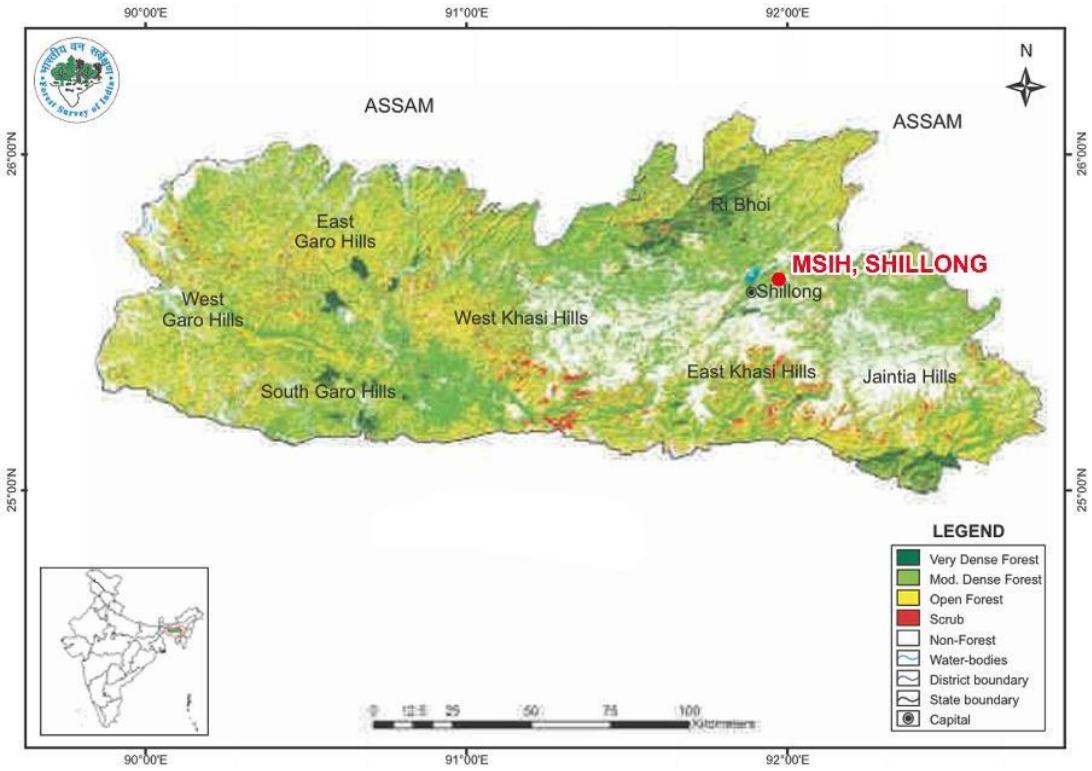
Source: Disaster Resilience Action Plan, Shillong, IRADe, 2021

B. Ecological Resources

Forests

51. As per the Forest & Environment Department, Government of Meghalaya, there are four protected forests (Upper Shillong P.F. (7.66 acres), Short Round P.F. (1.13 acres), Laitkor P.F. (3.25 acres), Green Block No. 2 (0.21 acres)) and three reserved forests (Riatkhwan R.F., Shyrwat R.F and Riat Laban R.F)) in the East Khasi Hills. The aerial distance of the project site with the Nongkhyllem WLS (Ri-Bhoi District) is 31 km (approximately) and the project is outside the corridor of impact of eco-sensitive zone of the WLS. There are no National Park and Wildlife Sanctuaries within the district. None of the protected and reserved forests fall under the project area. Forest cover map is shown in **Figure 15**. The district wise forest cover of Meghalaya is given in **Table 9.**

Figure 15: Forest Cover Map of Meghalaya



Source: Forest Survey of India. https://fsi.nic.in/isfr19/vol2/isfr-2019-vol-ii-meghalaya.pdf

Table 9: District-wise Forest Cover of Meghalaya
(in sq. km)

District	Geographical Area (GA)	2019 Assessment				% of GA	Change wrt 2017 assessment	Scrub
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total			
East Garo Hills	2,603	62.73	1,085.89	1,139.34	2,287.96	87.90	21.96	60.73
East Khasi Hills	**2,748**	**19.39**	**969.24**	**723.56**	**1,712.19**	**62.31**	**-38.81**	**109.73**
Jaintia Hills	3,819	103.31	1,448.69	985.89	2,537.89	66.45	34.89	104.59
Ribhoi	2,448	127.36	1,097.30	912.68	2,137.34	87.31	-5.66	51.16
South Garo Hill	1,887	65.39	990.45	646.36	1,702.20	90.21	14.20	17.68
West Garo Hills	3,677	0.00	1,260.41	1,599.81	2,860.22	77.79	23.22	70.64
West Khasi Hills	5,247	110.80	2,415.31	1,354.88	3,880.99	73.97	-77.01	185.30
Grand Total	**22,429**	**488.98**	**9,267.29**	**7,362.52**	**17,118.79**	**76.32**	**-27.21**	**599.83**

sq. km = square kilometer
Source: Forest Survey of India. https://fsi.nic.in/isfr19/vol2/isfr-2019-vol-ii-meghalaya.pdf

Bamboo Forest

52. Meghalaya is richly endowed with bamboo forests. Its abundance and multiple uses have led bamboo to play a pivotal role in the socio-economic and cultural life of the tribal people of the state. It finds varied uses like construction material, in making of diverse implements for agriculture, fishing and cattle rearing and the simple household items like utensils small furniture etc. The livelihood of a significant population in the state is dependent on the handicrafts made of bamboo. Bamboo forests in the state have diverse species base including clump forming and non-clump forming types. It has been reported that 36 species of bamboo from 14 genera are found in Meghalaya (Biswas, 1988).

Flora and Fauna

Flora

53. Trees such as *Terminalia arjuna*, *Terminalia bellerica*, *Terminalia myriocarps*, *Alstoniascholaris*, *Ficusglomerata*, *Gmelinaarborea*, *Bauhinia acuminata*, *Ailanthus grandis*, *Duabanga grandiflora* are very frequent in the project site area. The dominant shrubs of this area are *Eupatorium odonatum*, *Zizyphusmuritinum* and *Clerodendroninfortunatum*, *Saccharumspontaneum*, *Thysanolaena maxima* are abundant in exposed places. There are quite a good number of herbs in exposed areas. The dominant forms are *Sidacordifolia*, *Sidaacuta, Urenalobata*, *Amaranthusviridis, Ageratum conyzoides*and *Bidenspillosa*. Climbers are abundant. The most predominant forms are *Mikeniascandense* and *Combretumroxburghii*. Wild *Musa sapiantum* occurs in the lower elevation. However, no endemic or endangered plant species were found in the project site area according to the reconnaissance/ initial survey.

Fauna

54. The common avi fauna found on the East Khasi hills district are Golden-throated Barbet *Megalaimafranklinii*, Blue-throated Barbet *M. asiatica*, Black winged Cuckoo-shrike *Coracinamelaschistos*, Rosy Minivet *Pericrocotusroseus*, Short-billed Minivet *P. brevirostris*,

Striated Bulbul *Pycnonotusstriatus*, Flavescent Bulbul *P. flavescens*, Crested Finch bill *Spizixoscanifrons*, Mountain Bulbul *Hypsipetesmaclellandii*, Orange-bellied Leaf bird *Chloropsishardwickii*, Bluewinged Minla *Minlacyanouroptera*, Rufous-backed Sibia *Heterophasiaannectens*, Small Niltava *Niltavamacgrigoriae*, Black-spotted Yellow Tit *Parusspilonotus*, Maroon Oriole *Oriolustraillii* and Grey Treepie *Dendrocittaformosae.* None of the bird species are considered as "Endangered or Rare" as per schedule of IWPA, 1972 and its amendment version.

55. ***Other key fauna***: No particularly significant species occurs, except for the occasional arrival of Flying foxes *Pteropusgiganteus*. Bamboo rats *Cannomysbadius* have been also reported.

List of Protected Areas and Distance from Project Site

56. The list of protected areas in Meghalaya is given in **Table 10.** None of the protected areas partially or fully fall in the project site delineated area. The nearest wildlife sanctuary (Nongkhyllem Wildlife Sanctuary) is 31 km from the project site location. Riat Khwan - Umiam Lake Key Biodiversity Area (KBA) is located at about 6 km from MSIH site.

Table 10: Protected Areas in Meghalaya

Protected Area	Area (m^2)	District	Established Year	Distance from MSIH Location (km)
Siju Wildlife Sanctuary	5.81	South Garo Hills	1979	129
Nongkhyllem Wildlife Sanctuary	29	Ri-Bhoi District	1981	31
Baghmara Pitcher Plant Sancturay	0.02	South Garo Hills	1984	136
Balpakram National Park	220	South Garo Hills	1985	105
Nokrek Ridge National Park	47.78	East Garo Hills	1986	140
Nokrek Biosphere Reserve	820	East, West and South Garo Hills	1988	130
Narpuh Wildlife Sanctuary	59.90	East Jaintia Hills	2014	70

Source: Meghalaya Biodiversity Board. https://megbiodiversity.nic.in/protected-areas

C. Economic Resources

Industries

57. Meghalaya has very few large-scale industrial units. The economy of East Khasi Hills district is based on agro products originating from agriculture and horticulture and a large section of the people are dependent on these. Other than agriculture, the economy is also dependent on small scale industries like handicrafts and handloom items. As shown in **Table 11** for the East Khasi Hills district has micro, small, and medium enterprises focusing on agro-products, repairing and service based, wood and paper etc. Besides this, the tourism industry in Shillong contributes a huge share of the economy of the city and the state. Secondary sectors like arts and crafts (cane and bamboo products) which have been exported in and outside the country as well. The Agro – Horticulture Industry in Shillong includes Alcohol from Tapioca, Medicinal Plant (Taxus

Baccata, Orchids & Floricultures), Spice Oleoresins (Ginger, Turmeric, Tezpata, Chilies). Shillong is also rich in mineral resource and therefore mineral based industry are slowly flourishing in the state. The mineral base industry in Shillong includes clay-based industries, limestone-based industry and coal-based industries. Apart from the above-mentioned industries, some of the other industries in Shillong include the leather, IT, and power generation industries.[7]

Table 11: Details of Existing Micro and Small Enterprises and Artisan Units in East Khasi Hills District

NIC Code No.	Type of Industry	Number of Units	Investment (₹ million)	Employment
20	Agro based	33	6.633	55
26	Ready-made garments and embroidery	15	2.49	52
27	Wood/wooden based furniture	11	4.402	67
28	Paper and paper products	3	2.664	15
29	Leather based	7	1.793	20
31	Chemical/Chemical based	1	0.035	3
32	Mineral based	11	27.448	86
33	Metal based (Steel Fab.)	13	2.91	41
97	Repairing & servicing	23	30.442	153
01	Others	13	10.677	59

Source: Brief Industrial Profile of East Khasi Hills District, MSME, Government of India

58. A study of the land use (**Table 12**) shows that majority of the East Khasi Hills district is under forest cover followed by barren lands with scrub. The land under agricultural use is 10.21%. The project site land use is institutional, and it is well within municipal council limits of New Shillong township. Due to the high speed of urban expansion of Shillong town owing to administrative and educational setup increase in built up area is noticed. A research paper[8] on the land use reflects that the annual urban expansion intensity index is to the tune of 1 km2.

Table 12: Land Use Pattern in East Khasi Hills District, FY2016

Sl. No.	Land Use/Land Cover	Area (Ha)	Area (%)
1.	Agriculture	28,620	10.21
2.	Barren lands with few open scrub	43,816	15.63
3.	Forest and others vegetation	178,949	63.81
4.	Thin/Degraded Forest	14,563	5.19
5.	Miscellaneous	14,474	5.16
Total		**280,422**	**100.00**

Source: https://www.nesdr.gov.in/dataset/east-khasi-hills-land-use-land-cover-map-2015-2016/resource/1947f5bc-4ab0-49c4-9577.

[7] https://www.shillongonline.in/city-guide/business-and-economy-in-shillong

[8] Dynamics Of Land Use Land Cover for Sustainability: A Case of Shillong, Meghalaya, India. International Journal of Scientific & Technology Research, Volume 2, Issue 3, March 2013. ISSN 2277-8616.

Agricultural Development

59. Agriculture is the main means of livelihood of the people in the district and about 80 % of the population is dependent on agriculture. The principal crops grown in the district are rice, maize, millets, oilseeds and pulses. Horticulture products include oranges, pineapple, pears, peaches, plums, sohiong, sophi, betel nut and many local fruits. Vegetables like potato, sweet potato, ginger, garlic etc. are also grown. Meghalaya has a strong floriculture sector and is one of the leading states in the Northeast in terms of production and supply of cut flowers to mainland consumer markets. About 14% (3,108 square kilometers) of Meghalaya is covered by bamboo forests, and the state is one of the leading bamboo producers in the country. However, Agricultural operations have limitations in Meghalaya due to its topography, climatic situation and socio-economic conditions claiming only about 10% of the total land for cultivation. Villagers also pursue livestock and poultry as an alternative avocation for a subsidiary living.

D. Social and Cultural Resources

Population and Communities

60. The population of Shillong as per census 2001 was 132,867 while in 2011 population was 143,229 showing a growth rate of 7.79%. The population of Shillong Municipal Board forms 68% of the total urban population of the state (DDMA, Shillong, 2018). Nearby institutions/settlement to the MSIH site are National Institute of Fashion Technology (NIFT) at distance of 0.50 km, Countryside View (CSV), Mawkasiang, Mawdiangdiang, Shillong at 2 km, Indian Institute of Management at 1.4 km and tuberculosis hospital (not operational, built as COVID-19 center in 2021) at 0.30 km. The demographic details of East Khasi Hills district are given in **Table 13**.

Table 13: Demographic Details of East Khasi Hills District

Capital	**Shillong**
Area	2,748 sq. km.
Location	The district lies between 25°07” & 25°41” N Lat. and 91°21” & 92°09” E Long
Bounded by	Ribhoi district in the North, West Jaintia Hills on the East, Bangladesh on the South and West Khasi Hills and Southwest Khasi Hills on the West
Population	824,059
Households	160,832 (excluding institutional households)
Density	292 per sq. km.
Literacy Rate	Total Literacy* 84.70 % (Male: 85.26 % & Female 84.15 %) *Literacy rate is the percentage of literates to population aged 7 years and above
Principal Languages	Khasi, Jaintia, and Garo
Official Language	English
Total No. of Assembly Constituencies	17
Civil Sub-Division	2 (Sohra and Pynursla)

Capital	Shillong
Community and Rural Development Blocks	11

E = east, LAT = latitude, LON = longitude, N = north, sq. km. = square kilometer.
Source: Census of India Handbook 2011 for East Khasi Hills District.

Housing and Drinking water

61. About 46% of the houses in Shillong City are made of concrete, followed by wood and burnt bricks.

62. The main source of water supply for Greater Shillong is the River Umiew near Mawphlang. In 2016-2017, almost 77% of the households (HHs) had a water supply connection. The per capita water supply is low at 78 liters per capita per day (lpcd). The extent of non-revenue water is 58%. Water connections are not metered and only 12% of the water services cost is recovered. Efficiency in the collection of water supply related charges (in the municipal area) is 71.3%. The MSIH will have residential facilities such as hostels, accommodation for staff and water supply from the municipal sources.

Power

63. The average electricity consumption in the residential area is 300 units /house/day and in the commercial area is 450 units /shop/day. A total number of 378 solar streetlights are available under Meghalaya Energy Corporation Limited (MeECL). No smart metering has been introduced yet. The agencies responsible for the supply, management and distribution of electricity in the city are: (1) Northeastern Regional Electricity Board, Shillong; (2) Meghalaya State Electricity Board, Shillong; and (3) Northeastern Electric Power Corporation Limited (NEEPCO). The Power supply to the MSIH will be from the grid.

Irrigation

64. The district does not have any major or medium irrigation projects. Agriculture is dependent on rainfall.

Transportation

65. Total road length of Shillong is 356 km with a road density of 2.05 km/sq. km (Shillong City Development Plan). NMT (Non-Motorized Transportation) has not been stressed upon in the city Comprehensive Mobility Plan (CMP) due to undulating topography and operational constraints. The MSIH site is connected by the New Shillong Township Development Agency (NSTDA) constructed two lane road.

Storm Water Drainage

66. The drains run for 148.91 km across the city and drain into the Umkhrah and Umshyrpi rivers. The reported stormwater drainage network 2016–2017 coverage is less than 75% of the city. The MSIH site is undulating and has a swift drainage system.

Solid Waste Management

67. The municipal solid waste produced is 159 metric tons (MT) per day or 0.4 kg of waste per capita per day. The major solid waste generation sources are households (56%), markets (23%), hotels and restaurants (7%), construction waste (2%), and street sweeping (7%). In the SMB area, 46% of the waste generated is collected while outside the SMB area the figure is only 32%, and for the entire Greater Shillong Planning Area (GSPA) the percentage of garbage collected works out to about 41%. Only 43% of households have a facility of door-to-door collection or Community Bin facility. Presently garbage collected is disposed into the gorges of the trenching ground situated at Mawlai on the Shillong Guwahati Road (Shillong Municipal Board).

Sewerage

68. Almost 94% of the households in the city have individual and community toilet coverage. Under Swachh Bharat Mission, 40 individual toilets, 7 community toilets and 115 public toilets are being proposed. There is no sewage treatment plant; all the house sullage (kitchen and bathroom wastewater) drains either into the River Umshyrpi in the south or in the Um Khrah in the north.

Rail

69. Guwahati (103 km from Shillong) is the nearest railway station connecting the Northeast region with the rest of the country through a broad-gauge track network. There is a plan for extending the rail link from Guwahati to Byrnihat (20 km from Guwahati) within Meghalaya.

Road

70. The road length at the time of creation of Meghalaya in 1970 was only 2,786.68 km which has gone up to 10,440.011 km by 31 March 2023 (Meghalaya at a Glance, Directorate of Economics and Statistics, Government of Meghalaya), out of which 7,752.761 km is black topped and remaining 2,687.25 km is graveled. The road density has increased from 12.35 km per 100 km^2 to 46.54 km per 100 km^2.

Aviation

71. Umroi (35 km from Shillong) is the only airport in Meghalaya to have a landing facility for smaller aircraft and has flights connected with Kolkata, Aizawl and Silchar. Another small airport is planned near Tura. Borjhar, the most important airport in the North-Eastern Sector, has a facility for bigger jet aircraft (like Boeing and Airbus) and is 124 km from Shillong. There is also a helicopter service connecting Shillong to Guwahati and Tura[9] (as per information provided in the footnote).

Health facilities[10]

72. There are good health facilities in Shillong in general. As per the data published by the GoM in 'Meghalaya at a Glance (year 2023)', the state has 14 Public Hospitals, 15 Private

[9] Report on Meghalaya State Profile, Ministry of Micro, Small and Medium Enterprises, Government of India Shillong.
[10] Meghalaya briefly, Directorate of Economics and Statistics, Government of Meghalaya.

Hospitals, 13 Dispensaries, 31 Community Health Centers, 114 Primary Health Centers, 470 Sub-Centers and 2 Leprosy units.

Education facilities

73. Shillong town has facilities of all levels of schools and colleges and educational institutes. Shillong is also emerging as an educational hub for the entire North-eastern region. Important educational institutes like Indian Institute of Management, National Institute of Fashion Technology Shillong and Northeastern Indira Gandhi Regional Institute of Health and Medical Sciences, the English and Foreign Languages University, Shillong Campus, St. Edmund's College, St. Anthony's College, Shillong and several other Colleges and Technical Institutions have been established here. Northeastern Hill University, Shillong, School of Post Graduate Studies, Central Agricultural University, Umroi are some of the other renowned universities at Shillong. The current MSIH project will also contribute towards skills development and employability of local youth.

Archaeological Resources

74. There are no heritage sites notified by National Monument Authority of GoI, Archaeological Survey of India (ASI) or the State Archaeological Department near the project site. The distances of protected monuments and sites have been provided in **Table 14**. The nearest notified monument (Manipur Memorial) is 7.6 km from the MSIH. Similarly, no common property resources such as public wells, water tanks, playgrounds, common grassing grounds or pastures, market areas and community buildings will be affected by the proposed project site.

Table 14: List of Notified Monuments and Sites in Meghalaya

Name of Monument	Locality	Coordinates	District	ASI Circle	Aerial Distance(km) from MSIH Site
U-Mawthoh-dur	Bhoi Country		East Khasi Hills	Guwahati	31
Scott's Monument	Sohra (Cherrapunji)	25.272983 N, 91.734091 E	East Khasi Hills	Guwahati	44
Manipur Memorial	Shillong	25.569926 N, 91.884543 E	East Khasi Hills	Guwahati	7.6
Megalithic bridge	Amlarem	25.215368 N, 92.183217 E	West Jaintia Hills	Guwahati	51.56 Km
Megalithic bridge known as Thlumuwi	Maput	25.347000 N, 92.144583 E	West Jaintia Hills	Guwahati	37
U-Mawthoh-dur-briew	Nartiang	25.573889 N, 92.216101 E	West Jaintia Hills	Guwahati	31
Megalithic bridge	Syndai		West Jaintia Hills	Guwahati	52
Ancient Tank	Syndai	25.178472 N, 92.134111 E	West Jaintia Hills	Guwahati	52.50

Source: Published by the ASI.

V. ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

A. Environmental Impacts

75. Development of infrastructure projects will cause some impacts on the environment. This IEE examines the potential impacts anticipated during the construction and operation of the MSIH at Shillong, including:

(i) **Location impacts:** Impacts associated with site selection including effect on the environment and resettlement or livelihood related impacts on communities.
(ii) **Design impacts and Pre-Construction Impacts:** Impacts arising from project design, including the technology used, scale of operations, discharge standards, topographic survey, geotechnical survey, etc.
(iii) **Construction impacts:** Impacts resulting from construction activities including site clearance, earthworks, civil works, etc.; and
(iv) **Operation and Maintenance impacts:** Impacts associated with the operation and maintenance of the infrastructure built in the project site.

76. ADB's REA checklist for buildings was used for screening the project site activities and ascertaining mitigation measures. The asbestos screening checklist was also completed as part of the IEE preparation.

B. Location Impacts

77. The proposed MSIH will be constructed on unencumbered land owned by the Government of Meghalaya. The site is in possession of Meghalaya State Skills Development Society, Department of Labor (DoL) and is vacant and transferred by the Department of Urban Affairs, Government of Meghalaya in November 2023. There are no significant ecological resources in the surroundings of MSIH. There is no heritage site notified by ASI, NMA, or state archaeological department within the plot boundary MSIH at Shillong or within the regulated distance of 300 m. No significant impacts can arise due to project site location as MSIH components will not impinge upon any area of ecological, archaeological, or historical importance. The MSIH site will also not require a change in land use as it is vacant land within the notified New Shillong Township which is being developed by the NSTDA, GoM.

78. The MSIH site is within seismic zone V and even a small magnitude earthquake may damage MSIH building at Shillong. The MSIH building design shall follow relevant codes ((IS: 1893 (Part I)-2002: Indian Standard Criteria for Earthquake Resistance Design of Structures (5th Revision) and IS:4326-1993: Indian Standard Code of Practice for Earthquake Resistance Design and Construction of Buildings (2nd Revision)) for the earthquake resilient structure design and construction. Necessary slope protection measures (such as maintenance of retaining wall, slope turfing, etc.) will be taken to avoid failure of slopes and damage to MSIH structures.

