Government of the People's Republic of Bangladesh
Ministry of Local Government, Rural Development and
Cooperatives. Local Government Division

Improving Urban Governance and Infrastructure Program (IUGIP)

Initial Environmental Examination

Sub-Project No: IUGIP/ROHA/UT/01/2023

ROHANPUR PAURASHAVA

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Prepared by:

Updated by: MDS Consultants

Development Design Consultants Limited (DDC)
Resource Planning and Management Consultants (Pvt) Ltd. (RPMC)
Design Planning & Management Consultants Limited (DPM)

CURRENCY EQUIVALENTS
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$ 1.00 = BDT 105.4

ABBREVIATIONS

ADB	-	Asian Development Bank
AFD	-	Agence Francaise de Development
Ap	-	Affective Person
DoE	-	Department of environment
DLI	-	Disbursement Link Indicator
EARF	-	Environmental Assessment and Review
FrameworkECA	-	Environmental Conservation Act
ECC	-	Environmental Clearance Certificate
ECR	-	Environmental Conservation Rules
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Plan
FD	-	Forest Department
GoB	-	Government of Bangladesh
GRC	-	Grievance Redressal Cell
GRM	-	Grievance Redress Mechanism
IEE	-	Initial Environmental Examination
IUGIP	-	Improving Urban Governance and Infrastructure
ProgramLCC	-	Location Clearance Certificate
LGED	-	Local Government Engineering Department
MDSC	-	Management Design and Supervision
Consultant MLGRDC	-	Ministry of Local Government, Rural
Development,Cooperatives		
O&M	-	Operation and Maintenance
PMU	-	Project Management Unit
PPTA	-	Project Preparatory Technical
AssistancePRSP	-	Poverty Reduction Strategy
Paper		
RBL	-	Result-Based Lending
RP	-	Resettlement Plan
SPS	-	Safeguard Policy Statement
ToR	-	Terms of Reference
UGIAP	-	Urban Governance Implementation Action Plan

I. GLOSSARY OF BANGLADESHI TERMS

Crore	-	10 million (= 100 lakh)
Ghat	-	boat landing station
Hartal	-	nationwide strike/demonstration called by opposition
partiesKhal	-	drainage ditch/canal
Khas, khash	-	belongs to government (e.g., land)
Katcha	-	poor quality, poorly built
Lakh, lac	-	100,000
Madrasha	-	Islamic college
Mouza	-	government-recognized land area
Parishad	-	authority (Pourashava)
Pourashava	-	municipality
Pucca	-	good quality, well built, solid
Thana	-	police station
Upazila	-	sub district

WEIGHTS AND MEASURES

Ha	-	hectare
Km	-	kilometer
M	-	meter
Mm	-	millimeter

NOTES

(i) In this report, "$" refers to US dollars.
(ii) —BDT refers to Bangladeshi Taka

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PREFACE

The premises of this Initial Environmental Examination Report (IEE) are the PRS Consultant services presentation of an analysis of data and conclusions, together with its appendices.

While PRS Consultants have been deputed to assist the Paurashava / Executing Agency (EA) for the preparation of the IEE, the responsibility and ownership of the IEE rest with the EA.

The key elements of the IEE Report focus on: Assessment of Compliance Guidelines of Environment Safeguards according to ADB and GoB policy.

N.B This Initial Environmental Examination was prepared by the Project Readiness Services Consultants (PRSC). Subsequently it has been updated by MDS Consultants.

DISCLAIMER

This Initial Environmental Examination (IEE) Report of Rohanpur Paurashava Under Urban Governance and Infrastructure Improvement Program (IUGIP). All the data used to prepare this Initial Environmental Examination (IEE) Report have been collected from the Paurashava Development Plan (PDP). Some of the information's have also been collected from the Paurashava personnel over telephone. Moreover, some information's have been collected by the respective experts of PRS consultant through intensive field visit which have been used in writing this report. If any information or data or any other things coincide with other project documents that are beyond our knowledge and fully coincidental event and we express apology for that.

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EXECUTIVE SUMMARY

1. The Government of Bangladesh (GoB) has undertaken the Urban Governance and Infrastructure and Improvement (Sector) Project (IUGIP) with financial assistance from the Asian Development Bank (ADB); ADB Loan to improve governance and urban service provision in selected 63 Paurashavas. Urban Governance and Infrastructure Improvement Program (IUGIP) with financial assistance from the Asian Development Bank (ADB). As per the requirements of a contract signed with the Local Government Engineering Department (LGED) on 7th September 2021 for "Consultancy Services for Project Readiness Services towards Urban Development (Sector) Project". ADB Loan to improve governance and urban service provision in selected 63 Paurashavas. It would allow prescribed allocation for infrastructure development from the project fund for 2021-22.

2. The overall objectives of the Project are (i) strengthen pro-poor and gender responsive urban governance and improve urban infrastructure and service delivery in 63 Paurashavas in Bangladesh (ii) develop these Paurashavas in an integrated and holistic way both in terms of governance and infrastructure. Featured by improved municipal services delivery, financial sustainability, citizen participation, accountability, inclusiveness, transparency and urban development control (iii) roll out application of governance criteria linked with budget allocation to all Class-A Paurashava in the country

3. **Environmental Assessment and Review Framework (EARF)** was prepared and endorsed by both the funding agencies and GoB to be adopted for implementation of IUGIP. The frameworks specified the screening procedures and the guidelines for identifying the APs, estimating the compensation and assistance to be paid for the losses, grievance redress mechanism, preparation of IEE and the institutional requirements for monitoring the implementation of environmental safeguard aspects of the project. The IEE for roads sub-project of Rohanpur Paurashava has been prepared following the PPTA and updated format.

4. Variety of sub-projects have been undertaken IUGIP, potential environmental impacts of a local nature can be expected and cover a wide spectrum. Accordingly, the criteria for selection or exclusion of sub-projects address concerns related to potential significant or irreversible negative environmental impacts.

5. Potential environmental impacts stem from poor or improper location, planning and design practice. Construction impacts in a local setting and within the local community can be significant, even though of short duration and limited extent.

6. Government of Bangladesh (GoB) law and ADB policy require that the environmental impacts of development projects be identified and assessed as part of the planning and design process, and that action be taken to reduce those impacts to acceptable levels. This is done through the screening/impact assessment process, which has become an integral part of all ADB lending operations, project development and implementation.

7. The objectives of the Road Improvement sub-project are to access and improve the urban environment through - Rehabilitation/Maintenance/Construction of roads and improvement of roads on various locations in Rohanpur Paurashava area.

8. **Categorization:** An environmental assessment using ADB Rapid Environmental Assessment (REA) checklist for roads was conducted and results of the assessment show that the sub-project is unlikely to cause significant adverse impacts. Rohanpur Paurashava road sub-project is classified as Environmental Category B as per ADB SPS as no significant impacts are envisioned. This initial environmental examination has been prepared in accordance with ADB SPS's requirements for environment category B projects and provides mitigation and monitoring measures to ensure no significant impacts because of the sub-project.

9. The project has been classified as environment 'Category B' by criteria in the Environment Policy of the ADB and Environmental Assessment Guidelines (November 2002) as applied by the ADB Urban Development Division, South Asia Department. Category B projects are "judged to have some adverse environmental impacts, but of lesser degree and/or significance than those for category A projects." As a result, "an initial environmental examination (IEE) is required to determine whether or not significant environmental impacts warranting an EIA are likely."

10. As per Government of Bangladesh Environment Conservation Act, 1995 (ECA, 1995) and Environment Conservation Rules (ECR, 2023), most of the sub-project under IUGIP have been categorized as Yellow and Orange. Water treatment plant, water distribution line laying/relaying/extension, solid waste landfill/dumping ground, Slaughter house and bus & truck terminals are in Red category.

11. During the feasibility phase, the PRSC safeguard team could not apply for ECC to DoE. However, another previous phase DoE has issued an Environmental Clearance Certificate (ECC) for Third Urban Governance and Infrastructure Improvement (Sector) Project (IUGIP), Additional Financing vide letter DoE/Clearance/5444/2015/580 dated 22.12.2019.

12. The objectives of the sub-project are (i) the sub-project will facilitate the local people smooth communication and reduce water logging, traffic jam in proposed location.

13. **Sub-project Scope**: The proposed sub-project package is IUGIP/ROHA/UT/01/2022. Implementation of sub-project will involve construction/improvement of 5.180 km road, 3 nos. cross drain and 190 ~~nos. street~~Nos. Street light under the existing network. The proposed sub-project is very essential for the communication of community people and reduces water logging and traffic jam.

14. Considering all the above following steps were adopted by the PRS Consultant's team for Environmental Safeguard compliance –

i. Review of the available Environmental safeguard documents and categorization of the project as per ADB and GoB guidelines.
ii. Separate Consultation with PRS team members, PMU staffs and PIU staffs to explain the importance of the safeguards.
iii. Separate Workshop on safeguard policies for all Municipal Engineers, EE and AE of all the Paurashava under IUGIP
iv. Screening and re-categorization of each and every scheme with the help of REA checklist transect walk and public consultation for individual schemes during visit to individual project scheme sites.
v. Preparation of sector sub-project IEE considering each component of the sub-project.

15. **Implementation Arrangements:** Local Government Engineering Department (LGED) only the executing agency (EA). LGED is responsible for providing support and guidance to Paurashavas concerning performance criteria and Paurashava development planning. However, LGED is the main executing agency and responsible for the implementation activities by establishing a PMU. The participating Paurashavas are the implementing agencies, with a Project Implementation Unit (PIU) within the Paurashava structure. Consultant teams are responsible for (i) detailed engineering design, contract documents preparation and safeguards facilitation; (ii) project management and administration support; (iii) assistance in supervising construction; (iv) strengthening of local governance, conducting required studies/surveys and (v) awareness raising on behavioral change in water, sanitation and solid waste management activities.

16. **Description of the Environment:** Sub-project components are located in Rohanpur Paurashava urban area or in its immediate surroundings which were converted into urban land use for many years ago, and there is no natural habitat left at these sites. There are no protected areas, cultural heritage site, wetlands, mangroves, or estuaries in or near the sub-project location. There are no forest areas within or near Rohanpur Paurashava.

17. **Environmental Management:** An environmental management plan (EMP) is included as part of this IEE, which includes (i) mitigation measures for environmental impacts during implementation; (ii) an environmental monitoring program and the responsible entities for mitigating, monitoring, and reporting; (iii) public consultation and information disclosure; and (iv) grievance redress mechanism. A number of impacts and their significance were reduced through mitigation measures in the preliminary design stage. The EMP will form part of the civil work bidding and contract documents.

18. Locations and sitting of the proposed infrastructures were considered to further reduce impacts. The concepts considered in design of the Rohanpur roads Sub-project are: (i) locating facilities on government-owned land to avoid the need for land acquisition and relocation of people; (ii) prioritizing rehabilitation over new construction using public right of

ways (ROWs), and taking all possible measures in design and selection of site or alignment to avoid resettlement impacts; (iii) avoiding where possible locations that will result in destruction/disturbance to historical and cultural places/values; (iv) avoiding tree-cutting where possible; (v) ensuring all planning and design interventions and decisions are made in consultation with local communities and reflecting inputs from public consultation and disclosure for site selection.

19. PRSC design team integrate a number of measures, both structural and non-structural, to mainstream climate resilience into the Rohanpur Paurashava road sub-project, including: (i) structural protection of facilities of future floods; (ii) location of components where there is no risk of flooding or other hazards and promote more efficient use of Paurashava resources accordingly as per public demand. As a result, some measures have already been included in the sub-project designs. This means that the impacts and their significance have already been reduced.

20. Key construction phase impacts identified and addressed in the IEE include (i) air, noise and vibration impacts due to construction vehicles, equipment and machinery in the vicinity of construction site and inhabited sections; (ii) management of spoils due to excavation for distribution network and civil works; (iii) safety measures during construction; (iv) traffic diversions; (v) management of sites temporarily used for construction activities, including borrow areas, construction camps, etc. and rehabilitation of the sites after completion of temporary use; (vi) impacts on community health and safety hazards posed to the public, specifically in inhabited areas. The debris from the demolition of the existing road at site will be used in the emergency repair, new construction and maintenance of roads in the Paurashava area.

21. In the operational phase, all facilities and infrastructure will operate with routine maintenance, which should not affect the environment. During the construction period environmental impacts will be minimize as the work following the EMP and take proper mitigation measures.

22. Mitigation measures have been developed to reduce all negative impacts to acceptable levels and will be assured through a program of environmental monitoring. The monitoring program will include observations on and off-site, document checks and interviews with workers and beneficiaries. The PMU will submit semi-annual monitoring reports to ADB which will include a detailed review of EMP implementation, including corrective actions taken.

23. **Consultation, Disclosure and Grievance Redress:** The stakeholders were involved in developing the IEE through discussions on-site and public consultation, after which views expressed were incorporated into the IEE and in the planning and development of the sub-project. The IEE will be made available at public locations in the Paurashava and will be disclosed to a wider audience via the ADB and LGED project websites. The consultation process will be continued and expanded during project implementation to ensure that stakeholders are fully engaged in the project and have the opportunity to participate in its development and implementation. A grievance redress mechanism is described within the IEE to ensure any public grievances are addressed quickly.

24. **Monitoring and Reporting:** The PMU, PIU (Rohanpur Paurashava), and Project Readiness and Supervision Consultants (PRSC) will be responsible for safeguard monitoring. The PRSC will submit monthly monitoring reports to PMU, and the PMU will send semi-annual monitoring reports to ADB. ADB will post the semi-annual environmental monitoring reports on its website as part of its disclosure requirements.

25. **Conclusion and Recommendations:** The citizens of Rohanpur Paurashava will be the major beneficiaries of this sub-project. The sub-project will facilitate the local people smooth communication and reduce water logging, traffic jam in proposed location. In addition to improved and maintained environmental conditions, the sub-project will also construct roads improvement infrastructure. Therefore, the proposed sub-project is unlikely to cause significant adverse impacts and net environmental benefits to citizens of Rohanpur Paurashava will be positive. The potential impacts that are associated with design, construction and operation can be mitigated to standard levels without difficulty through proper engineering design provided that the EMP is included in the contract document and its provisions implemented and monitored to their full extent.

26. Based on the findings of the IEE, there are no significant impacts and the classification

of the sub-project as Category “B” is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS, (2009).

II. Introduction

A. Background

1. Bangladesh has a population of approximately 162 million and experienced rapid urbanization with the growth of many secondary towns over the last three decades. About 28 per cent of the total population now lives in urban areas where the population growth rate is much higher than the overall national growth rate. With the present high increase-trend in urban population, it is justifiably anticipated that by year-2020, such population will constitute nearly 40 percent of the national aggregate. One principal cause of such rapid growth is the presence of better opportunities spanning economic, communication, education, health and other social aspects in the urban areas.

2. Urban Governance and Infrastructure Improvement Program (IUGIP)' with financial assistance from the Asian Development Bank (ADB). As per the requirements of a contract signed with the Local Government Engineering Department (LGED) on 7th September 2021 for "Consultancy Services for Project Readiness Services towards Urban Development (Sector) Project". ADB Loan to improve governance and urban service provision in selected 63 Paurashavas. It would allow prescribed allocation for infrastructure development from the project fund for 2021-22. The Paurashavas are:

63 sample Paurashavas: 1) Bandarban 2) Brahmanbaria 3) Banshkhali 4) Chandanaish 5) Nazirhat 6) Raozan 7) Sandwip 8) Faridganj 9) Hajiganj 10) Matlab South 11) Sundarganj 12) Sonagazi 13) Khagrachhari 14) Raipur 15) Ramganj 16) Ramgati 17) Chowmuhani 18) Basurhat 19) Rangamati 20) Bhanga 21) Boalmari 22) Kaliganj 23) Kal-iakair 24) Tungipara 25) Bhairab 26) Hossainpur 27) Pakundia 28) Kalkini 29) Manikganj 30) Munshiganj 31) Mirkadim 32) Araihazar 33) Monohordy 34) Goalanda 35) Naria 36) Modhupur 37) Alamdanga 38) Keshabpur 39) Monirampur 40) Mohespur 41) Bheramara 42) Kumarkhali 43) Gangni 44) Gafargaon 45) Madan 46) Nokla 47) Shariakandi 48) Ro-hanpur 49) Shibganj 50) Nazipur 51) Santhia 52) Bagha 53) Bhabaniganj 54) Charghat 55) Keshorhat 56) Naohata 57) Rangamati 58) Ulipur 59) Patgram 60) Chunarughat 61) Kulaura 62) Moulvibazar and 63) Chatak.

25 Pourashavas Operation and Maintenance (O & M) are selected Pourashavas as- 1) Barguna 2) Pirojpur, 3) Nabinagar, 4) Laksam 5) Laxmipur, 6) Gopalganj,7) Kishoreganj, 8) Rajbari, 9) Chuadanga 10) Benapole 11) Jashore, 12) Magura, 13) Meherpur, 14) Muk-tagacha 15) Netrakona, 16) Sherpur, 17) Chapai Nawabganj, 18) Joypurhat 19) Naogaon, 20) Bera 21) Ishwardi, 22) Shahjadpur, 23) Lalmonirhat, 24) Nilphamari 25) Panchagarh

3. The Local Government Engineering Department (LGED) under the Local Government Division (LGD) of the Ministry of Local Government, Rural Development and Cooperatives (MLGRD&C) and having extensive experience in managing urban sub-projects financed by ADB, will be the executing agencies of the project.

4. Infrastructure sub-projects proposed IUGIP encompass a variety of types of urban infrastructure and services including those shown in Table I.1.

Table II.1: Sub-projects and Components Proposed in IUGIP

Water Supply	Source Augmentation	Deep Tube Wells (Hand Pump)
		Deep Tube Wells (Production Pump)
	Distribution	Piping, Street hydrant, Valves and Fittings
	Treatment	Water Treatment (Iron and Arsenic Removal)
	Storage	Elevated Tank
	System improvement	Repair/Replacement of Lines
		Bulk Water Meters
		Domestic water meter
Sanitation	Community Facility	Community Toilets
	Public Facility	Public Toilets

	Septic tank	Vacuum Units
Solid Waste Management	Disposal/waste collection	Disposal Alternatives
		Neighbourhood Collection
	Waste transfer	Community Storage Bins
		Dump Trucks/Rickshaw
	Waste disposal	Transfer Station
		Access Road to Landfill
		Landfill Facility
		Treatment/Composting
Urban Drainage	Roadway Drainage	Roadside Drains
	Area drainage	Outfall
		Main Drain
		Secondary and Tertiary Drains
		Retention Pond
Urban Transport & communication	Roadway Provision	Bridge Replacement Drainage/Culverts
		Roadway Widening/Resurfacing
Slum	System improvement	Repair/Replacement of Lines
	Community Facility	Community Toilets
	Septic tank	Vacuum Units
Public use facilities	Municipal facilities	Market/Community Centres
		Municipal and Kitchen Markets
		Improvement of Slaughterhouses
		Bus and Truck Terminals

5. The overall objectives of the Project are (i) strengthen pro-poor and gender responsive urban governance and improve urban infrastructure and service delivery in sample 37 Paurashavas in Bangladesh (ii) develop these Paurashavas in an integrated and holistic way both in terms of governance and infrastructure. Featured by improved municipal services delivery, financial sustainability, citizen participation, accountability, inclusiveness, transparency and urban development control (iii) roll out application of governance criteria linked with budget allocation to all Class-A Paurashava in the country.

B. Sub-project Scope

6. The proposed sub-project package is IUGIP/ROHA/UT/01/2022. Implementation of sub-project will involve construction/improvement of 5.180 km road, 3 nos. cross drain and 190 nos. street light under at Rohanpur Paurashava under the existing network. The proposed roads are very essential for the communication of local people.

7. The objectives of the sub-project are the roads improvement infrastructure will facilitate the local people smooth communication and reduce traffic congestion in proposed location.

C. Purpose of the Report

8. The initial environmental examination aims to provide guidance on safeguard screening, assessment, institutional arrangement, and process to be followed for components of the project, where design takes place after Boards approval. This IEE (i) describes the project and its components; (ii) explains the general anticipated environmental impacts and mitigation measures for the sub-projects; (iii) specifies the requirements that will be followed in relation to screening and categorization, assessment, and planning, including arrangements for meaningful consultation with affected people and other stakeholders and information disclosure requirements; (iv) assesses the capability of the project proponents to implement national laws and ADB's requirements, and identifies needs for capacity building; (v) specifies implementation procedures, institutional arrangements, and capacity development requirements; and (vi) specifies monitoring and reporting requirements. Moreover, this IEE is to ensure, in line with ADB EARF, that the roads sub-project, in the entirety of its project cycle, will not deteriorate or interfere with the environmental sensitivity of the project area, but rather improve environmental quality.

D. Categorization

9. A Sector Initial Environmental Examination (SIEE) has been conducted for the overall IUGIP project and the IEEs ~~was~~ were prepared for each of the Paurashava sub-projects individually. The SIEE sought to identify any regional and cumulative impacts that may result from the sector intervention. Cumulative impacts were all in the social or human development sphere~~s~~ of the environment, and all were found to be positive. No direct cumulative or regional potential negative impact of the project activities on environmental resources and values was detected.

10. From the variety of sub-projects undertaken under IUGIP, potential environmental impacts of a local nature can be expected and cover a wide spectrum. In general, these were determined not to be significant or irreversible, and precautionary measures have been taken (and incorporated into guidance, management plans and implementation frameworks) to avoid or reduce them. Even the criteria for selection or exclusion of sub-projects address potential significant or irreversible negative environmental impacts.

11. The ADB has categorized IUGIP project as Category B and following its normal procedure has determined that an IEE will be conducted for each sub-project submission. The impacts of sub-projects will be assessed according to ADB requires the consideration of environmental issues in all aspects of the operations and the requirements for environmental assessment are described in ADB Safeguard Policy Statement (SPS), 2009.

12. IUGIP's ~~the~~ impact will be to improve~~d living~~the living environment in project towns. The outcome of same will ~~be~~ improve~~d~~ municipal service delivery and urban governance in project towns. Project towns are pre-selected 36 towns to be supported in an integrated manner under the project. IUGIP will improve the existing ones and will also provide new municipal infrastructures including (i) roads; (ii) drainages; (iii) water supply system; (iv) solid waste management facilities; (v) slaughterhouses; (vi) markets, community center/auditorium, bus and truck terminals and river ghats; (vii) public toilets and (viii) others such as provision for street lighting and improvement of slums.

13. An environmental assessment using ADB Rapid Environmental Assessment (REA) checklist for roads was conducted and results of the assessment show that the sub-project is unlikely to cause significant adverse impacts. Rohanpur Paurashava road sub-project is classified as Environmental Category B as per ADB SPS as no significant impacts are envisioned. This initial environmental examination has been prepared in accordance with ADB SPS's requirements for environment category B projects and provides mitigation and monitoring measures to ensure no significant impacts because of the sub-project.

E. Scope of this Report

14. The Project requires that any proposed development will require that the laws and regulations of Bangladesh be applied in full. The Project is then subject to approval under the Government of Bangladesh's Environment Conservation Act (1995) (ECA) and Environment Conservation Rules (1997).

15. The IEE report aims to provide guidance on safeguard screening, assessment, institutional arrangement, and process to be followed for components of the project, where design takes place after approval. This IEE:

- describes the project and its components;
- explains the general anticipated environmental impacts and mitigation measures for the sub-projects;
- specifies the requirements that will be followed in relation to screening and categorization, assessment, and planning, including arrangements for meaningful consultation with affected people and other stakeholders and information disclosure requirements;
- assesses the capability of the project proponents to implement national laws and ADB's requirements, and identifies needs for capacity building;
- specifies implementation procedures, institutional arrangements, and capacity development requirements; and
- Specifies monitoring and reporting requirements.

- Moreover, this IEE is to ensure, in line with ADB EARF, that the sub-project, in the entirety of its project cycle, will not deteriorate or interfere with the environmental sensitivity of the project area, but rather improve environmental quality.

16. This report fulfils the requirements of IEE under the provisions of the ECR. The IEE identifies potential environmental and social impacts and issues associated with undertaking the proposed sub-project. It provides an outline of the potential positive and negative impacts because of the Project and proposes suitable mitigation and management measures.

17. The scope of this report and the subsequent IEE is specific to the sub-project. It does not provide any assessment for any other/future developments or activities at the location or anywhere else within Rohanpur town. Should any further development be planned as result of either this sub-project or other related work, additional planning and assessment to the requirements of the GoB must be carried out specifically in relation to that proposed development.

F. Approach and Methodology

18. The primary purpose of the IEE is to investigate and describe impacts of the proposed sub-project to the existing environmental elements. Specifically, the study aims to predict the potential impacts of the project activities and recommend mitigation and abatement measures for impacts (in the pre-construction, construction, after completion of works and operational stages of development) that are considered potentially adverse to the surrounding environment.

19. In general, this IEE intends to:

- Examine and describe the existing status of the various ecological, physical and human related components surrounding the project area;
- Predict the potential significant impacts of the project on the surrounding environment during the pre-construction, construction, after completion of works, operations and maintenance stages and recommend appropriate mitigation and abatement measures; and
- Identify residual impacts of the sub-project and recommend appropriate short-term and long-term management plans.

a. Data Sources of IEE

20. The following documents were used as reference in the preparation of the IEE report:

- Available technical reports from Paurashava and various organizations
- Available laws, rules, regulations, acts, policies from Bangladesh Government websites
- Maps from open sources and various governmental and non-governmental websites
- Data from secondary literatures including books and relevant websites

b. Scoping and Gathering Baseline Data

21. Scoping of issues to be addressed in the IEE was conducted early in the assessment process (i.e. Safeguard team field visit) to collect the appropriate baseline information so that collected and the IEE report/study can focused on the relevant issues needed.

22. The objectives of undertaking the scoping activities were:

- To provide an early link among the implementing agency, the recipient and affected community and the IEE preparer;
- To ensure that the IEE will address only relevant issues and concerns;
- To present the scope of environmental studies, issues and alternatives that requires thorough examination and consideration in the master plan; and
- To ensure complete coverage of potential environmental and social issues that is required under the ADB Environmental and Social Considerations.

G. Structure of This Report

23. Following the ADB SPS 2009, the Report is structured as follows:

Executive Summary

Chapter I Introduction provides the background on the sub-project, purpose of this report, approach and methodology

Chapter II Policy, Legal, and Administrative Framework presents a review of relevant national laws and policies, international environmental obligations, and ADB's environmental requirements, procedure of environmental clearance, environmental categorization

Chapter III Description of the sub-project provides a brief description of the Project, the location, size and need, description of sub-project components

Chapter IV Description of the Baseline Environment includes details on the baseline data for environmental conditions in the sub-project area (current features and conditions, pre-project)

Chapter V Anticipated Potential Project Impacts identifies the potential environmental, economic, and social impacts from pre-construction, construction, after completion of works and operation phase.

Chapter VI Stakeholder Consultation and Information Disclosure discusses the issues raised during the consultations, proposed actions to address them, and the information needed to disclose to the public.

Chapter VII Grievance Redress Mechanism describes the process of addressing complaints

Chapter VIII This chapter includes the environmental management plan that includes description of ~~-~~the impacts of the proposed sub-project on environment and the society ~~is described~~. All of the anticipated potential impacts in pre-construction stage, construction stage, after completion of works and operational stages have ~~-~~been ~~are~~ described ~~here~~in this chapter as well..

Chapter IX This chapter includes the conclusion ~~and~~ along with some recommendations ~~are~~ which have been suggested ~~here~~ about the proposed sub-project.

III. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. Introduction

24. This section of the IEE details the Administrative Framework for the sub-Project, covering national requirements as well as applicable international treaties and conventions. The intent of this section is to lay out the regulatory and non-regulatory performance requirements for all stages of the sub-project. For the purposes of this report, only those regulatory elements directly relevant to the proposed sub-Project will be discussed.

B. Environmental Legislation Framework

a. Overview of the Sub-project Approval Process

25. Key legislation governing the environmental approvals process for the proposed sub-project is the Bangladesh Environment Conservation Act, 1995 (BECA, 1995)[1] and the Environment Conservation Rules (ECR, 1997)[2].

26. According to Rule 5 of the ECR 2023, proposed developments within Bangladesh are classified as one of four categories, as follows:

- Green;
- Yellow;
- Orange; and
- Red

27. These categories define proposed developments according to their potential environmental impact. Section 12 of the ECA states that 'No industrial unit or sub-project shall be established or undertaken without obtaining an Environmental Clearance Certificate from the Director General, in the manner prescribed by the Rules'.

b. Environmental Approval Framework

28. Key milestones in the approvals process are outlined in Figure II.1 These comprise:

- **Project Authorization Letter:** Formal authorization of the Project by the owner is required in order for the environmental approvals process to formally commence.
- **No Objection Certificate (NOC):** A NOC must be received from the Deputy Commissioner (DC) in the sub-project area before the SCC application can be made.
- **Site Clearance Certificate (SCC):** DoE will issue a SCC upon approval of the IEE study (note that the IEE submission is to include the Project Authorization Letter, NOC, and SCC application form). The SCC will include a ToR for the IEE/EIA study, and typically provides authorization for site establishment works to commence.
- **Environmental Clearance Certificate (ECC):** DoE will issue the ECC upon approval of the IEE/EIA study (including associated EMP). The ECC allows project construction to commence, and contains specific approvals requirements for matters such as pollution control and environmental monitoring.

C. National Relevant Policies and Strategies

29. This section summarizes the National Laws and describes the procedure for obtaining environmental permits to allow project implementation. Over the years, the Government of Bangladesh has enacted environmental acts, rules, policies and regulation toward imposing restrictions facilitating minimization / mitigation of likely impacts due to development projects. The most important Act is Environmental Conservation Act, 1995 (ECA, 1995) and Environmental Conservation Rules (ECR, 2023)).

a. National Environmental Policy

30. The National Environmental Policy was adopted in 1992 and is now under revision. It embraces different sectors related to agriculture, forest, power, health, transport, housing etc. The central theme of policy is to ensure protection and improvement in environment. The policy gives a thrust to sustainable development and long-term use of natural resources. The National Environment Policy contains policy statements and strategic options with regard to population and land-use management, management and utilization of natural resources and other socio-economic sectors, as well as the necessary arrangements for the implementation of the policy. The policy enables:

- the country to strike a dynamic balance between population and resources while complying with the balance of ecosystems;
- to contribute to sustainable and harmonious socio-economic development such that, both in rural and urban areas, and well-being in a sound and enjoyable environment; and
- To protect, conserve and develop natural environment.

