



GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH
MINISTRY OF ROAD TRANSPORT AND BRIDGES



ROADS AND HIGHWAYS DEPARTMENT

**Environmental and Social Management for Jhenaidah - Jashore Road Section (Phase-1)
and Bhomora - Satkhira - Navaron Road Section (Phase-3) for Western Economic
Corridor and Regional Enhancement (WeCARE) Program**



**FINAL ESIA FOR PHASE 1
NOVEMBER 2022**

JOINT VENTURE OF



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STUP CONSULTANTS PVT. LIMITED (STUP), INDIA



BCL ASSOCIATES LIMITED (BCL), BANGLADESH

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GLOSSARY

Adverse Impact	: An impact that is considered undesirable
Ambient Air	: Surrounding air
Aquatic	: Growing or living in or near water
Accident	: It is an unplanned event, which has a probability of causing personal injury or property damage or both
Bangla	: Bengali language
Baseline (or existing)	: The 'baseline' essentially comprises the factual understanding and interpretation of existing environmental, social, and health conditions of where the business activity is proposed. Understanding the baseline shall also include those trends present within it, and especially how changes could occur regardless of the presence of the Project, i.e., the 'No-development Option'.
Bazar	: Market
Beel	: A 'back swamp' or depression can be either perennial or seasonal
Beneficial Impacts	: Impacts, which are considered to be desirable and useful
Biological Diversity	: The variety of life forms, the different plants, animals, and microorganisms, the genes they contain, and the ecosystems they form. It is usually considered at three levels: genetic diversity, species diversity, and ecological diversity
Char	: Newly accreted land, sometimes islands, within main river channels and nearby mainland or in the estuary, subject to erosion and accretion
Disaster	: It is defined as a catastrophic situation that causes damage, economic disruptions, loss of human life, and deterioration of health and health service on a scale sufficient to warrant an extraordinary response from outside the affected area or community. Disasters occasioned by man are factory fire explosions and the release of toxic gases or chemical substances, etc.
Environmental Assessment	: The systematic, reproducible, and interdisciplinary identification, prediction and evaluation, mitigation, and management of impacts from the proposed development and its reasonable alternatives.
Ecosystem	: A dynamic complex of plant, animal, fungal and microorganism communities and associated non-living environments interacting as an ecological unit
Endangered Species	: Species in danger of extinction and whose survival is unlikely if the existing conditions continue to operate. Included among those are species whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to suffer from the immediate danger of extinction
Environmental Effects	: The measurable changes, in the natural system of productivity and environmental quality, resulting from a development activity
Environmental Impact	: An estimate or judgment of the significance and value of environmental effects for natural, socio-economic, and human receptors
Environment Management Plan	: A plan to undertake an array of follow-up activities that provide for the sound environmental management of a Project/ intervention so that adverse environmental impacts are minimized and mitigated; beneficial environmental effects are maximized; and sustainable development is ensured
Environmental Management	: Managing the productive use of natural resources without reducing their productivity and quality
Emergency	: It is defined as a situation where the resources outpass the demand. This highlights the typical nature of an emergency. Situations of this kind are avoidable but it is not possible to avoid them always.

Emergency Preparedness	: It is one of the key activities in overall management. Preparedness, though largely dependent upon the response capability of the persons engaged in direct action, will require support from others in the organization before, during, and after an emergency.
Erosion	: Process in which wind and water remove materials from their original place; for instance, soil washed away from an agricultural field
Evaluation	: The process of looking back at what has been done or accomplished
Fauna	: A collective term denoting the animals occurring in a particular region or period
Field Reconnaissance	: A field activity that confirms the information gathered through secondary sources. This field study is essentially a rapid appraisal
Flora	: All of the plants found in a given area
Habitat	: The natural home or environment for a plant or animal
Hazard	: It is defined as a physical situation, which may cause human injury, damage to property or the environment, or some combination of these criteria.
Household	: A household is identified as a dwelling unit where one or more persons live and eat together with a common cooking arrangement. Persons living in the same dwelling unit having separate cooking arrangements constitute separate households
Important Environmental Component	: : These are environmental components of biophysical or socioeconomic importance to one or more interested parties. The use of important environmental components helps to focus the environmental assessment
Khal	: A small channel, canal
Land use	: Types include agriculture, horticulture, settlement, pisciculture, and industries
Mauza	: A Bangla word for the smallest government administrative area corresponding to a village revenue unit
Mitigation	: An action, which may prevent or minimize adverse impacts and enhance beneficial impacts
Negative Impact	: A negative change from the existing situation due to the Project
Public Consultation	: A range of techniques can be used to inform, consult, or interact with stakeholders affected / to be affected by a proposal
Reversible Impact	: An environmental impact that recovers either through natural process or with human assistance (e.g., cutting off fish migration by an embankment might be reversible at a later stage if a proper regulator is built)
Risk	: It is defined as a likelihood of an undesired event (accident, injury, or death) occurring within a specified period or under specified circumstances. This may be either a frequency or a probability depending on the circumstances.
Stakeholders	: Those who may be potentially affected by a proposal, e.g., local people, the proponent, government agencies, NGOs, donors, and others, all parties who may be affected by the Project or take an interest in it
Taka	: Unit of Bangladeshi currency
Terrestrial	: Living on land
Thana	: Sub-district level of government administration, comprising several unions under district
Union	: The smallest unit of local self-government comprising several villages
Upazila	: Sub-district name. Upazila introduced in 1982
Zila	: Bengali word for district

ABBREVIATION

AIIB	:	Asian Infrastructure Investment Bank
ADB	:	Asian Development Bank
AEZ	:	Agro- Ecological Zone
AIDS	:	Acquired Immunodeficiency Syndrome
AMAN	:	Rice (grown in the wet season)
APHA	:	American Public Health Association
ARIPA	:	Acquisition and Requisition of Immoveable Property Act
As	:	Arsenic
BD	:	Bangladesh
BIWTA	:	Bangladesh Inland Water Transport Authority
BNBC	:	Bangladesh National Building Code
BOQ	:	Bill of Quantities
Boro	:	Rice (grown in the dry season)
BMD	:	Bangladesh Meteorological Department
BRTA	:	Bangladesh Road Transport Authority
BTCL	:	Bangladesh Telecommunication Company Limited
BWDB	:	Bangladesh Water Development Board
C-ESMP	:	Construction Environmental and Social Management Plan
CCL	:	Cash Compensation under Law
C&D	:	Construction and Demolition
CITES	:	Convention on Trade in Endangered Species
CO	:	Carbon Monoxide
CoI	:	Corridor of Impact
COVID	:	Coronavirus Disease
CPRs	:	Community Property Resources
CSC	:	Construction Supervision Consultant
DAE	:	Department of Agriculture Extension
DIA	:	Direct Impact Area
DMMP	:	Dredged Material Management Plan
DC	:	Deputy Commissioner
DO	:	Dissolved Oxygen
DoE	:	Department of Environment
DoF	:	Department of Forest
EA	:	Executive Agency
ECA	:	Environmental Conservation Act
ECC	:	Environmental Clearance Certificate
ECP	:	Environmental Code of Practice
ECR	:	Environmental Conservation Rules
EHS	:	Environmental, Health, and Safety

EIA	:	Environmental Impact Assessment
ESMP	:	Environmental and Social Management Plan
EMoP	:	Environmental Monitoring Plan
Engineer	:	The Construction Supervision Consultant/ Engineer
EPAS	:	Environmental Parameter Air Sampler
EPC	:	Engineering Procurement and Construction
EQS	:	Environmental Quality Standards
ESIA	:	Environmental and Social Impact Assessment
ESS	:	Environmental and Social Standards
ESMP	:	Environmental and Social Management Plan
ESSU	:	Environmental and Social Safeguards Unit
FC	:	Faecal Coliform
FGD	:	Focus Group Discussion
FOB	:	Foot Over Bridge
FSCD	:	Fire Services & Civil Defense
GBV	:	Gender-Based Violence
GHG	:	Greenhouse Gases
GoB	:	Government of Bangladesh
GPS	:	Global Positioning System
GRC	:	Grievance Redress Committee
GRM	:	Grievance Redress Mechanism
HIV	:	Human Immunodeficiency Virus
ICTPs	:	International Conventions, Treaties, and Protocols
IEC	:	Individual Environmental Consultant
IEE	:	Initial Environmental Examination
INGO	:	Implementing Non-Government Organization
IoL	:	Inventory of Losses
IFC	:	International Finance Corporation
IRC	:	Indian Roads Congress
IUCN	:	International Union for Conservation and Nature
ILO	:	International Labor Organization
ICNIRP	:	International Commission on Non-Ionizing Radiation Protection
JPBS	:	Jashore Palli Biddut Samity
LGED	:	Local Government Engineering Department
LMP	:	Labor Management Procedure
Km	:	Kilometer
Km/h	:	Kilometer per hour
KML	:	Keyhole Markup Language zipped Google Earth
NM	:	Noise Measurement
NO	:	Nitric Oxide
NO ₂	:	Nitrogen Dioxide
MoEFCC	:	Ministry of Environment, Forestry and Climate Change

MoRTB	:	Ministry of Road and Bridges
O ₃	:	Ozone
OHS	:	Occupational Health and Safety
PAP	:	Project Affected Person
PCM	:	Public Consultation Meeting
PD	:	Project Director
PDPs	:	Project Displaced Persons
PIU	:	Project Implementing Unit
PM ₁₀	:	Particulate Matter (less than or equal to 10 microns)
PM _{2.5}	:	Particulate Matter (less than or equal to 2.5 microns)
POP	:	Pedestrian Overpass
PPE	:	Personal Protective Equipment
PPV	:	Peak Particle Velocity
PWD	:	Public Works Department
RAP	:	Resettlement Action Plan
RHD	:	Roads and Highway Department
RoW	:	Right of Way
SEA	:	Sexual Exploitation and Abuse
SEM	:	Stakeholder Engagement Plan
SH	:	Sexual Harassment
SPM	:	Suspended Particulate Matter
STD	:	Sexually Transmitted Diseases
SO _x	:	Sulfur Dioxide
SOP	:	Standard Operating Procedure
SRDI	:	Soil Resource and Development Institute
RHD	:	Roads and Highways Department
TC	:	Total Coliform
TDS	:	Total Dissolved Solid
TOC	:	Total Organic Carbon
TSS	:	Total Suspended Solid
TPP	:	Tree Plantation Plan
VOP	:	Vehicle Overpass
WB	:	World Bank
WHO	:	World Health Organization
WMM Plant	:	Wet Mix Macadam Plant

CURRENCY EQUIVALENTS

Currency unit	-	Bangladesh Taka (BDT)
BDT 1.00	=	\$ 0.0098
1 US Dollar (USD)*	=	BDT 101.58

WEIGHTS AND MEASURES

Cm	-	centimeter
ha	-	hectare
1 ha	-	2.47 acre/10,000 sqm
1 acre	-	100 decimals
km	-	kilometer (1,000 meters)
m	-	meter
mm	-	millimeter

UNIT CONVERSION

1 meter	=	3.28 ft
1 kilometer	=	0.621 mile
1 nautical mile	=	1.852 kilometer
1 kilogram	=	2.20 pound
1 metric ton	=	1000 kg
1 barrel	=	159 liters
1 liter	=	0.264 gallon
1 square mile	=	640 acres
1 hectare	=	2.471 acres
1 Pascal	=	1 N/m ²
1 liter	=	0.001 cubic meter
1°C	=	273.15K
1 mg/m ³	=	1 µg /L
1 mg/L	≈	1 ppm (w/w)
1 mg/ m ³	≈	1 ppb (w/w)
1 knot	=	0.514444 m/s
1µg/m ³	=	1 ppb*(12.187) *(M) / (273.15 + °C)

Note: In this report, "\$" refers to the US dollar; *1 US Dollar (USD) = 101.58 BDT as the exchange rate of Bangladesh Bank on 02 November 2022

EXECUTIVE SUMMARY

1 INTRODUCTION

- i. The Western Economic Corridor & Regional Enhancement (WeCare) program is devised for efficient, safe, and resilient connectivity to strengthen road sector management in Western Bangladesh. Under this program, the World Bank (WB) is financing the Government of Bangladesh (GoB) to improve the present condition of the Jhenaidah to Jashore road section, which is connecting Natore, Pabna, Kushtia districts to Jashore, Khulna, and Satkhira districts in Phase-1.
- ii. An Environmental and Social Impact Assessment (ESIA) for the proposed road Section of the corridor was prepared as part of the formulation of the WeCARE program in 2019 (prior appraisal) that was built on an ESIA developed in 2015 with ADB assistance. This ESIA now needs to be updated due to changes in design and to cover the latest data considering the current scenario.

2. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

- iii. Relevant environmental and social policies, laws, regulations, and rules of the country, the international treaties as well as the WB's Environmental and Social Standards (ESS) have been reviewed along with their applicability and gaps.
- iv. According to the requirement of the Department of Environment (DoE), the project has been accorded the Environmental Clearance Certificate (ECC) on 09/12/2021 which needs to be renewed before December 2022.

3. DESCRIPTION OF PROJECT

- v. The total length of this road is approximately 47.48 km starting at Jhenaidah Bus Terminal and ending at Chachra Circle. The roads and Highways Department (RHD) of the Ministry of Roads, Highways, and Bridges is the responsible agency for developing this road section of N7. The project features include widening this road stretch, Slow Moving Vehicle traffic lanes on both sides, realignments to improve geometrics and avoid congested areas; raising embankment height, and widening cross drainage structures and provision roadside drain in urban areas; widening bridges and culverts including a few new cross drainage structures; Vehicular Overpasses (VOPs), Pedestrian Overpasses (POPs), ROB, and Flyover at big bazaar areas and grade U-turns; improvement of bus stop/bus shelter, Foot Overbridge (FOBs), pedestrian crossing, rumble strips, wildlife crossings signage, footpath-cum storm water drains and road intersections improvements; provision of road furniture's, and tree plantation; Intelligent Traffic System.

4. DESCRIPTION OF THE BASELINE ENVIRONMENTAL AND SOCIAL BASELINE

- vi. The project road alignment region is largely in the northwestern and southwestern parts of the country, and freshwater is supplied by the Ganges River. The entire road alignment passes across the physiographic unit of the Ganges Floodplain. The project region offers unique land, soil, climate, hydrology, and rainfall characteristics due to its placement in a dormant delta and tidal environment. As per the seismic zone classifications, the project road falls in Zone I i.e., low seismic intensity. Soil profiles of the project area characteristically have textural classes ranging from silt loam to silty clay or clay in most of the horizons.
- vii. The predominant land use pattern within the affected area is agricultural land (23.18%), followed by zonal road (49.41%), residential area (11.56%), commercial area (11.44%), water bodies (2.6%), educational area (0.85%), industrial area (0.77%), religious structures (0.19%), etc.
- viii. The climate is characterized by a tropical wet and dry climate and the region experiences hot & humid summer and dry winter. The monthly average temperature during the monsoon is around 29.5°C. The cool and dry winter season begins in November. The coldest month is January with an average minimum temperature of 10.6°C. The rain is due to the southern monsoon between May and September which is over 85% of total rainfall falls. The maximum average relative humidity for the project area is 93.9% in August whereas the

minimum is 55.4% in March. The southwesterly monsoon begins in the middle of March and ends around the end of September. From March to October, monsoon winds blow from the south with sustained force whereas in January the winds blow from the north/northeast.

ix. The primary field investigation covering ambient air quality at nine (09) locations, noise and vibration level at nine (09), Surface water at eight (8) locations, and groundwater quality (4 locations) monitoring has been carried out along the Project Road. According to the monitoring results, dust particles (particulate matter) e.g., PM_{2.5}, PM₁₀, SPM, and gaseous pollutants such as NO₂, SO₂, CO, CO₂, O₃, etc. have been monitored. The air quality results are well within the national standard. The noise levels are exceeding the standards in the daytime whereas nighttime noise is far below the standards at all locations. The average vibration level is from 0.62 to 0.96 mm/s on the existing highway.

x. Oil and grease concentration is exceeding the standard in the surface water samples. Besides this, other parameters are under the standard level except for TSS on the higher side of the Chitra river. Manganese (Mn) in all groundwater samples is found to be more than the standard. Other parameters are quite good enough to drink.

xi. A total of 365 species including herbs, shrubs, trees, and climbers have been recorded from both terrestrial and aquatic habitats of the study area. Amongst them, 131 woody plant species; of this 30% are represented by fruit-bearing tree species followed by timber (27%), medicinal (24%), and ornamental plant (19%) species. A total of 154 fauna species were recorded from both terrestrial and aquatic habitats. Among them, 8 were amphibians, 13 reptiles, 86 birds, 18 mammals, and 29 fishes. From the assessment of both terrestrial and aquatic flora and fauna, species under Red List categories of IUCN (Threatened, Endangered, Critically Endangered, Vulnerable and so on), species protected by laws including CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), and species protected by Wildlife Protection & Security Act, 2012 were not recorded in the project area.

xii. A total of 3464 households (affected persons 14,938) are likely to be affected in Contract 1, Contract 2, and Contract 3 due to land acquisition for the proposed project. The highest primary occupation of affected male household heads is businesses followed by service-class male household heads and skilled laborers. There are no indigenous people/ethnic in the project-affected area.

5. ANALYSIS OF ALTERNATIVE ALIGNMENTS

xiii. Two alternatives have been considered in the design of the road section between chainage Km 0+800 and Km 0+1600 to improve the geometrics of the road. The first one is the widening of existing roads and the second one is the realignment between this chainage. It is found that there will be environmental and social impacts due to the proposed alignments. But the second alignment will provide better geometrics, smoothen the flow of traffic and reduce the travel time. Thus, a realignment is proposed between this chainage.

xiv. “With the project” and “Without Project” options have also been studied by working on CO₂ emissions for both. It is found that there will be a reduction in the the “With the Project” option. Thus, recommended for implementation.

6. CONSULTATIONS, PUBLIC PARTICIPATION, AND INFORMATION DISCLOSURE

xv. A total of thirty-seven (37) events have been organized in the consultations, public participation, and information disclosure process. Out of a total, twenty-four (24) KIIs followed by eight (8) SECs, five (5) FGDs, etc. have been organized along the project area between March 2022 and August 2022.

xvi. During the stakeholders’ consultation process the following has been brought forward such as, pertinent project related information; project objectives and benefits; land acquisition (LA) and resettlement for the proposed development and LA process; requirement of relocation of Utilities, CPR, etc. gender-based violence issues; skill development requirement under livelihood restoration program for poor and vulnerable; labor influx during the construction phase; trees removal for developing the road section; pedestrian safety; pollution arising from the movement construction equipment and vehicle movement; Prevalent diseases along the road.

xvii. Though people agreed with proposed development but with some demand which have been addressed/considered in design as well as in updated ESMP and RAP for project such as, Underpass, Pedestrian overpass, and foot over Bridge for pedestrian are to be provided; Realignment have been considered for road safety; Adequate number of culverts and bridges etc. are there in the project to cater for the smooth passage of water; In urban areas, side drains are provided; Notice period should be 3-4 months; Participant agreed for removal of the trees since they are very old and could pose risk/injury/causality by falling tree branches during cyclone; For shifting of CPRs compensation will be paid as per RAP; Contractor will be encouraged to employ locals as per their skills to reduce the labor influx; Contractor will also assist the PIU in maintaining the SEA-SH free environment by adopting measures suggested in the updated ESMP; GRM procedures has been formulated to redress the grievances; Gender Focused Considerations have formulated in the updated ESMP and RAP; Labor Management Procedures have been recommended in updated ESMP and ESIA.

7. ENVIRONMENTAL AND SOCIAL IMPACTS, RISKS, AND MITIGATION MEASURES

xviii. Environmental risks have been studied in this section of the updated ESIA based on the collected data in the month of March to August 2022 About 14008 trees are required to be removed. Out of these, trees of girth size more than 60 cm are about 3500. The baseline data indicate that there is no endangered or endemic species of terrestrial and aquatic ecology are getting impacted. To mitigate the impacts due to tree cutting, tree plantation in the ratio of 1:3 as per the guidelines of GoB, shrubs plantation, grass root plantation, etc. are also proposed to be undertaken.

xix. The air quality impacts have been assessed using Caline 4 of CALTRON (Lakes Environment) and Noise modeling (SoundPLAN) was carried out to assess the impacts on Noise quality. It is found that the air quality will be within the prescribed limit of DoE. There will be an increase of 3 dB (A) due to project road development as the existing noise levels itself are exceeding the standards. It is to be noted that these schools/madrasahs along the road are in mixed land use patterns of rural residential cum commercial areas.

xx. To reduce the intensity of impacts due to noise, tree plantation in 3 three rows is proposed. Further, the compensation to construct the boundary wall which is getting affected will be made. This will also help to reduce the impacts.

xxi. To reduce the impacts on the socioeconomic environment, a separate Resettlement Action Plan (RAP) has been prepared. The mitigation measures include Payment of Cash Compensation, Payment of Top-up, compensation for the loss of pond and private trees, social and economic development support to restore the livelihoods of women and vulnerable groups, Grievance Redress Mechanism (GRM), etc.

xxii. Mitigation measures are suggested to ensure Community Health and Safety, barricading excavated areas and to prevent trespassing from construction sites/construction camps/labor camps, provision of warning sign boards, prevention of water logging at the construction sites to prevent community exposure to water-borne, vector-borne diseases, and communicable and non-communicable diseases.

xxiii. Measures to prevent impacts on gender, SEA/SK, the contractor will take the mitigation measures including the installation of Close circuit cameras at prominent locations such as contractor's facilities/office/camps/canteen, etc.; necessary arrangements and systems for effective and timely patrolling to ensure the safety of the women and girls; implementation of a SEA/SK-free work environment at the project site in; measures for preventing gender-based discrimination and violation; Any type of sexual harassment shall be dealt strictly with as per local law of the country; Code of conduct (CoC) will be rolled out which need to be signed by the worker; Staff shall be encouraged to report suspected or actual GBV or SEA/SK incidences; Grievance redress mechanism is suggested to be established at the site to address the issues immediately.

8. LABOR MANAGEMENT PROCEDURE

xxiv. The Labor-Management Procedure (LMP) has been prepared to ensure that the project complies with the Bangladesh Labor Act of 2006, as well as the World Bank's Environmental and Social Framework (ESF),

and Environmental and Social Standard (ESS). The whole process of hiring and recruitment will be conducted considering the standard procedure of relevant rules and regulations (national and international) as well as rolling out of code of conduct for workers.

xxv. The contractor will follow the CoC/LMP for employment, remuneration, leaves, holidays, housekeeping, facilities e.g., lodging, drinking water supply, sanitation, and waste disposal, supply of fuel/cooking gas, firefighting, medical services, etc.

9. EMERGENCY RESPONSE AND DISASTER MANAGEMENT PLAN

xxvi. To prevent untoward incidents/accidents due to construction activities, an Emergency Response and Disaster Management Plan is presented to manage the emergency and crises arising from the construction activities. The ESMP will be included in the contractor bidding document to implement the mitigation measures as a mandatory requirement to comply by the contractor.

xxvii. It is suggested in the ESMP, that the contractor will engage a Safety specialist. The contractor must formulate a Site Emergency Response Team (SERT) wherein senior management of the level of Project Management and Deputy Project Management besides others will be there to deal with the emergency depending upon the severity.

xxviii. Any emergency must be reported immediately to CSC and PIU to address the situation at the district level or national level if required. It is also advised that the contractor must maintain up-to-date information on local authorities, nursing homes/clinics or hospitals or ambulances.

10. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

xxix. An updated environmental and social management plan (ESMP) is devised for the sustainable development of the project. It is prepared for Design/preconstruction, Construction, and Operation/Post-construction phases.

xxx. A matrix suggesting mitigation measures for different construction activities along with the implementation agency and the responsible agency has been presented in the ESMP. It includes institutional agreement, capacity building measures; tree and shrubs plantation; environmental checklists for environmental monitoring; reporting procedures, and budgetary cost estimates.

xxxi. Environmental monitoring of vital environmental pollutants such as ambient air quality, ambient air concerning noise, soils, and sediments, and vibration has been suggested in the updated ESMP. In addition to this, a provision is made that the contractor will purchase portable environmental monitoring equipment for each contract as an obligatory requirement of ESMP for random monitoring by PIU and CSC. This equipment will keep at PIU.

xxxii. The cost of the construction phase environmental management plan has been worked out to be BDT27,700,000, BDT29,718,000, and BDT22,150,000 for Contract-1, Contract-2, and Contract-3 respectively. The operation phase EMP budgetary cost is estimated to be BDT5,820.

1 INTRODUCTION

1.1 PROJECT BACKGROUND

1. Bangladesh is one most populous and densely populated countries¹ in the world having an estimated population of 167 million in 2019 with a geographical area of about 144,415 km². The country is vulnerable to floods, and tropical cyclones. The per capita income of the country is reported to be well above the middle-income countries threshold which it crossed in the financial year (FY) 2014.



Figure 1-1: WeCARE Program Road Network

2. Road transport is the prevalent mode of transport in Bangladesh. The country has also made great advances in developing an extensive transport system, particularly road transport. About 70% of passenger traffic and 60% of freight is there on road transport. The total road network size of the country is roughly 375,000 km (road density of roughly 250 km per 100 km²). The primary road network² is congested and in poor condition, operating at or near maximum capacity, and is unable to keep up with rapidly increasing demand. The average speed on the primary network is less than 30 km/hour².

3. However, the country has made tremendous progress in improving connectivity, particularly at the sub-national levels but still needs considerable investment for improving, upgrading, and maintaining the current road network.

4. Previous assessments of the road sector show that the road network in Bangladesh needs considerable investments for upgrading and maintaining the current primary road network which is congested and unable to keep up with rapidly increasing future traffic demand because it is already operating at its maximum capacity. This is one of the reasons for the high logistic costs and constraining the country to play a more active role in regional integration through its strategic geographical location.

5. The Western Economic Corridor & Regional Enhancement (WeCare) program is to provide efficient, safe, and resilient connectivity along a section of a regional transport corridor in western Bangladesh and strengthen road sector management (Figure 1-1). It is a ten (10) yearlong initiative have four phases and will cover ten (10) districts.

6. The WeCare program will have the following five (5) components.

- Upgrading National Highway Corridor and Enhancing Digital Connectivity

¹ Project Information Document (PID), Concept Stage | Date Prepared/Updated: 06-Jun-2019 | Report No: PIDC26456

² Project Appraisal Document, WeCARE, PAD3635, The World Bank

- ▶ Upgrading Rural Roads and Enhancing
- ▶ Digital Connectivity Developing Complementary Logistics Infrastructure and Services
- ▶ Improving Road Sector Management and Institutional Capacity
- ▶ Contingent Emergency Response

7. Under this program, upgrading and improvement of National Highways along with utilities for improved digital connectivity, and development of complementary infrastructure, and services will also be taken up. The primary road network is congested, operating near full capacity, and is unable to meet future traffic.

8. The program will support the Roads and Highways Department (RHD) as well as the Local Government Engineering Department (LEGD) in upgrading 260km of National Highways.

9. The World Bank is financing the Government of Bangladesh (GoB) to improve the present road condition of the Jhenaidah to Jashore. The total length of the road is approximately 48.7 km which starts at Jhenaidah Bus Terminal and ends at Chachra Circle. This road is connecting Natore, Pabna, and Kushtia districts to Jashore, Khulna, and Satkhira districts. The road will be constructed in Phase 1. The development of the Jashore – Jhenaidah national highway will be from a two-lane single-carriageway to a climate-resilient four-lane dual carriage. The phase-1 includes:

- ▶ Separate service road for slow-moving vehicles and vulnerable users on both the sides of the carriageway
- ▶ Installation of Optical Fiber Cable (OFC), Safe Corridor Demonstration Program (SCDP), and deployment of ITS.
- ▶ It will also finance the upgrading of priority Upazila, Union, and village roads and complementary logistics infrastructure at rural markets (commonly referred to as growth centers) in the four (4) Program Districts of Jashore, Jhenaidah, Magura, and Chuadanga.
- ▶ Pieces of training/capacity building activities;
- ▶ Establishing a Road Transport Sector Integration and Coordination Platform (RTSICP) and operationalizing the Road Maintenance Fund Board Act

10. It is expected that this phase will provide job opportunities through labor-intensive civil works and meet the requirement of the “Pandemic Response Plan” in this Covid-19 crisis (Ref. Page 3 of the ToR and Annex 1-1).

1.2 NEED OF THE PROJECT

11. Road transport is the prevalent mode of transport in Bangladesh. The country has also made great advances in developing an extensive transport system, particularly road transport. About 70% of passenger traffic and 60% of freight is there on road transport. The total road network size of the country is roughly 375,000 km (road density of roughly 250 km per 100 km²). However, the country has made tremendous progress in improving connectivity, particularly at the sub-national levels but still needs considerable investment for improving, upgrading, and maintaining the current road network.

12. WeCare program will support the RHD and LEGD to upgrade the 260Km of the national highway from a two-lane single carriageway to four lanes divided carriageway. The World Bank is financing the Government of Bangladesh (GoB) to improve the present road condition of the Jhenaidah to Jashore. The total length of the road is approximately 48.7 km which starts at Jhenaidah Bus Terminal and ends at Chachra Circle. This road is connecting Natore, Pabna, and Kushtia districts to Jashore, Khulna, and Satkhira districts. The index map of the road project is presented in Figure 1-2.



- ▶ Separate service road for slow-moving vehicles and vulnerable users on both the sides of the carriageway
- ▶ Installation of Optical Fiber Cable (OFC), Safe Corridor Demonstration Program (SCDP), and deployment

of ITS.

- ▶ It will also finance the upgrading of priority Upazila, Union, and village roads and complementary logistics infrastructure at rural markets (commonly referred to as growth centers) in the four (4) Program Districts of Jashore, Jhenaidah, Magura, and Chuadanga.
- ▶ Training/capacity building activities;
- ▶ Establishing a Road Transport Sector Integration and Coordination Platform (RTSICP) and operationalizing Road Maintenance;
- ▶ Fund Board Act

1.3 OBJECTIVE AND SCOPE OF THE STUDY

14. The project is likely to cause adverse environmental & social risks and impacts in terms of loss of mature trees along the Right of Way (RoW); health and safety of workers and communities; acquisition of private lands for the up-gradation and expansion of road networks and related utilities, partial or full impacts on structures such as houses, mosques, temples, graves, and madrasas. Considering these adverse impacts, the project has been categorized as high-risk. Both RHD and LGED will need to develop Environmental and Social Impact Assessments (ESIAs), Environmental and Social Management Plans (ESMPs), and Resettlement Action Plans (RAPs) for their respective infrastructure components.

15. An Environmental and Social Impact Assessment (ESIA) for the Jashore – Jhenaidah section of the corridor was prepared as part of the formulation of the WeCARE program in 2019 (prior Appraisal) that was built on an EIA developed in 2015 with ADB assistance. This ESIA now needs to be updated. Accordingly, RHD engaged STUP consultant and BCL (JV) for updating the existing ESIA and ESMP for the proposed development of the Jhenaidah to Jashore road stretch.

16. The objective and the scope of work are as follows:

- ▶ Update the risks and impacts identified in the ESIA during the preparation phase and identify any additional E&S risks and impacts associated with the identified project investments that may not have been identified during preparation.
- ▶ Update the environmental and social screening of the project's ESIA if required based on the final alignment that is part of the three-contract based on the final design specifications;
- ▶ Undertake additional stakeholder consultations to cover groups/ communities/ stakeholders not covered during the initial assessment or engagement, to elicit their views and suggestions on actions and measures for inclusion in the ESMP;
- ▶ Finalize the ESMP based on the risk-mitigation hierarchy addressing site-specific risks and impacts;
- ▶ Update the implementation and monitoring arrangements proposed in the earlier ESMP, including the project-specific grievance redress mechanisms, capacity building measures within the implementing agency (RHD) to effectively handle E&S risks, and revised budgetary estimates for implementing the ESMP, based on the new assessment.
- ▶ Update the ESIA to reflect the new/additional impacts brought forward by the pandemic (Covid-19) and update relevant mitigation measures
- ▶ Update the stakeholder engagement and disclosure-related sections of the ESIA to reflect limitations arising from pandemic (COVID-19) circumstances

1.4 THE PROJECT PROPONENT

17. The road and Highways Department (RHD) of the Ministry of Roads, Highways, and Bridges is responsible for the construction and maintenance of major roads network, including national highways, regional highways, and district roads. As an implementing agency of the WeCARE, RHD is responsible for the environmental and social assessments (ESAs), and the formulation and implementation of the proposed updated environmental and social management plan (ESMP) for this road project. The address of the project proponent is as follows:

Project Director,

WeCARE

Roads and Highways Department (RHD)

Allen Bari Tejgaon,

Dhaka-1215.

1.5 STRUCTURE OF THE REPORT

18. The updated ESIA currently includes:

- ▶ Section 1: Introduction
- ▶ Section 2: Regulatory Framework, Standards, and Guidelines
- ▶ Section 3: Project Description
- ▶ Section 4: Analysis of Alternatives
- ▶ Section 5 Environmental and Social Baseline
- ▶ Section 6: Stakeholder Engagement and Information Disclosure
- ▶ Section 7: Environmental and Social Impacts and Risks
- ▶ Section 8: Labor Management Procedure During Construction
- ▶ Section 9: Emergency Response and Disaster Management Plan
- ▶ Section 10: Environmental and Social Management Plan

2 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 INTRODUCTION

19. This section describes a review of existing policies, laws, and administrative frameworks applicable to the Jhenaidah and Jashore road project. Relevant environmental and social safeguards policies of the World Bank are also presented in herein this section. Table 2-1 summarizes the existing policies/acts/rules.

Table 2-1: Existing Policy/Acts/Rules

Sl. No.	Policy/Acts/Rules	Key Provisions and Purpose	Applicability to Project Road
1.	National Environmental Policy, 1992 (Amendment 2018)	This policy has been formulated based on the National Environmental Policy 1992 aimed to achieve Sustainable Development Goals (SDGs). The main consideration of this policy is to ensure sustainable development reducing the dependency of human on nature resources. A total of 19 sectors has been considered in this policy including environment, water, agriculture, water resources dev	Regarding the transport sector, the environmental policy aims at prevention of pollution and degradation of resources caused by roads and inland waterways transport.
2. s	National Environmental Management Action Plan (NEMAP), 1995	The NEMAP was developed with the following objectives: to identify key environmental issues affecting Bangladesh. to identify actions to halt or reduce the rate of environmental degradation. to improve management of the natural environment. to conserve and protect habitats and biodiversity. to promote sustainable development; and to improve the quality of life.	The plan proposes development and application of guidelines to avoid environmental pollution due to transport and communication system. It particularly puts emphasis on different environmental pollution, hamper of natural drainage pattern and agricultural land acquisition due to development of transport system
3.	Environmental Conservation Act (ECA), 1995(Amended in 2000, 2002 & 2010)	The main objectives of ECA are: Conservation and improvement of the environment; and Control and mitigation of pollution of the environment. 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.	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 from the Director General.
4.	The Water Act, 2013	The Act recognizes the significance for managing all forms of water resources in the context of natural flow of surface water and recharge of groundwater. The private landowners will be able to use the surface water inside their property for all purposes in accordance with the Act. No individuals or organizations will be allowed to extract, distribute, use, develop, protect, and conserve water resources, nor will they be allowed to build any structure that would impede the natural flow of rivers and creeks.	To regulate the water quality during construction phase
5.	Environment Conservation Rules, 1997	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	In accordance with the Environment Conservation Rules (ECR) of 1997, the Project is

Table 2-1: Existing Policy/Acts/Rules

Sl. No.	Policy/Acts/Rules	Key Provisions and Purpose	Applicability to Project Road
	(Amended in 2002)	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.	classified as a Red Category, requiring a complete Environmental and Social Impact Assessment (ESIA) for RHD to obtain clearance for construction
6.	Environmental Courts Act, 2000	This Act sets out policy for effective pursuance and completion of legal proceedings related to environmental crimes. Under this Act the Director General of the DoE has the power to impose heavy penalties to industrial polluters who are dumping untreated wastewater into the environment or not operating their legally mandated ETPs.	According to this act, government can take legal actions if any environmental problem occurs due to project interventions.
7.	National Land Transport Policy	The objectives of this policy are: To introduce long-term network planning. To maintain the road network at a level, this protects the value of the investment. To secure a sustainable means of funding road maintenance. To improve the management of traffic. Management of road-side activities. To develop an integrated planning approach in road construction. To involve the private sector more in infrastructure, services, and maintenance. To well protect the environment from road construction program.	According to the policy, all new roads, and major improvements, tolled or otherwise, are subjected to an Environmental and Social Impact Assessment (ESIA).
8.	RHD's Road Master Plan	The objectives of RHD's road master plan are: Protecting the value of RHD's road and bridge assets Improving the connectivity of the road network Enhancing and developing the strategic road network to meet economic and traffic growth targets Improving the zila road network to enhance connectivity to the country's growth targets Improving road safety to reduce road accidents Provide environmental and social protection Outline the institution improvements required for RHD	According to the plan, the physical and social environment must be protected from adverse effects of road construction
9.	Water Reservoir Conservation Act 2000	Water Reservoir Conservation Act 2000 suffers from loopholes and inadequacies regarding protection of water bodies. Section 1 of this Act suggests that it has application on the water bodies of the cities, divisional and district towns, and municipalities. The water bodies in the rural areas are outside the jurisdiction of this Act	The Act specifies the fine and imprisonment term for violation of any of its provisions, it does not direct the government to recover the original characteristics of the water bodies if someone fills them up.
10.	The Forest Act (1927) and the Forest (Amendment) Act (2000)	It is the main legislative context for forestry protection and management in Bangladesh. It was enacted to control trespass, illegal resources extraction from forests and to provide a framework for the forestry revenue collection system	The act is relevant to the project as construction of the project road will require cutting which belong to the forest department.
11.	National Forest Policy (amendment), 1994	The policy is designed to conserve the existing forest areas, bring about 20% of the country's land area under the Forestation Program and increase reserve forests by 10 percent per year to 2015.	The Act is relevant to the project as construction of the project road will require cutting of forest trees.
12.	The Private Forests Ordinance, 1959	An Ordinance to provide for the conservation of private forests and for the afforestation in certain cases of waste lands in Bangladesh.	According to the section 61 of this ordinance any land is required for any of the purposes of this Ordinance; such land shall be deemed to be needed for a public purpose.
13.	Bangladesh Wildlife (Conservation & Security) Act, 2012 (previously	This Act protects 1,307 species of plants and animals under four schedules that mandates imprisonment and fines for wildlife poaching, capturing, trapping, and trading.	This Act is relevant to the project as intervention may affect wildlife habitation, obstruct movement.