C. Impacts during Design and Pre-Construction Phase

79. **Compliance with Permits/Clearances requirements.** The following will be done to ensure compliance with regulations.

a) Obtain all necessary consents, permits, clearance, NOCs, etc. prior to start of civil works. These permissions and NOCs include but not limited to labor license, labor insurance (under the Workmen Compensation Act, 1923) and permission for

ground water extraction (if ground water extraction planned).

b) Acknowledge in writing and provide report on compliance with all obtained consents (CTE for 30 KLD STP planned), permits, clearance, NOCs, etc.

c) Include in preliminary design drawings and documents all conditions and provisions if necessary.

d) Obtain necessary approval from the Town and Country Planning Department (NSTDA) as well building design from the fire department and /or civic authorities.

80. **Impacts on landscape.** The proposed MSIH will not have any adverse impacts on aesthetics of sites as these involve construction of buildings on vacant land. The proposed land is a vacant plot surrounded by vacant land parcels and land use is mostly institutional. Hence, no mitigation measures are warranted.

81. **Slope stabilization measures.** The MSIH site is on an undulating terrain in a hilly area. During the building design, necessary slope protection measures have been adopted as part of building design.

82. **Site drainage.** The design of proposed MSIH will allow efficient drainage (storm water drainage system designed) and maintain natural drainage pattern. The storm water management is part of the MSIH design. The drainage will not be an issue as the site is on undulating terrain. The roof top rainwater will be diverted through pipe to underground rainwater harvesting pit for ground recharge and re-use. Open area and parking lot water will not be mixed with the roof top water.

83. **Impact on trees.** As noted above, the proposed site is owned by GoM. There are bamboo grooves and a few pine (12 in numbers) shrubs at the boundary of a few sites. No impact on these trees is expected. As per DPR, there is no tree cutting requirement. Based on the environmental screening of the site, there are no significant adverse environmental impacts during the design and pre-construction phases.

84. **Wastewater management.** For domestic wastewater generation, a STP of 30 KLD capacity is planned. Necessary consent to establish (CTE) will be obtained from the Meghalaya State Pollution Control Board.

85. **Energy conservation measures.** Following measures have been included in the design to enhance energy efficiency:

a) Usage of recyclable materials like wood substitutes.

b) Installation of Bureau of Energy Efficiency (BEE) certified equipment

c) Usage of energy efficient lighting fixtures (LED and solar).

d) Provision of Solar power generation for water heating.

D. Impacts during Construction Phase

86. All construction activities at the MSIH site will be approved by the PMU. The construction stage impacts due to the proposed project components are generic to the construction activities. The EMP emphasizes the construction impacts and necessary mitigation measures to be strictly followed by the contractor and supervised by the DSC and PIU-2. The key potential impacts are covered in the following paragraphs.

87. **Health and safety of workers in construction camps.** The contractor is likely to engage local labor for various construction activities. However, in case migrant labor must be engaged, the contractor will establish properly designed labor camps (well ventilated, structurally stable, permanent beds, electric lighting, cleaner cooking fuel etc.) with all basic amenities such as potable drinking water supply and gender-segregated sanitation facilities including safe disposal of wastewater through septic tanks and soak pits. The above social infrastructure facilities at camp will be created to have no pressure on social infrastructure of locals. Although there is no habitation within the 500 m aerial distanc, the workers will also be sensitized for not having conflicts with the locals. There should be a common kitchen and fuel for cooking should be LPG. The fuel wood will not be used for cooking. The water supply shall be continuous/on demand and quality for potability will be checked regularly. Dustbins will be placed in adequate numbers.

88. **Dust and siltation from earthworks and stockpiles.** Improper stockpiling of construction materials and excavated soil in and around the MSIH site could obstruct local drainage, and cause siltation of nearby water body. Stockpiles will be covered to protect from dust and erosion. Materials will be stored away from natural drains. The site for stockpiling will be identified during construction by the DSC and PIU in consultation with local government authorities.

89. **Soil Erosion.** Necessary slope protection measures (such as retaining wall maintenance, slope turfing, etc.) at the MSIH building site should be provided as per drawings. Adequate measures will be taken up at this site so that there is no soil erosion causing risks in the vicinity. The slopes in excavated areas will also be protected. The cost of slope protection measures will be part of engineering and construction cost.

90. **Quarry and Borrow pits operations.** Since the civil works are of a small size, all construction material will be procured from the market. There will not be any need for direct procurement of stones and building material from quarries. But the sources will be confirmed and only suppliers who have sources compliant with environmental regulations of India and GoM will be used for procurement of construction materials.

91. **Increase in noise levels.** Noise levels in the immediate proximity of sub- project site are expected to increase during construction. However, these will be imperceptible as civil works will be confined to a small area. The construction duration will also be brief. Construction materials will be confined to daytime, depending on the extent of construction activity. The traffic increase due to construction activity shall not exceed 10 trucks and tempos and 10-15 passenger cars. The increase in noise levels on account of increased vehicular traffic and construction activity is expected to be marginal and of no consequence for inconvenience. This increase is likely to be felt up to 25-40 m only. This noise will be intermittent in nature and will last only during the construction phase. Owing to educational institutions in the surroundings and TB Hospital, proper barricading (sound and dust control barriers) of the project boundary shall be done. The increase in noise levels will not be felt at TB hospital (aerial distance 300 m), NIFT (aerial distance 500m), IIM Shillong (aerial distance 1.40 km) and Indian Institute of Hotel Management (aerial distance 2.20 km). Further, TB hospital is not functioning at present, it was operated as a COVID-19 Centre and it is off the connecting road (at 300 m) also so traffic movement for the project site will not have noise impacts. The RMC plant is not anticipated at the site. It may be mentioned that these intermittent construction noise levels are not anticipated to exceed the stipulated limits of residential areas. Nevertheless, the MSIH site will be properly barricaded with prefabricated MS sheets (acoustic sheets, if required) to avoid noise impact in the surroundings. But necessary monitoring of noise levels will be taken up as part of the environmental monitoring program.

92. **Impacts on biodiversity during construction phase.** No major impacts are expected on the biodiversity during the construction phase as the site of project site is in an open area and there are no significant trees and vegetation at the site. There are 12 recently planted pine trees. These have been saved while finalizing the layout. There are no endangered or rare species of flora and fauna at the MSIH site.

93. The immediate surrounding land comprises of mostly vacant plots earmarked for development by the NSTDA and institutional areas, and there are no wildlife/bird sanctuaries/national parks/biospheres located within 31 km from the proposed sub project. The entire area has been earmarked for the development of New Shillong Township and any disturbance to any wildlife for roosting, foraging, and nesting is not envisaged.

94. **Increased traffic.** At the time of construction, there will be some temporary inconvenience due to transportation of building materials and clearance of debris by about 10 trucks a day. The site is accessible through the urban road of New Shillong Township. However, since the scale of civil works is small, inconvenience to the Highway traffic or local community is not anticipated, it will be limited only to the construction phase. Before site activities and mobilization on ground, the contractor will prepare a traffic circulation plan for safe passage of local traffic during construction stage. This will include alternative access routes, traffic regulations, signages, etc. The contractor will get these plans approved by the TSA (SSCM), and local transport authority. The contractor will disseminate the traffic circulation plan around the site.

95. **Impact on cultural properties and Chance Find.** The proposed MSIH construction at Shillong will not have any impact on any religious structure or any other structure of historical and/or cultural significance. In case any 'Chance Find' is identified during excavation or construction works it will be handled as per advice of State Archaeological department and pending instructions from them the works/activity will be suspended. The contractor will prepare a 'Chance Find' protocol and submit it for approval of PIU-2 and DSC.

96. **Ground Water Pollution**. Ground water will not be extracted and used for construction purposes. The contractor will arrange for water from the market. It will be supplied by water tankers. The problem of ground water contamination is also not anticipated during the construction phase since there will be proper disposal of the wastewater from the construction site. At the site sanitation facilities will be provided with septic tanks and soak pits of adequate size. Provide proper wastes and chemicals storage with adequate bund to prevent spills or leaks onto soil or the ground. Fuel storage and vehicle cleaning area at the project site will be stationed such that water discharge does not drain into the local drain. The water pollution parameters will be monitored as per the monitoring program.

97. **Dust and Emissions.** Generation of dust is anticipated during transportation, excavation, and construction activities. Some dust and gaseous emissions will also be generated during the construction period from machines such as mixers, and vehicles engaged in transportation of construction materials. Pollutants of primary concern at this stage include respirable and suspended Particulate Matter (RSPM) and gaseous emissions (NO_X, SO_2, CO, etc.). However, transportation of construction materials will be confined to a few trips (about 10 round trips) per day depending upon the extent of construction activity. Therefore, impact at this stage will be temporary and restricted to the close vicinity of the construction sites only.

98. All vehicles and construction equipment operating for the contractor(s) and the consultant will obtain and maintain "Pollution under Control" (PUC) certificates. To control dust emissions, vehicles deployed for borrowing materials, sand, and aggregate haulage, will be covered with

tarpaulins to prevent spillage. Regular sprinkling of water during excavations, loading, unloading, vehicular movement, and raw material transport will prevent the spread of dust and other contaminants. The DG sets with adequate chimney height, as per CPCB stipulations, will be installed. Periodic air quality monitoring will be conducted to ensure that emissions to comply with the vehicle emission standards specified by the Government of India and ambient air quality standards specified by the Central Pollution Control Board. The contractor will submit emission monitoring results as a compliance with environmental monitoring program.

99. **Waste Generation and Disposal.** Some waste will be generated due to excavated earth material and waste from construction. Debris and excavated earth material can be reused (as fill for the retaining wall to be constructed on roadside and towards local seasonal drain side, subject to the approval of the PIU-2 Engineer in consultation with DSC during the construction. Remaining construction waste generated during construction and demolition will be disposed of as per law (Construction and Demolition Waste Management Rules 2016) to the satisfaction of the Engineer (DSC). No construction waste disposal will be done into any streams, drain or water body. Extraneous construction waste will be transported to the pre-identified disposal sites (preferably sites approved by the Meghalaya Pollution Control Board) for safe disposal. The clean-up and restoration operations will be implemented by the contractor prior to demobilization. The contractor will clear all temporary structures and dispose of all garbage from the construction site. Dumping of waste in waterbodies will be prohibited. Safe disposal of the construction waste will be ensured in the pre-identified disposal locations. In no case, any construction waste will be disposed of around the project site and especially in vacant land/drains in the vicinity. Regulatory compliances as per 'Construction and Demolition Waste Management Rules, 2016.

100. **Hazardous material handling/works.** All the workers and staff personnel will be provided with personal protective equipment commensurate with the risks associated with the tasks. Further, the following shall be ensured:

- Workers employed in mixing cement, lime mortars, concrete, etc., will be provided with protective footwear and protective goggles.
- Workers who are engaged in welding works will be provided with welder's protective eye-shields.
- Workers engaged in stone breaking activities will be provided with protective goggles and clothing.
- The use of any toxic chemical will be strictly in accordance with the manufacturer's instructions. The DSC, TSA and PMU will be given at least 6 working days' notice of the proposed use of any chemical. A register of all toxic chemicals delivered to the site will be kept and maintained up to date by the Contractor.

101. **Handling of Asbestos Containing Materials (if detected in Excavation) and/or Asbestos containing Materials.** The project will not use asbestos containing materials. If the asbestos containing materials are encountered during the excavations or in any construction material, accidentally, it will be handled as per the national /international guidelines including the good practice guidance provided in ADB published document titled as 'Good Practice Guidance for Management and Control of Asbestos' to minimize any health hazards to the construction team. The standard operating procedure for safe handling will be prepared by the contractor after the mobilization to site.

102. **Workers and Community Health and Safety.** Adequate safety measures for workers during handling of materials at the project site will be taken up. The contractor must comply with all regulations for the safety of workers. Precautions will be taken to prevent danger to the workers from fire, accidental injury, etc. First aid treatment will be made available for all injuries likely to

be sustained during work. The Contractor will conform to all anti-malaria instructions given by the DSC and PIU-2.

103. **Emergency Plan for Accident and Natural Hazards.** The contractor, with the help of PIU and PMC, will prepare an onsite emergency plan for possible accidental scenarios due to construction activities and material handling and transport. For any natural hazards emergency management plan prepared by District Disaster Management Authority (DDMA)as part of Disaster Management Plan will be followed. An off-site emergency management plan will also be included for any major fire, accidental land slide during construction of retaining wall (as site is undulating) and accident of transport vehicles.

107. **Post-construction clearing.** Contractor at the project site will prepare site restoration plan for approval by the Engineer (DSC). The camp site restoration plan will be implemented by the contractor before demobilization. On completion of the works, all temporary structures will be cleared away, all rubbish properly disposed of (in an environmentally responsible manner and as per regulatory requirements) excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the Contractor's expense. A final inspection shall be conducted by the Engineer and certify the satisfactory implementation of the restoration plan.

E. Environmental Impacts during Operation Phase

104. Vocational training and counseling will be undertaken at the proposed MSIH, so emissions and liquid effluents are not likely due to training courses/activities and adverse environmental impacts during operation phase are anticipated to be minimal as adequate sanitation facilities have been in MSIH building. The MSIH design also provides adequate parking and safe disposal for wastewater and solid waste. The solid waste generated at MSIH during operation phase will be segregated. Its disposal will be integrated with the New Shillong Township waste disposal system.[11] STP was proposed for wastewater disposal, so regular maintenance and cleaning of the same needs to be done as part of MSIH operation. The STP treatment plant process and parameters will be finalized by the contractor during detailed design as MSIH project is to be developed based on Design and Built modality (if needed IEE report will be updated after finalization of STP design). The necessary consent to operate (CTO) for STP will be obtained from the Meghalaya State Pollution Control Board before the start of operations of STP. The roof top solar power system will be used for water heating (about 4,000 liters per day) and power generation (3 kVA). There may be waste due to the operation and maintenance of solar PV cells. This is due to the breaking of panels, support system, etc. The supplier of the PV cell will be responsible for the collection of waste for recycling and reuse. During the operations of solar system, the waste usable e.g., support system will be utilized, and broken glass pieces will be sold to the vendors. But this all will be handled by the PV Cell supplier.

105. Given the small size of the MSIH, there will not be any significant vehicular traffic increase as hostel and staff accommodation is planned within MSIH. Also, most local students are not using hostel facilities and local staff will be using public transport. Also, since counseling, skill development training courses and placement assistance to the trained and skilled youth will be taken up at the proposed MSIH; only minimal impacts are anticipated during operation as adequate sanitation facilities have been planned in the MSIH. A diesel generator set will be required, but only during power cuts. The fuel storage for DG sets will not be on site, it shall be

[11] The local civic authority ensures that the waste is collected during the morning hours every day. It is the duty of the public institutions to deliver segregated municipal solid waste to the collection vehicle by the Local Authority or its authorized agents.

purchased on a needless basis. The generator will be of the silent type and will comply with the emission levels stipulated by the Central Pollution Control Board. Necessary measures for effective ventilation in the classrooms/halls/workshops will be provided. In the operation phase, there are chances of air emissions from the equipment and machinery to be used in the laboratories/workshops of MSIH. Necessary measures for effective ventilation in the laboratories shall be provided and students shall be provided masks during practical sessions if any vapors or emissions are anticipated from the workshop machinery and equipment. In case there are increased noise levels due to operation of machinery and equipment in the workshops, then mitigation measures such as use of ear plugs shall be enforced by the MSIH administration.

106. The MSIH building and slopes (as the site is undulating so internal roads will be sloping) will need periodic maintenance during operation phase to ensure long term sustainability. All the components of MSIH have been designed to have earthquake resistance following seismic coefficient of Zone V.

107. **Structural safety, fire safety, natural disaster and emergency response.** All permits and clearance shall be obtained prior to building occupancy. The MSIH building will be equipped with a fire-fighting system with portable fire extinguishers and smoke detectors with alarm systems. Firefighting facilities shall be regularly maintained, and regular fire drills will be carried out. The staircase will have adequate width to allow for people to exit the MSIH building during any fire-related or other eventuality. At one time, a maximum of 250 people is anticipated. During natural calamities, the operations will be stopped. The trainees and staff will be safely evacuated as per the district level Disaster Management plan of Meghalaya (prepared by DDMA). Necessary first aid facilities will be provided at the MSIH building. The Managers of MSIH building will prepare on site emergency plans for accidents and mishaps during the operation phase. The off-site emergency plan shall be prepared for scenarios like fire, accident of transport vehicles and landslides in the vicinity. For natural calamities, the disaster management plan prepared by DDMA will be followed. To avoid slope failures and ensure long-term sustainability of MSIH building, regular maintenance will be taken as per the maintenance schedule prepared at the end of construction.

108.**Unhygienic conditions due to poor maintenance of sanitation facilities and irregular solid waste collection.** The MSSDS will maintain the toilets and regularly collect and dispose of waste to local disposal sites. STP will be maintained regularly. The necessary CTO for the STP will be obtained from the Meghalaya State Pollution Control Board before the start of operations of STP. The solid waste will be handled as per the provisions of 'The Solid Waste (Management) Rules, 2016. There shall be segregation of bio-degradable and inorganic waste at the site.

109. **Maintenance of rainwater harvesting structure.** The RWH shall be maintained and cleaned regularly for effective functioning for ground water recharge and re-use of collected rainwater

110. **Disposal of e-Wastes including Solar PV cells.** The e-waste generation will be from the operation and maintenance of computers and electronic gadgets in MSIH building operations. The disposal and handling will comply with e-Waste (Management) Rules, 2016. The MSSDS through MSIH building Manager will have agreements with the maintenance partners to take away discarded peripherals, spare parts, discarded old computers for reuse and recycle. The Solar PV cell supplier will collect any waste generated due to operation and maintenance for recycle/reuse/disposal as operations will be maintained by the supplier.

117. Vegetation clearing and landscaping. Since the MSIH will be located on vacant land without many trees (about 12 recently planted trees of pine) and shrubs, no adverse impacts on fauna and flora are anticipated due to operation. There are bamboo grooves also in the periphery. In case, if any felling is required at later stages, adequate permission for tree felling will be obtained and compensatory plantation will be undertaken as per the regulatory requirements. Further, to enhance the natural look of the MSIH building and premises, plantation of shrubs and landscaping will be taken up along the pathways and vacant space. There is no existence of any wildlife park, bird sanctuary, national park or any other area notified by the GoM or MoEFCC for ecological importance within an aerial distance of 31 km from MSIH. Riat Khwan - Umiam Lake Key Biodiversity Area (KBA) is located at about 6 km from MSIH site. The Umiam lake is located 6.3 km distance from the MSIH.

117. Health and safety in laboratory facilities. In case any machinery and equipment in the laboratories of MSIH is emitting air emissions then effective ventilation will be maintained and students will be provided masks during practical hours. At present no liquid effluents (except discarded lubricating oil generated from workshop equipment and machinery during periodic maintenance) are anticipated. The discarded lubricant oil due to maintenance of machinery and equipment will be sold to the authorized recyclers. In case increased noise levels are felt in the laboratories then ear plugs should be provided to the students.

F. Description of Planned Mitigation Measures

111. Screening of environmental impacts is based on the magnitude and duration of the impact. **Table 15** provides the potential environmental impacts and the mitigation measures including the institutional responsibilities for implementing the same. The project site is located sufficiently away from protected areas and the components proposed will not impact any environmentally sensitive or protected areas. All project site activities including construction and operation will take place within available land.

Table 15: Summary of Environmental Impacts and Planned Mitigation Measures

Sl. No.	Potential Environmental Issues	Duration or Extent	Magnitude	Proposed Mitigation Measures	Institutional Responsibilities
1	**Location Impacts**				
1.1	Earthquake and other natural disasters	Permanent	Major	• The design of MSIH building has been completed considering earthquake coefficient of zone V. The MSIH building design has followed relevant codes (IS: 1893 (Part I)-2002: Indian Standard Criteria for Earthquake Resistance Design of Structures (5th Revision) and IS:4326-1993: Indian Standard Code of Practice for Earthquake Resistance Design and Construction of Buildings (2nd Revision)). • Necessary slope protection measures (such as maintenance of retaining wall, slope turfing, etc.) will be taken to avoid failure of slopes and damage to MSIH structures. • The MSIH site is not on any bank of river and away from core, buffer, and ecologically sensitive zones of protected areas. The site is also not in any reserved, protected or revenue forest.	PMU, TSA (SSCM) PIU
2	**Design and Pre-construction Impacts**				
2.1	Consents, permits, clearances, no objection certificates (NOC), etc.	Permanent	Major	• Obtain all necessary consents, permits, clearance, NOCs, etc. prior to start of civil works. These permissions and NOCs include but not limited to labor license, labor insurance (under the Workmen Compensation Act, 1923) and permission for ground water extraction (if ground water extraction planned). • Acknowledge in writing and provide report on compliance on all obtained consents (CTE for 30 KLD STP planned), permits, clearance, NOCs, etc. • Include in preliminary design drawings and documents all conditions and provisions if necessary. • Obtain necessary approval from the Town and Country Planning Department (NSTDA) as well building design from the fire department and /or civic authorities.	PIU-2, Contractor, TSA (SSCM) and DSC
2.2	Layout of components to avoid impact on the aesthetics of the site.	Permanent	Major	The proposed MSIH will not have any adverse impacts on aesthetics of sites as these involve construction of buildings on vacant land. The proposed land is a vacant plot surrounded by vacant land parcels and land use is	Not Applicable

Sl. No.	Potential Environmental Issues	Duration or Extent	Magnitude	Proposed Mitigation Measures	Institutional Responsibilities
				mostly institutional. Hence, no mitigation measures are warranted.	
2.3	Slope stability related issues	Permanent	Major	The MSIH site is on an undulating terrain in a hilly area. During the building design, necessary slope protection measures have been adopted as part of building design.	PMU, PIU-2, DSC, PMC, Contractor, TSA (SSCM)
2.4	Increased storm water runoff from alterations of the site's natural drainage patterns due to landscaping, excavation works, construction of parking lots, and addition of paved surface.	Permanent	Moderate	• The design of proposed MSIH will allow efficient drainage (storm water drainage system designed) and maintain natural drainage pattern. The storm water management is part of the MSIH design. The drainage will not be an issue as the site is on undulating terrain. • The roof top rainwater will be diverted through pipe to underground rainwater harvesting pit for ground recharge and re-use. Open area and parking lot water will not be mixed with the roof top water.	PMU, PIU-2, DSC, PMC, and Contractor, TSA (SSCM)
2.5	Wastewater treatment	Permanent	Moderate	The STP will be constructed/installed as per relevant IS6908-1975. Package STP of 30 KLD capacity shall be installed as per feasibility.[12]	PMU, PIU-2, PMC, DSC, Contractor, TSA (SSCM)
2.6	Integration of energy efficiency and energy conservation programs in design MSIH	Permanent	Moderate	Following measures have been included in the design to enhance energy efficiency: • Usage of recyclable materials like wood substitutes. • Installation of Bureau of Energy Efficiency (BEE) certified equipment • Usage of energy efficient lighting fixtures (LED and solar). • Provision of Solar power generation for water heating.	PMU, PMC, DSC, Contractor and TSA (SSCM)
3	**Construction Impacts**				
3.1	Health and safety of workers in construction camps	Temporary	Moderate	The contractor is likely to engage local labor for various construction activities. However, in case migrant labor must be engaged, the contractor will establish properly designed labor camps (well ventilated, structurally stable, permanent beds, electric lighting, cleaner cooking fuel etc.) with all basic amenities such as potable drinking water supply and gender-segregated sanitation facilities including safe disposal of wastewater through septic tanks and soak pits. The above social infrastructure facilities at camp will be created to have no pressure on social	Contractor and PIU-2, TSA (SSCM)

[12] The STP will be design and built and the contractor during construction will present details of anticipated raw sewage parameters, treated water quality and process design details to DSC and PIU. On approval from DSC and PIU the STP will be installed.