31. **Relevance to the project -** With regard to the sub-project, the environmental policy aims at prevention of pollution and degradation of resources caused by the roads construction. The policy mentions that Environmental Assessments (EA) should be conducted before projects are undertaken.

b. Environmental Conservation Act (ECA), 1995

32. The ECA is currently the main legislation relating to environment protection in Bangladesh. This Act is promulgated for environment conservation, environmental standards development and environment pollution control and abatement.

33. The main objectives of ECA are:

- Conservation and improvement of the environment; and
- Control and mitigation of pollution of the environment.

34. The main focuses of the Act can be summarized as:

- Declaration of ecologically critical areas and restriction on the operations and processes, which can or cannot be carried out/ initiated in the ecologically critical areas (ECA);
- Regulations in respect of vehicles emitting smoke harmful for the environment;
- Environmental clearance;
- Regulation of industries and other development activities' discharge permits;
- Promulgation of standards for quality of air, water, noise and soil for different areas for different purposes;
- Promulgation of a standard limit for discharging and emitting waste; and
- Formulation and declaration of environmental guidelines.

35. Before any new project can go ahead, as stipulated under the ECA, the project promoter must obtain Environmental Clearance from the Director General (DG), DoE. An appeal procedure does exist for those promoters who fail to obtain clearance. Failure to comply with any part of this Act may result in punishment to a maximum of 5 years imprisonment or a maximum fine of Tk.100, 000 or both. The DoE executes the Act under the

leadership of the DG.

36. The Project will be undertaken in line with the aims and objectives of the Act by conserving the environment and controlling and mitigating potential impacts throughout the drilling program.

- ***Environmental Conservation Act (Amendment 2000)***

37. The Bangladesh Environment Conservation Act Amendment 2000 focuses on ascertaining responsibility for compensation in cases of damage to ecosystems, increased provision of punitive measures both for fines and imprisonment and the authority to take cognizance of offences.

- ***Environmental Conservation Act (Amendment 2002)***

38. The 2002 Amendment of the ECA elaborates on the following parts of the Act:

- Restrictions on polluting automobiles;
- Restrictions on the sale, production of environmentally harmful items like polythene bags;
- Assistance from law enforcement agencies for environmental actions;
- Break up of punitive measures; and
- Authority to try environmental cases.

- ***Environmental Conservation Act (Amendment 2010)***

39. This amendment of the act introduces new rules and restriction on:

- No individual or institution (Gov. or Semi Govt., / Non-Govt. / Self Governing) can cut any Hill and Hillock. In case of national interest; it can be done after getting clearance from respective the department
- Owner of the ship breaking yard will be bound to ensure proper management of their hazardous wastes to prevent environmental pollution and Health Risk
- No remarked water body cannot be filled up/changed; in case of national interest; it can be done after getting clearance from the respective department; and
- Emitter of any activities/incident will be bound to control emission of environmental pollutants that exceeds the existing emission standards.

40. **Relevance to the project -** According to this law no industrial unit or project shall be established or undertaken without obtaining, in the manner prescribed by rules, an Environmental Clearance Certificate (ECC) from the Director General.

c. Environment Conservation Rules, 1997 (Amended in 2002)

41. These are a set of rules, promulgated under the ECA, 1995 and its amendments. The Environment Conservation Rules provide categorization of industries and projects and identify types of environmental assessment required against respective categories of industries or projects. The Rules set:

- The National Environmental Quality Standards (NEQS) for ambient air, various types of water, industrial effluent, emission, noise, vehicular exhaust etc.;
- The requirement for and procedures to obtain environmental clearance; and
- The requirement for IEE and EIA according to categories of industrial and other development interventions.

42. The Environment Conservation Rules, 1997 were issued by the GoB in exercise of the power conferred under the Environment Conservation Act (Section 20), 1995. Under these Rules, the following aspects, among others, are covered:

- Declaration of ecologically critical areas;
- Classification of industries and projects into four categories;
- Procedures for issuing the Environmental Clearance Certificate (ECC); and
- Determination of environmental standards.

43. Rule 3 defines the factors to be considered in declaring an 'ecologically critical area' as per Section 5 of the ECA (1995). It empowers the Government to declare the area as the Ecologically Critical Areas (ECA), if it is satisfied that the ecosystem of the area has reached

or is threatened to reach a critical state or condition due to environmental degradation. The Government is also empowered to specify which of operations or processes may be carried out or may not be initiated in the ecologically critical area. Under this mandate, the Ministry of Environment, Forest and Climate Change (MoEFCC) has declared Sundarbans, Cox's Bazar-Tekhnaf Sea Shore, Saint Martin Island, Sonadia Island, Hakaluki Haor, Tanguar Haor, Marzat Baor and Gulshan-Baridhara Lake as ecologically critical areas and prohibited certain activities in those areas.

44. Rule 5 of the 2023 ECR provides a classification of industrial units and projects into four categories, depending on environmental impact and location. These categories are:

- Green;
- Yellow;
- Orange &
- Red.

45. The categorization of a project determines the procedure for issuance of an Environmental Clearance Certificate (ECC). All proposed industrial units and projects that are considered to be low polluting are categorized under "Green" and shall be granted Environmental Clearance. These are Orange B for work that requires Initial Environmental Examination (IEE) and Red for work that requires full environmental assessment.

46. A detailed description of those four categories of industries has been given in Schedule-1 of ECR'97. Apart from general requirement, for every Red category proposed industrial unit or project, the application must be accompanied with feasibility report on Initial Environmental Examination, Environmental Impact Assessment based on approved TOR by DOE, Environmental Management Plan (EMP) etc.

47. Depending upon location, size, and severity of pollution loads, projects/activities have been classified in ECR, 2023 into four categories: Green, Yellow, Orange, and Red respectively, to nil, minor, medium, and severe impacts on important environmental components (IECs).

48. **Relevance to the project -** In accordance with the Environment Conservation Rules (ECR) of 2023, the sub-Project is classified as Orange Category. But as per SPS 2009 of ADB it requires an Initial Environmental Examination (IEE) to obtain clearance for construction.

d. National Water Policy, 1999

49. The policy aims to provide guidance to the major players in water sector for ensuring optimal development and management of water. The policy emphasizes efficient and equitable management of water resources, proper harnessing and development of surface and ground water, availability of water to all concerned and institutional capacity building for water resource management. It also addresses issues like river basin management, water rights and allocation, public and private investment, water supply and sanitation and water need for agriculture, industry, fisheries, wildlife, navigation, recreation, environment, preservation of wetlands, etc. The policy has several clauses related to the project for ensuring environmental protection.

50. **Relevance to the project -** Clause 4.6b of this policy states that natural depressions and water bodies in major urban areas must be preserved in order to recharge of underground aquifers and rainwater management. Moreover, measures must be taken to minimize disruption to the natural aquatic environment in streams and water channels (Clause 4.9b). In addition, this policy requires each water resources development project or rehabilitation program to give full consideration to environmental protection, restoration and enhancement measures consistent with National Environmental Management Action Plan (NEMAP) and the National Water Management Plan (NWMP) and adhere to a formal environment impact assessment (EIA) process, if required by the Government (Clause 4.12a and clause 4.12b).

e. Other National Legal Instruments

51. The Ministry of Environment, Forests and Climate Change (MoEFCC) prepare the

environmental policies. MoEFCC also has formulated regulation toward clearance of projects from environmental angles based on environmental impact assessment report. The Department of Environment (DoE) is responsible for environmental issues while forest issues are looked after Forest Department (FD). Over the years the MoEFCC has adopted number of legal instruments in the form Acts for the protection and conservation of the environment. Table II.1 summarizes the Environmental Legislation applicable to the sub-project.

Table III.1: Summary of Applicable Environmental Legislations

No.	Environmental Legislation / Act	Objective	Relevance to the Project	Responsible Institution
1	National Environmental Policy, 1992	Ensure that development components do not pollute the environment or degrade resources. It sets out the basic framework for environmental action together with a set of broad sectoral action guidelines.	Restriction on operations which cannot be initiated in ecological critical areas Regulation on vehicles emitting smoke which is harmful to the environment Follow standards on quality of air, water, noise and soil Sets limits for discharging and emitting waste	Ministry of Environment and Forests, and Climate Change
2	National Environmental Management Action Plan (NEMAP), 1995	An action plan to identify key environmental issues affecting Bangladesh, identifies actions for reducing the rate of environmental degradation and improve quality of life.	Sectoral agencies to coordinate with MoEFCC in preparing environmental guidelines	Ministry of Environment and Forests, and Climate Change
3	Environment Court Act, 2000 and subsequent amendments in 2003	Establishment of Environment Court for trial of an offence or for compensation under environmental law, such as environment pollution.	Option to affected persons for grievances related to environment safeguards.	Ministry of Environment and Forests, and Climate Change
4	The Forest Act (1927) and Forest (Amendment) Act (2000)	An act to control trespassing, illegal resource extraction and provide a framework for the forestry revenue collection system;	Requires clearances for any project within forest areas and clearances for any felling, extraction, and transport of forest produce.	Department of Forests
5	National Forest Policy (1994)	To conserve existing forests and bring about 20% of the country's land area under the Forestation Programme and increase reserved forests by 10% per year until 2015	Incorporate tree planting in the subproject Clearance for any felling, extraction, and transport of forest produce	Department of Forests
6	The Bangladesh Wildlife (Conservation & Security) Act, 2012	To conserve and protect wildlife in Bangladesh including designation of protected areas. Protection of wildlife is provided with lists of species with four schedules: first, second, third and fourth schedule. The fourth schedule species have the highest level of protection.	Consultation and necessary permits required if the project would affect the wildlife in the project area.	Department of Forests
7	National Safe Drinking Water Supply and Sanitation Policy of 1998	Ensures access to safe water and sanitation services at an affordable cost	Paurashavas and water sanitation authorities will take actions to prevent wastage of water. They will take necessary steps to increase public awareness to prevent misuse of water Paurashavas shall be responsible	Ministry of Local Government, Rural Development, and Cooperatives

No.	Environmental Legislation / Act	Objective	Relevance to the Project	Responsible Institution
			for solid waste collection, disposal and their management	
8	National Water Act 2013	Ensures Bangladesh water sources are free from any type of pollution. Pollution from water in urban outfalls and reservoirs, e.g. lakes, canals, ponds and ditches may result in amenity losses, fisheries depletion, health problems, fish, and aquatic species contamination.	Secure clearance certificate on water resource development subprojects	Ministry of Water Resources
9	Wetland Protection Act 2000	Advocates protection against degradation and resuscitation of natural water-bodies such as lakes, ponds, beels[3], khals, tanks, etc. affected by man-made interventions or other causes. Prevents the filling of publicly-owned water bodies and depressions in urban areas for preservation of the natural aquifers and environment. Prevents unplanned construction on riverbanks and indiscriminate clearance of vegetation on newly accreted land.	In case of impact on the natural water bodies within the project area	Ministry of Water Resources
10	Bangladesh ~~Labor~~Labour Law, 2006	It is a comprehensive law covering labour issues such as: conditions of service and employment, youth employment, benefits including maternal benefits, compensation for injuries, trade unions and industrial relations, disputes, participation of workers in company's profits, regulation of safety of dock workers, penalty procedures, administration and inspection. This Act pertains to the occupational rights and safety of factory workers and the provision of a comfortable environment for working. It also includes rules on registration of labourers, misconduct rules, income and benefits, health and fire safety, factory plan	Compliance to provisions on employment standards, occupational health and safety, welfare and social protection, labor relations and social dialogue, and enforcement. Prohibition of employment of children and adolescents.	Ministry of Labor and Employment
11	Bangladesh Labor Rules, 2015	Includes rules on registration of laborers, misconduct rules, income and benefits, health and fire safety, factory plan	Contractors to implement occupational health and safety measures Contractor will be liable for compensation for work-related injuries	Department of Labor
12	The Paurashava Act 2009 / Ordinance issued for the amendment of local government (municipality)	Provides guidance for subproject integrated community and workers health and hygiene at the construction and operation and maintenance stages of the project	Coordinate with Paurashava committees on disaster management measures, water and sanitation and waste management	Local Authorities

[3] A beel is a billabong or a lake-like wetland with static water (as opposed to moving water in rivers and canals - typically called khals), in the Ganges - Brahmaputra flood plains of the Eastern Indian states of West Bengal, and Assam and in the country of Bangladesh.

No.	Environmental Legislation / Act	Objective	Relevance to the Project	Responsible Institution
	ordinance, 2009 and 2010; The Paurashava Ordinance, 1977; Municipal Administration Ordinance, 1960			
13	Bangladesh Climate Change Strategy and Action Plan of 2009	Enhances the capacity of government ministries, civil society and private sector to meet the challenges of climate change	Integrate adaptation measures for infrastructures in consideration of extreme climatic events	Ministry of Environment, Forests and Climate Change
14	National Disaster Management Act of 2012	Establishes a framework for managing disasters in a comprehensive way.	Setting-up emergency response procedures	Ministry of Disaster and Relief

D. Applicable International Agreements

52. Aside from the legal framework on environment, Bangladesh is also a party to several international conventions, treaties, and protocols related to environmental protection. The applicable international conventions, treaties, and protocols are described in Table II.2.

Table III.2: International Conventions, Treaties, and Protocols Signed by Bangladesh

Conventions	Years	Ratified/Accessed (AC)/Accepted (AT)/ Adaptation (AD)	Relevance
International Plant Protection Convention (Rome,) & Plant Protection Agreement for SE Asia and Pacific (1999 Revision)	1951	01.09.1978 04.12.1974 (AC) (Entry into Force)	Ensuring that the Project work or construction materials do not introduce plant pests
Convention on Wetlands of International Importance ("Ramsar Convention":1971)	1999	20.04.1992 (ratified)	Protection of significant wetland and prevention of draining or filling during construction
Convention on Biological Diversity, (Rio de Janeiro, 1992.)	1992	05.06.1992	Protection of biodiversity during construction and operation.
Convention on Persistent Organic Pollutants, Stockholm.	2001	In process	Restrict use of different chemicals containing POPs.
United Nations Framework Convention on Climate Change, (New York, 1992.)	1992	15.04.94	Reduction of emission of greenhouse gases.
Convention on Biological Diversity, (Rio De Janeiro, 1992.)	1992	03.05.94	Conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.
Kyoto protocol to the United Nations Framework Convention on Climate Change		21.8.2001 (AC) 11.12.1997 (AD)	Reduction of emission of greenhouse gases.
International Convention for Protection of Birds, Paris	1950	Signed	Protection of the birds in their wild state.
Convention Concerning the Prevention and Control of Occupational Hazards caused by Carcinogenic Substances and Agents, Geneva.	1974	Signed	To protect workers against hazards arising from occupational exposure to carcinogenic substances and agents.
Convention Concerning the Protection of Workers Against Occupational Hazards in the Working Environment due to Air Pollution, Noise and Vibration, Geneva	1977	Signed	Protection of workers' health against occupational hazards in the working environment due to air pollution, noise and vibration.
Convention Concerning Occupational Safety and Health and the Working Environment, Geneva.	1981	Signed	Ensuring occupational health and safety of workers in all branches of economic activity.
Vienna Convention for the Protection of the Ozone Layer, Vienna	1985	02.08.90 (AC) 31.10.90 (entry into force)	Preventing human activities that may have adverse effects on ozone layer.
Convention Concerning Occupational Health Services, Geneva.	1985		Convention Concerning Occupational Health Services, Geneva.
Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal.	1987	31.10.90 (entry into force)	Reduction of the abundance of the substances that deplete the ozone layer in the atmosphere, and thereby protect the earth's fragile ozone Layer.
Convention Concerning Safety in the Use of Chemicals at Work, Geneva.	1990	Signed	Regulating the management of chemicals in the workplaces I order to protect workers from the harmful effects of these substances.
London Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, London.		18.03.94 (AC) 16.06.94 (entry into force)	To strengthen the control procedure and extend the coverage of Montreal Protocol to new substances.
Preparedness, Response and Cooperation (London, 1990.) 30.11.90 United Nations Framework Convention on Climate Change, New York	09.06.92	15.04.94	Achieving stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

Conventions	Years	Ratified/Accessed (AC)/Accepted (AT)/ Adaptation (AD)	Relevance
Convention on Biological Diversity, Rio De Janeiro	05.06.92	03.05.94	Conservation of biological diversity (or biodiversity) and sustainable use of its components.
Agenda 21, UNCED, Rio de Janeiro	1992	Signed	Ensuring sustainable development.
Copenhagen Amendment to the Montreal protocol on Substances that Deplete the Ozone Layer, Copenhagen, 1992	1992	27.11.2000 (AT) 26.2.2001 (Entry into force)	Extending the coverage of Montreal Protocol to new substances
Montreal Amendment of the Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal		27.7.2001 (Accepted) 26.10.2001 (Entry into force)	Controls in the trade of ozone depleting substances and the use of licensing procedures to control the import and export of new, recycled and reclaimed ozone depleting substances.

E. Environmental Categorization and Standards

a. Environmental Category: DoE

53. For the purpose of issuance of Environmental Clearance Certificate, the industrial units and projects shall, in consideration of their site and impact on the environment, be classified into the following four categories: (a) Green; (b) Orange – A; (c) Orange – B; and (d) Red. The industries and projects included in the various categories are specified in sub-rule (1) have been described in Schedule-1. The ECA indicates that all industrial units or projects must obtain a Location Clearance Certificate (LCC) and Environmental Clearance Certificate (ECC) from the Department of Environment (DoE). No industrial unit or project shall be established or undertaken without obtaining environmental clearance from DoE in the manner prescribed by the rules.

54. The environmental category of the sub-project is not listed in Schedule-1 of ECR. However, the construction of roads improvement sub-project is listed in Schedule -1 of ECR and falls in Orange B. Table II.3 describes DoE classification for roads sub-project.

Table III.3: Likely GoB Classification of road Sub-project

Sub-project	Component	Equivalent in Schedule I of ECR	DoE Classification
Roads,	Road provisions (include road Rehabilitation/ Improvement/ Construction, road signs, intersection, T-Junction, Sharp bend improvement)	(Rehabilitation/Improvement/Construction and extension of road & Street light	**Orange**

55. During the feasibility phase, the PRSC safeguard team could not apply for ECC to DoE. However, another previous phase DoE has issued an Environmental Clearance Certificate (ECC) for Third Urban Governance and Infrastructure Improvement (Sector) Project (IUGIP), Additional Financing vide letter DoE/Clearance/5444/2015/580 dated 22.12.2019.

b. Environmental Category: ADB

56. The Safeguards Policy Statement (SPS 2009) of ADB provides guidance on the environment category of sub-projects based on the degree of anticipated environmental impacts. ADB environmental safeguards objectives are: (i) to ensure the environmental soundness and sustainability of sub-projects and (ii) to support the integration of environmental considerations into the sub-project decision-making process. ADB environmental safeguards are triggered if a project is likely to have potential environmental risks and impacts. The initial process of categorization involves filling out a sectoral Rapid Environmental Assessment (REA) checklist. A project is classified as one of the four environmental categories (A, B, C, or FI) based on the most environmentally sensitive component. Categories are as follows:

Category A: Project that is likely to have significant adverse environmental impacts which 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 (EIA), including an environmental management plan (EMP), is required.

Category B: Project with potential adverse environmental impacts that 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 (IEE), including an EMP, is required.

Category C: Project that is likely to have minimal or no adverse environmental impacts. An EIA or IEE is not required, although environmental implications need to be reviewed.

Category FI: Project is classified as category FI if it involves the investment of ADB funds to, or through, a financial intermediary.

57. The project has been categorized as B for environment under the ADB's Safeguards Policy Statement 2009 (SPS).

F. Institutional Arrangements/Framework

58. The main Ministry, Department, Institutions and Boards responsible for development of policy, framing regulation, developing projects, monitoring and approval of issues related to environment protection and conservation are DoE, LGED and the PIU.

a. LGED and Rohanpur Paurashava

59. The Local Government Engineering Department (LGED) is the executing agency. LGED has constituted a Project Management Unit (PMU) and Project Implementation Unit (PIU). The PMU is headed by Project Director (PD). In order to put the project to logical conclusion the PD is assisted by two consultant team to assist and support the PMU and PIU (Project Implementation Unit).

IV. DESCRIPTION OF THE SUB-PROJECT

A. The Study Area

60. Rohanpur Paurashava lies between 24°81'12'' to 24°90'28" north latitude and 88°32'40" to 88°35'38" east longitude. This Paurashava is located at Gomastapur Upazila of Chapai Nawabganj district under Rajshahi Division. Rohanpur Paurashava has been established in 1st January, 1995. Rohanpur Paurashava's present ~~area is 25.40 square kilometers and consist~~area is 16.52 square kilometers and consists of 9 wards. Rohanpur municipality is situated on the south bank of the river Purnabhaba, about 350 km west from the capital of Dhaka and 60 km northwest of divisional city of Rajshahi. Most part of the Paurashava is on flat land. Paddy, Sugarcane, Jute, Turmeric, Banana, Potato, Mango, Jack fruit, Pulses, Yam, Betel Leaf, Tobacco, Oil seeds etc. are the main agro products. The Paurashava has a population of 36569 nos.~~,~~ with density of population of 2213 per Square Kilometer.

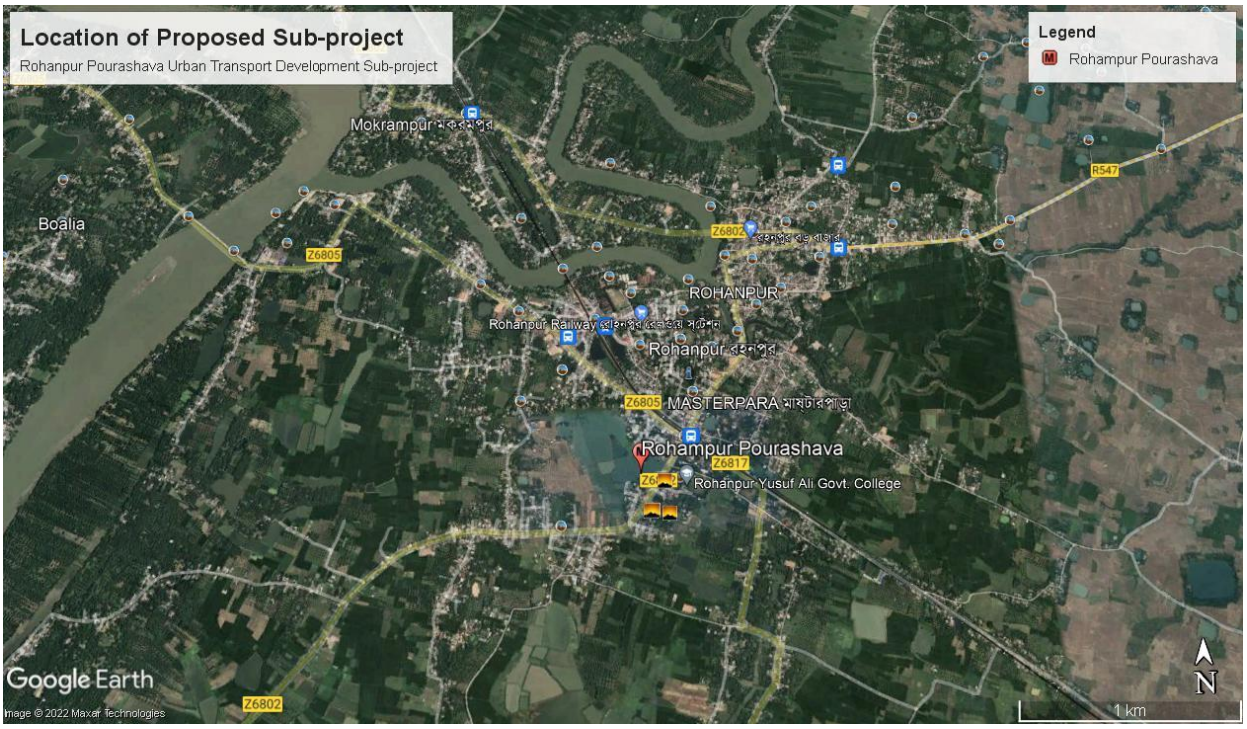


Figure IV.1: Rohanpur Paurashava in Google Map

61. This report contains the Initial Environmental Examination (IEE) for the roads sub-project at Rohanpur Paurashava of Gomastapur Upazila, in Chapai Nawabgonj District, which is under the Division of Rajshahi (Figure III.1). Sub-project components are located in Rohanpur urban area or in its immediate surroundings that were converted into urban use for many years ago, and there are no protected areas, wetlands, mangroves, or estuaries in or near the sub-project location. The Sub-project sites are located in existing right of way (~~RoWs~~ROWs) and Paurashava/government-owned land.

B. The Sub-Project

62. The Sub-project Package IUGIP/ROHA/UT/01/2022 submitted herewith include construction/improvement of 5.180 km road, 3 nos. cross drain and 190 nos. street light under at Rohanpur Paurashava. The construction of roads infrastructure schemes will be constructed under the IUGIP.

Table IV.1: Proposed roads Sub-Project in Rohanpur Paurashava

Sl No.	Financial Year	Name of Package	PDP SL	Scheme Name/ Name of works	Length (m)	Estimated Amount in BDT		
						Gross Amount (Tk)	Salvage (Tk)	Net Amount (Tk)
	2021-2022	IUGIP/ROHA/UT/01/2022		Name of Sub-Project: Construction/Improvement of Roads 5,180m in 18 locations, installation of Street Light 190 nos., RCC cross drain in 3 locations (Size 1.0 m X 1.0 m), & protection work 115m at ROHAanpur Paurashava under Chapainawabganj District.				
1			ROHA-R-1	Improvement of Road by RCC from Kasimpur Yasin Ali house to Asharaf's house & installation of street light 5 nos. at Ward No.-01, ROHAanpur Paurashava, Chapainawabganj. (Length = 130 m)	130	3,642,316.81	39,412.53	3,602,904.28
2			ROHA-R-2	Improvement of Road by RCC from Kasimpur main road to Nazrul's house via Alauddin & Malek's house & installation of street light 8 nos. at Ward No.-01, ROHAanpur Paurashava, Chapainawabganj. (Length = 220 m)	220	4,208,083.99	29,559.40	4,178,524.59
3			ROHA-R-3	Improvement of Road by RCC from main Road to Mayajjem's house & installation of street light 5 nos. at Ward No.-01, ROHAanpur Paurashava, Chapainawabganj. (Length = 125 m)	125	2,412,536.54	-	2,412,536.54
4			ROHA-R-4	Improvement of Road by RCC from Dhulauri main Road to Mohammad Ali Sarkar's house & installation of street light 8 nos. at Ward No.-01, ROHAanpur Paurashava, Chapainawabganj. (Length = 200 m)	200	4,074,792.37	-	4,074,792.37
5			ROHA-R-5	Improvement of Road by RCC from Dhulauri Botthla to Khari Bridge including protection work at (Ch.90m-205m, R/S), Cross drain 1 nos. at Ch.90m, Size (1m X 1m) & Installation of street light 11 nos. at Ward No.-01, ROHAanpur Paurashava, Chapainawabganj. (Length = 285 m)	285	8,556,537.13	63,821.18	8,492,715.95
6			ROHA-R-17	Improvement of Road by RCC from Puraton Bazar Lutfar's Garage to Eidgah house & installation of street light 5 nos. at Ward No.-02, ROHAanpur Paurashava, Chapainawabganj. (Length = 120 m)	120	2,652,874.38	34,485.96	2,618,388.42
7			ROHA-R-18	Improvement of Road by RCC from Babur Ghone main road Club to Intaj's mango garden via Baburgurghone graveyard house & installation of street light 16 nos. at Ward No.-02, ROHAanpur Paurashava, Chapainawabganj. (Length = 440 m)	440	8,832,612.36	39,099.65	8,793,512.71
8			ROHA-R-19	Improvement of Road by RCC from Babur Ghone Ajhar Ali's house to Bosir's house & installation of street light 15 nos. at Ward No.-02, ROHAanpur Paurashava, Chapainawabganj. (Length = 430 m)	430	8,603,538.24	73,898.50	8,529,639.74
9			ROHA-R-30	Improvement of Road by RCC from ROHAanpur Bazar Central Eid Ghah to ROHAmat Para R&H (via Mohila College) & installation of street light 15 nos. at Ward No.-03, ROHAanpur Paurashava, Chapainawabganj. (Length = 415 m)	415	7,394,968.27	-	7,394,968.27
10			ROHA-R-39	Improvement of Road by RCC from Baganpara Fansur's house to Abul Kasem's house via Baganpara main road and GM house & installation of street light 5 nos. at Ward No.-04,ROHAanpur Paurashava, Chapainawabganj. (Length = 130 m)	130	2,471,020.47	8,580.10	2,462,440.37

Sl No.	Financial Year	Name of Package	PDP SL	Scheme Name/ Name of works	Length (m)	Estimated Amount in BDT		
						Gross Amount (Tk)	Salvage (Tk)	Net Amount (Tk)
11			ROHA-R-45	Improvement of Road by RCC from Masterpara Pan Montur house to Gov. Primary School & installation of street light 8 nos. at Ward No.-04, ROHAanpur Paurashava, Chapainawabganj. (Length = 210 m)	210	4,020,499.79	50,190.34	3,970,309.45
12			ROHA-R-63	Improvement of Road by RCC from Dak-bangla Para Ajgor Ali house (Near R&H) to Narul's house & installation of street light 5 nos. at Ward No.-05, ROHAanpur Paurashava, Chapainawabganj. (Length = 125 m)	125	2,564,799.69	38,879.23	2,525,920.46
13			ROHA-R-65	Improvement of Road by RCC from ROHAanpur Tetul more to Nimtala including Cross drain 2 nos. at Ch. 686, Ch. 830, Size (1m X 1m) & installation of street light 31 nos. at Ward No.-05, ROHAanpur Paurashava, Chapainawabganj. (Length = 900 m)	900	26,910,481.68	-	26,910,481.68
14			ROHA-R-69	Improvement of Road by RCC from Bagduarpara Abdur Rahman house to Sirajul Mistri house & installation of street light 5 nos. at Ward No.-05, ROHAanpur Paurashava, Chapainawabganj. (Length = 120 m)	120	2,473,471.52	15,439.87	2,458,031.65
15			ROHA-R-86	Improvement of Road by RCC from Koyes Uddin Vondul Mondal house to No.rth Side of Prosadpur Girls School & installation of street light 12 nos. at Ward No.-06, ROHAanpur Paurashava, Chapainawabganj. (Length = 340 m)	340	6,013,894.73	49,265.66	5,964,629.07
16			ROHA-R-88	Improvement of Road by RCC from Nur Gula Alam Bekari to Professor Sohel's house via Mukim Master House & installation of street light 19 nos. at Ward No.-06, ROHAanpur Paurashava, Chapainawabganj. (Length = 530 m)	530	9,362,963.29	119,809.54	9,243,153.75
17			ROHA-R-104	Improvement of Road by RCC from Maiju's Pond to Guda Master House & installation of street light 14 nos. at Ward No.-06, ROHAanpur Paurashava, Chapainawabganj. (Length = 390 m)	390	6,899,810.92	-	6,899,810.92
18			ROHA-R-191	Improvement of Road by RCC from Dhulauri R&H road to ROHAanpur Homeo College & installation of street light 3 nos. at Ward No.-01, ROHAanpur Paurashava, Chapainawabganj. (Length = 70 m)	70	1,467,451.27	19,706.27	1,447,745.00
				Total Road (A) =	**5180**	**112,562,653.45**	**582,148.23**	**111,980,505.22**