Table 2-1: Existing Policy/Acts/Rules

Sl. No.	Policy/Acts/Rules	Key Provisions and Purpose	Applicability to Project Road
	known as Bangladesh Wildlife (Preservation) Order, 1973; amended as Bangladesh wildlife (Preservation) Act 1974)		
14.	National Water Policy, 1999	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.	Measures must be taken to minimize disruption to the natural aquatic environment in streams and water channels (Clause 4.9b).
15.	National Fisheries Policy, 1998	National Fisheries Policy focuses on aquaculture and marine fisheries development. The policy suggests, among others, that biodiversity will be maintained in all- natural water bodies and in marine environment and control measures will be taken against activities that have a negative impact on fisheries, resources and vice-versa.	The project required to take proper action to prevent any hindrance of biodiversity in all-natural water bodies and in aquatic environment.
16.	Protection and Conservation of Fish Act 1950 (Amended 1982)	This is framework legislation with rule making powers. Among others, some of these rules may prohibit the destruction of, or any attempt to destroy, fish by the poisoning of water or the depletion of fisheries by pollution, by industrial effluent or otherwise.	The project required to take proper action to prevent any hindrance of biodiversity in all-natural water bodies and in marine environment.
17.	National Agriculture Policy, 1999	This policy aims to make the nation self-sufficient in food through increasing production of all crops including cereals and ensure a dependable and secure food system for all	Adequate measures should be taken to reduce water- logging and hamper of irrigation system due to construction of the project road.
18.	National Road Design Standard	A comprehensive National Transport Policy (NTP) need be formulated to integrate different modes of transport for most efficient performance considering intermodal interactions, to develop communications network without damaging the physical environment, and to allocate resources according to conservation and environmental considerations and priorities of economic development.	This will specify the proper design required for the project road to avoid maximum damage.
19.	National Land Use Policy, 2001	The main contents of this policy are: Stopping the high conversion rate of agricultural land to nonagricultural purposes. Utilizing agro-ecological zones to determine maximum land use efficiency. Adopting measures to discourage the conversion of agricultural land for urban or development purposes. Improving the environmental sustainability of land- use practices.	The proposed project must adhere to this policy so that environmental sustainability of land-use practices is assured.
20.	The Embankment and Drainage Act, 1952	It provides provision for the construction, maintenance, management, removal and control of embankments and water courses for the better drainage of lands.	There will no dredging activities conducted during the construction period.
21.	Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009	This is a comprehensive strategy to address climate change challenges in Bangladesh. Bangladesh Climate Change Strategy and Action Plan built on and expanded the NAPA.	Relevant as the project road is vulnerable to climate change effect
22.	Constitution of the People's Republic of Bangladesh, 04	Bangladesh's Constitution defines the rights of every citizen irrespective of their ethnicity and religion where the State is responsible for the provision of Basic Necessities for the citizens	This is applicable as to ensure the health and safety of the labors and project related persons.

Table 2-1: Existing Policy/Acts/Rules

Sl. No.	Policy/Acts/Rules	Key Provisions and Purpose	Applicability to Project Road
	November 1972		
23.	The Acquisition and Requisition of Immovable Property Act 2017 (ARIPA)	It is the principal legislation governing eminent domain land acquisition in Bangladesh. The Act requires that compensation be paid for: (i) land and assets permanently acquired (including standing crops, trees, houses); and (ii) any other damages caused by such acquisition. The Act also provides for the acquisition of properties belonging to religious organizations like mosques, temples, pagodas and graveyards if they are acquired for the public interest. The Ministry of Land (MoL) is the authorized government agency to undertake the process of land acquisition. The MoL partly delegates its authority in relation to land acquisition to the Commissioner at Divisional level and to the Deputy Commissioner at the District level. The Deputy Commissioners (DC) is empowered by the MoL to process land acquisition under the Act and pay compensation to the legal owners of the acquired property. Khas (government-owned land) lands should be acquired first when a project requires both Khas and private land. If a project requires only khas land, the land will be transferred through an inter-ministerial meeting following the acquisition proposal submitted to DC or MoL. The Government of Bangladesh does not have a national policy on involuntary resettlement. The new Act of 2017 has incorporated specific provisions to address social and economic impacts that were not previously included in the 1982 land acquisition ordinance and therefore these provisions under the new law would reduce the gaps between the national legislative framework of the government and WB policies.	The nature of the civil works related to the project will entail land acquisition and subsequent economic and physical displacement. ARIPA 2017 defines the land acquisition process and contains pertinent information related to compensation payment to titleholders.
24.	Khas Land Policy 1997	In 1997, the Khas Land Settlement Policy was promulgated, authorizing khas land to be distributed for a 99 years lease period, (or for a one-year temporary lease). Khas land means government owned fallow land, where nobody has property rights. It is land which is deemed to be owned by government and available for allocation according to government priorities.	This is applicable to confirm the acquisition of khas land along the RoW. The compensation will be handed over the Govt. authority as per policy.
25.	Vested Property (Repeal) Act. 2013	The Vested Property Act (VPA), was enacted by the erstwhile Pakistan government after partition of India in 1947 for administer and manage the number of land/buildings/and other properties of those people who migrated to India. Subsequently, an Enemy Property Act, 1968 was enacted. A year after this act., Enemy Property Ordinance, 1969 was issued by the President of Pakistan which was in effect up to the Independence of Bangladesh. After independence the GOB repealed the act/ordinance and promulgated a Vested Property Act 1972 in 1974. Finally, the Government of Bangladesh passed the Vested Property Act 2011 which was amended in 2013 cancelling the Schedule B (under other's control and non-restorable).	It is to be noted that there is no such or disputed property found within the proposed ROW, during the census and Inventory of Loss (IOL) survey conducted by the consultant. Thus, Vested Property Act is not applicable to the project.
26.	Labor Related Laws (Labor Act 2006; Bangladesh Labor Rules 2015; and Occupational Health and Safety	The Mentioned Rules and Acts are comprehensive legislation and addresses three areas: Conditions of service and employment including wages and payment, the establishment of Wages Boards, employment of young people, maternity benefits, working hours and leave. Health, safety, hygiene, and welfare, and compensation	To carry out the civil works, a significant amount of labor will be required to be hired. Therefore, to safeguard the interest of the labor, host community, project authorities, contractors and other project stakeholders these laws

Table 2-1: Existing Policy/Acts/Rules

Sl. No.	Policy/Acts/Rules	Key Provisions and Purpose	Applicability to Project Road
	Policies 2013)	for injury. Trade unions and industrial relations. The law applies to all “establishments” which are defined broadly to include, shops, hotels, restaurants, factories (though these must employ more than five laborer’s), plantations, docks, transport services, construction sites, and “any premises in which laborers are employed for the purposes of carrying on any industry”. It covers contractors (and its operations at construction sites) however it is not clear if the law applies to development project organizations which are "ad hoc" and with co-terminus staff with the project. The Public Procurement Rule 2008 requires contractors to (a) take all reasonable steps to safeguard the health and safety of all workers working and other individuals authorized to work on-site; (b) to keep the site in an orderly state; and (c) to protect the environment on and off the site;(iv) to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of the Contractors methods of operation.	will be triggered. The project will ensure that the stipulations of the law are duly followed when it comes to labor related activities
27.	Community Health and Safety Related Laws	The management of community health and safety of development projects is covered under ECA and ECR. Typically, OHS measures extend to the public at construction sites. There are two components of CHS. One is the physical safety of project communities who are exposed to the project activities during construction and operation, including risks of accidents and risks of violence due to increase in crimes and cultural conflict between locals and migrant population. The other pertains to the exposure and/or increased risks of diseases by the community due to influx of people during construction and operation and due to the changes in the project area, including pollution and ecological change. The physical safety aspects are partly addressed by the OHS provisions of Labor Act. Traffic road accident is a severe issue in Bangladesh and Road safety issue have been incorporated in Some road Improvement projects.	Land acquisition and upgradation of roads is likely to cause negative impact especially those communities living close by. These laws aim to protect
28.	Cultural Heritage	The Antiques Law of 1968 law consolidates all laws relating to the preservation and protection of antiquities under the auspices of the Department of Archaeology. The law empowers the Director of the Department of Archaeology to take steps necessary for the custody, preservation and protection of the antiquity.	Project activities may lead to the unearthing of antiques or may impact cultural heritage by chance. Therefore, laws related to cultural heritage and antiques aim to protect these finds.
29.	Stakeholder Engagement and Information Disclosure.	The DoE guidelines for IEE/EIA preparation instructs the implementing agency to conduct public consultations of orange-B and red category projects. Implementing agencies usually conduct public consultations during EIA study and present the outcome in the IEE/EIA reports which they submit to the DoE for clearance. However, opportunities for the public to review the final/completed IEE/EIA report are under the discretion of the Director-General of the DoE. The DoE does not officially disclose EIA report findings publicly on their website	Stakeholder engagement is an important instrument of public policy and these regulations/laws aim to make the development project inclusive by giving voice to the communities. The anticipated civil work makes it necessary to implement stakeholder engagement.
30.	Electricity Act 2018	Relates to the supply and use of electrical energy, allows any person to secure a license to supply energy and to put down or place electrical supply lines for the transmission of energy. The Act provides that the	This Act. is applicable to the project when electricity use for construction camp, accommodation, machineries,

Table 2-1: Existing Policy/Acts/Rules

Sl. No.	Policy/Acts/Rules	Key Provisions and Purpose	Applicability to Project Road
		licensee, in the exercise of any of the powers conferred by or under this Act, will cause as little damage, detriment, and inconvenience as may be and will make full compensation for any damage, detriment, or inconvenience caused by the licensee or by anyone employed by the licensee.	vehicle, workshop, maintenance, road construction etc.
31.	Electricity Rules 2020 (Amendment 2022)	Electricity Rules has been published by ministry on November 2020 based on Clause 59 of Electricity Act 2018 (SRO 297 of Act/2020). The main observation is to provide compensation for the installation of transmission line towers to the land owners as per the applicable laws and policy	This rule is applicable for rearrangement, installation and shifting of the transmission line, tower, poles etc. along the project road.
32.	Solid Waste Management Regulations 2021	The Solid Waste Management Regulations 2021 were published in Bangladesh on December 23, 2021, under the Bangladesh Environmental Protection Act, 1995. The Regulations define the responsibilities of businesses involved in solid waste management and impose collection, recycling, and disposal obligations according to Extended Producer Responsibility (EPR) on manufacturers of non-biodegradable products such as glass, plastic, and bottles. The Regulations also include provisions for the treatment of solid waste such as composting and energy recovery. The main provisions of the Regulations are as follows- When recovering resources from waste, the principles of management that consider the waste hierarchy, such as the 3Rs, segregation, and reduction, must be followed at all stages from waste generation to final disposal; Responsibilities of waste generators, consumers, and users: Dispose of waste in accordance with the regulations of authorities including local government. Dispose of waste separately, do not dump, store, or burn waste outdoors; Responsibilities of manufacturers (*not defined) and importers of products-Collect non-biodegradable products such as glass, plastic, polyethylene, multi-layered packaging, bottles, and cans from consumers and recycle or dispose of them if appropriate; Determine work plans and implementation procedures for recycling and disposal; Ensure that EPR is properly implemented; Submit an annual report to the Department of Environment (DOE) on the amount of plastic recycled; Raise public awareness of proper waste management.	This is applicable to the project road to ensure the whole project area with zero waste pollution and also comprehensive practices for waste management as well as sourcing, separation, dumping, reuse etc. A vast number of solid wastes will be generated from the project activities and this regulation is applicable to proper management of the induced wastes.
33.	E-Waste Management Rules 2021	Under the Bangladesh Environmental Protection Act of 1995, the Department of Environment (DoE) of Bangladesh announced the Hazardous Waste (e-waste) Management Rules, 2021 on June 10, 2021. The E-waste regulation imposes duties on the producers, assemblers, collectors, marketers, and users of the items mentioned in the Schedule (home appliances, monitoring and control equipment, medical equipment, automated machines, IT and communication equipment). Additionally, the regulation establishes restrictions on the use of the 10 compounds covered by the EU RoHS Directive. Following publication, this legislation became enforceable.	The proposed project must be obliged this rule for managing the electronic wastes from the construction of the road project.

Source: Adopted from Environmental and Social Impact Assessment (ESIA) Report for Jashore-Jhenaidah Road Corridor, 2019, RHD

2.2 WORLD BANK GUIDELINES

20. Since the proposed project is being financed by the World Bank, the ESIA and ESMP required to follow the environmental and social safeguard standards. These environmental social safeguards standards and gap between WB's ESS and relevant national laws and policies are listed in Table 2-2.

Table 2-2: The World Bank's Environmental and Social Standard, Related National Laws and their Gaps on WeCARE Phase 1

World Bank ESS Standards	Objectives	Requirements	Applicability
ESS-1: Assessment and Management of Environmental and Social Risks and Impacts	Identify, assess, evaluate, and manage environment and social risks and impacts in a manner consistent with the ESF. Adopt differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable, and they are not disadvantaged in sharing development benefits and opportunities.	The types of E&S risk and impacts that should be considered in the environmental and social assessment. The use and strengthening of the Borrower's environmental and social framework for the assessment, development and implementation of World Bank financed projects where appropriate. Relevant GoB Laws/Regulation ▶ ECA 1995 ▶ ECR 1997, EIA guidelines for Industries Gaps: - The EIA screening and scoping study may not comprehensively cover all of the WB's ESS in their analysis. - Stakeholder engagement is carried out during the EIA. However, the nature of the stakeholder engagement is limited in scope. The EIA report is also not publicly disclosed as required in ESS. - The EIA framework doesn't require the analysis of alternatives	▶ Yes, the existing ESIA and ESMP prepared in 2019 has been updated. ▶ The ESS1 is applicable to all associated facilities.³
ESS-2: Labor-and-Working-Conditions	Promote safety and health at work. Promote the fair treatment, non-discrimination, and equal opportunity of project workers. Protect project workers, with particular emphasis on vulnerable workers. Prevent the use of all forms of forced labor and child labor. Support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law. Provide project workers with accessible means to raise workplace concerns.	Requirements for the Borrower to prepare and adopt labor management procedures. Provisions on the treatment of direct, contracted, community, and primary supply workers, and government civil servants. Requirements on terms and conditions of work, non-discrimination and equal opportunity and workers organizations. Provisions on child labor and forced labor. Requirements on occupational health and safety, in keeping with the World Bank Group's Environmental, Health, and Safety Guidelines (EHSG). Relevant GoB Laws/Regulation ▶ Labor Act 2006 (Amendment 2013) ▶ Occupational Health and Safety Policy 2013 ▶ Public Procurement Rule 2008	Project will be hiring the following types of workers: 1. Direct workers will include the project managers and supervisors, who are employees of RHD; ii) All the work force deployed by the Contractors and the Project Management Consultant (for all contracts) under the RHD will be deemed to be contracted workers. The Contractor(s) might further engage multiple subcontractors; iii) Influx of migrant labor from other districts for construction works is a norm in this district and is likely to

³ Note: Associated Facilities will meet the requirements of the ESSs, to the extent that the Borrower has control or influence over such Associated Facilities.

		Gaps: - The labor act does not make it mandatory for development interventions to be assessed and reviewed in terms of labor and working conditions, including OHS before approval. - The labor act does not require development projects to prepare labor management plans / procedure or OHS Plan.	- continue in this project; - A labor management procedure will be prepared to regulate working condition and management of workers relation including worker specific GRM, terms and conditions of employment, non-discrimination, and equal opportunity, GBV, protection of workforce, the prohibition of child /forced labor and provision of OHS.
ESS-3: Resource-Efficiency-and-Pollution-Prevention-and-Management	Promote the sustainable use of resources, including energy, water, and raw materials. Avoid or minimize adverse impacts on human health and the environment caused by pollution from project activities. Avoid or minimize project-related emissions of short and long-lived climate pollutants. Avoid or minimize generation of hazardous and non-hazardous waste. Minimize and manage the risks and impacts associated with pesticide use. Requires technically and financially feasible measures to improve efficient consumption of energy, water, and raw materials, and introduces specific requirements for water efficiency where a project has high water demand.	Requires an estimate of gross greenhouse gas emissions resulting from project (unless minor), where technically and financially feasible. Requirements on management of wastes, chemical and hazardous materials, and contains provisions to address historical pollution. ESS-3 refers to national law and Good International Industry Practice, in the first instance the World Bank Groups' EHSGs. Gaps: - The majority of ESS-3 requirements are addressed by existing regulations and indirectly for resource efficiency and climate change aspects. - Existing energy and water conservation policies, laws and regulations do not require development projects to assess resource efficiency issues and incorporate resource efficiency measures in their ES risk management plans	With respect to Resource Efficiency, the project preparation and the ESIA process will identify feasible measures for efficient (a) energy use; (b) water usage and management to minimize water usage during construction, conservation measures to offset total construction water demand and maintain balance for demand of water resources; and (c) raw materials use by exploring use of local materials, recycled aggregates, use of innovative technology so as to minimize project's footprints on finite natural resources. With respect to Pollution Management, based on past road project experiences, the project will develop, as part of the ESIA process, prevention and management measures to offset risks and impacts of pollution from potential sources such as dust and emission from operation of hot-mix and batching plants, crushers, construction and haulage vehicles, material and spoil stockpile; effluents and wastewater from labor camps, construction camp; spillage or leakage during handling of chemical admixtures, hazardous materials like bitumen, high strength diesel, used oil,

			battery wastes etc.; and disposal of non-hazardous wastes (municipal wastes) generated during project implementation period.
ESS-4: Community-Health-and-Safety	Anticipate or avoid adverse impacts on the health and safety of project-affected communities during project life-cycle from routine and non-routine circumstances. Promote quality, safety, and climate change considerations in infrastructure design and construction, including dams. Avoid or minimize community exposure to project-related traffic and road safety risks, diseases and hazardous materials. Have in place effective measures to address emergency events. Ensure that safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.	Requirements on infrastructure, considering safety and climate change, and applying the concept of universal access, where technically and financially feasible. Requirements on traffic and road safety, including road safety assessments and monitoring. Addresses risks arising from impacts on provisioning and regulating ecosystem service. Measures to avoid or minimize the risk of water-related, communicable, and non-communicable diseases. Requirements to assess risks associated with security personnel, and review and report unlawful and abusive acts to relevant authorities. GoB Laws and Regulation - National Road Transport Act - ECR 1997 - BLA 2006 - Public Procurement Rule, 2008 - Water Act 2013 Gaps: - While other acts cover for all of ESS-4 requirements, gaps exist for Community- community exposure to health issues. - The gaps are addressed through suitable provisions in ESMP and contractor obligation as part of C-ESMP for Community health and safety include need for OHS plan, influx management plan, workers camp management plan, traffic and road safety management Plan. - Covered under ESIA but the systems do not provide clear requirements for the development project and implementation.	In the project corridor there is likely to be, road excavation, use of vibratory equipment, construction debris handling and disposal etc. during construction; ii) high likelihood of direct exposure to increased construction related traffic and equipment especially at road sections traversing settlement area with limited carriageway/roadway width, and sensitive receptors such as schools, religious place, health center/hospitals; iii) high dust levels from earthworks, high noise and emission level from traffic congestion and idling of vehicles; and iv) influx of migrant workers could potentially cause local discomfort or potential conflicts with local people. The gaps between GoB regulations and ESS-4 will be addressed through suitable provisions in the ESMP and contractor's obligation as part of the Contractor's ESMP for CHS. This should also include OHS plan, influx management plan, workers camp management plan, traffic and road safety management plan.
ESS-5: Land-Acquisition-Restrictions-on-Land-Use- and-Involuntary-	Avoid or minimize involuntary resettlement by exploring project design alternatives. Avoid forced eviction. Mitigate unavoidable adverse impacts from land acquisition or restrictions on land use by providing compensation at replacement cost and	Applies to permanent or temporary physical and economic displacement resulting from different types of land acquisition and restrictions on access. Does not apply to voluntary market transactions, except where these affects third parties. Provides criteria for "voluntary" land donations, sale of community land,	Land will be required for widening, upgradation works in identified corridors and possibly for rehabilitation corridor works, curve/geometric improvements, blind spots, etc. Hence impacts on land,

Resettlement	assisting displaced persons in their efforts to improve, or at least restore, livelihoods and living standards to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher. Improve living conditions of poor or vulnerable persons who are physically displaced, through provision of adequate housing, access to services and facilities, and security of tenure. Conceive and execute resettlement activities as sustainable development programs.	and parties obtaining income from illegal rentals. Prohibits forced eviction (removal against the will of affected people, without legal and other protection including all applicable procedures and principles in ESS5). Requires that acquisition of land and assets is initiated only after payment of compensation and resettlement has occurred. Requires community engagement and consultation, disclosure of information and a grievance mechanism. GoB Laws and regulation Acquisition and Requisition of Immovable Property Act, 2017 Gaps: - Preparation of SIA and RAP not required. - Does not provide compensation or assistance to those who are none-title holders. - Does not have provisions to include transitional allowances for the restoration of livelihoods for informal settlers focused on cash compensation which may be viewed as a short-term strategy, however involuntary resettlement can cause long term impacts. ARIPA does not include sustainable or inclusive developmental objectives. - No special provisions specific groups such as the vulnerable groups of the population. - Valuation of lost asset is not based on replacement cost principle.	private and community owned assets including structures, trees and crops within existing and proposed ROW is likely. Physical and economic displacement too is very likely. I) Important gaps (between ESS and GoB policy) exist in terms of determination of compensation, identification of non-titleholders, cut-off dates for non-title holders and valuation of structures with depreciation. These gaps, along with other short- and long-term measures will be included in the RAP.
ESS-6: Biodiversity-Conservation and Sustainable Management of Living Natural Resources	Protect and conserve biodiversity and habitats. Apply the mitigation hierarchy and the precautionary approach in the design and implementation of projects that could have an impact on biodiversity. To promote the sustainable management of living natural resources.	Requirements for projects affecting areas that are legally protected designated for protection or regionally/internationally recognized to be of high biodiversity value. Requirements on sustainable management of living natural resources, including primary production and harvesting, distinguishing between small- scale and commercial activities. Requirements relating to primary suppliers, where a project is purchasing natural resource commodities, including food, timber, and fiber. Gaps: No equivalent requirements on: - the application of hierarchy of measures; - the preparation of Biodiversity Management Plan;	Site clearance activities for road construction will involve removal of road side vegetation and felling of trees. The biodiversity studies have indicated that entire corridor along the project road is rich in biodiversity, interspersed with invasive species. Other than the clearance of road side vegetation, road construction will also require felling of trees.

		iii. differentiated measures on types of habitats; iv. conduct of due diligence on primary suppliers.	
ESS-7: Indigenous-Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	To ensure that the development process consider full respect for affected parties' human rights, dignity, aspirations, identity, culture, and natural resource-based livelihoods. Promote sustainable development benefits and opportunities in a manner that is accessible, culturally appropriate, and inclusive. Improve project design and promote local support by establishing and maintaining an ongoing relationship based on meaningful consultation with affected parties. Obtain the Free, Prior, and Informed Consent	Applies when the Indigenous Peoples are present or have a collective attachment to the land, whether they are affected positively or negatively and regardless of economic, political, or social vulnerability. The option to use different terminologies for groups that meet the criteria set out in the Standard. The use of national screening processes, providing these meet World Bank criteria and requirements. Coverage of forest dwellers, hunter gatherers, and pastoralists and other nomadic groups. Requirements for meaningful consultation tailored to affected parties and a grievance mechanism. Requirements for a process of free, prior and informed consent in three circumstances. Gaps: No equivalent requirements on: i. coverage of IP impacts in the ESIA; ii. special treatment or differentiated approach to IPs and vulnerable groups; iii. conduct of FPIC; iv. development of IP Plan.	This ESS will identify the measures to minimize disruption of the livelihoods due to the project development. There is no Indigenous person.
ESS-8: Cultural-Heritage	Protect cultural heritage from the adverse impacts of project activities and support its preservation. Address cultural heritage as an integral aspect of sustainable development. Promote meaningful consultation with stakeholders regarding cultural heritage. Promote the equitable sharing of benefits from the use of cultural heritage.	Requires a chance finds procedure to be established. Recognition of the need to ensure peoples' continued access to culturally important sites, as well as the need for confidentiality when revealing information about cultural heritage assets that would compromise or jeopardize their safety or integrity. Requirement for fair and equitable sharing of benefits from commercial use of cultural resources. Provisions of archaeological sites and material. Gaps: No equivalent requirements on: i. the application of hierarchy of measures; ii. the development of Cultural Heritage Management Plan; iii. the development and adoption of project-specific Change Find Procedures; and iv. the engagement of cultural heritage experts.	The alignment of the project road does not have any ancient monuments and/or archaeological site(s), protected. i) If an of them (antiques/cultural heritage) are found, they need to be relocated, and provisions must be made in the RAP.
ESS-9: Financial-	Sets out how Financial Intermediaries (FI) will	Financial Intermediaries (FIs) to have an Environmental and	Not applicable

Intermediaries	assess and manage environmental and social risks and impacts associated with the subprojects it finances.	Social Management System (ESMS) - a system for identifying, assessing, managing, and monitoring the environmental and social risks and impacts of FI subprojects on an ongoing basis Gaps: Not applicable to country system. Project proponents regardless of funders are subject to the same country laws.	
ESS-10: Stakeholder-Engagement- and-Information-Disclosure	Establish a systematic approach to stakeholder engagement that helps the project proponent (RHD) to identify stakeholders and maintain a constructive relationship with them. Assess stakeholder interest and support for the project and enable stakeholders' views to be considered in project design. Promote and provide means for effective and inclusive engagement with project- affected parties throughout the project life cycle. Ensure that appropriate project information is disclosed to stakeholders in a timely, understandable, accessible, and appropriate manner.	Requires stakeholder engagement throughout the project life cycle, and preparation and implementation of a Stakeholder Engagement Plan (SEP). Requires early identification of stakeholders, both project-affected parties and other interested parties, and clarification on how effective engagement takes place. Stakeholder engagement to be conducted in a manner proportionate to the nature, scale, risks and impacts of the project, and appropriate to stakeholders' interests. GoB Laws/Regulation No Specific Policy or Legislation identified Gaps: i. The ECA/ECR does not specifically require consultation but the ESIA guidelines issued by DoE and other agencies recommends public consultations during scoping and the preparation of the ESIA. ii. There is also no provision for any stakeholder engagements during project implementation.	This is relevant to the project and RHD has prepared a stakeholder engagement plan. The project will ensure: I) Stakeholders have been/are to be consulted to the Stakeholders engagement plan. (II) Updated SEP to be followed during the implementation of the project. (III) Ensure stakeholders are well informed, have access to project documentations, which are expected to be publicly disclosed as and when available and in publicly assessable places in local languages to the people.
Gender and Gender-Based Violence	Gender and Gender-Based violence are considered a cross-cutting theme across all the World Bank's ESS and are especially relevant for Major Infrastructure Projects.	(I) Adequate measures to address gender issues and GBV including GRM have been addressed in this ESA	
<i>Source: Adopted from Environmental and Social Impact Assessment (ESIA) Report for Jashore-Jhenaidah Road Corridor, 2019, RHD</i>			

2.3 CLEARANCES/PERMISSIONS REQUIRED FOR THE PROJECT ROAD

As list in Table 2-3, the following clearances/approvals are required to be obtained during preconstruction and construction stage for development of the proposed project.

Table 2-3: List of Clearances/Approvals Required

Sl. No.	Clearances/Permissions Required	Competent Authority to Accord Clearances	Responsibility to Obtain Clearance	Remarks
A. Pre-construction Stage				
A-1	Clearances for diversion of forest land for project road construction	MoEFCC, Bangladesh	RHD	EC has been already obtained by the RHD which requires to be extended in the month of December 2022. (Mentioned in Chapter 3 and Annex 3-1)
A-2	Permission for Tree felling	Divisional Forest officer, Department of Forests	RHD	RHD has requested the Forest Department and Zilla Parishad for removal of the trees (Permission Letter Attached in Annex 2-1).
B. Construction Stage				
B-1	Establishment and Operation of construction camp sites, crusher units, hot mix plants, concrete batch mix plants, WMM plants, work force camps	Department of Environment (DoE)	Contractor	Contractor must follow the ECC requirement and ESMP requirement
B-2	Water for construction activities (Surface Water)	Bangladesh Water Development Board	Contractor	Contractor must follow the ECC requirement, national rules/regulations and ESMP requirement
B-3	Permission to Establish Construction camps	District Commissioner & Local Panchayat (s), land owners in case of private land	Contractor	Contractor must follow the ECC requirement, national rules/regulations and ESMP requirement
B-4	Extraction of Groundwater	BWDB/Directorate of Public Health Engineering	Contractor	Contractor must follow the ECC requirement, national rules/regulations and ESMP requirement
B-5	Labor License	District Labor commissioner	Contractor	Contractor must follow the ECC (Mentioned in Chapter 3 and Annex 3-1), Labor Act 2006, Bangladesh Labor Rules 2015, Occupational Health and Safety Policies 2013, Khas Land Policy 1997, and Vested Properties (Repeal) Act 1974 requirement, national rules/regulations and ESMP requirement
<i>Source: Adopted from Environmental and Social Impact Assessment (ESIA) Report for Jashore-Jhenaidah Road Corridor, 2019, RHD</i>				

2.4 NATIONAL STANDARDS

2.4.1 AMBIENT AIR QUALITY

21. The emitted polluted air from different sources makes load to the ambient environment. To maintain the quality of the ambient environment the Department of Environment, Bangladesh has standardized the ambient air quality standard in ECR, 1997 in Schedule-2. The standard values are precisely changed in the subsequent amendment in 2005 (National Ambient Air Quality Standard). The air quality standard is presented in Table 2-4.

Table 2-4: Air Quality Standard (Subsequent Amendment in 2005)

Sl. No.	Air Pollutants	Concentration ECR, 2005	Concentration Draft ECR, 2017	Average Time
1.	CO	10 mg/m ³	10 mg/m ³	3 hr.
		40 mg/m ³	40 mg/m ³	1 hr.
2.	Pb	0.5 µg/m ³	0.15 µg/m ³	Annual
3.	NO _x	100 µg/m ³	100 µg/m ³	Annual
		-	200 µg/m ³	24 hr.
4.	SPM	200 µg/m ³	-	8 hr.
5.	PM ₁₀	50 µg/m ³	50 µg/m ³	Annual
		150 µg/m ³	150 µg/m ³	24 hr.
6.	PM _{2.5}	15 µg/m ³	15 µg/m ³	Annual
		65 µg/m ³	35 µg/m ³	24 hr.
7.	O ₃	235 µg/m ³	235 µg/m ³	1 hr.
		157 µg/m ³	157 µg/m ³	8 hr.
8.	SO ₂	80 µg/m ³	80 µg/m ³	Annual
		365 µg/m ³	85 µg/m ³	24 hr.

22. The World Bank has established its standard following emission values from the WHO (World Health Organization), "WHO air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide, global updated 2005". The IFC EHS guideline for thermal power plants in 2008 stated that emissions from a single project should not contribute more than 25% of the applicable ambient air quality standard to allow additional, future sustainable development in the same airshed. The approach termed the Prevention of Significant Deterioration (PSD) Increment approach is based on allowing a specific incremental release (termed PSD increment) from each installation. The PSD increment can be viewed as the maximum relative increase in concentration (as a percentage of the ambient air quality standard) that is allowed to occur for each pollutant from each installation. The IFC standard for ambient air quality and PSD value for national ambient quality are presented below in Table 2-5 for SO₂ and NO₂.

Table 2-5: Ambient Air Quality Standard

Sl. No.	Air Pollutant	Average Period	IFC, 2008 (mg/m ³)	PSD Value for National Standard (25%) (mg/m ³)
1.	SO ₂	10 min	500	
		24 hr.	125 (IT-1)	
			50 (IT-2)	91.25
			20	
		Annual		20
2.	NO ₂	1-hr	200	
		1-Year	40	
3.	NO _x	Annual		25

Note: IT-Interim Target

23. To determine compliance, the predicted ground level concentration (based on the full cumulative analysis and existing background data) at each model receptor as compared to the applicable ambient air quality limit value or PSD increment in the region of overlap between the impact area of the proposed installation and the existing installation. If the predicted pollutant concentration increase over the baseline concentration is below the applicable increment (i.e., 25% of the AQS), and the predicted total ground-level

concentrations are below the ambient air quality standards, then the applicant has successfully demonstrated compliance IFC, 2007 standard for Particulate Matters (PM):

Particulate matter PM10 - 1-year averaging period:	70 µg/m ³	interim target 1
	50 µg/m ³	interim target 2
	30 µg/m ³	interim target 3
	20 µg/m ³	guideline
Particulate matter PM10 - 24 hr. averaging period:	150 µg/m ³	interim target 1
	100 µg/m ³	interim target 2
	75 µg/m ³	interim target 3
	50 µg/m ³	guideline
Particulate matter PM2.5 - 1-year averaging period:	35 µg/m ³	interim target 1
	25 µg/m ³	interim target 2
	15 µg/m ³	interim target 3
	10 µg/m ³	guideline
Particulate matter PM2.5 - 24 hr. averaging period:	75 µg/m ³	interim target 1
	50 µg/m ³	interim target 2
	37.5 µg/m ³	interim target 3
	25 µg/m ³	guideline

The WHO recommends the guideline values but accepts that for countries where pollution is already high the interim targets may be used.

2.4.2 GROUNDWATER QUALITY

24. According to Rule 12, Schedule-3 (B), ECR 1997, the standard for drinking water has been depicted in Table 2-6.

Table 2-6: Bangladesh Standards for Ground Water				
Sl. No.	Parameter	Unit	Analysis Method	Bangladesh Standards*
1.	Alkalinity	mg/l	Colorimetric Method	-
2.	Arsenic	mg/l	Modified Gutzeit Method	0.05
3.	Ammonia	mg/l	Nessler	0.5
4.	Aluminium	mg/l	Aluminon Method	0.2
5.	Chloride	mg/l	Mercury (II) Thiocyanate Method	150-600
6.	Chromium	mg/l	Diphenyl Carbohydrazide Method	0.05
7.	Coliform (Fecal)	N/100ml	MFM	0
8.	Coliform (Total)	N/100ml	MFM	0
9.	DO	mg/L	Do Meter	6
10.	EC	ms/cm	Hanna Combo Meter	-
11.	Fluoride	mg/l	UVS	1
12.	Hardness	mg/l	Colorimetric Method	200-500
13.	Iron	mg/l	Phenanthroline Method	0.3-1.0
14.	Lead	mg/l	AAS	0.05
15.	Manganese	mg/l	Periodate Oxidation	0.1
16.	Nitrate	mg/l	Cadmium Reduction	10
17.	Potassium	mg/l	Turbidimetric Method	12
18.	Phosphate	mg/l	Amino Acid Method	6
19.	Phosphorus	mg/l	Amino Acid Method	0
20.	pH	---	Hanna Combo Meter	6.5-8.5
21.	Salinity	ppt	Digital Salinity Meter	-
22.	Sulfate	mg/l	Turbidimetric Method	400
23.	TDS	mg/l	Hanna Combo Meter	1000
24.	Temperature	°C	Hanna Combo Meter	20-30
25.	Zinc	mg/l	Zincon Method	5

Source: Rule 12, Schedule-3, ECR.1997, Bangladesh.

2.4.3 SURFACE WATER QUALITY

25. According to Rule 12, Schedule-3 (A), ECR 1997, the standard for surface water has been depicted in Table 2-7⁴.

Table 2-7: Bangladesh Standard for Inland Surface Water

Sl. No.	Best Practice-Based Classification	Parameter			
		pH	BOD (mg/l)	DO (mg/l)	Total Coliform (N/100 ml)
1.	Source of drinking water for supply only after disinfecting	6.5-8.5	2 or less	6 or above	50 or less
2.	Water usable for recreational activity	6.5-8.5	3 or less	5 or more	200 or less
3.	Source of drinking water for supply after conventional treatment	6.5-8.5	6 or less	6 or more	5000 or less
4.	Water usable by fisheries	6.5-8.5	6 or less	5 or more	-
5.	Water usable by various process and cooling industries	6.5-8.5	10 or less	5 or more	5000 or less
6.	Water usable for irrigation	6.5-8.5	10 or less	5 or more	1000 or less

26. Surface water quality standards as per Draft ECR 2017 is presented in Table 2-8.

Table 2-8: Surface Water Quality Standard (Draft ECR 2017)

Sl. No.	Best Practice-Based Classification	Parameter			
		pH	BOD (mg/l)	DO (mg/l)	Total Coliform (N/100 ml)
1.	Source of drinking water for supply only after disinfecting	6.5-8.5	2 or less	6 or above	50 or less
2.	Water usable for recreational activity	6.5-8.5	3 or less	5 or more	200 or less
3.	Source of drinking water for supply after conventional treatment	6.5-8.5	6 or less	6 or more	5000 or less
4.	Water usable by fisheries	6.5-8.5	6 or less	5 or more	-
5.	Water usable by various process and cooling industries	6.5-8.5	10 or less	5 or more	5000 or less
6.	Water usable for irrigation	6.5-8.5	10 or less	5 or more	1000 or less

*Note: *Electrical conductivity for irrigation water - 2250 us/cm (at a temperature of 25°) Sodium less than 26%; boron less than 0.2%.*

Table 2-9: Bangladesh Standards for Sewage Discharge (ECR, 1997)

Sl. No.	Parameters	Unit	Values
1.	BOD	mg/l	40
2.	Nitrate	mg/l	250
3.	Phosphate	mg/l	35
4.	Suspended Solids (SS)	mg/l	100
5.	Temperature	oC	30
6.	Coliforms	N/100ml	1000

Table 2-10: Effluent Guideline (IFC, 2008)

Sl. No.	Parameter	Unit (mg/L) (Except pH and Temperature)
1.	pH	6-9
2.	TSS	50
3.	Oil and grease	10

⁴ Source: Rule 12, Schedule-3; Environmental Conservation Rules, 1997; DO = Dissolve Oxygen, BOD = Biological Oxygen Demand, mg/l = Milligram per Liter, pH = Negative decimal logarithm of the hydrogen ion activity in a solution; Notes: In water used for pisciculture, maximum limit of ammonia presence as Nitrogen is 1.2 mg/l.; Electrical conductivity for irrigation water – 2250 phoms/cm (at a temperature of 25°C); Sodium less than 26%; boron less than 0.2%.