Sl. No.	Potential Environmental Issues	Duration or Extent	Magnitude	Proposed Mitigation Measures	Institutional Responsibilities
				infrastructure of locals. Although there is no habitation within the 500 m aerial distance, the workers will also be sensitized for not having conflicts with the locals. There should be a common kitchen and fuel for cooking should be LPG. The fuel wood will not be used for cooking. The water supply shall be continuous/on demand and quality for potability will be checked regularly. Dustbins will be placed in adequate numbers.	
	Chance Finds	Permanent	Major	In case any 'Chance Find' is identified during excavation or construction works it will be handled as per advice of State Archaeological department and pending instructions from them the works/activity will be suspended. The contractor will prepare a 'Chance Find' protocol and submit it for approval of PIU-2 and DSC.	Contractor and PIU-2, TSA (SSCM)
3.2	Increased traffic	Temporary	Moderate	• Before site activities and mobilization on ground, the contractor will prepare a traffic circulation plan for safe passage of local traffic during construction stage. This will include alternative access routes, traffic regulations, Signages, etc. The contractor will get these plans approved by the PIU (DSC), and local transport authority. • The contractor will disseminate the traffic circulation plan around the sub- project site.	Contractor and PIU-2, TSA (SSCM)
3.3	Drinking water availability	Temporary	Major	A sufficient supply of potable water will be provided and maintained at the construction site. If the drinking water is obtained from an intermittent public water supply, then storage tanks will be provided. The water quality will meet drinking water standards specified in IS:10500-2012.	Contractor, DSC, and PIU-2, TSA (SSCM)
3.4	Waste generation and disposal	Permanent	Major	Some waste will be generated due to excavated earth material and waste from construction. Debris and excavated earth material can be reused (as fill for the retaining wall to be constructed on roadside and towards local seasonal drain side, subject to the approval of the PIU-2 Engineer in consultation with DSC during the construction. Remaining construction waste generated during construction and demolition will be disposed of as per law (Construction and Demolition Waste Management Rules 2016) to the satisfaction of the Engineer (DSC). No construction waste disposal will be done into any streams, drain or water body. Extraneous construction waste will be transported to the pre-identified disposal sites (preferably	Contractor, DSC and PIU-2, TSA (SSCM)

Sl. No.	Potential Environmental Issues	Duration or Extent	Magnitude	Proposed Mitigation Measures	Institutional Responsibilities
				sites approved by the Meghalaya Pollution Control Board) for safe disposal. The clean-up and restoration operations will be implemented by the contractor prior to demobilization. The contractor will clear all temporary structures and dispose of all garbage from the construction site. All construction zones used and affected by the project site will be left clean and tidy, at the contractors' expense as per the satisfaction the PIU Dumping of waste in waterbodies will be prohibited. Safe disposal of the construction waste will be ensured in the pre-identified disposal locations. In no case, any construction waste will be disposed of around the project site and especially in vacant land/drains in the vicinity. Regulatory compliances as per 'Construction and Demolition Waste Management Rules, 2016.	
3.5	Dust and siltation due to earthworks and stockpiled materials	Temporary	Moderate	Improper stockpiling of construction materials and excavated soil in and around the MSIH site could obstruct local drainage, and cause siltation of nearby water body. Stockpiles will be covered to protect from dust and erosion. Materials will be stored away from natural drains. The site for stockpiling will be identified during construction by the DSC and PIU in consultation with local government authorities.	Contractor, DSC and PIU-2, TSA (SSCM)
3.6	Soil Erosion, Quarry and Borrow Pits	Temporary	Major	Necessary slope protection measures (such as retaining wall maintenance, slope turfing, etc.) at the MSIH building site should be provided as per drawings. Adequate measures will be taken up at this site so that there is no soil erosion causing risks in the vicinity. The slopes in excavated areas will also be protected. The cost of slope protection measures will be part of engineering and construction cost. Procure construction materials (stones, aggregates, cement) from suppliers who are compliant with environmental regulations of India and GoM	Contractor, DSC, and PIU-2, TSA (SSCM)
3.7	Soil and Water Pollution due to wastewater and chemicals like fuel and lubricants, construction waste	Temporary	Moderate	At the site sanitation facilities will be provided with septic tanks and soak pits of adequate size. Provide proper waste and chemicals storage with adequate bund to prevent spills or leaks onto soil or the ground.	Contractor, DSC and PIU-2, TSA (SSCM)

Sl. No.	Potential Environmental Issues	Duration or Extent	Magnitude	Proposed Mitigation Measures	Institutional Responsibilities
				fuel storage and vehicle cleaning area at the project site will be stationed such that water discharge does not drain into the local drain. The water pollution parameters will be monitored as per the monitoring program.	
3.8	Dust and Emissions			All vehicles and construction equipment operating for the contractor(s) and the consultant will obtain and maintain "Pollution under Control" (PUC) certificates. To control dust emissions, vehicles deployed for borrowing materials, sand, and aggregate haulage, will be covered with tarpaulins to prevent spillage. Regular sprinkling of water during excavations, loading, unloading, vehicular movement, and raw material transport will prevent the spread of dust and other contaminants. The DG sets with adequate chimney height, as per CPCB stipulations, will be installed. Periodic air quality monitoring will be conducted to ensure that emissions to comply with the vehicle emission standards specified by the Government of India and ambient air quality standards specified by the Central Pollution Control Board. The contractor will submit emission monitoring results as a compliance with environmental monitoring program.	Contractor, DSC, and PIU-2, TSA (SSCM)
3.9	Noise Pollution	Temporary	Moderate	Noise limits for construction equipment used in this project will not exceed the CPCB specified limits for the residential areas. The MSIH site will be properly barricaded with prefabricated MS sheets (acoustic sheets, if required) to avoid noise impact in the surroundings.[13] monitoring of noise levels will be taken up as part of the environmental monitoring program.	Contractor, DSC and PIU-2, TSA (SSCM)
3.10	Hazardous material handling (including asbestos)/hazardous works	Temporary	Moderate	• All the workers and staff personnel will be provided with personal protective equipment commensurate with the risks associated with the tasks. Further, the following shall be ensured: • Workers employed in mixing cement, lime mortars, concrete, etc., will be provided with protective footwear and protective goggles.	Contractor, DSC and PIU-2, TSA (SSCM)

[13] Non-operating TB hospital building at 300 m distance and NIFT at 500m aerial distance and no house or habitations in the immediate surroundings.

Sl. No.	Potential Environmental Issues	Duration or Extent	Magnitude	Proposed Mitigation Measures	Institutional Responsibilities
				• Workers who are engaged in welding works will be provided with welder's protective eye-shields. • Workers engaged in stone breaking activities will be provided with protective goggles and clothing. • The use of any toxic chemical will be strictly in accordance with the manufacturer's instructions. The DSC, TSA and PMU will be given at least 6 working days' notice of the proposed use of any chemical. A register of all toxic chemicals delivered to the site will be kept and maintained up to date by the Contractor. • No asbestos containing material will be used in the construction. If any asbestos containing material is encountered accidently during the excavation, then it will be handled following national and international guidelines (including those specified in ADB published Good Practices document) to minimize health hazards to construction team at site. For this, safe operating procedures (SOPs) will be prepared by the contractor after mobilizing at site.	
3.11	Workers and community heath and safety	Temporary	Moderate	• Adequate safety measures for workers during handling of materials at the project site will be taken up. • The contractor must comply with all regulations for the safety of workers. Precautions will be taken to prevent danger to the workers from fire, accidental injury, etc. First aid treatment will be made available for all injuries likely to be sustained during work. • The Contractor will conform to all anti-malaria instructions given to him by the DSC and PIU-2.	Contractor, DSC, and PIU-2, TSA (SSCM)
3.12	Onsite emergency plan for probable accidents and mishaps and Disaster Management Plan for Natural Calamities	Temporary	Major in case of natural calamity and probable accidents or mishaps at construction site	• The onsite emergency plan will be prepared by the contractor in consultation with PIU-2, DSC, and PMC. The off-site emergency plan will also include situations like fire, transport vehicle accidents, landslides, etc. • For natural calamities, a disaster management plan prepared by the DDMA under the provisions of Disaster Management Act 2005 will be followed.	Contractor, TSA (SSCM)
3.13	Clearing of Construction of Camps and Restoration	Temporary	Major	• Contractor at the project site will prepare site restoration plan for approval by the Engineer (DSC). The camp site restoration plan will be implemented by the contractor before demobilization.	Contractor and PIU-2, TSA (SSCM)

Sl. No.	Potential Environmental Issues	Duration or Extent	Magnitude	Proposed Mitigation Measures	Institutional Responsibilities
				• On completion of the works, all temporary structures will be cleared away, all rubbish properly disposed of (in an environmentally responsible manner and as per regulatory requirements) excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the Contractor's expense. A final inspection shall be conducted by the Engineer and certify the satisfactory implementation of the restoration plan.	
4	**Operation and Maintenance impacts**				
4.1	Structural Safety, Fire Safety, Natural Disaster, Other Emergencies	Temporary	Major	All permits and clearance shall be obtained prior to building occupancy • 1-Fire plan approval will be obtained from Chief Fire Officer before occupying the buildings. • 2-Occupancy certificate from municipal council/development authority shall be obtained before occupying building. • 3-Firefighting system will be in place as per NBC-2005 All safety features (such as fire hydrant system, slope protection measures, etc.) provided as part of MSIH building constructions will be maintained. Fire Fighting facilities shall be regularly maintained, and regular fire drills will be carried out. • The Managers of MSIH building will prepare on site emergency plans for accidents and mishaps during the operation phase. • The off-site emergency plan shall be prepared for scenarios like fire, accident of transport vehicles and landslides in the vicinity. For natural calamities, the disaster management plan prepared by DDMA will be followed To avoid slope failures and ensure long-term sustainability of MSIH building, regular maintenance will be taken as per the maintenance schedule prepared at the end of construction.	PIU-2

Sl. No.	Potential Environmental Issues	Duration or Extent	Magnitude	Proposed Mitigation Measures	Institutional Responsibilities
4.2	Unhygienic conditions due to poor maintenance of sanitation facilities and irregular solid waste collection	Temporary	Severe	• The MSSDS will maintain the toilets and regularly collect and dispose of waste to local disposal sites. STP will be maintained regularly. The necessary CTO for the STP will be obtained from the Meghalaya State Pollution Control Board before the start of operations of STP. The solid waste will be handled as per the provisions of 'The Solid Waste (Management) Rules, 2016. There shall be segregation of bio-degradable and inorganic waste at the site.	PIU-2
4.3	Waste from operation and maintenance of Solar PV Cell	Occasionally	Insignificant	• The Solar PV cell supplier will collect any waste generated due to operation and maintenance for recycle/reuse/disposal as operations will be maintained by the supplier.	Operator Solar PV Cell
4.4	Maintenance of Rainwater Harvesting Structure	Periodically	Moderate	• The RWH shall be maintained and cleaned regularly for effective functioning for ground water recharge and re-use of collected rainwater	PIU-2
4.5	E- Waste	Periodically	Minor	• The e-waste generation will be from the operation and maintenance of computers and electronic gadgets in MSIH building operations. The disposal and handling will comply with e-Waste (Management) Rules, 2016 • The MSSDS through MSIH building Manager will have agreements with the maintenance partners to take away discarded peripherals, spare parts, discarded old computers for reuse and recycle.	PIU-2
4.6	Health and safety in laboratory facilities	Regularly	Moderate	• In case any machinery and equipment in the laboratories of MSIH is emitting air emissions then effective ventilation will be maintained and students will be provided masks during practical hours. At present no liquid effluents (except discarded lubricating oil generated from workshop equipment and machinery during periodic maintenance) are anticipated. The discarded lubricant oil due to maintenance of machinery and equipment will be sold to the authorized recyclers. • In case increased noise levels are felt in the laboratories then ear plugs should be provided to the students.	PIU-2
4.7	Vegetation clearing and landscaping.	Periodic	Moderate	• In case, if any felling is required at later stages, adequate permission for tree felling will be obtained and compensatory plantation will be undertaken as per the regulatory requirements. Further, to enhance the natural look of the MSIH building and premises,	PIU-2

Sl. No.	Potential Environmental Issues	Duration or Extent	Magnitude	Proposed Mitigation Measures	Institutional Responsibilities
				plantation of shrubs and landscaping will be taken up along the pathways and vacant space.	

ADB = Asian Development Bank, CPCB = Central Pollution Control Bureau, DDMA = District Disaster Management Authority, DSC = design and supervision consultant, MSIH = Meghalaya Skills Innovation Hub, MSSDS = Meghalaya State Skills Development Society, PIU-2 = project implementation unit 2, PMC = project management consulting, PMU = project management unit, RWH = rainwater harvesting, SSCM = State Sports Council of Meghalaya, STP = sewage treatment plant, TA = technical assistance, TSA = technical support agency.
Source: Site Visit Findings, Stakeholder Consultation, Desktop Analysis

VI. ANALYSIS OF ALTERNATIVES

A. Introduction

112. In this chapter analysis of alternatives has been carried out for 'with' and 'without' MSIH project, location selection, project implementation scheduling and materials usage in the detailed design and construction of MSIH.

B. Without Project Scenario

113. The GoM has set an ambitious target of becoming a US$10 billion economy by 2028,[14] a two-fold increase from its current gross state domestic product of US$5.68 billion. The state faces hurdles such as a low economic base with most people engaged in the agriculture sector, infrastructure challenges, limited wage employment, and a rural (80%) and unskilled population. The government has introduced numerous schemes and policies to boost economic activity across traditional and agro-based sectors in rural areas as well as to attract investments to generate much-needed jobs in sectors such as tourism, information technology (IT) and IT enabled services.[15] However, a weak human capital base remains a critical and binding constraint. An ADB study on Northeast Economic Corridor that includes Meghalaya has identified high unemployment, unskilled workforce and poor skilling eco-system as key challenges hindering its development.[16]Meghalaya has one of the least skilled workforces in India with only 27.3% of the state's workforce with secondary education or higher (compared to the national average of 39.1%) and high youth unemployment rate at 7.5%. [17] The government aims to skill over 150,000 youth over the next five years.[18] Meeting this target and ensuring meaningful results that lead to better employment and economic opportunities for the state's youth will require transformative interventions in the state's education and skills development systems. Hence, without a project scenario it is not desirable as the project will help GoM directly and indirectly in achieving US$10 million economy target by 2028.

C. With Project Scenario

114. The project site scope targets one of the key stages of state youth education that will expand opportunities for further training and improve the quality of and access to skills training and innovation support. The other component of SHCDM-II project focuses on improvement in teaching quality in government schools that are not being covered by any scheme and will follow eligibility criteria to ensure fair and need-based coverage. Considering the connectivity issues in the state, a hybrid modality for delivery of digital content will be adopted. The MSIH sub- project will provide a balanced mix of skills training and support for innovation and entrepreneurship that cater to the local socioeconomic and cultural context, economic landscape, and youth aspirations. Hence, the project scenario is more desirable.

D. MSIH Location Alternatives

115. Various locations for MSIH were evaluated. The considerations for the current and selected site finalization were availability of government land, good connectivity, and proximity

[14] Government of Meghalaya. 2023. Budget Speech 2023–2024 by Honorable Chief Minister of Meghalaya.

[15] The government has established and operationalized the Shillong Technology Park that hosts several employers in the service sector and is planning to build additional such facilities, including in urban areas outside of Meghalaya. The government has also introduced the ELEVATE program to provide financial and handholding support to small businesses. The government has announced plans for a rural connectivity program to provide last mile connectivity to 1,000 villages.

[16] ADB. 2022. Northeast Economic Corridor- Bringing People and Markets Together. Manila.

[17] Ministry of Statistics and Program Implementation (MOSPI). 2022. Periodic Labor Force Survey 2020–2021. New Delhi.

[18] Government of India. 2023. Honorable Chief Minister's Speech on Independence Day.

to planned institutional area of New Shillong Township. MSIH site was selected in Shillong considering good connectivity with the rest of country and the world. This will help the youth passing out from MSIH in getting faster employment and connecting with major industries for entrepreneurship. Moreover, with major infrastructure projects such as hydropower, multimodal logistics parks, etc. which are either ongoing or are in the pipeline, North-Eastern states will require highly skilled manpower and MSIH will be one of the good sources for skilled manpower. The MSIH site is encumbrance free land under the ownership of GoM. The MSIH site is more than 31 km from notified ecologically sensitive areas such as national parks, wildlife sanctuary and bird sanctuary. The MSIH site is also devoid of any revenue, reserved or protected forest. There are no sites of cultural and heritage importance within the 300 m boundary of MSIH site. Hence, it can be said that the current location of MSIH is suitable for the development in terms of environmental considerations in addition to techno-economic considerations.

E. Material Usage and Sustainability considerations

116. In terms of design, quality materials (steel bars, cement, and bricks) will be appropriately selected (as per approved design specification) considering that the area is within the seismic zone V classification. There will be no use of asbestos containing sheets or pipes. Further, to conserve natural resources, treated wastewater (about 30 KLD) will be recycled through double plumbing piping system for flushing, air conditioning and irrigation of green areas. The STP design will ensure usage of treated water for the above-mentioned usages. To reduce the carbon footprints through solar water heating system for 4,000 liters per day capacity is planned. Further, the roof top solar panel will also have capacity to generate 3.0 kVA power. The MSIH also plans to have an energy efficient lighting system.

F. Conclusion

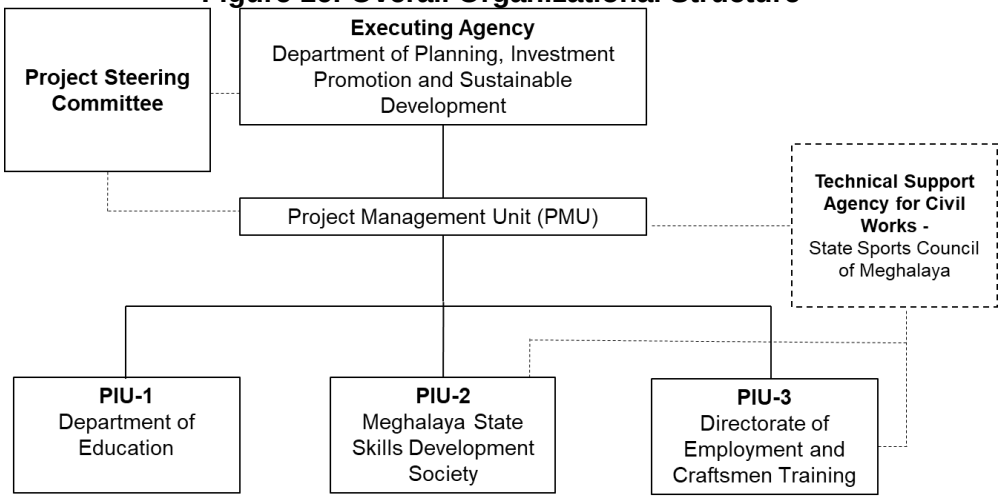
117. It is clear from the above that without project scenario is undesirable and the location of MSIH has been strategically selected with only short-term and reversible environmental impacts. To make the project outcome and outputs sustainable, necessary measures have been included in the project design.

VII. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

A. Institutional Arrangements for Project Implementation

118. The overall organizational structure of the project is shown in Figure 16.

Figure 16: Overall Organizational Structure



Source: Stakeholder consultation and desktop analysis.

119. The implementing agencies (IAs) for the Project are MSSDS, DECT, and the Department of Education (DOE). The Technical Support Agency (TSA) will support PIU-2 and PIU-3 and PMU in project implementation including MSIH. The TSA responsibilities include (i) project planning and budgeting; (ii) procurement and contract management for civil works for PIU 2 and PIU 3 on behalf of employer, i.e., Department of Planning, Investment Promotion and Sustainable Development (EA); (iii) support PMU in preparing bidding documents for works in consultations with PIUs and submit to PMU for onward submission to ADB for approval; (iv) support PMU in issuance of invitation for bids, evaluate bids and submit reports to ADB for approval and award contracts after approval from ADB; (v) support PMU in obtaining all clearances including administrative, regulatory, and all statutory approvals; (vi) oversee, coordinate, and monitor works (civil, electro-mechanical, plumbing) and supply of equipment and materials ensuring sound works supervision and high-quality control and any other technical matters and issue certificates for acceptance; (vii) measure and record acceptable works, check contractors'/suppliers' invoices, and recommend to PMU for payments payable to the contractors; (viii) support PMU in managing contracts, variation orders; (ix) requests to approving authority in consultation with IAs; (x) coordinate preparation of final measurement and 'as built' drawings; and monitor implementation; and (xi) support PMU, PIU 2 and PIU 3 in ensuring safeguards compliance ; updating of safeguard documents as per detailed engineering design, implementation of GRM for grievance redressal, implementation of GESI, implementation of EMP; implementation monitoring and reporting for social safeguards, and GESI reporting to ADB, compliance with ADB's SPS 2009. and matters requiring higher level decision to Project Steering committee (PSC) and ADB.

120. The Project Steering Committee headed by the Chief Secretary, with Seniormost Secretary, DPIPSD; Seniormost Secretary, Finance Department; Seniormost Secretary, DOE; Seniormost Secretary, DOL; chief executive officer, MSSDS; and Secretary/Joint Secretary, DPIPSD will (i) guide overall project implementation and give policy direction, (ii) approve the project's annual budget and spending on major items (iii) ensure timely decisions on critical

and implementation issues, (iv) brief the Chief Minister and other Ministers as required, and (v) hold half yearly meetings.

121. The PMU will (i) coordinate and manage fund transfers, timely audit of accounts; (ii) timely progress reports to ADB and PSC; (iii) receive and review progress reports from DOE, MSSDS and DECT; (iv) review funding requests from DOE, MSSDS and DECT; (v) recommend fund disbursements to DOF for DOE, MSSDS and DECT components; and (vi) overall monitoring of project milestones and progress including environmental and social safeguards.

122. The Project Director (an officer nominated by GoM) will be the Focal Point for all issues related to social and environment safeguards.

123. The MSIH project site will be implemented by the Project Implementation Unit (PIU-2) at MSSDS of appropriate qualifications and expertise and will be headed by Principal Secretary cum Team Leader from the Department of Labor Employment and Skill Development. The PIU-2 will be responsible for: (i) Assisting MSSDS to fulfill its mandate and targets effectively; ; (ii) establishing a state-wide skills database cum labor market information system; (iii) undertaking skills-gap analysis and disseminating timely updates on labor market information to employment exchanges in the state; (iv) mobilizing staff and consultants for smooth implementation of project activities (including resources for the safeguards implementation), capacity development, and institutional strengthening; (v) maintaining and updating the system for tracking skilled trainees; (vi) environmental and social safeguards implementation as per the loan covenants and (vii) seeking timely action and decisions from the Project Steering Committee (PSC) and PMU as needed.