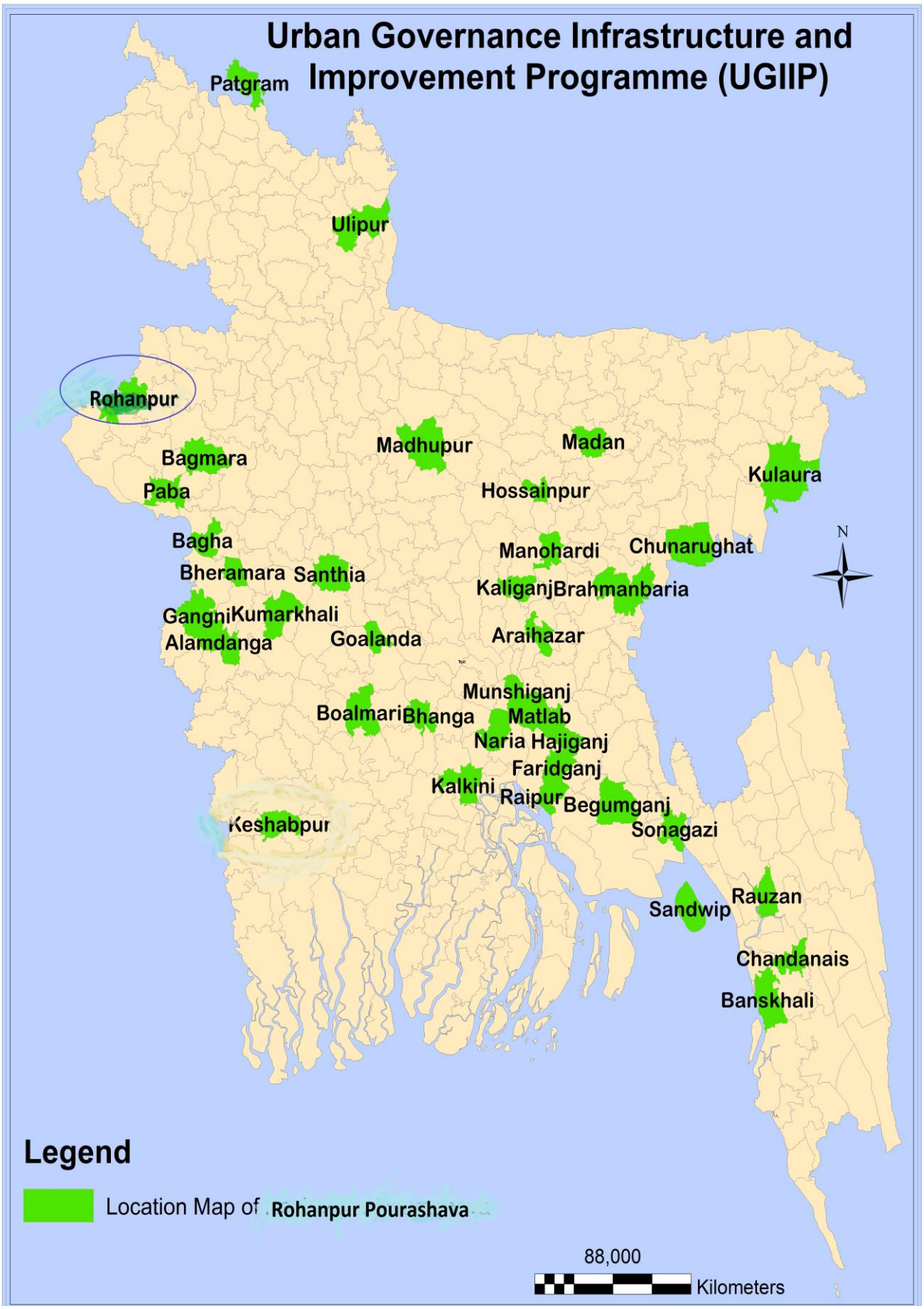


Figure IV.2: Paurashava under IUGIP

a. Existing Condition and Need for the Sub-Project

63. Rohanpur Paurashava is a class-A type Paurashava and one of the renowned Paurashavas in Bangladesh. Most of these roads have uneven-rough surface, damaged topping and pavement sides, narrow in width and without roadside footpath and thus incapable of accommodating road traffic. The road surfaces are worn out partly and, in some cases, entirely. Justifiably, they call for intervention varying from normal significant maintenance to large improvement/reconstruction. No people/vehicles can move in this road due to water logging/damaged condition in rainy season. That's why Paurashava demanded the development of this drains through improvement of dense carpeting, RCC road and partial beautification besides road. The Paurashava has a separate section named conservancy section to clean drain, road, footpath, Market/Bazar, waste collection, management, dispose. It is a good practice of Rohanpur Paurashava cleaning the existing drains and roads. The nearby urban residents in surrounding locality will be benefited from improvement of the proposed sub-project for creating better business and livelihood opportunities. No economic activities will be impeded resulting losses in income or asset during construction period. There is no need to be acquired any land for the construction as required land is available under the possession of the Rohanpur Paurashava.

	
ROHA-R-17: Improvement of Road by RCC from Puraton Bazar Lutfar's Garage to Eidgah house & installation of street light 5 nos. at Ward No.-02, Rohanpur Paurashava.	ROHA-R-86: Improvement of Road by RCC from Koyes Uddin Vondul Mondal house to North Side of Prosadpur Girls School & installation of street light 12 nos. at Ward No.-06, Rohanpur Paurashava

Figure IV.3: Existing Conditions of Paurashava Road

b. Roads Component

64. Figure III.4 presents status of the proposed roads for improvement/construction. To accommodate climate change related inundation and annual floods, each road was assessed against whether: (i) existing crest level is 600 millimeters (mm) above existing normal flood level; (ii) road embankments are protected against annual floods; and (iii) drainage is adequate to accommodate rainfall runoff. The proposed road is not situated at agricultural area and beside land is Paurashava fallow land.

	
ROHA-R-39: Improvement of Road by RCC from Baganpara Fansur's house to Abul Kasem's house via Baganpara main road and GM house & installation of street light 5 nos. at Ward No.-04, Rohanpur Paurashava	ROHA-R-4: Improvement of Road by RCC from Dhulauri main Road to Mohammad Ali Sarkar's house & installation of street light 8 nos. at Ward No.-01, Rohanpur Paurashava

Figure IV.4: Existing Status of Proposed Roads

c. Design Concept

65. The design considerations adopted for design were as follows: (i) LGED's Road design manual and standards followed. The road design type 6 for BC pavement was considered, with some modifications; (ii) guidelines on climate change resilience and adaptation measures were studied and accommodated as necessary; and (iii) existing bitumen finished surface (BFS) and HBB roads were considered for improvement with CC or reinforced cement concrete (RCC) pavement where necessary, with modified design standard~~.~~.

~~65.~~66. In general, the following are the major features of the roads design guidelines. All the roads are considered to provide covers in front of the sensitive receptors or any other location where required. Figures III.5-6 shows the typical sections of different types of roads of the sub-project.

Figure IV.5: Locations of the Proposed Road in Rohanpur Paurashava

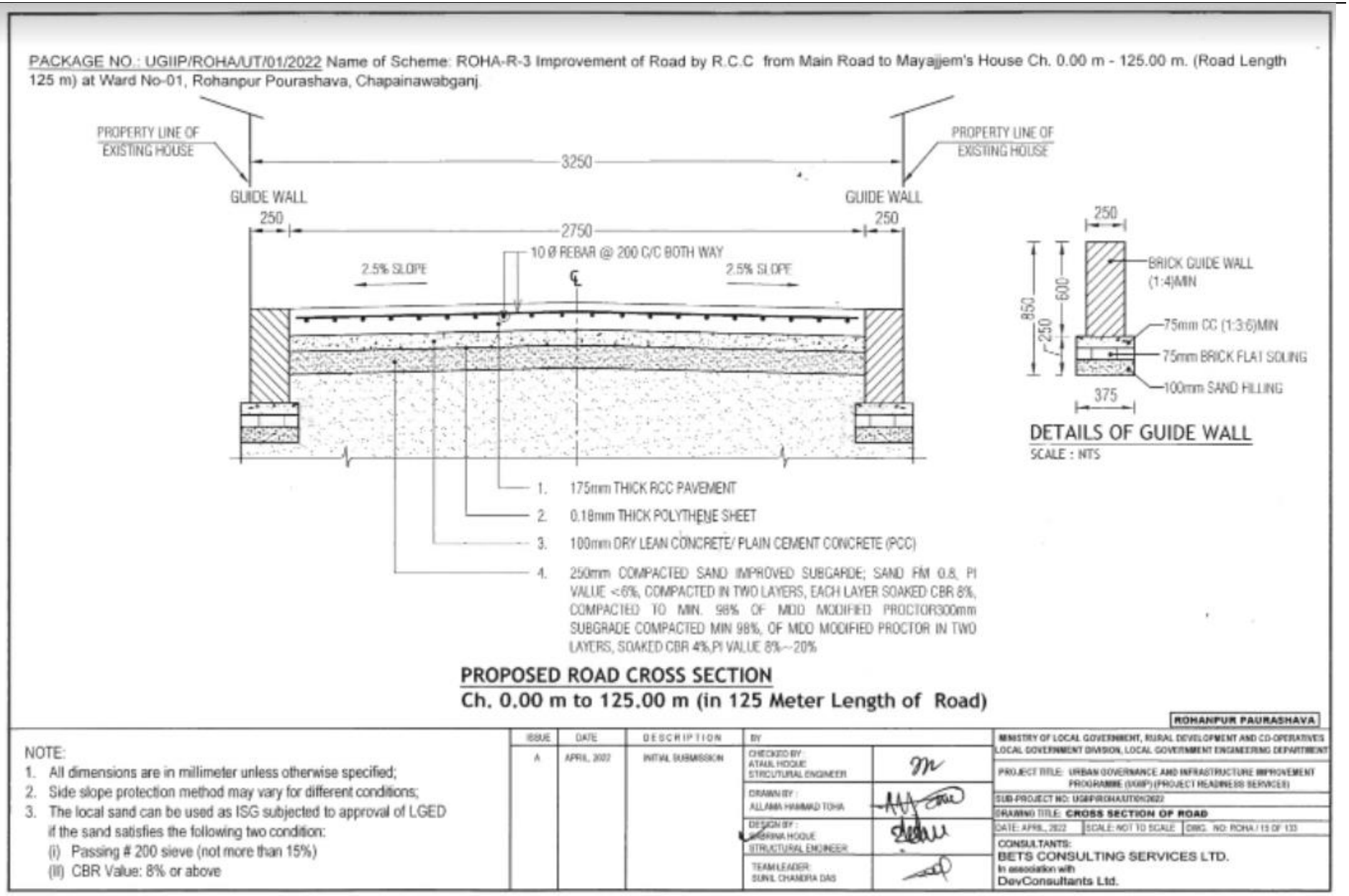


Figure IV.6: Cross-Section of Road

d. Implementation Schedule

~~66.~~67. Implementation of IUGIP is split up 18 months or 1.5 years.

~~67.~~68. Substantial time is required spanning the continuum of sub-project preparation, approval, survey, design & estimate, contract award and contract execution. Efforts needs to be made to meticulously follow the schedule should a timely implementation of work is aimed at.

~~68.~~69. Usually, the construction work season in Bangladesh runs from October through May (eight months). Construction works are sometimes impeded for the following reasons.

- Early floods in April/May,
- Late floods in September/October,
- Natural calamities (cyclone/tornado, excessive floods) occur in April/May and October/November.

~~69.~~70. Normally, the best construction period is only for 6 months a year (October to March). The construction period is sometimes squeezed to 4 months due to natural calamities.

~~70.~~71. However, sometimes, based on time constraint or exigency, construction work may even need to be carried out in the monsoon. Besides, whenever possible, simultaneousness of activities can be ascertained and cashed in on and consequently, quantum of work can be maximized through efficient planning and adoption of best available practice.

~~71.~~72. Summing up, over a 18-months period, major works are advisable to take place between July, 2023 to December 2024. A tentative time-schedule for implementation (only as indication) is shown Table III.2.

Table 6: Sub-project Implementation Schedule

Period	From January 2024 to May 2026																												
	2024												2025												2026				
Items of Work	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Assessment of the Sub-project Supported by MDSC Team in field visit																													
Preparation and approval of Sub-project																													
Compliance of Sub-project and Approval																													
Tendering of Sub-project																													
Evaluation of Sub-project and work order																													
Execution of Physical work																													
Final Inspection and certificate																													

V. DESCRIPTION OF THE ENVIRONMENT

A. Methodology Used for the Baseline Study

a. Secondary Data

~~72.~~73. Data for this study has been primarily collected through comprehensive literature survey, discussion with stakeholder agencies, and field data provided by the Paurashava. The literature survey broadly covered the following:

i. sub-project details, reports, maps, and other documents available with the ADB, PRS consultants, LGED, and Rohanpur Paurashava;
ii. relevant acts and extraordinary gazettes, and guidelines issued by Government of Bangladesh agencies; and
iii. literature on land use, soil, geology, hydrology, climate, socioeconomic profiles, and environmental planning documents collected from Government of Bangladesh agencies and websites.

b. Primary Data

~~73.~~74. Therefore, several visits to the sub-project sites were made by the persons of Paurashava engineering section and supplied to PRSC to assess the existing environment (physical, biological, and socioeconomic) and gather information with regard to the proposed sites and scale of the proposed sub-project. Demographic information, archaeological and religious places, densely populated pockets, and settlements were gathering from PDP and other documents.

c. Data ~~analysis~~ Analysis and Interpretation

~~74.~~75. The data collected was analyzed and interpretations were made to assess the physical, biological, and socioeconomic features of the project area. The relevant information is presented in the succeeding paragraphs.

~~75.~~76. The IEE including specific description of the environment and corridor of impact has been updated as necessary based on the final detailed design.

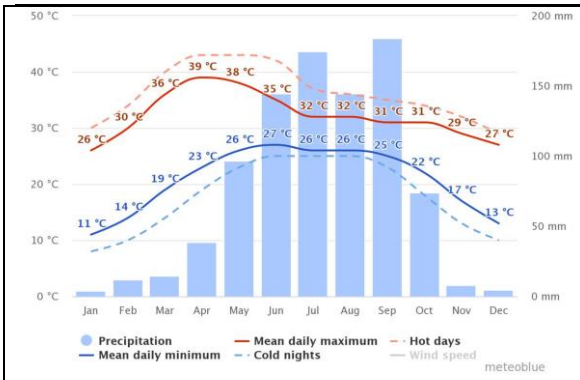
B. Physical Characteristics

a. Topography & Geology

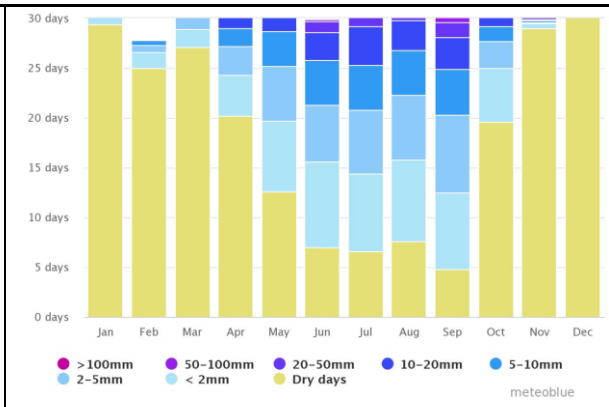
~~76.~~77. Rohanpur Paurashava is in the district of Chapai Nawabganj under Rajshahi division. The topography of Rohanpur Paurashava is mainly divided into two parts, namely: Diar and Barind region. The Diar area is almost flat. The Barind region, on the other hand, consists of high and low hilly soils. The soil of Barind region is red. Generally, the area on the west side of the river Mahananda is known as Diar area. The origin of this region is due to the frequent change in the course of the river Ganges. The soil in this region is very fertile.

b. Climatic Conditions

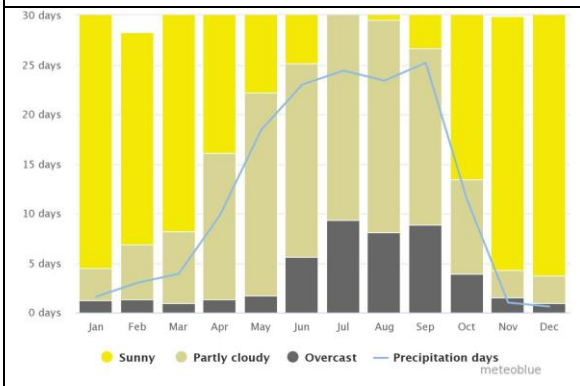
~~77.~~78. The climate of the Paurashava area is moderate with the maximum and minimum mean monthly temperature being 32.2°C and 20.7°C, respectively observed in April and January. Mean annual rainfall is 1003 mm, with most of it occurring during five months of monsoon, between May to September, which is around 83% of the aggregate precipitation. In the winter months of December-January, at times, temperature comes down substantially that at times adds to the woe of the dwellers. Rain and cold temperatures are not very usual in Rohanpur inflicting hardship on the local community. The rainfall occurs during May to October is 78% and 90% during May to March of the year. The average monthly rainfall variation, temperature, wind speed and directions at Rohanpur (from 1985 to 2018) is shown in Figure IV.1.



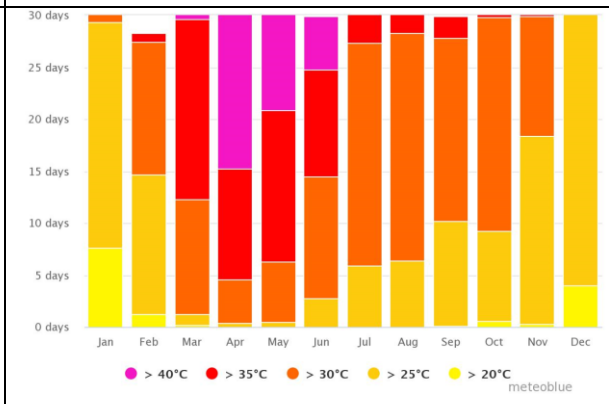
Average Temperatures and Precipitation



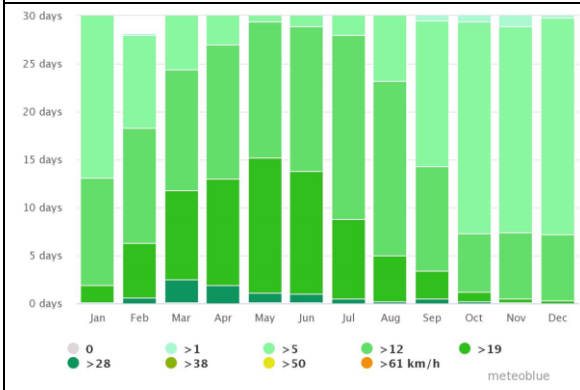
Precipitation Amounts



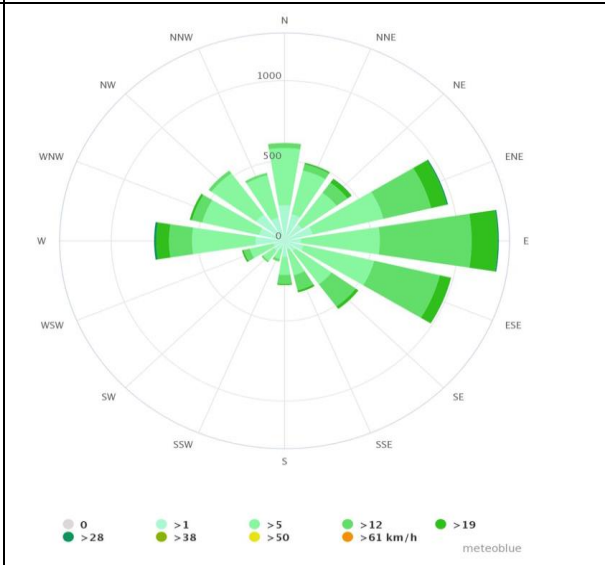
Cloudy, Sunny, and Precipitation Days



Maximum Temperatures



Wind Speed



Wind rose

Source: www.meteoblue.com

Figure V.1: Historical Climatic Record at Rohanpur Region

c. Surface Water

~~78.~~79. Several number of water bodies such as small and medium ponds are located along the road sub-project, which are used for multiple purposes. The surface water in ponds is not suitable for drinking purposes. All the ponds are man-made and used for fishing, water supply and domestic use. The surface water quality test will be done before commencement of work and will treat as baseline and all other measurements during implementation will be reported as part of EMP implementation. Rohanpur municipality is situated on the banks of the rivers Mahananda and Purnabhaba. Purnabhaba river flows through the northern boundary of Rohanpur Paurashava. Canals are mainly used for drainage and irrigation. At present these canals are carrying the domestic and industrial wastes so not suitable for domestic,

commercial and industrial use. So only source of potable water for the above uses is the underground water.

d. Earthquake

~~79.~~80. Rohanpur is located in a seismic Zone III, referred to as the low-risk zone for earthquake in the country. Seismic events in Bangladesh are relatively infrequent, but historically, have been severe, such as the earthquakes of 1930, 1950 and 2004. To address any potential impacts due to seismic activities, provisions of the Bangladesh National Building Code (BNBC) 1993 and 2006 shall be strictly followed in the detailed designs of project components, apart from consideration of seismic vulnerability in the specifications for the design and construction of the works, including the choice of materials and methods for construction work.

e. Air Quality

~~80.~~81. Other than normal, there are no undue air emission sources at the construction site except for limited vehicular emissions from inter-Paurashava traffic that are occasional

~~81.~~82. This has an impact on agriculture, forestry and natural ecosystems. Ambient air quality data was not available. Here quality of air appears to be clean but due to poor condition of road surface, dust is generated, especially during the movement of vehicles that causes air pollution. As such only the fuel operated vehicles and non-point sources such as open burning is the main source of air pollution. The baseline air quality will be measured by the sub-project contractors prior to commencement of work. The results will be provided in the updated IEE and all other measurements during implementation will be reported as part of EMP implementation.

f. Acoustic Environment

~~82.~~83. Noise is not a major impediment for the quality of the environment in the study area. Vehicles such as motor cycle, tempo, mini truck, votvoti (Locally made 3–wheeler using diesel engine), Battery driven easy-bike , including ~~and~~ tractor trailer etc. move on the road during day and night. Some of ~~These~~ these vehicles generate noise in the sub-project area but within tolerable limit in most cases. No other perceptible sources of noise generation such as factories, industries, etc. are found near by the sub-project area. The baseline noise level will be measured by the sub-project contractors prior to commencement of work. The results will be provided in the updated IEE and all other measurements during implementation will be reported as part of EMP implementation.

C. Biological Characteristics

a. Ecological Resources

~~83.~~84. The ecological setting is mostly with wetland, homestead and roadside vegetation, etc. Homestead vegetation has a positive effect on improvement of soil moisture through the shading and mulching process. Trees growing at homesteads also provide easy access to fuel wood, fodder and other products. A large number of multipurpose trees (fruit, timber, fodder, medicine) are grown in the area. The most common among them are jackfruit, mango, lemon, banana, etc. Two major types of fauna viz. terrestrial and aquatic fauna have been identified in and around the area.

b. Birds, Wildlife and Wetland Habitat s

~~84.~~85. Other than common birds like crows, sparrows, shalik, cuckoos etc., and some domestic cattle, no wild animals inhabit the area. Wildlife that fully depends on the terrestrial land throughout their whole life for shelter, food, nesting, breeding, and producing offspring is called terrestrial fauna. The main types of terrestrial fauna are amphibian, reptile, bird and mammal. Aquatic habitats are common in the project area due to the numerous freshwater lowlands, ponds, wetlands and rivers coursing through the area. Fish diversity in rivers and streams is decreasing due to heavy pollution in the aquatic bodies from industrial effluent.

c. Flora and Fauna

~~85.~~86. Sub-project components are located in Rohanpur urban area or in its immediate surroundings that were converted into urban use for years ago, and there is no natural habitat left at these sites. Animals and plants in the subproject area are those commonly found in urban and built-up areas. The district is also famous for good quality of jute and rice. Although there is no organized forest area in the district, the plain land is mostly covered under homestead forests containing varieties of fruit trees and other trees. No endangered/protected species of either flora or fauna are found in the Paurashava or its immediate surroundings.

d. Agriculture, Tourism and Fishery

~~86.~~87. Agricultural farming practices within most of the study area have adjusted to the agro climatic conditions prevailing in the Kharif (March-October) and the Rabi (November-February). Main Crops: The major agricultural crops of Rohanpur district are rice, wheat, jute, pulse, oilseed, vegetable, spice, sugarcane, tobacco, etc. Among rice crops aman occupies the largest area followed by aus and boro. The fruit crops are banana and coconut. The crop which is very commonly grown and is very special of this district is betel nut. The common fruits found in this district are coconut (Cocos nucifera), date palm (Phoenix sylvestris), betal nut (Areca catechu) and palmyra.

e. Protected Areas

~~87.~~88. There are no protected forests, wetlands, mangroves, or estuaries in or near the sub-project area which might be impacted due to the construction activities.

D. Socioeconomic Characteristics

a. Population

~~88.~~89. Rohanpur Paurashava occupies an area of 16.52 square km. with population of 36569, out of which male 19,183 are male and 17,386 are female. It consists of 9 wards. Here the agricultural land is 30% and residential area is 44.79%. The summation of industrial, commercial and wet land is 20.21%. The population density is 2,214 persons per square km and the growth rate is 2.15%.

b. Literacy Rate

~~89.~~90. Rohanpur Paurashava has an average literacy rate of 47.09% (7+ years), male 35.6% and female 24.9% and the national average of 30.4% literate. (BBS, 2011).

c. Transport & Communication

~~90.~~91. According to the field level survey, 4.62 km of roads and highways have 9.62 km of main roads, 11.11 km of general roads and 25.16 km of access roads. Observably, most of these roads have uneven-rough surface, damaged topping and pavement sides owing to lack of maintenance, mostly narrow in width, hence incapable of accommodating generated traffic. While visiting different roads, the team observed that the surfaces are worn out partly and, in some cases, entirely. Justifiably, they call for intervention varying from normal significant maintenance to large Rehabilitation/reconstruction.

d. Economic Development

~~91.~~92. ~~98.~~The city of Rahanpur is considered as a famous business center. A large number of paddy huts, machine-operated rice mills, cold storages, bronze and brass industries, silk industries have sprung up here. The city is expanding along the main road. The Paurashava has insufficient capacity and resources and is finding it difficult to respond to the need for forward planning and investment in basic urban infrastructure and services. This undercut sustainable local urban governance, makes local planning ineffective and undermines local economic development. The impact of climate change further exacerbates the weaknesses in municipal management more generally.

e. Historical, Cultural and Archaeological Characteristics

~~92.~~93. Rahanpur Municipality is a local government body located in the ancient state

of Pundravardhana . Rahanpur municipality was part of the then greater Malda district before the partition of the country in 1947. Gomstapur Thana became an upazila and the administrative office of the Upazila Parishad was established at Rahanpur as the center of overall activities of the upazila. Chapainawabganj district was once an important town in Gaur, the capital of ancient Bengal. Traditional Chhota Sona Mosque (built between 1493-1519 AD), Darsbari Mosque and Madrasa (built between 1469 AD), Shah Sujar Kachari Bari (built between 1839-69 AD), Tombs of Hazrat Shah Neyamtullah (RA) The ruins of the Champai Jame Mosque and the crematorium built at Makrampur Ghat (built in 1156-69 AD), the architectural monuments of Nadhayer, Nachol, etc., are of historical significance. The area is famous for silk and is rich in folk elements like Gambhira, Alkaap, Meyeli Geet.

VI. ASSESSMENT OF POTENTIAL ENVIRONMENTAL IMPACTS

A. Impact Assessment Methodology

~~93.~~94. Issues for consideration have been raised by the following means: (i) input from interested and affected parties; (ii) desktop research of information relevant to the proposed subproject; (iii) site visits; and (iv) evaluation of proposed design scope as per PRSC study and potential impacts.

~~94.~~95. The corridors of impact considered include: (i) existing alignment and width of roads to be rehabilitated; and (ii) existing ROWs. No additional land is required beyond the ROWs. Categorization of the subproject and formulation of mitigation measures have been guided by ADB's REA checklist for roads improvement and ADB SPS, 2009.

B. Anticipated Impacts and Mitigation Measures

a. Planning and Design Phase

~~95.~~96. Planning principles and detail design considerations have been reviewed and incorporated into the site planning process. Location for the sub-project components will be on properties held by the Paurashava. Access to the sub-project site is through public existing roads.

1. Sub-project Selection Criteria

~~96.~~97. The project environmental assessment and review framework specifies environmental criteria to avoid or minimize adverse impacts during the identification and finalization of road improvement sub-project. Table V.1 summarizes site and design considerations as per final design.