Table 2-10: Effluent Guideline (IFC, 2008)

Sl. No.	Parameter	Unit (mg/L) (Except pH and Temperature)
4.	Total residual chlorine	0.2
5.	Chromium -Total (Cr)	0.5
6.	Copper (Cu)	0.5
7.	Iron (Fe)	1.0
8.	Zinc (Zn)	1.0
9.	Lead (Pb)	0.5
10.	Cadmium (Cd)	0.1
11.	Mercury (Hg)	0.005
12.	Arsenic (As)	0.5
13.	Temperature increases by thermal discharge from the cooling system.	Elevated temperature areas due to the discharge of once-through cooling water (i.e., maximum 30oC above ambient water temperature) should be minimized in the mixing zone (i.e., 100 m) by adjusting outfall design or by the project-specific EA depending on the sensitive aquatic ecosystems around the discharge point.

Table 2-11: Standard After Treated Sanitary Sewage Discharge (IFC, 2008)

Sl. No.	Pollutants	Units	Guideline Value
1.	pH	--	6-9
2.	BOD5	mg/l	30
3.	COD	mg/l	125
4.	Total nitrogen	mg/l	10
5.	Total phosphorus	mg/l	2
6.	Oil and Grease	mg/l	10
7.	Total suspended solids	mg/l	50
8.	Total coliform bacteria	N/100ml	400*

*Note: *Not applicable to centralized, municipal, wastewater treatment systems which are included in EHS Guidelines for Water and Sanitation.*

2.4.4 AMBIENT NOISE LEVEL

27. The ambient noise level standard has been modified in the amendment of ECR 2006. The level of noise from multiple sources will be limited to the following (Table 2-12) standard depending on the temporal and spatial sensitivity. The noise level standard of the IFC guideline is shown in Table 2-13.

Table 2-12: Noise Level Standard (ECR, 2006)

Sl. No.	Zone Categorization	Standard dB(A) Leq	
		Day (6:00 AM - 9:00 PM)	Night (9:00 PM - 6:00 AM)
1.	Silent Zone	50	40
2.	Residential Zone	55	45
3.	Mixed Zone	60	50
4.	Commercial Zone	70	60
5.	Industrial Zone	75	70

Table 2-13: Noise Level Guideline (IFC, 2008)

Sl. No.	Receptors	One Hour Leq (dBA)	
		Daytime (7:00-22:00)	Nighttime (22:00-7:00)
1.	Residential, Institutional, Educational	55	45
2.	Industrial, Commercial	70	70

3 DESCRIPTION OF THE PROJECT

3.1 PROJECT LOCATION

28. The proposed Jhenaidah-Jashore national highway (N7) starts at Al-Hera More, Jhenaidah Bus Stand (Kushtia-Magura Road intersection, Ch. 0+000, GPS coordinate 23°32'30.49" N, 89°11'27.28" E and end at Chachra More, Jashore city, Ch. 47+800 coordinated 23°8'41.17" N, 89°11'48.13" E. The project road passes through two Upazila Jhenaidah Sadar and Kaliganj in Jhenaidah district and one Upazila Jashore Sadar in Jashore district. Both districts are under the Khulna division. The location map of the project road is presented in Figure 3-1. The route connects with the existing N7 national highway heading in a western direction through Magura and onward to Jhenaidah before turning south to Jashore and finally south-east to Khulna. The project road corridor connected some important Upazila and local big markets such as Jhenaidah Sadar Upazila, Tetultola Bazar, Bishoykhali Bazar, Kaliganj, Barobazar, Barinagar, Jashore Cantonment and Jashore Sadar Upazila.

29. The Jashore-Jhenaidah Highway Project will be an important road network covering six districts e.g., Chuadanga, Meherpur, Magura, Kushtia, Jhenaidah and Jashore (Area of 9095.82 Km Approximately). The Upazilla of these districts will be benefited after getting upgradation of the proposed road development. It is designed for a speed of 80 km/hour. The upgradation will improve the geometrics of the existing road as well as remove the congestion due to the proposed realignment. The proposed road will be provided an efficient and time saving route for vehicle movement. The Modhumoti Bridge in Narail and Padma Bridge has been opened now and after upgrading this Jashore-Jhenaidah highway, the people of these six districts are expected to use the Jhenaidah-Jashore road to go to Narail-Bhanga highway for their comforts. This will save approximately 100 km to go Dhaka whereas avoid Doulatdia Ferry Terminal. Besides, Benapole land port in Jashore district will also be benefited that the track and lorry will avoid a day's waiting in Ferry Terminal. Moreover, these districts will be extensively benefited or influenced by economically, socially and also environmentally.

3.2 PROJECT CATEGORY

30. The current project will be upgraded from the current 2-lane highway into a 4-lane national highway with separate service lanes for the slow-moving vehicles. According to the Bangladesh Environmental Conservation Rule, 1997 this project is deemed as "Red" or 'A' category, since it belongs to Item 67 and Item 64 under Schedule -1, which requires the preparation of an Environmental Impact Assessment (EIA) and an approval of Environmental Clearance Certificate (ECC) from the Department of Environment (DoE) under the Ministry of Environmental, Forest and Climate Change. (MoEFCC) for implementation. An EIA⁵ study of the project road portion is carried under the SRTPPF of RHD funded by ADB, and the ESIA⁶ study of Jhenaidah-Jashore road also carried out funded under the World Bank based on the preliminary design prepared under SRTPPF and subsequently an ECC is approved for the project road by DoE on 09 December 2021 (Approved ECC is attached in Annex 3-1).

31. The proposed project interventions include the extensive civil works and land acquisition due to widening 2-lane National Highway into 4-lane Highways with service roads on both sides including other facilities and hence their impacts will be more significant on the social environments than the ecological impacts.

⁵ Environmental Impact Assessment, Doulatdia-Magura-Jhenaidah-Jessore-Khulna Road (N7), Sub regional Transport Project Preparatory Facility (STPPF) Project RHD, 2015

⁶ Environmental and Social Impact Assessment, Jhenaidah-Jessore Road, RHD Development Research Initiative 2019

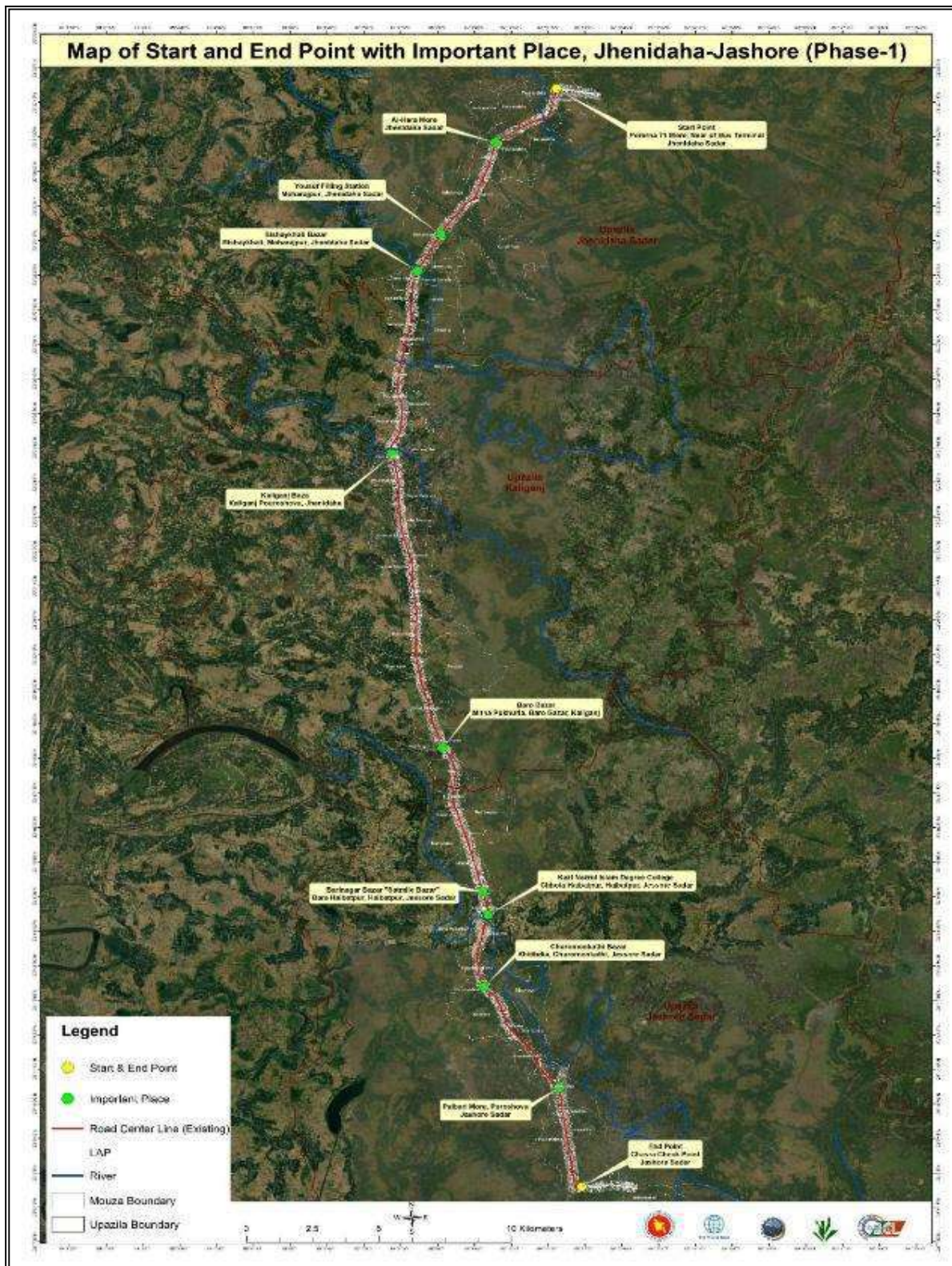


Figure 3-1: Location Map of the Jashore-Jhenaidah Road Project (Phase 1)

32. The existing RoW is between 24 to 36 m. In 2015, the engineering design of the proposed RoW for the project was considered 34.6-39 m wide depending on the nature of areas, viz., rural, urban or markets setting. However, the present Technical Design Consultant of the RHD is now considering total clear width

45m in urban area and 50m in rural areas for their proposed detailed design. Therefore, the project requires more land acquisition in both sides of the existing road than the proposed RoW was considered for preparation of previous design in 2016⁷.

33. The project alignment is outside of any legally protected area, that is the road will not pass through any notified eco-sensitive zone boundary or through any critical protected area notified by Govt of Bangladesh or in accordance to International Agreement or Convention. Any impact on biodiversity due to the proposed widening and improvement may not be anticipated in terms of impact on wildlife movement characterised by vehicular accidents during the operation of the project. Most of the adverse impacts are co-terminus with the construction stage, limited within the proposed RoW, that will be mitigated through comprehensive plantation programme, good engineering and housekeeping practices.

34. However, the updated ESIA and ESMP for the project road based on final design of project road is required for compliance of the World Bank's ESS guidelines as well as ECR and relevant environmental and land acquisition laws and regulations of Bangladesh.

3.3 EXISTING ROAD PROFILE

35. The project road has major junctions with National and Regional Highways and also connected with LGED roads, various small, semi-pucca roads originating from nearby unions and growth centers. The main mode of vehicles plying over project road are local and long distance, inter district buses, trucks, cars and motorcycles, and locally made vans, three and four wheelers slow moving vehicles, etc.

36. The road passes through mostly rural areas as well the urban and semi urban centres of Jhenaidah sadar upazila, Kaliganj upazila and reaching to Jashore city. Project corridor connected some important Upazila and local big markets such as in Jhenaidah Sadar Upazila, Tetultola Bazar, Bishoykhali Bazar, Kaliganj, Barobazar, Barinagar, Jashore Cantonment and Jashore Sadar Upazila. This corridor also carries huge traffic from Jashore through Jhenaidah to north Bengal. The alignment of the existing road is narrow and substandard designed. Currently, the width of existing road is varied approximately 7.5 to 8 meters. Traffic congestion was also observed during reconnaissance survey in different parts of the N7 highway, such as in Kaliganj, Barobazar, Bishoykhali, Barinagar & other areas. Upgrading the 2-lane highway into a four-lane highway may require an increased proposed RoW.

37. There are constrictions of the alignment in a number of urban and semi urban areas. In Kaliganj Upazila, Barobazar, Bishoykhali, Jashore Cantonment area, both commercial and residential, big or small pockets of congested semi-pucca to pucca infrastructures were observed. These include farmer's markets, mosques, temple and other religious institutions, and educational institutions. Industries like sugar and rice mill, poultry, feed and dairy farms and a power station are noticed along the N7 corridor.

38. The road is also proximate to the railway line and runs parallel about 1.0 Km with crossing two locations. In some sections, the present RoW along with its shoulders belonging to RHD is not sufficient for widening the road as per design. Therefore, a strip land acquisition will be required in both sides of entire road corridor. Land acquisition and civil works is likely to trigger involuntary physical (loss of homestead and assets) and economic displacement (loss of income, business structures) and may cause environmental degradation through loss of roadsides century old trees owned by Zila Parishad and forest department.

39. The road intersects with rivers Naboganga, Begobati, Chitra and Bhairab Rivers by four 2-lane bridges. The road crosses a few canals, and there are many ponds and ditches located at both sides of the project road. A few ponds and burrow pits within RoW are presently used for fish culture or fish stocking. There is no natural stream or wetland / low-lying areas within the proposed RoW so upgrading the 4-lane will not impact local

⁷ Detailed Engineering Design Doulatdia-Magura-Jhenaidah-Jessore-Khulna Road (N7), Sub regional Transport Project Preparatory Facility (STPPF) Project RHD, 2015

or regional hydrology. There are 53 culverts with inadequate opening and insufficient drainage system, and during the disruption of local drainage in monsoon the flooding occurs in the agricultural lands and water logging some places at urban areas.

40. No natural wetland, forest, sensitive area, archaeological sites were noticed. The existing main road intersections, major built areas alongside the RoW and cross drainages structures are provided in the following Table 3-1. According to the survey, contract wise major and minor intersection has been included where, 6 major and 33 minor intersections for Contract 1; 6 major and 27 minor intersections for Contract 2 and finally 8 major and 31 minor intersections falls in Contract 3.

Table 3-1: Existing Road Intersection, Build-Up Section and Cross Drainages Structures

Contract	Road Section (Chainage)	RoW (m)	Description of Road Intersection		Build-Up section/Town/Bazars Location Chainage (km)		Cross Drainage Structures (Nos.)	
			Location	Chainage (km)	Location	Chainage (km)	Culverts	Bridges
Contract-1	0+00–15+900	55	Alhera More Rd.	03+200	Alhera More	3+200	22	2
			Vorua Para Rd.	3+440	Vorua Para	3+440		
			Laudia Bazar	4+500	Laudia Bazar	4+500		
			Tetul Tola More	6+760	Tetul Tola Bazar	6+753		
			Khorikhali	10+140	Bishoykhali Bazar	9+180		
			Naldanga-Gariwala Rd	11+445	Amtola Bazar	10+600		
			Salavara Rd	12+915				
			Sanjay Mitro Rd.	14+144				
Contract-2	15+900–31+700	45	Kaliganj – Ganna Rd.	16+180	Kaliganj – Ganna	16+180	19	1
			Bypass Rd.	16+800	Kaliganj Bus Terminal	16+700		
			Hunger Rd.	17+900	Hunger Rd	17+900		
			Amin Electronic More	19+890	Dulal Mundia Bazar	19+900		
			Aam Bagan Jame Masjid More	21+240	Keya Bagan Bazar	22+740		
			Roghunathpur Bazar Bus Stop	24+840	Roghunathpur Bazar	24+840		
			Pirojpur Jamtala More	26+865	Barobazar	28+715		
			Barobazar – Kola Rd.	28+715	Mandar Tola bazar	31+162		
Contract-3	31+700-48+480	45	Mothurapur Notun Rasta More	32+833	Satmile Bazar	34+600	12	1
			Barinagar Bazar More	34+600	Churamonkathi Bazar	38+555		
			Churamonkathi Bus Stop	38+445	Khairtala Bazar	42+180		
			Khairtala Bazar More	42+180	Palbari More	43+400		
			Palbari More	43+400	Khairtala	43+800		
			Arabpur More	44+448	Arabpur More	44+448		
			Two Rail Crossing	46+398				
			Burhan Shah Rd Intersection	45+280				
			Ekramul Huq Sarak	46+300				

Source: Field Survey, ESMP of Jhenaidah- Jashore Road, 2022

3.4 PROPOSED UPGRADING AND IMPROVEMENT OF THE PROJECT ROAD

41. The project road improvement will mostly follow special codal provisions relevant to highways prescribed by the design code standards of Geometric Design Standard and Manual 2005 of RHD and Geometric Design of Highway and Streets of American Association of State Highway and Transportation Officials (AASHTO), 2001, Asian Highway Classification Design standards of United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), Overseas Road Note 6 “A Guide to Geometric Design” published by TRRL 1988. The improvement / upgradation of Jhenidah- Jashore Road Project road involves the following civil works:

- ▶ Widening of Jhenaidah-Jashore 2-lane national highway (N7) to 4-lane national highway configuration;
- ▶ Construction of Service lanes instead of SMVT route on both sides;
- ▶ Improved realignments at the congested areas;
- ▶ Raising embankment height, and widening of Cross drainage (CD) structures and provision of roadside drains in water logged sections in urban areas;
- ▶ Construction of widened bridges and culverts including a few new cross drainage structures;
- ▶ Construction of VOPs, POPs, ROB, and Flyover at big bazar areas and grade U-turns;
- ▶ Improvement of bus stop/bus shelter, FOBs, pedestrian crossings, rumble strips, wildlife crossings signage, footpath cum storm water drains and road intersections improvements;
- ▶ Mandatory compensatory plantations and additional plantation alongside proposed improved road
- ▶ Improved road furniture with safety provision.

42. The proposed RoW width of the project road at urban and rural areas varies according to the total available land and the proposed RoW perimeter has been designed to provide a minimum of 5 meters’ space between the outer extent of the construction works and boundary line of RoW for utility corridor. This margin will allow full access to all parts of the highway for the maintenance and emergency vehicles parking/ break down and equipment placement. No provision for borrow-pits has been considered within the RoW adopted. During road alignment design, land acquisition requirements have been kept to the minimum in consistent with design standard.

3.4.1 ROAD DESIGN

43. The road design speed is reduced where site conditions are restrictive (intersections, bridge approaches, curves, built-up sections, educational and other sensitive receptors, forest and potential wildlife crossing sections, etc.) and adequate land width is not available. In built-up sections, it is generally restricted to 20 kmph. Gradual changes will be introduced by providing successive sections of increasing/decreasing design speeds so that road users become progressively conditioned to such changes. Road safety, Speed limit and Warning signs have been proposed at intersections, bazar areas and commercial areas. The adopted geometric design criteria for the project road are shown in Table 3-2.

Table 3-2: Proposed Road Engineering Design

Sl. No.	Description	Value
1.	Speed Control	Design Speed (Km/h)
2.	Sight Distance	Stopping Sight Distance (SSD) in meter Overtaking /Passing Intermediate
3.	Horizontal Controls	Minimum Curve Radius (m) Maximum Super Elevation Minimum Transition Curve (m)
4.	Vertical Controls	Maximum Gradients Minimum K value Vertical Clearance for roadway (m) Vertical Clearance for Railway(m)
5.	Cross Section Elements	Carriageway (m)

Table 3-2: Proposed Road Engineering Design

Sl. No.	Description	Value
	for main carriageway (each side)	Cross-fall 3% Paved shoulder (m) 2.5 Soft shoulder 1.5 Central Depressed Median (m) Rural 5.0 Median Urban 1.20 Break down 2.50
6.	Cross-Section Elements for Service Road (each side)	Carriageway (m) 5.5 Service Lane in market area (m) 3% Cross fall 1.5 Verge: Width (m) & Cross-fall 5% Separator 1.20 Inner margin (m) 1.2 Footpath (m) 2.00 Utility 2.00 Embankment slope minimum H=2, V=1

Source: Technical Engineering Design, 2022

44. **Road Cross-Section:** Adopted cross section carries 4 lane carriageways (each carriageway 7.3m wide) separated by 1.2m wide Kerb median for rural, 1.0m New Jersey for urban and flanked by 1.5m paved shoulder on each side. Alongside the paved shoulders, 1.2m wide divider is proposed. In general, 0.3m shy distance/ inner margin are proposed along Kerb median, whereas 0.6m proposed for New Jersey barrier. Two different cross sections have been designed for rural and urban/market areas with different widths including Service lanes are provided for the pedestrians and mixed modal traffic. In above footpath with side drain and utility duct are also proposed. The typical road cross-sections for Rural and Urban areas of the project road are shown in Figure 3-2 to Figure 3-8. The proposed different types of structures under three contracts are presented in Figure 3-8.

45. **Service Lanes:** The existing traffic on the project road consists of different type of vehicles, such as heavy vehicles and light vehicles with fast-moving and slow-moving vehicles (SMV) as well local and long-distance vehicles. Two separate Service lanes are designed on both sides of the main road for the SMV and local traffic to achieve the optimum speed of the fast-moving vehicles, and maximize capacity and safety of the main carriageway as well to avoid traffic congestion and accidents. The Service lanes are proposed with a width 5.5m for urban/market areas and rural areas.

46. **Cross fall and Side Slopes:** A cross fall of 3% has been applied for carriageway and paved shoulder as recommended in RHD's Standard Design Manual to control heavy rainfall and easy maintenance of pavement. For the soft shoulder (1.5m) verge a cross fall of 5.0% is considered as per RHD's Standard. The embankment construction the side slope at 1V: 2H is proposed for both cut and fills section for the project road.

47. **Horizontal Alignments:** There are many several urban structures located on both sides of the project corridor. It is also noted that many temporary markets/ local bazars are set up on a regular basis in different roadside. In long densely built up in areas where the existing alignment is winding with sub-standard curves and neither existing alignment improvement, nor the flyover is technically and or economically feasible, the improved realignment has been proposed. Two improved realignments are proposed at locations for smooth movement of traffic and to avoid social disruption and resettlement as follows.

48. The existing road section from Km 0+800 to Km 0+1600 has sharp curve and requires smoothening. Thus, a realignment near Jhenaidah Bus stand from Gobindapur to Mondolpara is proposed to avoid existing urban area in Jhenaidah Sadar. This improved realignment will pass mostly on the agricultural lands and a few homesteads.

49. **Vertical Alignment:** The design level of the sub grade has been fixed with minimum 0.9 m above the Design Flood Level based on 100 years return flood. The vertical alignment of the roads has been designed for smooth transition from elevated bridge/road overpass level to the designed road level. Maximum 4.0% longitudinal gradient has been provided for the approach roads. For connecting the approaches with design road profile and bridge ends vertical curves have been inserted using minimum K values of 35. The Vertical Clearances for the roadway and for Railway are proposed 5.7 m and 8.5 m are considered, respectively.

50. **Intersections and Markets Areas:** The widening of existing 2-lane road to a 4-lane configuration is complicated at the road junctions and markets areas due limited available RoW. Proper junction will be constructed at Al Hera More and other places. The typical cross section for minor intersection is shown in Figure 3-3. In addition, the existing road alignment mostly will be widened as per proposed design with minor modifications for smoothing sharp bends and avoiding the dismantling the structures like mosques, temple, graveyards, etc. as much possible. Alignment shifting has also been done to connect proposed rail overpasses and Vehicle-Overpasses (VOP). A total five (5) VOP are designed for four (4) intersections including one (1) bazar to allow cross over movement in urban areas like market areas with wider service lane, roadside drain and footpath. The typical Road cross sectional design of VOP is in Figure 3-4.

51. To avoid public grievances on road safety issues eight (8) Pedestrian Overpass (PoP) including six (6) at intersections and two (2) bazars to facilitate the pedestrian free movement are designed. The typical Road cross sectional design of POP is in Figure 3-5. Two (2) Foot over Bridge (FOB) are proposed in the final design for the road safety of users.

52. **Flyovers at Cantonment Area:** Two Flyovers are proposed under the Contract 3. One Flyover is from 140+330 km to 142+202 km at Cantonment area is proposed, where the widening will be difficult due to costly land acquisition in Cantonment area. While to eliminate traffic congestion and the safety concern are prime requirement. Thus, construction of 700 m structure flyover will result to allow cross movement as the Cantonment area is undisturbed. Another Flyover cum Railway Over Bridge (ROB) is proposed for at Arabpur Moor for rail crossing at from 43+905 Km to 46 +942 Km. The cross-section design of Flyover is depicted in Figure 3-6.

53. The improvement Bus Stop Junction, at Jhenaidah city is considered at about 100m towards the Kushtia side. Several Bus Bye are designed at service roads and typical cross section is presented in Figure 3-7. The Entry/ Exist provision at Grade separation is proposed as shown in Figure 3-8.

Table 3-3: Proposed Structures Under Contract Contracts					
Contract No.	Road Section (Chainage)	RoW (m)	Proposed Structures		Proposed Structures
			Location	Chainage	
Contract-1	0+000-15+900	55	Intersections	02+400	POP
			Al-hera Moor	03+200	VOP
			Tetultala Bazar	05+512	VOP
			Tetultala Moor	06+760	FOB
			Naldanga –Gariwala Road	11+445	POP
			Bakulia	14+970	POP
Contract-2	15+900-31+700	45	Kaliganj	16+822	VOP
			Amin Electronic Moor	19+890	POP
			Keya Bagan Bazar	22+740	POP
			Roghunathpur	24+840	VOP
			Boro Bazar	28+715	POP
			Mandartala Bazar	24+840	POP
Contract-3	31+700-48+480	45	Satmile Bazar	34+610	POP
			Churamankathi Moor	38+445	VOP
			Cantonment Area	41+025	Flyover
			Palbari Moor	43+300	FOP
			Arabpur Moor (Two Rail Crossing)	44+448	ROP cum Flyover
				46+398	

Source: Technical Engineering Design, 2022

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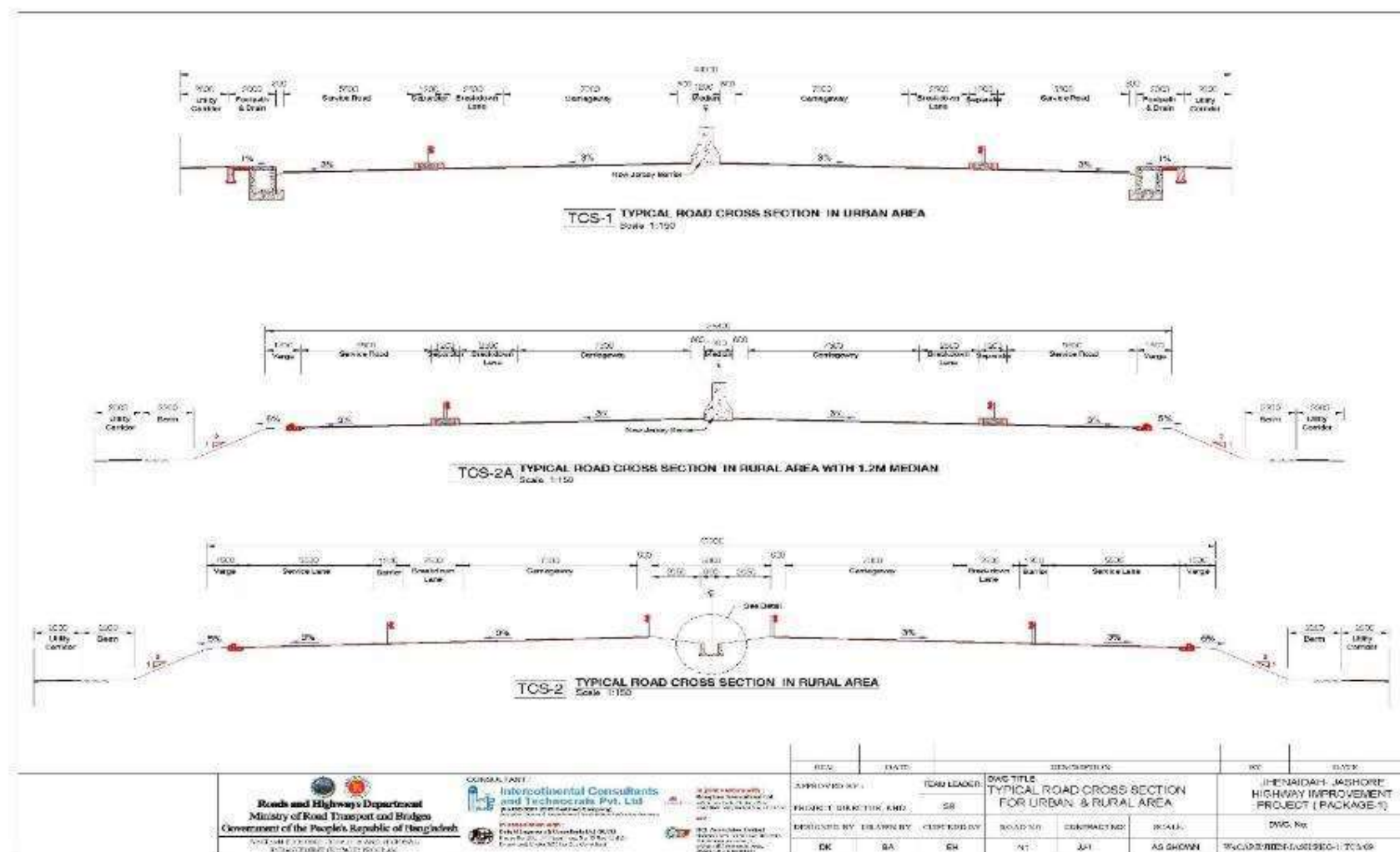


Figure 3-2: Typical Road Cross Sections at Urban and Rural Areas of the Project Road

November 2022

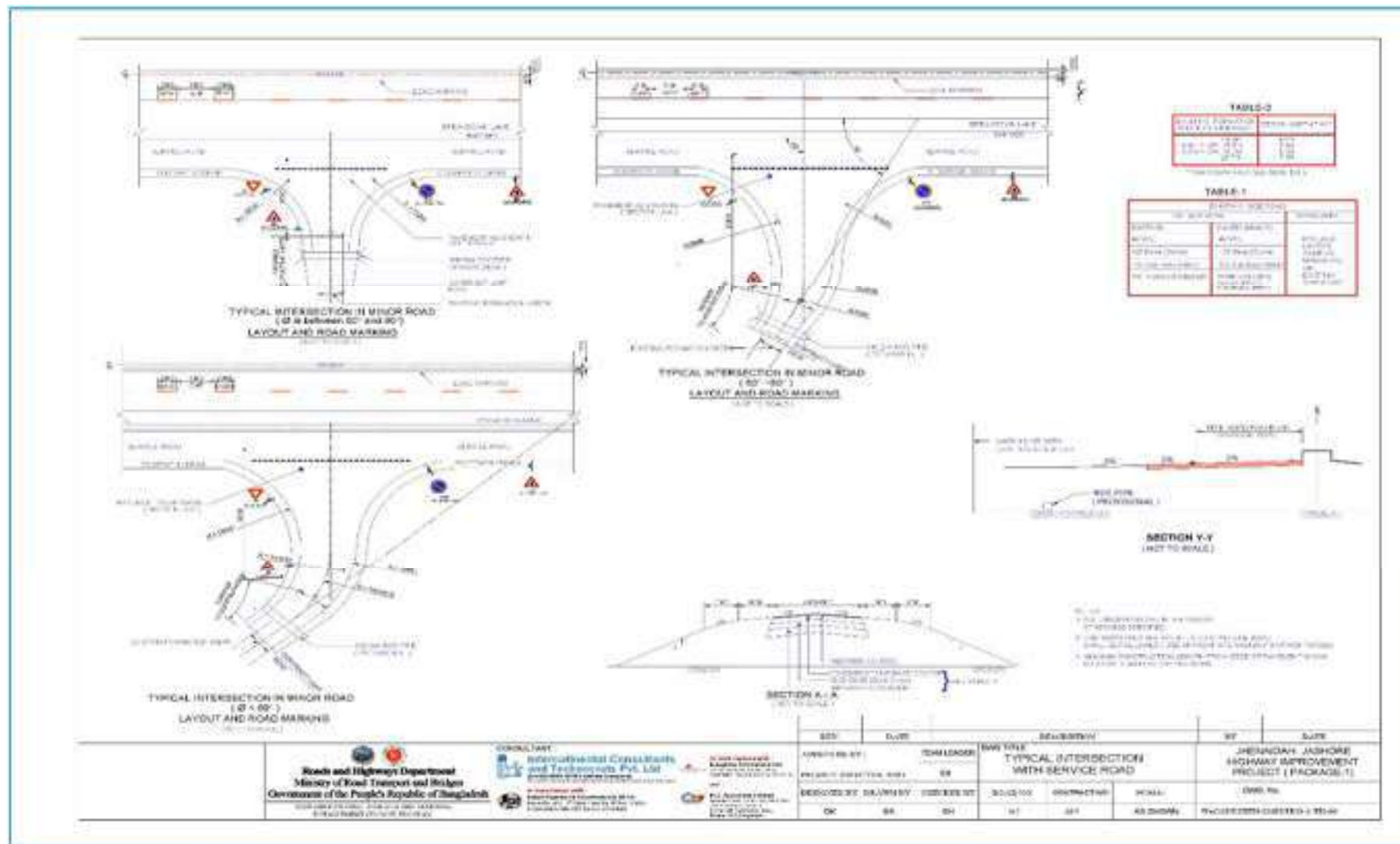


Figure 3-3: Typical Road Cross Section of Minor Road Intersection

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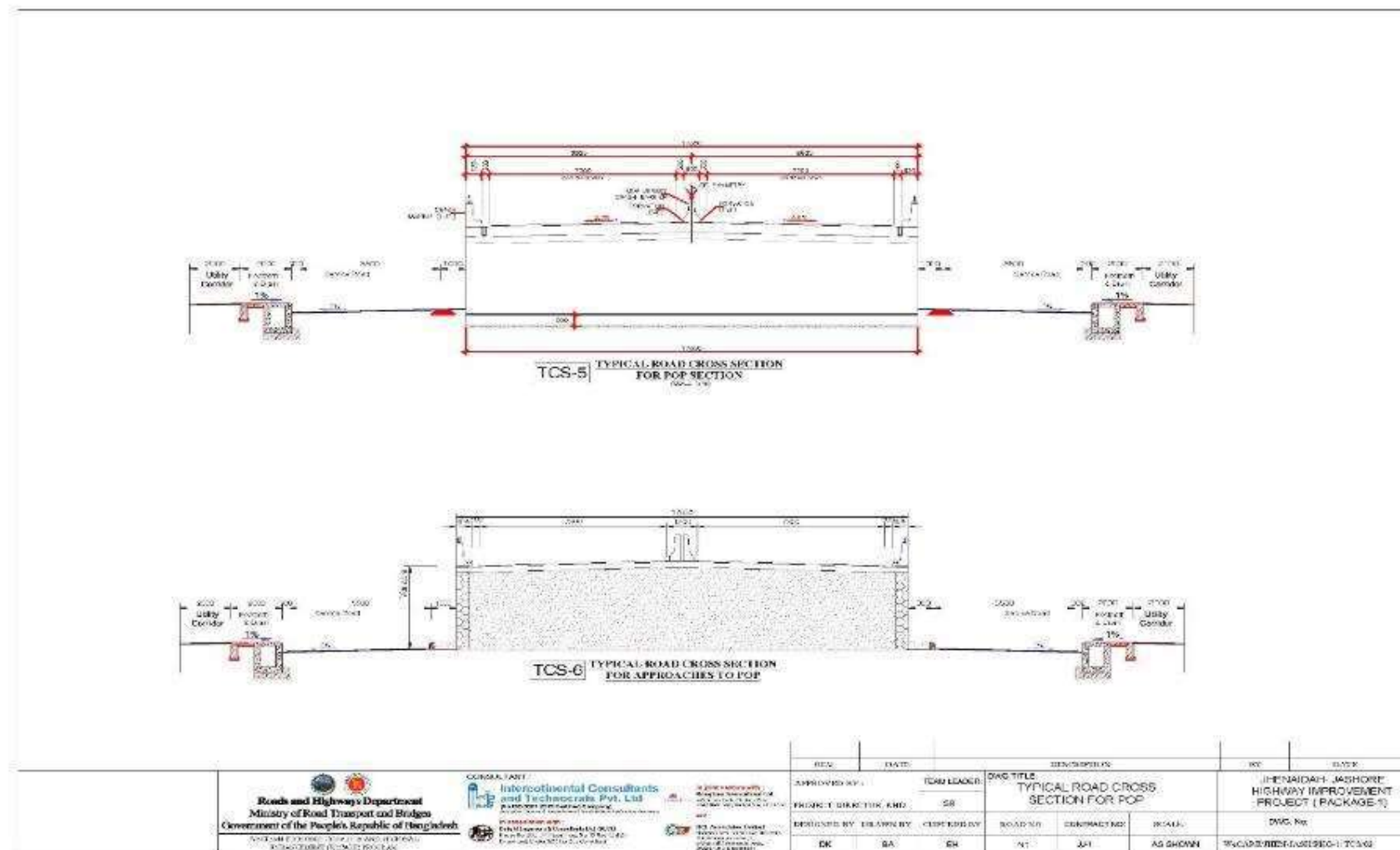