124. The environment specialists (DSC and PMC) will guide and advise the project director and the PMU in all safeguard related matters. The input of both environmental specialists will be intermittent and mobilized as per need. The DSC and PMC environment specialists will support the PIU-2 at MSSDS and PMU in ensuring the effective implementation of EMP for the MSIH project site. The DSC environmental specialist and contractor will submit monthly and quarterly reports to the PIU-2 and PMU. The PMU, with the assistance from the PMC environmental specialist will compile semi-annual environmental monitoring reports for submission to ADB. The PMU will submit a report to ADB through the Project Director's office. At the MSIH site, DSC environmental specialist in close coordination with HSE officer of contractor will implement EMP. The PMC environmental specialist will visit the site as per need or to carry out capacity building training programs. The contractor HSE officer, DSC environmental specialist and PMC environmental specialist will also handle grievance redressal pertaining to environmental safeguards. Any other complex environmental safeguards issues will be brought to the project director's attention along with practical options for addressing them.

125. The environment safeguard specialists, who are part of the PMC and DSC will also assist other PIUs formed in ensuring that ADB's environmental safeguards procedures and processes are met. They will undertake capacity development and sensitization workshops for staff of the GoM departments involved in the SHCDM II project as well as the contractors.

126. The contractor(s) at project site(s) will appoint one officer as safeguard cum health and safety officer for the implementation of EARF and EMP requirements at sites. The project implementation arrangement for safeguard compliance is shown below in **Table 16.**

Table 16: Institutional Arrangement for Environmental Safeguard Implementation

	Head: Head/Principal of the Project Site or Component

Level 1 – Component/Site Level	Members: Contractor's Environment Engineer and Health & Safety Officer, Staff nominated by project site/component, Nominated Officer/Staff at level 2, Additional Supporting Staff are the Monitoring Officer/Staff at resources of PMU and DSC mentioned at level 3 below

Level 2 – District Level	**Head: Deputy Commissioner**
	Members: District Planning Officer, focal/s for safeguards, additional supporting staff are the Monitoring Officer/Staff and resources of PMC and DSC mentioned at level 3 below. Other members (such as District Forest Entity, District Urban Entity, Power Electricity, District Education, and other Government entities for the monitoring of EM and H&S) to be nominated by the Head
	Supported by DSC

Level 3 – PIU Level	**Head: Chairman of PIUs**
	Members: Monitoring Officer/Staff, focal/s for safeguards at PIU level, Additional supporting are resources of PMC and DSC mentioned at level 4 below. Other members to be nominated by the Head
	Supported by PMC

Level 4 – PMU Level	**Head: Project Director**
	Members: Addl. Project Director, 2 (two) Environment Assistants (that may be recruited), focal/s for safeguards at PMU level, Environment Specialist of PMC and DSC, Social Safeguard of PMC & DSC, Social Development (Gender) Specialist of PMC

Note: Project site or component implies the location/facility for all civil works.
Sources: Stakeholder Consultation and Desktop Analysis.

127. The EMP for the project site for the project lifecycle (preconstruction, construction, and operation phases) has been given in **Tables 18 to 20.**

B. Responsibility for monitoring, reporting and updating of IEE report during Pre-Construction and Construction

128. **Responsibility for monitoring.** During construction, the environmental specialist of the PMC at MSSDS and the environmental specialist of DSC will monitor the contractor's performance. During the operation phase, monitoring will be the responsibility of the PMU and PIU-2. The Environmental specialists will support PMU in preparation of semi-annual reports until project completion. The current IEE report is based on preliminary design of MSIH and the MSIH project will be implemented based on design and built modality, therefore, IEE report will need to be updated by the environmental specialist of PMC in coordination with the DSC environmental specialist on completion of detailed design by the appointed contractor. The commencement of works shall only be initiated after clearance of updated IEE report from the ADB. The ADB cleared IEE report will be submitted to the ADB for approval and disclosure. The TSA (SSCM) will support PIU-2 in all matters. The TSA roles and responsibilities include (i) Procurement and Contract Management for civil works for PIU 2 and PIU 3 on behalf of employer, i.e. Planning Department (PMU); (ii) Support PMU in preparing bidding documents for works in consultations with PIUs and submit to PMU for onward submission to ADB for approval; (iii) Support PMU in issuance of invitation for bids, evaluate bids and submit reports to ADB for approval and award contracts after approval from ADB; (iv) Support PMU in obtaining all clearances including administrative, regulatory, and all statutory approvals; (v) Oversee, coordinate, and monitor works (Civil, Electro-Mechanical, Plumbing) and supply of equipment and materials ensuring sound works supervision and high-quality control and any other technical matters and issue certificates for acceptance; (vi) measure and record acceptable works, check contractors'/suppliers' invoices, and recommend to PMU for

payments payable to the contractors; (vii)Support PMU in Managing contracts, variation orders; (viii) Requests to approving authority in consultation with IAs; (ix) Coordinate preparation of final measurement and 'as built' drawings; and monitor implementation, (x) Support PMU, PIU 2 and PIU 3 (through contractors/suppliers) for safeguards compliance including compliances with safeguard frameworks and plans; updating of safeguard documents asper detailed engineering design, implementation of GRM for grievance redressal, implementation of GESI, implementation of EMP; implementation and monitoring and reporting for social safeguards, environment safeguards and GESI reporting to ADB and compliance with ADB's SPS 2009.

129. **Responsibility for Reporting.** The PMU (through Project Director's office) will submit semi-annual environmental monitoring reports on the implementation of the EMP to ADB. The PMU with the assistance of TSA (SSCM) and PMC will support the project director in the project implementation including environmental safeguards. It will permit ADB to field environmental review missions to examine in detail the environmental aspects of the project. Any major lapses in adhering to the EARF and IEE and/or EMPs for specific project sites shall be reported to ADB immediately. The PMC and DSC's Environment Safeguard Specialists will assist the PIU and PMU in finalizing the semi-annual environmental monitoring reports. For any noncompliance observed, corrective actions will be implemented in a time bound manner. The cost for mitigating non-compliance will be borne by the contractor as per contract provisions. These conditions will be included in the bid and contract document of the contractor. In case of mitigation costs not coming in scope of contract, these will be met out of contingencies built in EMP cost and in overall project cost.

130. **Table 17** summarizes the responsibilities of PMU, PIU, DLF and Contractor in implementing environmental safeguards.

Table 17: Responsibilities of PMU, PIU, DLF and Contractor in Environmental Safeguard Implementation

Contractor	DLF (supported by DSC)	PIU (supported by PMC and DSC)	PMU (supported by PMC)
• Preparation of site-specific Contractor's EMP (SEMP/CEMP) including Health and safety (H&S) plan in compliance with the ADB-approved Environment Management Plan (EMP) in consultation with concerned PIUs and PMU and may be reviewed by Environment, Social and Gender Experts of PMC & DSC. • Day to day H&S and EMP implementation at site during construction stage, conducted with due diligence and in compliance with EMP. The online data	• Facilitate the E&S team in meeting with various Government functional entities viz. District Forest Entity, District Urban Entity, Power Electricity, District Education, and other Government entities for the monitoring of EMP and Health and safety (H&S) implementation work of contractor. • Provide guidance to the contractor for achieving compliances. • Maintenance of records on	• Screen and categorize project sites using the REA checklist and project site selection criteria in this EARF. • Prepare IEE-EMPs for respective project sites and updating the IEEs according to changes in scope or unanticipated impacts, if any, or based on detailed design • Ensure inclusion of EMP in the bid and contract documents • Ensure continuing consultations are conducted as part of project implementation. • Ensuring that the requisites clearances for environment and labour are at place prior to commencement of	• Review and approve the screening and categorization of project sites by PIU. • Review of IEE/ updated IEEs of each project site and submit to ADB. • Ensure allocation of fund for EMP implementation • Ensure inclusion of EMP in the bid and contract documents • Ensure disclosure of IEEs and SEMRs • Ensure continuing consultations are conducted as part of project implementation. • Assisting the relevant stakeholders such

Contractor	DLF (supported by DSC)	PIU (supported by PMC and DSC)	PMU (supported by PMC)
capturing Form will be shared with the vendors/project site head/etc for capturing progress report. • Securing regulatory permits such as Labor/Work permit/license, group insurance for laborers, Contractor's All Risk Insurance (CARI), Pollution Under Control (PUC) for vehicles & machinery and renewal of the permit/license/insurance on time. And Maintenance of records of regulatory permits/approvals prior to and during construction phase • Conduct Environmental Monitoring during pre-construction and construction phase with due diligence and in compliance with EMP. The online data capturing Form will be shared with the vendors/project site head/etc for capturing progress report. • Provide required data/information for Monitoring Reporting to PIU and others engaged in Environmental management (like Project site head) at Project site level with due diligence. • Submit monthly progress report to PIU and others engaged in Environmental management (like Facility Principle) including EHS compliances along with Action Taken	regulatory permits/ approvals taken by contractor during construction phase • Identify areas where specific mitigation measure is needed from safeguard point of view (Corrective Action Plan) during construction stage due to underperformance by contractor's EMP, H&S implementation practice. • EMP implementation, Environmental Monitoring, and compliance to regulatory norms during operation phase • Submit monthly progress report to PIU. • Participate in GRM • Ensure GRM remain functional through implementation period. • Participate in Stakeholder consultations. • Provide requisite trainings to facility level staff on environment safeguards requirements compliances for both construction and operations	any work. Coordinate/consult with the project site Head and the Contractor's experts for implementing EMP diligently and effectively. • Review of SEMP/CEMP/ EHS plans prepared by Contractor, supported by the Environment, Social and Gender Experts from PMC and DSC for advice, suggestions, etc. to improve them. • Frequent monitoring of EMP and Health and safety (H&S) implementation work of contractor, supported by PMC, DSC & Contractor's experts. • Provide guidance to the contractor for achieving compliances, supported by PMC & DSC. • Maintenance of records on regulatory permits/approvals taken by contractor during construction phase • Identify areas where specific mitigation measure is needed from safeguard point of view (Corrective Action Plan) during construction stage due to underperformance by contractor's EMP, H&S implementation practice. • EMP implementation, Environmental Monitoring, and compliance to regulatory norms during operation phase, supported by PMC, DSC, and Project site head.	as PIUs/DLFs/Project site level in Environment safeguards related activities. • Guide the field staff and PIUs in achieving compliance. • Review project site progress reports submitted by DSC/ Contractors/ PMCs/ PIUs/others from Environmental Unit at Project site Level. • Final Review and approval of SEMP/CEMP/ EHS plans prepared by Contractor and first review by PMC & DSC. • Assist in obtaining and renewing statutory permissions that are required to be taken by the project authority. • Prepare Semi-Annual Environmental Monitoring Report and review inputs from PIU, with support of PMC & DSC, and accordingly submit to ADB. • Ensure formation of GRM • Ensure GRM remain functional through implementation period. • Provide requisite trainings to PIUs, DLFs, project site level and vendors Officers/staff on environment safeguards

Contractor	DLF (supported by DSC)	PIU (supported by PMC and DSC)	PMU (supported by PMC)
Report for any non-compliance, risks, issues, grievances, etc. to any Environmental matter raised by the Government/PIUs • Establish and participate in GRM with due diligence. • Participate in Stakeholder Engagement with due diligence. • Participate in the public consultation mission conducted by Govt Entity, PMC, or DSC. • Participate in capacity building on Environment, Social and Gender safeguard. • Maintenance of health and hygiene on site. • Identifying areas where specific mitigation measure is needed from safeguard point of view (Corrective Action Plan) during construction stage due to underperformance by contractor's EMP, H&S implementation practice.		• Provide inputs for preparation of Semi-Annual/Annual Environmental Monitoring Report (that will include H&S components), supported by PMC and DSC. • Participate in GRM • Ensure GRM remain functional through implementation period. • Participate in Stakeholder consultations. • Provide requisite trainings to facility level staff on environment safeguards requirements compliances for both construction and operations. • Assist in obtaining and renewing statutory permissions that are required to be taken by the project authority. • Ensure disclosure of IEEs and SEMRs	requirements compliances for both construction and operations. • Coordination with Funding Agency and Reporting • Coordination with external regulatory authorities, supported by PMC and DSC. • Regular Coordination with Environmental Unit at Project site Level, supported by PMC and DSC. • Get regular updates from site level on regulatory compliance and EMP Implementation, supported by PMC and DSC, PIUs, DLFs and Project site heads. • Taking decision on corrective measures (if required), advised by PMC and DSC.

ADB = Asian Development Bank, CEMP = Contractor Environmental Plan, DLF = district level forum, DSC = design and supervision consultants, EARF = environmental assessment and review framework, EMP = environmental management plan, E&S = Environmental and Social, EHS = Environmental Health and Safety, GRM = grievance redress mechanism, H&S = Health and Safety, IEE = initial environmental examination, PIU = project implementation unit, PMU = project management unit, SEMP = Site-Specific Environmental Management Plan, PMC = project management consulting, REA = rapid environmental assessment, SEMR = semiannual monitoring report.

Source: Stakeholder Consultation and Desktop Analysis

Table 18: Pre-Construction Phase Environmental Management Plan for MSIH Shillong

Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
1	Lack of sufficient planning to assure long-term sustainability of the improvements and protect the assets created.	1-Design for MSIH Shillong has included provisions for ensuring effective maintenance and protection of the assets to be created to ensure long-term sustainability. The long term sustainability has been ensured by taking into consideration appropriate Bureau of Indian Standards Codes (BIS) for design, Seismic Zone V coefficient (IS: 1893 (Part I)-2002: Indian Standard Criteria for Earthquake Resistance Design of Structures (5th Revision) and IS:4326-1993: Indian Standard Code of Practice for Earthquake Resistance Design and Construction of Buildings (2nd Revision)), appropriate wind load factor (corresponding to the prevalent wind speed), and detailed design after carrying geotechnical investigations and topographic survey. 2-The MSIH Shillong site is not on any bank of river and away from core and buffer zones of protected areas. The site is also not in any reserved, protected or revenue forest. 3- The roof-top solar panel will be installed to meet the water heating	Verification of design parameters	PIU-2, Contractor and DSC, TSA (SSCM)	PMC, PMU	Review after completion of DPR (after detailed design completion).	Part of PIU-2 Budget for project site and PMC Professional Fee

Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		requirements and generate 3.0 kVA electricity. 4- Roof top rainwater will be collected through pipe for ground water recharge and other uses (gardening and recycling, air conditioning and flushing)- total RWH capacity planned 20,000 liters. The runoff from open areas on the ground (especially from parking areas) shall not be diverted to the recharge pit to avoid ground water contamination. Necessary slope protection will be maintained to avoid any slope failures.					
2	Layout of components to avoid impacts on the aesthetics of the MSIH Shillong site and surroundings.	Locating the MSIH in a planned area will avoid impacts on the aesthetics and surroundings as MSIH Shillong building will very well mix with other such institutional buildings. The exterior design of MSIH Shillong will take care of this issue.	MSIH Shillong building's exteriors	PIU-2, Contractor and DSC, TSA (SSCM)	PMC, PMU	Review after completion of detailed design	Part of PIU-2 and DSC Professional Fee
3	Slope stability related issues	The MSIH Shillong site is on a hilly undulating terrain and there is need for slope protection. Necessary slope protection measures have been considered in the design. These mitigation measures will be implemented in the project. Further, during construction, exposed slopes at excavated areas will be covered and slope protection measures	Slope protection measures in buildings and on side slopes of access paths, internal roads, etc.	PIU-2, Contractor and DSC, TSA (SSCM)	PMC, PMU	Review of recommended slope protection measures after completion of detailed design.	Part of Consultancy/ contractor's fee

Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		provided at side slopes of internal roads.					
4	Increased storm water runoff from alterations of the site's natural drainage patterns due to landscaping, excavation works, construction of parking lot, and addition of paved surfaces, domestic wastewater generation from the sanitation facilities	• Design of proposed MSIH Shillong building enables efficient drainage of the plot and maintains natural drainage patterns. The storm water generated will be diverted to local drains (as per the storm water drainage design) through a properly constructed drainage system. Since the general topography of the site is hilly, there is swift flow, and drainage is not an issue. • RWH structures of suitable size (20,000 liters total capacity) will be designed depending on space availability to divert and collect roof top water for ground recharge and other uses. • To treat domestic wastewater a STP of 30 KLD capacity planned. The technology of treatment will be finalized during detailed design.	Arrangement for proper diversion of storm water runoff, RWH structures, STP detailed design and installation	PIU-2, Contractor and DSC, TSA (SSCM)	PMC, PMU	After mobilization of contractor at the site and during establishment of construction camp at site	Incidental to construction cost
5	Integration of energy efficiency and energy conservation programs in design of MSIH components	The detailed design for the MSIH has ensured that environmental sustainability principles, including energy efficiency, resource recycling, waste minimization, etc. are included. The design considers the following energy efficiency measures:	Specifications of rainwater harvesting structures, electrical fixtures, details	PIU-2, Contractor and DSC, TSA (SSCM)	PMC, PMU	During finalization of detailed design	Part of project cost

Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		• Usage of recyclable materials like wood substitutes. • Installation of BEE certified equipment • Usage of energy efficient lighting fixtures (LED) • Provision of P-V cells on roof for solar power for water heating.	of water heating system				
6	Consents, permits, clearances, no objection certificate (NOC), etc.	• Obtain all necessary consents, permits, clearances, NOCs, etc. prior to start of civil works. The permits and NOCs include labor license, insurance (both for local and migrant workers) and ground water extraction permission (if ground water extraction planned). After finalization of STP technology and detailed design of the STP by the contractor, CTE from the Meghalaya State Pollution Control Board will be obtained by the PMU at MSSDS. • Acknowledge in writing and provide report on compliance all obtained consents, permits, clearances, NOCs, etc. • Obtain permission from New Shillong Township Development Agency/Shillong Municipal Council	Consents, permits, clearance and NOCs Records and communications	PIU-2, DSC and Contractor, TSA (SSCM)	PMC, PMU	check consent for establishment of construction camp, approval from civic authorities for the proposed MSIH Shillong, approval of building plans from fire department and permission from Town and country planning	Project cost

Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		for the MSIH Shillong building plan or any other permissions.				Department (if required)	
7	Establishment of baseline environmental conditions prior to start of civil works	1-Conduct documentation of location of components, areas for construction zone (Camp, staging, storage, stockpiling, etc.) and surroundings (within direct impact zones). Include photos and GPS co-ordinates 2-Carry out preconstruction phase environmental monitoring/testing in respect of ambient air quality, water quality and noise levels as per monitoring program. This monitoring is to establish baseline environmental monitoring.	Records and Photographs	Contractor	PIU-2, and DSC, PMC, TSA (SSCM)	Once prior to start of construction works	Contractor
8	Utilities	• The locations and operators of utilities to be impacted should be identified and documented in detailed design documents. This measure is to avoid unnecessary disruption of services during the construction phase. • The contractor is to prepare a contingency plan to include actions to be taken in case of unintentional interruption of services. • Obtain from the PIU the list of affected utilities and operators.	List and maps showing utilities to be shifted. Contingency plan for services disruption	• PIU-2 will prepare preliminary list and maps of utilities to be shifted • During detailed design phase, contractor to (i) prepare list and operators of	PIU and DSC PMC, TSA (SSCM)	Pre-Construction Phase	Contractor

Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		• If relocations are necessary, the contractor will coordinate with the service providers to relocate the utility.		utilities to be shifted; (ii) contingency plan for any interruption in services			
9	Social and Cultural Resources and Chance Find Protocol preparation	• Consult Archaeological Survey of India (ASI) or Meghalaya State Archaeology Department to obtain an expert opinion on the archaeological potential of MSIH Shillong site. • Consider alternatives if the site is found to be of medium or high risk. Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available. • Develop a protocol for use by the contractor in conducting any excavation work, to ensure that any chance finds are recognized, and measures are taken to ensure they are protected and conserved. • No impact is foreseen on any NMA or ASI notified monument/heritage site/structure of cultural importance	Chance finds protocol	• DSC in consultations with ASI or Meghalaya State Archaeology Department and develop protocol for chance finds	PMC, PMU, TSA (SSCM)	Prior to start of construction activities	DSC Consultancy fee

Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		(nearest one – Manipur Memorial at 7.6 km)					
10	Construction Camps - Locations, Selection, Design and Layout and material storage locations	• The construction Camp site at MSIH Shillong site shall be as per the guidelines below and details of layout approved by PIU-2. • The potential sites near the MSIH Shillong site will be selected for labor camp and this site shall be visited by the environmental expert of PMC with environmental expert of DSC and one having least impacts on environment will be approved by the PIU-2. As far as possible, construction camps will be established on vacant land within the MSIH Shillong site to avoid impact on other land. • Locations for storage of construction materials shall be identified within the MSIH Shillong site. • Gender segregated sanitation facilities at construction camp shall be adequately planned if it is established in open. • The accommodation of workers at the construction camp will be of adequate height, well-ventilated and bed facility. There shall be provision	Construction Camp site, and locations of material storage areas, sanitation facilities	Contractor	PIU-2 and DSC, PMC, TSA (SSCM)	At the time of construction camp establishment and finalization of storage areas	Contractor

Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		for a common kitchen for cooking food. • The contractor shall provide LPG for cooking and no fuel wood will be used for cooking. • Adequate dustbins will be placed.					
11	Sources of construction materials	• Use quarry sites and sources licensed by the GoM. These sources should be compliant with the environmental regulations of GOI and GoM. • Verify suitability of all material sources and obtain approvals from PIU-2 and DSC. • If additional quarries are required after construction has started, obtain written approval from PIU-2 and DSC. • Submit to PIU-2 and DSC monthly documentation of sources of materials.	Permits issued to quarries and sources of materials	Contractor DSC and PIU-2 to verify sources (including permits) if additional is requested by contractor)	PMC, PMU, TSA (SSCM)	Upon submission by contractor	As part of contractor's fee
12	Access for Construction material transportation	• Plan transportation routes so heavy vehicles do not use narrow local roads, except near MSIH site. • Schedule transport and hauling activities during non-peak hours. • Locate entry and exit points in areas where there is low potential for traffic congestion.	Traffic management plan	Contractor	PIU-2 and DSC, TSA (SSCM)	During Delivery of construction materials	Contractor

Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		• Keep the site free from all unnecessary obstructions. • Drive vehicles in a considerate manner. • Coordinate with the Traffic Police Department for temporary road diversions (if needed) and for provision of traffic aids if transportation activities cannot be avoided during peak hours.					
13	Occupational health and safety	• Comply with IFC EHS Guidelines and provisions of core labor standards of ILO (ratified by the GOI)[19] on Occupational Health and Safety. • Develop comprehensive site-specific health and safety (H&S) plan. The overall objective is to provide guidance to contractor on establishing a management strategy and applying practices that are intended to eliminate, or reduce, fatalities, injuries and illnesses for workers performing activities and tasks associated with the project.	Health and safety (H&S) plan	Contractor	PMU and PMC, PIU-2 and DSC, TSA (SSCM)	During construction phase	Contractor

[19] 1-Forced Labor Convention, 1930 (No. 29),2- Abolition of Forced Labor Convention, 1957(No.105), 3-Equal Remuneration Convention, 1951 (No. 100), 4-Discrimination (Employment and Occupation) Convention (N0.111), 5- Minimum Age Convention, 1973 (No.138) and 6-Worst Form of Child Labour Convention, 1999 (No.182).

Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		• Include in H&S plan measures such as: (i) type of hazards at MSIH construction site; (ii) corresponding personal protective equipment for each identified hazard; (iii) H&S training for all site personnel; (iv) procedures to be followed for all site activities; and (v) documentation of work-related accidents. • Provide medical insurance coverage (under the Workmen Compensation Act, 1923) for workers. • Procure PPEs in adequate numbers.					
14	Stakeholder consultations	Continue information dissemination, stakeholder consultations, and involvement/participation of stakeholders during project implementation.	-Disclosure records - Consultations	PMU, PMC PIU-2, DSC and Contractor	PMU and PIU-2, TSA (SSCM)	• During updating of IEE Report after completion of detailed design • During preparation of site- and activity-specific plans as per EMP	PMU, and Contractor

Sl. No.	Environmental Issues	Mitigation Measures	Parameters (Indicators for Compliance)	Responsible for Implementation	Responsible for Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
						• Prior to start of construction • During construction	
15	Asbestos Management (for accidental situations)	• The project will not use any asbestos containing materials. • Prepare Statement of method/protocol if asbestos containing material is encountered in excavations or any accidental handling of materials containing asbestos	Asbestos containing materials identified during construction	Contractor	PIU-2, PMU and PMC, TSA (SSCM)	Continuous during entire construction phase	Contractor

ADB = Asian Development Bank, BEE = Bureau of Energy Sufficiency, DSC = design and supervision consultants, EMP = environmental management plan, EHS = environmental, health, and safety, IEE = initial environmental examination, IFC = International Finance Corporation, GOM = Government of Meghalaya, H&S = health and safety, ILO = International Labor Organization, MSIH = Meghalaya Skills Innovation Hub, PIU-2 = project implementation unit 2, PMC = project management consulting, PMU = project management unit, PPE = personal protective equipment, RWH = rainwater harvesting, SSCM = Supporting Human Capital Development in Meghalaya Project, STP = sewage treatment plant, TSA = technical support agency.
Source: Site Visit Findings, Stakeholder Consultation, Desktop Analysis

Table 19: Construction Phase Environmental Management Plan for MSIH at Shillong

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
1	Sanitation and drinking water facilities at construction Camps of MSIH project site	• The contractor shall provide sanitation facilities at the MSIH construction camp site. These facilities will include dust bins in adequate numbers for solid waste collection, drinking water facilities, and separate toilets for male and females. In case the camp is established in some house, then the contractor will ensure that adequate facilities exist in the house. These toilets facilities shall be maintained. In case camp is established in open at site, then septic tanks/soak pits or other environmentally facilities such as bio-toilets and/or bio-digestor septic tanks at toilets will be provided. The dustbins shall be regularly emptied and waste from camp sites shall be disposed of at designated locations. Camp facilities will adhere to national and international labor standards. • The quality of drinking water shall be tested regularly.	Construction camp sanitation and drinking water facilities	Contractor	PIU-2and DSC, TSA (SSCM)	Regularly during construction phase	Contractor
2	Traffic Circulation plan during	Prior to commencement of site activities and mobilization on the	Safe movement of Traffic	Contractor	PIU-2 and DSC	Every day during	Contractor

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
	construction phase	ground, the Contractor will prepare and get approved from the engineer (DSC), circulation plan during construction for safe passage of public vehicles so that locals are not at inconvenience. The contractor with support of the PIU-2 will carry out dissemination of these information and circulation plans at site and at key access roads to the MSIH site. The contractor, with PIU-2's help, will get approval of the traffic circulation plan from the relevant authorities.				construction phase	
3	Site clearance activities, including delineation of construction areas	• Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works shall be removed with prior approval from the environmental experts of DSC and PMC. Tree cutting permission shall be taken (if tree cutting is needed after completion of detailed design). • All areas used for temporary construction operations will be subjected to complete restoration to their former conditions with appropriate rehabilitation procedures. The photographic records shall be maintained for the temporary sites used for	Pre-construction records of site and vegetation in area of construction	Contractor	PIU-2 and DSC, TSA (SSCM)	Duration of site preparation	PIU-2

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		construction. These will help in proper restoration.					
4	Drinking water availability at Construction camp and construction site, workers' accommodation, sanitation facilities, cooking fuel and facilities, prevention for mosquito breeding and communicable diseases	• Sufficient supply of potable water meeting drinking water quality standards (specified in IS:10500) to be provided and maintained. If the drinking water is obtained from an intermittent public water supply, then storage tanks will be provided. The drinking water quality shall be tested regularly to ensure that water quality meets drinking water standards. For this contractor will submit plans for how availability of drinking water shall be assured. In case it is obtained from the natural spring then permission from local authorities shall be obtained. • The workers' accommodation, sanitation facilities, cooking fuel and facilities will meet the requirements indicated in Table 18 (sl. no. 10). • All measures such as avoidance of water stagnation, periodic fogging and proper upkeep of camp shall be taken up to avoid mosquito breeding. • The environmental specialist of DSC and HSE officer shall periodically sensitize the	Water supply source and availability of water, permission of local authority if obtained from local spring	Contractor	PIU-2 and DSC, TSA (SSCM)	During Construction phase regularly	Contractor

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		construction workers on the communicable diseases and organize health checkup camps also.					
5	Waste disposal	• The pre-identified disposal location (preferably approved by the Meghalaya Pollution Control Board) shall be part of the Comprehensive Waste Disposal Plan. Solid Waste Management Plan to be prepared by the Contractor in consultation with local civic authorities. • On the advice and recommendations of the environmental specialists of PMC and DSC the PIU-2 at MSSDS shall approve the disposal site. • The contractor shall ensure that waste shall not be disposed of near natural streams in the site's surroundings and along the access path.	Waste Disposal sites, waste management plan	Contractor	PIU-2 and DSC, TSA (SSCM)	Regularly during construction phase	Contractor
6	Stockpiling of construction materials	Stockpiling construction materials will be done so that it does not impact and obstruct the drainage. The stockpiles will be covered to protect from dust and erosion.	Stockpiling sites at project sites	Contractor	PIU-2 and DSC, TSA (SSCM)	Regularly during construction phase	Contractor
7	Arrangement for Construction Water	• The Contractor shall provide a list of locations and types of sources from where water for construction shall be acquired.	Water availability at identified water	Contractor	PIU-2 and DSC, TSA (SSCM)	Regularly during construction phase	Contractor

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		• The contractor shall use ground/surface water as a source of water for the construction with the written consent of the Department concerned. • To avoid disruption/ disturbance to other water users, the Contractor shall arrange water from market or from local municipality and consult PIU-2 and DSC before finalizing the source.	source locations				
8	Soil Erosion	Slope protection measures will be undertaken as per design to control soil erosion. Retaining wall shall be constructed. This is important in the present case as the topography of the site is hilly. Further, side slopes of access and internal roads shall also be protected.	Locations of slope protection	Contractor	PIU-2 and DSC, TSA (SSCM)	Regularly during construction phase	Contractor
9	Water Pollution from Construction Wastes	The Contractor shall take all precautionary measures to prevent entering of wastewater into any local stream during construction.	MSIH Shillong site	Contractor	PIU-2 and DSC, TSA (SSCM)	Regularly during construction phase	Contractor
10	Water Pollution from Fuel and Lubricants	• The Contractor shall ensure that all construction vehicle parking locations, fuel/ lubricants storage sites, vehicle, machinery and equipment maintenance and refueling sites shall be located at	Vehicle parking, refueling sites, Oil interceptor functioning	Contractor	PIU-2 and DSC, TSA (SSCM)	Regularly during construction phase	Contractor

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		least 500 m away from the natural streams. • The contractor shall ensure that all vehicle/machinery and equipment operation, maintenance and refueling shall be done so that spillage of fuels and lubricants does not contaminate the ground. • Waste water from vehicle parking, fuel storage areas, workshops, wash down and refueling areas shall be treated in an oil interceptor before discharging it on land or into surface water bodies or into other treatment systems.					
11	Soil Pollution due to fuel and lubricants, construction wastes	The fuel storage and vehicle cleaning area will be stationed such that spillage of fuels and lubricants does not contaminate the ground. Soil and pollution parameters will be monitored as per the monitoring program.	Vehicle maintenance and parking area, soil quality monitoring results	Contractor	PIU-2 and DSC, TSA (SSCM)	Regularly during construction phase	Contractor
12	Siltation of water bodies due to spillage of construction wastes and runoff from the site	No disposal of construction wastes will be carried out into the surface water bodies. Extraneous construction waste will be transported to the pre-identified disposal site for safe disposal. Necessary measures such as sedimentation tanks shall be	Water bodies especially natural streams near MSIH Shillong site	Contractor	PIU-2 and DSC, TSA (SSCM)	Regularly during construction phase	Contractor

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		constructed so that soil laden storm water during site clearance and initial stage of excavations do not go outside site boundary.					
13	Generation of dust	• The contractor will take every precaution to reduce the levels of dust at the construction site. • All filling works to be protected/ covered in a manner to minimize dust generation. The MSIH site shall be properly barricaded with MS sheet of adequate height to avoid any inconvenience to the surrounding population.	MSIH Shillong site, air quality monitoring results	Contractor	PIU-2 and DSC, TSA (SSCM)	Regularly during construction phase	Contractor
14	Emission from Construction Vehicles, Equipment and Machinery	• All vehicles, equipment and machinery used for construction shall conform to the relevant Bureau of India Standard (BIS) norms. The discharge standards promulgated under the Environment Protection Act, 1986 shall be strictly adhered to. The silent/quiet equipment available in the market shall be used as far as possible in the MSIH construction works. • The Contractor shall maintain a record of PUC for all vehicles and machinery used during the contract period which shall be produced for verification whenever required.	PUC certificates of vehicles and machinery	Contractor	PIU-2 and DSC, TSA (SSCM)	Regularly during construction phase	Contractor

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
15	Noise and Vibration Issues	• The Contractor shall confirm that all Construction equipment used in construction shall strictly conform to the MoEFCC and CPCB noise standards and all vehicles and equipment used in construction shall be fitted with exhaust silencers. • At the construction site noisy construction work such as compaction, rock cutting, operation of DG sets, use of high noise generation equipment, etc. shall be stopped during the nighttime between 10.00 pm to 6.00 am. • Noise limits for construction equipment to be used in this project will not exceed specified limits of CPCB. To minimize impacts on TB Hospital MSIH site will be properly barricaded with prefabricated MS sheets (acoustic sheet, if required) of adequate height. Although the distance of TB hospital from site is 300m and this hospital is not in operation. • Vibration issues are not anticipated as no blasting or rock cutting is envisioned and the nearest structures of TB hospital are at 300	Certificates of vehicles conforming noise standards, noise monitoring results	Contractor	PIU-2 and DSC, TSA (SSCM)	Regularly during construction phase	Contractor

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		m distance. In case any unforeseen scenario is encountered pertaining to vibrations then necessary measures to avoid vibration transmission shall be taken up. These measures will be specified by the design team.					
16	Impacts on flora and fauna	• Minimize impacts on flora and fauna during construction phase by limiting site clearance bare minimum and limiting all types of pollution generation. • At the end of construction period, plant trees and shrubs in the available vacant space. The plantation may be taken up in vacant space. The shrubs may be planted as per landscaping plan.	Environmental monitoring reports, Trees and shrubs planted at MSIH Shillong site	Contractor	PIU-2 and DSC, TSA (SSCM)	Regularly during construction phase	Contractor
17	Material Handling at MSIH Shillong site	• Workers employed in mixing cement, lime mortars, concrete, etc., will be provided with protective footwear and protective goggles. • Workers who are engaged in welding works will be provided with welder's protective eye-shields. • The use of any toxic chemical will be strictly in accordance with the manufacturer's instructions. The PWD will be given at least 6 working days' notice of the proposed use of any chemical. A register of all toxic	Data on available personal protective equipment	Contractor	PIU-2and DSC	Regularly during construction phase	Contractor

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		chemicals delivered to the site will be kept and maintained up to date by the Contractor.					
18	Disposal of Construction Waste, Debris and surplus cut	The Contractor shall confirm that safe disposal of the construction waste will be ensured in the pre-identified disposal locations. In no case, any construction waste will be disposed of around the MSIH Shillong site indiscriminately.	Disposal sites	Contractor	PIU-2 and DSC, TSA (SSCM)	Regularly during construction phase	Contractor
19	Occupational Health and Safety Measures During Construction	• Adequate safety measures for workers during handling of materials at project sites will be taken up. • The contractor must comply with all regulations for the safety of workers. Precautions will be taken to prevent danger to the workers from accidental injuries, fire, etc. First aid treatment will be made available for all injuries likely to be sustained during work. • The contractor will conform to all anti-malaria instructions given to him by the DSC (engineer) and PIU-2. • The contractor will provide and enforce usage of PPEs as per prevailing Indian Laws and International best practices.	Records of availability of personal protective equipment, availability of first aid kits	Contractor	PIU-2 and DSC, TSA (SSCM)	Regularly during construction phase	Contractor

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		• Clean fuel for cooking at the camp side shall be provided. The usage of fuel wood will be avoided.					
20	Asbestos Management (if found/generated)	The MSIH Shillong project site will not use any material containing asbestos. However, if any asbestos containing material is encountered during excavation or any construction works, necessary guidelines specified in IS: 11769 (2005 affirmed) -Guidelines of Safe use of Products Containing Asbestos', and also available in various other documents published by the Environment Protection Agency, USA (US-EPA) and ADB Good Practice Guidance for the Management and Control of Asbestos will be followed to avoid any health-related impacts to construction workers and technical staff at site. For this, the contractor will prepare a safe operating procedure after the mobilization.	Asbestos containing material identification	Contractor through technical guidance of DSC	PIU-2 and PMU, TSA (SSCM)	As and when asbestos containing material is identified	Contractor
21	Onsite emergency plan for probable accidents and mishaps and Disaster Management Plan	• The onsite emergency plan will be prepared by the contractor in consultation with PIU-2 and PMC. • For natural calamities, a disaster management plan prepared under the provisions of Disaster	Onsite emergency plan document and Disaster Management Plan document of the state	Contractor	PIU-2 and DSC, TSA (SSCM)	Mock Drill every quarter	Contractor

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
	for Natural Calamities	Management Act 2005 will be followed.					
22	Clearing of Construction of Camp and Restoration	• Contractor to prepare site restoration plans for approval by the Engineer (PIU-2). The plan is to be implemented by the contractor prior to demobilization. The restoration of the camp and other temporary structures shall be done environmentally responsible. • On completion of the works, all temporary structures will be cleared away, all rubbish burnt, excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the Contractor's expense, to the entire satisfaction of the PIU-2	Restoration plan, and records of pre-construction of temporary sites	Contractor	PIU-2 and DSC, TSA (SSCM)	End of construction phase	Contractor

ADB = Asian Development Bank, CPCB = Central Pollution Control Board, DSC = design and supervision consultants, EHS = environmental, health, and safety, IEE = initial environmental examination, MoEFCC = Ministry of Environment, Forest, and Climate Change, MSIH = Meghalaya Skills Innovation Hub, MSSDS = Meghalaya State Skills Development Society, PUC = pollution under control, PIU-2 = project implementation unit 2, PMC = project management consulting, PMU = project management unit, PPE = personal protective equipment, TB = tuberculosis.
Source: Site Visit Findings, Stakeholder Consultation, Desktop Analysis

Table 20: Operation Phase Environmental Management Plan for MSIH at Shillong

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
1	Environmental Conditions	The periodic monitoring of the ambient air quality, noise level, surface water quality at MSIH Shillong as suggested in the monitoring program through an approved and NABL accredited monitoring agency shall be taken up.	Monitoring results and relevant standards	MSSDS through NABL accredited Laboratory/Agency	PIU-2	As per monitoring program	MSSDS and PMU
2	Unhygienic condition due to poor maintenance of sanitation facilities and irregular solid waste collection	The MSSDS, while operating, MSIH Shillong, will maintain the toilets and regularly collect and dispose of waste to a designated waste treatment site. The solid waste disposal will be integrated with New Shillong township/Shillong Town (as feasible) waste disposal. STP of 30 KLD capacity shall be installed and maintained regularly. The STP performance will be ensured as guaranteed in detailed design. Necessary CTO from the Meghalaya State Pollution Control Board will be obtained by the MSSDS PMU on completion of installation.	Maintenance schedule of MSIH Shillong building and facilities created	MSSDS	PIU-2	Every Quarter	MSSDS and PMU
3	Natural Disasters	Necessary procedures to be followed, by the MSIH Shillong and other staff, students and visiting people, during the natural disasters shall be written at prominent locations.	Warnings of disasters by Meteorological Department	District Administration	PIU-2	During Disasters	Government of Meghalaya

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
4	Waste from operation and maintenance of solar PV Cell	The Solar PV cell supplier will collect any waste generated due to operation and maintenance for recycle/reuse/disposal as operations will be maintained by the supplier.	Waste generated from operation and maintenance of Solar PV Cell	Supplier and Operator of Solar PV Cell	Executive Director MSIH	As per schedule of maintenance	Fee of Solar PV Cell Supplier
5	Maintenance of RWH structure	The rainwater harvesting (RWH) structure will be maintained during operation phase for the effective collection of roof top rainwater for re-use/ground water recharge. The maintenance schedule for the RWH will be prepared at the end of the construction phase. Filter media contamination, if any will be ascertained during the maintenance.	RWH	Executive Director MSSDS	MSSDS	Annually	MSIH operation cost
6	Maintenance of MSIH Shillong building	The MSIH building maintenance including maintenance of slopes will be taken up as per the maintenance schedule to be prepared at the end of construction in the closure report.	Maintenance schedule of MSIH building for all the components	Executive Director MSIH	MSSDS	At the time of monitoring activities	MSIH operations cost
7	Onsite emergency plan for probable accidents and mishaps and Disaster Management Plan for Natural Calamities	• The Manager of MSIH will prepare an on-site emergency plan for accidents and mishaps for the operational phase. • For natural calamities such as earthquakes, floods, etc. the disaster management plan prepared by GoM will be followed. • The Offsite emergency accidental scenarios such as fire, land slide,	Onsite Emergency plan document and Disaster Management Plan document	Executive Director MSIH	MSSDS	Mock Drills every quarter	MSIH operation cost

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
		slope failure, transport vehicles accident, etc. will also be included in the emergency plan.					
9	Fire and Toxic Hazards and Obtaining Building Occupancy Certificate and NOC from the Fire Department	1-Fire plan approval will be obtained from Chief Fire Officer before occupying the MSIH buildings. 2-Occupancy certificate from municipal Corporation/development authority shall be obtained before occupying building. 3- Firefighting system will be in place as per NBC-2005 4- Fire Fighting facilities shall be regularly maintained, and regular fire drills will be carried out.	Fire plan approval, occupancy certificate, maintenance schedule of firefighting system, records of fire drills	Executive Director	MSSDS	Regularly	MSIH operation cost
10	Noise Generation during Practical/Practice Hours at workshops and laboratories of MSIH	The students and faculty members have a risk of higher-level noise exposure during practical and practice hours due to operation of MSIH machinery/equipment. This noise should be measured and if higher than permissible limits, necessary protection devices such as ear plugs should be used.	Noise levels in workshops and laboratories	MSIH Executive Director	MSSDS	Regularly	MSIH Operations cost
11	Air Emissions during Practical/Practice Hours at workshops and	The air emissions in classrooms are not anticipated but in case due to change of training courses if machinery /equipment are installed which emit air emissions then necessary ventilation (along with air	Air emissions	MSIH Executive Director	MSSDS	Regularly	MSIH Operations cost

Sl. No.	Environmental Issues	Mitigation Measures	Parameter (Indicators for Compliance)	Responsible Implementation	Responsible Supervision	Frequency for Monitoring	Sources of Fund for Implementing Mitigation Measures for Adverse Environmental Impacts
	laboratories of MSIH	filtration system) will be provided in the laboratories/workshops and students will be provided masks also.					
12	E- Waste	The e-waste generation will be from the operation and maintenance of computers and electronic gadgets in various laboratories. The disposal and handling will comply with e-Waste (Management) Rules, 2016.	Storage facilities of e-waste and records of sale/lifting by the vendors	MSIH Executive Director	MSSDS	Regularly	MSIH Operations cost

ADB = Asian Development Bank, CTO = Consent to Operate, GOM = Government of Meghalaya, MSIH = Meghalaya Skills Innovation Hub, MSSDS = Meghalaya State Skills Development Society, NABL = National Accreditation Board for Testing and Calibration Laboratories, PMU = project management unit, RWH = rainwater for harvesting, STP = sewage treatment plant.
Source: Site visit findings, stakeholder consultation, desktop analysis.

C. Environmental Monitoring Program

131. Environmental monitoring will be undertaken during construction at three levels. The Environment Specialist of the PMC will ensure that IEE and EMP of new project sites identified in future are prepared in accordance with ADB's and GoM's requirements as well as following the approved EARF for the project. If scope changes of MSIH project site, IEE and EMP will be updated accordingly. For this project site, the PMC/ DSC staff will also coordinate with PMU and the user department – MSSDS to ensure that all the provisions of the EMP are being adhered to by the contractor. Relevant staff from the PIU-2 and DSC will monitor the contractor and ensure that the MSIH- EMP and all GoM's rules with respect to the environment, and handling of solid and liquid waste are being followed.

132. To ensure the effective implementation of mitigation measures and EMP during construction and operation phase of MSIH, it is essential that an effective Environmental Monitoring Program be followed as given in **Table 21**. The proposed monitoring of all relevant environmental parameters, with a description of the sampling stations, frequency of monitoring, applicable standards and responsible agencies are presented in this table.

Table 21: Monitoring Program for MSIH Shillong for Preconstruction, Construction, and Operation Phases

Sl. No.	Field (Environmental Attribute)	Phase	Parameters to be Monitored	Locations	Frequency	Responsibility	Estimated Cost (₹/US$)[20]
1	Air Quality	During pre-construction phase	CO, NOx, PM_{10}, $PM_{2.5}$, and SO_2 (In case emissions anticipated from equipment in laboratories then suitable parameters may be monitored in labs also.)	MSIH Shillong construction site	Once in the pre-construction phase to establish baseline	Contractor, PIU-2, PMU, and MSSDS through NABL accredited approved Monitoring Agency, TSA (SSCM)	INR160,000/ US $ 2000
		During Construction Phase			Once in every three months (except monsoon season) during construction phase (24 months construction phase)		
		Operation Phase			Once in season except monsoon season for initial 2 years		
2	Water quality	During pre-construction phase	TDS, TSS, pH, Hardness, BOD, Fecal Coli form	Ground water/ Surface water closes to MSIH construction site	Once in pre-construction phase to establish baseline	Contractor, PIU-2, PMU, and MSSDS through approved (NABL Accredited) Monitoring Agency, TSA (SSCM)	INR160,000/ US $2000
		During Construction Phase			Once in every three months (except monsoon season) during construction phase		
		Operation Phase			Once in season except monsoon season for initial 2 years		
3	Noise Levels	During pre-construction phase	Noise quality as per National Ambient Noise Standards on dB(A) scale	Noise levels at MSIH construction sites	Once in pre-Construction phase to establish baseline	Contractor, PIU-2, PMU, and MSSDS through approved (NABL Accredited) Monitoring Agency, TSA (SSCM)	INR 48,000/ US $ 600
		During Construction Phase			Once in every three months (except monsoon season) during construction phase		
		Operation Phase			Once in season except monsoon season for initial 2 years		

MSIH = Meghalaya Skills Innovation Hub, MSSDS = Meghalaya State Skills Development Society, PIU-2 = project implementation unit 2, TSA = technical support agency,
Source: Site Visit Findings, Stakeholder Consultation, Desktop Analysis

[20] The BoQs are part of contractor's responsibility. Any additional BoQs can be met from the provisional sum under the civil works (?) contracts on actual basis.

Summary of Site- and Activity-Specific Plans as per EMP

133. **Table 22** summarizes site- and activity-specific plans to be prepared as per EMP tables.