Table VI.1: Site and Design Considerations to Meet EARF Environmental Criteria

Sl. No.	Components	Environmental Selection Guidelines	Remarks
1.	Overall selection guideline	▪ Comply with all requirements of relevant national and local laws, rules and guidelines.	▪ Requisite LCC and ECC to be obtained prior to commencement of works
		▪ Avoid/minimize where possible locations in protected areas, including notified reserved forests or biodiversity conservation hotspots (wetlands, national reserves, forest reserves and sanctuaries).	▪ Not present in Paurashava area.
		▪ Avoid possible locations that will result in destruction/disturbance to historical and cultural places/values.	▪ Use of "chance find" procedures in the EMP that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.
		▪ Avoid tree cutting where possible. Retain mature roadside trees that are important/valuable or historically significant. If any trees have to be removed, plant two new trees for every one that is lost.	▪ Permit for tree-cutting to be obtained by contractor/s prior to commencement of work ▪ Compensatory plantation for trees lost at a rate of 2 trees for every tree cut, in addition to tree plantation as specified in the design, will be implemented by the contractor, who will also maintain the saplings for the duration of his contract.
		▪ Ensure all planning and design interventions and decisions are	▪ All consultations during project preparation are documented and

Sl. No.	Components	Environmental Selection Guidelines	Remarks
		made in consultation with local communities and include women. Reflect inputs from public consultation and disclosure for site selection.	concerns expressed by public addressed in the IEE.
		▪ Synchronize the road and associated works (to extent possible) to minimize disturbance and optimize use of resources (e.g., water pipes laid prior to road improvements).	▪ Included in the design and EMP
2.	Road improvement/ Rehabilitation/Maintenance	▪ Ensure tree planting alongside roads to provide a natural barrier to noise and visual impacts, and include additional man-made barriers where suitable for public safety.	▪ Included in the design and EMP
		▪ ensure the provision of new or improved household, storm water drainage to remove the increased runoff caused by increasing the road surface area	▪ Included in the design and EMP
		▪ Ensure construction of road will be on a Paurashava owned land or after completion of land acquisition if required.	▪ Proposed existing network is located at the Paurashava owned land.
		▪ Avoid eviction of any structures or commercial activities within the sub-project area, if required adopt appropriate procedure.	▪ The proposed site is on developed previously non-agricultural low land. No structure was there.
		▪ Avoid any ecological sensitive area and impact on wildlife, or rare and endangered species.	▪ Proposed site is not situated near any ecological sensitive area and no impact on wildlife or rare and endangered species.

Table VI.2: Actions to Mitigation against Climate Change Impacts and Improve Climate Resilience

Sl. No.	Climate Change Effect	Mitigation Measures
A.	**Climate change effect**	
1.	Increased rainfall quantity and runoff Increased frequency of storms	▪ Improve O & M, organizational capacity, resource allocation, etc. ▪ Work with relevant stakeholders to manage water use and flood discharges more effectively ▪ Improve collection and disposal of waste ▪ Control encroachments ▪ Improve public behavior through active and prolonged information, education, and communication campaigns to reduce uncontrolled solid waste disposal, encroachments, damage to infrastructure, unregulated development in key areas, etc., supported by enforcement. ▪ Guide wall to protect erosion and sliding for roads with adjacent water bodies/ponds
B.	**Impact Factor**	
1.	Construction materials' quality	▪ Choose most durable materials possible, even if higher cost, e.g. concrete, high quality bricks. ▪ Monitor and control construction quality
2.	Rising temperatures	▪ Execute works during most favorable times of year and day. ▪ Monitor and control preparing, placing, and curing concrete and mortar, to ensure placement, etc., during most favorable times. ▪ Use plain high-quality un-rendered brick work and high-quality cement mortar in preference to rendered low-grade bricks

Sl. No.	Climate Change Effect	Mitigation Measures
		▪ Use sulphate resisting cement in vulnerable locations (higher heat gain during curing) or cement containing fly ash (less heat gain, so preferred).

2. Land Acquisition and Resettlement

~~97.~~98. The proposed sub-project to be constructed in Paurashava owned land and through the existing Roads. There are no encroachers or residential/ commercial structures in the proposed area as per the study of social and resettlement team. In addition, there is no squatters will be disturbed due to the proposed sub-project as per the social and resettlement assessment. Hence, no negative impacts are envisaged due to the sub-project.

~~98.~~99. The concepts considered in design of the road sub-project are: (i) prioritizing rehabilitation/maintenance over new construction; (ii) locating facilities on government/Paurashava-owned land to avoid the need for land acquisition; (iii) taking all possible measures in design and selection of sites to avoid resettlement impacts; (iv) avoiding where possible locations that will result in destruction/disturbance to historical and cultural places/values; (v) avoiding tree-cutting where possible; (vi) ensuring all planning and design interventions and decisions are made in consultation with local communities and reflecting inputs from public consultation and disclosure for site selection.

3. Landscape and Existing Utilities

~~99.~~100. The proposed ~~road are~~roads are within the existing network. The proposed sub-project will also be ~~also~~ constructed/~~rehabilitation~~rehabilitated/~~maintenance within~~maintained within existing network. Therefore, investigation before construction and formulation of plan of restoration of existing utilities within shortest time is recommended. The plan must be formulated with coordination with PIU, contractor and the field level construction supervisor. The plan must be shared with the PIU/ PRSC and approved by them.

4. Obtaining NOC

~~100.~~101. Failure to obtain necessary consents, permits, NOC's can result in design revisions and/or stoppage of the works. All the sites have own land available to the Paurashava. Therefore, the Contractor will not have any obstacle to start the construction without any delay. Moreover, an ECC is already obtained from the DoE against the IUGIP.

5. EMP Implementation Training

~~101.~~102. Often lack of proper training to implement the EMP stipulated in the 'Bid Document' leads to mismanaged environmental safeguards. Therefore, EMP training for the contractors, workers and implementing agency is necessary before construction goes on-board. A training needs to be arranged before construction starts with all involved parties: contractor, workers and representatives from Implementing Agency to implement the EMP and therefore is necessary.

b. Construction Phase

~~102.~~103. In the case of this sub-project (i) most of the individual elements are relatively small and involve straightforward construction, so impacts will be mainly localized and not greatly significant; (ii) most of the predicted impacts are associated with the construction process and are produced because that process is invasive, involving excavation and earth movements; and (iii) being located in the built-up area of the Paurashava, will not cause direct impact on biodiversity values.

~~103.~~104. Although construction of these project components involves quite simple techniques of civil work, the invasive nature of excavation and the sub-project sites in built-up areas of Rohanpur Paurashava where there are a variety of human activities, will result to impacts to the environment and sensitive receptors such as residents, businesses and the community in general. These anticipated impacts are short-term, site-specific and within a relatively small area. There are no impacts that are significant or complex in nature, or that need an in-depth study to assess the impact. Thus, Rohanpur Paurashava road improvement sub-project is unlikely to cause significant adverse impacts.

1. Construction Method

~~104.~~105. Tasks to be performed for construction of road: (i) site clearing; (ii) laying of base, sub-base, sub-grade, track coat, prime coat, sill coat etc.; (iii) road end edging; (iv) construction of drainage slope; (v) construction of drain cover slab; (vi) architectural components and finishes; and (vii) ordering, procurement and installation of building services. Excavation for the foundation will be dug by backhoe digger, supplemented by manual digging where necessary. Excavated soil will be placed nearby, and the materials (brought to site on trucks and stored on unused land nearby) will be placed by crane or using a small rig. The infrastructures will be constructed manually according to design specifications. Any excess materials will be disposed to pre-approved disposal sites.

~~105.~~106. There is sufficient space for a staging area, construction equipment and stockpiling of materials. However, the contractor will need to remove all construction and demolition wastes on a daily basis. The debris accumulated from the demolition of the existing old structure at site will be stored in a safe place in the Paurashava own compound.

2. Worker Camps

~~106.~~107. To accommodate the needs of the workforce, the contractor should provide suitable housing, adequate supplies of potable water, and toilet and bathing facilities within the housing area. Onsite facilities for preparing food need to be provided, or food service contracted. The contractor should provide means for disposing of wastewater from toilets, baths and food preparation areas either through a septic tank or through sock well or holding tank with removal by vacuum truck. Solid waste should be collected at waste bins and disposed of properly offsite. The labor camp should be located at a distance from any nearby community and workers transported daily to the construction sites. Temporary lodging for workers should not be set up along the alignments where piping is being installed. The labor camp should be set up at a selected and approved location for the duration of the contract, and located such that it does not interfere with or cause a nuisance for the local community. Complete closure of the camp is required at the end of the work, including removal of any underground tanks and above-ground structures.

3. Site and Route Maintenance

~~107.~~108. The contractor should plan haul routes to avoid congested areas and narrow roads, and schedule transportation to avoid peak traffic periods. Speed limits and other traffic rules need to be strictly enforced among drivers. Traffic detours need to be identified and marked in the event they are necessary to maintain traffic flow through the construction zone. Flagmen need to be posted at the start and finish of construction areas as necessary to direct the movement of traffic. Movable sanitary facilities should be provided at the site and kept clean, free of odors and usable. No materials should be stored onsite for longer than a day before their use. Excess materials should be removed after a segment is complete. The contractor should avoid trenching where damage might occur to buildings, and provide shoring and backfill with sand/cement admixture to prevent caving. The contractor should avoid stockpiling earth and construction materials in areas subject to flooding and flowing water. Loss of fuel oil, engine oil and other types of pollutants to the soil or to drainage courses will not be tolerated.

4. Topography, Landforms, Geology and Soils

~~108.~~109. Significant amount of gravel, sand, and cement will be required for this sub-project. Extraction of construction materials may cause localized changes in topography and landforms. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.

~~109.~~110. Utilize readily available sources of materials. If contractor procures materials from existing burrow pits and quarries, it has to be ensured that these conform to all relevant regulatory requirements. Borrow areas and quarries (If these are being opened up exclusively for the sub-project) must comply with environmental requirements, as applicable. No activity will be allowed until formal agreement is signed between PIU, landowner and contractor.

5. Surface Water Quality

~~110.~~111. Trenching and excavation, run-off from stockpiled materials, and contamination

from fuels and lubricants may result to silt-laden runoff during rainfall that may cause siltation and reduction in the quality of adjacent bodies of water. There are few small ponds/ditches near the road and drain ROW and surface water pollution is expected due to the construction activities. Therefore, the expected impacts are minor negative and short term, site-specific within a relatively small area and reversible by mitigation measures.

- Prepare and implement a spoils management plan (see Appendix 6 for outline).
- Prioritize re-use of excess spoils and materials in construction activities. If spoils will be disposed, consult with Rohanpur local authority on designated disposal areas.
- All earthworks must to be conducted during dry season to maximum extent possible to avoid the difficult working conditions that prevail during monsoon season such as problems from runoff.
- Location for stockyards for construction materials shall be identified at least 300m away from watercourses.
- Place storage areas for fuels and lubricants away from any drainage leading to water bodies.
- Take all precautions to minimize the wastage of water in the construction activities.
- Take all precautions to prevent entering of wastewater into streams, watercourses, or irrigation system. Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies.
- Ensure diverting storm water flow during construction shall not lead to inundation and other nuisances in low-lying areas.
- While working across or close to any water body, the flow of water must not be obstructed. Ensure no construction materials like earth, stone, or appendage are disposed of in a manner that may block the flow of water of any watercourse and cross drainage channels.
- Monitor water quality according to the environmental management plan.

6. Groundwater Quality

~~111.~~112. Increased demand of groundwater is anticipated during the construction phase for construction activities and domestic purposes. Uncontrolled extraction of water may also affect availability of waters to locals. In addition to that, construction waste, if left unattended will result in forming leachate which will percolate through the soil strata and will reach underground water table and hence, will end up contaminating it. Mitigation measures will include

- Pumping of groundwater should be from deep aquifers of more than 300 m to supply arsenic free water. Safe and sustainable discharges are to be ascertained prior to selection of pumps.
- Tube wells will be installed with due regard for the surface environment, protection of groundwater from surface contaminants, and protection of aquifer cross contamination.
- All tube wells, test holes, monitoring wells that are no longer in use or needed shall be properly decommissioned.
- Protect groundwater supplies of adjacent lands.

7. Air Quality & Dust

~~112.~~113. Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants (such as COx, SOx, PMs, NOx, and HCs) which will affect people who live and work near the sites. Different activities regarding the machinery movement and other works generate dust and impair the air quality. The impacts are negative but short-term, site- specific within a relatively small area and reversible by mitigation measures.

- Damp down exposed soil and any sand stockpiled on site by spraying with water when necessary, during dry weather;
- Use tarpaulins to cover soils, sand and other loose material when transported by trucks.
- Unpaved surfaces used for haulage of materials within settlements shall be maintained dust-free.
- Arrangements to control dust through provision of windscreens, water sprinklers, and dust extraction systems shall be provided at all hot-mix plants, batching plants, and crushers (if these establishments are being set up exclusively for the sub-project).

- Water will be sprayed to control the dust, which is the main way to suppress dust in the working site.
- Debris materials should be transported through truck covered by tarpaulin.
- Apply water every 4 hours to the area within 30m of structures being demolished, to reduce vehicle track out.
- Apply water to disturbed soils after demolition is completed or at the end of each day of clean up
- Prohibit demolition activities when wind speeds exceed 30 kph.
- Limit on-site vehicle speeds (on unpaved roads) to 20 kph.
- Provide jute made cloth around the structures to be demolished.
- Monitor air quality.

8. Acoustic Environment

~~113.~~114. Construction activities will be far from settlements, far from schools and areas with small-scale businesses. Temporary increase in noise level and vibrations may be caused by excavation equipment and the transportation of equipment, materials, and people. However, the proposed sub-project situated out of core area and impact is short-term, site-specific and within a relatively small area. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.

- Involve the community in planning the work program so that any particularly noisy or otherwise invasive activities can be scheduled to avoid sensitive times.
- Plan activities in consultation with Rohanpur local authority so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance.
- Use of high noise generating equipment shall be stopped during night time.
- Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach;
- Utilize modern vehicles and machinery with the requisite adaptations to limit noise and exhaust emissions and ensure that these are maintained to manufacturers' specifications at all times.
- All vehicles and equipment used in construction shall be fitted with exhaust silencers. Use silent-type generators (if required).
- Monitor noise levels. Maintain maximum sound levels not exceeding 85 decibels (dBA) when measured at a distance of 10m or more from the vehicle/s.
- If it is not practicable to reduce noise levels to or below noise exposure limits, the contractor must post warning signs in the noise hazard areas. Workers in a posted noise hazard area must wear hearing protection.
- Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity. Complete work in these areas quickly.

9. Aesthetics

~~114.~~115. The construction activities do not anticipate any cutting of trees but will produce excess excavated earth (spoils), excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, spoils, oils, lubricants and other similar items. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.

- Prepare a debris disposal plan.
- Remove all construction and demolition wastes on a daily basis.
- Coordinate with Rohanpur local authority for beneficial uses of excess excavated soils or immediately dispose to designated areas. Avoid stockpiling of any excess spoils.
- All vehicles delivering fine materials to the site and carrying debris for disposal shall be covered to avoid spillage. All existing roads used by vehicles of the contractor, shall be kept clear of all dust/mud or other extraneous materials dropped by such vehicles.
- Lighting on construction sites shall be pointed downwards and away from oncoming traffic and nearby houses.
- In areas where the visual environment is particularly important or privacy concerns for surrounding buildings exist, the site may require screening. This could be in the form of shade cloth, temporary walls, or other suitable materials prior to the beginning of construction.

- The site must be kept clean to minimize the visual impact of the site. Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas.

10. Biodiversity

~~115.~~116. Activities are being located in the built-up area of Rohanpur Paurashava. There are no protected areas in or around sub-project sites, and no known areas of ecological interest. Preliminary design shows there are no trees at the sites that need to be removed.

- Check if tree-cutting will be required during detailed design stage. No trees, shrubs, or groundcover may be removed or vegetation stripped without the prior permission of the environment management specialist.
- All efforts shall be made to preserve trees by evaluation of minor design adjustments/ alternatives (as applicable) to save trees.
- Special attention shall be given for protecting giant trees and locally-important trees (with religious importance) during implementation.
- Prevent workers or any other person from removing and damaging any flora (plant/ vegetation) and fauna (animal) including fishing in any water body in the sub-project vicinity.
- Prohibit employees from poaching wildlife and cutting of trees for firewood.
- Implement compensatory plantation for trees lost at a rate of 2 trees for every tree cut. Maintain the saplings for the duration of contract. Additionally, plantation of 300 trees as per the EMP.

11. Traffic Congestion

~~116.~~117. Hauling of construction materials and operation of equipment on-site can cause traffic problems. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.

- Follow the traffic management plan given in Appendix 4 of this report.
- Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites.
- Maintain safe passage for vehicles and pedestrians throughout the construction period.
- Schedule truck deliveries of construction materials during periods of low traffic volume.
- Erect and maintain barricades, including signs, markings, flags and flagmen informing diversions and alternative routes when required.
- Notify affected sensitive receptors by providing sign boards informing nature and duration of construction activities and contact numbers for concerns/complaints.
- Leave spaces for access between mounds of soil.
- Consult businesses and institutions regarding operating hours and factoring this in work schedules. Ensure there is provision of alternate access to businesses and institutions during construction activities, so that there is no closure of these shops or any loss of client age.
- Ensure any damage to properties and utilities will be restored or compensated to pre-work conditions.

12. Socio-economic Status

~~117.~~118. Work force will be required during the 12-month construction stage. This can result to generation of contractual employment and increase in local revenue. Thus, potential impact is positive and long-term.

- Employ at least 50% of ~~labor~~labour force from communities in the vicinity of the site. This will have the added benefit of avoiding social problems that sometimes occur when workers are imported into host communities, and avoiding environmental and social problems from workers occasionally housed in poorly serviced camp accommodation.
- Secure construction materials from local market as far as practicable~~.~~.

13. Existing Amenities for Community Welfare

~~118.~~119. Although construction of sub-project components involves quite simple techniques of civil work, the invasive nature of excavation and the sub-project sites being in existing networks of Rohanpur Paurashava where there are a variety of human activities, will result to impacts to the sensitive receptors such as residents, businesses and the community

in general. Excavation may also damage existing infrastructure (such as water distribution pipes, electricity pylons, etc.) located alongside the roads. The impacts are potentially negative but of short-term, site-specific within a relatively small area and reversible by mitigation measures.

- Obtain details from Paurashava nature and location of all existing infrastructure, and plan excavation carefully to avoid any such sites to maximum extent possible;
- Integrate construction of the various infrastructure sub-projects to be conducted in Rohanpur (road, etc.) so that different infrastructure is located on opposite sides of the road where feasible and roads and inhabitants are not subjected to repeated disturbance by construction in the same area at different times for different purposes.
- Consult with local community to inform them of the nature, duration, and likely effects of the construction work, and to identify any local concerns so that these can be addressed.
- Ensure any damage to properties and utilities will be restored or compensated to pre-work conditions.

14. Community Health and Safety

~~119.~~120. The public should be barred from construction areas, and excavations should be barricaded and marked. Paths of access and passage for vehicles and pedestrians should be clearly marked through the work zone. The contractor should minimize use of heavy equipment in congested areas, conduct activities during daylight hours, and apply water to suppress dust as needed. In heavily trafficked areas such as markets, the contractor should increase the work force to complete construction quickly, reduce dust by removal of excess earth, and avoid obstructing the paths of travel for pedestrians and vehicles. The contractor should minimize downtime of existing water supply, limit shutdowns to less than four hours, and notify the public in advance to store water as necessary.

~~120.~~121. Construction works will impede the access of residents and business in limited cases. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.

- Contractor's activities and movement of staff will be restricted to designated construction areas.
- Consult with Rohanpur local authority on the designated areas for stockpiling of soils, gravel and other construction materials.
- If the contractor chooses to locate the work camp/storage area on private land, he must get prior permission from the environment management specialist and landowner.
- Use small mechanical excavators to attain faster trenching progress. Crusher will be used for stone and concrete breaking.
- Under no circumstances may open areas or the surrounding bushes be used as a toilet facility.
- Recycling and the provision of separate waste receptacles for different types of waste shall be encouraged.
- A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following general rules: (i) no alcohol/drugs on site; (ii) prevent excessive noise; (iii) construction staff are to make use of the facilities provided for them, as opposed to ad hoc alternatives (e.g. fires for cooking, the use of surrounding bushes as a toilet facilities); (iv) no fires permitted on site except if needed for the construction works; (v) trespassing on private/commercial properties adjoining the site is forbidden; (vi) other than pre-approved security staff, no workers shall be permitted to live on the construction site; and (vii) no worker may be forced to do work that is potentially dangerous or that he/she is not trained to do.
- Interested and affected parties need to be made aware of the existence of the complaints book and the methods of communication available to them. The contractor must address queries and complaints by: (i) documenting details of such communications; (ii) submitting these for inclusion in complaints register; (iii) bringing issues to the environmental management specialist's attention immediately; and (iv) taking remedial action as per environment specialist's instruction.
- The contractor shall immediately take the necessary remedial action on any compliant/grievance received by him and forward the details of the grievance along with the action taken to the environment management specialist within 48 hours of receipt of such compliant/grievance.

15. Occupational Health and Safety

~~121.~~122. The Contractor should have a basic safety and health plan in place for workers, in which workers are required to wear personal protective gear suitable to the type of work being performed and a worker is suitably trained (or experienced) in the work he/she is assigned to do. Emergency care should be available on call. The Contractor should maintain a record of accidents, which should be reviewed on occasion with the supervising engineer. The contractor should maintain a high standard of safety in the performance of work. Workers need to be informed of potential risks associated with activities conducted in the vicinity of moving equipment, and workers should not be allowed to enter deep trenches unless they are properly shored.

~~122.~~123. There is invariably a safety risk when construction works such as excavation and earthmoving are conducted in urban areas. Workers need to be mindful of the occupational hazards which can arise from working i height and excavation works. Potential impacts are negative and long term but reversible by mitigation measures.

- Comply with requirements of Government of Bangladesh ~~labor~~labour law of 2006 and all applicable laws and standards on workers' health and safety (H&S).
- Ensure that all site personnel have a basic level of environmental awareness training.
- Procedure and implement a site H&S plan which include measures as: (i) excluding the public from worksites; (ii) ensuring all workers are provided with and required to use personal protective equipment (reflectorized vests, footwear, gloves, goggles and masks) at all times; (iii) providing (H&S) training for all site personnel; (iv) documenting procedures to be followed for all site activities; and (v) maintaining accident reports and records.
- Arrange for readily available first aid unit including an adequate supply of sterilized dressing materials and appliances.
- Maintain necessary living accommodation and ancillary facilities in functional and hygienic manner in work camps. Ensure (i) uncontaminated water for drinking, cooking and washing, (ii) clean eating areas where workers are not exposed to hazardous or noxious substances; and (iii) sanitation facilities are available at all times.
- Provide medical insurance coverage for workers;
- Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection and preventing injuring to fellow workers;
- Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted;
- Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating area;
- Ensure moving equipment is outfitted with audible back-up alarms;
- Mark and provide signboards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to and easily understood by workers, visitors and the general public as appropriate; and
- Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.

c. Operation & Maintenance Phase

~~123.~~124. In the operations and maintenance (O & M) phase, the road and drain system will operate with routine maintenance, which should not affect the environment. The infrastructures will need to be repaired from time to time, but environmental impacts will be much less than those of the construction period as the work will be infrequent, affecting small areas only. O & M will be the responsibility of Rohanpur Paurashava local authority, which will be given training by this sub-project.

~~124.~~125. Routine repairs and maintenance works will be very small in scale, to conducted manually by small teams of men and works will be very short in duration thus will not cause significant physical impacts.

1. Air Quality

~~125.~~126. Air emissions of common air contaminants and fugitive dust may be elevated in proximity to active work sites may include gaseous for disinfection processes. Develop and implement a prevention program that includes identification of potential hazards, written operating procedures, training, maintenance, and accident investigation procedures.

2. Acoustic Environment

~~126.~~127. Temporary increase in noise level and vibrations is expected. The impacts are minor negative and long-term, site-specific within a relatively small area reversible by mitigation measures.

~~127.~~128. Plan activities in consultation with Rohanpur local authority so that activities with the greatest potential to generate noise are conducted during periods of the day that will result in least disturbance.

3. Surface/Waste Water Quality

~~128.~~129. The surface water bodies may get flooded and polluted due to uncontrolled release of contaminated storm-water/road runoff from road surfaces. The pollutants associated with the road-runoff include, hydrocarbons, heavy, corrosive products and suspended solids including insoluble heavy metals as colloidal materials from traffic. The worst contamination generally takes place during the first flush of runoff from roads after a spell of dry weather. The level of pollution is directly related to the traffic volume. The pollution risk from accidental spillage may increase moderately. In the long run, the increased traffic volume and faster traffic speeds would increase the risk of accidental spillage, which could have medium adverse impact on surface water quality. Since the roads are within the Paurashava and traffic sizes are relatively small and light vehicle thus the overall impact is negligible.

~~129.~~130. On the other hand, the surface water quality at the drain's outfall location of all the existing Roads within this Paurashava might be impacted if maintenance of Roads will not be taken regularly. Water quality of the Punarbhaba ~~river~~River are good as per visual observations and no solid waste was observed. Also, it was noticed that no illegal connection is permitted by the municipality and it should be followed in the future. The Paurashava have to clean the drains regularly and have to ensure that no other source of water except rainfall and household water to the drains. In addition to the maintenance, the waste water quality have to be tested regularly from the outfall location and have to take mitigation measures accordingly if there any ascendance of national standard.

4. Biodiversity

~~130.~~131. All activities will be in the built-up area of Rohanpur Paurashava. There are no protected areas in or around sub-project site and no known areas of ecological interest. No trees, shrubs, or groundcover may be removed or vegetation stripped without the prior permission. The planted trees will be nurtured by the road slope Paurashava O&M budget.

5. Solid Waste

~~131.~~132. The main ~~causes of non-functionality of the existing drainage system is~~causes of non-functionality of the existing drainage system are clogging the Roads by the solid waste and inadequate design in some cases. Solid waste generated from the sub-project activities may contribute to the risk of clogging of roads. However, proper solid waste management facilities should be provided in the sub-project areas. Awareness raising camps and demonstration including the house owners regarding the waste management and their roles in keeping the Poura drains clean through daily activities. Poura authority should also remove the waste materials from drain side within the shortest time and periodic monitoring by the designated person of Paurashava.

d. Scheme Specific Impacts & Mitigations

Sl-No	PDP no.	Name of schemes	Length UT (m)	Existing Conditions & Impacts	Mitigations
R-01	ROHA-R-1	Improvement of Road by RCC from Kasimpur Yasin Ali house to Asharaf's house & installation of street light 5 nos. at Ward No.-01, Rohanpur Paurashava, Chapainawabganj. (Length = 130 m)	130	- Existing BC Road poor condition. - No impact on trees, temporary/ permanent structures - Water logging occurred during rainy season - Sensitive receptors like Mosque were identified during the environmental survey.	- There are no impacts on biodiversity. - Barriers should be given at specific location during construction - Roadside tree plantation may reduce noise & dust impacts during operation.
R-02	ROHA-R-2	Improvement of Road by RCC from Kasimpur main road to Nazrul's house via Alauddin & Malek's house & installation of street light 8 nos. at Ward No.-01, Rohanpur Paurashava, Chapainawabganj. (Length = 220 m)	220	- Existing earthen road poor condition - No impact on trees, temporary/ permanent structures	- General mitigation and monitoring measures are applicable - Barriers should be given at specific location during construction - Install road sign
R-03	ROHA-R-3	Improvement of Road by RCC from main Road to Mayajjem's house & installation of street light 5 nos. at Ward No.-01, Rohanpur Paurashava, Chapainawabganj. (Length = 125 m)	125	- This scheme is mostly along the residential areas - No impact on temporary/permanent structures	- General mitigation and monitoring measures are applicable
R-04	ROHA-R-4	Improvement of Road by RCC from Dhulauri main Road to Mohammad Ali Sarkar's house & installation of street light 8 nos. at Ward No.-01, Rohanpur Paurashava, Chapainawabganj. (Length = 200 m)	200	- This scheme is mostly along the residential areas - No impact on temporary/permanent structures	- General mitigation and monitoring measures are applicable
R-05	ROHA-R-5	Improvement of Road by RCC from Dhulauri Botthla to Khari Bridge including protection work at (Ch.90m-205m, R/S), Cross drain 1 nos. at Ch.90m, Size (1m X 1m) & Installation of street light 11 nos. at Ward No.-01, Rohanpur Paurashava, Chapainawabganj. (Length = 285 m)	285	- Existing road poor condition. - No impact on trees, temporary/ permanent structures	- There are no impacts on biodiversity. - construction - Install road sign both side in cross drain locations
R-06	ROHA-R-17	Improvement of Road by RCC from Puraton Bazar Lutfar's Garage to Eidgah house & installation of street light 5 nos. at Ward No.-02, Rohanpur Paurashava, Chapainawabganj. (Length = 120 m)	120	- Existing HBB & earthen road poor condition - No impact on trees, temporary/ permanent structures -	- General mitigation and monitoring measures are applicable - Install steel shutter in cross drain location