Figure 3-5: Typical Road Cross Sections of Pedestrian Overpass

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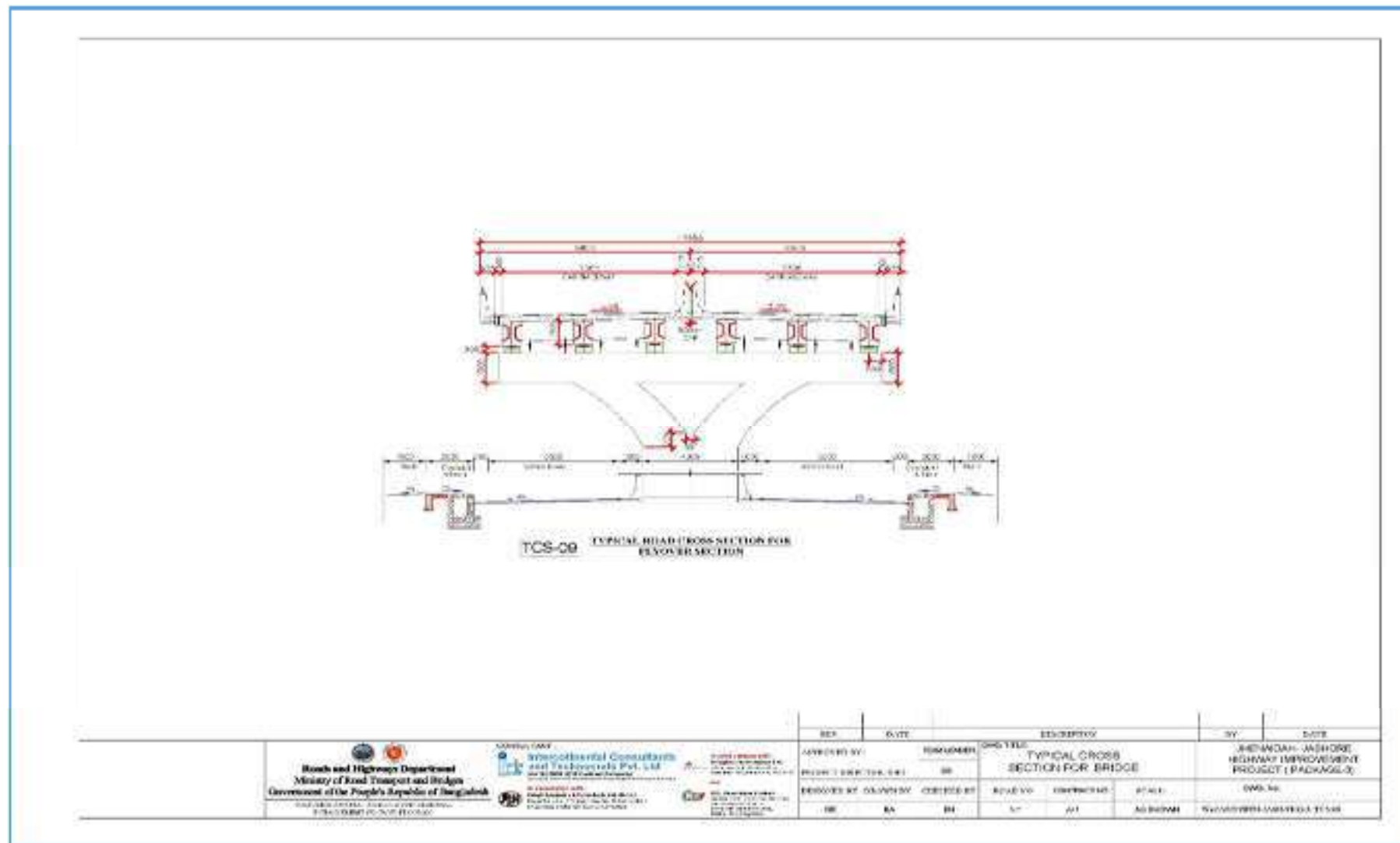


Figure 3-6: Typical Road Cross Section of Flyover Section

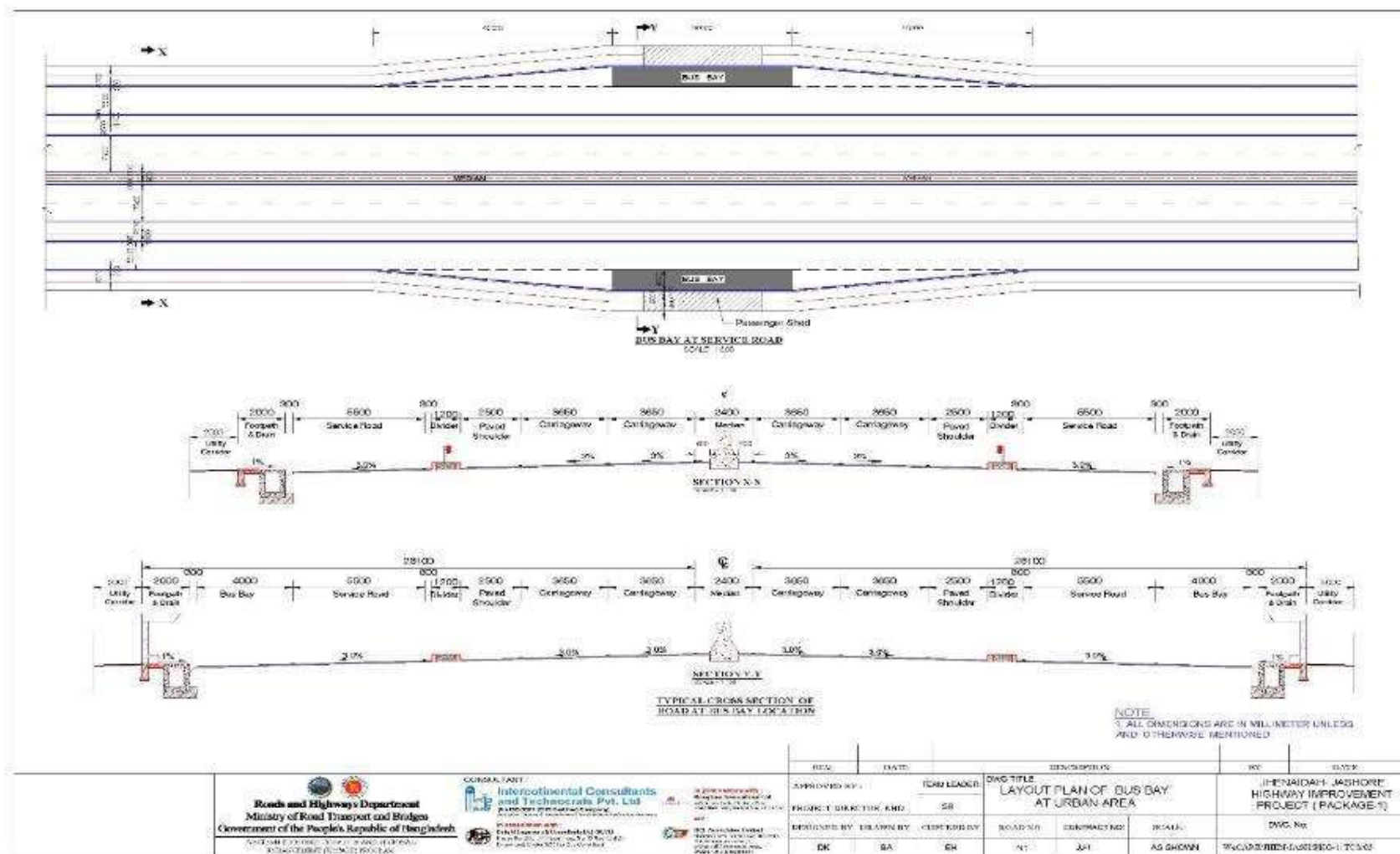


Figure 3-7: Typical Cross Section of Service Road and Bus Bay

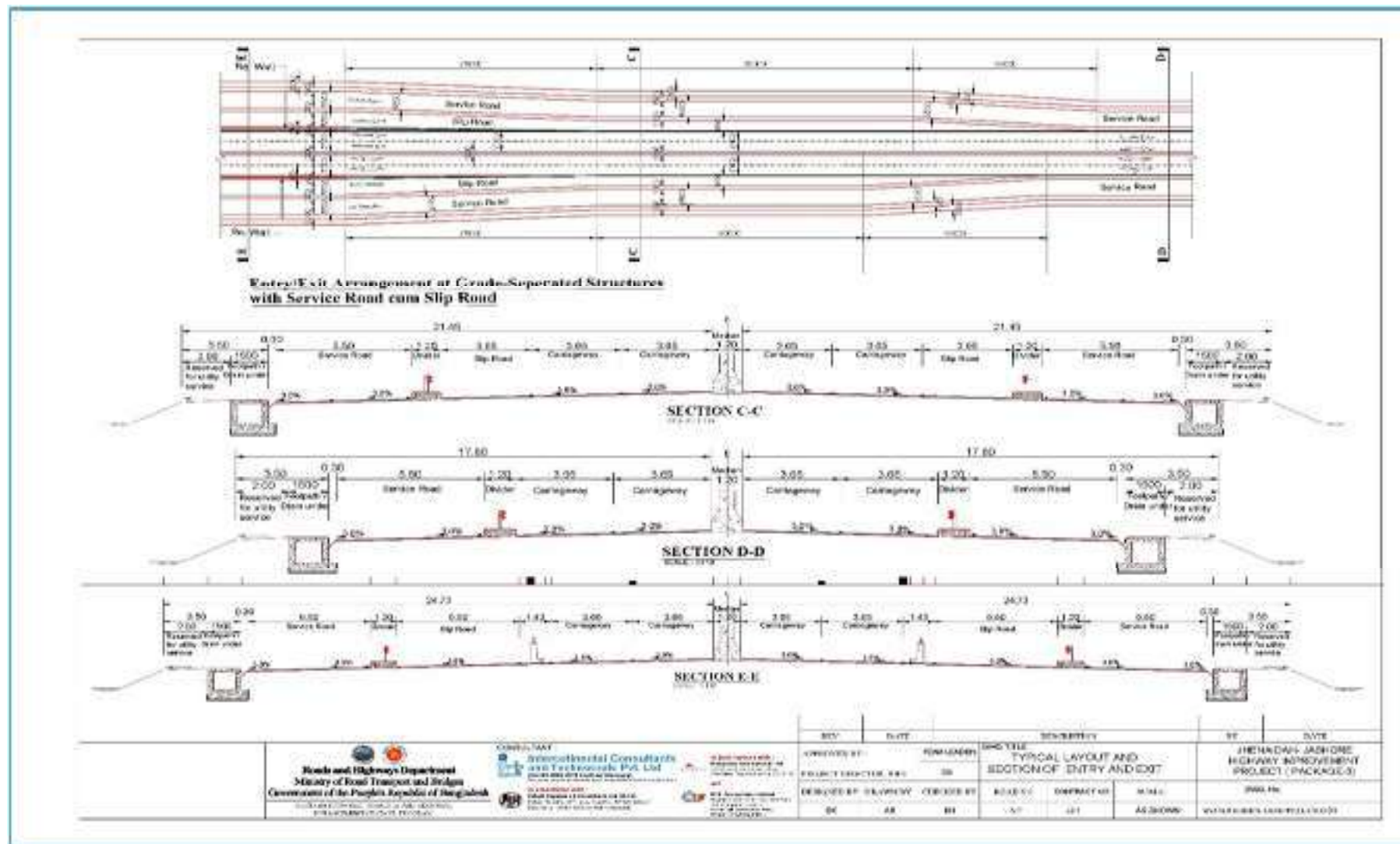


Figure 3-8: Proposed Entry/Exit Provision at Grade Separated Structures

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3.4.2 DRAINAGE

54. Roadside drainage facilities are also to be required at number of locations where the road passes through markets and local markets (bazars). The proposed total length of rectangular footpath cum covered roadside drains under all contract contracts is shown in Table 3-4. Provision of roadside drains to avoid water logging in built-up-sections proposed with suitable outfalls.

Table 3-4: Proposed Drains cum Footpath under the Contract		
Contract Nos.	Chainage (km)	Length (m)
Contract 1	0+000-15+900	11010
Contract 2	15+900-31+700	15280
Contract 3	31+700-48+480	24630

Source: Technical Engineering Design, J-J Project Road, WeCARE 2022

3.4.3 BRIDGES AND CULVERTS

55. The existing bridges and culverts are mostly 2-lane structures with poor condition and inadequate to handle the local drainage flow across the road, those needs to be reconstruction including construction of a few new cross drainage structures. To control the drainage congestion of the catchment areas a total number of four (4) bridges and 72 culverts no 4-lane are proposed with widened opening.

56. The Bangladesh Inland Water Transport Authority's (BIWTA) inland navigable class river standards were adopted during designing the horizontal and vertical clearances of the bridges. To minimize the obstruction to the waterways and keep the embankment height within permissible soil capacity are proposed at approaches of all Bridge locations. The existing bridge over the Bhairab River to be retained as it is still under the Defect Liability Period (DLP). A list of proposed bridges length, channel width with recommended regime and calculated Soffit levels are presented in Table 3-5 and Table 3-6.

Table 3-5: Proposed Bridges, Channel Width along Route at HFL and Recommended Width						
Contract No.	Location	Chainage Km	Name of Rivers	Length of Bridge (m)	Channel width along proposed route at HFL (m)	Recommended regime width (m)
Contract-1	Bhutiargati	1+200	Naboganga	42.05	61.75	72.00
	Bishoykhali	9+170	Begobati	31.45	49.26	40.00
Contract-2	Kaliganj	16+400	Chitra	43.45	41.169	45.00
Contract-3	Churamankathi	35+750	Lower Bhairab	40.05	62.51	52.00

Source: Technical Engineering Design, J-J Project Road, WeCARE 2022

Table 3-6: Calculated Soffit Levels of Bridges								
Sl. No.	Chainage	Name of Bridge/ river	Navigation class	Vertical clearance over SHWL (m)	Interpolated WL 20-years flood (m PWD)	SHWL from BIWTA hyetograph (mPWD)	Existing bridge Top Level (mPWD)	Recommended Soffit level (SHWL + VC) (mPWD)
1.	1+200	Naboganga River / Dhopa Ghata canal Bridge	IV	5.00	7.76	8.00	10.191	13.00
2.	9+175	Begobati River Bridge	IV	5.00	6.82	7.50	9.837	12.50
3.	16+400	Chitra River Bridge	III	7.62	6.38	7.00	10.691	14.62
4.	35+770	Lower Bhairab Bridge	IV	5.00	5.48	5.00	9.151	10.00

Source: Technical Design Team, J-J Project Road, WeCARE Program 2022

57. Bridge construction will require placement of bored piles, using drilling mud followed by the pile casings being filled with concrete. All other elements of the Bridge, namely the pile caps and piers will be fixed in place on top of the pile cap. The Bridge deck, consisting of precast concrete lengths as well as steel girders will be set in place from the Bridge as it is built and super structurers. The construction works from the water body also requires using special cranes on barges.

58. For designing the large Bridge, BIWTA's inland navigable class river standards were adopted according to the BIWTA's river classification standard for horizontal and vertical clearances. To minimize obstruction to the waterways and keep the embankment height within permissible soil capacity are proposed at approaches of major Bridge locations. All bridges are <100m span and does not require an environmental impact assessment. The four bridges over the river crossings are shown below in Google earth image in Figure 3-9.

59. The typical cross sections for bridge and bridge approaches are presented in Figure 3-10. Where bridges are located in or close to urban areas the provision for future installation of roadway lighting is to be incorporated within the structure. Guard Rail or Crash barriers design are needed for all bridge locations for safety purpose.



Bridge Over Naboganga River, Contract- 1



Bridge Over Begobati River, Contract- 1



Bridge over Chitra River, Contract- 2



Bridge over Bhairab River, Contract- 3:

Figure 3-9: Contract wise Four Bridges on the J-J Improvement Road Project

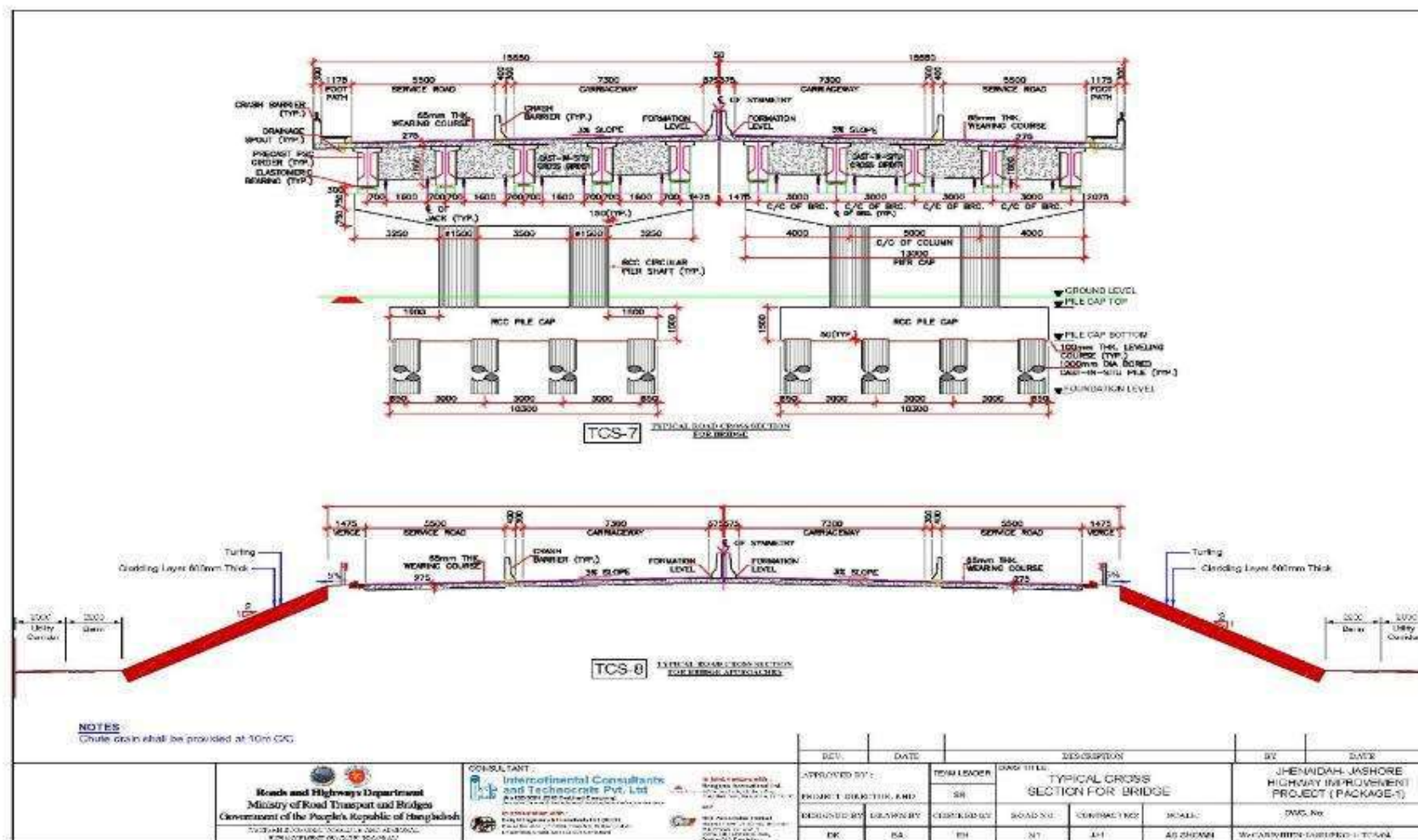


Figure 3-10: Typical Cross sections of Proposed Bridge and Approaches

There are 53 culverts with inadequate opening are located within the project corridor. To control the drainage congestion of the catchment areas a total number of 72 culverts no 4-lane are proposed with widened opening are proposed by the Design Team. List of existing culverts with opening sizes and recommended total opening sizes is presented in Table 3-7.

Table 3-7: Existing and New Proposed Culverts with Recommended Opening Sizes						
Contract No.	Existing Culverts No	Total size of Culverts (m ²)	Proposed New Culverts No.	Total Culverts	Increased Area	Recommended Total size of Culverts (m ²)
Contract-1	22	273.217	10	30	344	617.217
Contract-2	19	123.105	2	24	185	308.105
Contract-3	14	37	6	18	127	164
Total	55	433.322	18	72	656	1089.322

Source: Technical Engineering Design, J-J Project Road, WeCARE 2022

60. The list of existing and proposed culverts is presented in Annex 3-2.

3.4.4 PAVEMENT DESIGN

61. The road portions will be strengthened by adopting the following procedure:

- ▶ Bituminous layers will remove from site.
- ▶ Exposed granular layer top portion will remove and the surface to be prepared by levelling and compacting.
- ▶ Base course Type-1 new materials will be used on the prepared surface according to engineering drawing and specification.
- ▶ Bituminous base course and wearing course to be placed on base course Type-1 according to drawing and specification.

3.4.5 ROAD SAFETY

62. The general road safety issues for the project are largely dependent on the mode of motorized traffic movement, Non-Motorized Vehicles (NMVs) and pedestrian. The road safety design issues mainly lie with features of road infrastructure are Horizontal and vertical alignment of road, Cross section of roads and bridges, Lane configuration and provision for NMVs, Crash barrier, Pedestrian facility along and across the carriageway, Intersection, Pavement, etc. The important road safety elements are considered in the engineering design as follows

- ▶ Roadside Safety barriers,
- ▶ Intersection, Delineation and lighting,
- ▶ Median barriers,
- ▶ Pedestrian crossings and fences,
- ▶ Central hatching, Paved shoulders,
- ▶ Formation width,
- ▶ Medians / Dividers,
- ▶ Cross-section at bridges & culvert approaches,
- ▶ At Grade Rail Crossings,
- ▶ Pavement Width and Surfaces,
- ▶ Edge drop of Paved Shoulder,
- ▶ Junctions, Pedestrian under / Overpass,
- ▶ Footpath
- ▶ Traffic Calming Measures,
- ▶ Road Signs, Pavement Markings, etc.

63. The recommended designs of the identified safety issues are documented in detail in the Road Safety Audit of Phase -1, Study Road, 2022 prepared by Technical Design Team and adopted in the design.

3.4.5.1 TRAFFIC SIGN AND ROAD MARKINGS

64. For night traffic, the proposed reflectors at railings are very necessary. There is a need use them also at the ends of islands, in front of raised zebra crossings and humps and along the median and edge marking (especially in curves and at junctions – island ends are commonly broken, today). In nighttime, the reflectors would indicate changes in traffic environment (e.g., junction/bazaar), and thus, improve safety. Reflectors also make a moving pedestrian visible in darkness as a kind of a shadow, when he/she moves in front of the reflection of light beam. The proposed traffic signs and features for the safety of road users are as follows;

- ▶ Road markings (edge and centerlines and between lanes)
- ▶ Adequate safety and cautionary sign and signal
- ▶ Well-marked zebra crossings (painted stripes)
- ▶ Marking of any hump on road in driving direction
- ▶ Refuges at pedestrian crossing
- ▶ Well maintained junction areas, with enough but not too much space
- ▶ Good guardrails at both at edges and the centerline, etc.

65. Traffic Signs Manual 2004 of Bangladesh Road Transport Authority (BRTA) will be followed in the Project and 80 Kmph design speed is recommended in the RHD Standard for the national and regional highways.

3.4.6 PROTECTION WORKS

66. Grass turfing on the side slopes and on the shoulder of road embankment of the project will be done to prevent the soil erosion. Bridge abutments/ approaches and culvert inlets shall be protected by CC blocks and geotextile filter fabric in accordance with the engineering specifications. The reinforce earth wall also proposed at approaches bridges/ culvers, at Over Passes (OVP) and Rail Over Passes (ROB). The proposed quantities of protection work of the project is presented in Table 3-8.

67. Highest quantities of C.C. blocks including Geotextile protection will be required in DS-10, and particularly for protection of wave action at near to Sherpur Bridge.

Table 3-8: Proposed Protection Works under the Project

Contract Contracts	Grass Turfing (Quantity Sqm)	C.C. blocks including Geotextile (Quantity Sqm)	Reinforced Earth Wall (Quantity Sqm)	River Training Works	Locations of Protection Works
Contract-1	489600	2371	28675	2371	Road Embankment slops abutment of all bridges, Viaduct, Flyover, Overpasses, and Rail over Bridge and river bank protection alongside the project road
Contract-2	282282	2209	30276	4671	
Contract-3	312389	1228	39279	4671	
Total	1084271	5808	98230	11713	

Source: Technical Engineering Design, J-J Project Road, WeCARE 2022

3.5 CONSTRUCTION MATERIALS, SOURCING AND UTILITIES REQUIREMENET

68. There are some quarries in Bangladesh which are not sufficient to meet the requirement. Therefore, most of the aggregates will be imported from other countries. Only authorized vendors who are having valid license to import the materials will be engaged to supply the construction materials such as, aggregates. The vendors and suppliers will obtain essential clearance such as income tax certificate, value added tax (VAT), custom clearance for importing the material. If boulders need to be crushed at site, necessary clearance as ECR 97 is to be obtained before installation of the crushers. Besides, Construction Supervision Consultant (CSC)

will closely monitor the vendors/suppliers' clearance validity and the E&S practices strategy in accordance with the valid guidelines of the government.

69. The construction materials such as, earth/sand, cement, steel, aggregate, bitumen and water are main requirement for the construction of the road. The construction materials will be procured/purchased from the approved suppliers by the Contractors of his own arrangement subject to compliance of statutory/legal requirements of the Bid Documents and approval of the Construction Supervision Consultant (CSC) or Engineer and RHD-PIU. The quantity of the major construction materials and their sources with suitable route distances including water, energy, and fuel supply provision are presented in Table 3-9 and Table 3-10 respectively.

Table 3-9: Construction Materials Quantity Requirement

Contract No.	Contract Chainage Km		Requirement of Construction Materials					Reuse of scarified 40%
	Start	End	Earth (cum)	Sand (cum)	Cement (T)	Steel / Rebar (T)	Bitumen (T)	
Contract-1	0+000	15+900	3,179,790	26,181	41,472	4117	19,382	21,110
Contract-2	15+900	31+700	2,252,352	18,546	29,376	4442	13,729	14,953
Contract-3	31+700	47.480	2,517,334	20,727	32,832	11841	15,344	16,713
Total			7,949,476	65,454	103,680	20,400	48,455	52,776

Source: Technical Engineering Design, J-J Project Road, WeCARE 2022

Table 3-10: Sources of Construction Materials, Workforce and Distance from the Project Road

Sl. No.	Construction Materials	Sources	Distance (KM)	Best Route
1.	Earth	Borrow pit	22 - 37	Jhenaidah - Jashore & Jhenaidah - Chuadanga Road.
2.	Coarse Sand	Sylhet	419	Sylhet - Dhaka - Jhenaidah
		Noapara, Jashore	30	Noapara - Jashore
		Panchagarh	418	Panchagarh - Issurdi - Jhenaidah
	Fine Sand	Pakshey	70	Pakshey - Kushtia - Jhenaidah
		Kushtia	45	Kushtia - Jhenaidah
	Filling Sand	Noapara, Jashore	30	Noapara - Jashore
3.	Cement	Dhaka	211	Dhaka - Doulatdia - Jhenaidah
	Cement	Noapara, Jashore	30	Noapara - Jashore
4.	Bitumen	Chattogram	430	Chattogram - Dhaka - Jhenaidah
5.	Water	Surface water/ Underground	0 - 50	Adjacent to Project Road
6.	Energy	National Power Grid	0-10	Adjacent to Project Road
7.	Fuel	Jashore/Jhenaidah	0 - 50	Adjacent to Project Road

Source: Technical Engineering Design, J-J Project Road, WeCARE 2022

70. **Earth or Embankment Fills:** As per engineering calculation the quantity of the fill materials will be 7,949,476 cum. The fill materials will be collected from nearby sand extraction site or can be dredged from the nearby rivers or borrow pit. The present practices in Bangladesh is to construct the roadway embankments with river sand rather than clayey agricultural soil. Sand can be easily compacted to a high degree of compaction, but with higher CBR value. The sand use as fill materials require protection against erosion by cladding with a layer of cohesive soil.

71. Technical Design team identified 16 borrow pit locations for the project road. The Contractor will collect the borrow material from the identified borrow areas. There are identified 7 borrow areas in Contract -1 within 1-17 Km of them 3 are within 7 Km in left side of project road from Jhenaidah to Jashore. In addition, another three are located within 26 Km at right side of the road. Two borrow pits are identified within 4 Km in Contract-2 area, while three borrow sites are located close to the Contract 3.

72. All of these borrow sites are more than 500m away from the project road. If borrow areas are adjacent to the road embankment that will cause the road embankment erosion. The locations of Sand quarries borrow pits are shown in Figure 3-11.

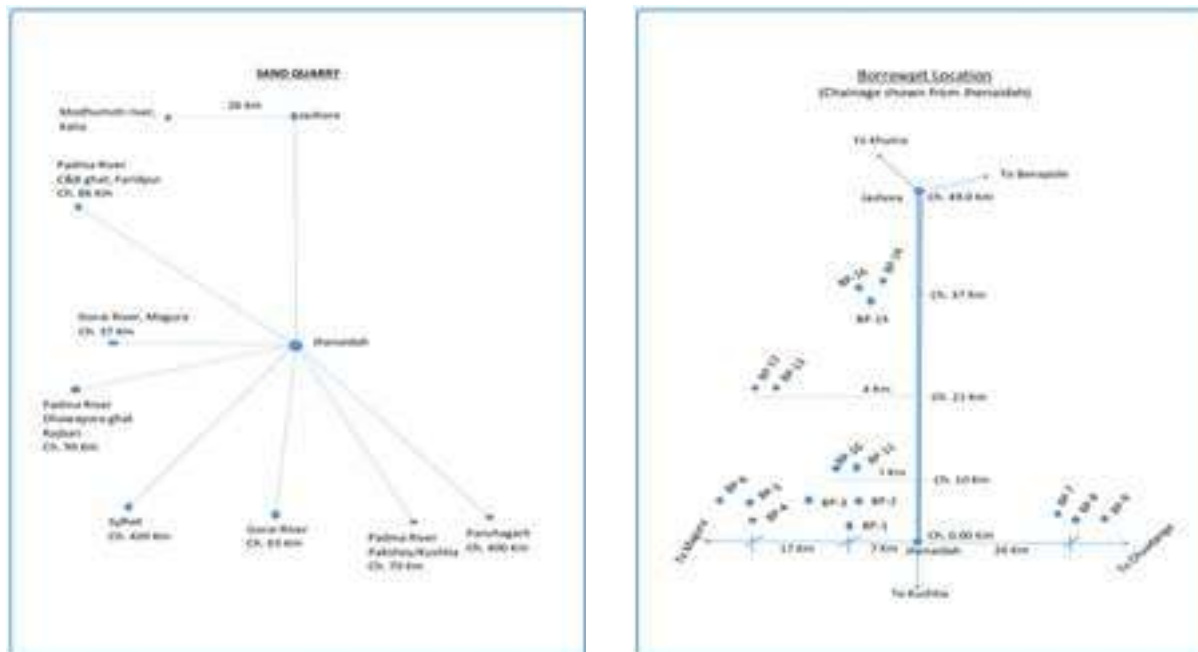


Figure 3-11: Locations of Suitable Sand Quarry and Borrow Pits for the Project

Source: Technical Engineering Design, J-J Project Road, WeCARE 2022

73. **Concrete Aggregate:** There are some quarries in Bangladesh which are not sufficient to meet the requirement. Therefore, most of the aggregates will be imported from other countries. Only authorized vendors who are having valid license to import the materials will be engaged to supply the construction materials such as, aggregates

74. **Cement and Steel Reinforcement:** Bangladesh produces different classes of EN and ASTM standard cement and high strength deformed bar of 40, 60 and 75 grades. These materials are readily available in Bangladesh. There many steel rolling mills are established in Bangladesh, like KSRM, BSRM Bandar Steel Industries Ltd. High-tech Steel & Re-Rolling Mills etc.

75. **Bitumen:** Bitumen will be imported. Commonly used bitumen in the road construction industry in Bangladesh is 80-100 penetration grade bitumen.

76. **Water:** In general the sources of the non-potable water for the construction works and sanitation purpose will extract from shallow aquifer. During construction period two types of water consumption will needed as follows;

- i. Water use with construction materials such as concrete mixing and compaction, etc;
- ii. Water use for site offices, construction yards and construction camps during project operating.

77. Sources of the non-potable water for the construction works will come mostly be from shallow aquifer or surface water. Drinking water may be taken from the deep aquifer, if the shallow aquifer is contaminated with excessive Iron and Arsenic contaminated. In addition, the contractor will provide safe drinking water by supplying bottled drinking water at the construction sites and offices. An overhead tank and water reservoir will be constructed to supply water facilities within the premises of site project office, contractors office and labor camps.

78. **Sewerage and Waste:** Project site office, contractor's offices, construction yard and construction camps will have sanitary toilets with proper solid/liquid waste management facilities. Sufficient numbers of

the toilets will be provided in all construction camps for the workers, offices and construction yard, at a formula of one toilet for every 10-12 persons.

79. **Energy:** The project area is mostly urban and semi urban area and therefore electricity will be provided from the national grid.

3.6 LAND ACQUISITION AND RESETTLEMENT⁸

80. The Jhenaidah-Jashore (N7) road is divided into three Contracts (Contract 1, Contract 2 and Contract 3). The Jhenaidah-Jashore road is extended between Jhenaidah and Jashore districts. Two affected Upazilas Jhenaidah Sadar and Kaliganj are located in Jhenaidah district while Jashore Sadar in Jashore district is also affected due to the project. Corresponding mitigation measures along with payment of compensation, assistance, allowances, and resettlement benefits will be presented in detailed in the Entitlement Matrix of the Updated RAP. Contract contract-wise distribution of length in km, affected Unions and Upazilas and Districts is presented in Table 3-11.

Table 3-11: Contract Wise Affected Districts, Upazilas and Unions under the Project Road					
Contract	Chainage (Km)	Land Required	District	Upazila	Union/ Poursabha
Contract 1	0 - 15 +900	138.962	Jhenaidah	Jhenaidah Sadar	Moharajpur
					Surat
					Naldanga
					Pourasabha
				Kaliganj	Kaliganj Union
Contract 2	15+900 – 31 +700	116.889	Jhenaidah	Kaliganj	Pourasabha
					Rakhalgachhi
					Roygram
					Bara Bazar
					Pourasabha
Contract-3	31+700 – 47+480	117.104	Jashore	Jashore Sadar	Haibatpur
			Jashore	Jashore Sadar	Haibatpur
					Pourasabha
					Churamankathi

Source: Census and IOL Survey, RAP, 2022

81. For implementation of Jhenaidah – Jashore Highway (NH-7) Improvement Project under WeCARE Project total 373.13 acres of private land will be required as per approved amount of land by the Ministry (MoRTB). At present, total 372.951 acres of land (100.00%) is required for Contracts 1, 2 and 3 for implementation of the project. The affected private land is being mainly used for residential, industrial/commercial, agricultural land, etc.

82. **According to RAP the Census and IoL Survey Findings:** Total 3,163 households with 13,923 population will be affected due to land acquisition in the project area. A total of 1962 title holder households, 900 non-title holder households and 179 encroachers' households require relocation. A total of 2,257 affected businesses including 1317 small businesses, 549 medium businesses and 391 large businesses will be affected due to the project. A total of 2,415 tenants including 1794 tenants of affected commercial structures and 202 tenants of affected residential structures will require shifting to other places for renting in structures due to the project. A total of 3,504 laborers including 2,307 unskilled laborers and 1,197 skilled laborers will be affected due to the project. Last but not the least, a total of 824 vulnerable households will be affected. A Resettlement Action Plan (RAP) is being prepared by the Social Team according to Bangladesh ARIPA, 2017 and guidelines of the WB especially ESS5. The above-mentioned all Project Affected Persons (PAPs) will be given compensation, assistance, allowance and resettlement benefits for their affected lands, assets and other

⁸ Census, Inventory of Loss (IOL) and Socio-economic Survey (SES) could not be completed under Contract -3 (approximately 2-3 km) due to non-finalization of LAP of Design Consultant in Jashore end.

losses based on Entitlement Matrix of the RAP. The census and IoL survey data are presented in section 4 of the ESIA report.

83. Land acquisition and RAP implementing agency of the Jhenaidah to Jashore road project is the RHD under MoRTHD. The concerned District Commissioners will play necessary significant roles in land acquisition. As practiced in all the projects in Bangladesh that generally Implementing NGOs/Firms assist the client/employer (e.g., RHD) in implementation of the Resettlement Action Plan (RAP) for the respective, projects. Against such background, an Implementing NGO will also play vital role as per INGO's ToR in implementation of RAP on behalf of RHD.

84. The project will effect on loss of income and livelihood of the affected persons. The E&S Consultant of the RAP preparation have been stipulating special measures to mitigate impacts and risks of those whose income and livelihoods will be affected in the project area and it will have positive impact on restoration of PAPs' income and livelihoods. The details on entitlement matrix for compensations and resettlement benefits of titled and non-titled affected peoples are to be documented in RAP, 2022 of the Project.

3.7 IMPLEMENTATION SCHEDULE

85. The implementation schedule is being prepared by the Technical Design Team. The Project tentatively construction scheduled to be commissioned and completed within 2.5 years (30 months) plus a 1.5 year (18 months) Defect Liability Period and maintainance period is 6 year (72 months). The environmental compliance monitoring work will be carried out by the PIU unit headed by Project Director and an appointed Construction Supervision Consultant (CSC) or Project Implementation Consultant (PIC), and the Contractor will collectively ensure the implementation of the project ESMP and ESMoP during construction and maintainance periods in their tenure.