Table 22: Site- and Activity-Specific Plans/Programs as per EMP

To be Prepared During	Specific Plan/Program	Purpose	Responsible for Preparation	Responsible for Implementation
Pre-Construction phase	Environmental monitoring program as per detailed design	Indicate sampling location, methodology and parameters	PMU, PIU-2, PMC and DSC, TSA (SSCM)	Contractor
Pre-Construction phase	List and maps showing utilities to be shifted	Utilities shifting	DSC and PIU-2 during preliminary design and preconstruction phase, TSA (SSCM)	Contractor
Pre-Construction Phase	Contingency plan	Mitigate impacts due to interruption of services during utilities shifting	Contractor	Contractor
Pre-Construction	Chance finds protocol	Address archaeological or historical finds	PIU-2, PMU and PMC, TSA (SSCM)	Contractor
Pre-Construction Phase	List of pre-approved sites for construction camp, stockpiles, and waste disposal sites	Location/s for construction camp, areas for stockpile, storage and disposal for minimization of impacts	PMC, PMU, DSC and PIU-2, TSA (SSCM)	Contractor
Pre-Construction phase	Waste/Spoil management plan	Mitigate impacts due to waste generation	Contractor	Contractor
Pre-Construction phase	Spill prevention and containment plan	Mitigate impacts of accidental spills of oil, lubricants, fuels, concrete, and other hazardous materials	Contractor	Contractor
Pre- construction phase	Asbestos Management plan safe operating procedure	To mitigate impacts due to handling of asbestos containing materials if encountered accidently during the construction	Contractor	Contractor
Construction phase	Traffic management plan	Mitigate impacts due to transport of materials and project related traffic movement	Contractor	Contractor
Construction phase	Health and Safety (H&S) plan	To comply with IFC EHS Guidelines on Occupational health and safety	Contractor	Contractor
Construction phase	Erosion control and re-vegetation plan	Mitigate impacts due to erosion and vegetation removal at project sites	Contractor	Contractor
Construction Phase	Environmental Monitoring Program Implementation	To check efficacy of mitigation measures	PMC, PMU, and DSC, PIU-2, TSA (SSCM)	Contractor

To be Prepared During	Specific Plan/Program	Purpose	Responsible for Preparation	Responsible for Implementation
Operation Phase	Maintenance of sub- project site landscape, and plantation and environmental monitoring program	To maintain plantation and to carry out environmental monitoring to check environmental conditions at site	MSSDS	MSSDS

DSC = design and supervision consultants, EHS = environmental, health, and safety, EMP = environmental management plan, IFC = International Finance Corporation, MSSDS = Meghalaya State Skills Development Society, PIU-2 = project implementation unit 2, PMC = project management consultants, PMU = project management unit, SSCM = Supporting Human Capital Development in Meghalaya, TSA = technical support agency.
Source: Site Visit Findings, Stakeholder Consultation, Desktop Analysis

134. During the construction phase, the contractor will prepare a traffic management plan and support from DSC and local traffic and transport department**.**

D. Institutional Arrangement and Capacity Building

135. In addition to the primary objective of skills enhancement of the local youth, the MSIH will also raise capacity about environmental conservation among trainees, implementing agencies, and contractors during construction through onsite capacity building training programs. Environmental awareness among the local communities will be taken up during stakeholder consultations. The project will have the chance to build environmental protection capacity for the above-mentioned stakeholders. For the trainees, topics on the environment and climate change will be included in their course curriculum finalized by the Technical and Vocational Education and Training (TVET) team.

136. The Environmental Specialists at PMC and DSC will provide the basic training required for environmental sensitization. Specific modules customized for the available skill set will be devised after assessing the capabilities of the Training Program members and the project's requirements. The training would cover basic principles of environmental assessment and management, mitigation plans and programs, implementation techniques, monitoring methods and tools. The proposed training program along with the frequency of sessions is presented in **Table 23** below.

Table 23: Training Modules for Environmental Management

Program	Description	Participants	Duration	Training Conducting Agency
A. Pre-Construction Stage				
Sensitization Workshop on Environment	Introduction to Environment: environmental assessment and social due diligence requirements in the project, Regulatory Clearances, and permission requirements in the project, and EMP Implementation, Introduction of ADB SPS 2009, and ADB Guidelines on Environmental considerations in planning, design and implementing projects	MSSDS officials, Environmental specialist of PMC, DSC and other engineering staff associated with the MSIH PIU-2 staff, PMU staff, officials of C&RD and contractor technical staff, TSA (SSCM)	½ Working Day	Environmental Specialist of the PMC
Session 1	Environmental impacts due to MSIH Shillong in construction and operation phases, pollution generation activities during pre-	All PIU-2 staffs, and MSSDS, TSA (SSCM) Staff associated with	½ Working Day	Safeguards Specialist of the PMC

Program	Description	Participants	Duration	Training Conducting Agency
	construction and construction phases Environmental Management, Environmental Mitigation Provisions in the Contract, Implementation Arrangements, Methodology of Assessment Good engineering practices to be integrated into contract documents	MSIH Shillong project site		
B. Construction Stage				
Session 2	**Roles and Responsibilities**- Roles and Responsibilities of Implementing Agencies officials, associated contractors and consultants towards protection of environment. Implementation Arrangements for EMP and environmental monitoring during construction phase	Engineers and staff of line departments of GoM, PIU-2, PMC, PMU, TSA (SSCM), MSSDS and contractor technical staff	½ Working Day	Safeguards Specialist of the PMC/DSC
Session 3	Monitoring and Reporting System	Engineers and staff of implementing agencies, PMU/PIU (including the environmental specialist), TSA (SSCM) and contractor technical staff	¼ Working Day	Safeguards Specialist of PMC/DSC

C&RD = community and rural development, DSC = design and supervision consultants, EMP = environmental management plan, GOM = Government of Meghalaya, MSIH = Meghalaya Skills Innovation Hub, MSSDS = Meghalaya State Skills Development Society, PIU = project implementation unit, PMC = project management consulting, PMU = project management unit, TSA = technical support agency, SSCM = Supporting Human Capital Development in Meghalaya.
Sources: Site Visit Findings, Stakeholder Consultation, Desktop Analysis

E. Environmental Budget

137. Most of the mitigation measures require the contractor to adopt good site practices, which should be part of their normal procedures already, so there are unlikely to be major costs associated with compliance. The other mitigation measures such as infrastructure cost for workers' camp, dust suppression measures, etc. will be part of construction cost and this has been confirmed by the technical team. Only those items not covered under budgets for construction (environmental testing) are included in the IEE budget. The IEE costs include mitigation, monitoring and capacity building costs. The summary budget for the environmental management costs for the MSIH project site is presented in **Table 24.**

Table 24: Environmental Management and Monitoring Costs (₹)

Monitoring Component	Rate (₹)	Amount (₹)	Source of Fund
Pre-Construction and Construction Phase			
Air Quality - one location at MSIH construction site, thrice a year (one sample preconstruction and 9 samples during construction phase; total 10 samples)	10,000	100,000	Contractor

Monitoring Component	Rate (₹)	Amount (₹)	Source of Fund
Water Quality - one ground water sample from MSIH construction site thrice a year (one sample preconstruction and 9 samples during construction phase; total 10 samples)	10,000	100,000	Contractor
Noise Quality - one location at MSIH construction site, thrice a year (one sample preconstruction and 9 samples during construction phase; total 10 samples)	3000	30,000	Contractor
Training for capacity building of stakeholders	Covered in the consultancy cost of DSC and PMC		
Construction of rainwater harvesting structure	Construction RWH is a BoQ item and included in the construction cost		Contractor
Occupational safety and health measures at camp and construction site	Covered in the construction cost of contractor		Contractor
Total Construction Phase Monitoring Cost (A)		**230,000**	Contractor
Operation & Maintenance Phase			
Air Quality – at MSIH building, thrice a year for initial 2 years (3 samples per annum, total 6 samples)	10,000	60,000	PMU and MSSDS
Water Quality - one ground water sample from MSIH site, thrice a year for initial 2 years (3 samples per annum, total 6 samples)	10,000	60,000	PMU and MSSDS
Noise Quality- one location at MSIH building, thrice a year, for initial 2 years (3 samples per annum, total 6 samples)	3000	18,000	PMU and MSSDS
Total O&M Phase Monitoring Cost (B)		**138,000.00**	PMU and MSSDS
Total Cost (A+B)		**368,000.00**	
Contingencies @ 5 %		**18,400.00**	
Total Budgeted Cost		**386,400 (Say 400,000)**	

BoQ = bill of quantities, DSC = design and supervision consultants, MSIH = Meghalaya Skills Innovation Hub, O&M = operation and maintenance, PMC = project management consulting.
Sources: Site visit findings, stakeholder consultation, desktop analysis.

F. Environmental Monitoring and Reporting

138. The Project Director will be the Focal Point for all issues related to environmental safeguards and grievance redressal. The environment specialists in the PMC and DSC will guide and advise the Project Director, MSSDS, (PIU-2) and the PMU in all environmental safeguard related matters. The PMU with the assistance of PMC and DSC will monitor EMP implementation during construction phase. They will work with PIU-2 to ensure that the EMP is implemented effectively. They will also handle the grievance redress mechanism.

139. During the operation phase PMU with assistance of MSSDS-PIU-2 will also submit semi-annual reports informing the Project director about the environmental safeguards implementation and compliance. This semi-annual report preparation will continue till the project completion report is issued by ADB. Monitoring reports will be posted on MSSDS website.

140. ADB will review project performance against the EA's commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the Project's risks and impacts. Monitoring and supervising of environmental safeguards will be integrated into the project performance management system. ADB will monitor projects on an ongoing basis until project completion.

VIII. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Process For Consultations

141. This project site is in an open area in New Shillong Township under development by the NSTDA. There is no habitation (residential area/village) within 500 m (NIFT at 500 m distance) except a TB Hospital constructed as COVID-19 Centre at 300 m and this hospital is not in operation currently. Particularly, regarding environmental impacts, the project site will have minimal environmental impacts as discussed in the previous sections of the IEE report.

142. During the preparation of this IEE, consultations have been held with the officials of the Meghalaya State Skills Development Society, Department of Planning, DSEL, IIM Shillong, etc. and local population near the site as well as caretaker TB hospital officials.

143. The process of consultations was taken up, as an integral part of the project site design and environmental assessment, in accordance with ADB Guidelines and following objectives:

- To educate the public, especially potentially impacted or benefited communities, individuals and stakeholders about the proposed project site activities.
- To familiarize the people with technical and environmental issues of the project site for better understanding.
- To solicit the opinion of the communities and individuals on environmental issues and assess the significance of impacts due to the proposed development.
- To foster co-operation among officers of EA and IAs, the community and the stakeholders to achieve a cordial working relationship for smooth implementation of the sub- project and
- To identify the environmental issues relating to the proposed activity.

144. During the consultations it was opined that the project will certainly address the market-oriented skilling gaps in the state and equip the youth with competitive skills. It will also foster Entrepreneurship by supporting the growth of startups and small businesses and help to establish a culture of creativity and innovation. The participating officials and line agencies assured themselves to provide full support to the project and expected its timebound execution. The dates of consultations and stakeholders consulted have been summarized below in **Table 25**. The views, comments and suggestions of stakeholders and their incorporation in project design are presented in **Table 26.** The records of consultations (list of participants with signatures) and consultation photographs are given in **Annex 2.**

Table 25: Dates and Stakeholders Consulted

Sl. No.	Stakeholders Consulted	Dates of Consultations
1	Commissioner & Secretary Planning, Investment Promotion and Sustainable Development Department, DSEL members, PMU, PIU-2, officials of MSSDS, Planning Department,	24 February 2024
2	Local population and TB Hospital caretaker officials	10 April 2024

DSEL = Department of School Education & Literacy, MSSDS = Meghalaya State Skills Development Society, PIU-2 = project implementation unit 2, TB = tuberculosis.
Source: Site Visit Findings, Stakeholder Consultation

145. Most of the suggestions of stakeholders have been taken care in the project design.

Table 26: Summary of Stakeholder Consultations at Institutional Level

Sl. No.	Place and date	Consultations held with	Issues discussed	Outcome of discussions and consideration in project design and Implementation
1	Conference Room, Meghalaya Secretariat, Shillong, 24/02/2024	Commissioner & Secretary Planning, Investment Promotion and Sustainable Development Department, DSEL members, PMU, PIU, officials of MSSDS, Planning Department,	Discussion on Project Plan and design, ADB procedures and timelines.	The TA consultants provided an overview of the Meghalaya Skills and Innovation Hub project site. It was informed that the sub project will help to create dynamic skills and innovation eco system in Meghalaya. The strategy of the project site is to: • Enhance Skills: Equip youth with the skills needed for today's local, national & global economy. • Foster Entrepreneurship: Support the growth of startups and small businesses. • Cultivate Innovation: Establish a culture of creativity and innovation. This will rest on 4 pillars of skilling initiatives: partnerships, incubate, accelerate and foster entrepreneurship. A concept plan of the MSIH was also presented. It was discussed that gaps related to lack of quality aspirational skills training, low provision of long-term skills courses (over 6 months), Skills training not anchored to wage employment and non-availability of Labor Management System (LMS) and labor market information shall be addressed through the proposed MSIH sub project. The timelines of the project and way forward was discussed. The indicative organizational structure was discussed. Discussion was also held on the ADB procedures related to procurement, safeguards and gender aspects. The TA consultant explained the environmental compliance requirements in the design, preconstruction construction and operation phase. The participants suggested that while finalizing the courses for skill development, local requirements for skill building and training needs should be considered. For proper awareness, a publicity campaign should be taken up so that the local youth benefit. The MSSDS member told the participants that their suggestion is noted and will be considered in the planning/DPR of MSIH. The Chairman directed the MSSDS team to expedite the project site

Sl. No.	Place and date	Consultations held with	Issues discussed	Outcome of discussions and consideration in project design and Implementation
				document and suggested all stakeholders/ line agencies to provide their full support in the project. The line agencies and present stakeholders including IIM representatives appreciated the project and assured to provide full support to the project.
2	Near MSIH Project site 10 April 2024	Locals	Discussion of project site features, environmental issues and mitigation measures, project layout, etc.	The locals were informed about the project site features and broad environmental impacts and mitigation measures. The environmental specialist requested the locals to provide the suggestions. The locals welcomed the project and were happy to know about the development in their area. They told them there is no local village or residential area near MSIH site. The nearest habitation is NIFT hostel and institute at an aerial distance of 500m although TB Hospital is closer (at 300 m distance), but it is not functioning. It was used at a COVID-19 Centre during COVID Pandemic for treatment and isolation. The locals suggested necessary measures for soil erosion should be taken. The environmental specialist replied that soil erosion measures have been taken up in the project site design. The locals were requested to provide suggestions to mitigate environmental impacts. The locals suggested that any surplus cut and waste should be handled properly during the implementation. The environmental specialist replied that any excess material/waste will be disposed of as per prevailing laws and at the site(s) approved by the Meghalaya Pollution Control Board. Further, maximum cut is likely to be consumed in the fill works of retaining wall. The locals requested that they should be employed during the construction. The environmental specialist replied that contractors once mobilized will consider if job requirements meet the qualification of interested local people.
3	TB Hospital near MSIH site (about 300 m aerial distance)	TB Hospital Caretakers Officials	Discussion of project site features,	The environmental specialist explained the project features, broad environmental impacts and requested

Sl. No.	Place and date	Consultations held with	Issues discussed	Outcome of discussions and consideration in project design and Implementation
	10 April 2024		environmental issues and mitigation measures, project layout, etc.	the officials to provide their comments and suggestions for the project. The officials welcomed the project and informed that the hospital is not in operation, and it was used as COVID-19 hospital/isolation centre. The environmental specialist explained that it is about 300 m from the access road to the MSIH site so no vehicular air emissions and noise impacts pertaining to vehicular movement pertaining to construction traffic are anticipated. Further, aerial distance of hospital is also 300 m from the MSIH site so noise and air impacts from the construction traffic are not anticipated. The TB Hospital officials requested for the faster implementation so that locals can benefit for the better employment. There were suggestions specific to environmental safeguards such as plantation and landscaping and energy conservation. The environmental specialist replied that both suggestions have been noted and will be conveyed to the design team.

ADB = Asian Development Bank, COVID = corona virus disease, DPR = Detailed Project Report, DSEL = Department of School Education & Literacy, MSSDS = Meghalaya State Skills Development Society, NIFT = National Institute of Fashion Technology, PIU-2 = Project Implementation Unit 2, TA = Technical Assistance, TB = tuberculosis.
Source: Site Visit Findings, Stakeholder Consultation

146. The land allocation document of the MSIH site is in Annex 3.

B. Future Consultation and Information Disclosure

147. To ensure continued public and stakeholder participation in the project site life cycle, periodic consultations and focus group discussion shall be continued. A grievance redressal mechanism has been formed within the PIU and at PMU Level to register grievances of the people regarding technical, social, and environmental issues. This participatory process will ensure that all views of the people are adequately reviewed and suitably incorporated in the design and implementation process. Further, to ensure an effective disclosure of the project site proposals to the stakeholders and the communities in the vicinity of the individual project site location, meaningful consultations shall be carried out throughout the project duration.

Information disclosure

148. The electronic version of the IEE will be placed on the official website of the DOL/MSSDS, Planning, Investment Promotion and Sustainable Development Department and the website of ADB after approval of the documents by the GoM and ADB. On demand, any person seeking information can refer to a hard copy of the complete IEE document from the office of the PMU and PIU (Meghalaya State Skill Development Society (MSSDS), Grove Site Building, 3rd Floor, Keating Road, Shillong, East Khasi Hills, Meghalaya – 793001, Tel. No- +91-364-2502243, Email id: skills-eg@gov.in), on a written request and can also get the report photocopied by paying the

cost, if required. The Executive Summary of IEE report and EMP will also be disclosed in English and local language (Khasi, Garo) at MSSDS/PMU website.

C. Grievance Redress Mechanism

149. The ADB SPS 2009 mandates the establishment of a project-specific, responsive, and culturally appropriate grievance redress mechanism (GRM) that is readily accessible for receiving and facilitating the resolution of environmental and social safeguards-related complaints. The GRM is designed to assist affected persons in resolving their grievances by providing an accessible and trusted platform for seeking solutions and relief related to the project's environmental and social safeguards. It is important to note that the GRM will not address matters pending in a court of law. This GRM has been developed with consideration of the existing institutional and administrative framework of the state, incorporating the needs of STs and women, ensuring cultural acceptability and gender sensitivity.

150. The fundamental objectives of the GRM are to: (i) reach mutually agreed solutions satisfactory to both the project and the affected persons for resolving environmental and social safeguards-related issues; (ii) facilitate the smooth implementation of environmental and social safeguards planning documents and prevent delays in project implementation; (iii) promote effective dialogue and open communication between the project and its stakeholders; and (iv) clearly define the roles and responsibilities of the various parties involved in the consideration and resolution of grievances.

Grievance Redress Process

151. The project will implement a four-tier Grievance Redress Committee (GRC) mechanism to address environmental and social safeguards-related complaints. The tiers are as follows:

Tier 1: Project site/Village Level Forum (VLF)

The first tier operates at the Site/Town/Village Level, leveraging the traditional political systems of the major tribal groups. The VLF will consist of the village headmen, who is supported and trusted by the villagers. The composition of this forum will mirror traditional structures like the Dorbar Shnong, Elaka Dorbar, or Nokma Mela'a. The village headmen can seek the assistance of the following:

- **Project site Head:** Co-chairs the VLF and serves as Member Secretary.
- **Monitoring Officers/Staff:** Provides guidance and assistance in grievance redressal.
- **Environmental, Social, and Gender Safeguard Experts of PMC and DSC:** Offers expertise and support.
- **Contractors/Vendors/Training Providers:** Directly addresses the complaints.

Tier 2: District Level Forum (DLF)

The second tier operates at the District Level, where grievances that cannot be resolved at the village level are escalated. The DLF will consist of:

- **Deputy Commissioner:** Chair of the DLF.
- **District Planning Officer:** Serves as Member Secretary.
- **Safeguards Focal(s):** Responsible for addressing specific grievances.
- **Subject-Matter Experts:** Officers nominated based on the nature of the grievance.
- **PIU Representative:** Represents the Project Implementation Unit.
- **Project site Heads/Representatives:** Contributes to resolving issues.
- **Environmental, Social, and Gender Specialists of PMC and DSC**
- **Contractors/Vendors/Training Providers:** Engages directly with the complainant to resolve issues.

Tier 3: Project Implementation Unit Level Forum (PIULF)

The third tier is at the Project Implementation Unit (PIU) level. The PLF will address grievances escalated from the District Level. The PLF will consist of:

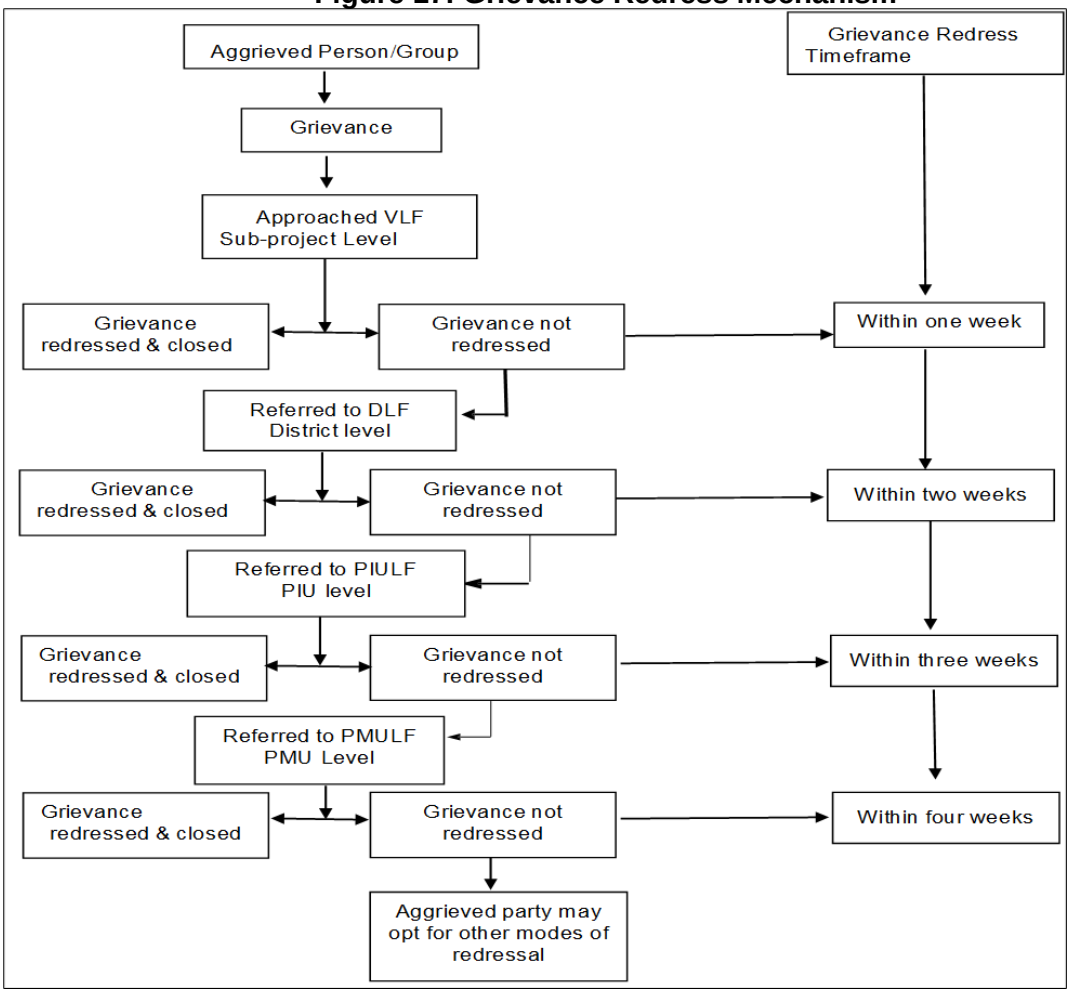
- **Chairperson/Team Leader of PIUs:** Leads the forum or delegates a representative.
- **PMU Representative:** Acts as a liaison between the PIU and PMU.
- **Safeguards Focal(s) at PIU Level:** Manages grievance resolution within the PIU.
- **Public Grievance Officer:** Oversees public grievance handling within the department.
- **District Level Forum Representative:** Ensures consistency in grievance handling.
- **Monitoring Officers/Staff of PIUs:** Provides ongoing support.
- **Environmental, Social, and Gender Specialists of PMC and DSC**
- **Contractors/Vendors/Training Providers:** Addresses issues directly with complainants.