Sl-No	PDP no.	Name of schemes	Length UT (m)	Existing Conditions & Impacts	Mitigations
R-07	ROHA-R-18	Improvement of Road by RCC from Babur Ghone main road Club to Intaj's mango garden via Baburgurghone graveyard house & installation of street light 16 nos. at Ward No.-02, Rohanpur Paurashava, Chapainawabganj. (Length = 440 m)	440	- Existing road poor condition. - No impact on trees, temporary/ permanent structures	- There are no impacts on biodiversity. - Barriers should be given at specific location during construction
R-08	ROHA-R-19	Improvement of Road by RCC from Babur Ghone Ajhar Ali's house to Bosir's house & installation of street light 15 nos. at Ward No.-02, Rohanpur Paurashava, Chapainawabganj. (Length = 430 m)	430	- Existing road poor condition. - No impact on trees, temporary/ permanent structures -	- There are no impacts on biodiversity. - Barriers should be given at specific location during construction -
R-09	ROHA-R-30	Improvement of Road by RCC from Rohanpur Bazar Central Eid Ghah to Rohmat Para R&H (via Mohila College) & installation of street light 15 nos. at Ward No.-03, Rohanpur Paurashava, Chapainawabganj. (Length = 415 m)	415	- Existing earthen damaged road - No impact on trees, temporary/ permanent structures - Water logging occurred during rainy season - Sensitive receptors like college were identified during the environmental survey. -	- There are no impacts on biodiversity. - Barriers should be given at specific location during construction - Roadside tree plantation may reduce noise & dust impacts during operation.
R-10	ROHA-R-39	Improvement of Road by RCC from Baganpara Fansur's house to Abul Kasem's house via Baganpara main road and GM house & installation of street light 5 nos. at Ward No.-04, Rohanpur Paurashava, Chapainawabganj. (Length = 130 m)	130	- Existing road poor condition. - No impact on trees, temporary/ permanent structures -	- There are no impacts on biodiversity. - Barriers should be given at specific location during construction -
R-11	ROHA-R-45	Improvement of Road by RCC from Masterpara Pan Montur house to Gov. Primary School & installation of street light 8 nos. at Ward No.-04, Rohanpur Paurashava, Chapainawabganj. (Length = 210 m)	210	- Existing earthen damaged road - No impact on trees, temporary/ permanent structures - Water logging occurred during rainy season - Sensitive receptors like school were identified during the environmental survey. -	- There are no impacts on biodiversity. - Barriers should be given at specific location during construction - Roadside tree plantation may reduce noise & dust impacts during operation.
R-12	ROHA-R-63	Improvement of Road by RCC from Dak-bangla Para Ajgor Ali house (Near R&H) to Narul's house & installation of street light 5 nos. at Ward No.-05, Rohanpur Paurashava, Chapainawabganj. (Length = 125 m)	125	- This scheme is mostly along the residential areas - No impact on temporary/permanent structures	- General mitigation and monitoring measures are applicable

Sl-No	PDP no.	Name of schemes	Length UT (m)	Existing Conditions & Impacts	Mitigations
R-13	ROHA-R-65	Improvement of Road by RCC fromRohanpur Tetul more to Nimtala including Cross drain 2 nos. at Ch. 686, Ch. 830, Size (1m X 1m) & installation of street light 31 nos. at Ward No.-05, Rohanpur Paurashava, Chapainawabganj. (Length = 900 m)	900	- Existing road poor condition. - No impact on trees, temporary/ permanent structures -	- There are no impacts on biodiversity. - construction - Install road sign both side in cross drain locations
R-14	ROHA-R-69	Improvement of Road by RCC from Bagduarpara Abdur Rahman house to Sirajul Mistri house & installation of street light 5 nos. at Ward No.-05, Rohanpur Paurashava, Chapainawabganj. (Length = 120 m)	120	- Existing BC Road poor condition - No impact on trees, temporary/ permanent structures	- General mitigation and monitoring measures are applicable - Barriers should be given at specific location during construction
R-15	ROHA-R-86	Improvement of Road by RCC from Koyes Uddin Vondul Mondal house to No.rth Side of Prosadpur Girls School & installation of street light 12 nos. at Ward No.-06, Rohanpur Paurashava, Chapainawabganj. (Length = 340 m)	340	- Existing earthen damaged road - No impact on trees, temporary/ permanent structures - Water logging occurred during rainy season - Sensitive receptors like school were identified during the environmental survey. -	- There are no impacts on biodiversity. - Barriers should be given at specific location during construction - Roadside tree plantation may reduce noise & dust impacts during operation.
R-16	ROHA-R-88	Improvement of Road by RCC from Nur Gula Alam Bekari to Professor Sohel's house via Mukim Master House & installation of street light 19 nos. at Ward No.-06, Rohanpur Paurashava, Chapainawabganj. (Length = 530 m)	530	- This scheme is mostly along the residential areas - No impact on temporary/permanent structures	- General mitigation and monitoring measures are applicable
R-17	ROHA-R-104	Improvement of Road by RCC from Maiju's Pond to Guda Master House & installation of street light 14 nos. at Ward No.-06, Rohanpur Paurashava, Chapainawabganj. (Length = 390 m)	390	- This scheme is mostly along the residential areas - No impact on temporary/permanent structures	- General mitigation and monitoring measures are applicable
R-18	ROHA-R-191	Improvement of Road by RCC from Dhulauri R&H road to Rohanpur Homeo College & installation of street light 3 nos. at Ward No.-01, Rohanpur Paurashava, Chapainawabganj. (Length = 70 m)	70	- Existing BC Road poor condition - No impact on trees, temporary/ permanent structures - Sensitive receptors like college were identified during the environmental survey	- General mitigation and monitoring measures are applicable - Barriers should be given at specific location during construction - Install road sign in college location -

e. Cumulative Impact Assessment

~~132.~~133. The cumulative impact assessment examined the interaction between the sub-project's residual effects (i.e., those effects that remain after mitigation measures have been applied) and those associated with other past, existing and reasonably foreseeable future sub-projects or activities. The interaction of residual effects associated with multiple projects

and/or activities can result in cumulative impacts, both positive and negative. The project's potential cumulative effects were considered with respect to valued components in environmental and socioeconomic categories, in four areas:

i. of any potential residual project effects that may occur incrementally over time;
ii. consideration of other known relevant projects or activities within the specified study area boundaries, even if not directly related to the project;
iii. potential overlapping impacts that may occur due to other developments, even if not directly related to the proposed sub-project; and
iv. future developments that are reasonably foreseeable and sufficiently certain to proceed.

~~133.~~134. Location and sitting of the proposed infrastructures were considered to reduce impacts. Detailed designs integrate a number of measures, both structural and non-structural, to mainstream climate resilience into the Rohanpur road sub-project, including (i) designed to the current best practice standard codes; (ii) built that the floods do not damage them; and (iii) side drains are to be kept free from wastes and siltation.

1. Surface Water Quality

~~134.~~135. Surface water quality will not be impacted like present trend due to improved road and drainage system. Illegal or unwanted connections to the improved drains will be controlled and entrance of solid wastes will be prohibited by providing nets at required intervals.

2. Socioeconomic and Socio-community

~~135.~~136. Concerns on existing provisions for pedestrians and other forms of transport will occur spatially during construction and O & M activities. Since the sub-project will be improvement of existing infrastructures, it will not conflict with existing or planned land use. However, following improvement in infrastructures and services, added residential developments, commercial, and business facilities and increased densities are expected to develop and enhance Rohanpur Paurashava. This can be considered a long-term cumulative benefit of the sub-project.

~~136.~~137. Given the scale of the project, it is likely that local people will obtain at least temporary socio-economic benefits, by gaining employment in the construction workforce and thus raising their levels of income. These benefits can bring wider social gains if they are directed at vulnerable groups.

~~137.~~138. Upon completion of the sub-project, the socio-community will be the major beneficiaries. With the improved traffic management, they will be provided with reliable and climate-resilient drain. In addition to improved environmental conditions, the sub-project will reduce occurrence of air borne-related diseases and exposure to climate extremes. People would spend less on healthcare and lose fewer working days due to illness, so their economic status should also improve, as well as their overall health. Beyond reducing the water-borne and water-washed diseases, providing better access to improved municipal services confers many other diverse benefits ranging from the easily identifiable and quantifiable (costs avoided, time saved) to the more intangible and difficult to measure (convenience, well-being). One set of the benefits related to health impacts that are relatively easy to quantify, are the cost-offsets (costs avoided due to less illness). Cost savings in health care are mainly due to the reduced number of treatments of air borne diseases cases. In addition, patients will avoid costs incurred by seeking treatment, including expenditures on care, drugs and transport and the opportunity costs of time spent on seeking care. Another set of benefits related to less illness are the avoided days lost, with respect to formal or informal employment, other productive activities in the household or school attendance. These are considered a long-term cumulative benefit.

3. Induced Traffic and Vehicle Emissions

~~138.~~139. The project is likely to induce additional vehicle ownership and related emissions. This is inevitable with a road designed and maintenance to improve the economic situation of the region, and therefore its use is a measure of its success. Given the nature of the road, and lack of infrastructure development, the additional vehicle emissions induced by the project are not considered to be locally significant; however, they will contribute to global emissions.

A. Risk Assessment Methodology

a. Risk Assessment Matrix of Proposed Sub-project

~~139.~~140. This section identifies the potential impacts that the various elements of the proposed sub-project may have on aspects of the physical, biological, and socio-economic environment. The identification of the potential impacts will be considered for the two distinctive Project stages (construction and operation) as detailed in Section 3. The activities undertaken during each of these sub-project stages form the basis for potential impact identification and analysis.

~~140.~~141. Assessment of potential impacts requires a multi-disciplinary approach in which a wide range of issues are taken into consideration to identify and determine which potential sub-project impacts may be significant and therefore require the application of reasonable and effective management and/or mitigation. Most projects result in positive and negative potential impacts on the environment, society and economy, all of which are identified and assessed in this section.

~~141.~~142. Certain impacts identified in this section have the potential to be significant. The determination of whether a given potential impact is significant depends on several factors:

- The potential for on-site and off-site impacts;
- The potential for direct and indirect impacts;
- The frequency and duration of a potential impact;
- The geographic area affected by a potential impact
- The period of time affected by any potential impact;
- The sensitivity of the receiving environment; and
- The degree of confidence with which the potential impacts of the action/activity are known and understood.

~~142.~~143. Measures of potential impact significance as part of the sub-project planning and assessment phase presented in this IEE have been determined using a risk-based model. The risk-based model is a two-dimensional matrix of ‘magnitude of impact’ and ‘likelihood’. Both are assigned score between 1 and 5 based on severity or probability and multiplied to obtain the ‘risk band’.

~~143.~~144. The ‘magnitude of impact’ is a 5-point based scale set by expert’s judgment. The scale and its explanation are given in Table V.3.

Table VI.3: Explanation and Assignment of Scores to 'Magnitude of Impact'

Colour Band	Incidental	Minor	Moderate	Major	Severe/catastrophic
Score	Score: 1	Score: 2	Score: 3	Score: 4	Score: 5
Explanation	Impacts such as localized or short-term effects on habitat, species or environmental media.	Localized, long term degradation of sensitive habitat or widespread, short-term impacts to habitat, species or environmental media	Impacts such as localized but irreversible habitat loss or widespread, long-term effects on habitat, species or environmental media	Widespread and persistent changes in habitat, species or environmental media	Persistent reduction in ecosystem function on a landscape scale or significant disruption of a sensitive species.

~~144.~~145. The ‘likelihood’ is also a 5-point based scale set by expert’s judgment. The scale and its explanation are given in Table V.4.

Table VI.4: Explanation and Assignment of Scores to 'Likelihood'

Colour Band	Rare	Unlikely	Seldom	Occasional	Likely
Score	Score: 1	Score: 2	Score: 3	Score: 4	Score: 5
Explanation	Rare or unheard of	Reasonable to expect that the consequence will not occur during this	Exceptional conditions may allow consequences to occur within	Conditions may allow the consequence to occur during the sub-project	Consequence can reasonably be expected to occur in life the sub-project

		sub-project though has occurred several times in industry	the sub-project lifetime	lifetime, or the event has occurred within similar sub-project	

~~145.~~146. Therefore, "Risk" factor is derived from the following equation:

Risk = Magnitude x likelihood (1)

~~146.~~147. The score of 'Risk' ranges from 1 to 25. The score is classified in 3 classes. The explanation is given in Table V.5. The score matrix for risk assessment has been used to identify the priority environmental impact and their mitigation plan.

Table VI.5: Two-Dimensional Risk Assessment Matrix

			MAGNITUDE OF IMPACT				
			Incidental	Minor	Moderate	Major	Severe/cats.
			Score: 1	Score: 2	Score: 3	Score: 4	Score: 5
LIKELIHOOD	Rare	Score: 1	1	2	3	4	5
	Unlikely	Score: 2	2	4	6	8	10
	Seldom	Score: 3	3	6	9	12	15
	Occasional	Score: 4	4	8	12	16	20
	likely	Score: 5	5	10	15	20	25

b. Risk Assessment of the Sub-Project

~~147.~~148. Based on the above discussion, a risk assessment matrix has been developed for this sub-project. This assessment will be using as a guideline to monitor the sub-project during implementation. Though some issues do not need to monitor but it is still included in the environmental management plan in later section of this report if required in any case.

Table VI.6: Risk Assessment Matrix of the Proposed Sub-project

Ref. No.	Issues & Impacts	Risk Assessment		Risk Factor	Mitigation & Monitoring Required		Required Controls
		Magnitude	likelihood		Yes	Yes	
1.0 Pre-construction Phase							
1.1	**Obtaining of SCC/NOCs**	Not Applicable				**X**	An ECC has already obtained from DoE. Social Safeguard team is addressing the other issues during project preparation.
1.2	**Updating of EMP based on necessary**	3	3	9	**X**		PRSC will be working on it up to project implementation.
1.3	**Existing Utilities**	2	2	4	**X**		Mitigation measures are already given in the EMP.
1.4	**Construction Camps, & Stock Yards**	3	2	6	**X**		Mitigation measures are already given in the EMP.
1.5	**Sources of Materials**	3	2	6	**X**		PIU & PRSC will be working together as per EMP.
1.6	**EMP Implementation Training**	3	2	6	**X**		Environmental Specialists along with

Ref. No.	Issues & Impacts	Risk Assessment		Risk Factor	Mitigation & Monitoring Required		Required Controls
		Magnitude	likelihood		Yes	Yes	
							training engineer will be arranging a training for PIU & Contractors.
2.0 Construction Phase							
2.1	**Topography, Landforms, Geology**	2	2	4		**X**	Mitigation measures are already given in the EMP.
2.2	**Soil Quality**	2	2	4	**X**		Mitigation measures are already given in the EMP. Soil quality test is proposed for monitoring.
2.3	**Surface/Waste Water Quality**	3	2	6	**X**		Mitigation measures are already given in the EMP. Water quality test is proposed for monitoring.
2.4	**Groundwater Quality**	2	2	4	**X**		Mitigation measures are already given in the EMP. Water quality test is proposed for monitoring.
2.5	**Air quality**	3	3	9	**X**		Mitigation measures are already given in the EMP. Air quality test is proposed for monitoring.
2.6	**Noise & Vibration**	3	2	6	**X**		Mitigation measures are already given in the EMP. Noise level measurement is proposed for monitoring.
2.7	**Waste Pollution**	3	3	9	**X**		Mitigation measures are already given in the EMP. Waste management plan is provided.
2.8	**Aesthetics**	2	2	4		**X**	Mitigation measures are already given in the EMP.
2.9	**Biodiversity**	2	2	4	**X**		Mitigation measures are already given in the EMP. Follow tree plantation programme as per EMP
2.10	**Traffic Congestion**	3	3	9	**X**		Mitigation measures are already given in the EMP. Traffic management plan is provided.
2.11	**Socio-economic status**	2	2	4		**X**	Social Safeguard team is addressing this issue.
2.12	**Community Health and Safety**	3	2	6	**X**		Mitigation measures are already given in the EMP.
2.13	**Workers Health and Safety**	2	3	6	**X**		Mitigation measures are already given in the EMP. Health safety manual is provided.
2.14	**Post-construction Clean-up**	3	3	9	**X**		Mitigation measures are already given in the EMP.
2.15	**Submission of EMP Implementation Report**	1	2	2	**X**		PRSC will monitor and be responsible to ensure the collection of this report from contractor.
3.0 Operation Phase							
3.1	**Air Quality**	2	3	6	**X**		Mitigation measures are already given in the EMP. PS will be responsible to monitor.

Ref. No.	Issues & Impacts	Risk Assessment		Risk Factor	Mitigation & Monitoring Required		Required Controls
		Magnitude	likelihood		Yes	Yes	
3.2	**Noise Level**	3	3	9	**X**		Mitigation measures are already given in the EMP. PS will be responsible to monitor.
3.3	**Surface/Waste Water Quality**	2	3	6	**X**		Mitigation measures are already given in the EMP. PS will be responsible to monitor.
3.4	**Waste Management**	3	3	9	**X**		Mitigation measures are already given in the EMP. PS will be responsible to monitor.
3.5	**Road Accident**	3	2	6	**X**		Mitigation measures are already given in the EMP. PS will be responsible to monitor.

VII. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. Purpose of Public Participation

~~148.~~149. The development and construction of any project will impact on the surrounding human and physical environment and will have beneficial or adverse effects. It is therefore essential that the community can fully understand the project, have the opportunity to express their views and to become directly involved in the project's overall decision-making process.

~~149.~~150. Public authority developers must take account of the community's views and include any useful suggestions to improve the sub-project. This may include suggestions to help further develop environmental protection measures thereby reducing environmental pollution, reducing the loss of environmental resources and improve the project's environmental and social benefits, thus helping achieve more sustainable development.

~~150.~~151. In accordance with the requirements of the ADB as defined in the SPS 2009, the ''borrower will carry out meaningful consultation with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation'' The following activities have therefore been carried out in his project in accordance with the ADB requirements.

B. Consultation during Detailed Design Phase

~~151.~~152. The public participation process included (i) identifying interested and affected parties (stakeholders); (ii) informing and providing the stakeholders with sufficient background and technical information regarding the proposed development; (iii) creating opportunities and mechanisms whereby they can participate and raise their viewpoints (issues, comments, and concerns) with regard to the proposed development; (iv) giving the stakeholders feedback on process findings and recommendations; and (v) ensuring compliance to process requirements with regards to the environmental and related legislation.

~~152.~~153. MDS safeguard team conducted public consultations on 21st April, 2022. The objective of the meetings was to appraise the stakeholders about environmental and social impacts of the proposed sub-project and safeguards to mitigate the same. A questionnaire was designed and environmental information was collected. Key respondents included project-affected persons, who may suffer temporary access disruptions during construction activities from the sub-project area and daily commuters consulted randomly. Issues discussed and feedbacks received are given in Table VI.1. The list of participants along with details of date, time, and location is given in Appendix 5. The environmental concerns and suggestions made by the participants were listed, and discussed, and suggestions accordingly incorporated in the EMP. These include speedy construction works to ensure low impacts to community during road closures and local employment.

~~153.~~154. The Project has already organized consultation training program for all staff working in IUGIP, consultants and Paurashava staff on safeguard policies. The aim of the consultation programme was to inform all stakeholders about the importance of the safeguard policies and their implementation at the design construction and operation stage. Field consultations were conducted with local people. Consultations by the PIU supported by the RES and the PMU include the following:

- Focus-group discussions (FGDs) and Workshop with affected persons and other stakeholders (including women's groups, NGOs and CBOs) to hear their views and concerns, were conducted and concerns were addressed in sub-project design.
- Structured consultation meetings with the institutional stakeholders (government bodies and NGOs) to discuss and approve key aspects of the sub-project.

Table VII.1: Outcome of the Public Consultation

Sl. No.	Key Issues/Demands	Perception of Community	Action to be Taken
1	Awareness of the project including coverage area	Yes, they are aware of the project that will be improved.	No need to take action.
2	In what way they may associate with the sub-project	They will give all types of cooperation for implementation of the sub-project	More consultation before start of the sub-project.
3	Presence of any forest, wildlife or any sensitive/ unique environmental components nearby the project area	No such information available.	No need to take action.
4	Presence of historical/cultural/ Religious sites nearby	No such information available	No need to take action.
5	Unfavorable climatic condition	During the rainy season, the town become flooded if heavy rainfall occurs within short duration.	Design the drain adequately.
6	Occurrence of flood	The city often inundated due to heavy rainfall for short duration. No major flood occurred recently.	Design the drain adequately.
7	Drainage and sewerage problem facing	The town has proper master drains covering most portion of the city to carry waste water. Therefore, no major problem with water logging in normal condition.	Design the drain adequately.
8	Availability of labour during construction time	Yes, Local labour is available.	No need to take action.
9	Dust and noise pollution disturbances during construction work	Yes, they know the impact will be short-term & negligible.	EMP will be prepared to minimize the impact.
10	Setting up construction camp site within the villages/project locality	Yes, no construction camp is required for this sub-project.	No camp or storage site within locality
11	Safety of residents during construction phase and plying of vehicle for construction activities	Yes, they are aware of the safety issues	Awareness programs will be taken before start of the construction work.

a. Summary of Consultations Outcome

~~154.~~155. If any important road of any area in development everything of that area will develop very soon. It's helpful to all classes of people who live at that area. All the local community people of that area will able to go their business, school, college and hospital within shortest time. It is helpful for extension of business which may help to earn so many foreign currencies. By earning lot of foreign currency our economic problem eradicates very soon. Pregnant woman and any ill person can go to any hospital within a small time. The employers of any government or non-government institution and the workers of that institution can go their work place very soon. The farmers can go to nearest town with their agricultural production within very short time and sale that product at high price. Police administration can take immediate action against any offender, such as Murderer, Eve-teaser, etc.

Figure VII.1: Public Consultation at Rohanpur Paurashava

C. Consultation during Construction Phase

~~155.~~156. Public meetings with affected communities to discuss and plan work programs and allow issues to be raised and addressed once construction has started. Smaller-scale

meetings to discuss and plan construction work with individual communities to reduce disturbance and other impacts and provide a mechanism through which stakeholders can participate in sub-project monitoring and evaluation.

D. Sub-project Disclosure

~~156.~~157. For the benefit of the community, the summary of the IEE will be discussed with the local people prior to the construction and consultations during construction period for their information of the sub-project activities. It will be ensured that the hard copies of IEE are kept at places which are conveniently accessible to people, as a means to disclose the document and at the same time creating wider public awareness. An electronic version of the IEE will be placed in the official website of executing and implementing agencies and the ADB website after approval of the IEE by ADB. In addition to the above the below actions also could be taken as disclosure of the information.

- Public information campaigns (via newspaper, flyers, banners, and poster) to explain the sub-project to the wider city population and prepare them for disruption they may experience once the construction programme is underway;
- Public disclosure meetings at key sub-project stages to inform the public of progress, future plans and to provide copies of summary documents in local language;
- Formal disclosure of completed sub-project reports by making copies available at convenient locations in the study areas and informing the public of their availability, and
- Providing a mechanism through which comments can be made.

~~157.~~158. A project-specific grievance redress mechanism (GRM) will be established to receive, evaluate, and facilitate the resolution of AP's concerns, complaints, and grievances about the social and environmental performance at the level of the project. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project.

VIII. GRIEVANCE REDRESS MECHANISM

A. Common GRM

~~158.~~159. A common GRM will be in place for social, environmental, or any other grievances related to the project; the resettlement plans (RPs) and IEEs will follow the GRM described below, which is developed in consultation with key stakeholders. The GRM will provide an accessible and trusted platform for receiving and facilitating resolution of affected persons' grievances related to the project. The multi-tier GRM for the project is outlined below, each tier having time-bound schedules and with responsible persons identified to address grievances and seek appropriate persons' advice at each stage, as required.

~~159.~~160. Paurashava-wide public awareness campaigns will ensure that awareness on grievance redress procedures is generated through the campaign. The project implementation unit (PIU) and governance improvement and capacity development consultants (GICDC) will conduct Paurashava-wide awareness campaigns to ensure that poor and vulnerable households are made aware of grievance redress procedures and entitlements and will work with the PMU and management, design and supervision consultants (PRSC) to help ensure that their grievances are addressed.

~~160.~~161. Affected persons (APs) will have the flexibility of conveying grievances/suggestions by dropping grievance redress/suggestion forms in complaints/suggestion boxes that have already been installed by project Paurashavas or through telephone hotlines at accessible locations, by e-mail, by post, or by writing in a complaint register in Paurashava offices. Careful documentation of the name of the complainant, date of receipt of the complaint, address/contact details of the person, location of the problem area, and how the problem was resolved will be undertaken. The project management office (PMU) safeguard officer will have the overall responsibility for timely grievance redress on environmental and social safeguards issues and for registration of grievances, related disclosure, and communication with the aggrieved party through the PIU designated safeguard focal person.

B. General

~~161.~~162. The objective the grievance redress mechanism (GRM) is to resolve complaints as quickly as possible and at the local level through a process of conciliation; and, if that is not possible, to provide clear and transparent procedures for appeal. A well-defined grievance redress and resolution mechanism will be established to resolve grievances and complaints in a timely and satisfactory manner. All affected persons will be made fully aware of their rights, and the detailed grievance redress procedures will be publicized through an effective public information campaign.

C. Grievance Redress Process

~~162.~~163. In case of grievances that are immediate and urgent in the perception of the complainant, the contractor and PRSC on-site personnel will provide the most easily accessible or first level of contact for quick resolution of grievances. Contact phone numbers and names of the concerned PIU safeguard focal person and contractors; will be posted at all construction sites at visible locations.

b. 1st Level Grievance

~~163.~~164. The phone number of the PIU office should be made available at the construction site signboards. The contractors and PIU safeguard focal person can immediately resolve on-site in consultation with each other, and will be required to do so within 7 days of receipt of a complaint/grievance.

c. 2nd Level Grievance

~~164.~~165. All grievances that cannot be redressed within 7 days at field/ward level will be reviewed by the grievance redress cell (GRC) headed by Panel Mayor of the Paurashava with support from PIU designated safeguard focal person and PRSC regional environment and resettlement specialists. GRC will attempt to resolve them within 15 days The PIU designated

safeguard focal person will be responsible to see through the process of redress of each grievance.

d. 3rd Level Grievance

~~165.~~166. The PIU designated safeguard focal person will refer any unresolved or major issues to the PMU safeguard officer and PRSC Senior environmental and resettlement specialists. The PMU in consultation with these officers/specialists will resolve them within 30 days.

~~166.~~167. Despite the project GRM, an aggrieved person shall have access to the country's legal system at any stage and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

~~167.~~168. In the event that the established GRM is not in a position to resolve the issue, the affected person also can use the ADB Accountability Mechanism (AM) through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB headquarters or the ADB Bangladesh Resident Mission (BRM). The complaint can be submitted in any of the official languages of ADB's DMCs. The ADB Accountability Mechanism information will be included in the PID to be distributed to the affected communities, as part of the project GRM.

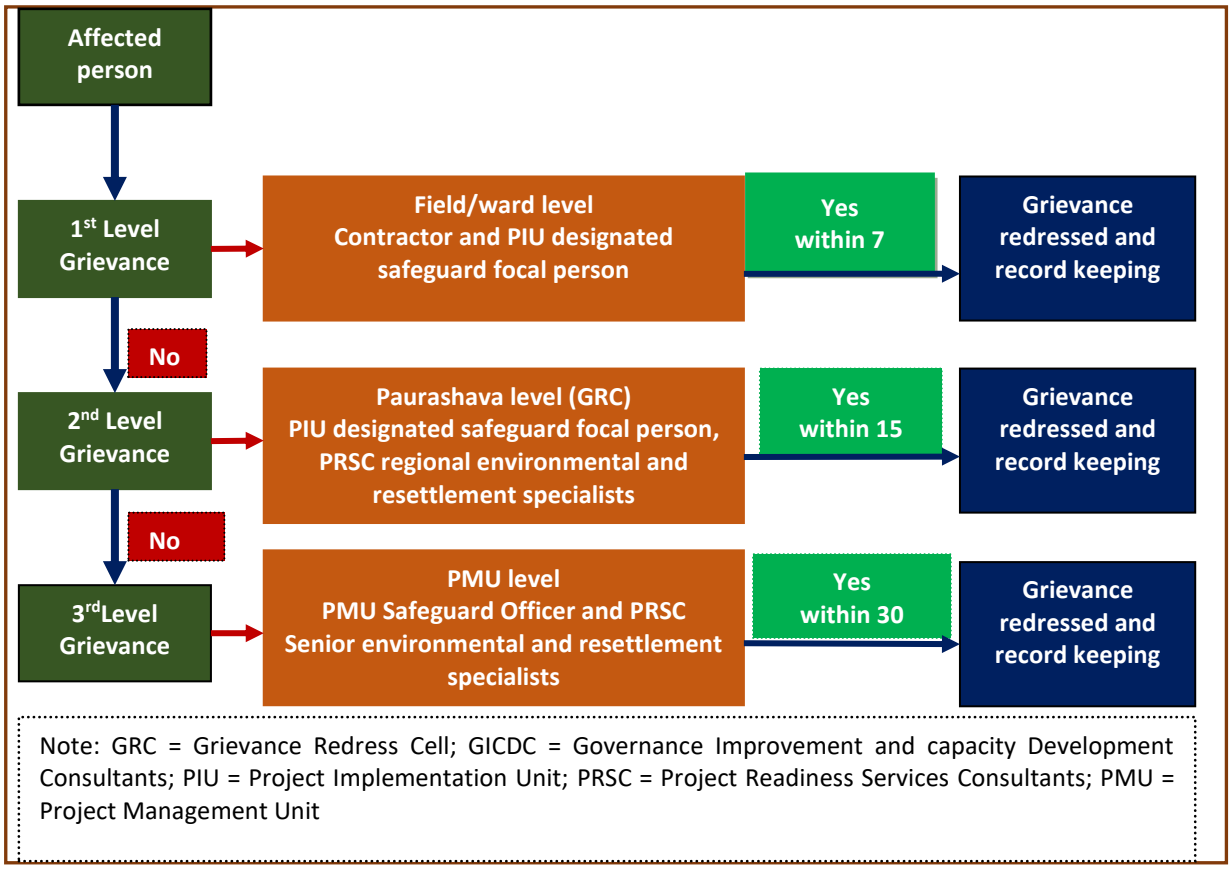


Figure VIII.1: Project Grievance Redress Mechanism

D. Recordkeeping

~~168.~~169. Records of all grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions, and the date these were affected and outcome will be kept by PIU. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the PMU office, Paurashava office, and on the web, as well as reported in monitoring reports submitted to ADB on a semi-annual basis.

E. Periodic Review

~~169.~~170. The PMU safeguard officer will periodically review the functioning of the GRM in each Paurashava and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances.

F. Costs

~~170.~~171. All costs involved in resolving the complaints (meetings, consultations, communication, and reporting/information dissemination) will be borne by the concerned PIU at Paurashava-level; while costs related to escalated grievances will be met by the PMU. Cost estimates for grievance redress related to both for social and environmental issues are included in resettlement cost estimates.

IX. ENVIRONMENTAL MANAGEMENT PLAN

A. Objectives of the EMP

~~171.~~172. The purpose of the environmental management plan (EMP) is to ensure that the activities are undertaken in a responsible, non-detrimental manner with the objectives of: (i) providing a proactive, feasible, and practical working tool to enable the measurement and monitoring of environmental performance on-site; (ii) guiding and controlling the implementation of findings and recommendations of the environmental assessment conducted for the project; (iii) detailing specific actions deemed necessary to assist in mitigating the environmental impact of the sub-project; and (iv) ensuring that safety recommendations are complied with.