4 DESCRIPTION OF THE ENVIRONMENTAL AND SOCIAL BASELINE

4.1 INTRODUCTION

86. The primary objective of this chapter is to provide an environmental and socio-economic baseline that potentially impacts the construction and operation phases of the project. Baseline data includes an assessment of the physical environment along with natural (pollution) of the project impact areas, ecological environment, and socio-economic environment of the project areas. Covering these aspects, baseline data has been compiled in the ensuing sections.

4.2 PHYSICAL ENVIRONMENT

87. The physical environment comprises the physiography and topography, geology and soil, meteorology, hydrology, water resources, and natural hazardous conditions of the project area. The physical environmental data for the study area had been collected using the following methods;

- ▶ Primary Survey
- ▶ Laboratory Analyses
- ▶ Local people consultations
- ▶ Organizational visit
- ▶ Observations and
- ▶ Websites browsing

4.2.1 PHYSIOGRAPHY AND TOPOGRAPHY

4.2.1.1 PHYSIOGRAPHIC FEATURES

88. The project road alignment region is largely in the north-western and south-western parts of the country, and fresh water is supplied by the Ganges River. The entire road alignment passes across the physiographic unit of the Ganges Floodplain. Figure 4-1 shows Ganges Active and Granges Inactive floodplain is prominent in the project area. The surrounding region occupies the central portion of the Gangetic delta between the Hugli (Hooghly; in India) and Meghna estuaries. It consists of an alluvial plain intersected by watercourses that to the south spread out into the large marshes of the Sundarbans. The chief crops of that region are rice, sugarcane, and dates.⁹ All uneven landscapes of mixed Tista and Ganga's silt make up the Mahananda floodplain. The cut-off areas of the Meghna floodplain feature a smooth relief and silty soils that are heavily flooded (by precipitation) during the monsoon season. The unit comprises most of Rajshahi districts including most of Jashore, Natore, and Pabna, as well as portions of Manikganj, Narayanganj, Munshiganj, Shariatpur, Madaripur, Barisal, Gopalganj, Narail, Khulna, Bagerhat, and Satkhira. This physiographic unit is almost triangular and is bordered on the south by the Ganges tidal floodplain. It traps the Gopalganj-Khulna Beels on its southern end (Banglapedia, 2021).

⁹ Bandyopadhyay, S. (2007). Evolution of the Ganga Brahmaputra delta: a review. Geographical review of India, 69(3), 235-268.

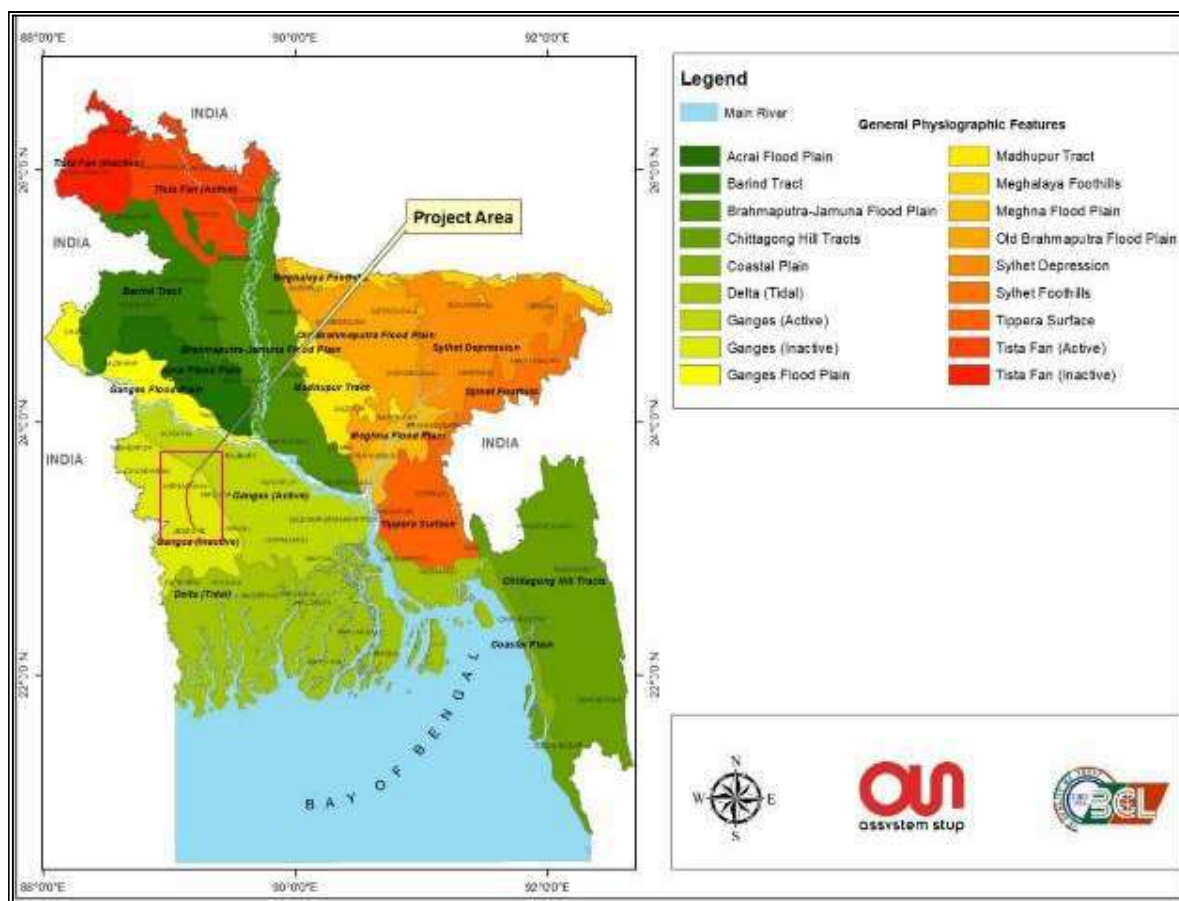


Figure 4-1: General Physiographic Features of ESMP for Jhenaidah-Jashore Road Section (WeCARE)

Source: Banglapedia, 2021

4.2.1.2 TOPOGRAPHY

89. Topography refers to the relief and curves of a land surface, as well as the distribution of mountains and valleys, river patterns, and all other natural and man-made characteristics that make up the landscape. There are three unique features in Bangladesh (i) a vast alluvial plain prone to flooding, (ii) an older, slightly higher plain, and (iii) a tiny hilly region drained by flashy rivers. The project area is in the country's southwest region under the alluvial floodplain, which has been shaped and influenced by the siltation process caused by a network of rivers. The project region offers unique land, soil, climate, hydrology, and rainfall characteristics due to its placement in a dormant delta and tidal environment. The project area's topography is undulating, including a pond, social forest, and high terrain. It has an elevation of 8 meters above sea level and a nearly sloping terrain from north to south (Banglapedia, 2021) as shown in Figure 4-2. The Ganges-tidal floodplain, which has lower relief and is crisscrossed by numerous tidal rivers and channels, might be used to describe the land in the project region. The project area's land surface is not entirely level and is divided into six distinct geomorphic units. Natural levees, floodplains, the historic meander complex, the bar, the tidal marsh, and the back swamps are all included. Natural levees are highly established along the Bhairab-Kopodak banks, and they are mostly occupied by the project area's current built-up area. Low-lying areas are mostly found on the outskirts of town and are characterized by swampy areas that are being employed for agricultural purposes but are poorly drained and have constant water logging issues ¹⁰. The Ganges deltaic activity carried mud and

¹⁰ Reiman, M. W., & Dinsmore, S. (1993). Effects of Cd²⁺ and DTPA on young sugar beets (Beta vulgaris), I. Cd²⁺ uptake and sugar accumulation. Plant Physiologist, 66, 69-74

limestone from the Himalayas, forming the project area altogether. The character of the soil is largely homogeneous, with very minor differences in the sand, silt, and clay admixture. The percentage of sand is naturally higher along the river's edge and lower in areas where deltaic action has stopped. The marshy lands on the outskirts of town are especially beautiful¹¹. The project area's main topography includes floodplains on most of the roads and terraces. The project area's geography slopes from north to south, with elevations ranging from 15 to 11 meters above mean sea level. The project is situated in the Ganges River's flood plain. The cluster of project locations is almost flat, with several depressions, a natural canal (*khals*), and rivers that run through it.

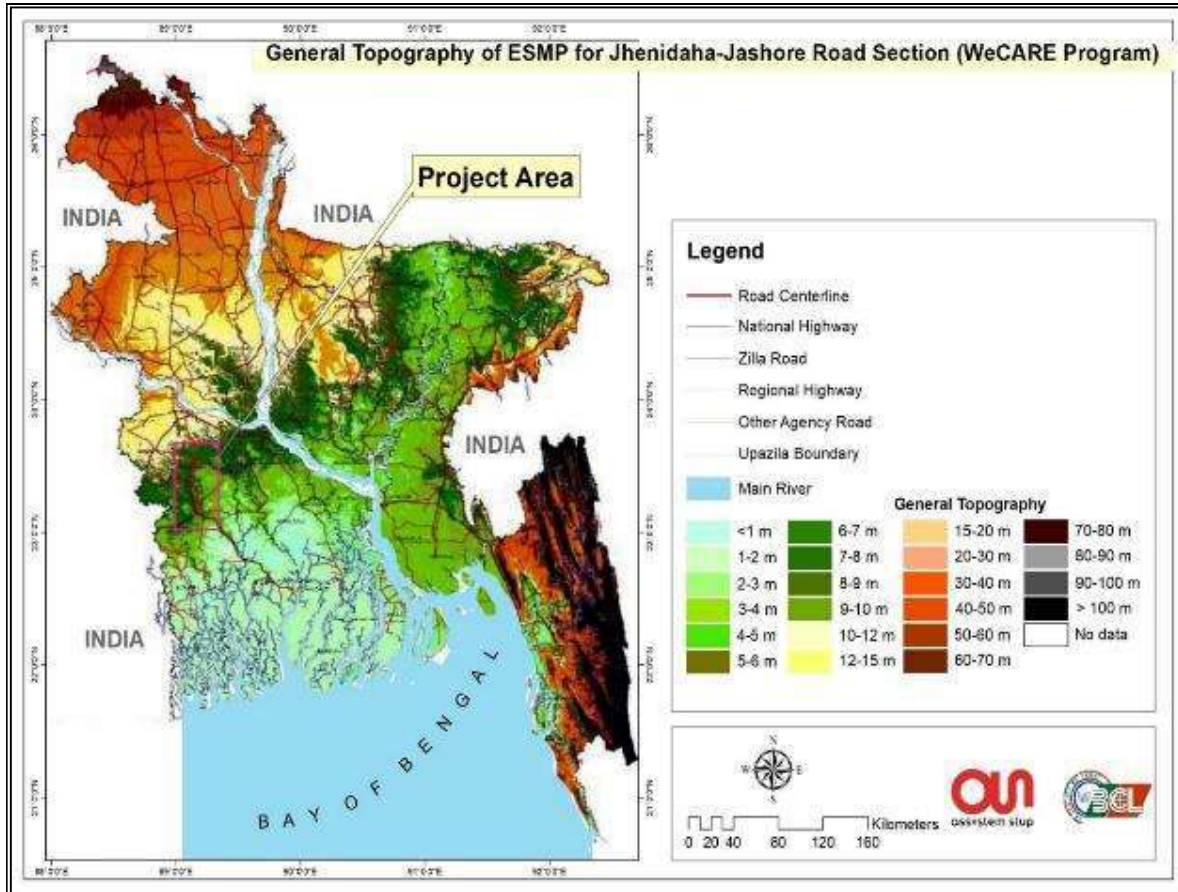


Figure 4-2: General Topography of ESMP for Jhenaidah-Jashore Road Section (WeCARE)

Source: Banglapedia, 2021

90. This terrain is used for irrigated and rain-fed paddy agriculture, with various land developers occupying huge portions of it along the Jashore-Jhenaidah alignment to extend the residential/commercial area. Filling flat agricultural land and marshes along the project's path may alter local relief, influencing surface drainage. Furthermore, soil filling along the road route may cause the Bhairab and Chitra Rivers to rise, flooding the surrounding areas. Storm water from the project alignment may cause waterlogging on the nearby level ground unless it is adequately handled and coordinated with the drainage system of adjacent residential sites¹².

¹¹ Malik, R. N., Jadoon, W. A., & Husain, S. Z. (2010). Metal contamination of surface soils of industrial city Sialkot, Pakistan: a multivariate and GIS approach. *Environmental geochemistry and health*, 32(3), 179-191

¹² Ali, M., Singh, K. K., Pramanik, S. C., & Ali, M. O. (2009). 14 Cropping Systems and Production Agronomy. *The Lentil*, 213.

4.2.2 GEOLOGY AND SOIL

4.2.2.1 GEOLOGICAL CHARACTERISTICS OF THE PROJECT AREA

91. According to GSB (1990), the Geology of Bangladesh is distinguished by Pleistocene to Tertiary bedrocks in the eastern hilly area and by dense Holocene sediments in the rest of the country. The Calcareous Alluvium, Calcareous Dark Grey Floodplain soils, and Calcareous Brown Floodplain soils are the general soil types of the project road (Jhenaidah-Jashore) area. Throughout or below the cultivated layer Calcareous Alluvium Soils are stratified or raw alluvium and are calcareous throughout or part of it and lack having diagnostic subsoil horizon. On the active Ganges floodplain, this alluvium mainly comprises brownish grey to pale brown sandy and silty deposits, which are moderately calcareous. Calcareous Dark Grey Floodplain soils are found extensively on the Ganges floodplain and as well as locally on the soils that comprise Cambic B-horizon and lime in part or throughout the solum and with dark grey topsoil and/or upper subsoil. In the Ganges tidal floodplain, there are continuous dark grey gleans as well and they are Calcaric Gleysols¹³. Calcareous Brown Floodplain soils have lime in the profiles and have Cambic B-horizon that is predominantly oxidized. They comprise pale brown to olive brown, friable, loamy, and clay soils occurring on the upper part of ridges on the Ganges River floodplain and the river bank of the Ganges tidal floodplain.

4.2.2.2 SEISMOLOGY

92. Bangladesh is located in one of the world's most tectonically active regions. Three main plates collide here (the Indian Plate, the Tibet Sub-Plate, and the Burmese Sub-Plate. Based on the distribution of earthquake epicenters, morphotectonic behavior of different tectonic blocks, and seismic coefficients due to the location of relevant plates, Bangladesh has been divided into four generalized seismic zones with the defined seismic coefficient. The coefficient is a measure of how strong an earthquake has the potential to be based on a combination of the mass of the plate and the seismic forces acting on it, as well as how frequently these quakes are likely to occur. Zone IV is in the most seismically active area, with a seismic coefficient of 0.36, whereas Zone I is in the least seismically active area with a significantly lower seismic coefficient of 0.12 (BNBC, 2020). The project site lies on the Indian Plate, which is moving north. As per the seismic zone classifications, the project road falls in Zone I means low seismic intensity as shown in Figure 4-3.

¹³ Banglapedia, 2015

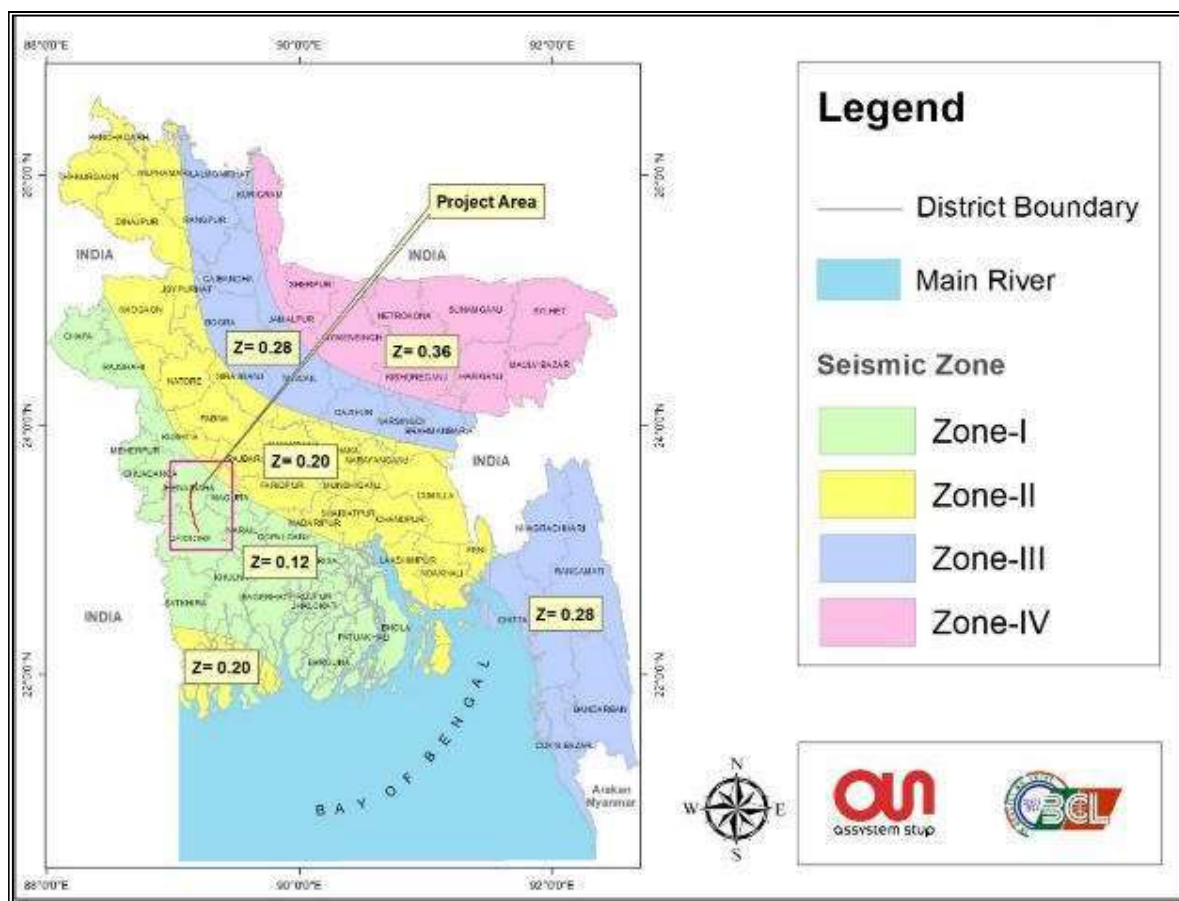


Figure 4-3: Seismic Zone of ESMP for Jhenaidah-Jashore Road Section (WeCARE)

Source: Bangladesh National Building Code, 2020

4.2.2.3 SOIL/ LANDS DESCRIPTION

93. The project road passes through three (3) Upazila namely Jhenaidah Sadar and Kaliganj of Jhenaidah District and Jashore Sadar of Jashore District. The total area of Jhenaidah Sadar is 46,778 ha and this Upazila consists of 17 unions and 1 pourasava. The total area of Kaliganj Upazila is 31,033 ha and consists of 11 unions and 1 pourasava. The total area of Jashore Sadar is 43,298 ha and consists of 15 unions and one (1) pourasava. A description of the Upazila-based land/soil types is given in Table 4-1.

Table 4-1: Upazila-based Land/Soil Description				
Name of Upazila	Description of Lands			
	Total Area(ha)	Land Type	Area (ha)	Area (%)
Jhenaidah Sadar	46,778	High Land	13,386	28.62
		Medium High land	17,590	37.60
		Medium Low land	5,316	11.36
		Low land	1,098	2.35
		Others (Settlements, rivers, water bodies, ponds.)	9,388	20.07
Kaliganj	31,033	High Land	8,256	26.60
		Medium High land	11,847	38.20
		Medium Low land	1,570	5.10
		Low land	162	0.50
		Others (Settlements, rivers, water bodies, ponds.)	9,198	29.60
Jashore Sadar	43,298	High Land	15,327	35.40
		Medium High land	1,5202	35.10

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 On July 1st, 2021, STUP was acquired by Assystem and rebranded as Assystem STUP.



BCL Associates Limited

Table 4-1: Upazila-based Land/Soil Description

Name of Upazila	Description of Lands			
	Total Area(ha)	Land Type	Area (ha)	Area (%)
		Medium Low land	2,016	4.70
		Low land	915	2.10
		Others (Settlements, rivers, water bodies, ponds.)	9,838	22.70

Source: SRDI, District Office, Jashore

94. To establish the baseline condition of the soil in the project area the quality and soil profiles are determined.

Methodology: A reconnaissance was conducted along both sides (covering approximately 100 m area aside from the road of the existing Jhenaidah – Jashore road corridor putting the road in the middle of the traverse line to be followed for the surveying. Soils were checked and identified considering the baseline information on soils as described in the Reconnaissance Soil Survey (RSS) report of the SRDI¹⁴ of the greater Jashore district. In addition, the information of the soils identified following the RSS report and further validated by cross-checking the edaphic data as described in the Upazila-based ‘Land & Soil Resource Utilization Guide’ popularly known as ‘Upazila Nirdeshika’ published by SRDI for Jhenaidah Sadar, Kaliganj and Jashore Sadar Upazila. Two soil profiles up to 100+ cm depth was considered in the field for testing the soils’ Physico-chemical properties into account relevant to the road construction. A mini-pit was also dug to understand the major differences (if any) in edaphic characteristics among the soils that occurred in the project area. During the survey period, 15 soil samples were collected from different horizons of three (3) different locations of the Jhenaidah-Jashore road corridor under Contracts 1, 2 & 3 as shown in Table 4-2 and photos of soil samples collection in Figure 4-4, Figure 4-5 and Figure 4-6. The collected samples were tested from the laboratory under the Department of Soil, Water & Environment, the University of Dhaka, applying prescribed methods for individual parameters to draw remarks and recommendations.



Figure 4-4: Ishurdi Series (Contract-1)



Figure 4-5: Sara Series (Contract-2)



Figure 4-6: Gopalpur Series (Contract-3)

Source: Soil Sample Collection by the Environment Team, 19-20 April 2022

95. **Observations: Contract 1:** Six soil samples from 6 different horizons (Ap, Ad, B21, B22, C1 & C2) of the Soil Profile (Ishurdi Series) were collected from the Surat Union of Jhenaidah Sadar Upazila of Jhenaidah District. The land type is Medium High Land (MHL). Topography is the Lower part of a very undulating ridge. Profile descriptions are presented in Table 4-2. Map of soil and landforms of Jhenaidah

¹⁴ Reconnaissance Soil Survey Report, Soil Research Development Institute (SRDI), 1970

Sadar Upazila are shown in Figure 4-7. Area of the land type including texture also presented in the Map considering 500m on the right side and 500m on the left side from the centerline of Jhenaidah-Jashore Road Corridor.

Table 4-2: Soil Profile Description of Ishurdi Series under Contract-1

Horizon	Depth (cm)	Profile Description
Ap	0 - 12	Very dark greyish brown with common fine distinct olive brown mottles; clay; massive; very hard dry; common fine tubular pores; many very fine roots; slightly calcareous; pH 7.32; abrupt wavy boundary.
Ad	12 - 20	Dark greyish brown with few fine faint yellowish brown mottles; silty clay; massive; very hard dry; few fine tubular pores; many very fine roots; slightly calcareous; pH 7.69; abrupt smooth boundary.
B21	20 - 35	Dark greyish brown with common fine distinct dark brown mottles; clay; very firm moist sticky wet; strong coarse prismatic structure; moderately thick dark greyish brown cutans along pores and peds; many very fine tubular pores; few fine roots; slightly calcareous; pH 7.77; clear smooth boundary.
B22	35 - 58	Olive brown with common fine distinct yellowish brown and dark brown mottles; clay; very firm moist sticky wet plastic to strong coarse prismatic structure breaking into angular blocky; moderately thick dark greyish brown cutans along vertical and horizontal ped faces; many very fine tubular pores; slightly calcareous; pH 7.65; clear smooth boundary.
C1	58 - 81	Light olive brown; common fine distinct yellowish-brown mottles; clay; massive; firm moist sticky wet plastic; slightly calcareous; pH 7.95; clear smooth boundary.
C2	81 - 100+	Light olive brown; common fine distinct yellowish-brown mottles; silty clay; massive; slightly calcareous; pH 7.20.

96. **Contract-2:** Three soil samples from 3 different horizons (topsoil, subsoil, and substratum) of the soil (Gopalpur Series) were collected from Barobazar Union of Kaliganj Upazila of Jhenaidah District. The land type is Medium High Land (MHL). Topography is the Middle part of a nearly undulating ridge. Soil descriptions of the Gopalpur Series are presented in Table 4-3. Map of soil and landforms of Kaliganj Sadar Upazila is shown in Figure 4-8. Area of the land type including texture also presented in the Map considering 500 m on the right side and 500m on the left side from the center line of the Jhenaidah-Jashore Road Corridor.

Table 4-3: Soil Profile Description of Gopalpur Series under Contract-2

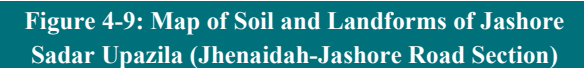
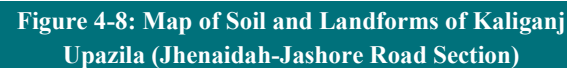
Horizon	Depth (in cm)	Description
Topsoil	0 – 15	Olive brown with common fine distinct yellowish brown and dark brown mottles; silty clay loam; slightly calcareous; pH 7.69.
Subsoil	20 – 30	Olive brown with common fine distinct yellowish brown and dark brown mottles; silt loam; slightly calcareous; pH 7.8.
Substratum	45–55+	Light olive brown; common fine distinct yellowish-brown mottles; silt loam; slightly calcareous; pH 7.98.

97. **Contract-3:** Six soil samples from 6 different horizons (Ap, Ad, B21, B22, C1 & C2) of the Soil Profile (Sara Series) were collected from Churamankathi Union of Jashore Sadar Upazila of Jashore District. The land type is High Land (HL). Topography is Summit of the nearly level ridge. Profile description of Sara Series are presented in Table 4-4. Map of soil and landforms of Jashore Sadar Upazila are shown in Figure 4-9. Area of the land type including texture also presented in the Map considering 500 m on the right side and 500 m on the left side from the center line of Jhenaidah-Jashore Road Corridor.

Table 4-4: Soil Profile Description of Sara Series under Contract-3

Horizon	Depth (in cm)	Profile Description
Ap	0 - 12	Light olive brown with light brownish grey mottles; silty clay loam; massive; friable moist, many fine tubular pores; many fine roots; neutral; pH 7.35; abrupt smooth boundary.
Ad	12 - 20	Dark greyish brown with yellowish brown mottles; silty clay; massive; friable moist; few fine tubular pores; many fine roots; slightly calcareous; pH 7.51; clear smooth boundary.
B21	20 - 35	Olive brown with common fine distinct yellowish-brown mottles; silt loam; weak coarse

Horizon	Depth (in cm)	Profile Description
		prismatic structure; breaking into angular blocky friable moist, many fine tubular pores; few fine roots; slightly calcareous; pH 7.73; clear smooth boundary.
B22	35 - 58	Olive brown with few fine distinct dark yellowish-brown mottles; silty clay; weak coarse prismatic structure; breaking into angular blocky; friable moist; many very fine tubular pores; slightly calcareous; pH 7.59; clear smooth boundary.
C1	58 - 81	Light olive brown with few fine distinct dark yellowish-brown mottles; silt loam; very friable moist; slightly calcareous; pH 7.69; clear smooth boundary.
C2	81- 100+	Light olive brown with strong brown mottles; silt loam; very friable moist; slightly calcareous; pH 7.55.



98. **Results and Discussion:** The physical and chemical test results of the samples from three locations under different contracts are shown in Table 4-5 and Table 4-6, respectively. The result test sheets of soil quality parameters are presented in Annex 4-1. There is no Bangladesh regulation/standard for soil except BARC-2018 but some of the parameters (total P, S, Na & Cl) are not yet standards. During the survey period, two soil profiles up to 100+ cm depth was selected in Jhenaidah Sadar and Jashore Sadar Upazila, and one mini-pit was also selected in Kaliganj Upazila. From the results, the soil profile of different horizons of Contract-1 has the soil texture varies from silty clay to clay; and in Contract-3 silt loam to silty clay; pH ranges from 7.2 to 7.95 in Contract-1 and 7.35 to 7.73 in contract-3. In both profiles of Contract-1 & 3 soil reaction is neutral to slightly alkaline. On the other hand, the pH of the soil profile of the mini-pit of 3 horizons (topsoil, subsoil & substratum) of Contract-2 ranges from 7.69 to 7.98, where soil reaction is slightly alkaline. Generally, pH reflects the base status of the soil. Soil reaction is an important indicator of crop production. Certain crops prefer a definite range of soil reactions. But in general, most crops thrive well in soil reactions ranging from 5.6 to 7.3. The organic carbon content of the three Contracts ranges from low to medium level and the total nitrogen content of 3 Contracts is low. Lead is also found low in 3 Contracts which indicates a safe level of the soil of the project area. Sulfate is optimum in 3 contracts. The soil salinity of the 3 Contracts is non-saline indicates a favorable condition for the construction of the Jhenaidah-Jashore road embankment. The recommendations based on the analysis of the testing parameters of baseline soil are as follows:

- ▶ Soil profiles of the project area characteristically have textural classes ranging from silt loam to silty clay or clay in most of the horizons. The property of having clay content will lead to the compaction of the soil, removal of air voids, increase of the soil's sheer strength, decrease in its compressibility, and permeability as well. It will reduce the voids ratio making it more difficult for water to flow through the soil.
- ▶ The project area consisting of soils having normal bulk density with such a range of particle density (<3 gm/cc) and low organic carbon (indicative of low organic matter) content will show a good load-bearing capacity.
- ▶ Owing to the presence of a good percentage of clay (in most cases >25%), soils of the project area are potentially less permeable having very less susceptibility to erosion.
- ▶ The status of soil reaction (soil pH >7.5) in the project area shows the presence of liming material including calcium and magnesium. This phenomenon prevailing in soils will play a considerable role in reducing wetness in soggy and clayey soils enabling natural stabilization. On the other hand, the calcium combines with chloride present in the soils forming calcium chloride (popularly known as hydrated lime) may also supplement as an additive for obtaining optimum moisture during the construction of roads.
- ▶ Low soil salinity (<1.0 dS/m) with lower content of sodium in the soils of the project area will not play any role in damaging the soil stability since the soils are potential enough to attain compaction as influenced by the presence of ample clay particles and particle density as well.
- ▶ Besides, the clay content, porosity, and water holding capacity of the soils are not much favorable to increase surface soil salinity due to the capillary rise of salt water during the dry season.

Table 4-5: Test Results of Soil Physical Analysis

Sl. No.	Soil Profile Horizon	% Clay	% Silt	% Sand	Textural Class	Particle Density (g/cc)	Bulk Density (g/cc)	Porosity (%)	Water holding capacity (% by Vol.)	Permeability (cm/h)
SQ-1	Ap	58.48	33.92	7.60	Clay	2.56	1.56	39.1	31.77	Negligible
	Ad	48.07	44.84	7.09	Silty Clay	2.55	1.64	35.8	29.36	Negligible
	B21	2.23	38.58	9.19	Clay	2.59	1.48	42.9	30.19	0.4
	B22	57.91	36.23	5.87	Clay	2.57	1.57	38.8	29.87	0.1
	C1	58.58	33.97	7.44	Clay	2.49	1.46	41.2	35.09	0.2
	C2	44.45	46.55	9.00	Silty Clay	2.54	1.43	43.7	34.00	0.2
SQ-2	Topsoil	39.04	54.24	6.72	Silty Clay Loam	2.54	-	-	-	-
	Subsoil	23.04	61.36	15.60	Silt Loam	2.58	-	-	-	-
	Substratum	9.95	70.69	19.36	Silt Loam	2.65	-	-	-	-
SQ-3	Ap	30.73	56.04	13.22	Silty Clay Loam	2.47	1.37	44.5	31.36	1.4
	Ad	30.76	58.68	10.56	Silty Clay	2.46	1.50	39.1	31.32	1.0
	B21	25.58	63.83	10.58	Silt Loam	2.40	1.45	39.5	32.67	0.2
	B22	36.45	59.53	4.01	Silty Clay	2.54	1.42	44.1	31.98	0.8
	C1	28.41	64.38	7.21	Silt Loam	2.49	1.49	40.2	32.70	0.3
	C2	25.77	64.29	9.94	Silt Loam	2.61	1.44	44.8	33.02	0.4

Source: Primary Data Collection by the Environment Team, 19-20 April 2022

Table 4-6: Test Results of Soil Chemical Analysis

Sl. No.	Soil profile Horizon	Soil pH	Organic Carbon (%)	EC (μS/cm)	Salinity (ds/m)	Cl	SO ₃ (mg/kg)	Total N (%)	Total P (mg/kg)	Total S (mg/kg)	Total Na (ppm)	Lead (ppm)
SQ-1	Ap	27.32	1.20	3132.3	40.037	5266.25	633.50	70.131	8855.42	9855.42	0300.84	115.06
	Ad	27.69	0.312	362.30	40.051	51011.8	625.20	70.079	8671.88	9840.00	0268.89	113.58
	B21	27.77	0.234	360.90	40.042	5443.75	62825	70.051	8721.16	9836.54	0228.14	114.10
	B22	27.65	0.117	355.90	40.037	5266.25	626.50	70.024	8624.29	9713.19	0327.64	116.67
	C1	27.95	0.156	356.42	40.041	5337.25	626.50	70.0282	81276.32	9627.63	0176.91	18.55
	C2	27.20	0.039	370.35	40.068	588.75	636.50	70.024	8847.40	91012.99	0320.52	122.12
SQ-2	Topsoil	27.69	0.546	385.87	40.082	51118.3	627.00	70.076	81104.94	9882.72	0224.14	116.67
	Subsoil	27.80	0.156	365.82	40.750	5550.25	625.20	70.0342	8667.56	9643.62	0177.71	19.04
	Substratum	27.98	0.039	389.15	40.127	5230.75	627.75	70.020	8721.16	9641.45	0181.71	13.95
SQ-3	Ap	27.35	0.624	369.22	40.069	5408.25	629.25	70.104	81314.02	9765.24	0314.21	110.97
	Ad	27.51	0.429	382.00	40.031	5369.75	627.75	70.071	81467.11	9853.55	0253.22	113.15
	B21	27.73	0.609	357.89	40.061	5976.25	624.50	70.040	8752.81	9797.75	0265.06	110.11
	B22	27.59	0.117	3109.2	40.102	5479.25	626.00	70.026	81021.88	9846.85	0263.19	114.20
	C1	27.69	0.234	362.11	40.069	5798.75	626.75	70.0163	8713.33	9816.67	0285.53	111.99
	C2	27.55	0.117	370.59	40.077	5656.75	628.25	70.015	8791.67	9632.19	0242.05	110.89

Source: Primary Data Collection by the Environment Team, ESM of J-J Project Road, WeCARE, 19-20 April 2022

Joint Venture of



STUP Consultant Pvt. Ltd.
On July 1st, 2021, STUP was acquired by Assystem and rebranded as Assystem STUP.



BCL Associates Limited, Bangladesh

4.2.3 LANDUSE PATTERN

99. Identification, delineation, and mapping of Land use /Land cover are important for global monitoring studies, resource management, and planning activities. A land-use study has a pivotal role to identify and assess the likely impacts due to the proposed project on the land environment.

4.2.3.1 STUDY AREA

100. The land use map has been prepared for 500m width of each side of road alignment to assess the impacts on the land environment.

4.2.3.2 METHODOLOGY

101. The downloaded satellite imagery from Google Earth was visually interpreted for studying the qualitative as well as quantitative aspects of images. On-screen digitization of the GeoEye Data has been carried out. The study area layers have been exported to ESRI shapefile format and relevant attributes have been incorporated in GIS layer shapefiles. Land use spatial distribution statistics have been generated to study the land environment. The area statistics and maps generated have been presented in the following section.

4.2.3.3 LAND USE CLASSIFICATION

102. The land use classification system presented in this report includes the more generalized first and second levels to have an idea of changing land use patterns and the extent of spatial growth along the project road alignment. At the more generalized levels, it meets the principal objective of providing land use and land cover classification system for use in finding out land use patterns over the study area.

4.2.3.4 EXISTING LAND USE PATTERN ALONG THE PROJECT ROAD ALIGNMENT

103. The analysis of the existing land use pattern along the project road alignment has been carried out for the three (3) Contracts separately/for the entire alignment and is presented in Table 4-7.

Table 4-7: Distribution of Land Use and Affected Area of the Project Alignment (Phase1)									
Sl. No.	Land Type	Contract-1		Contract 2		Contract 3		Entire Alignment	
		Area (ha)							
		within 500m	Affected Area (ha)	within 500m	Affected Area	within 500m	Affected Area	within 500m	Affected Area
1.	Agricultural Land (Marsh Land, Low Land, Vegetation)	911.322	21.185	995.132	24.347	599.453	13.052	2505.907	58.584
2.	Industrial Area (Brick Kiln, Mini Factory, Industry)	20.375	1.268	10.01	0.687	0.375	0	30.76	1.955
3.	Educational Area (School, College, Madrasah, Training Institute, etc.)	3.148	0.366	7.096	1.002	14.83	0.774	25.074	2.142
4.	Commercial Area (Market, Bazar, Shopping Complex, Filling Station, etc.)	33.669	3.838	143.639	10.007	111.813	15.056	289.121	28.901
5.	Water Bodies (Ditch, Pond, River, Fisheries, etc.)	98.298	3.894	59.508	1.788	91.276	0.898	249.082	6.58
6.	Religious Area (Mosque, Temple, Dargah, etc.)	0.231	0.203	0.699	0.177	0.165	0.099	1.095	0.479
7.	Residential Area	447.186	16.465	266.872	4.795	645.727	7.947	1359.785	29.207

Table 4-7: Distribution of Land Use and Affected Area of the Project Alignment (Phase1)									
Sl. No.	Land Type	Contract-1		Contract 2		Contract 3		Entire Alignment	
		Area (ha)							
		within 500m	Affected Area (ha)	within 500m	Affected Area	within 500m	Affected Area	within 500m	Affected Area
	(Cantonment, Local Residence)								
8.	Zonal Road (Feed Road, Private Road, Side Road, Railway)	86.514	39.499	99.238	43.882	116.76	41.471	302.512	124.852
Total		1600.728	86.718	1582.194	86.685	1580.4	79.297	4763.322	252.7

104. As shown the Figure 4-10, predominant land use pattern within 500m is agricultural land followed by residential land, residential area, commercial area, zonal road, water bodies, and others.