Tier 4: Project Management Unit Level Forum (PMULF)

The final tier operates at the PMU level, dealing with grievances that cannot be resolved at the lower tiers. The PMULF will comprise:

- **Project Director:** Serves as the Chair of the forum.
- **PMU Officials:** Constitute the core members of the GRC at this level.
- **Safeguards Focal(s) at PMU Level:** Oversees grievance resolution at the PMU.
- **Additional Project Director:** Acts as the Member Secretary.
- **PIU Representatives:** Ensures coordination between PIU and PMU.
- **Contractors/Vendors/Training Providers:** Engages directly with the complainant.
- **Other Members:** May include nominated representatives of the Environmental, Social, and Gender Experts from PMC and DSC.

Figure 17: Grievance Redress Mechanism



Source: ADB consultation with PIUs and PMU.

Grievance Record Keeping

152. Records of all grievances received will be maintained by PIUs and reported to the Social Safeguards Focal in the PMU for further consolidation. These records will include the contact details of the complainants, the dates the complaints were received, the nature of the grievances, agreed corrective actions and their implementation dates, and the outcomes. The number of grievances recorded, resolved, and their outcomes will be disclosed at the PIU office by the Social Safeguards Focal. A summary of this information will also be included in the semi-annual safeguard monitoring reports submitted to ADB. All GRC meeting deliberations and decisions will be recorded and made available for public reference. If ADB is involved in grievance resolution, it will maintain records of its proceedings and disclose them to all parties engaged in the hearings. All costs associated with GRC meetings, consultations, communication, reporting/information dissemination and resolutions will be borne by the project. Complainants will not be charged any fees for these services.

Key Elements of the GRM Under the Project

153. The project GRM includes the following key elements and procedures to ensure satisfactory functioning:

154. **Grievance Registration Process:** Grievances can be registered in person or through a letter addressed to the Chairperson of the GRC. Before registering a complaint or query, a procedural step will assess its eligibility and verify that the issues raised fall within the scope of the GRM. Complaints or queries may be submitted in various forms, from verbal communications by mobile phone to formal written complaints, or through the grievance box installed in the PIU offices. They can be submitted directly by affected person or via third parties. All grievances, regardless of their source or form, will be accepted by the focal points at the respective level and registered in a grievance register. The registration form will be available to the public, and a sample grievance registration form is provided in Appendix 6.

155. **Redressal Durations and Disclosure Procedures:** The GRM will be publicly advertised and promoted to stakeholders. The GRM will specify the expected timeframes for acknowledgment, response, and resolution of grievances. To ensure community awareness, the GRM will be publicized through IEC campaigns, materials, and wall writings. The response time for the GRC is set at a maximum of four weeks, covering all four levels. A quorum of sixty percent attendance of committee members at all levels will be required. For site and district-level GRCs, participation of community members and representatives of STs and IPP implementing agencies will be mandatory. The PIU will also ensure that Display Boards with GRM information are installed at the site, with support from civil works contractors. The GRC will convene meetings as grievances are received, with the Chairperson responsible for organizing these meetings.

156. **Transparency and Good Governance:** For transparency, community members will be selected as GRC members at the site level. Grievances that cannot be resolved at the PIU or PMU level, or where the complainant is not satisfied with the decision, may be referred to the Commissioner and Secretary, Planning Department. Consultative meetings and the distribution of leaflets to STs will be conducted to educate them about the GRM and its escalation process, encouraging their use when necessary. The PMU will also ensure a mechanism is in place to address grievances from laborers and staff deployed at project sites by Contractors.

157. **Confidentiality.** The complainant's confidentiality will be strictly maintained by limiting access to complaint details to authorized personnel only, storing physical records in locked cabinets or secure rooms with restricted access, and redacting personal identifiers (such as names and contact details) from documents and reports shared outside the immediate complaint handling team.

158. **Feedback to the complainant.** The PIU will be responsible for ensuring that decisions regarding complaints received (at any level) are reported back to the aggrieved party with an acknowledgment of the same. The PIU will maintain records of this, which will be available for review by PMU.

159. **Costs.** The PIU will cover the costs involved in resolving the complaints (meetings, consultations, communication, and reporting/information dissemination), while the PMU will handle costs related to further action on intensified grievances.

Court of Law

160. Despite the project's GRM, an aggrieved person shall have access to the country's legal system at any stage. This access can run parallel to the GRM process and is not dependent on its outcome.

ADB's Accountability Mechanism

161. The person(s)/aggrieved party who are, or may, be adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The accountability mechanism provides an independent forum and process whereby people can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, the affected person(s)/aggrieved party should first make a good-faith effort to solve their problems by working with the ADB South Asia operations department including the India Resident Mission.

IX. FINDINGS AND RECOMMENDATIONS

162. The proposed MSIH does not involve any interventions in and around the natural and cultural heritage destinations and has less significant (direct and indirect) environmental impacts. The proposed project site is expected to provide skill development to local youth as per modern industry requirements, support the growth of startups and small businesses and establish a culture of creativity and innovation. This will help in getting employment to the trained skilled youth within the country and abroad.

163. This IEE has identified impacts on water, air and noise during construction and operation period and has defined mitigation measures. Those mitigation measures will be implemented and monitored during the project site's execution. The overall environmental quality of project site surroundings will not be affected because of operating the MSIH as appropriate mitigation measures have been planned for the identified adverse impacts during the project lifecycle.

164. The specific management measures laid down in the IEE will effectively address any adverse environmental impacts due to the project site. The effective implementation of the measures proposed will be ensured through the building up of capacity towards environmental management within the PMU and PIU-2 at the MSSDS supplemented by the technical expertise of Environmental Safeguards Specialists of the DSC and PMC. Further, the environmental monitoring program prepared to check the efficacy of mitigation measures will provide adequate opportunities towards course correction to address any residual impacts during the project lifecycle.

X. CONCLUSIONS

165. Based on the IEE, it is expected that the proposed MSIH will have only localized, temporary, and less adverse environmental impacts. These can be easily mitigated through adequate mitigation measures and regular monitoring during the design, construction, and post construction phases of the project site. Environmental impacts on water, air quality and noise levels during civil works and operation phase will be appropriately monitored and adequately mitigated. This report has not identified any significant adverse environmental impacts that are

irreversible, diverse, or unprecedented. Based on the findings of the IEE, the classification of the project site as Category “B” is confirmed. No further special study or detailed EIA needs to be undertaken to comply with ADB SPS (2009).

166. The project site has less than 20,000 sq.m built-up area and environmental clearance is not applicable as per environmental impact assessment (EIA) notification 2006 and its amendment thereof.

167. This draft IEE with EMP has been prepared based on preliminary design and shall be included in the bidding and contract documents. The required budget for EMP implementation will be included in the contract amount. This IEE will be updated based on final design and submitted to ADB for review and disclosure. No work can commence until the final IEE is approved by ADB and provided to the contractor, and until the SEMP is approved by the PMU/PIU. The draft and updated IEE reports, including EMPs, will be disclosed on ADB website as per ADB’s SPS, 2009 requirements.

Annex 1: Rapid Environmental Assessment (REA) Checklist and Asbestos Screening Tool

Rapid Environmental Assessment (REA) Checklist: General

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Safeguards Division (SDSS), for endorsement by Director, SDSS and for approval by the Chief Compliance Officer.

(ii) This checklist focuses on environmental issues, concerns, and includes an Asbestos Screening Tool. To ensure that social dimensions are adequately considered, refer also to ADB's: (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:	Supporting Education and Skills Development Facility —Project Preparation Support for Supporting Human Capital Development in Meghalaya Phase 2 **Sub Project: Meghalaya Skills and Innovation Hub (MSIH), Shillong**
Sector Division:	SG-HSD

Screening questions	Yes	No	Remarks
A. Project siting Is the project area adjacent to or within any of the following environmentally sensitive areas?			
Cultural heritage site		√	There are no international/national/ state notified cultural heritage sites located within or adjacent to the proposed sub project site. Nearest Archaeological Survey of India (ASI) protected monument from the proposed site is Manipur Memorial (distance: 7.6 Km).
Legally protected area (core zone or buffer zone)		√	Based on consultation with PIU-2 and site visit, the proposed project site is not in any such area. The nearest legally protected area (Nongkhyllem Wildlife Sanctuary) is 31 km from the MSIH site.
Wetland		√	There is no Ramsar site (as per Ramsar convention) within 10 km aerial distance from the proposed sub project site. However, being in the hilly terrain, there are a few small and seasonal streams present nearby (especially carrying rainwater). Riat Khwan - Umiam Lake India located at ~6.3km from proposed project site towards NW direction.
Mangrove		√	Not applicable as the proposed site is far away from marine or estuarine ecosystem.
Estuarine		√	Not applicable as the proposed site is far away from marine or estuarine ecosystem.
Special area for protecting biodiversity		√	Riat Khwan - Umiam Lake, India Key Biodiversity Area (KBA) is located at ~6 Km from proposed sub-site towards NW direction.

Screening questions	Yes	No	Remarks
Potential environmental impacts Will the project cause:			
impairment of historical/cultural areas; disfiguration of landscape, or potential loss/damage to physical cultural resources?		√	Not applicable as there are no government notified cultural heritage sites within or adjacent to the proposed sub project site (the nearest Manipur Memorial at 7.6 km). However, a change in land use has been anticipated as the built-up area will be developed at the site, which is a green field.
disturbance to precious ecology (e.g., sensitive, or protected areas)?		√	There are no protected natural habitat areas (like sanctuary, national parks etc.), and reserved/ protected forest, etc. located close to the proposed project site. No disturbance to the precious ecology is anticipated. The nearest notified Wildlife Sanctuary (Nongkhyllem Wildlife Sanctuary) is 31 km from the MSIH site.
alteration of surface water hydrology of waterways resulting in increased sediment in streams affected by increased soil erosion at construction sites.		√	No impact on water hydrology of waterways is anticipated as no alteration of watercourse is envisaged.
deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?	√		Soil erosion and surface runoff may occur during construction phase; however, the impact is likely to be short term. The contractor of the project site shall make necessary arrangements for processing of muddy water like filtering and sedimentation, and direct discharge to surface water bodies shall be prohibited. There is no surface water stream or River near MSIH site. The nearest River is Umiam at about 6 km. Improper waste management and poor material handling during construction phase may deteriorate surface water quality. Also surface runoff may cause siltation of the waterbodies. However, this will be prevented through implementation of effective mitigation measures included in the EMP (such as preparation of solid waste management plan, septic tank with soak pit at workers' camp, storage, and handling of chemicals such as paints and solvents as per material safety data sheets and on impervious surface).
increased air pollution due to project construction and operation?	√		This is anticipated during construction phase primarily. The sources of dust and air emission anticipated during site preparation (excavation-leveling-earthwork) activities, movement of trucks transporting materials to the site, machinery use, DG Sets etc. But these vehicles/machineries are required to undergo emission tests in compliance with regulatory norms. During operation phase, occasional emission from usage of DG set is envisaged. Impact due to gaseous emission and dust generation will be adequately mitigated by adopting measures. These will be included in the EMP.

Screening questions	Yes	No	Remarks
noise and vibration due to project construction or operation?	√		Since site preparation activities are required, generation of noise is anticipated due to excavation/site leveling works, and operation of construction machinery. In addition to that, movement of construction vehicles and operation of construction equipment may further contribute to noise. No requirement of blasting is anticipated and hence vibration issue is not anticipated. The terrain in its current form will be utilized for proposed MSIH. The noise impacts are expected to be minimal as there are no settlements near the MSIH site (non-operating TB hospital at 300 m and NIFT educational institute at 500m). During operation, limited increase in noise level is anticipated due to movement of vehicles to and from proposed Facility (Also Refer Table-17, sl. no. 15 for mitigation measures).
involuntary resettlement of people (physical displacement and/or economic displacement)?		√	The land identified for construction is unencumbered; no human settlements are within the periphery of the project site boundary.
disproportionate impacts on the poor, women and children, indigenous peoples, or other vulnerable groups?		√	Not anticipated as the New Shillong Township Development Agency (NSTDA) is the custodian of the land concerned. The site is encumbrance free ant not being used (permanently and/or temporarily) by any community like poor, women and children, indigenous peoples, or other vulnerable groups.
poor sanitation and solid waste disposal in construction camps and work sites, and transmission of communicable diseases (such as sexually transmitted infections and HIV/AIDS) from workers to local populations?	√		Poor Sanitation quality at the site (including Contractor's camp, if any) could affect the hygiene or aesthetic of immediate vicinity due to wastewater releases, improper solid waste management. These are potential sources of vector-borne diseases. The project would need to provide measures to avoid or minimize this impact, such as following the mandatory waste disposal through government authorized collection services and treatment of wastewater generated by construction camp. The wastewater from the camp shall be diverted to a septic tank followed by a soak pit to avoid any negative impacts. In case migratory laborers are involved and construction camps are created for the project, the possibility of transmission of communicable diseases cannot be ruled out. During the project implementation the DSC and PMC environmental specialists carry out sensitization programs and HIV and AIDS awareness programs will also be undertaken. These measures are included in the EMP (Refer Table-17, sl. no. 15 for mitigation measures).
creation of temporary breeding habitats for mosquitoes and rodents that may transmit diseases.	√		This is anticipated during the construction phase as mentioned above. In addition to that, during operation phase, similar kind of condition

Screening questions	Yes	No	Remarks
			may occur if adequate solid waste management is not ensured, or wastewater is discharged untreated. These impacts can be adequately mitigated by adopting measures included in the EMP. The mitigation measures included in the EMP are diversion of wastewater at the camp site to the septic tanks and proper collection, segregation, and disposal of waste from the camp site (Refer Table-17, sl. no. 5 for mitigation measures).
social conflicts if workers from other regions or countries are hired?	√		In case migrant laborers are involved and construction camps are created for the project, the possibility of transmission of communicable diseases and possibility of having conflict with locals cannot be ruled out. These impacts can be adequately mitigated by adopting mitigation measures. These measures will be detailed the EMP. To mitigate these impacts adequate social infrastructure at the construction camp is planned and the project site is of small nature, so a large workforce is not anticipated.
large population influx during project construction and operation that causes an increased burden on social infrastructure and services (such as water supply and sanitation systems)?	√		Based on the understanding, the project will not require many laborers who will move to the proposed site area. Engaging local labor will be a priority under the project. Although the project may recruit a limited number of migrant workers, in this case the contractor shall provide water supply, source of cooking fuels, accommodation and adequate access to proper hygiene and sanitation conditions. Therefore, this project site might not cause significant burden to the infrastructure such as the water supply and sanitation during construction phase. During the operation however, an influx of students, teaching staff, non-teaching staff are anticipated (total population anticipated around 250). However, the social infrastructure and services are less likely to be impacted as this is a planned development and provisions to meet the excess demand of social and physical infrastructure has been considered by the project proponent and competent authorities.
risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	√		This is anticipated during the construction phase. During construction phase, it is envisaged that Occupational health and safety (OHS) risk will primarily be associated with various mechanical activities and improper management of waste and effluent which may create an unhygienic environment for the workers. Therefore, adequate mitigation will be necessary to mitigate OHS risks. These measures will be detailed in the EMP. No radiological hazards are anticipated at the site during the construction or operation phases.
risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as	√		Fuel, paints and other chemicals normally used for building development will be used during construction phase. In addition to that, gaseous emission-dust generation-increased noise level

Screening questions	Yes	No	Remarks
explosives, fuel, and other chemicals during construction and operation?			due to various construction activities and material transportation, accidental spill of material/oil etc. may expose the community to risk will be minimized by adopting site specific mitigation measures. As mentioned in the above row, improper management of waste and effluent may also get local community exposed to health and safety risks. These impacts can be adequately mitigated by adopting measures included in the EMP (Refer Table-17 sl. no. 10 for mitigation measures). No explosives are planned to be used during construction or operation.
community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation, and decommissioning?		√	No significant impact is anticipated as the project site is planned in the greenfield area and will have restricted access to locals.
generation of solid waste and/or hazardous waste?	√		The municipal waste will be collected and disposed of as per the prevailing regulations. In addition to that, Hazardous waste during construction and operation phase could be due to used oil generated from DG sets and used oil containing clothes not disposed appropriately. The sludge envisaged to be generated during operation phase is considered hazardous waste. Management measures as per national and international guidelines will be adopted as part of the EMP.
use of chemicals?	√		Fuel, paints and chemicals normally used for building development will be used during construction phase. Management measures as per national and international guidelines will be adopted as part of the EMP.
generation of wastewater during construction or operation?	√		This is anticipated during the construction and operation phases of the project. Wastewater (sewage) generated from labor camp may contaminate project surrounding area if not managed/ treated/ disposed properly. Wastewater during operation is envisaged in the form of sewage and effluent. This needs to be adequately treated prior to discharge in drainage network or surface water bodies. Management measures as per national and international guidelines will be adopted as part of the EMP.

ASBESTOS SCREENING TOOL

Screening Questions	Yes*	Maybe*	No	Remarks *For those with answers of YES and, document the potential likelihood of asbestos being encountered.
Does the proposed project involve, or potentially involve, any of the following activities that are commonly associated with asbestos use:				
• Construction/commissioning of a new asset?	√			This is a greenfield project site, and the project proposes to construct the skills and innovation hub on vacant parcels of land.
• Refurbishment/demolition of an existing asset?			√	This is a greenfield project. Refurbishment / demolition not anticipated.
• Post-disaster response, involving reconstruction, repair, or removal of damaged assets?			√	Not applicable.
• Maritime activities?			√	Not applicable as proposed project is not in coastal regulation zones.
• Water supply, sanitation, wastewater, sewerage, or water hygiene initiatives?	√			Developing such utility facilities within facility premises is envisaged.
• Earthworks, remedial activities, or solid waste management?	√			Earthwork will be involved but chances of finding asbestos during excavation are low since the site is greenfield. Provisions of surveying for existing utilities/ water pipeline/ sewer line etc. in consultation with the local utility bodies and preparation of asbestos protocol as per international good practices and ADB published guidelines in the event asbestos encountered accidently will be included in the EMP.
• Power, telecommunications, or energy supply infrastructure?	√			Power supply infrastructure within facility premises is envisaged as a part of project intervention. In the transformers at the electric sub-station PCB free oil shall be used.
• Maintenance, demolition, transportation, or disposal of wastes associated with the above activities.	√			Demolition work is not anticipated as the project site will be greenfield in nature. However, transportation, handling, and disposal of waste (including hazardous waste during construction and operation phase) will be needed.

Note: If you answered YES or MAYBE to the above questions, assume that the project is likely to encounter asbestos as a direct or indirect result of project-related activities and proceed to the TOOLKIT FOR SCREENING

Annex 2: Photographs and Attendance Sheets of Consultations

A. Stakeholder Consultation Photographs at PIU Level

Project Director Providing Suggestions

View of Stakeholder Consultations Layout plan and site features Discussion

Another View of Stakeholder Consultations

B. Attendance Sheet

Stakeholder Consultation

Project 46166-003: Supporting Human Capital Development in Meghalaya-II

Dated: 24 Feb 2024 **Package/Location: Construction of MSIHs, Shillong**

Sl. No.	Name	Organization	Phone Number	Signature
1.	Mark Lyngdoh	D.S.E.L.	9774486198	
2.	A. G. Lyngdoh	DSEL	9774593689	
3.	TEIDIK LYNGDOH	TJIM Shillong	9633392848	
4.	K. HYNNIEWTA	JF. Secy, Plg		
5.	Barry Lyngdoh	Project Manager PIU3.	9856024237	
6.	Dennis Khonshing	Asst. Dir. DECT.	7005870677	
7	Aditya Sen	PRIME	9900866133	
8.	B. Khongwir	MSSDS	7005692637	
9.	A. Kharbudon	MSSDS	9774022438	
10.	B. M. Rani	MSSDS	—	
11.	D. Syiem	Planning	9612409457	
12.	S. Rani	D.SE.L	98180-73642	
13.	Dr. Vijay Kumar	IAS, Commissioner & Secretary, Planning Dept.		
14.	HARSHIT SAXENA	PPTA Team	9312329291	
15.	komal	PPTA Team	9873282326	
16.	Anugrah	PPTA Team	9818725026	
17.	Yashpal Malik	PPTA Team	9015040458	
18.	Swati Sharma	PPTA Team	9718575053	

19.	Johnny Edward	PPTA Team	9940148407	
20.	Shreeniras Verma	PPTA Team	9811224458	
21.	Hitansh Jishtu	PPTA Team	9805-772880	
22.	Suman Sarkar	PPTA Team	9830318386	
23.				
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C. Local Level Stakeholder Consultations Photographs

Discussion with TB Hospital caretaker Officials

Another View of Discussion with TB Hospital Officials

Stakeholder Discussion with local community- Environmental Specialist Explaining Project

Another View of Consultations at Site

Environmental Specialist Answering queries of Stakeholder Consultations

D. Local Level Stakeholder Consultations Signature Sheet

Stakeholder Consultation

Project 46166-003: Supporting Human Capital Development in Meghalaya-II

Dated: 10 April 2024 **Package/Location: Construction of MSIH, Shillong** (MSIH Site)

Sl. No.	Name	Organization	Phone Number	Signature
1	Kitbok Lyngdoh	Local	—	[illegible]
2	Shandrawell	Local	—	[illegible]
3	Bidahun Khariv	Local	—	[illegible]
4	Jakmen Kharie	Local	—	J. Kharie
5	Indari Sohtun	Local	—	I Sohtun
6	M. Nongsiej	Local	—	M. Nongsiej
7	Yusufali	Local	883724808	[illegible]
8	Bhabat	Local	8730885189	[illegible]
9	Shreenivasan	ADB PPTA Consultant	9811224458	SL
10	Vijan Sarkar	Local	8170885655	Bijan Sarkar
11	Jagannath	Local	—	[illegible]

Annex 3: Land Allocation Document of the MSIH Site

NEW SHILLONG TOWNSHIP DEVELOPMENT AGENCY (NSTDA)
RAITONG BUILDING, SECRETARIAT HILL: SHILLONG-793001

No. NSTDA/P/15/2015/99 Dated Shillong, the 15th February 2024

From:- Shri. E. Kharmaiki, I.A.S.,
Director, Urban Affairs
Cum
Member Secretary,
New Shillong Township Development Agenc.