~~172.~~173. A copy of the EMP must be kept on work sites at all times. This EMP is included in the bid documents and will be further reviewed and updated during implementation. The EMP will be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

~~173.~~174. For civil works, the contractor will be required to (i) establish an operational system for managing environmental impacts (ii) carry out all of the monitoring and mitigation measures set forth in the EMP; and (iii) implement any corrective or preventative actions set out in safeguards monitoring reports that the employer will prepare from time to time to monitor implementation of this IEE and EMP. The contractor shall allocate a budget for compliance with these EMP measures, requirements and actions.

B. EMP – Mitigation Measures

~~174.~~175. Mitigation measures for each of the impacts listed in the Table VIII.1 in accordance with the chapter V. Responsible institutions/departments for the implementation and supervision of each of the environmental issues have also been illustrated. Mitigation measures have been suggested based on the knowledge of the Environmental Specialist, suggestions of the stakeholders collected during public consultation, and opinions from other relevant specialists.

~~175.~~176. The mitigation measures will be considered successful when comply with the Environmental Quality Standards (EQS), policies, legal requirements set by DoE and other relevant GoB organizations. In absence of DoE's own EQS, other relevant international or other recognized organization's quality standard will have to be followed.

Table IX.1: Environmental Management Plan – Mitigative Measures

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
1.0 Pre-construction Phase				
1.1	**Obtaining of SCC/NOCs** Failure to obtain necessary consents, permits, NOC's can result in design revisions and/or stoppage of the Works.	▪ The proposed road will be constructed in Paurashava own land and existing road networks, that's why all necessary consents, permits, clearance, etc. not required to be obtain before start of civil works (ensured from DDR report).	PIU/Contactor	PRSC
1.2	**Updating of EMP based on necessary** Specific impacts will be identified as per design updating and construction works	▪ Update IEE and EMP as per necessary of detail design and construction works ▪ Ensure updated EMP is provided to contractors	PMU/ PRSC	PRSC
1.3	**Existing Utilities** Disruption of services (short term).	▪ Drawing from the consultant's visit, there was no utility or services found. Therefore, disruption in services is not expected. ▪ There is no vegetation alongside the existing Right Off Ways and proposed site. In addition, there is no water body nearby. No impact is expected on flora and fauna. ▪ Require construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. ▪ Existing infrastructure (such as water distribution pipes, electric pole, and shop/boundary wall etc.) shall be relocated before construction starts at the sub-project sites. ▪ Prior permission shall be obtained from respective local authority for use of water for construction. Use of water for construction works shall not disturb local water users. ▪ If construction work is expected to disrupt users of community water bodies, notice to the affected community shall be served 7 days in advance and again 1 day prior to start of construction.	Contractor	PRSC/PIU
1.4	**Construction Camps, & Stock Yards** Disruption to traffic flow and sensitive receptors Water body and agricultural land may be disturbed	▪ Determine locations prior to award of construction contracts. ▪ Avoid nearby water body, educational institutes and agricultural land	Contactor	PRSC/PIU
1.5	**Sources of Materials** Extraction of materials can disrupt natural land contours Air pollution and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.	▪ Prepare list of approved quarry sites and sources of materials ▪ Select authorized supplier	Contactor	PRSC/PIU
1.6	**EMP Implementation Training** Irreversible impact to the environment, contactor representative/workers, Paurashava officials	▪ Training will be required to undergo EMP implementation including waste management, Standard operating procedures (SOP) for construction works; health and safety (H&S), core labor laws, applicable environmental laws, etc	Contractor	PMU/PIU

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
2.0 Construction Phase				
2.1	**Topography, Landforms, Geology** Significant amount of gravel, sand, bitumen and cement will be required for this sub-project. Extraction of construction materials may cause localized changes in topography and landforms. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	▪ Utilize readily available sources of materials. If contractor procures materials from existing burrow pits and quarries, ensure these conform to all relevant regulatory requirements. ▪ Borrow areas and quarries (If these are being opened up exclusively for the sub-project) must comply with environmental requirements, as applicable. No activity will be allowed until formal agreement is signed between PIU, landowner and contractor.	Contractor	PRSC/PIU
2.2	**Soil Quality** ▪ Leakages of oil and chemical materials from construction activity ▪ Inappropriate disposal of waste ▪ Exhaust gas and dust from vehicles	▪ Storage of oil and chemical materials in an appropriate storage site and method to prevent permeation into the ground. ▪ Prohibit illegal dumping ▪ Soil quality monitoring	Contractor	PRSC/PIU
2.3	**Surface/Waste Water Quality** Trenching and excavation, run-off from stockpiled materials, and contamination from fuels and lubricants may result to silt-laden runoff during rainfall which may cause reduction in the quality of adjacent bodies of water. Surface water pollution is expected but minor negative and short term, site-specific within a relatively small area and reversible by mitigation measures.	▪ Prepare and implement a waste management plan (see Appendix 1 for outline). ▪ Prioritize re-use of excess waste and materials in construction activities. If waste will be disposed, consult with Rohanpur local authority on designated disposal areas. ▪ All earthworks must be conducted during dry season to the maximum extent possible to avoid the difficult working conditions that prevail during monsoon season such as problems from runoff. ▪ Water quality will be tested pre-during-post construction by contactor. ▪ Location for stockyards for construction materials shall be identified far away from watercourses. ▪ Place storage areas for fuels and lubricants away from any drainage leading to water bodies. ▪ Take precautions to minimize the wastage of water in the construction activities. ▪ Take all precautions to prevent entering of wastewater into nearby watercourses. Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies. ▪ Ensure diverting storm water flow during construction shall not lead to inundation and other nuisances in low lying areas. ▪ Ensure no construction materials like earth, stone, or appendage are disposed of in a manner that may block the flow of water	Contractor	PRSC/PIU
2.4	**Groundwater Quality** The potential exists for drinking water sources to be contaminated by the seepage of wastes from workers camps through the soil profile into the GW aquifer (particularly if wells access the shallow aquifer).	▪ Workforce camps will be located away from water resources. All practical measures such as provision of septic tanks, garbage bags, and other sanitation facilities will be implemented at the construction camps to prevent the wastewater and solid wastes from entering well and groundwater recharge areas. ▪ Wells used for drinking will be tested quarterly to ensure portability.	Contractor	PRSC/PIU
2.5	**Air quality** Conducting works at dry season and moving	▪ Water spraying to control dust as per necessary; ▪ Use tarpaulins to cover soils, sand and other loose material when transported by	Contractor	PRSC/PIU

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
	large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants (such as carbon monoxide, sulphur oxides, particulate matter, nitrous oxides, and hydrocarbons) which will affect people who live and work near the sites. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	trucks. ▪ Unpaved surfaces used for haulage of materials within settlements shall be maintained dust-free. ▪ Arrangements to control dust through provision of windscreens, water sprinklers. ▪ Air quality will be tested pre-during-post construction by contactor		
2.6	**Noise & Vibration** Temporary increase in noise level and vibrations may be caused by excavation equipment, transportation of equipment, construction materials and construction activity. However, the proposed sub-project will be existing location and impact is short-term, site-specific and within a relatively small area. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	▪ Involve the community in planning the work program so that any particularly noisy or otherwise invasive activities can be scheduled to avoid sensitive times. ▪ Plan activities in consultation with Rohanpur local authority so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance. ▪ Use of high noise generating equipment shall be avoided. ▪ Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach; ▪ Utilize modern vehicles and machinery with the requisite adaptations to limit noise and exhaust emissions, ▪ All vehicles and equipment used in construction shall be fitted with exhaust silencers. Use silent-type generators (if required). ▪ Monitor noise levels. Maintain maximum sound levels not exceeding 85 decibels (dBA) when measured at a distance of 10 m or more from the vehicle/s. ▪ If it is not practicable to reduce noise levels to or below noise exposure limits, the contractor must post warning signs in the noise hazard areas. Workers in a posted noise hazard area must wear hearing protection. ▪ Identify any buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity. Complete work in these areas quickly. ▪ Noise level will be tested pre-during-post construction by contactor	Contractor	PRSC/PIU
2.7	**Waste Pollution** ▪ Construction waste from construction work ▪ Domestic waste from workers ▪ Hazardous waste	▪ Follow the 'Waste Management Plan' in Appendix 1. ▪ Conduct separate waste collection and promote recycling and reuse. ▪ Appropriate disposal of non-recyclable waste according to rules ▪ Hazardous waste should be treated under the related regulation	Contractor	PRSC/PIU
2.8	**Aesthetics** The construction activities do not anticipate any cutting of trees but will produce excess excavated earth (spoils), excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, spoils, oils, lubricants, and other similar items. The impacts are negative but	▪ Follow the waste management plan properly (Appendix 1) ▪ Remove all construction and demolition wastes on a daily basis. ▪ Coordinate with Rohanpur local authority for beneficial uses of excess excavated soils or immediately dispose to designated areas Avoid stockpiling of any excess spoils ▪ Suitably dispose of collected materials from construction site, unutilized materials and debris either through filling up of pits/wasteland or at pre-designated disposal locations.	Contractor	PRSC/PIU

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
	short-term, site-specific within a relatively small area and reversible by mitigation measures.	▪ No construction materials like earth, stone, rod, polythene, paper, wood and concrete are kept in the sub-project area that may block the flow of water of existing drains. ▪ Clean the construction side road/drain regularly. ▪ All vehicles delivering fine materials to the site and carrying waste debris for disposal shall be covered to avoid spillage of materials. All existing roads used by vehicles of the contractor, shall be kept clear of all dust/mud or other extraneous materials dropped by such vehicles. ▪ Lighting on construction sites at night. ▪ In areas where the visual environment is particularly important or privacy concerns for surrounding buildings exist, the site may require screening. This could be in the form of shade cloth, temporary walls, or other suitable materials prior to the beginning of construction. ▪ The site must be kept clean to minimize the visual impact of the site.		
2.9	**Biodiversity** Activities being located in the built-up area of Rohanpur Paurashava. There are no protected areas in or around existing sub-project sites, and no known areas of ecological interest. There are no trees at the site that need to be removed.	▪ No trees, shrubs, or groundcover may be removed or vegetation stripped without the prior permission of the environment specialist. ▪ If during construction period cutting of trees will be required, compensatory plantation for trees lost at a rate of 2 trees for every tree cut, in addition 200 tree plantation along Road-R-18, R-65 and R-88 as specified in EMP cost, will be implemented after discussion with PIU by the contractor, who will also maintain the saplings for the duration of his contract. ▪ All efforts shall be made to preserve trees by evaluation of minor design adjustments/ alternatives (as applicable) to save trees. ▪ Special attention shall be given for protecting giant trees and locally-important trees (with religious importance) during implementation. ▪ Prevent workers or any other person from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body in the subproject vicinity. ▪ Prohibit employees from poaching wildlife and cutting of trees for firewood. ▪ Plantation of 10 trees along the road No. R-2, R-5 & R-9.	Contractor	PRSC/PIU
2.10	**Traffic Congestion** Hauling of construction materials and operation of equipment on-site can cause traffic problems. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	▪ Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites. ▪ Maintain safe passage for vehicles and pedestrians throughout the construction period. ▪ Schedule truck deliveries of construction materials during periods of low traffic volume. ▪ Erect and maintain barricades, including signs, markings, flags and flagmen informing diversions and alternative routes when required. ▪ Notify affected sensitive receptors by providing sign boards informing nature and duration of construction activities and contact numbers for concerns/complaints. ▪ Provide walkways and metal sheets where required to maintain access across for people and vehicles. ▪ Increase workforce in front of critical areas such as institutions, place of worship,	Contractor	PRSC/PIU

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
		business establishment, hospitals, and schools. ▪ Consult businesses and institutions regarding operating hours and factoring this in work schedules. Ensure there is provision of alternate access to businesses and institutions during construction activities, ▪ Ensure any damage to properties and utilities will be restored or compensated to pre-work conditions.		
2.11	**Socio-economic status** Sub-project components will be located in Paurashava land and there is no requirement for land acquisition or any resettlements. Manpower will be required during the construction stage. This can result to generation of contractual employment and increase in local revenue. Thus, potential impact is positive and long-term.	▪ Employ at least 50% of labor force from communities in the vicinity of the site. This will have the added benefit of avoiding social problems that sometimes occur when workers are imported into host communities, and avoiding environmental and social problems from workers housed in poorly serviced camp accommodation. ▪ Secure construction materials from local market. ▪ To ensure engage women employee as per gender action plan	Contractor	PRSC/PIU
2.12	**Community Health and Safety** Construction works will impede the access of residents and businesses in limited cases. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures. Poor safety signage and lack of barriers at work site and trenches will create hazard to pedestrians and children.	▪ Provide safety signage at construction sites visible to public ▪ Provide safety barriers near any trenches, and cover trenches with planks during non-work hours. ▪ Contractor's activities and movement of staff will be restricted to designated construction areas. ▪ Consult with Rohanpur local authority on the designated areas for stockpiling of, soils, gravel, and other construction materials. ▪ If the contractor chooses to locate the work camp/storage area on private land, he must get prior permission from the environment specialist and Paurashava. ▪ Recycling and the provision of separate waste receptacles for different types of waste shall be encouraged. ▪ A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following general rules: (i) no alcohol/drugs on site; (ii) prevent excessive noise; (iii) construction staff are to make use of the facilities provided for them, as opposed to ad hoc alternatives (e.g. fires for cooking, the use of surrounding bushes as a toilet facility); (iv) no fires permitted on site except if needed for the construction works; (v) trespassing on private/commercial properties adjoining the site is forbidden; (vi) other than pre-approved security staff, no workers shall be permitted to live on the construction site; and (vii) no worker may be forced to do work that is potentially dangerous or that he/she is not trained to do. ▪ Interested and affected parties need to be made aware of the existence of the complaints book and the methods of communication available to them. The contractor must address queries and complaints by: (i) documenting details of such communications; (ii) submitting these for inclusion in complaints register; (iii) bringing issues to the Sr./regional environmental specialist's attention immediately; and (iv) taking remedial action as per Sr./regional environment specialist's instruction.	Contractor	PRSC/PIU

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
		▪ The contractor shall immediately take the necessary remedial action on any complaint/grievance received by him and forward the details of the grievance along with the action taken to the national/regional environmental specialist within 48 hours of receipt of such complaint/grievance.		
2.13	**Workers Health and Safety** There is invariably a safety risk when construction works such as excavation, sand filling, carrying of mixture materials, Shuttering, steel/wood work and earthmoving are conducted in urban areas. Workers need to be mindful of the occupational hazards which can arise from working in height and excavation works. Potential impacts are negative and major but reversible by mitigation measures.	▪ Comply with requirements of Government of Bangladesh Labor Law of 2006 & 2015 and all applicable laws and standards on workers H&S. ▪ Ensure that all site personnel have a basic level of environmental awareness training. If necessary, the environmental management specialist and/or a translator shall be called to the sites to further explain aspects of environmental or social behaviour that are unclear. ▪ Produce and implement a site health and safety (H&S) plan which include measures as: (i) excluding the public from worksites; (ii) ensuring all workers are provided with and required to use personal protective equipment (reflectorized vests, footwear, gloves, goggles and masks) at working times; (iii) providing (H&S) training for construction site personnel; (iv) documenting procedures to be followed for all site activities; and (v) maintaining accident reports and records. ▪ Arrange for readily available first aid unit including an adequate supply of sterilized dressing materials and appliances ▪ Maintain necessary living accommodation and ancillary facilities in functional and hygienic manner in work camps. Ensure (i) uncontaminated water for drinking, cooking and washing, (ii) clean eating areas where workers are not exposed to hazardous or noxious substances; (iii) providing fire extinguisher at construction site and (iv) sanitation facilities are available at all times. ▪ Provide medical insurance coverage for workers; ▪ Provide H&S orientation training to all workers to ensure that they are apprised of the basic site rules of work at the site, PPE, and preventing injuring to fellow workers; ▪ Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; ▪ Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.	Contractor	PRSC/PIU
2.14	**Post-construction Clean-up** Damage due to debris, spoils, excess construction materials	▪ Remove all spoils wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and. ▪ All disrupted utilities restored ▪ All affected structures rehabilitated/ compensated ▪ The construction camp is to be checked for spills of substances such as used container/water bottles, paint, etc. and these shall be cleaned up. ▪ All hardened surfaces within the construction camp area shall be ripped, all imported materials removed, and the area shall be top soiled and regressed using the guidelines set out in the re-vegetation specification that forms part of this document. ▪ The contractor must arrange the cancellation of all temporary services.	Contractor	PRSC/PIU

Ref. No.	Issues & Impacts	Mitigation Measures	Responsible for	
			Implementation	Supervision
		▪ Request PMU/PIU to report in writing that worksites and camps have been vacated and restored to pre-project conditions before acceptance of work.		
2.15	**Submission of EMP Implementation Report** Unsatisfactory compliance to EMP	▪ Appointment of supervisor/Manager to ensure EMP implementation ▪ Timely submission of Progress report/environmental monitoring reports including pictures	Contractor	PRSC/PIU
3.0 Operation Phase				
3.1	**Air Quality** ▪ Exhaust gas from vehicles used for mobilization of equipment and workers ▪ Dust from road and drain	▪ Provisions of Paurashava budget for operation & maintenance of the road; ▪ Awareness raising camps and demonstration including the transport owners and drivers; ▪ Watering the roads during dry season; ▪ Periodic monitoring;	Paurashava	Paurashava
3.2	**Noise Level** ▪ Noise caused by vehicles moving along the road carrying passengers and goods.	▪ Provisions of Paurashava budget for operation & maintenance; ▪ Awareness raising camps and demonstration including the transport owners and drivers; ▪ Prohibit the use of hydraulic horns; ▪ Use of signs at sensitive locations; ▪ Periodic monitoring;	Paurashava	Paurashava
3.3	**Surface/Waste Water Quality** ▪ Surface water runoff to nearby lands ▪ Ponds along the road ▪ Waste water to the khal	▪ Provisions of Paurashava budget for operation & maintenance of drains; ▪ Water quality test from the drain outfall once in a year take mitigation measures accordingly. ▪ If the water quality of the river will be deteriorated then check the drains within the sub-project at first and others drain accordingly. ▪ Awareness raising camps and demonstration including the house owners; ▪ Cleaning the drains regularly; ▪ Prohibit the illegal connections to the drains; ▪ Periodic monitoring;	Paurashava	Paurashava
3.4	**Waste Management** Clogging of drains.	▪ Provisions of Paurashava budget for operation & maintenance of drains; ▪ Awareness raising camps and demonstration including the house owners; ▪ Do not throw plastic materials in to the drains; ▪ Remove the waste materials from drain side within the shortest time; ▪ Periodic monitoring;	Paurashava	Paurashava
3.5	**Road Accident** Increase of road accident due to additional traffics	▪ Provide road safety signs and speed bumps/speed breaker at the densely populated/accident prone area such as school, college, commercial area etc. ▪ Provide training to community people to aware about road safety	Paurashava	Paurashava

C. Environmental Monitoring Plan

~~176.~~177. The monitoring plan is one of the important tools of the implementing the mitigation plan for the proposed road/drain sub-project. The Monitoring plan provides guidance regarding environmental issues/parameters, location, frequency and means of monitoring.

~~177.~~178. The aim of environmental monitoring during the pre-construction, construction and operation phases of the sub-project road/drain is to compare the monitored data against the baseline condition collected during the study period (particularly during the detailed design stage) to assess the effectiveness of the mitigation measures and the protection of environmental components (e.g. air, water, soil, noise etc.) based on the national environmental standards (e.g. ECR 1997). Since the project is likely to have impact on various components of the environment, a comprehensive monitoring plan covering soil erosion, drainage congestion, tree plantation, air quality, water quality, noise, wildlife movement, workers' and community health and safety and so on need to be developed.

~~178.~~179. An Environmental Monitoring Plan (EMoP) has been prepared (Table VIII.2) along with this IEE for the execution as a means to mitigate or minimize the adverse impacts associated with construction and operational activities of the project on the natural and social environments.

a. Objectives

~~179.~~180. The objective of environmental monitoring during the construction and operation phases is to compare the monitored data against the baseline condition collected during the study period to assess the effectiveness of the mitigation measures and the protection of the ambient environment based on national standards. The main objectives of the pre-construction, construction and operation phase monitoring plans will be to:

i. Monitor the actual impact of the works on physical, biological and socioeconomic receptors within the project corridor for indicating the adequacy of the IEE;
ii. Recommend mitigation measures for any unexpected impact or where the impact level exceeds that anticipated in the IEE;
iii. Ensure compliance with legal and community obligations including safety on construction sites;
iv. Monitor the rehabilitation of borrow areas and the restoration of construction campsites as described in the EMP;
v. Ensure the safe disposal of excess construction materials.
vi. Appraise the adequacy of the IEE with respect to the project's predicted long-term impacts on the corridor's physical, biological and socio-economic environment;
vii. Evaluate the effectiveness of the mitigation measures proposed in the EMP and recommend improvements, if and when necessary;
viii. Compile periodic accident data to support analyses that will help minimize future risks; and
ix. Monitor the survival rate of avenue plantations.

Table IX.2: Environmental Management Plan - Monitoring Actions

Ref. No.	Environmental Issues	Significant Impact	Purpose of the Monitoring	Monitoring Method			Responsibility	
				Method of Collecting and Reporting Data	Location	Duration and Frequency	Implementation	Supervision
1.0 Pre-construction Phase								
1.1	**Obtaining of SCC/NOCs**	Failure to obtain necessary consents, permits, NOC's can result in design revisions and/or stoppage of the Works.	Compliance to GoB and ADB policies	Obtaining certificates	Paurashava	Prior to contractor mobilization	PMU/PIU	PMU/PRSC
1.2	**Updating of EMP**	Specific impacts will be identified as per design updating and construction works	Ensuring the compliance with construction schedule	Preparation of report	PMU	During the pre-construction period	PRSC	PMU
1.3	**Existing Utilities**	Disruption of services (short term).	Implementation of EMP	Obtain record of implantation	In the work site	Prior to contractor mobilization	Contractor	PIU/PRSC
1.4	**Construction Camps, & Stock Yards**	Disruption to traffic flow and sensitive receptors Water body and agricultural land may be disturbed	Implementation of EMP	Obtaining approval from PRSC/PIU	In the work site	Prior to contractor mobilization	Contractor	PIU/PRSC
1.5	**Sources of Materials**	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.	Compliance with GoB laws and Implementation of EMP	Obtaining approval from PRSC/PIU	Paurashava	During the pre-construction period	Contractor	PIU/PRSC
1.6	**EMP Implementation Training**	Irreversible impact to the environment, contactor representative/workers, Paurashava officials	Implementation of EMP	Obtain record of training	PMU/PIU	Prior to contractor mobilization	PRSC	PMU
2.0 Construction Phase								
2.1	**Topography, Landforms, Geology**	Significant amount of gravel, sand, rod, and cement will be required for this sub-project. Extraction of construction materials may cause localized changes in topography and landforms. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	▪ Restoration of changes due to construction activities ▪ Visual amenity	▪ Visual inspection & consultation with local people	▪ In the work site	During construction period	Contractor	PRSC/PIU
2.2	**Soil Quality**	Significant amount of soil will be required for this sub-project. Extraction of construction materials may cause localized changes in	▪ Restoration of changes due to construction activities	▪ Soil quality test report ▪ Parameters for	▪ Road sub-project ▪ Road-R-63	▪ During construction period ▪ Once during	Contractor	PRSC/PIU

Ref. No.	Environmental Issues	Significant Impact	Purpose of the Monitoring	Monitoring Method			Responsibility	
				Method of Collecting and Reporting Data	Location	Duration and Frequency	Implementation	Supervision
		topography and landforms. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	▪ Visual amenity	testing are Organic Matter, Zn, Sulphur, Lead and Nitrate		construction		
2.3	**Surface/Waste water Quality**	Trenching and excavation, run-off from stockpiled materials, and contamination from fuels and lubricants may result to silt-laden runoff during rainfall which may cause reduction in the quality of adjacent bodies of water. Surface water pollution is expected but minor negative and short term, site-specific within a relatively small area and reversible by mitigation measures.	Evaluation of effect of the mitigation measure towards water pollution	▪ Visual inspection & consultation with local people ▪ Water quality test report ▪ Surface/Waste water parameters: pH, Temperature, ORP, DO, Phosphate, Alkalinity, Sulphate, Fe, EC, TDS, TSS, Nitrate, COD, and BOD	▪ In the work site ▪ Nearby ponds/canal	▪ Once during pre-construction ▪ Twice during construction period	Contractor	PRSC/PIU
2.4	**Groundwater Quality**	The potential exists for drinking water sources to be contaminated by the seepage of wastes from workers camps through the soil profile into the GW aquifer (particularly if wells access the shallow aquifer).	Evaluation of effect of the mitigation measure towards water pollution	▪ Record of water borne diseases ▪ Water quality test report ▪ Groundwater parameters: pH, DO, Lead, Fe, EC, TDS, Nitrate, As, TC, FC, Cl, Ca, and Manganese	▪ Groundwater from construction camp	▪ Once during pre-construction ▪ Twice during construction period	Contractor	PRSC/PIU
2.5	**Air quality**	Conducting works at dry season and moving large quantity of materials may create dusts and increase in concentration of vehicle-related pollutants (such as carbon monoxide, sulphur oxides, particulate matter, nitrous oxides,	Evaluation of effect of the mitigation measure towards air pollution	▪ Visual inspection & consultation with local people ▪ Air quality test report ▪ Parameters are PM_{10}, $PM_{2.5}$, SOx,	▪ In the work site ▪ Road-R-30 and R-45	▪ Once during pre-construction ▪ Twice during construction period	Contractor	PRSC/PIU

Ref. No.	Environmental Issues	Significant Impact	Purpose of the Monitoring	Monitoring Method			Responsibility	
				Method of Collecting and Reporting Data	Location	Duration and Frequency	Implementation	Supervision
		and hydrocarbons) which will affect people who live and work near the sites. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.		NOx, and CO				
2.6	**Noise & Vibration**	Temporary increase in noise level and vibrations may be caused by excavation equipment, transportation of equipment, construction materials and construction activity. However, the proposed sub-project will be existing location and impact is short-term, site-specific and within a relatively small area. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	Evaluation of effect of the mitigation measure towards noise pollution	▪ Visual inspection & consultation with local people ▪ Noise level test report ▪ LAeq (Day & Night)	▪ In the work site ▪ Road-R-30 and R-86	▪ Once during pre-construction ▪ Twice during construction period	Contractor	PRSC/PIU
2.7	**Waste Pollution**	▪ Construction waste from construction work ▪ Domestic waste from workers ▪ Hazardous waste	Evaluation of effect of the mitigation measure for waste	Record of kinds and quantity of waste, and the disposal method	▪ Along the roads Workers camp	During construction period	Contractor	PRSC/PIU
2.8	**Aesthetics**	The construction activities do not anticipate any cutting of trees but will produce excess excavated earth (spoils), excess construction materials, and solid waste such as removed concrete, wood, packaging materials, empty containers, spoils, oils, lubricants, and other similar items. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	Evaluation of effect of the mitigation measure	Visual inspection & consultation with local people	In the work site	During construction period	Contractor	PRSC/PIU
2.9	**Biodiversity**	Activities being located in the built-up area of Rohanpur Paurashava. There are no protected areas in or around existing sub-project sites,	▪ 200 trees plantation along the Road-R-18, R-65 and R-88. ▪ Confirm that this planting	▪ Visual inspection ▪ Record of plant survival percentage	In the work site and nearby homestead	During construction period	Contractor	PRSC/PIU

Ref. No.	Environmental Issues	Significant Impact	Purpose of the Monitoring	Monitoring Method			Responsibility	
				Method of Collecting and Reporting Data	Location	Duration and Frequency	Implementation	Supervision
		and no known areas of ecological interest. There are no trees at the site that need to be removed.	plan is following during the construction period. ▪ Also confirm that grass turfing and drainage system instalment is preventing surface runoff and erosion.		vegetation			
2.10	**Traffic Congestion**	Hauling of construction materials and operation of equipment on-site can cause traffic problems. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures.	Evaluation of effect of construction schedule	▪ Visual inspection & consultation with local people ▪ Record of accidents ▪ Record of numbers construction vehicles	In the work site	During construction period	Contractor	PRSC/PIU
2.11	**Socio-economic status**	Sub-project components will be located in Paurashava land and there is no requirement for land acquisition or any resettlements. Manpower will be required during the construction stage. This can result to generation of contractual employment and increase in local revenue. Thus, potential impact is positive and long-term.	Evaluation of effect of construction schedule	Consultation with local people	In the project area	During construction period	Contractor	PRSC/PIU
2.12	**Community health and safety**	Construction works will impede the access of residents and businesses in limited cases. The impacts are negative but short-term, site-specific within a relatively small area and reversible by mitigation measures. Poor safety signage and lack of barriers at work site and trenches will create hazard to pedestrians and children.	Evaluation of effect of the work safety plan	▪ Visual inspection & consultation with local people ▪ Record of accidents	In the project area	During construction period	Contractor	PRSC/PIU

Ref. No.	Environmental Issues	Significant Impact	Purpose of the Monitoring	Monitoring Method			Responsibility	
				Method of Collecting and Reporting Data	Location	Duration and Frequency	Implementation	Supervision
2.13	**Workers health and safety**	There is invariably a safety risk when construction works such as excavation, sand filling, carrying of mixture materials, Shuttering, steel/wood work and earthmoving are conducted in urban areas. Workers need to be mindful of the occupational hazards which can arise from working in height and excavation works. Potential impacts are negative and major but reversible by mitigation measures.	Evaluation of effect of the work safety plan	▪ Visual inspection & consultation with worker ▪ Record of accidents	In the work site	During construction period	Contractor	PRSC/PIU
2.14	**Post-construction clean-up**	Damage due to debris, spoils, excess construction materials	Evaluation the implementation of EMP	▪ Visual inspection & consultation with local people ▪ Reporting	In the work site	At the end of construction period along with the EMP implementation report	Contractor	PRSC/PIU
2.15	**Submission of EMP implementation report**	Unsatisfactory compliance to EMP	Evaluation the implementation of EMP	Record of report submission	PRSC/PMU	At the end of construction period	Contractor	PRSC/PIU
3.0 Operation Phase								
3.1	**Air Quality**	Movement of vehicle will create air quality	Visual inspection, and consultation with local people	▪ O&M budget for periodic monitoring	Paurashava area	During operation period	Paurashava	Paurashava
3.2	**Noise Level**	Movement of vehicle will create noise level	Monitoring, and consultation with local people	▪ O&M budget for periodic monitoring	Paurashava area	During operation period	Paurashava	Paurashava
3.3	**Surface/Waste Water Quality**	The surface water might be contaminated due to waste water carrying by the drains	▪ Visual inspection and consultation with worker ▪ Waste water quality test	▪ O&M budget for periodic monitoring	Paurashava area	During operation period	Paurashava	Paurashava
3.4	**Health & Safety**	Worker involved in cleaning and maintaining the drains and roads may get sick if not trained and provided the PPE adequately	Visual inspection and consultation with worker	▪ O&M budget for periodic monitoring	Paurashava area	During operation period	Paurashava	Paurashava
3.5	**Waste Management**	Worker involved in waste management and maintaining the	Visual inspection and consultation with worker	▪ O&M budget for	Paurashava area	During operation	Paurashava	Paurashava

Ref. No.	Environmental Issues	Significant Impact	Purpose of the Monitoring	Monitoring Method			Responsibility	
				Method of Collecting and Reporting Data	Location	Duration and Frequency	Implementation	Supervision
		sub-project may get sick if not trained/awareness adequately		periodic monitoring		period		
3.6	**Road Accident**	Increase of road accident due to additional traffics	Visual inspection, record of accidents and consultation with local people	▪ O&M budget for periodic monitoring	Paurashava area	During operation period	Paurashava	Paurashava

D. Institutional Capacity Development Program

~~180.~~181. The PRSC Senior and regional environmental specialists are responsible for trainings on environmental awareness and management in accordance with both ADB and government requirements. Specific modules customized for the available skill set will be devised after assessing the capabilities of the target participants and the requirements of the project. Typical modules would be as follows: (i) sensitization; (ii) introduction to environment and environmental considerations in water supply and waste water projects; (iii) review of IEEs and integration into the project detailed design; (iv) improved coordination within nodal departments; and (v) monitoring and reporting system. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. The proposed training project along with the frequency of sessions is presented in Table VIII.3.