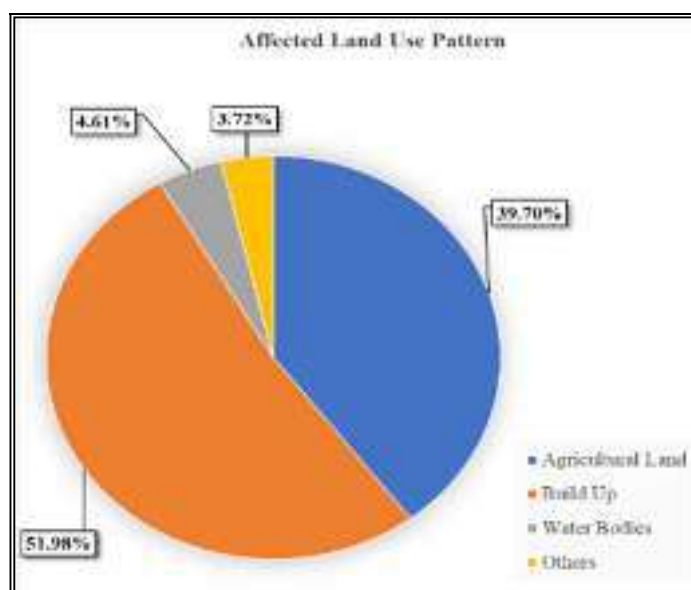
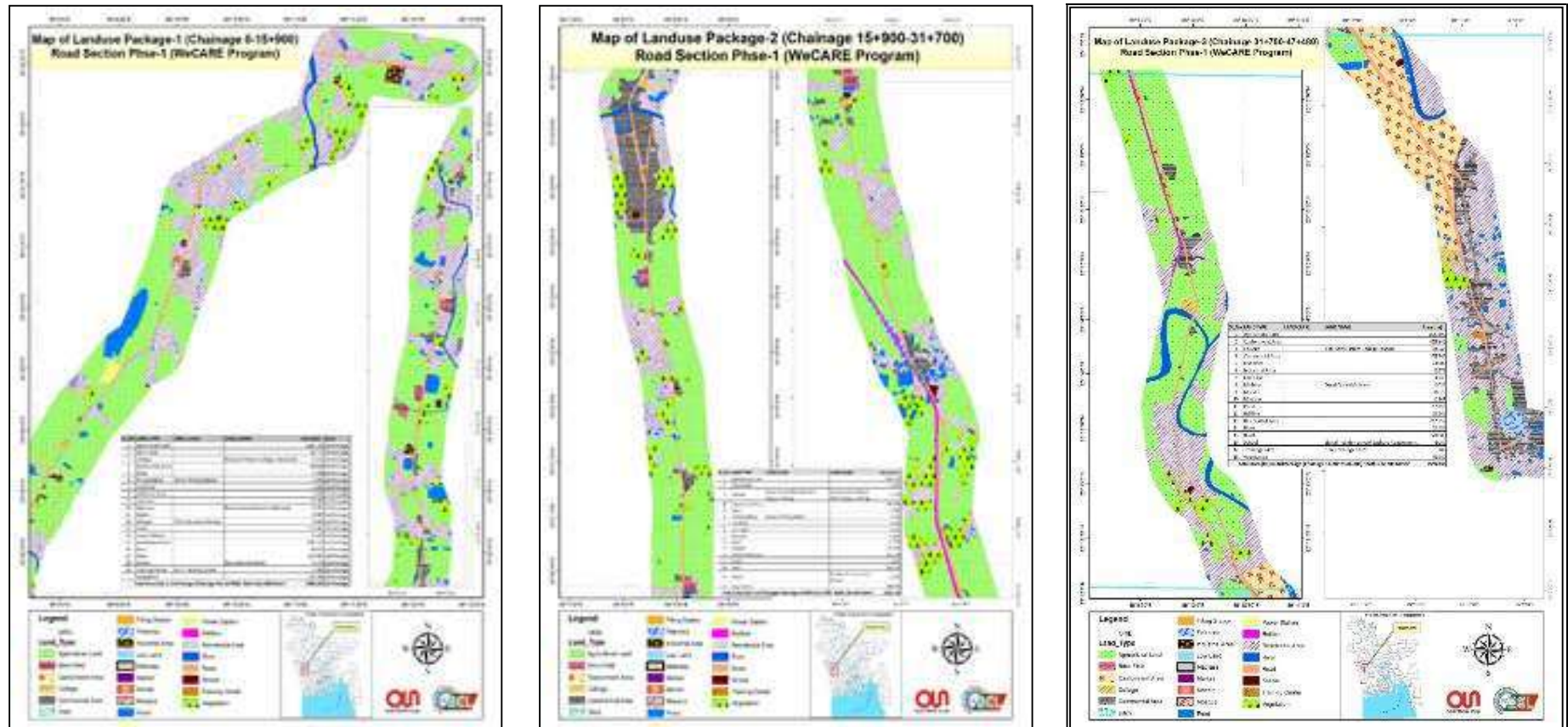


Figure 4-10: Land Use Pattern Along the Road Alignment

105. Whereas, the predominant land use pattern within affected area is agricultural land (23.18%), followed by zonal road (49.41%), residential area (11.56%), commercial area (11.44%), water bodies (2.6%), educational area (0.85%), industrial area (0.77%), religious structures (0.19%), etc. (Figure 4-11).



Contract-1

Contract-2

Contract-3

Figure 4-11: Land Use Pattern Along the Road Alignment

4.2.4 METEOROLOGICAL STUDY

4.2.4.1 CLIMATE

106. Bangladesh is located in the central part of the Asiatic monsoon region where the climate is tropical. The relatively small size of the country and generally low-lying areas cause moderate spatial variation of temperature, precipitation, relative humidity, wind speeds, and other climatic variables. However, the climate of Bangladesh exhibits pronounced temporal variability. This is because of the moisture-laden monsoon winds flowing predominantly from the southwest during summer and the comparatively dry and colder north-western winds during winter.

107. The project area has a humid subtropical climate with large variations between summer and winter temperatures. The cluster has a tropical monsoon climate. It has three main seasons.

- ▶ Summer/Pre-monsoon - March to May
- ▶ Rainy Season/Monsoon - June to September
- ▶ Post-Monsoon - October to November
- ▶ Winter Season - December to February

108. According to the Köppen climate classification, the project area falls under the Aw category which is characterized by the tropical wet and dry climate. This region experiences hot and humid summer, and dry winter. Whereas, according to these climatic characteristics, Bangladesh is divided into seven different climatic sub-regions. Under these climatic sub-regions, the project area falls under category F, which is the south-western climatic sub-region of the country according to the Figure 4-12. In general, this zone receives abundant rainfall having 85 percent of annual rainfall.

109. The winter is predominately cool and dry. The summer is hot and dry interrupted by occasional heavy rainfall. The annual average maximum temperature is 35.7 °C and the average minimum temperature is about 10.6 °C. The annual average rainfall is about 1402 mm. This is a transitory zone between the Southeastern, North-western, and South-western zones, and most of the severe hail storms, nor'westers and tornadoes have been recorded in the category 'F' Area.

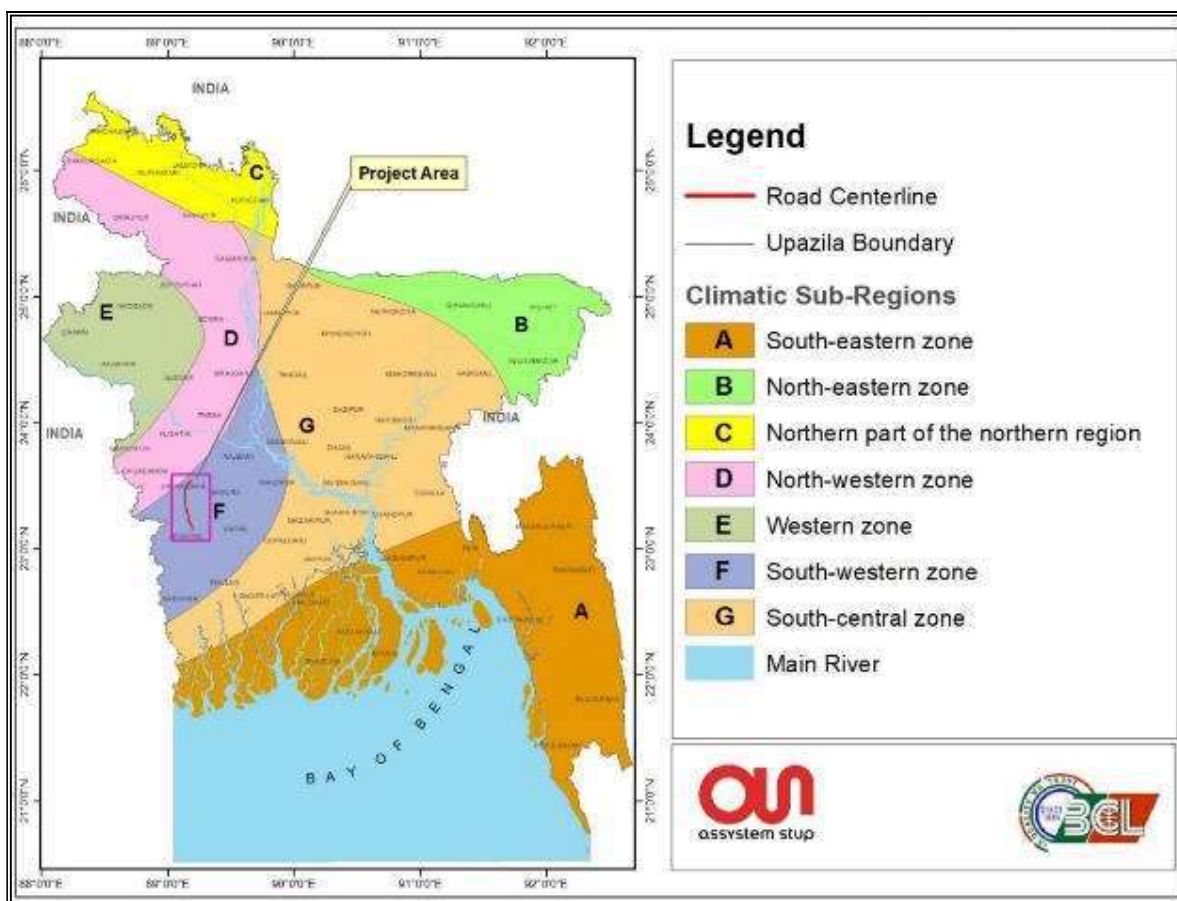


Figure 4-12: Climate Sub-Region of ESMP for Jhenaidah-Jashore Road Section (WeCARE)

Sources: Climate Cell, Department of Environment, MoEF, 2020

Different meteorological data like rainfall, temperature, relative humidity, and wind speeds monitored at the meteorological station in Jashore is summarized in Table 4-8.

Table 4-8: Monthly Averages of Climatic Variables of the Project Site, 2012-2021

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean Temp (°C)	16.7	21.2	26.0	28.9	30.1	30.0	29.2	29.3	29.2	27.2	22.9	18.2
Max Temp (°C)	30.4	35.4	39.6	42.4	42.2	40.8	37.8	37.4	37.4	36.8	34.2	31.6
Min Temp (°C)	9.0	17.0	23.8	25.8	27.4	27.8	27.4	27.4	27.0	25.0	20.4	15.2
Rainfall (mm)	0.0	1.1	0.7	2.7	4.2	5.1	9.3	4.9	4.0	3.0	0.6	0.3
Humidity (%)	77.8	72.6	67.6	71.2	74.4	79.2	83.6	83.3	82.9	81.9	78.5	80.3
Avg. Wind speed (knot)	3.07	3.47	4.03	5.07	5.12	4.15	4.14	4.12	3.66	3.16	2.29	2.73
Max. Wind Speed (knot)	11.3	18.0	12.0	17.3	18.0	12.0	13.0	15.3	12.0	12.3	14.0	7.5

Source: Jashore Meteorological Station, Bangladesh Meteorological Department (BMD), 2021

4.2.4.2 TEMPERATURE

110. The project area experiences significant temperature variations as the season's change. May is the hottest month, with an average monthly high temperature of 35.7°C. The project area, on the other hand, has a milder summer than inland locations, particularly the northwest district, where summer temperatures can reach 40°C. The temperature drops dramatically in June owing to monsoon outbreaks. The monthly average temperature during the monsoon is around 29.5°C. The cool, dry winter season begins in November, and the coldest month is January, with an average minimum temperature of 10.6°C depicted the Figure 4-13.

4.2.4.3 RAINFALL

111. Between 2012 and 2021, the project area received an average rainfall of roughly 2.99 mm. The southern monsoon is the main source of rain. Between May and September, over 85% of total rainfall falls. The Northwestern influence causes some rainfall in March and April. Winter is the driest season, with little or no rain. However, little rain is recorded during December and February as per the Figure 4-14. According to the climate cell of the Department of Environment, huge changes have been seen in climatic variables such as heavy rainfalls during winter, droughts during summer, hailstorms in monsoon, and excessive temperature in pre-monsoon and monsoon seasons, and so on in the previous few years. The highest monthly average rainfall occurred in July (179.0 mm), with the lowest monthly average rainfall recorded during the winter season. This indicates that the rainy season is very prevalent in this area. During the monsoon season, the average monthly rainfall in the project area is 5.82 mm. Maximum rainfall during the monsoon season (June-September) ranges from 66.0 mm to 179.0 mm, according to records. Winter is the driest season, lasting from December to February, with an average rainfall of 0.50 mm.



Figure 4-13: Temperature Variation in Jashore Region from 2012 to 2021

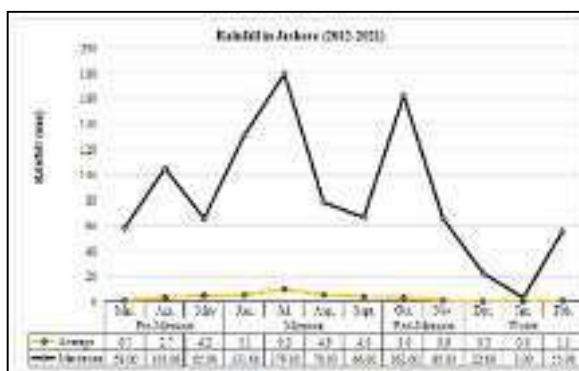


Figure 4-14: Average Rainfall Variation in Jashore Region from 2012 to 2021

Source: Jashore Meteorological Station, Bangladesh Meteorological Department (BMD), 2021

4.2.4.4 HUMIDITY

112. As expected, humidity during the wet season is significantly higher than the other times of the year, as shown the Figure 4-15. The maximum average relative humidity for the project area is 93.9 percent in August, and the minimum relative humidity is 55.4 percent in March. Humidity is relatively dependent on temperature variations and fluctuates continuously based on the temperature of the project area. There has been a tremendous weather change observed in the project area over the last 10 to 20 years of meteorological data.



Figure 4-15: Relative Humidity Variation in Jashore Region from 2012 to 2021

Sources: Jashore Meteorological Station, Bangladesh Meteorological Department (BMD), 2021

4.2.4.5 WIND SPEED AND DIRECTION

113. Wind may be the most significant and influential weather factor. As a result, knowing the direction and velocity is critical. To comprehend wind factors, the Wind Rose model is used to depict the prevailing wind conditions in the project area based on seasonal variation. The wind rose indicates the number of hours per year that the wind blows from the indicated direction. According to the wind rose diagrams, the region is primarily characterized by West, West-Southwest, North, and North-West wind flow. In a year, wind speeds ranging from 0 to 4 knots dominated the entire wind speed spectrum.

114. Wind direction varies in the project area due to monsoonal variations in the climate. The southwesterly monsoon begins in the middle of March and ends around the end of September. From March to October, monsoon winds blow from the south with sustained force; in January, winds blow from the north and northeast. February is a quiet month, with foggy mornings in particular. Figure 4-16 shows the seasonal monthly maximum wind speed direction rose plot from 2012 to 2021 duration.

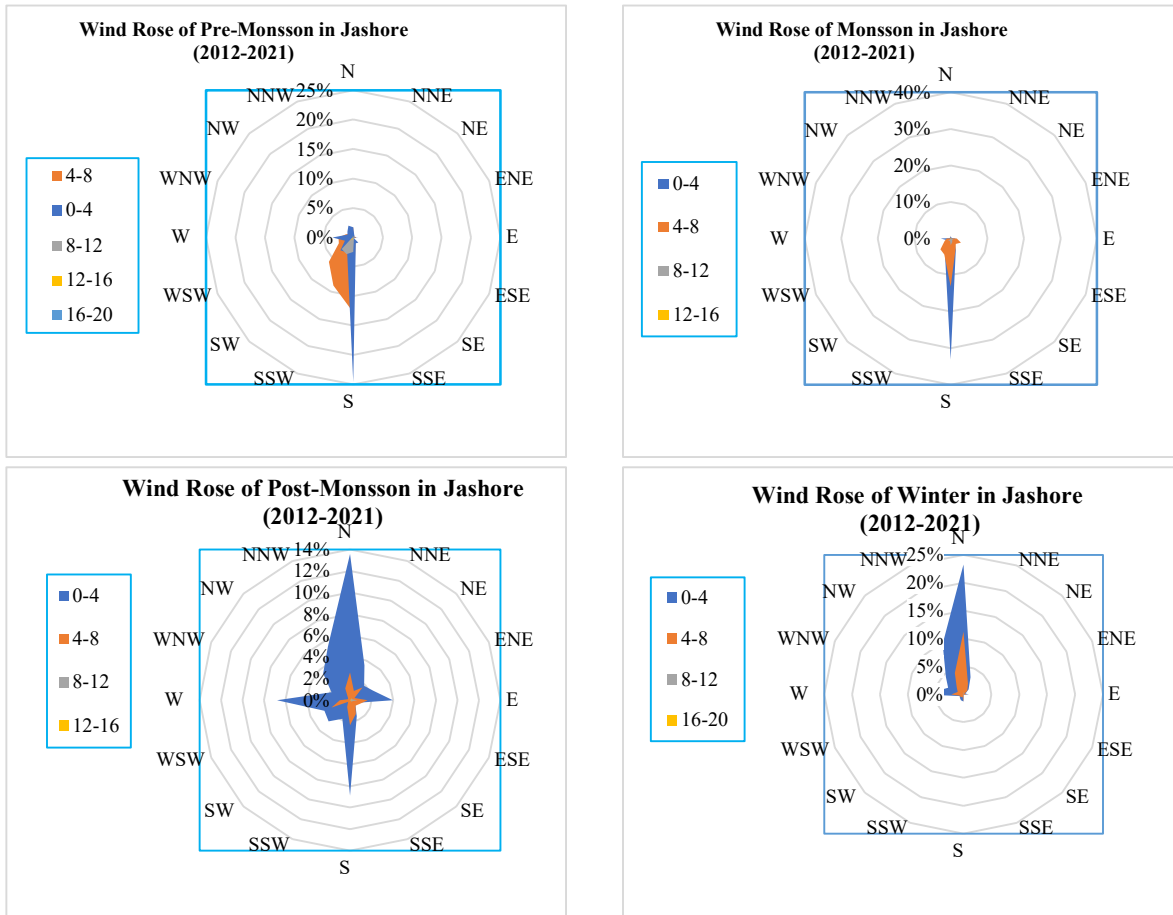


Figure 4-16: Seasonal Variation of Wind Rose in Jashore during the Years of 2012-2021

Source: Jashore Meteorological Station, Bangladesh Meteorological Department (BMD), 2021

4.2.5 AMBIENT AIR QUALITY

115. In the project area, there are several small and large brick kilns, one rice mill, one sugar mill, and a few frozen factories/industries. Furthermore, there are numerous brick kilns located along the project corridor. As a result, air pollution along the project corridor is limited and relatively mild. Road dust, black smoke from diesel engines, construction dust, windblown dust from agricultural lands, residential heating and cooking, and transit all contribute to air pollution in the project area.

116. Measurements of ambient air quality were taken in nine (09) places along the Project Road. The sampling locations were chosen in commercial areas, residential areas, educational institutes, and mixed areas where a large number of people show up during the day and where the greatest number of people may be exposed to air pollution during road construction. The monitoring photographs are presented in Figure 4-17, Figure 4-18 and Figure 4-19. The ambient air quality monitoring locations shows in Annex 4-12. For ambient air quality monitoring and analysis, standard procedures were followed. Samples obtained at each sampling location were examined for important air quality indices Particulate Matter of a diameter of 10 microns or less (PM₁₀), Particulate Matter of a diameter of 2.5 microns or less (PM_{2.5}); Suspended Particulate Matter including 2.5 and 10 microns (SPM); Nitrogen Dioxides (NO₂); Sulphur Dioxides (SO₂); Ozone (O₃); Carbon Monoxides (CO); Carbon Dioxides (CO₂) and meteorological indices e.g., Air Temperature, Pressure, Humidity, Wind Speed, and Direction. The following Table 4-9 depicts the air quality monitoring points in the project region.

Table 4-9: Ambient Air Quality Monitoring Details					
Sl. No.	Code	Locations	Area Settings	GPS Coordinate	Date and Time
1.	AAQ1	In front of Rahim's Stationary Shop, Al-Hera Moor, Jhenaidah	Mixed Zone	23°31'22.79"N 89°10'9.86" E	30.05.2022 09:29:23 AM
2.	AAQ2	Premises of Narish Silo Project, Bishoykhali, Jhenaidah	Industrial Zone	23°26'41.08"N 89° 8'19.36"E	30.05.2022 04:39:27 PM
3.	AAQ3	Premises of Govt. Mahtab Uddin Degree College, Kaliganj, Jhenaidah	Silent Zone	23°24'57.97"N 89° 8'10.82"E	30.05.2022 01:44:12 PM
4.	AAQ4	Infront of Bazar Mosque, Dulalmundia Bazar, Kaliganj, Jhenaidah	Commercial Zone	23°22'50.47"N 89° 8'17.33"E	31.05.2022 03:40:17 PM
5.	AAQ5	Premises of Nazir's House, Jamtola-Pirojpur, Kaliganj, Jhenaidah	Residential Zone	23°19'18.33"N 89° 8'47.43"E	31.05.2022 12:53:05 PM
6.	AAQ6	Premises of Hat Barobazar High School, Kaliganj, Jhenaidah	Silent Zone	23°18'3.32"N 89° 9'16.43"E	31.05.2022 10:45:18 AM
7.	AAQ7	Premises of Kazi Nazrul Islam College, Barinagar, Jashore	Silent Zone	23°14'39.09"N 89° 9'59.21"E	01.06.2022 09:20:18 AM
8.	AAQ8	Surrounding Area of Jashore Cantonment, Khayertala, Jashore	Mixed Zone	23°11'23.54"N 89°11'4.40"E	01.06.2022 01:06:25 PM
9.	AAQ9	In Front of Hazi Azharul Islam Market, Dharmatala Moor, Jashore	Commercial Zone	23° 9'52.51"N 89°11'36.39"E	01.06.2022 04:04:02 PM

Source: Primary Data Collection by the Environment Team of STUP-BCL JV, May 2022



Figure 4-17: Air Quality Monitoring Activities at three Location Under Contract-1



Figure 4-18: Air Quality Monitoring Activities at three Location Under Contract-2



Figure 4-19: Air Quality Monitoring Activities at three Location Under Contract-3

Source: Primary Data Collection by the Environment Team of STUP-BCL JV, May 2022

117. Among all the parameters of ambient air CO, CO₂ and O₃ had been converted for 8 hours and the rest of the parameters were transformed on a 24-hourly basis. Both particulate and gaseous samples had been analyzed as per the proper procedures. Analysis results of every location are briefly mentioned in the following Table 4-10. The test sheets of ambient air quality have been attached in Annex 4-2.

Table 4-10: Results of the Ambient Air Quality Tastings

Sl. No.	Code	Concentrations (µg/m ³)						CO (ppm)	CO ₂ (ppm)
		PM _{2.5}	PM ₁₀	SPM	NO ₂	SO ₂	O ₃		
1.	AAQ1	10.5	19.1	38.8	39.2	167.2	37.8	0.761	193.3
2.	AAQ2	11.9	22.2	43.7	22.6	139.8	22.6	0.695	173.1
3.	AAQ3	19.6	33.7	70.8	27.4	145.2	13.6	0.620	195.1
4.	AAQ4	15.3	29.3	61.2	25.4	194.4	16.9	0.563	192.5
5.	AAQ5	14.1	27.3	61.2	22.0	187.6	15.0	0.607	179.73
6.	AAQ6	20.2	35.2	97.8	33.4	145.9	23.5	0.385	146.04
7.	AAQ7	23.0	47.1	112.8	31.7	139.1	22.4	0.159	120.54
8.	AAQ8	27.6	48.8	115.5	34.8	184.1	28.7	0.357	167.1
9.	AAQ9	17.9	38.9	89.5	39.4	152.4	20.2	0.863	147.3
National Standard ¹⁵		65	150	200	-	365	157	9	-

Source: Primary Data Collection by the Environment Team of STUP-BCL JV, May 2022

118. **Result and Discussion:** Ambient air quality in the study area has been monitored and compared with the applicable standard of Bangladesh considering Environmental Conservation Rules (ECR) 1997, Schedule 2 and Subsequent Amendment as National Ambient Air Quality Standard (NAAQS) 2005. According to the monitoring results, dust particles (particulate matter) e.g., PM_{2.5}, PM₁₀, and SPM have been observed below the national standard of Bangladesh. Locations defining AAQ7 and AAQ8 are picking high concentrations of particulate matter than the others but not alarming to the environmental hazardous situation. Therefore, dust pollution is a common phenomenon in the perspective of Bangladesh including this project area due to a lot of vehicle movement, sand excavation, extraction, transportation, local construction, road dust, etc. Besides, the main reasons for dust or particulate matter abundance are the unconsciousness of people. According to the field monitoring team, there have been no natural aspects or suspicious things observed in dust pollution on the project road alignment. Gaseous parameters such as NO₂, SO₂, CO, CO₂, O₃, etc. have also been observed under the standard of Bangladesh depicted in Figure 4-20 but CO₂ concentration always showed the higher value, which has no set standard value in the ECR, 1997. Depending on the deep clarification of the higher value of the mentioned parameters in the study area, the first reason behind this is the cooking practices of the local people. They are most preferably depending on wood for cook and other combustion activities like brick fields. More scientifically it proved that combustion or incineration of wood products will increase the NO₂, SO₂, and CO₂ continuously. Besides, gasoline (diesel, petrol, kerosene, etc.) fuel combustion for transport,

¹⁵ Environmental Conservation Rules (ECR) 1997, Schedule 2 and Subsequent Amendment as National Ambient Air Quality Standard (NAAQS) 2005.

vehicle, and household purposes is also responsible for increasing the higher value of gaseous substances in the atmosphere more specifically in the project surroundings. Natural phenomena have not been observed or known for increasing the concentration of gaseous substances in the atmosphere.

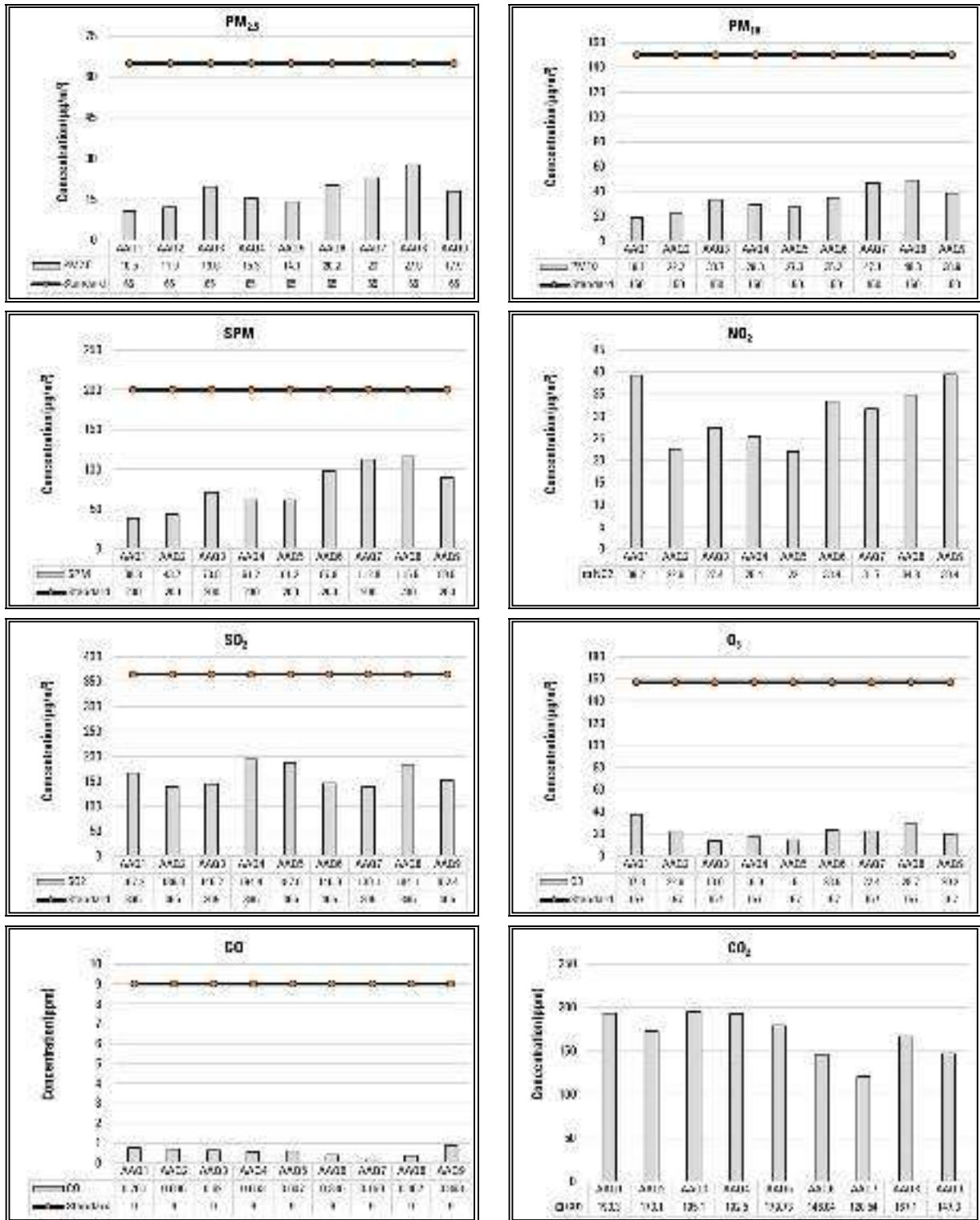


Figure 4-20: Recorded Air Quality Results with Standard Comparison

Source: Primary Data Collection by the Environment Team of STUP-BCL JV, May 2022

Figure 4-21: Micro-meteorology of Wind Speed and Wind Direction

4.2.6 AMBIENT NOISE LEVEL

121. Daily sound pressure levels of 50 decibels (dB) or higher can cause discomfort in humans, according to the World Health Organization's Guidelines for Community Noise (1999), while ongoing exposure to sound pressure levels over 85 dB is usually considered the critical level for temporary hearing damage. Three primary sources of noise have been identified in the project area:

- Road Traffic: Road traffic is one of the most significant sources of noise in the project area. This roadway transports a large number of both motorized and non-motorized vehicles, resulting in noise pollution along the road corridors.
- Industries: There are few industries and factories in the project area. Noise is generated in the project area by these industries and manufacturing units. However, while noise from agro-based sectors is minimal, other types of enterprises, particularly roadside brick crushing plants and truck loading and unloading of bricks, cause significant noise in the impacted area.
- Commercial / Bazar Areas: There are some business or refreshment places where a large number of people always congregate and create constant turmoil and source of noise pollution.

122. To determine the baseline ambient noise level in the project area, the noise monitoring was carried out along the project at same nine locations where ambient air quality monitored. The photographs of monitoring under three contracts are shown in Figure 4-22, Figure 4-23 and Figure 4-24. The noise level monitoring locations shows in Annex 4-12.

123. Noise levels have been recorded at nine locations in the study area. Noise levels have been recorded in the form of sound pressure levels using a digital sound level meter. Detail list of noise level sampling locations is given in Table 4-12. The sound level is recorded in form of A-weighted equivalent continuous sound pressure level (L_{eq}) values with the use of A-weighting filters in the noise measuring instrument.

Sl. No.	Code	Locations	Area Settings	GPS Coordinate	Date	Time	
						Day	Night
1.	ANL1	In front of Rahim's Stationary Shop, Al-Hera Moor, Jhenaidah	Mixed Zone	23°31'22.69"N 89°10'9.89"E	30.05.2022	09:31:04 AM	09:04:05 PM
2.	ANL2	Premises of Narish Silo Project, Bishoykhali, Jhenaidah	Industrial Zone	23°26'41.33"N 89° 8'17.86"E	30.05.2022	04:35:18 PM	08:45:18 PM
3.	ANL3	Premises of Govt. Mahtab Uddin Degree College, Kaliganj, Jhenaidah	Silent Zone	23°24'57.93"N 89° 8'10.55"E	30.05.2022	01:40:11 PM	10:28:04 PM
4.	ANL4	Infront of Bazar Mosque, Dulalmundia Bazar, Kaliganj, Jhenaidah	Commercial Zone	23°22'50.17"N 89° 8'17.46"E	31.05.2022	03:38:23 PM	07:11:00 PM
5.	ANL5	Premises of Nazir's House, Jamtola-Pirojpur, Kaliganj, Jhenaidah	Residential Zone	23°19'18.06"N 89° 8'47.50"E	31.05.2022	12:50:00 PM	08:37:57 PM
6.	ANL6	Premises of Hat Barobazar High School, Kaliganj, Jhenaidah	Silent Zone	23°18'3.01"N 89° 9'16.39"E	31.05.2022	10:42:09 AM	10:05:42 PM
7.	ANL7	Premises of Kazi Nazrul Islam College, Barinagar, Jashore	Silent Zone	23°14'39.03"N 89° 9'59.88"E	01.06.2022	09:17:11 AM	06:55:43 PM
8.	ANL8	Surrounding Area of Jashore Cantonment, Khayertala, Jashore	Mixed Zone	23°11'23.02"N 89°11'4.73"E	01.06.2022	01:00:54 PM	08:13:24 PM
9.	ANL9	In Front of Hazi Azharul Islam Market, Dharmatala Moor, Jashore	Commercial Zone	23° 9'52.37"N 89°11'36.45"E	01.06.2022	03:54:00 PM	08:13:24 PM

Source: Primary Data Collection by the Environment Team of STUP-BCL JV, May 2022



Figure 4-22: Noise Level Monitoring Activities on Contract-1



Figure 4-23: Noise Level Monitoring Activities on Contract-2



Figure 4-24: Noise Level Monitoring Activities on Contract-3

Source: Primary Data Collection by the Environment Team of STUP-BCL JV, May 2022

An electronic and auto-recorded noise meter has been used to conduct the study. The recorded noise levels monitoring results are shown in Table 4-13 and results sheet in Annex 4-3.

Table 4-13: Ambient Noise Level Analysis Results

Sl. No.	Code	Noise Level (dBA)							*Standard (dBA)	
		Leqday	Leqnight	L _{max}	L _{min}	L ₁₀	L ₉₀	L ₅₀	Day	Night
1.	ANL1	68.2	57.5	70.6	53.0	62.2	79.2	41.2	60	50
2.	ANL2	61.6	50.5	63.5	49.6	56.5	74.5	45.6	75	70
3.	ANL3	64.0	52.2	67.3	47.7	57.4	72.6	40.3	50	40
4.	ANL4	61.7	49.2	63.6	41.6	54.5	71.4	37.4	70	60
5.	ANL5	63.8	48.7	66.5	45.2	58.1	69.8	36.1	55	45
6.	ANL6	55.1	46.4	57.6	38.6	52.1	62.2	35.4	50	40
7.	ANL7	58.3	45.3	62.0	42.8	53.0	65.9	41.5	50	40
8.	ANL8	59.1	47.8	63.1	42.3	53.2	64.9	38.8	60	50
9.	ANL9	65.9	55.1	68.0	48.0	60.6	74.8	43.0	70	60

Note: *Environmental Conservation Rules 1997, Schedule 4 and Subsequent Amendment as Noise Pollution Control Rules 2006, Schedule 1

124. **Discussion:** According to the categorization of the locations following ECR 1997 Schedule 4, and subsequent Amendment as Noise Pollution Control Rules 2006, Schedule 1, the project locations fall into four categories. Almost all of the locations alongside the existing highway have been exceeded the standard in Bangladesh except ANL2, ANL4, ANL8, and ANL9.