To,

Shri. Ram Kumar S, I.A.S.,
Executive Director,
Meghalaya State Skill Development Society,
Shillong.

Sub:- **Provision of Coordinates for Land Allocation to the Meghalaya State Skill Development Society, Labour Department, Government of Meghalaya, for the Meghalaya Skills & Innovation Hub Construction.**

Ref: **No. MSSD/ADB 2/315/2019(4) Dtd Shillong, 07.02.2024.**

Sir,

With reference to the above, I have the honour to provide information on the particulars required by your office as follows:-

1. A map showing the Coordinates of the land prepared by this office is enclosed below. The Plot number of the land is issued after formalities of handing/taking over/Execution of lease agreement are completed.

2. This is the land acquired by the Government in Urban Affairs Department and presently under the Custodian of the New Shillong Township Development Agency, the land is an open land with no existing forests around.

3. NSTDA is engaging its own In-house Consultant to take up the survey of all the Government lands at New Shillong Township. You are requested to approach Survey of India (SOI) for further details, if required.

Further, it may be mentioned that the premium of the land as fixed by NSTDA @ Rs. 35 Lakhs per acre for societies which is to be deposited to NSTDA prior to formalities of handing/taking over of the land and execution of lease agreement, after obtaining approval of NSTDA committee headed by the Chief Secretary to the Government of Meghalaya.

It may also be informed that NSTDA does not issue lease for a period of **99 years** but for a period of **30 years** only to all the Departments allotted with land at New Shillong Township

This is for your kind information.

Yours Faithfully

Enclosed: As Stated

Receipt No. 114
Dated 16/02/2024

Member Secretary
New Shillong Township Development Agency,
Meghalaya, Shillong.

GOVERNMENT OF MEGHALAYA
URBAN AFFAIRS DEPARTMENT

****

No. UAU. 49/2020/Pt/ Date 15th November 2023

LETTER OF UNDERTAKING

This is to certify that Urban Affairs Department hereby agree to lease 5 acres of land at New Shillong Township, free from all encumbrances for a period of 99 years, to the **Meghalaya State Skill Development Society (MSSDS), Labour Department, Government of Meghalaya** for the explicit purpose of constructing a Skill Park and an Innovation Hub.

Smti. W.A.M. Booth, IAS,
Joint Secretary to the Govt. Meghalaya
Urban Affairs Department

FORMAT FOR SEMI ANNUAL MONITORING REPORT

Environmental Monitoring Report

Semiannual Report {Insert Number}
Reporting Period {From Month Year to Month Year}
Date {Month Year}

IND: Title of the Project
{Example: India: Supporting Human Capital Development in Meghalaya (Phase 2)}

Prepared by {Consultant and/or Implementing Agency} for the {Executing Agency} and for theAsian Development Bank

Environmental Safeguard Monitoring Report

{Red text serves as guide for report preparation, please delete it when the report is finalized}

TITLE PAGE

LIST OF ABBREVIATIONS {All abbreviations used in the report should be listed here as well as being spelt out in full the first time they appear in the report}

TABLE OF CONTENTS

EXECUTIVE SUMMARY {Maximum two-page summary following table like the sample below, if necessary cross reference the relevant section of the main report for details to keep summary succinct}

Project Name	
Executing Agency	
Implementing Agency	
Environment Safeguards Categorization	
Environment Safeguards Documentation	EARF/EIA/IEE/Existing Facilities CAP/EMP
Project Stage Obtained	Design/Pre-Construction/Construction/Commissioning/O&M
Detailed Design Required Post-Approval	Yes/No _ if yes include remarks on status of design progress (%)and if more than one design package, provide details if any differences between the status
Contract(s) Awarded	Yes/No _ if more than one contract package, provide details
Bidding Document(s) Include EMP Cleared by ADB	Yes/No _ if more than one contract package, provide details if any difference between the status
Contract(s) Awarded Include EMP Cleared by ADB	Yes/No if more than one contract package, provide details if any difference between the status
National Environment, Health and Safety Clearance(s) Obtained	Yes/No/NA provide details if any clearances are outstanding or there is any difference between the status of contract packages,use NA if any clearances not yet required
Contractor(s) Given Access to Site	Yes/No if more than one contract package, provide details if anydifference between the status
Construction Progress (%)	If more than one contract package, provide details if any difference between the status
Unanticipated Impacts including Change of Scope or Design	Yes/No if yes, provide brief details with how the IEE and EMPupdated as required
Number of Site Inspections and Audits Undertaken by Environment Safeguards Staff in Reporting Period	
Corrective Action Required from Previous Reporting Period	Yes/No/NA use NA if this is the first project reporting period
Outstanding Corrective Action this Reporting Period	Yes/No/NA if yes, provide bulleted summary of the key actions still required, use NA if the response to above is No or NA
Non-Compliances Recorded this Reporting Period	Yes/No if yes, provide bulleted summary of the key non-compliances recorded
Corrective Action Required	Yes/No if yes, provide bulleted summary of the key actions to be taken in response to non-compliances including timeline andbudget

Number of Health and Safety Incidents	Provide brief details including how they were responded to
GRM Functional	Yes/No briefly elaborate on set up if differs to description in IEE/EMP
Number of Unresolved Grievances from Prior Reporting Period	
Number of Grievances Received in Reporting Period	
Number of Grievances Resolved this Reporting Period	
Number of Grievances Still Outstanding	Provide brief details with timeline for resolution
Number of Grievances referred to Court of Law	Provide brief details
Number of Grievances referred to the Accountability Mechanism	Provide brief details

1.0 Introduction

2.0 Brief Project Description

{Maximum two pages to succinctly convey who the executing and implementing agencies are, the project outputs, construction works involved, details of contract packages, details of construction camps and other related facilities, national and ADB environmental safeguards project categorizations, and the environment safeguard documents (dates) applicable to the project}

{Include maps and plans showing the project site locations and project area of influence}

{Include table and/or organogram of environmental safeguards staffing and relationships between executing and implementing agencies, consultants, contractors, subcontractors, lenders, etc.}

3.0 Project Progress Status and Implementation Schedule

{Describe the implementation stage reached (design, pre-construction, construction, commissioning or O&M) and the % progress, main project activities and milestonesachieved during the reporting period, including bidding documents issued and contracts awarded during the reporting period etc. No need to repeat progress information included in previous monitoring reports if no change, cross reference the previous monitoring reportsif needed}

{Highlight any unanticipated impacts in relation to change in the project scope, locations of components, construction methods, and/or implementation schedule during the reporting period, if none confirm this.}

{Highlight any changes in the project organization and environmental safeguards staffing during the reporting period, if none confirm this}

{Report on any unanticipated impacts and updates to IEE/EMP that were required during the reporting period, status of delivery of documents, required amendments, consultation and disclosure undertaken etc.}

{The project Gantt chart may be included}

{Include a simplified table like the sample below to report progress}

Project Component/Stage	Target Completion Date {Revised Target Date, if delayed}	Progress Status {not yet started; ongoing; completed}	Percent Completed	Remarks
Component (construction phase)	*Example for reporting period Jul-Dec 2024*			
Contract award •	31 Jan 2022	Completed	100%	Contract awarded to XYZ contractor, copy of EMP included
Construction (site clearance, earthworks, civil works, installation of equipment, …) •	31 Mar 2023 (original target completion was 31Dec 2012)	Ongoing	85%	There was a delay in the delivery of equipment….

4.0 Compliance to National Regulations and International Agreements

{Status of compliance and further action to ensure ongoing compliance; if there is partial or no compliance recommendations for corrective action are required. Provide explanations of any instances where the requirements of regulations or agreements were breached along with detailsof responses taken to rectify the breach once identified. Include all the applicable National Regulations and International Agreements following the sample table below}

National Regulation or International Agreement	Compliance Requirements under the Regulation or Agreement including any Environmental Clearances Required	Compliance Status {complied; partially complied; not complied; still ongoing or n/a at current stage of the project}	Remarks {provide details (evidence) to show how compliance was achieved; or explain the corrective action to be taken if there was non-compliance including timeline and budget}

5.0 Compliance to Environmental Covenants from the ADB Loan Agreement

{Status of compliance and further action to ensure ongoing compliance; if there is partial or no compliance recommendations for corrective action are required. Provide explanations of any instances where covenants were breached along with details of responses taken to rectify the breach once identified. Include all the applicable Loan Agreement covenants on environment following the sample table below}

Schedule #, Para. #	Covenant	Compliance Status {complied; partially complied; not complied; still ongoing or n/a at current stage of the project}	Remarks {provide details (evidence) to show how compliance was achieved; or explain the corrective action to be taken if there was non-compliance including timeline and budget}

6.0 Compliance to Environmental Assessment and Review Framework

{Status of compliance and further action to ensure ongoing compliance; if there is partial or no compliance recommendations for corrective action are required. Provide explanations of any instances where tasks allocated to the executing or implementing agency and any consultants have not been undertaken along with details of responses taken to rectify the situation once identified. Include all applicable organizations with responsibility for environmental safeguards following the sample table below}

Organization	Tasks	Compliance Status {complied; partially complied; not complied; still ongoing or n/a at current stage of the project}	Remarks {provide details (evidence) to show how compliance was achieved; or explain the corrective action to be taken if there was non-compliance including timeline and budget}
Executing Agency			
Implementing Agency			
Consultants…			
Contractors			

7.0 Compliance to Contract

{Status of compliance and further action to ensure ongoing compliance; if there is partial or no compliance recommendations for corrective action are required. Provide explanations of any instances where tasks allocated to the contractor have not been undertaken along with details of responses taken to rectify the situation once identified. Include all contract packages and provisions relating to environment, health and safety management following the sample table below}

Contract Package	Contract Provisions	Compliance Status {complied; partiallycomplied;	Remarks {provide sufficient details (evidence) to show how compliance was achieved; or

		not complied; still ongoing or n/a at current stage of theproject}	explain the corrective action tobe taken if there was non-compliance including timelineand budget}
Package 1	Clause xx: Environment Protection	Partially complied	Provide details, if given in EMP compliance table just refer the table
Package 2	Clause xx EMP	Partially complied	Provide details, if given in EMP compliance table just refer the table
Package 3….			

8.0 Compliance to Environmental Management Plan and Corrective Action Plan (if any)

{With reference to the EMP (design, pre-construction, construction or operation as applicable in a particular reporting period) of the project, include a table following sample table below with the compliance status during the reporting period, with sufficient details (evidence) to show how compliance was achieved, or corrective action to be taken if there was non-compliance including timeline and budget}

{Flag if previous environmental monitoring report(s) included corrective action plan, if it did details of that corrective action plan should be incorporated into the EMP table and compliance status reported}

{Provide explanations of any instances where performance standards were temporarily exceeded during the reporting period, along with details of any response taken to rectify the exceedance once identified, even if at the end of the reporting period the project is deemed as being compliant}

{Copies of clearances, SEMP/CEMP, construction method statements, and other documentation produced in accordance with EMP during the reporting period should be included as an appendix}

Item #	Environment Management Measures	Prior Corrective Action, if any	Compliance Status {complied; partially complied; not complied; still ongoing or n/a at current stage of the project}	Remarks {provide sufficient details (evidence) to show how compliance was achieved; or explain the corrective action to be taken if there was non-compliance including timeline and budget}

Item #	Management measures as per CAP drawn as part of audit of existing facilities, if any	Prior Corrective Action	Compliance Status {complied; partially complied; not complied; still ongoing or n/a at current stage of the project}	Remarks {provide sufficient details (evidence) to show how compliance was achieved; or explain the corrective action to be taken if there was non-compliance including timeline and budget}

9.0 Environmental Safeguard Capacity Building

{With reference to the EMP capacity development plan summarize trainings for the executing and implementing agencies, contractors, and subcontractors, and other activities completed. Include as appendices the training agenda, attendance sheets, andphotos. If no trainings or other activities in reporting period, please confirm. Copies of training records related to EMP during the reporting period should be included as an appendix}

Trainings	Number and Position ofParticipant/s	Location/s and Date/s	Remarks

10.0 Environmental Safeguard Inspection and audits

{Site inspections and audits completed summarize the number and type of site visits, persons involved, the issues covered, and status of compliance with them, the number ofnon-compliance notices given out to the contractor as a result of the site visit, and the checklists/reporting format used (sample of checklists and reports to be included as an appendix)}

Date	Type and Purpose of Visit	Location/s Visited	EA, IA, Consultant Staff Participating	Remarks

11.0 Quantitative Environmental Monitoring

{Environmental monitoring results - summarize summarize in a table the reporting period's quantitative monitoring activities and data obtained in accordance with the Environmental Monitoring Plan (EMP) of the project. Provide explanations of any instances where performance standards were exceeded along with details of responses taken to rectify theexceedance once identified}

Typically, this section will include the results of:Noise and vibration surveys, Water quality surveys Air quality surveys, Flora and fauna surveys etc.

{Indicate the monitoring locations using a map or plan, dates, times, duration of samples as applicable, weather conditions as applicable, parameters measured, equipment used,standards, tests, and limits used etc.}

{Corrective actions with timeline and budget are required to ensure any exceedances will be prevented in the future}

{Graphs can be used in this section to show trends; however, large tables of data or multiple graphs should be attached as an appendix.

{Calibration and QA certifications of monitoring equipment and laboratories analyzing samples should be included as an appendix}

12.0 Occupational and Community Health and Safety Monitoring

{Health and safety monitoring results - summarize the reporting period's health and safety activities and data obtained in accordance with the Environmental Monitoring Plan (EMP) of the project. Provide explanations of any instances where performance standards were exceeded along with details of responses taken to rectify the exceedance once identified}

{Corrective actions with timeline and budget are required to ensure any exceedances will be prevented in the future}

{Include the occupational and community trainings/drills/inspections conducted during the reporting period following the sample table below. Include as appendices the training/drill/inspection agenda, attendance sheets, and photos. If no trainings/drills/inspections, please confirm}

Trainings/Drills /Inspections	Number and Position of Participant/s	Location/s and Date/s	Remarks
Example: Fire Drill	50 Laborers	Construction Camp, 15 Aug 2018	Participants safely evacuated the site …

{If there was any near-miss or accident, illness, or other occupational or community health and safety related incident during the reporting period (or a previously reported incident with ongoing rectification) report following the sample table below. Include as appendices work safety checklists, incident reports, and other relevant supporting documents. If no incidents, please confirm}

	Number and Position of Person/s Involved	Location/s and Date/s of Incident	Detailed Description of Incident- Attach root cause analysis report	Time-bound Corrective Action
Fatality				
Non-fatal Injury (Lost Time)				
Non-fatal Injury (Minor)				
Near-miss				
Illness				
Other Incidents				

13.0 Meaningful Consultation and Grievance Redress

{Meaningful consultation report on any ongoing consultation undertaken, and main issues raised by consultees; detailed consultation records should be included as an appendix. If no ongoing consultation, please confirm}

Date		Sub Project and Venue			
Sl.no	Participants Name	Occupation	Gender	Issues raised by participants	Response Given by EA/PMC/Contractors

{Include a brief description of the GRM, provide a flowchart, list of grievance redress committee members and any trainings they have received}

{If there was any grievance or complaint, regardless informal or minor, during the reporting period (or previously reported complaint with ongoing rectification) provide the corrective action taken following the sample table below. Detailed grievance records and response reports should be included as an appendix}

Complainant's name & contact details	Date/s of Complaint	mode of communication to EA/ADB	Description of Complaint	Resolution details	Date of resolution	Mode of communication to complainant

14.0 Compliance to recommendations of Previous reporting period EMR

Non-compliance identified in previous EMR	Corrective Action recommended in previous EMR	Compliance status	Continued noncompliance, if any (please add this to the current EMR's recommendation as continued NCs)

15.0 Conclusions and Recommendations

{Summarize the project's environmental performance during the reporting period based on the previous sections and, if any non-compliance identified, provide detailed recommendations including responsibilities, timeliness and budget for the preparation and completion of correctiveaction}

{If non-compliance is major or not readily addressed then a separate corrective action plan may need to be prepared. For minor and readily addressed non-compliances the corrective action plan can be incorporated into this final section of the environmental monitoring report following the sample table below}

Non-compliance	Corrective Action to be Taken	Responsibility	Timeline	Budget

APPENDIXES

Photographs {Include relevant photographs of the project site and project area of influence taken during the reporting period to provide evidence of compliance and/or non-compliance. Foreach photo, provide a caption with description of what it illustrates, accurate location, and date taken}

Supporting Documents
{E.g. Maps and plans, Sample checklists and reports Clearances and documentation Training records, Detailed monitoring data, laboratory results etc.Calibration and QA certificates, Consultation records, Meeting agendas and attendance records,Grievance records, Environment, health and safety reports etc}

SAMPLE DAILY MONITORING SHEET FOR CONTRACTORS

NAME OF PROJECT
Contractor Monitoring Sheet

Name of Project site: _____
Location: _____
Supervising PIU: _____
Contractor: _____
Contractor EHS Supervisor (or equivalent): _____
Date of monitoring: _____

Summary of Findings

Monitoring Item	Status	Remarks
1. Compliance with Local Permit Requirements	(Secured / Application Submitted / Not Applicable)	
Location/zoning permits		
Permit to construct		
Building permit		
Transport / hauling permits		
2. Compliance with IEE Requirements	(Approved / Under Preparation / Submitted to PMU for Approval / Not Applicable)	
Site-specific EMP (SEMP)		
Corrective Action Plan, if any		
3. Compliance with SEMP		
Construction Site	(Satisfactory / Needs Improvement / Not Implemented/Not Applicable)	
Conduct of toolbox talk		
Use of PPE		
Rest areas for male and female workers		
Toilets for male and female workers		
Medical kits		
Drinking water supply		
Dust control		
Noise control		
Solid waste management		
Wastewater management		
Chemicals storage (fuel, oil, etc.)		
Siltation or erosion control		
Heavy equipment staging / parking area		
Barricades around excavation sites		
Access to residential houses/shops/businesses		
Traffic routing signages		
Lightings at night		
Trench shoring / landslide protection		
Construction Workers' Camp Site	(Available / Needs Improvement / Not Available / Not Applicable)	
Quarters for male and female workers		
Sleeping utilities (e.g. beds, pillows, blankets, mosquito nets, etc.)		
Power/Electricity supply		
Drinking water supply		

Monitoring Item	Status	Remarks
Toilets for male and female workers		
General purpose water supply (cooking, washing, bathing)		
Cooking facilities and areas		
Solid waste management		
Wastewater management		
Pest control		
4. Implementation of GRM	(Yes / No or None / Under Resolution)	
Complaints		
Complaints resolution		
5. Environmental Quality Measurement	(Passed / Failed / Not Applicable)	
Ambient air quality sampling		
Noise level measurement		
Receiving water quality sampling		

Other Issues:

Attachments:
1. Copies of permits secured, if any.
2. Photos taken at worksites, if any.
(photos attached in previous monitoring sheets should not be used again).
3. Laboratory results of environmental quality measurements, if any.

Prepared by: _____
Name, Designation and Signature

SAMPLE SITE INSPECTION CHECKLIST FOR PMU/PIU

Project: _____ Date: _____

Project site / Location: _____

MONITORING/INSPECTION QUESTIONS		FINDINGS			COMMENTS/ CLARIFICATIONS
1.	Supervision and Management On-Site	Yes	No	NA	
	Is an EHS supervisor available?				
	Is a copy of the SEMP available?				
	Are daily toolbox talks conducted on site?				
2.	The Facilities	Yes	No	NA	
	Are there a medical and first aid kits on site?				
	Are emergency contact details available on-site?				
	Are there PPEs available? What are they?				
	Are the PPEs in good condition?				
	Are there firefighting equipment on site?				
	Are there separate sanitary facilities for male and female workers?				
	Is drinking water supply available for workers?				
	Is there a rest area for workers?				
	Are storage areas for chemicals available and with protection? in safe locations?				
3.	Occupational Health and Safety	Yes	No	NA	
	Are the PPEs being used by workers?				
	Are excavation trenches provided with shores or protection from landslide?				
	Is breaktime for workers provided?				
	How many for each type of collection vehicle is in current use?				
4.	Community Safety	Yes	No	NA	
	Are excavation areas provided with barricades around them?				
	Are safety signages posted around the sites?				
	Are temporary and safe walkways for pedestrians available near work sites?				
	Is there a record of treated wastewater quality testing/measurement?				
5.	Solid Waste Management	Yes	No	NA	
	Are excavated materials placed sufficiently away from watercourses?				
	Is solid waste segregation and management in place?				
	Is there a regular collection of solid wastes from work sites?				
6.	Wastewater Management	Yes	No	NA	
	Are there separate sanitary facilities for various types of use (septic tanks, urination, washing, etc.)?				
	Is any wastewater discharged to storm drains?				
	Is any wastewater being treated prior to discharge?				

MONITORING/INSPECTION QUESTIONS		FINDINGS			COMMENTS/ CLARIFICATIONS
	Are measures in place to avoid siltation of nearby drainage or receiving bodies of water?				
	Are silt traps or sedimentation ponds installed for surface runoff regularly cleaned and freed of silts or sediments?				
7.	Dust Control	Yes	No	NA	
	Is the construction site watered to minimize generation of dust?				
	Are roads within and around the construction sites sprayed with water on regular intervals?				
	Is there a speed control for vehicles at construction sites?				
	Are stockpiles of sand, cement and other construction materials covered to avoid being airborne?				
	Are construction vehicles carrying soils and other spoils covered?				
	Are generators provided with air pollution control devices?				
	Are all vehicles regularly maintained to minimize emission of black smoke? Do they have valid permits?				
8.	Noise Control	Yes	No	NA	
	Is the work only taking place between 7 am and 7 pm, weekdays?				
	Do generators operate with doors closed or provided with sound barrier around them?				
	Is idle equipment turned off or throttled down?				
	Are there noise mitigation measures adopted at construction sites?				
	Are neighbouring residents notified in advance of any noisy activities expected at construction sites?				
9.	Traffic Management	Yes	No	NA	
	Are traffic signages available around the construction sites and nearby roads?				
	Are re-routing signages sufficient to guide motorists?				
	Are the excavation sites along roads provided with barricades with reflectors?				
	Are the excavation sites provided with sufficient lighting at night?				
10.	Recording System	Yes	No	NA	
	Do the contractors have recording system for SEMP implementation?				
	Are the daily monitoring sheets accomplished by the contractor EHS supervisor (or equivalent) properly compiled?				
	Are laboratory results of environmental sampling conducted since the commencement of construction activities properly compiled?				

MONITORING/INSPECTION QUESTIONS		FINDINGS			COMMENTS/ CLARIFICATIONS
	Are these records readily available at the site and to the inspection team?				

Other Issues: _____

_____

_____

_____

_____

Prepared by: _____

Name, Designation and Signature

Sample Grievance Registration Form
(to be available in Khasi and Garo)

The Supporting Human Capital Development Project in Meghalaya (Phase II) welcomes complaints, suggestions, queries, and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback. Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

Date		**Place of registration**			
Contact Information/Personal Details					
Name		**Gender**		**Age**	
Home Address					
Place					
Phone Number					
E-mail					
Complaint/Suggestion/Comment/Question Please provide the details (who, what, where and how) of your grievance below					
How do you want us to reach you for feedback or update on your comment/grievance?					

FOR OFFICIAL USE ONLY

Registered by: (Name of Official registering grievance)

Mode of communication: Note/Letter Email Verbal/Telephonic	
Reviewed by: (Names/Positions of Official(s) reviewing grievance)	
Action Taken:	
Whether Action Taken Disclosed:	**Yes**
Means of Disclosure:	