Table IX.3: Training Program for Environmental Management

Items	Pre-construction/prior to construction	Construction	
Training Title	Orientation workshop	Orientation program/ workshop for contractors and supervisory staffs	Experiences and best practices sharing
Purpose	-To aware the participants of the environmental safeguard requirements of ADB and GOB and how the project will meet these requirements - Training Program for Environmental Management	-To build the capacity of the staffs for effective implementation of the designed EMPs aimed at meeting the environmental safeguard compliance of ADB and GoB - To aware the contractors representative/workers about road safety	To share the experiences and best practices aimed at learning lessons and improving implementation of EMP
Contents	Module 1: Orientation • ADB Safeguards Policy Statement • Government of Bangladesh Environmental Laws and Regulations Module 2: Environmental Assessment Process • ADB environmental process, identification of impacts and mitigation measures, formulation of an environmental management plan (EMP), implementation, and monitoring requirements • Review of environmental assessment report to comply with ADB requirements • Incorporation of EMP into the project design and contracts	•Roles and responsibilities of officials/ contractors/ consultants towards protection of environment •Environmental issues during construction •Implementation of EMP •Monitoring of EMP implementation •Reporting requirements	Experiences on EMP implementation – issues and challenges Best practices followed
Duration	1 day	1 day	1 day on a regular period to be determined by PMU, PIUs, and PMSC
Participants	LGED, PMU, and PMU staffs (technical and environmental) involved in the project implementation	PMU/ PIUs Contractors	PMU /PIUs Contractors

a. Institutional Arrangement

~~181.~~182. The Local Government Engineering Department (LGED) under the Local Government Division (LGD) of the Ministry of Local Government, Rural Development and Cooperatives (MLGRD&C) and having extensive experience in managing urban and road sub-projects financed by ADB, are the executing agencies of the project. The participating

Paurashavas are the implementing agencies.

b. Project Management Unit

~~182.~~183. A PMU has been established for the overall management of the project. The PMU is headed by Project Director (PD) supported by officials including two project managers in charge of (i) municipal infrastructure and governance improvement and capacity development (ii) water supply and sanitation. The PMU will receive support from Sr. environmental specialist and Sr. resettlement specialist on the PRSC team. Key tasks and responsibilities of the Sr. Assistant Engineer, PMU Safeguard (Environment) officer are as follows:

- confirm existing IEEs/EMPs are updated based on detailed designs, and that new IEEs/EMPs are prepared in accordance with the EARF and sub-project selection criteria related to safeguards;
- confirm whether IEEs/EMPs are included in bidding documents and civil works contracts;
- provide oversight on environmental management aspects of subprojects and ensure EMPs are implemented by project implementation unit (PIU) and contractors;
- Site specific EMP would be submitted by the contractor before start of the work" as a contract clause by PMU
- establish a system to monitor environmental safeguards of the project, including monitoring the indicators set out in the monitoring plan of the EMP;
- facilitate and confirm overall compliance with all government rules and regulations regarding site and environmental clearances, as well as any other environmental requirements (e.g., location clearance certificates, environmental clearance certificates, etc.), as relevant;
- supervise and provide guidance to the PIUs to properly carry out the environmental monitoring and assessments as per the EARF;
- review, monitor, and evaluate the effectiveness with which the EMPs are implemented and recommend necessary corrective actions to be taken as necessary;
- consolidate monthly environmental monitoring reports from PIUs and submit semi-annual monitoring reports to ADB;
- ensure timely disclosure of final IEEs/EMPs in locations and form accessible to the public; and
- address any grievances brought about through the grievance redress mechanism in a timely manner.

c. Project Implementation Unit

~~183.~~184. The participating Paurashavas have established PIUs within the Paurashava structure. The PIUs will (i) be responsible for land acquisition; (ii) take necessary action for obtaining the proposed land free from encroachments, squatters, mobile vendors and hawkers if any; (iii) plan, implement and monitor public relations activities, gender mainstreaming initiatives and community participation activities at Paurashava level; (iv) disseminate information related to the project to the public and media; (v) ensure compliance with loan covenants concerning safeguards measures; and (vi) facilitate implementation of safeguards plans. The PIUs will each designate a Safeguard Officer and will receive assistance from the assigned PRSC regional environmental specialist to:

- update IEEs/EMPs during implementation stage and prepare new IEEs/EMPs in accordance with the EARF;
- conduct environmental compliance audit of existing facilities as per Item of ADB SPS, 2009;
- include IEEs/EMPs in bidding documents and civil works contracts;
- comply with all government rules and regulations;
- take necessary action for obtaining the proposed land free from encroachments, squatters, mobile vendors and hawkers if any;
- oversee implementation of EMPs including environmental monitoring by contractors;
- take corrective actions when necessary to ensure no environmental impacts;
- submit monthly environmental monitoring reports to PMU,
- conduct continuous public consultation and awareness;

- address any grievances brought about through the Grievance Redress Mechanism in a timely manner as per the IEEs; and
- organize an induction course for the training of contractors preparing them on EMP implementation, environmental monitoring requirements related to mitigation measures; and taking immediate actions to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of implementation.

d. Project Readiness Services Consultants (PRSC)

~~184.~~185. PRSC has been engaged to work closely with and advise the PMU, to be involved in project supervision including monitoring during construction phase. The PRSC has one Senior Environmental Specialist and two Regional Environmental Specialists as well as one Senior Resettlement Specialist and two Regional Resettlement Specialists. The PRSC Senior Environmental Specialist will, but not limited to:

- work under the general supervision of the team leader;
- review the environmental guidelines and requirement of the government of Bangladesh and ADB SPS, 2009, environmental sub-project selection guidelines and EARF;
- Guide the implementation of future sub-projects;
- provide technical support to the PMU and PIUs including review and update of EARF and guidelines for specific type of sub-projects and assist in preparing terms of reference for environmental assessment;
- assist and guide the PRSC regional environmental specialists to provide support to environmental management functions including updating sub-project IEEs in respect to EMP;
- assist in preparing IEEs and in monitoring impact and mitigation measures associated with subprojects;
- assist PIUs and PRSC regional environmental specialists working in the steps for preparing the EIA/IEE, capacity building and training, preparation of guidelines and procedure and sub-project specific guidance;
- provide support and guidance to PIUs in undertaking environmental monitoring
- support PMU in submitting semi-annual environmental monitoring reports to ADB;
- facilitate in grievance redress and corrective actions;
- train PIU officials regarding environmental requirement and issues; and
- perform any other task assigned by the team leader, deputy team leader and the project director.

~~185.~~186. **The PRSC regional environmental specialists will, but not limited to:**

- work under the supervision and guidance of the team leader and PRSC Sr. Environmental Specialist;
- assist PIUs in preparing and updating IEEs including EMPs in accordance with the EARF and assist in monitoring impact and mitigation measures associated with sub-projects including implementation of EMPs by contractors;
- assist in preparation of IEEs and in the environmental review of sub-project consisting of screening at Paurashava level by PIU through a committee formed with municipal mayor as chairman and representatives from DoE, LGED and other relevant district office as members;
- assist PIUs in the steps for preparing EIA/IEE, capacity building and training, preparation of guidelines and procedure and sub-project specific guidance;
- support PIU in environmental monitoring and submit monitoring reports to PMU as inputs into the semi-annual monitoring report submitted to ADB;
- undertake mitigation measures and other specific measures in the construction contract;
- facilitate in grievance redress and corrective actions;
- follow sub-project selection guidelines and EARF to ensure compliance with the environmental guidelines and requirement of the Government of Bangladesh and ADB SPS, 2009;
- support PMU safeguard officer and PRSC Sr. environment specialist by providing data, information and all other requested assistance;
- train PIU officials regarding environmental issues
- perform any other task assigned by PRSC Senior environment specialist, team leader and the project director.

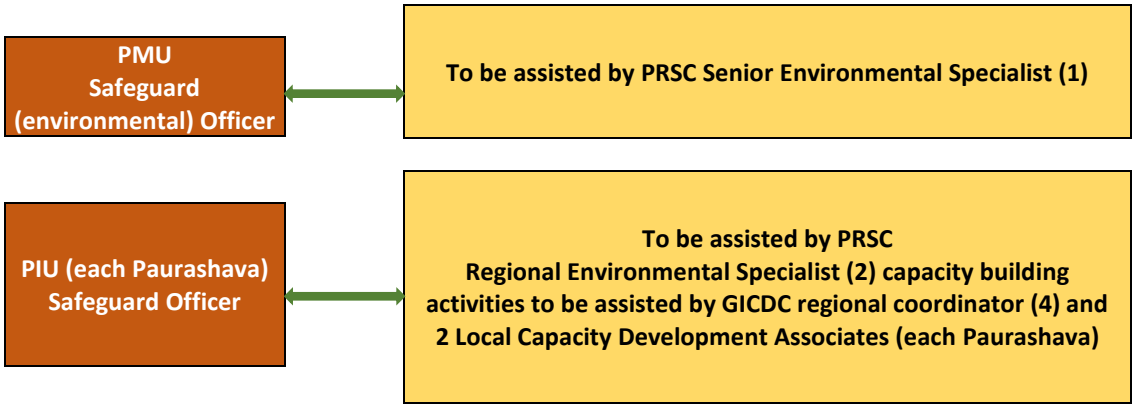
e. Civil Works Contracts and Contractors

~~186.~~187. EMPs are to be included in bidding and contract documents and verified by the PIUs and PMU. The contractor will be required to designate an environmental supervisor to (i) coordinate with PRSC on updating the IEE/EMP based on detailed designs, and (ii) ensure implementation of EMP during civil works. Contractors are to carry out all environmental mitigation and monitoring plans outlined in their contract Table VIII.1-2.

f. Governance Improvement and Capacity Development Consultants (GICDC)

~~187.~~188. The PMU and PIUs will require support on a range of activities related to governance improvement and capacity development of Paurashavas. The GICDC will support PMU and PIUs in implementing urban government improvement action plan (UGIAP) by providing capacity development, community mobilization and other facilitation services. There are 4 GICDC regional offices consisting of 4 regional coordinators at each regional office. There are 2 Local Capacity Development Associates (Community Mobilization and Municipal Finance) in each project Paurashava. The regional coordinators are assisting the Paurashavas and the LCDAs in the activities related to community participation and inclusive development. The community mobilizers have been posted at the Paurashava and (i) are working maintaining close liaison with the mayor, councilors, Paurashava staffs and communities, (ii) providing assistance and support to PIU regarding planning and implementation of citizen awareness and participation activities, urban planning, equity and inclusiveness of women and urban poor. The GICDC also have a training specialist who is responsible for identifying and coordinating capacity building activities at Paurashava level Figure VIII.1.

Figure IX.1: Safeguards Implementation Arrangement



g. Staffing Requirement

~~188.~~189. Costs required for implementing the EMP will cover the following activities:

(i) Updating IEE, preparing and submitting reports and public consultation and disclosure;
(ii) Application for environmental clearances; and
(iii) Implementation of EMP, environmental monitoring program and long-term surveys.

~~189.~~190. The infrastructure involved in each scheme is generally straightforward and will take between three and nine months to build. Environmental monitoring during construction will also be straightforward and will involve periodic site observations and interviews with workers and others, plus checks of reports and other documents. This will be conducted by PRSC Sr. environmental specialist assisted by the PMU environment officer (Sr. Assistant Engineer). Therefore, no separate budget required for PRSC environment management specialist.

~~190.~~191. The operation phase mitigation measures are again of good operating practices, which will be the responsibility of Rohanpur Paurashava. All monitoring during the operation and maintenance phase will be conducted by LGED therefore, there are no additional costs.

E. Budget for EMP

~~191.~~192. Most of the mitigation measures require the contractors/project authority to

adopt good site practice, which should be part of their normal procedures already, so there are unlikely to be major costs associated with compliance.

~~192.~~193. Mitigation that is the responsibility of PIU and contractors will be provided as part of their management of the sub-project. The cost estimation for Environmental Mitigation Measures and Monitoring is given in the Table VIII.4. The total mitigation and monitoring cost for the project is calculated as BDT 765,000 in addition to compliance to the clauses 27, 28 and 29 of GCC of tender documents and IEE to the entire satisfaction of E-I-C.

Table IX.4: EMP in Bidding Document

EMP Task No.	Mitigation and Monitoring Items	Unit	Cost/Unit	Total Unit	Total Cost
1.0	**Pre-construction Period**				
1.1	Obtaining of SSC/NOCs	Included in Project Preparation Cost			0
1.2	Updating of EMP	Included in Project Preparation Cost			
1.3	Existing Utilities	Included in Engineering Cost			
1.4	Construction Camps, & Stock Yards	Included in Engineering Cost			
1.5	Sources of Materials	Included in Engineering Cost			
1.6	EMP Implementation Training	No.	10000	1	30000
1.7	Environmental Quality Test-Baseline				
	Air Quality Test (Road-R-30 and R-45)	No.	35000	2	70000
	Noise Level Measurement (R-30 and R-86)	No.	5000	2	10000
	Soil Quality Test (Road-R-63)	No.	25000	1	25000
	Groundwater Quality Test (Camp Site)	No.	10000	1	10000
2.0	**Construction Period**				
2.1	Topography, Landforms, and Geology	Monitoring by Contractor			0
2.2	Soil Quality	No.	25000	2	50000
2.4	Groundwater Quality	No.	10000	2	20000
2.5	Air Quality	No.	35000	4	140000
2.6	Noise & Vibration	No.	5000	4	20000
2.7	Waste Pollution	Monitoring by Contractor			0
2.8	Asthetics				
2.9	Biodiversity	Monitoring by Contractor			0
2.10	Traffic Congestion	Monitoring by Contractor			0
2.11	Socio-economic Status	Monitoring by Contractor			0
2.12	Community Health and Safety	Lump-sum			100000
2.13	Workers Health and Safety	Lump-sum			150000
2.14	Post-construction Clean-up	Lump-sum			20000
2.15	Submission of EMP Implementation Report	No.	10000	1	10000
	Other Expenses during Construction Period				
	Tree Plantation (Road R-18, R-65 and R-88)	No.	200	550	110000
3.0	**Operation Period**				
3.1	Air Quality	Paurashava O&M Budget			0
3.2	Noise Level	Paurashava O&M Budget			0
3.3	Surface/Waste Water Quality	Paurashava O&M Budget			0
3.4	Health & Safety	Paurashava O&M Budget			0
3.5	Waste Management	Paurashava O&M Budget			0
3.6	Road Accident	Paurashava O&M Budget			0
	Grand Total:	**765000**			

Note: Cost of the EMP items should be as fixed budget

F. Monitoring and Reporting

~~193.~~194. PMU will monitor and measure the progress of EMP implementation. The monitoring activities will correspond with the project's risks and impacts, and will be identified in the IEE for the sub-project components. In addition to recording information on the work and deviation of work components from original scope PMU, PIUs, and PRSC will undertake site inspections and document review to verify compliance with the EMP and progress toward the final outcome. Corrective actions to be taken quickly and reported in monitoring reports.

~~194.~~195. Contractor shall submit monthly Environmental Monitoring Report covering the mitigation measures listed in this EMP for all the sub-project components to the PRSC for approval.

~~195.~~196. PRSC will submit monthly monitoring and implementation reports to PMU, who will take follow-up actions, if necessary. PMU will submit semi-annual monitoring reports to ADB. The suggested monitoring report format is in ADB. Sub-project budgets will reflect the costs of monitoring and reporting requirements. For projects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis. Monitoring reports will be posted in a location accessible to the public.

~~196.~~197. LGED will document monitoring results, identify the necessary corrective actions, reflect them in a corrective action plan and for each quarter, will study the compliance with the action plan developed in the previous quarter. Compliance with loan covenants will be screened by ADB.

~~197.~~198. ADB will review project performance against the commitments as agreed in the legal documents. The extent of ADB monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising of social and environmental safeguards will be integrated into the project performance management system. ADB will monitor projects on an ongoing basis until a project completion report is issued. ADB will carry out the following monitoring actions to supervise project implementation:

i. conduct periodic site visits for projects with adverse environmental or social impacts;
ii. conduct supervision missions with detailed review by ADB safeguard specialists/officers or consultants for projects with significant adverse social or environmental impacts;
iii. review the periodic monitoring reports submitted by EAs to ensure that adverse impacts and risks are mitigated, as planned and as agreed with ADB;
iv. work with EAs to rectify to the extent possible any failures to comply with their safeguard commitments, as covenanted in the legal agreements, and exercise remedies to re-establish compliance as appropriate; and
v. Prepare a project completion report that assesses whether the objective and desired outcomes of the safeguard plans have been achieved, taking into account the baseline conditions and the results of monitoring.

~~198.~~199. The process described in this document has assessed the environmental impacts of all elements of Rohanpur Paurashava road sub-project. All potential impacts were identified in relation to design and location, construction, and operation phases.

X. CONCLUSION AND RECOMMENDATIONS

~~199.~~200. Planning principles and design considerations have been reviewed and incorporated into the site planning process whenever possible. Preliminary designs integrate a number of measures, both structural and non-structural, to mainstream climate resilience into the sub-project. Thus, environmental impacts as being due to the project design or location were not significant.

~~200.~~201. Most of the individual elements of the sub-project are relatively small and involve straightforward pre-construction, construction and operation activities, so any potential impacts will be mainly localized and not greatly significant. Most of the predicted impacts are associated with the construction process, and are produced because that process is invasive, involving trenching and other excavation. However, the routine nature of the impacts means that most can be easily mitigated. In the operational phase, all facilities and infrastructure will operate with routine maintenance, which should not affect the environment. Facilities will need to be repaired from time to time, but environmental impacts will be much less than those of the construction period as the work will be infrequent, affecting small areas only.

~~201.~~202. Mitigation measures have been developed to reduce all negative impacts to acceptable levels. Mitigation will be assured by a program of environmental monitoring to ensure that all measures are implemented, and will determine whether the environment is protected as intended. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries. Any requirements for corrective action will be reported to the ADB.

~~202.~~203. The stakeholders were involved in developing the IEE through discussions on-site and public consultation, after which views expressed were incorporated into the IEE and in the planning and development of the sub-project. The IEE will be made available at public locations in the city and will be disclosed to a wider audience via the ADB and LGED websites. The consultation process will be continued and expanded during project implementation to ensure that stakeholders are fully engaged in the project and have the opportunity to participate in its development and implementation. A grievance redress mechanism is described within the IEE to ensure any public grievances are addressed quickly.

~~203.~~204. The PMU and PRSC will be responsible for monitoring. The PRSC will submit monthly monitoring reports to PMU, and the PMU will send semi-annual monitoring reports to ADB. ADB will post the environmental monitoring reports on its website.

~~204.~~205. The EMP will assist the PMU, PRSC, and contractors in mitigating the environmental impacts and guide them in the environmentally sound execution of the proposed sub-project. The EMP will also ensure efficient lines of communication between the implementing agency, project management unit, and contractors. A copy of the EMP shall be kept on-site during the construction period at all times. The EMP shall be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with/or any deviation from the conditions set out in this document shall constitute a failure in compliance.

~~205.~~206. The citizens of Rohanpur Paurashava will be the major beneficiaries of this sub-project. The improved roads will provide a more efficient and effective transport route, which should improve the overall economy by reducing time spent idle in traffic by delivery vehicles, employees and customers.

~~206.~~207. Therefore, the proposed sub-project is unlikely to cause significant adverse impacts and net environmental benefits to citizens of Rohanpur Paurashava will be positive. The potential impacts that are associated with design, construction, and operation can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures.

~~207.~~208. Based on the findings of the IEE, there are no significant impacts and the classification of the sub-project as Category “B” is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB. All required issues have been assessed to the best of our knowledge and no further studies are required to comply with ADB procedures or the laws of GoB.

APPENDIX

Appendix 1: Waste Management Plan (Construction Period)

1. GENERAL

Considerable quantities of wastes (general & construction) will be generated due to the 1-year construction of the sub-project components. Two types of wastes will be generated during construction:

a. General Waste:

– Organic waste (foods, fruits, tree leaves etc.); and
– Inorganic (such as papers, plastic and glass bottles & containers, polythene etc.); and

b. Construction Waste:

– Construction wastes are: construction materials such as sand, piece of rocks, bricks, rods, bamboo, wood, geotextiles, remaining concrete & bentonite waste.

2. OBJECTIVES

The main objective of the WMP is to organize disposal of all wastes generated during construction in an environmentally acceptable manner specially consider the following:

- Health hazards of the project personnel as well as community people should not be occurred;
- Manage the wastes in such a way that environment (specially air, soil, water etc.,) will not be polluted;
- Odor means bad smell should not be generated;
- Always friendly environment at the construction sites and construction camps;
- Any waste should not be disposed into the river and any water bodies to avoid water pollution;
- Any waste should not be burnt; and
- Any waste should not be placed in earth holes/chambers.

3. POTENTIAL ENVIRONMENTAL IMPACTS

Major potential environmental impacts due to the lack of waste management are:

- All types of environmental pollutions such as air, soils, water (surface & ground) pollutions;
- Generation of odor;
- Increase of flies, mosquitoes, insects etc.,
- Health hazards; and
- Environmental nuisance at the project sites

4. STRATEGIES TO ADOPT

The following strategies need to be adopted for appropriate soil waste collection system to be functioned properly:

a. Setting waste collection bins (not permanent structure, movable high-quality movable plastic bins; See Figure 1) in strategic points of the construction camp and work sites.
b. Introduce solid waste bins for organic and non-organic waste.
c. Coordinate with the municipalities waste collection system so that the waste can be collected at midnight when the road transports are minimum.
d. Wash liquids needs to be drained out though the functioning drains. The liquid waste needs to be treated with bleaching power every evening before draining so that the waste water cannot create nuisance and local pollution.
e. The other strategies that might be adopted are explained in later paragraphs.

Figure 1: High quality plastic bins for solid waste collection

Table 1: Mitigation Measures for Sector-wise Waste

Aspect	Waste Type	Mitigation Measures	Proposed Reuse/Recycling/ Disposal
site clearing/disposal of debris	-Vegetation (logs, mulched timber, weeds) -demolition of existing building	-Due care should be taken during site clearance and disposal of debris during demolition of existing building. - The waste should be stored at site ensuring that existing water bodies, road and drains within or adjacent to the site are kept safe and free and no blocking of drains - Prior clearance will be taken from concerned Govt. Authorities or landowner	Recycling/Disposal whereas applicable or where suitable and approved by PIU
Construction site waste	-Plastics, Concrete and Timber/Steel formwork Packaging Materials, papers -Empty containers and other drums -Metals and electrical cabling	- The waste should be stored at PIU suggested location ensuring that existing water bodies, road and drains within or adjacent to the site are kept safe and free and no blocking of drains -Construction waste will be connected to dispose in Paurashava existing/proposed waste management system	Recycling/Disposal/ Re-use
Construction camp	Waste generated by food, papers, weir, wood, polythene and empty packets -labor camp waste generated by workers	- It will be made mandatory for waste to be segregated right at the source of waste generation -The waste should be stored at construction camp in separate dustbin	Re-use/ Recycling/Disposal whereas applicable

		-labor camp waste will be connected to dispose in Paurashava existing/proposed waste management system	
Traffic movement with waste	Waste generated from construction site/labor camp	-Ensure covered the waste during Traffic movement -Adequate traffic control signals and barriers should be used in case traffic is to be diverted during debris disposal. All efforts should be made to ensure avoidance of traffic jam, which otherwise results in air pollution, noise pollution and public unrest.	Disposal

5. METHOD OF DISPOSAL OF WASTES

The Contractor will collect the general wastes in separate waste bin at sources (means organic waste in one bin & inorganic waste in another bin) and dumped at the designated waste disposal site. The contractor will construct concrete waste disposal site; means concrete floor and wall and covered by shed to avoid, air, bad smell, soil and ground water pollutions. Based on the quantity of general waste (organic & inorganic waste), the following two chambers (rooms) of the concrete disposal site will be constructed by Contractor:

Just after filling one chamber (say after 6 months) by organic waste through pocket gate, it should be covered by earth (soils) properly & keeps it for about 6 months for converting organic fertilizer for the agricultural lands. After filling 1st chamber by organic waste, disposing of waste will be started for 2nd chamber.

The inorganic waste will be collected in the waste collection bins. Just after filling, these inorganic wastes can be given to the vender free of cost.

The Contractor will collect construction waste as mentioned above separately and dump in to the designated room at the construction camp. Just after filling the room, Contractor will sale these waste to the vender for re-cyclic.

The Contractor will maintain log book for the measurement of quantity of the wastes (especially hazardous wastes) disposed every day.

6. INSTITUTIONAL ARRANGEMENT

Contractor is mainly responsible for design, construction, maintenance as well as environmental monitoring for the disposal of waste. Environmental Specialist of the PRSC is responsible for monitoring of the disposal. The PIU of the Municipality will setup a 'Waste Management Committee' with the representatives of the PRSC and contractor to effectively disposing the wastes and distribution of organic fertilizer to the farmers and inorganic wastes to the venders. The committee is also responsible for monitoring procedure for the collection and carrying of wastes without causing any environmental hazards.

Appendix 2: Sample Site Specific EMP of Road sub-project

Sl. No.	Activity	Management Measures	Action By	When
01	Preparation & mobilization of field office	• A detailed plan and drawing of the semi-pucca site office (Area: 50 sq.m) with the arrangement of sufficient natural light, fan, toilet, safe drinking water, hit protecting ceiling, damp proofing equipment, and so on will be developed & submitted to the Paurashava before beginning the construction work.	Contractor	Before the construction
02	Camp for the workers,	• Camp for the workers will provide properly. Adequate disposal of sanitary waste will be considered in order to follow best waste management practices. Basic hygiene and cleanliness in the worker cam. In particular, usable toilet facilities separate Male & Female, Kitchen waste collection & dumping will be exist & well-maintained with basic provision of soak pits & septic tanks. Safe drinking water will be provided to the workers. Fire extinguisher would be provided, First Aid Box with Doctor's Name, Mobile number & necessary emergency Ambulance number.	Contractor	Before the construction
03	Storing construction material	• Well-defined area for storage with suitable containment, proper labeling of different items, and determines locations prior to award of contract will be ensured.	Contractor	Before the construction
04	Worker safety & security	• Provision of personal protection equipment (PPE) such as helmets, safety shoes & glass, gloves, and face masks, safety sign for the workers; provision of first aid box with basic apparatus will be available. (Bangladesh Labour Law of 2006, Bangladesh labor service rules 2015 and all applicable laws and standards on workers H & S.),	Contractor	During the construction
06	Safe drinking water	• Tube well is the source of drinking water in this area. Thus Tube well water will be provided to labors for drinking & other purposes. Water quality is good in this area, water quality will be monitor when necessary.	Contractor	During the construction
07	Excavation/ cutting, filling and clearing of proposed sub-project	• During excavating / cleaning work of the safety measures will be taken by the construction crew wearing protective clothing, shoes, gloves and face masks. Collected earth and sand will be covered during transportation.	Contractor	During the construction
08	Dust & cleaning	• Regular sprinkling of water in the vicinity of the construction site is necessary so that dust is not re-suspended. Frequency of the sprinkling to be three (3 or 4) times a day or more based on the extent of activity and dryness of the season; Cleaning will be done in a manner that it does not generate or re-suspend dust.	Contractor	During the construction
09	Cutting/digging of proposed schemes	• Proper notification will be provided to the public surrounding the construction site. A notice board informing the proposed work should be erected two weeks prior to actual work. An alternative road/detour route will be ensured for temporary passing the people, rickshaw, van, car private etc.	Contractor	During the construction
10	Tree-cutting & safeguarding	• Compensatory tree plantation in the ratio of 2 trees planted for each tree that had to be cut due to construction activities; • Any tree saved from cutting will be barricaded and protected.	PIU & Contractor	During the construction
11	Debris	• Well-defined onsite area for storing of any debris	Contractor	During the

	management	generated; transporting debris with proper coverage; Disposal in an approved dump yard / landfill will be ensured.		construction
12	Safety measures	• Protection of traffic at all times along the existing sub-project, necessary barricades, warning lights & guide signs etc. will be ensured.	Contractor	During the construction
13	Other existing amenities for community welfare	• Safety signage at all sites visible to public will be provided. • Safety barriers near any trenches, and cover trenches with planks during non work hours will be provided. • If construction work is expected to disrupt users of community water bodies, notice to the affected community shall be served 7 days in advance and again 1 day prior to start of construction. • Properties and utilities will be restored or compensated to pre-work conditions if any damage occurred.	Contractor	During the construction
14	Transporting construction material	• Transporting with adequate safety precautions, (e.g. not to use undersized trucks) as well as adequate covering of trucks that are used to transport material to and from the construction site will be maintained properly.	Contractor	During the construction
15	Air quality	• Damp down exposed soil and any sand stockpiled on site by spraying with water when necessary during dry weather will be accelerated; • Use tarpaulins to cover soils, sand and other loose material when transported by trucks will be ensured. • And hot-mix plants, batching plants and crushers 350.00m will be situated far from residence.	Contractor	During the construction
16	Noise	• Use of ear plugs / muffs by all construction workers during operation of heavy equipment/ machinery will be ensured. • Wherever feasible, noise absorption padding / enclosures will be used surrounding the noise-generating machinery.	Contractor	During the construction
17	Public awareness campaign	• Public awareness events will be held before and during construction work. This awareness campaign may be done through miking, deployment of the watchmen, sticking/hanging posters, banners and sign board (size: 1.2mx0.9m Plane CI Sheet) near the construction site.	PIU & Contractor	During the construction
18	Pedestrian & traffic safety	• Extensive barricades of the construction zone will be provided so that pedestrians do not come into direct contact with the machines, tools, material and other accessories; • Provision of barricading will be done so that these do not create traffic safety problems. Supplementary aids / tools such as signboards, reflectors and night lighting will be used to avoid possible accidents.	Contractor	During the construction
19	Existing utilities	• Preparation of spoils management plan and traffic management plan will strongly be maintained.	Contractor	During the construction

***Site specific EMP will be ensured from contactor before start of the construction work*

Appendix 3: Health Safety Manual of Construction Workers

Parameters/issues	Workplace Hazards	Suggested PPE
Eye and Face protection	Flying particles, molten metal, liquid fuel, gases or vapors, light radiation.	Safety glasses with side-shields, protective shades, etc.
Head Protection	Falling objects, inadequate height clearance, and overhead power cords.	Helmets with top and side impact protection.
Hearing protection	Noise, ultra-sound.	Hearing protectors (ear plugs of ear muffs.)
Foot Protection	Falling or rolling objects, pointed objects. Corrosive or hot liquids.	Safety shoes and boots for protection against moving & falling objects, liquids and fuels.
Hand Protection	Hazardous materials, cuts or lacerations, vibrations, extreme temperatures.	Gloves made of rubber or synthetic materials (Neoprene), leather, steel, insulating materials, etc.
Respiratory Protection	Dust, vapors.	Facemasks with appropriate filters for dust removal and air purification spray, mists, vapors and gases). Single or multi-gas personal monitors, if available.
	Oxygen deficiency	Portable or supplied air (fixed lines.) on site rescue equipment.
Body/leg Protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration.	Insulating clothing, body suits, aprons etc. of appropriate materials.