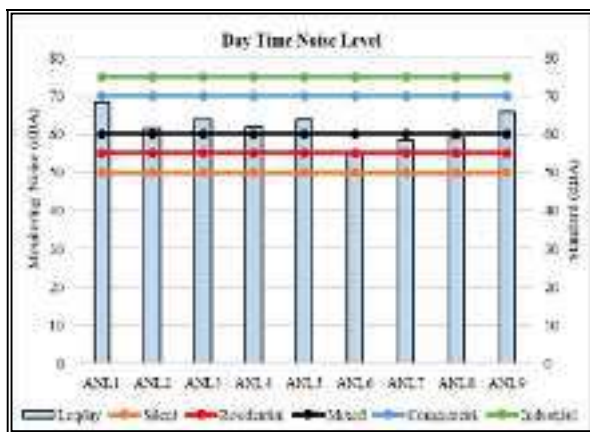


Figure 4-25: Day Time Noise Level and Standard of Bangladesh

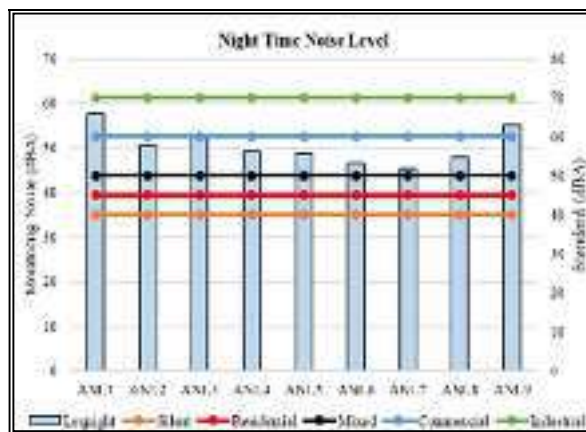


Figure 4-26: Night Time Noise Level and Standard of Bangladesh

125. Road transport, vehicle, local people screaming, crowds, local construction, and industrial activities are the main reasons for noise pollution with the respect to noise monitoring points during daytime. The highest noise has been captured in ANL1 (Rahim's Stationary Shop, Al-Hera Moor, Jhenaidah) at 68.2 dBA and the lowest noise was captured in ANL6 (Kazi Nazrul Islam College, Barinagar, Jashore) at 55.1 dBA that also depicted as diagram in Figure 4-25. ANL1 is an important intersection and joint bypass road of Jhenaidah and it is the busiest area due to locations of a few hospitals and other public service offices including school, college, Madrasha, etc. Other locations e.g., silent and residential areas are affected due to highway adjacent classrooms, living rooms, mosques, temples, Eidgah, and rest houses. The construction activities for road construction may increase the noise generation more than the current status in the mentioned infrastructures.

126. During the noise monitoring the vehicle transportation was higher at night time than in the daytime. However, the noise level (Leq) in ANL2, ANL4, ANL8, and ANL9 have been also shown under the standard of Bangladesh at nighttime (Diagram in Figure 4-26). The residential and silent zone of the selected locations Nazir's House, Jamtola-Pirojpur, Kaliganj (ANL5) Govt. Mahtab Uddin Degree College, Kaliganj (ANL3), Barobazar High School (ANL6) and Kazi Nazrul Islam College (ANL7) Jashore were exceeded the standard due to the load truck movement, industrial activities, hydraulic horn, local transportation, etc. in the nighttime. Besides, anthropogenic activities such as loudly miking, parties, religious programs, individual parties, etc. are also responsible for higher noise in the study locations.

4.2.7 AMBIENT VIBRATION LEVEL

127. The project area's vibration intensity is negligible. The vibration from traffic on a neighboring road, on the other hand, is insignificant. On focusing on the heavy vehicle movement, vibration levels were measured at close to nine locations where air and noise monitoring were carried out (Figure 4-27, Figure 4-28 and Figure 4-29). An electronic and auto-recorded vibration meter has been used to conduct the measurement at three locations in each contract contracts. The ambient vibration monitoring locations shows in Annex 4-12. The vibration level has been recorded at nine locations in the study area using a digital vibration level meter. Detail list of vibration level monitoring locations is given in Table 4-14.

Table 4-14: Vibration Level Monitoring Details

Sl. No.	Code	Locations	Area Settings	GPS Coordinate	Date and Time
1.	VL1	In front of Rahim's Stationary Shop, Al-Hera Moor, Jhenaidah	Mixed Zone	23°31'22.40"N 89°10'9.95" E	30.05.2022 09:35:09 AM
2.	VL2	Premises of Narish Silo Project, Bishoykhali, Jhenaidah	Industrial Zone	23°26'41.40"N 89° 8'16.49"E	30.05.2022 04:40:09 PM
3.	VL3	Premises of Govt. Mahtab Uddin Degree College, Kaliganj, Jhenaidah	Silent Zone	23°24'57.79"N 89° 8'10.17"E	30.05.2022 01:47:09 PM

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Table 4-14: Vibration Level Monitoring Details

Sl. No.	Code	Locations	Area Settings	GPS Coordinate	Date and Time
4.	VL4	Infront of Bazar Mosque, Dulalmundia Bazar, Kaliganj, Jhenaidah	Commercial Zone	23°22'49.98"N 89° 8'17.82"E	31.05.2022 03:43:00 PM
5.	VL5	Premises of Nazir's House, Jamtola-Pirojpur, Kaliganj, Jhenaidah	Residential Zone	23°19'17.57"N 89° 8'47.01"E	31.05.2022 12:54:09 PM
6.	VL6	Premises of Hat Barobazar High School, Kaliganj, Jhenaidah	Silent Zone	23°18'2.44"N 89° 9'15.19"E	31.05.2022 10:46:00 AM
7.	VL7	Premises of Kazi Nazrul Islam College, Barinagar, Jashore	Silent Zone	23°14'39.05"N 89°10'1.98"E	01.06.2022 09:22:25 AM
8.	VL8	Surrounding Area of Jashore Cantonment, Khayertala, Jashore	Mixed Zone	23°11'24.77"N 89°11'2.57"E	01.06.2022 01:08:00 PM
9.	VL9	In Front of Hazi Azharul Islam Market, Dharmatala Moor, Jashore	Commercial Zone	23° 9'52.29"N 89°11'36.87"E	01.06.2022 03:59:55 PM

Source: Primary Data Collection by the Environment Team of STUP-BCL JV, May 2022



Figure 4-27: Vibration Level Monitoring Activities under Contract-1



Figure 4-28: Vibration Level Monitoring Activities under Contract-2



Figure 4-29: Vibration Level Monitoring Activities under Contract-3

Source: Primary Data Collection by the Environment Team of STUP-BCL JV, May 2022

128. An electronic and auto-recorded vibration meter has been used to conduct the study. The recorded vibration levels summary monitoring results are shown in Table 4-15. The test sheets of vibration level have been attached in Annex 4-4.

Table 4-15: Vibration Level Analysis Results

Sl. No.	Code	Vibration Level (mm/s)			Standard (mm/s)
		Average	Maximum	Minimum	

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Table 4-15: Vibration Level Analysis Results

Sl. No.	Code	Vibration Level (mm/s)			Standard (mm/s)
		Average	Maximum	Minimum	
1.	VL1	0.63	1.2	0.13	Not Set Yet for Bangladesh
2.	VL2	0.87	1.95	0.12	
3.	VL3	0.96	1.91	0.23	
4.	VL4	0.74	1.27	0.11	
5.	VL5	0.71	1.90	0.27	
6.	VL6	0.64	1.02	0.28	
7.	VL7	0.62	1.23	0.09	
8.	VL8	0.79	1.37	0.08	
9.	VL9	0.91	1.67	0.23	

129. The vibration level in the project area has been observed as a negligible state. The government of Bangladesh has not set any standard for vibration level in the perspective of construction or other activities. Therefore, the average vibration level is captured from 0.62 to 0.96 mm/s on the existing highway (Figure 4-30). A lot of vehicles have been moving on this highway during both daytime and nighttime. The main sources of vibration generation in the study area are road traffic, local construction, heavy trafficking, industrial activities, etc.

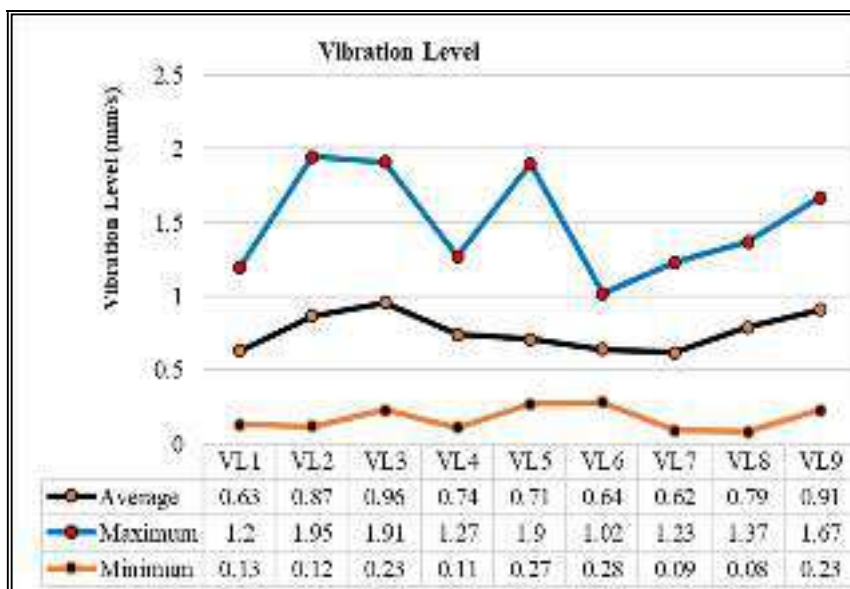


Figure 4-30: Maximum, Average and Minimum Vibration

4.2.8 HYDROLOGY AND WATER RESOURCE

4.2.8.1 GENERAL HYDROLOGY AND RIVER NETWORK

130. A multitude of rivers and canals intersect the project site. At many points, the project road alignment crosses rivers such as the Naboganga River at Vutiarghati, Begobati River at Bishoykhali, Chitra River at Kaliganj and Bhairab River at Churamankathi and there are numerous beels and canals in and around the project sites. The rivers now have almost lost their navigation routes.

131. **Naboganga River:** Nabaganga river is one of the offshoots of Mathabhanga river. This river originates from the Chuadanga city and joins with Kumar at Magura and Chitra at Narail. It is a meandering river which has a very narrow width before joining the river Kumar at Magura district. From observation on the river site crossing the N7 at Vutiarghati, Gobindapur, the average width of this river is seemed to be about 25 meter in dry season. The river water seemed less fresh and lean season flow during the dry months of February – April. It undergoes comparatively less pollution than Begobati and Chitra as it crosses N7 through

a village area. The river is about 214 km long. Maximum and minimum widths of the river are 409 m and 24 m respectively. The average width of the river is about 85 m. The river has a slope of 4 cm per km. The historical image of the during 2003, 2010 and 2017 as shown in Figure 4-31.

132. Most fishermen catch fish from this river and fish catching is more or less ample round the year. There is a licensed society of 34 fishermen who catch fish from this river. Besides, more than 5 fishermen were seen catching fishes from the bridge at the intersecting point of Nabaganga and N7 highway. The presence of water hyacinth was less than average.



Figure 4-31: Historical Image of the Nabaganga River Crosses the Project Road

133. **Begobati River:** Begobati River is an offshoot of the river Mathabhanga. It originates near the Chuadanga city and flowing through Bishoykhali, where it crosses the N7 highway, it falls into the Bhaduri Beel. The river has a meandering pattern and it doesn't show any erosional tendency. The river crosses N7 road through the heart of Bishoykhali Bazar, Jhenaidah and has a very narrow width during dry season (approximately 20 m). It is a seasonal, meandering tidal river with higher flow during monsoon months of July – September. The river dries out during the dry months of January – April. The river is about 53 km long. Maximum and minimum widths of the river are 70 m and 14 m respectively. The average width of the river is about 32 m. The historical images of Begobati River are depicted in Figure 4-32.

134. The river is seen to have a high pollution rate as it is near the Bazar area and people dump market garbage in the river. Besides, high water hyacinth presence was also observed. There was no flow of water during dry season and high siltation and sediment were seen. Less fish catching was observed in the river site.



Figure 4-32: Historical Image of the Begobati River Crosses the Project Road

135. **Chitra River:** Chitra River crosses the Jhenaidah part of N7 through the Kaliganj Upazila. It originates from the lower part of Chuadanga and Darshana Upazilas, passing through Darshana, Kaliganj, Jashore, Salikha, and Kalia Upazilas until joining the Narail district's Nabaganga River at Gazirhat and then met Bhairab River at Daulathpur Upazila in Khulna district.

136. The Chitra was once an offshoot of the Ichamati, but due to siltation at its mouth, it became a distributary of the Nabaganga. From its original site to Salikha, the river is heavily silted up and impassable. The river is navigable for launch and engine boats etc. from Khulna. A flood control, drainage, and irrigation project has been built an embankment along the river's left bank from Rathdanga to Gazirhat. The river shows no signs of eroding or overflowing its banks. Except for occasional meanders at Salikha Upazila, it follows a straight path and some river ports are developed alongside Chitra river at Kaliganj, Salikha, Narail, and Gazirhat.

137. The river doesn't show any tendency to erode or overflow its banks. Here the presence of water hyacinth has been seen during dry season. Though it contains less water and flows through a market, it showed less garbage pollution than Begobati. The amount of fish catchment here is quite good and fishermen were seen catching fish from the crisscross spot of Chitra river crosses the N7 highway. It flows though the mid of Kaliganj bazar of Kaliganj Upazila, Jhenaidah. The historical images on changes of river morphology during the years 2004, 2013 and 2018 as shown in Figure 4-33.

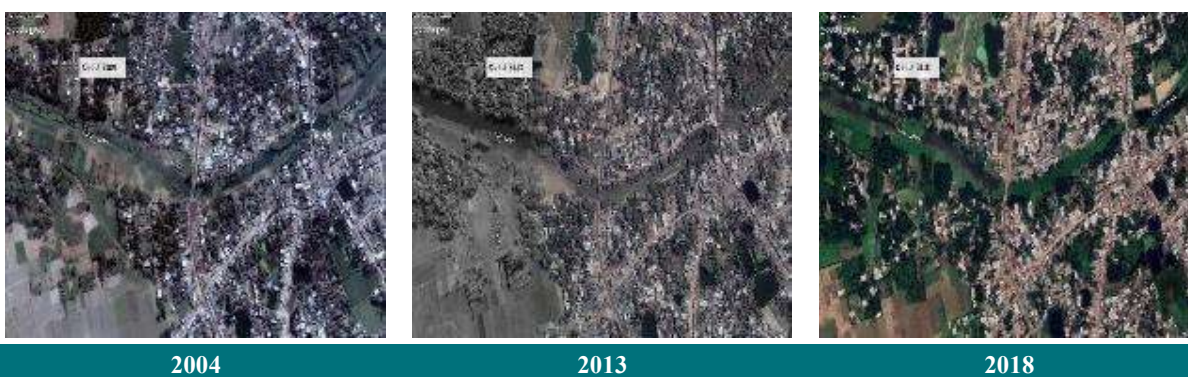


Figure 4-33: Historical Image of the Chitra River Crosses the Project Road

138. **Bhairab River:** Bhairab River is a distributary of Padma River and it flows a long meandering path before it meets Rupsha River in Khulna district. The Bhairab River, a Ganges distributary, flows through Bangladesh's southwest flows a long meandering path before it meets Rupsha River in Khulna district. It divides Khulna into two halves as it goes through it. The Bhairab River flows through Jashore city, beginning at the Tengamari boundary of Meherpur District. The river is 160 kilometers long and 300 feet wide. It has an average depth of 1.2 to 1.5 meters (4 to 5 feet) and plenty of silt despite the lack of water flow. The Khulna-Ichamati and the Kobadak rivers branch off from the Bhairab River. Between Bangladesh and India, the Khulna-Ichamati forms a border. On the river's bank, the towns of Khulna and Jashore are located. The river had an impact on the growth of their communities and culture. The Rupsha River is created by the confluence of several rivers. On the banks of the river are the towns of Khulna and Jashore. The river influenced the development of their communities and culture. The Bhairab and Atai rivers combine to form the Rupsha River, which flows into the Pasur River.

139. It becomes dry in dry season and during monsoon, the Padma feeds it with a large flow of water. Its lower course is navigable throughout the year and it is influenced by tides. The river has about 50 m width where it crosses the N7 highway at Kazi Nazrul Islam College, Jashore. At that point, during dry season, the river has average water, comparative more than that of other 3 rivers. It contains a high amount of water hyacinth and no flow was seen during field survey. The historical image of the Bhairab river during 2004, 2013 and 2018 as shown in Figure 4-34.



2006

2010

2017

Figure 4-34: Historical Image of the Bhairab River Crosses the Project Road

140. In addition to rivers and canal, the project area contains a large number of ponds and ditches are fully and partially affected by the project. About 27 big, medium and small ponds will be affected under Contract-1, of them two (2) are cultured fishery ponds. In Contract -2, a total pond is 22, of them seven (7) area cultured fishery ponds, similarly six (6) fisher ponds out of 11 ponds in Contract -3 are affected (Table 4-16).

Table 4-16: Affected Ponds with Area Located alongside the Project Road						
Sl. No.	1 st Contract	Area (ha)	2 nd Contract		3 rd Contract	
	Land Type		Land Type	Area (ha)	Land Type	Area (ha)
1.	Pond	0.182	Pond	0.414	Pond	0.081
2.	Pond	0.379	Pond	0.589	Pond	0.006
3.	Pond	0.008	Pond	0.177	Pond	0.281
4.	Pond	0.125	Pond	0.177	Pond	0.019
5.	Pond	0.489	Pond	0.225	Pond	0.163
6.	Pond	0.489	Pond	0.111	Pond (Fisheries Cultured)	0.340
7.	Pond	0.587	Pond	0.954	Pond (Fisheries Cultured)	0.101
8.	Pond	1.341	Pond	0.040	Pond (Fisheries Cultured)	0.184
9.	Pond	2.065	Pond	0.088	Pond (Fisheries Cultured)	0.087
10.	Pond	0.669	Pond	0.093	Pond (Fisheries Cultured)	0.200
11.	Pond	0.669	Pond	0.331	Pond (Fisheries Cultured)	0.315
12.	Pond	0.044	Pond	0.194		
13.	Pond	0.173	Pond	0.543		
14.	Pond	0.168	Pond	0.102		
15.	Pond	0.201	Pond	0.168		
16.	Pond	0.052	Pond (Fisheries Cultured)	0.076		
17.	Pond	0.009	Pond (Fisheries Cultured)	0.066		
18.	Pond	0.213	Pond (Fisheries Cultured)	0.507		
19.	Pond	0.090	Pond (Fisheries Cultured)	0.337		
20.	Pond	0.932	Pond (Fisheries Cultured)	0.097		
21.	Pond	0.628	Pond (Fisheries Cultured)	0.269		
22.	Pond	0.066	Pond (Fisheries Cultured)	0.269		
23.	Pond	0.066				
24.	Pond	0.001				

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Table 4-16: Affected Ponds with Area Located alongside the Project Road

Sl. No.	1 st Contract	Area (ha)	2 nd Contract		3 rd Contract	
	Land Type		Land Type	Area (ha)	Land Type	Area (ha)
25.	Pond	0.159				
26.	Pond (Fisheries Cultured)	0.207				
27.	Pond (Fisheries Cultured)	0.534				

141. Because the area has an overall southwest gradient, the present 2-lane upgrade to a 4-lane road alignment will have little effect on local or regional hydrology. To eliminate drainage impedance during a monsoon, adequate east-west openings on the road embankment already exist. Furthermore, considering hydrological and climate change assessments, the road construction will generally follow the existing alignment and the number of hydrological buildings will be kept the same with greater water openings, in addition to new cross drainage structures.

4.2.8.2 SURFACE WATER QUALITY

142. The most relevant metrics of surface water quality in the project's influence region have been assessed. During the field survey, samples were gathered from the proposed highway's key rivers (e.g., Bhairab River, Begobati River, Nobo-Ganga River, and Chitra River). Surface water samples were collected by the environment team of Consultant for ESM of J-J road Project and sent to the EQMS Laboratory (Bangladesh Accredited Board) for examination of the water quality parameters. Besides, the Design Team of the project (ICTL) has also collected three specific water samples from the project's existing road alignment.

143. Eight specific locations including upstream and downstream have been selected for surface water sampling which was the major river bodies and the possibility to pollute over the project activities. The water samples had been collected for examined the value of bacteriological and physio-chemical parameters and which are comparable to the national and international standard levels. Sample locations and collection date of surface water samples from rivers are expressed in Table 4-17 and collection date of surface water samples from pond and irrigation well is also depicted Table 4-18. The surface water sampling locations shows in Annex 4-12.

Table 4-17: Surface Water Sampling Details from River

Sl. No.	Code	Locations	Chainage (Km)	Water Bodies	Type	GPS Coordinate	Date and Time
1.	SW1 (Upstream)	Nob-Ganga River, Jhenaidah Bypass Road, Jhenaidah	1+200	River	Non-Seasonal	23°31'56.06"N 89°11'9.85"E	19.04.2022 04:21 PM
2.	SW1 (Down Stream)					23°31'53.54"N 89°11'9.46"E	19.04.2022 04:16 PM
3.	SW2 (Upstream)	Begobati River, Bishay Khaly, Jhenaidah	9+180	River	Non-Seasonal	23°28'33.65"N 89° 8'33.32"E	20.04.2022 10:48 AM
4.	SW2 (Down Stream)					23°28'31.96"N 89° 8'35.78"E	20.04.2022 10:42 AM
5.	SW3 (Upstream)	Chitra River, Kaliganj, Jhenaidah	16+385	River	Non-Seasonal	23°24'43.79"N 89° 8'1.77"E	20.04.2022 11:19 AM
6.	SW3 (Down Stream)					23°24'43.77"N 89° 8'5.45"E	20.04.2022 11:26 AM
7.	SW4 (Upstream)	Bhairab River, Barinagar, Jashore	35+790	River	Non-Seasonal	23°14'31.63"N 89° 9'58.14"E	20.04.2022 12:45 PM
8.	SW4 (Down Stream)					23°14'29.13"N 89°10'0.81"E	20.04.2022 12:41 PM

Source: Primary Data Collection by the Environment Team of STUP-BCL JV, 19-20 April 2022

Table 4-18: Surface Water Sampling Details from Pond and Irrigation Well

Sl. No.	Sample ID	Locations	Chainage (km)	Water Bodies	Type	GPS Coordinate	Date and Time
1.	01	Near Bishoykhali, Jhenaidah	11+200r	Large Pond	Seasonal	23°27'27.82"N 89° 8'27.54"E	29.03.2022
2.	02	Near Keya Bagan Bazar Kaliganj, Jhenaidah	22+300	Irrigation Well	Seasonal	23°21'36.09"N 89° 8'31.27"E	29.03.2022

Source: Technical Design Team, 29 March 2022

144. The surface water of the project area is analyzed on the biological and chemical parameters. All of the parameters are compared with the national and international standard levels. The surface water analysis results with comparing to the standard is shown in Table 4-19 & Table 4-20 and result sheets in Annex 4-5.

145. Surface water parameters from the corresponding rivers of the project road alignment have been compared with the best standard practices in Bangladesh that were promoted by the Department of Environment (DoE) as Environmental Conservation Rules (ECR), 1997. All of the surface water parameters have been compared to schedule 3 (A) and Schedule 10 accordingly. Most of cases, oil and grease has been exceeding the standard or showed a high concentration.

146. Besides these, other parameters are quite under the standard level for all others but TSS and Oil and Grease concentration are high in water sample from the Chitra River. According to the field survey, the water bodies of the major four rivers have already been observed as little polluted due to the surroundings of commercial spaces, residential garbage disposal directly the river body, stagnant water bodies, embankment erosion, and eutrophication, illegal filling, etc. According to this result of pond water samples no parameters found exceeded the standard of Bangladesh. So, after an observational study on the surface water of the study area, it is understandable that the surface water quality of the study area is quite vulnerable in some river water due to contamination of the water bodies but ground. Anthropogenic and natural activities are both responsible for this contamination. However, the project site has no notable sources of water pollution.

Table 4-19: Surface Water Analysis Results of River

Sl. No.	Parameters	Unit	Water Samples Parameters Concentration								National Standard ¹⁶
			SW1		SW2		SW3		SW4		
			Up	Down	Up	Down	Up	Down	Up	Down	
1.	Biochemical Oxygen Demand (BOD)	mg/L	0.8	0.3	0.9	0.7	1.2	0.6	1.0	0.5	6 or less
2.	Dissolved Oxygen (DO)	mg/L	8.6	8.3	6.9	8.0	8.1	8.0	8.1	7.9	5 or more
3.	pH	--	7.9	8.0	7.5	7.9	7.6	7.9	7.8	7.9	6.5-8.5
4.	Total Dissolved Solid (TDS)	mg/L	260.0	250.0	320.0	320.0	310.0	300.0	230.0	230.0	2100
5.	Turbidity	NTU	2.7	1.7	2.7	1.2	1.3	1.0	2.3	1.0	-
6.	Oil and Grease (O & G)	mg/L	13.1	8.2	10.0	6.0	24.0	16.2	7.8	6.2	10.0
7.	Total Suspended Solid (TSS)	mg/L	61.0	71.0	20.0	27.0	1011.0	968.0	130.0	127.0	150
8.	Total Coliform (TC)	N/100ml	65.0	58.0	64.0	58.0	96.0	75	52	46	-
9.	Fecal Coliform (FC)	N/100ml	27.0	23.0	31.0	28.0	42.0	37	21	20	-
10.	Nitrate (NO ₃ ⁻)	mg/L	8.0	7.0	1.1	0.8	15.3	11.4	2.1	1.8	10.0
11.	Phosphate (PO ₄ ³⁻)	mg/L	7.1	6.8	2.8	1.2	11.8	8.7	1.7	1.2	-
12.	Temperature	°C	26.7	27.5	28.0	27.9	26.8	26.7	29.0	29.3	40

Source: Primary Data Collection by the Environment Team of E & S Management Consultant of J-J Project Road 19-20 April 2022

Table 4-20: Surface Water Analysis Results of Pond and Irrigation Well

Sl. No.	Parameters	Unit	Concentration	National Standard ¹⁷
			Sample ID: Pond Water	
1.	Total Organic Content (TOC)	mg/L	80.0	-
2.	Chloride (Cl ⁻)	mg/L	30.0	600
3.	pH	-	7.6	6.5-8.5
4.	Total Suspended Solid (TSS)	mg/L	15.0	150

Source: Tested carried out by the Technical Design Team, 29 March 2022

¹⁶ According to ECR 1997, Schedule 3(A); Best Practice based classification (Water Usable for Fisheries) and Schedule 10

¹⁷ According to ECR 1997, Schedule 3(A); Best Practice based classification (Water Usable for Fisheries) and Schedule 10

4.2.8.3 GROUND WATER QUALITY

147. The aquifer in the project region is mostly recharged by deep percolation of rain and floodwater. The actual recharge appears to be far less than its potential, resulting in a significant drop in the seasonal water table. During the dry season, the groundwater level in the Project area is said to be decreasing every year. The combined consequences of decreasing rainfall, severe droughts, increasing warmth, and reduced river flow during the dry season are most likely the reasons for this loss. The project site is located in a high land area and water is available within 100-120 ft. depth. The groundwater table varies 4-8 meters in the year at the project area and is potable (Figure 4-35).

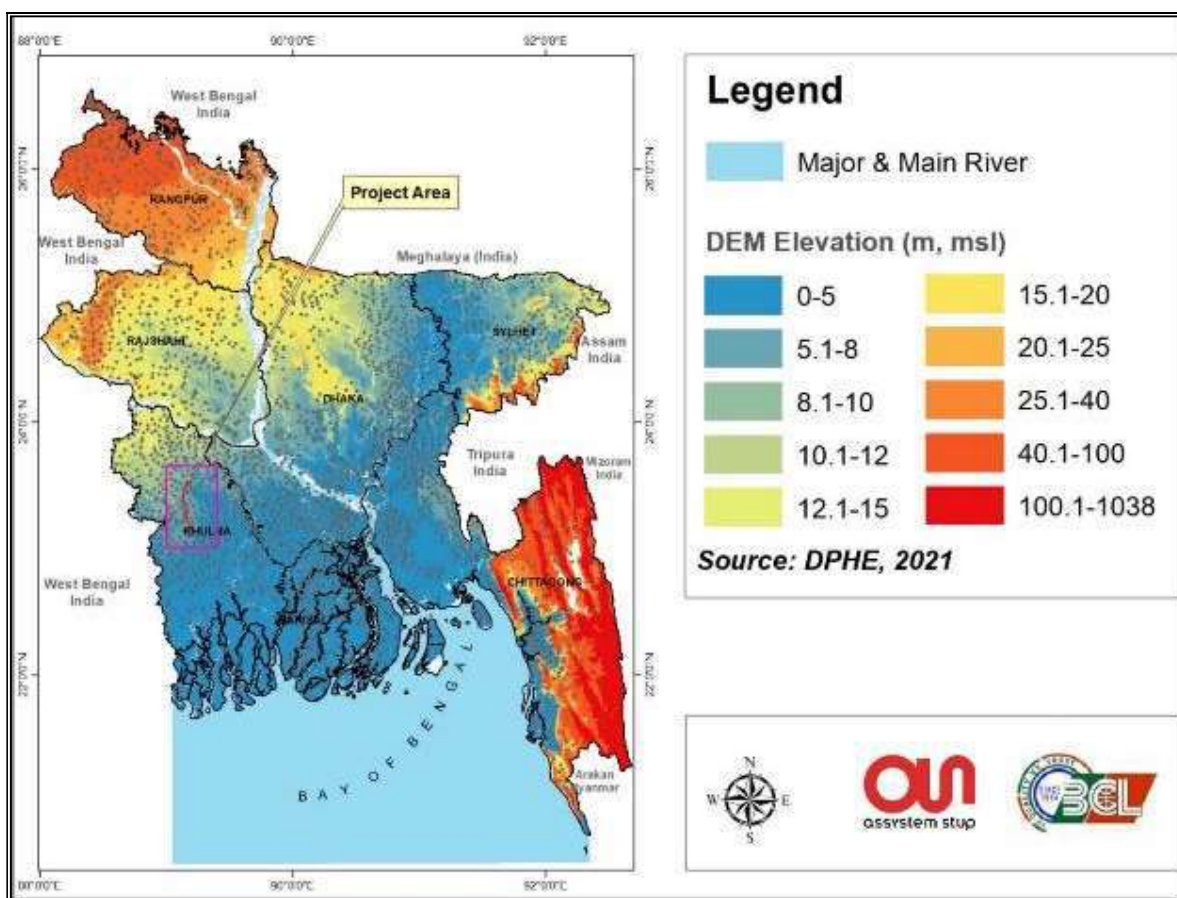


Figure 4-35: Ground Water Level of ESMP for Jhenaidah-Jashore Road Section (WeCARE)

148. The groundwater samples have been collected from the project site for analysis of chemical parameters to get the primary idea regarding the quality of groundwater (Result sheets in Annex 4-6). Shallow tube wells in the project area were selected as the sources of groundwater. The ground water sample from the irrigation well also tested by the Design Team to determine quality to use ground water as the water source for construction works. The ground water sampling locations shows in Annex 4-12. Detail of the all-sampling location is provided in Table 4-21 and Table 4-22.

Table 4-21: Groundwater Sampling Details

Sl. No.	Code	Locations	Chainage (Km)	Sources	Depth (ft.)	GPS Coordinate	Date and Time
1.	GW1	Local Residence, Jhenaidah Bypass Road, Jhenaidah	1+300	Shallow Tube well	135	23°31'55.14"N 89°11'6.73"E	19.04.2022 04:37 PM
2.	GW2	Bazar Tube well, Bishay Khaly, Jhenaidah	9+250	Shallow Tubewell	150	23°28'30.00"N 89° 8'34.39"E	20.04.2022 10:56 AM

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Table 4-21: Groundwater Sampling Details

Sl. No.	Code	Locations	Chainage (Km)	Sources	Depth (ft.)	GPS Coordinate	Date and Time
3.	GW3	Community Tubewell, Nimtala Bus stand, Kaliganj, Jhenaidah	16+320	Shallow Tubewell	140	23°24'45.62"N 89° 8'4.65"E	20.04.2022 11:29 AM
4.	GW4	Primary School Tubewell, Barinagar, Jashore	35+710	Shallow Tubewell	120	23°14'32.21"N 89°10'1.25"E	20.04.2022 12:51 PM

Source: Primary Data Collection by the Environment Team of STUP-BCL JV, 19-20 April 2022

Table 4-22: Groundwater Sample from the Irrigation Well Location Details

Sl. No.	Sample ID	Locations	Chainage (km)	Water Bodies	Type	GPS Coordinate	Date and Time
1.	02	Near Keya Bagan Bazar Kaliganj, Jhenaidah	22+300	Irrigation Well	Seasonal	23°21'36.09"N 89° 8'31.27"E	29.03.2022

Analysis results of the groundwater are represented Table 4-23 where the values are compared with the standard limit.

Table 4-23: Groundwater Analysis Results

Sl. No.	Parameters	Unit	Concentration				National Standard ¹⁸
			GW1	GW2	GW3	GW4	
1.	Arsenic (As)	mg/L	0.0	0.0	0.0	0.0	0.05
2.	Chloride (Cl ⁻)	mg/L	0.9	0.8	1.2	30.0	150-600
3.	Iron (Fe)	mg/L	0.09	0.08	0.0	0.01	0.3-1.0
4.	Manganese (Mn)	mg/L	0.3	1.0	0.3	0.4	0.1
5.	pH	---	7.5	7.7	7.5	7.5	6.5-8.5
6.	Sulfate (SO ₄ ²⁻)	mg/L	7.0	7.0	10.0	9.0	400
7.	Total Coliform (TC)	N/100ml	0	0	0	0	0
8.	Fecal Coliform (FC)	N/100ml	0	0	0	0	0
9.	Nitrate (NO ₃ ⁻)	mg/L	1.7	1.7	16.2	8.7	10
10.	Phosphate (PO ₄ ³⁻)	mg/L	2.5	0.1	0.8	1.9	6
11.	Temperature	°C	24.5	25.2	24.7	25.1	20-30

149. Groundwater parameters of the existing sources have been compared to the best practices tools in Bangladesh called Environmental Conservation Rules (ECR), 1997, Schedule 3 (B) for understanding the baseline status of the parameter's quality. After a comparative study between the testing data and standard, it's easy to understand that Manganese (Mn) for all of the samples has exceeded the standard. Besides these, other parameters are quite good enough to drink. The groundwater level of the study area may be the main cause of the high manganese concentration. However, groundwater from irrigation well was found within the permissible limit of Bangladesh standard Table 4-24.

Table 4-24: Irrigation Well Water Analysis Results

Sl. No.	Parameters	Unit	Concentration			National Standard ¹⁹
				Sample ID: 02		
1.	Total Organic Content (TOC)	mg/L		36.0		-
2.	Chloride (Cl ⁻)	mg/L		36.0		600
3.	pH	-		7.5		6.5-8.5
4.	Total Suspended Solid (TSS)	mg/L		12.0		150

Source: Tested carried out by the Technical Design Team, 29 March 2022

¹⁸ According to ECR 1997, Schedule 3(B)

¹⁹ According to ECR 1997, Schedule 3(A); Best Practice based classification (Water Usable for Fisheries) and Schedule 10

4.2.9 NATURAL HAZARDS

150. Bangladesh is almost 10% is prone to seasonal floods, with up to 24% of the country vulnerable to flooding during wet years. Regularly hit by deadly tropical cyclones due to its unusual geographic location. When cyclones make landfall, the funnel-shaped northern region of the Bay of Bengal creates tidal waves, affecting thousands of people living along the shore. Because Jashore is located in Bangladesh's south-western region and is near the Bhairab River, the project area is geographically elevated and hence has a low risk of natural disasters such as, floods, cyclones and earthquakes.

151. **Flooding:** The Faridpur-Jhenaidah-Jashore-Khulna highway location was prone to seasonal floods of 50-100 cm in the southeast, 0-50 cm in the northwest, and a tidal flood in the southeast just a few decades ago. The depth and duration of floods have changed as a result of surface water management measures by the Bangladesh Water Development Board (BWDB). Unless the flood protection bank is breached, the region is currently safe from flooding.

152. Flood occurs moderately in the project region (Figure 4-36) but not regularly due to its geographic location. The classification is based on the BWDB's flood management database from 1998. According to the BWDB, a moderate flood zone is defined as an area where 1-5 feet of flooding occurred in 1998. Rapid land filling by land developers has significantly altered the terrain of the surrounding area, and it is expected that rapid filling would gradually encroach on the floodplains of the Bhairab and Chitra rivers. The water levels of both rivers will rise as a result of the current landfilling tendency and future urbanization. The crest level of the road must be calculated because of rising water levels in adjacent rivers and unpredictable local high rainfall in a short period due to climate change. The water levels of the Periphery Rivers determine the drainage of the surrounding areas. As a result, the project region is safe from intensive flooding. According to flood records from 1988 and 1998, during the high flood, the project road communication was never hindered or damaged. This national roadway is elevated above the flood level. There are no river floods in the area.