Appendix 4: Sample Outline Traffic Management Plan

A. Principles

One of the prime objectives of this TMP is to ensure the safety of all the road users along the work zone, and to address the following issues:

- The safety of pedestrians, bicyclists, and motorists travelling through the Construction zone;
- Protection of work crews from hazards associated with moving traffic;
- Mitigation of the adverse impact on road capacity and delays to the road users;
- Maintenance of access to adjoining properties; and
- Addressing issues that may delay the project.

B. Operating Policies for TMP

The following principles will help promote safe and efficient movement for all road users (motorists, bicyclists, and pedestrians, including persons with disabilities) through and around work zones while reasonably protecting workers and equipment.

(i) Make traffic safety and temporary traffic control an integral and high-priority element of every project from planning through design, construction, and maintenance.
(ii) Inhibit traffic movement as little as possible.
(iii) Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they approach and travel through the temporary traffic control zone.
(iv) Inspect traffic control elements routinely, both day and night, and make modifications when necessary.
(v) Pay increased attention to roadside safety in the vicinity of temporary traffic control zones.
(vi) Train all persons that select, place, and maintain temporary traffic control devices.
(vii) Keep the public well informed.
(viii) Make appropriate accommodation for abutting property owners, residents, businesses, emergency services, railroads, commercial vehicles, and transit operations.

Figure A2 to Figure A3 illustrates the operating policy for TMP for the construction of water pipes and the sewers along various types of roads.

C. Analyse the impact due to street closure

Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

(i) approval from the ULB/CMC/Public Works Department (PWD) to use the local streets as detours;
(ii) consultation with businesses, community members, traffic police, PWD, etc, regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
(iii) determining of the maximum number of days allowed for road closure, and 3 incorporations of such provisions into the contract documents;
(iv) determining if additional traffic control or temporary improvements are needed along the detour route;
(v) considering how access will be provided to the worksite;
(vi) contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and
(vii) developing a notification program to the public so that the closure is not a surprise. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

If full road-closure of certain streets within the area is not feasible due to inadequate capacity of the detour Street or public opposition, the full closure can be restricted to weekends with

the construction commencing on Saturday night and ending on Monday morning prior to the morning peak period.

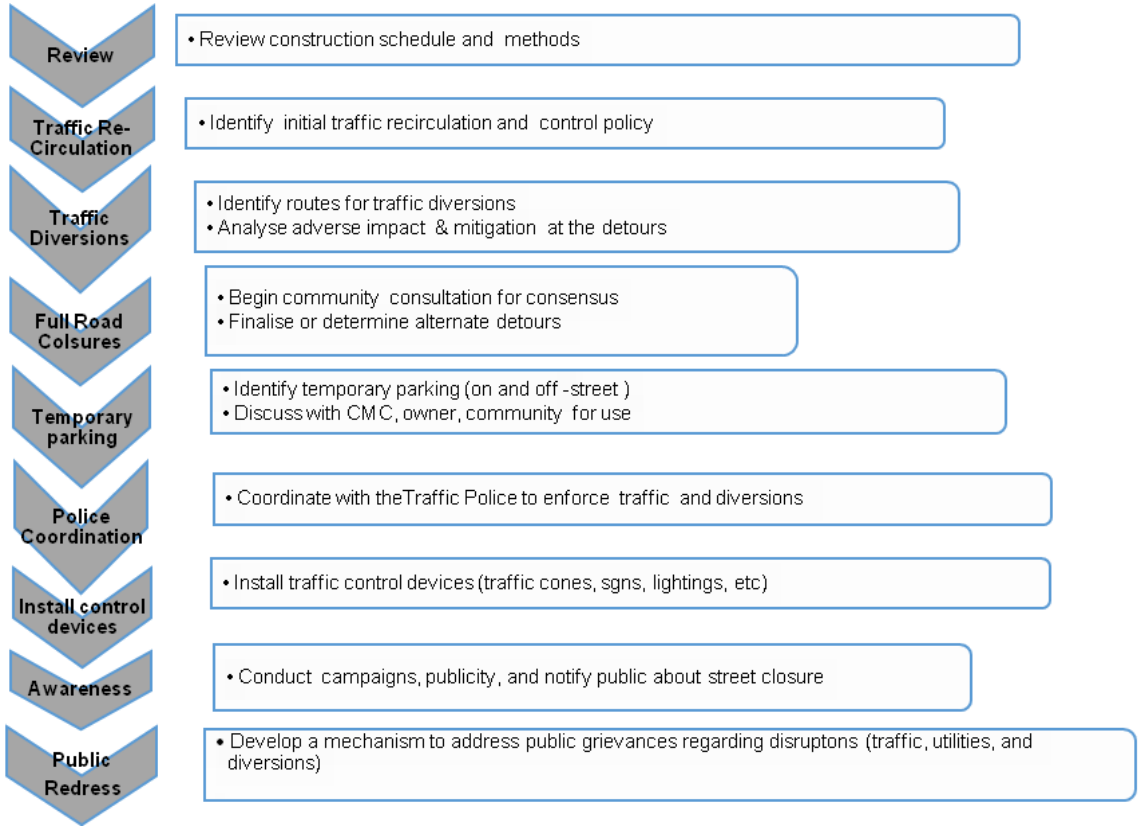


Figure A1: Policy Steps for the TMP

D. Public awareness and notifications

As per discussions in the previous sections, there will be travel delays during the constructions, as is the case with most construction projects, albeit on a reduced scale if utilities and traffic management are properly coordinated. There are additional grounds for travel delays in the area, as most of the streets lack sufficient capacity to accommodate additional traffic from diverted traffic as a result of street closures to accommodate the works.

The awareness campaign and the prior notification for the public will be a continuous activity which the project will carry out to compensate for the above delays and minimize public claims as result of these problems. These activities will take place sufficiently in advance of the time when the roadblocks or traffic diversions take place at the particular streets. The reason for this is to allow sufficient time for the public and residents to understand the changes to their travel plans. The project will notify the public about the roadblocks and traffic diversion through public notices ward level meetings and city level meeting with the elected representatives.

The PIU will also conduct an awareness campaign to educate the public about the following issues:

(i) traffic control devices in place at the work zones (signs, traffic cones, barriers, etc.);
(ii) defensive driving behaviour along the work zones; and
(iii) reduced speeds enforced at the work zones and traffic diversions.

It may be necessary to conduct the awareness programs/campaigns on road safety during construction.

The campaign will cater to all types of target groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centres. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will also be available at the PIU, and the contractor's site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

(i) explain why the brochure was prepared, along with a brief description of the project;
(ii) advise the public to expect the unexpected;
(iii) educate the public about the various traffic control devices and safety measures adopted at the work zones;
(iv) educate the public about the safe road user behaviour to emulate at the work zones;
(v) tell the public how to stay informed or where to inquire about road safety issues at the work zones (name, telephone, mobile number of the contact person; and
(vi) indicate the office hours of relevant offices.

E. Install traffic control devices at the work zones and traffic diversion routes

The purpose of installing traffic control devices at the work zones is to delineate these areas to warn, inform, and direct the road users about a hazard ahead, and to protect them as well as the workers. As proper delineation is a key to achieve the above objective, it is important to install good traffic signs at the work zones. The following traffic control devices are used in work zones:

- Signs
- Pavement Markings
- Channelizing Devices
- Arrow Panels
- Warning Lights

Procedures for installing traffic control devices at any work zone vary, depending on road configuration, location of the work, construction activity, duration, traffic speed and volume, and pedestrian traffic. Work will take place along major roads, and the minor internal roads. As such, the traffic volume and road geometry vary. The main roads carry considerable traffic; internal roads in the new city areas are wide but in old city roads very narrow and carry considerable traffic. However, regardless of where the construction takes place, all the work zones should be cordoned off, and traffic shifted away at least with traffic cones, barricades, and temporary signs (temporary “STOP” and “GO”).

Figure A4 to Figure A5 illustrates a typical set-up for installing traffic control devices at the work zone of the area, depending on the location of work on the road way, and road geometrics:

- Work on shoulder or parking lane
- Shoulder or parking lane closed on divided road
- Work in Travel Lane
- Lane closure on road with low volume
- Lane closure on a two-line road with low volume (with yield sign)
- Lane closure on a two-line road with low volume (one flagger operation)
- Lane closure on a two-lane road (two flagger operation)
- Lane closure on a four-lane undivided Road
- Lane closure on divided roadway
- Half road closure on multi-lane roadway
- Street closure with detour

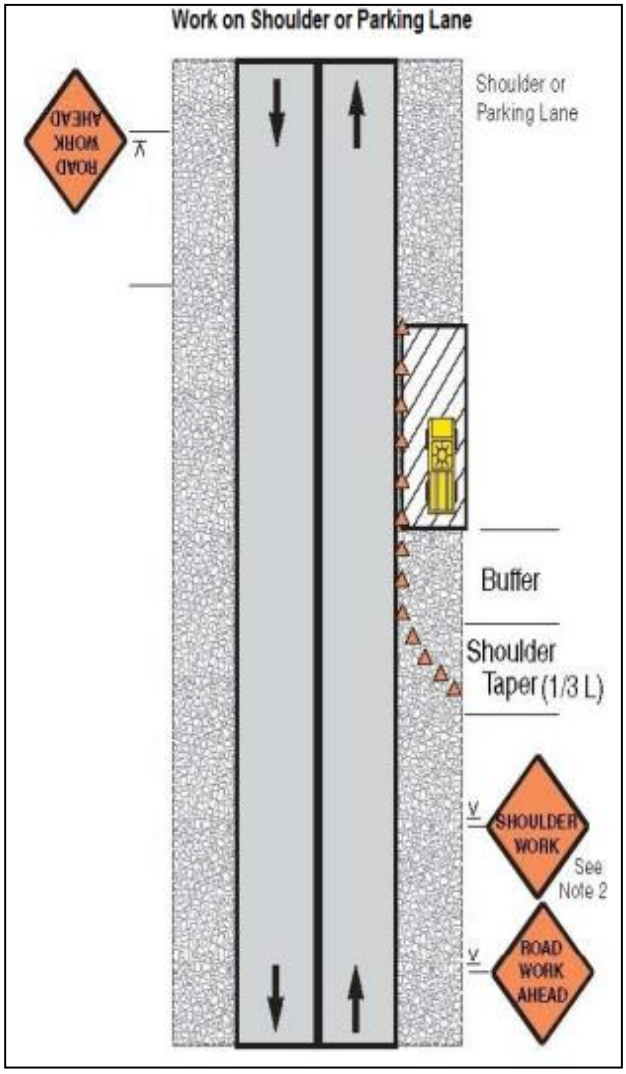
The work zone should take into consideration the space required for a buffer zone between the workers and the traffic (lateral and longitudinal) and the transition space required for delineation, as applicable. For the works, a 30 cm clearance between the traffic and the

temporary STOP and GO signs should be provided. In addition, at least 60 cm is necessary to install the temporary traffic signs and cones.

Traffic police should regulate traffic away from the work zone and enforce the traffic diversion result from full street closure in certain areas during construction. Flaggers/ personnel should be equipped with reflective jackets at all times and have traffic control batons (preferably the LGED type) for regulating the traffic during night time.

In addition to the delineation devices, all the construction workers should wear fluorescent safety vests and helmets in order to be visible to the motorists at all times. There should be provision for lighting beacons and illumination for night constructions.

Figure A2 & A3: Work on shoulder or parking lane and shoulder or parking lane closed on divided road



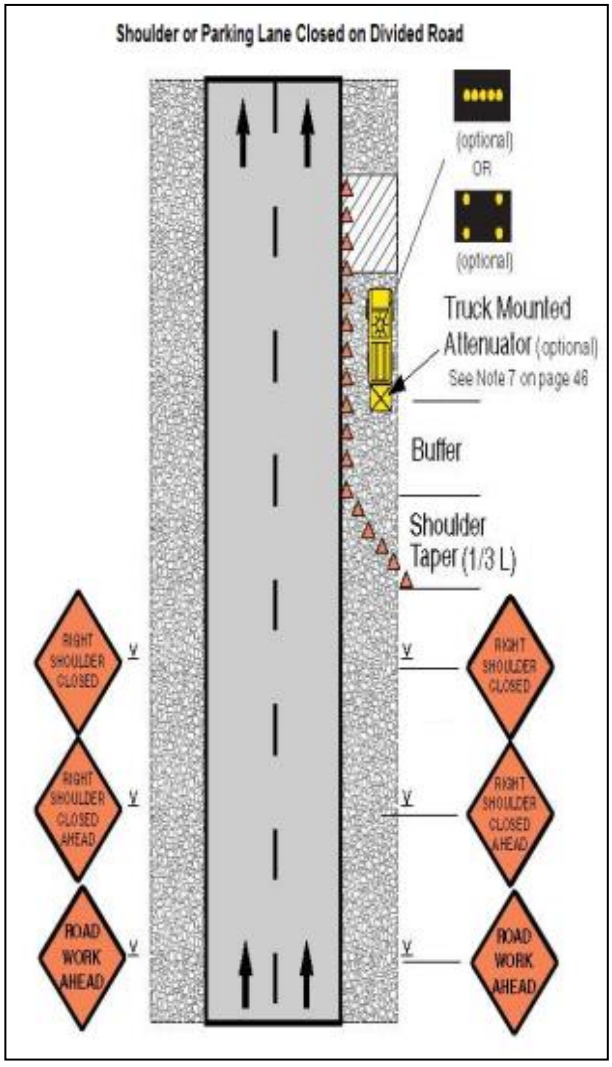
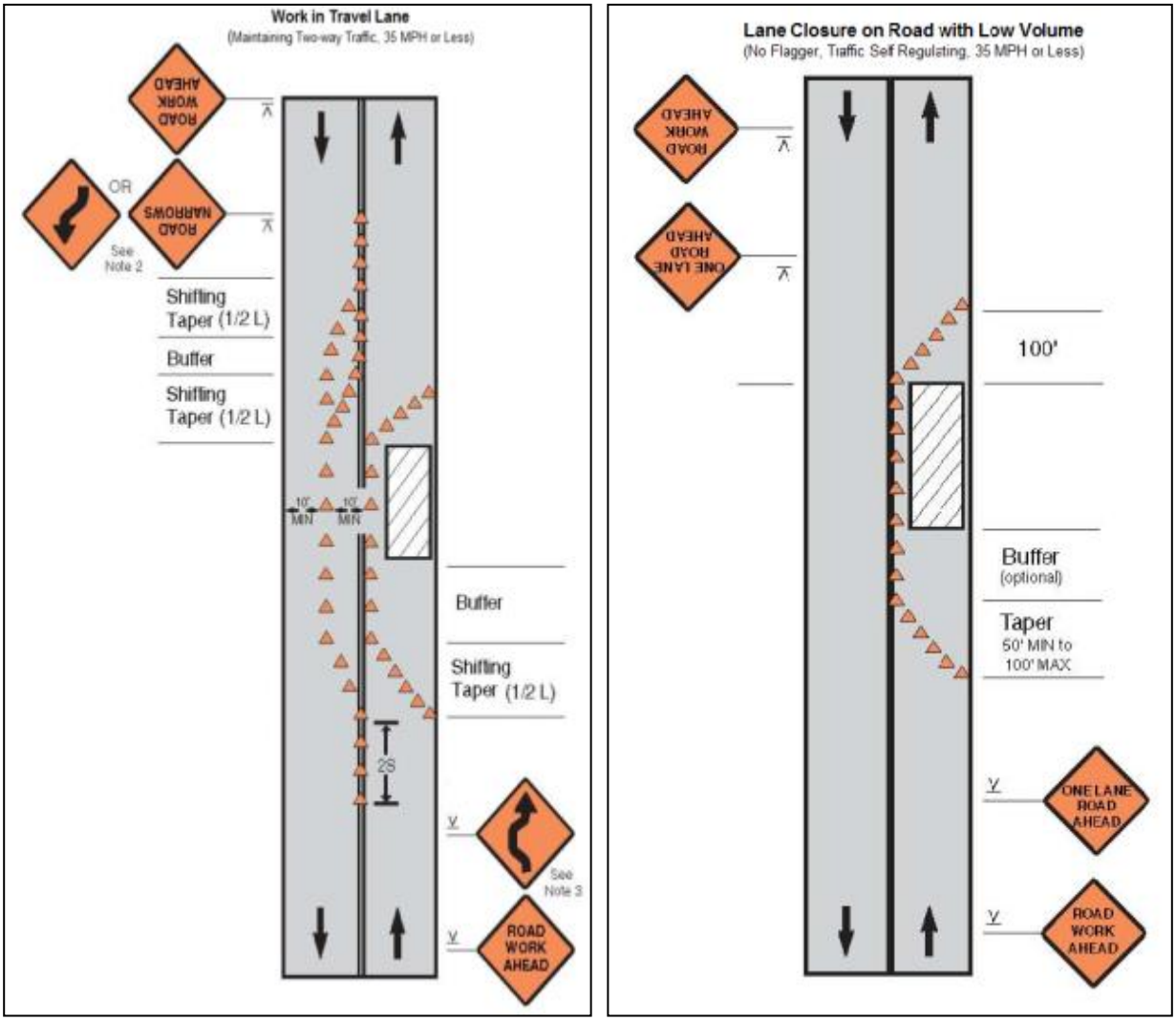


Figure A4 & A5: Work in Travel lane & Lane closure on road with low volume



Appendix 5: Consultation Meeting Participants List

Urban Governance and Infrastructure Improvement Programme (UGIIP), LGED

Public Consultation Meeting Social and Environmental Safeguards

Name of the Pourashava: Rohanpur pourashava

Name of Location/ Venue of FGD meeting: Station para, dak bangla road. Ward No 05

Visit/ Meeting Date: 21.04.2022 Time: 11.30 am

Type of Meeting FGD (Road and Drain)

List of Participants

Serial (ক্রমিক)	Name (নাম)	Address/ Contact No(ঠিকানা/মোবাইল)	Age (বয়স)	Occupation (পেশা)	Signature (স্বাক্ষর)
১	[illegible]	[illegible]		[illegible]	[illegible]
২	[illegible]	[illegible]	৫৭	ব্যবসা	[illegible]
৩	[illegible]	[illegible]	৪৮	ব্যবসা	[illegible]
৪	[illegible]	[illegible]	৪০	ব্যবসা	[illegible]
৫	[illegible]	[illegible]	৪২	ব্যবসা	[illegible]
৬	[illegible]	[illegible]	৩২	চাকুরী	[illegible]
৭	এনামুল হক	০১৭৭৪৫৬৪৮২৮	৫০	ব্যবসা	[illegible]
৮	[illegible]	[illegible]	৫০	ব্যবসা	[illegible]
৯	[illegible]	[illegible]	৬৮	ব্যবসা	[illegible]
১০	[illegible]	[illegible]	৬৫	ব্যবসা	[illegible]
১১	নূর উদ্দিন	০১৭৬২৯৮৫৯৬২	৮০	গৃহস্থ	[illegible]
১২	[illegible]	[illegible]	৫৫	ব্যবসা	[illegible]
১৩	হাসান মিয়া	০১৬২৯৪৬৫৮৮৬	৭৫	দিনমজুর	[illegible]
১৪					
১৫					

Name Signature

Appendix 6: SOP for Oil & Chemical Handling

1. Aim and Scope

The objective of this SOP is to specify detailed rules, times and responsibilities related to the use, storage and handling of oils and chemicals (hereunder referred to as “chemicals”) within working areas by the Contractor.

This document is to be given by the PIU Responsible person to the Contractor when the contract becomes effective. The Responsible Engineer shall ensure that the Contractor has clearly understood these good practices for chemical handling and shall abide by them.

2. Responsibilities

- Contractor personnel responsible for the task
- Coordinate and ensures that the Contractor is working in accordance with this SOP
- Ensures that personnel assigned to handle and transport chemicals are properly trained and equipped to handle chemicals safely, and prepared to contain and clean accidental spills
- Ensures that chemicals are labelled and placed in designated location according to this SOP
- Provides Safety Data Sheet of the chemicals to be used to the responsible person
- Carry out handling of chemicals from one location to another
- Responsible for regular checks required in the implementation of this SOP

3. Operative Rules

The responsible person of Contractor is to ensure that the SOP is following as per the requirement. This procedure also defines the training requirements, handling methods and precautions to be taken during transportation of chemicals from one site to another, in order to minimize any hazards these chemicals might pose to human beings as well as to the environment.

3.1 Chemicals handling planning

- The person planning the transfer of chemicals must be informed of quantities to be transferred, the type of packaging and the scheduled locations when assessing the methods and means necessary for the handling.
- The person in charge of the transfer and/or handling of chemicals must:
  - Clearly identify the chemical and be aware of the hazards involved.
  - Ensure that the chemicals being sanctioned for transfer are stored and stacked in a correct and safe manner as detailed in the subsequent clauses of this SOP to avoid accidental spills and possible injuries.
- The Contractor must provide his personnel with the Personal Protective Equipment (PPE), adequate means of transportation and spill control materials.

3.2 General safety requirements

When a hazardous chemical is handled, the following recommendations should be observed:

- The Contractor must ensure that his personnel are trained in chemical handling and spill management.
- The Contractor must ensure that adequate manpower is assigned to the task in order to carry out the job safely.
- The Contractor has to ensure that the competent personnel are provided with the appropriate PPE.
- Adequate materials should be readily available for spill management and the action to be taken in case of Oil and/or Chemical Spills should include:
  - Use of appropriate PPE
  - Ensure that the necessary spill kit material is handy and used Isolate source
  - Inform responsible person so he can inform the required personnel so that the spill can be contained with minor consequences.
  - Contain spill as far as possible, especially if it can go into the road or drains

- Inform the responsible person if the spill is in the road and can cause a hazard to traffic such that he can place warning signs and advice Police to assist controlling traffic, if necessary
- Recover spill using suitable means:
  (i) Bucket & shovel / dustpan work well on smooth floors
  (ii) Absorbent pads which can each absorb (approx) 1 litre
  (iii) Sand or other oil absorbing particulates
- Recovered chemical and absorbent material is to be dealt with as "hazardous waste".

3.3 Chemicals Usage

When using chemicals on work premises, the Contractor has to ensure that the following rules/recommendations apply:

- Wherever possible, chemicals and their compounds used shall be free from Mercury, Chromium and Zinc.
- Use CFC and HCFC-free sprays and products.
- All chemicals used are to be accompanied by the "Safety Data Sheet (SDS)".
- Wherever possible, the use of toxic and very toxic substances as well as carcinogenic substances shall be avoided.
- The Contractor should ensure that any chemicals used within work premises are not stored in a damaged container/drum and that they are labelled properly.

3.4 Labelling and identifying chemicals

The Contractor should ensure that:

- All bunded areas and basins, vessels, drums or cans and pipelines containing hazardous chemicals shall be properly labelled. The label/s shall not be removed and should be replaced if damaged or faded.
- In case the container or packaging needs to be changed or substances are to be transferred to a smaller container for safer handling, the Contractor must fix a label to the new container. It must be ensured that the label is firmly affixed to the container or alternatively, the name of the hazardous chemical, as indicated in the original label, is to be clearly written directly onto the new container. Apart from the chemical name, the common name of the chemical is also to be written on the container to ensure that the container's content is easily understood by the personnel who will be using it. Moreover, each container should depict pictograms to indicate constituent chemical properties.
- When reusing a container, it must be ensured that the original label on the old container is removed to eliminate any possibility of incorrect use of the chemical.
- When identifying containers, cans, etc. of chemicals, it must be ensured that a permanent marker is used and text is written clearly (preferably in block letters) and in an adequate font size to allow for easy identification.

3.5 Handling chemicals

All Contractor personnel handling chemicals should adhere to the following rules and recommendations:

- Handler/end user should be trained in chemical handling prior any handling
- Use of PPE is mandatory
- The specific SDS of the chemicals are always to be consulted prior to the handling of a chemical
- Chemical SDSs for each chemical being used, and safety and environmental information shall be available on site where the chemicals are being used
- Mixing or pouring of chemicals should be performed on waterproof surfaces to prevent soil contamination
- Handling of hazardous chemicals (transportation, change of containers, etc.) should always be kept to a minimum

- Chemical containers are not to be left open and are always to be kept closed when not in use
- Mixing of hazardous chemicals should be avoided since mixing of incompatible chemicals can induce emissions of toxic gases and other dangerous reactions
- The right amount of product is to be used (check product instructions to dilute chemicals)
- Hazardous chemicals are never to be left unattended

3.6 Storage of chemicals

If any chemicals are to be stored on work premises for the duration of works, the Contractor must ensure that the following rules are put into practice:

- It should be verified that all legal limits related to chemical storage are being met.
- Storage areas for the chemicals are to be defined.
- All dangerous chemicals must be located in the appropriate storage area unless currently in use.
- Storage areas should always be bunded and covered to avoid leaching of pollutants through rainwater.
- The capacity of the chemical storage basin or containment should always be the greater
- Any spill occurring within the bunded storage area shall be isolated from the drainage and sewage systems.
- It must be ensured that the capacity and characteristics of storage areas, shelves and any other device used to store chemicals are adequate for the specific operation.
- Good housekeeping must be ensured in storage areas
- Chemicals cannot be stored and/or located in areas such as passageways, vehicles, and so on.
- It must be ensured that incompatible chemicals are segregated within the storage areas.
- Chemical products must be stored according to their compatibility. Acids are to be stored away from bases (such as Alkalis). Flammable products are to be stored away from all other products and especially away from potential fire hazards.
- Storage areas for explosives shall be designed in such a way as to prevent hits, falls or any other potential cause of explosion and to protect the surroundings against explosions.
- Chemicals should ideally not be stored under direct sunlight, in warm areas or near heat sources.
- When storing chemicals, the label and SDS are to be consulted for correct storage of each substance.
- Certain chemicals or substances have to be stored in well ventilated areas or at a specific humidity and temperature.
- It must be ensured that all containers such as drums and their lids are in good condition, are safe to use and there is no possibility for spills or leakages.

3.7 Control and monitoring activities

The Contractor has the responsibility to:

- Check periodically for correct identification, handling, use and storage of process chemicals at point-of-use;
- Check periodically that all waterproof areas where chemicals are located are in good
- condition and that there are no surface irregularities or cracks. This is especially important for storage of large containers;
- Check periodically for spills and leaks;
- Check periodically on the correct use of products by his personnel and give adequate training if deemed necessary.
- Visual checks shall suffice.

3.8 Abnormal conditions and emergency situations

In case of an accident or emergency such as spills, dangerous chemical reactions, etc., the Contractor shall ensure that the following recommendations are followed:

- Necessary safety protection devices (gloves, glasses, etc.) are to be worn
- The hazardous chemical causing the problem is to be identified
- If the level of risk is acceptable, all valves are to be isolated and taps turned off in order to stop the spill from spreading further out in the accident area as well as to contain the spill as much as possible and stop it from reaching unprotected areas, such as areas which are not waterproof, sewage discharges, etc.;
- The Responsible Person is to be informed so as to intervene;
- The accident area is to be cordoned off;
- Given that the danger level is acceptable, appropriate materials are to be used to clean up the spill. Rags, sawdust or other combustible materials are not to be used to collect combustible agents or flammable chemicals;
- Access to the area is only to be allowed when the spill has been contained, cleaned and the area is risk free.
- In case of damage to a container, this is to be replaced and it must be ensured that the container is clearly and correctly identifiable and disposed of in the appropriate manner.
- Proper absorbent materials should always be readily available for use close to all chemical storage and handling areas.