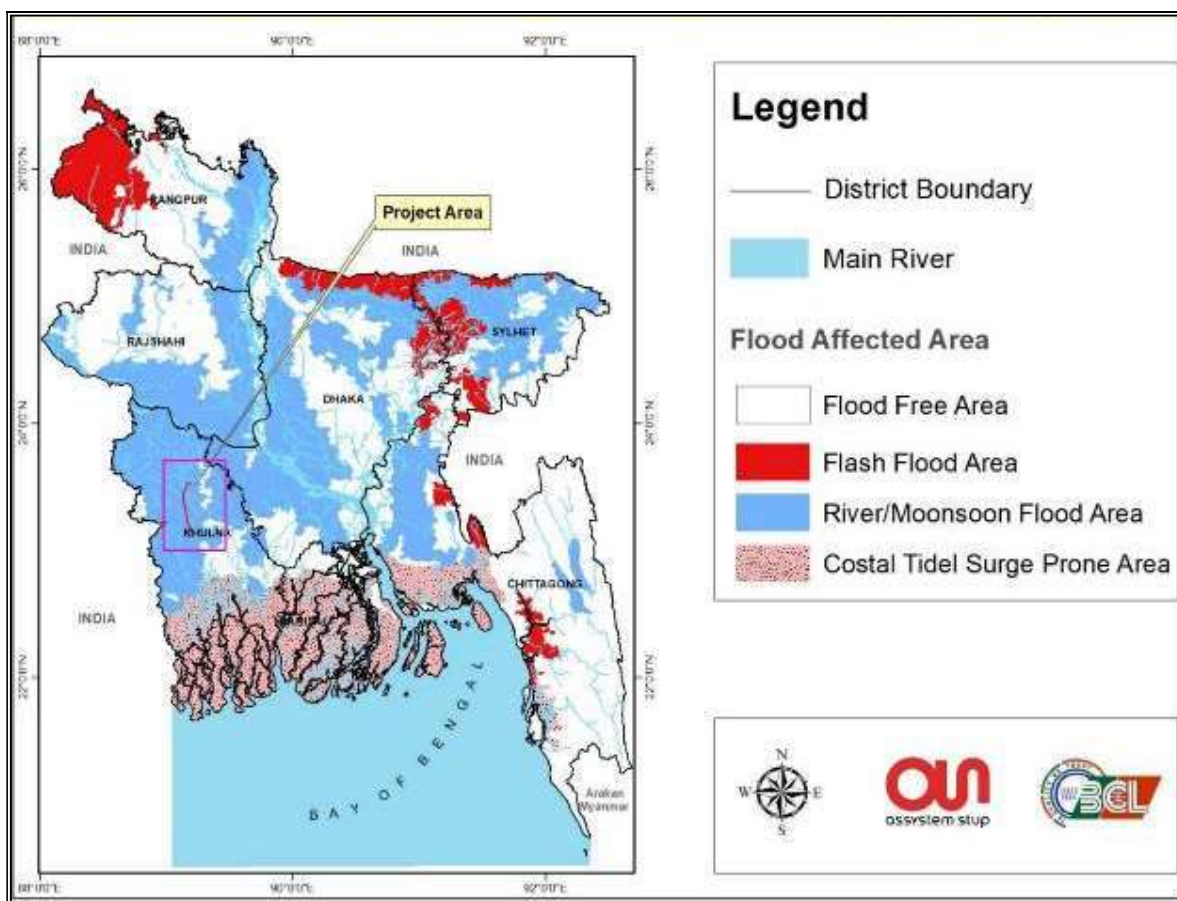


Figure 4-36: Flood Zone of ESMP for Jhenaidah-Jashore Road Section (WeCARE)

Source: Banglapedia, 2021 & BWDB, 2021

153. **Cyclone:** Cyclones are most common in the Bay of Bengal between April and May and October and November. Bangladesh is frequently the landing ground of cyclones that originate in the Bay of Bengal because of its funnel-shaped shoreline. From 1793 to May 2021, there were approximately 54 devastating cyclones in Bangladesh's coastal area. During this time, cyclones occurred around once every 4.5 years on average. These cyclones wreak havoc on the country's farms, crops, infrastructure, and the lives of coastal residents. The cyclone intensity around the project site is often lower than in other parts of the coastal belt. Bangladesh is regularly hit by deadly tropical cyclones due to its unusual geographic location. When cyclones make landfall, the funnel-shaped northern region of the Bay of Bengal creates tidal waves, affecting thousands of people living along the shore. The project area is not located in a cyclone danger zone. Because Jashore is located in Bangladesh's south-western region and is near the Bhairab River, the project area is geographically elevated and hence has a low risk of natural disasters such as cyclones, floods, and earthquakes.

4.3 ECOLOGICAL ENVIRONMENT

154. To establish the baseline of ecology and biodiversity, field investigations have been carried out along the road alignment and a study area has been defined as discussed in subsection 4.3.1. The study has been carried in the month of February 2022, March 2022, and April 2022 as per the following schedule.

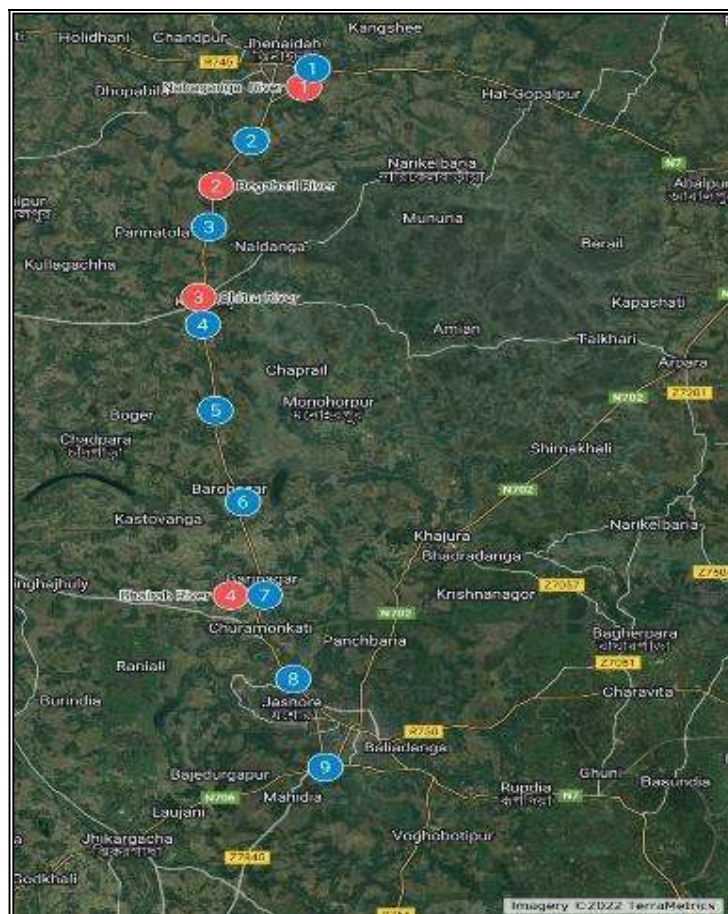
- ▶ 13 February 2022 to 16 February 2022, 1st Visit
- ▶ 18 March 2022 to 21 March 2022, 2nd Visit
- ▶ 20 April 2022 to 23 April 2022, 3rd Visit
- ▶ Consultation and site visited for Tree on private land and GOB's lands between 9 March 2022 and 23 April 2022.

4.3.1 STUDY AREA

155. The study area has been taken as 48.7km x 200m area in the N7 road that extends from Jhenaidah Bus Terminal, Jhenaidah to Chachra Moor, Jashore. Total length of the road (48.7 km) has been taken as the transect and the width is considered 200m i.e., 100 m from the center line of the road on both side (RHS/LHS) which formed as study area for carrying out the assessment. For the sampling, nine (9) square quadrats, each being of area 200 m × 200 m, have been selected within the study area mentioned above. Out of these 9 sampling stations, there are four (4) cross-river sites which have also been studied for carrying out aquatic survey, especially fishes. If the quadrat has fallen in market area, (*bazaar*), the quadrat has been shifted before or after the bazar for better representation of ecological assessment. The locations of these sampling stations are in Table 4-25 Apart from this survey, another survey was done for enumeration of trees that fall in both sides (RHS/LHS) of the road from the center which will be cut down during the road construction. These trees belong to RHD, Social Forestry, Zila Parishad and also private owners.

Sl. No.	Sampling Spot	Location	Latitude	Longitude
1.	Quadrat 1	Jhenaidah Bus Terminal (<i>Prerona 71 Square</i>)	23°32'33''N	89°11'25.728''E
2.	Quadrat 2	Kulandanga	23°30'05''N	89°09'37''E
3.	Quadrat 3	Koyargachi	23°27'08''N	89°08'22''E
4.	Quadrat 4	Kaliganj	23°23'48''N	89°08'11''E
5.	Quadrat 5	Keya Bagan Bazar	23°20'52''N	89°08'33''E
6.	Quadrat 6	Barobazar Bede Para	23°17'44''N	89°9'22''E
7.	Quadrat 7	ChhotoEbadpur	23° 14' 32.54"N	89° 10' 0.40"E
8.	Quadrat 8	Jessore Cantonment	23°11'41''N	89°10'51''E
9.	Quadrat 9	Chachra Mor, Jessore	23° 8' 39.65"N	89° 11' 48.02"E

The location map of the above-mentioned sampling sites is presented in Figure 4-37.



Legend:

-  Terrestrial Site
-  Aquatic Site

Figure 4-37: Location Map of Ecology Survey Sampling

Note: River site 4 and Quadrat 7 overlap each other, so they are placed side by side

4.3.2 TERRESTRIAL ECOLOGY

156. Terrestrial habitats A total of 365 species including herbs, shrubs, trees and climbers have been recorded from terrestrial habitat of the study area. The percentage of Climber, Herb, Shrub and Trees Terrestrial Flora in the Project Areas as shown in Figure 4-38. List of terrestrial flora species are presented in Annex 4-7. Amongst them 131 woody plant species, of this 30% represented by fruit bearing tree species followed by timber (27%), medicinal (24%) and ornamental plant (19%) species in Figure 4-39. Detailed list of tree species is provided in the Annex 4-7. From the assessment of terrestrial flora, species under Red List categories of IUCN (Threatened, Endangered, Critically Endangered, Vulnerable and so on), species protected by laws including CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), and species protected by Wildlife Protection & Security Act, 2012 were not recorded. The detailed contract wise lists of tree species with girth size those will removed along the road are provided in the Table 4-26.

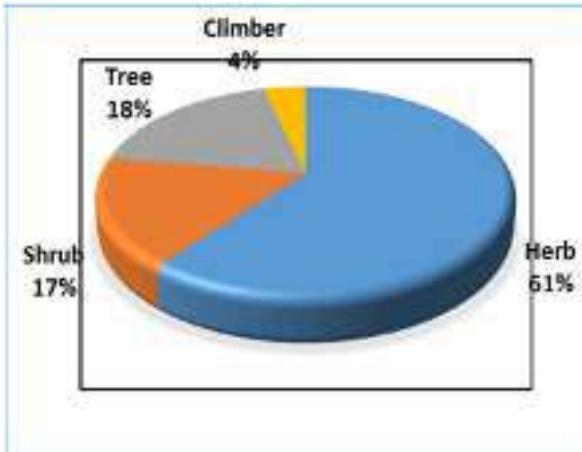


Figure 4-38: Percentage of Climber, Herb, and Shrub Terrestrial Flora in the Project Area Trees

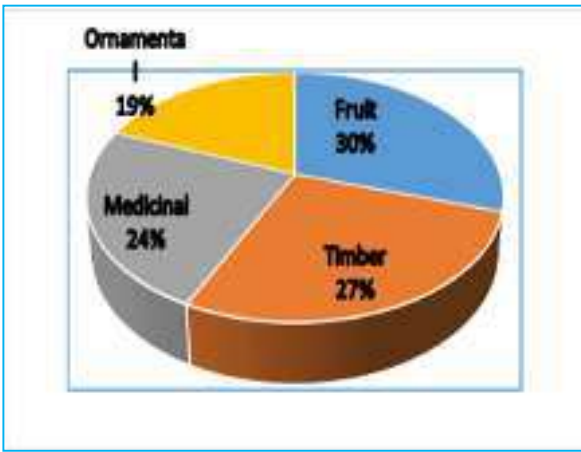


Figure 4-39: Percentage of Fruit, Timber, Medicinal, and Ornamental Terrestrial Flora in the Project Area Trees

157. In addition, there are roadside flora, homestead flora, agricultural flora, aquatic flora which are briefly discussed in the following subsections. But at about 6-8 Km east of Kaliganj & Barobazar area, a natural haor named ‘Mohishatir Baor’ and the largest Banyan tree of Bangladesh are located. But they are out of the influence area of the project corridor.

Table 4-26: Girth Wise List of Major Tree Species

Contract	Girth Size in cm				
	<30	30-80	81-120	120-180	>180 cm
1.	<i>Swietenia mahagoni</i> (Mehogoni), <i>Mangifera indica</i> (Aam), <i>Musa paradisiaca</i> (Banana), <i>Acacia nilotica</i> (Babul/Babla), <i>Bambusabalcooa</i> (Borak bash), <i>Artocarpus heterophyllus</i> (Khathal), <i>Phoneix dactylifera</i> (Khejur), <i>Cocos nucifera</i> (Coconut), <i>Moringa oleifera</i> (Sajina), <i>Bambusa vulgaris</i> (Tolla bash), <i>Samanea saman</i> (Raintree/ Motakoroi), <i>Areca catechu</i> (Supari)	<i>Swietenia mahagoni</i> (Mehogoni), <i>Mangifera indica</i> (Aam), <i>Acacia nilotica</i> (Babul/Babla), <i>Bambusabalcooa</i> (Borak bash), <i>Phoneix dactylifera</i> (Khejur), <i>Cocos nucifera</i> (Coconut), <i>Moringa oleifera</i> (Sajina), <i>Bambusa vulgaris</i> (Tolla bash), <i>Samanea saman</i> (Raintree/ Motakoroi), <i>Areca catechu</i> (Supari), <i>Borassus flabellifer</i> (Taal)	<i>Swietenia mahagoni</i> (Mehogoni), <i>Mangifera indica</i> (Aam), <i>Samanea saman</i> (Raintree/ Motakoroi), <i>Areca catechu</i> (Supari), <i>Borassus flabellifer</i> (Taal), <i>Ficus benghalensis</i> (Bot), <i>Bombax ceiba</i> (Shimul)	<i>Swietenia mahagoni</i> (Mehogoni), <i>Samanea saman</i> (Raintree/ Motakoroi), <i>Mangifera indica</i> (Aam), <i>Borassus flabellifer</i> (Tal)	<i>Swietenia mahagoni</i> (Mehogoni), <i>Samanea saman</i> (Raintree/ Motakoroi), <i>Mangifera indica</i> (Aam), <i>Ficus benghalensis</i> (Bot)
2.	<i>Swietenia mahagoni</i> (Mehogoni), <i>Mangifera indica</i> (Aam), <i>Acacia auriculiformis</i> (Akashmoni), <i>Musaparadisiaca</i> (Banana), <i>Artocarpus heterophyllus</i> (Khathal), <i>Phoneix dactylifera</i> (Khejur), <i>Samanea saman</i> (Raintree/ Motakoroi), <i>Terminalia arjuna</i> (Arjun), <i>Zizuphusmauritiana</i> (Boroi), <i>Azadirachta indica</i> (Neem), <i>Dalbergia sissoo</i> (Sisso), <i>Elaeocarpus serratus</i> (Jalpai), <i>Syzygiumcumini</i> (Jam), Others	<i>Swietenia mahagoni</i> (Mehogoni), <i>Mangifera indica</i> (Aam), <i>Acacia auriculiformis</i> (Akashmoni), <i>Artocarpus heterophyllus</i> (Khathal), <i>Phoneix dactylifera</i> (Khejur), <i>Samanea saman</i> (Raintree/ Motakoroi), <i>Bombax ceiba</i> (Shimul), <i>Areca catechu</i> (Supari), <i>Azadirachta indica</i> (Neem), <i>Borassus flabellifer</i> (Tal), <i>Terminalia arjuna</i> (Arjun), <i>Zizuphusmauritiana</i> (Boroi), <i>Dalbergia sissoo</i> (Sisso), <i>Elaeocarpus serratus</i> (Jalpai), <i>Syzygiumcumini</i> (Jam), <i>Leucaena leucocephala</i> (Ipil ipil), Others	<i>Swietenia mahagoni</i> (Mehogoni), <i>Mangifera indica</i> (Aam), <i>Samanea saman</i> (Raintree/ Motakoroi), <i>Borassus fleabellifer</i> (Tal), <i>Bambusa vulgaris</i> (TollaBash), <i>Terminalia arjuna</i> (Arjun), Others	<i>Swietenia mahagoni</i> (Mehogoni), <i>Samanea saman</i> (Raintree/ Motakoroi), Others	<i>Swietenia mahagoni</i> (Mehogoni), <i>Samanea saman</i> (Raintree/ Motakoroi), Others
3.	<i>Swietenia mahagoni</i> (Mahagoni), <i>Mangifera indica</i> (Aam), <i>Musa paradisiaca</i> (Banana), <i>Artocarpus heterophyllus</i> (Kanthal), <i>Phoenix dactylifera</i> (Khejur), <i>Tectona grandis</i> (Segun), <i>Moringa oleifera</i> (Sajina), <i>Bambusa vulgaris</i> (Tolla bash)	<i>Swietenia mahagoni</i> (Mahagoni), <i>Acacia auriculiformis</i> (Akashmoni), <i>Musa paradisiaca</i> (Banana), <i>Artocarpus heterophyllus</i> (Kanthal), <i>Phoenix dactylifera</i> (Khejur), <i>Samanea saman</i> (Raintree), <i>Moringa oleifera</i> (Sajina), <i>Bambusa vulgaris</i> (Tolla bash), <i>Syzygiumcumini</i> (Jaam)	<i>Artocarpus heterophyllus</i> (Kanthal), <i>Samanea saman</i> (Rain tree), <i>Tectona grandis</i> (Segun), <i>Cocos nucifera</i> (Narikel)	<i>Swietenia mahagoni</i> (Mahongoni), <i>Samanea saman</i> (Rain tree)	<i>Swietenia mahagoni</i> (Mahongoni), <i>Samanea saman</i> (Rain tree), <i>Acacia auriculiformis</i> (Akashmoni)

4.3.2.1 ROADSIDE FLORA

158. The trees found in the road alignment were planted by Social Forestry Divisio, Zila Parisad and RHD. Most common trees are *Samanea saman* (Rain tree), *Tectona grandis* (Shegun), *Phoneix dactylifera* (Khejur), *Swietenia mahagoni* (Mehogoni), *Ficus benghalensis* (Bot), *Ficus racemosa* (Jogdumur), *Ficus religiosa* (Oswatha Bot), *Leucaena leucocephala* (Ipil Ipil), *Moringa oleifera* (Sajina), *Polyalthia longifolia* (Debdaru), *Pithocellobium dulce* (KhoiyaBabla), *Psidium guajava*(Peyara), *Bombax ceiba* (Shimul), *Cratevanurvala*(Barun), *Delonix regia* (Krishnachura), *Mangifera indica* (Aam), *Sizygium cumini* (Jaam), *Artocarpus heterophyllus* (Kanthal), *Alibizia procera*(SadaKoroi), *Borassus flabellifer* (Taal), *Areca catechu* (Supari) and so on. Some native bushy plants were also found in both sides of the road. The major species are *Calotropis procera* (Akanda), *Ficus hispida* (Khoksha), *Glycosmis pentaphylla* (Motkila), *Phyllanthus reticulatus* (Shitki), *Cassia occidentalis* (Kolkasunde) and *Urena lobata* (Okra). The ground has been covered by many herbaceous plants particularly the members of Poaceae, Cyperaceae, Asteraceae, Euphorbiaceae, Araceae, Vitaceae and Fabaceae.

159. According to the ecological survey about 14008 are planted alongside the existing road, will need to be cut down due to widening of existing road. The species and number of trees under three contracts are presented in the Annex 4-7.

4.3.2.2 HOMESTEAD FLORA

160. Each homestead has been planted by a good number of tree species and it has the most diversity of plants of the total species collected. The appearance of such homestead looks like a segment of mini forest. The most common recorded tree species from the homestead part of the project site are *Areca catechu* (Supari), *Artocarpus heterophyllus* (Kanthal), *Azadirachta indica* (Neem), *Cocos nucifera* (Narikel), *Lanneacoramandela* (Bhadi), *Mangifera indica* (Aam), *Moringa oleifera* (Shajna), *Swietenia mahagoni* (Mehohoni), *Diospyros discolor* (Gab), *Syzygiumaqueum* (Panijam), and *Litsea glutinosa* (Menda). Recorded common shrubs include *Carica papaya* (Pepe), *Clerodendrum viscosum* (Bhat), *Ficus hispida* (Dumur), *Glycosmis pentaphylla* (Motkila), *Murraya paniculate* (Kamini), *Ocimum sanctum* (Tulshi), *Bougainvillea spectabilis* (Baganbilash), *Jatropha gossypifolia* (Verenda), *Anisomeles indica* (Gabura). Besides, a good number of herbs have also been recorded from the area including *Acalypha indica* (Muktajuri), *Ageratum conyzoides* (Uzaru), *Alocasia indica* (Kachu), *Alocasia maximiliani* (Mankachu), *Amaranthus viridis* (Notey), *Agremone Mexicana* (Shialmuti), *Bambusa bambos* (Bans), *Centella asiatica* (Thankuni), *Enhydra fluctuans* (Helencha), *Oplismenus hirtellus* (Grass), *Senna occidentalis* (Kalkashunde) and many other species. Local people use the homestead tree species as sources of fruits, timber, fire wood, medicines and other household purposes.

4.3.2.3 AGRICULTURAL LAND FLORA

161. The project area includes huge cultivated/agricultural land. Local people use such land for mostly rice production both in dry and rainy seasons. During winter and summer some of the lands are used for winter crops and summer crops. Besides *Oryza sativa* (paddy) & *Triticum aestivum* (wheat), the agricultural lands of the project area are mostly used for *Allium cepa* (Onion), *Allium sativum* (Zinger), *Curcuma longa* (Turmeric), *Lagenaria siceraria* (Gourd), *Momordica charantia* (Bitter gourd), *Momordica cochinchinensis* (Kakrol), *Solanum lycopersicum* (Tomato), *Abelmoschus esculentus* (Ladies finger), *Solanum melongena* (Egg plants), *Lens esculenta*, *Lathyrus sativus* (Pulses), *Daucus carota* (Carrot), *Cucumis sativus* (Cucumber), *Capsicum frutescens* (Chili), *Arachis hypogaea* (Groundnut), *Brassica oleracea* (Cabbage), *Brassica oleracea* var. *botrytis* (Cauliflower), *Lablab purpureus* (beans), *Amaranthus viridis* (Note), *Amarnathus spinosus* (Kata note), *Cucurbita pepo* (Sweet pumpkin) etc. Commercial cultivation *Nicotiana tabacum* (Tobacco), *Phoenix dactylifera* (Date palm), *Saccharum officinarum* (Sugarcane), *Musa* (Banana), *Carica papaya* (Papaya), *Litchi*

chinensis(Litchi,)*Mangifera indica* (Mango), *Swietenia mahagoni* (Mehogoni) tree were also found in the project area.

4.3.3 TERRESTRIAL FAUNA

162. A total of 125 fauna species was observed in the proposed road development. Among them, 8 were amphibians, 13 were reptiles, 86 were birds and 18 were mammals. The list for this status for all the wildlife present in the project site is given in Annex 4-9. Among the species, 11 live in both terrestrial and aquatic habitats. In case of fauna, IUCN concerned species such as *Herpestesaur opunctatus*, *Prionailurus viverrinus*, *Varanus flavescens*, *Naja naja*, *Varanus bengalensis*, *Felis chaus* and *Vulpes bengalensis* were mentioned in the district literature. But practically, the survey team didn't observe any such species along the roadside. Though occasionally, these species come to the roadside, the roadside is not their permanent habitat. So, ultimately these faunal species will not stay in the project site, rather they will return to their original habitats (may be Majdiya Baor, Marjat Baor) which are out of the impact zone of the project. Apart from the mentioned seven species in the literature, species under Red List categories of IUCN (Threatened, Endangered, Critically Endangered, Vulnerable, and so on), species protected by laws including CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), and species protected by Wildlife Protection & Security Act, 2012 were not recorded.

4.3.4 AQUATIC ECOLOGY

4.3.4.1 AQUATIC FLORA

163. In the N7 highway corridor, no natural wetland was found during the field survey. But a good number of man-made ponds, seasonal wetlands, and four rivers are present which sporadically support a non-luxurious growth of aquatic flora except river water surface which is covered by invasive alien species including water hyacinth (*Eichhornia crassipes*). The water bodies also support a good number algal flora, though those are not counted in the study. From the assessment in the aquatic habitat along the road alignment, a total of 35 species have been recorded. Among the species, maximum is medicinal (34%) followed by fodder (20%), ornamental (17%), duckweed (15%) and edible (14%) (Figure 4-40). From the assessment of aquatic flora, species under Red List categories of IUCN (Threatened, Endangered, Critically Endangered, Vulnerable and so on), species protected by laws including CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), and species protected by Wildlife Protection & Security Act, 2012 were not recorded.

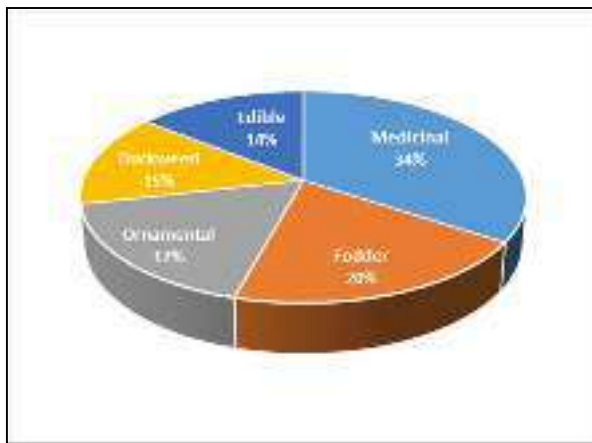


Figure 4-40: Percentage of medicinal, fodder, ornamental, duckweed and edible aquatic plants of the project site.

164. Apart from the lists of both aquatic and terrestrial angiosperm flora, a non-significant growth of lower group of flora such as fungi, algae, moss and ferns were observed along the alignment. A detailed list of the

recorded aquatic flora has been provided in Annex 4-8. In the aquatic habitat of the project site, the most common aquatic species are *Enhydra fluctuans* (Helencha), *Alternanthera philoxeroides* (Malancha), *Alternanthera sessilis* (Chanchi), *Ludwigia adscendens* (Molsi), *Ipomoea aquatica* (Kolmi), *Nymphaea nouchali* (Shapla), *Sagittaria vaginalis*, *Sagittaria sagittalis* (Nukha), *Nymphoides hydrophylla* (Panchuli), *Utricularia exolete* (Jhaji), *Spirodela polyrrhiza* (Khudipana), *Pistia stratiotes* (Topapana), *Lemna minor* (Lemna), *Azolla* sp. (Azolla), *Pistia stratiotes* (Pistia), *Ceratopteris thalictroides* (Ceratopteris), *Limnophila aromatica* (Limnophila), *Aponogeton ulvaceus* (Apanogeton), *Potamogeton nodosus* (Potamogeton), *Ottelia alismoides* (Panikola), *Hygroryza aristata* (Dhansi), *Schoenoplectus articulatus* (Chesra), *Echinochloa colonum* (Shamagass), *Hemarthria protensa* (Chaillagass), *Cyperus rotundus* (Sedge) etc. Apart from this, luxuriant growths of the members of grass and sedge families were observed in the edges of wetlands during rain.

4.3.4.2 AQUATIC FAUNA INCLUDING FISH

165. In total, 29 fish species were identified through interviews and discussions with local fishermen. These fish species are said to be caught from 4 rivers that crisscross highway. These are listed in Annex 4-10. The area covered a number of man-made ponds, approximately more than 100 in number, 4 rivers and small channels and some seasonal ditches. During dry season, all seasonal ditches become dry. During rainy season, they contain some water and support a number of local fish population. In case of pond, some are commercially cultivated, some are not. The rivers have adequate flow during rainy period but in summer or dry season, the water becomes almost stagnant. A good number of local fishes were recorded during the catchment survey and market survey. The major fishes are *Notopterus notopterus* (Poli), *Anguilla bengalensis* (Bain), *Oxyurichthys petersii* (Baila), *Mystus bleekeri* (Tengra), *Amblypharyngodon* (Mola), *Putinus* (Puti), *Channa punctatus* (Taki), *Channa striata* (Shoal), *Heteropneustes* (Shing), *Clarias batrachus* (Magur), *Macrobrachium rosenbergii* (Chingri), *Anabastus tudineus* (Koi), *Channa marulius* (Gojar) and so on. From the assessment of aquatic fauna, species under Red List categories of IUCN (Threatened, Endangered, Critically Endangered, Vulnerable and so on), species protected by laws including CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), and species protected by Wildlife Protection & Security Act, 2012 were not recorded.

166. **Discussion:** From the assessment of both terrestrial and aquatic flora, and aquatic fauna, species under Red List categories of IUCN (Threatened, Endangered, Critically Endangered, Vulnerable and so on), species protected by laws including CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), and species protected by Wildlife Protection & Security Act, 2012 were not recorded in the project area. In case of terrestrial fauna, the species observed in the project site belonging to the IUCN category were seen occasionally during the survey. The road alignment is not their permanent habitat. So, ultimately these fauna species will not stay in the project site, rather they will return to their original habitats. Moreover, among the species, no endemic species was found in the study area and even no genetic resource (wild relatives of cultivated crops such as: wild rice, wild bean, wild banana etc.) was recorded from the survey. Further, there is no flagship species, umbrella species and keystone species found in the study area. Some faunal supporting species such as *Ficus benghalensis* (Bot), *Bombax ceiba* (Shimul), *Ficus religiosa* (Ashwath), *Ficus racemosa* (Jogdumur), *Mimusops elengi* (Mohua) etc. found during the survey within the study area and these are also found outside the study area. Thus, removal of these species will not cause any impact on faunal species due to the project road. No previously declared protected area/national park/wildlife sanctuary is located within the study area or along the project corridor. However, one very old banyan tree which is in Kaligonj Upazila of Jhenaidah district probably eight (8) km away from the road alignment. This tree is approximately 300-year-old and occupies an area of 3.08 acre. Forest department has declared it as a protected tree. In case of old and largest Banyan trees along the road alignment, consultation has been done with the local people and public perception and expert opinion have been provided.

4.4 SOCIOECONOMIC CONDITION

167. The present subsection described the existing socioeconomic condition along the project road alignment. Previous document such as Resettlement Plan 2015 was prepared with financial support of the ADB which was approved by the ADB. SIA done and incorporated in the RAP 2015 has been update in the ESIA, 2019. The RAP 2015 and the ESIA 2019 have been reviewed before collecting the fresh primary data on socioeconomic condition (from March 2022 to August 2022) to identify the gaps. The current SIA has been done based on the fresh data which has been collected and analyzed based on the changed design.

4.4.1 CENSUS AND IOL SURVEY

168. The data have been collected from 3464 households and 59 CPRs through 8 Stakeholders' Consultation Meetings, 11 Focus Group Discussions (FGDs) and 28 Key Informant Interviews. This subsection presents socioeconomic information based on census, IOL and socioeconomic survey.

169. The following tasks have been done during census, IOL and socioeconomic baseline survey conducted from March 2022 to August 2022 as per the ESS1:

- ▶ Environmental and social risks and impacts and corresponding anticipated outcomes have been assessed and identified to possible extent,
- ▶ Environmental and social assessment has been done proportionately to anticipated risks and impacts of the project,
- ▶ The social baseline has gathered disaggregated data on the 'vulnerable households, disadvantaged and marginalized group/peoples. Relevant information will be presented later part of this Chapter in the ESMP and in also the updated RAP. Disaggregated data on the 'vulnerable households, disadvantaged and marginalized group/peoples, anticipated risks and impacts of the project on them and mitigation measures are presented in the ESMP and also in the Entitlement Matrix of the updated RAP.
- ▶ Mitigation measures and actions have been identified, and
- ▶ Environmental and Social Management Plan has been prepared which contain how borrower will manage environmental and social risks with assistance of contractor(s), RAP implementing NGO and Construction Supervision Consultant (CSC).

170. The compiled data with analyses on (a) affected male, female and total population; (b) affected households; (c) age wise affected population; (d) dependency ratio; (e) household size; (f) distribution of affected population by religion; (g) educational level of affected population; (h) marital status; (i) economic profile containing (i) occupations of the affected household heads, (ii) occupations of other members of affected households, (iii) annual income and expenditures of the affected households, (iv) vulnerable households and groups, (v) list of CRPs will be presented after describing administrative structure and three contracts (Contract-1, Contract-2 and Contract 3). Reason behind it is all the above statistical information are disaggregated contract wise. It underscores the requirement of introducing both administrative structures and contract wise distribution of mouzas, unions, Upazila and districts.

171. It has already been described major project impacts under subheading "Land Acquisition and Resettlement in subsection 3.6. Mitigation measures and entitlement contracts against the mentioned losses will be presented in the Entitlement Matrix of the RAP. Besides, relevant mitigation measures are also included in the ESMP as well.

4.4.2 ADMINISTRATIVE STRUCTURE

172. The implementing agency of the Jhenaidah to Jashore road project is the RHD— through the World Bank Assistance. Local Government Institutes at different levels from Union Parishad, Union Land Office, AC (Land) Office, Upazila Land Settlement Office, Upazila Parishad, UNO Office, Pourasabha, District Parishad and Deputy Commissioner Offices have been playing necessary significant roles in land acquisition, and will also play role in implementation of the project and implementation of RAP as well.

173. The J-J road is divided into three Contracts, namely Contract-1 (Ch: 0 – 15 Km+900m.), Contract-2 (Ch: 15 Km + 900m to 31 Km+700m) and Contract-3 (Ch: 31 Km+700m. – 47 Km + 480m.). The J-J road is extended between Jhenaidah and Jashore districts. Three Upazilas are affected due to the project. Two affected Upazilas Jhenaidah Sadar and Kaliganj are located in Jhenaidah district while Jashore Sadar is also affected due to the project. Contract Wise distribution of length in Km, affected mouzas, Unions, Upazilas and Districts is presented in Table 4-27 below along with corresponding Administrative Structures as well.

174. **Contract 1:** Contract-1 of the J-J road covers 15 Km + 900m, which extends through Jhenaidah Sadar and Kaliganj Upazila of Jhenaidah district towards Jashore district. Moharajpur, Surat and Naldanga Unions and Jhenaidah Pourasabha are affected in the Contract 1 due to the project. Five mouzas are affected under Moharajpur Union, which is the highest number of affected mouzas followed by two affected mouzas under Surat Union of Jhenaidah district. Besides, Jhenaidah Pourasabha and Naldanga Union are also affected. The affected households, businessmen, CPRs and other entities and the project authority will seek diverse cooperation of the local government institutions at Union, Pourasabha, Upazila and District administration level for implementation of land acquisition and implementation of the RAP in the Contract-1 of the J-J road project.

175. **Contract 2:** Contract-2 of the J-J road covers 15 Km + 800m, which extends through Kaliganj Upazila toward Jashore Sadar Upazila. Major part of Contract 2 occupies Kaliganj Upazila. Nine mouzas are affected in the Contract-2. Out of 9 affected mouzas, four mouzas each are affected under Roygram and Bara Bazar Unions while one mouza is affected under Rakhalgachhi union under Kaliganj Upazila. Only Muradghar mouza is affected under Jashore Sadar Upazila. Local government institutions at the above-mentioned Union, Pourasabha, Upazila and district levels will extend their administrative supports for implementation of land acquisition and implementation of RAP and construction of civil works.

176. **Contract 3:** Contract-3 of the J-J road covers 15 Km + 780m., which is extended within Jashore Sadar Upazila. Two mouzas each are affected under Haibatpur Union and Churamankathi Union. Besides, one Pourasabha is also affected due to the project. Local Government Institutions at the concerned Union Parishad, Upazila Parishad, Pourasabha, District Parishad and DC Office have been playing role in execution of land acquisition, and will also play role in implementation of the project and implementation of RAP as well.

Table 4-27: Contract Wise Affected Upazilas, Unions and Mouzas under the Project

Contract	Chainage (Km. + M.)	District	Upazila	Union/Pourasabha	Mouza
Contract 1	0 - 15 +900	Jhenaidah	Jhenaidah Sadar	Moharajpur	Nrisinhapur, Bara Kharkhali, Bishaykhali, Khayargachhi, Kuladanga,
				Surat	Teghari, Laudia
				Naldanga	Gariala
				Pourasabha	Pourasabha
			Kaliganj	Kaliganj Union	Bhatpara, Bejpara
				Pourasabha	Porasabha
Contract 2	15+900 – 31 +700	Jhenaidah	Kaliganj	Rakhalgachhi	Raghunathpur
				Roygram	Khamar Mundia, Dulal Mundia, Agmundia,
				Bara Bazar	Fulbari, Mithapukhuria, Belat Daulatpur, Pirojpur,
				Pourasabha	Pourasabha

Table 4-27: Contract Wise Affected Upazilas, Unions and Mouzas under the Project

Contract	Chainage (Km. + M.)	District	Upazila	Union/Pourasabha	Mouza
		Jashore	Jashore Sadar	Haibatpur	Muradghar
Contract-3	31+700 – 47+480	Jashore	Jashore Sadar	Haibatpur	Chhota Haibatpur Bara Haibatpur
				Pourasabha	Pourasabha
				Churamankathi	Khitibdia Churamankathi

4.4.3 DEMOGRAPHY OF AFFECTED POPULATION

4.4.3.1 DISTRIBUTION OF HOUSEHOLDS BY SEX

177. Table 4-28 shows that a total of 3464 households are likely to be affected in the Contract 1, Contract 2 and Contract 3 due to land acquisition for the proposed project. In contract-1 the total number of affected households is 1055 while in Contract-2 and Contract 3 the numbers of households 1123 and 1286 getting affected respectively. Total average male headed households are 94.66% while female headed households are 5.34 in the affected areas in the project. The highest female headed households is 185 female headed households (5.34%) which are found in Contract 3 compared to 77 female headed households (5.99%) in Contract 2 and 74 female headed households (7.01%) in Contract 1.

Table 4-28: Contract Wise Average Household Size within RoW

Particulars	Contract 1		Contract 2		Contract 3		Total	
	No.	%	No.	%	No.	%	No.	%
Male Headed HHs	981	92.99	1089	96.97	1209	94.01	3279	94.66
Female Headed HHs	74	7.01	34	3.03	77	5.99	185	5.34
Total	1055	100.00	1123	100.00	1286	100.00	3464	100.00
%	30.46		32.42		37.12		100.00	

Source: Census and IOL Survey, March –August 2022

4.4.3.2 AGE-WISE DISTRIBUTION OF POPULATION

178. Table 4-29 presents the population pattern of the affected households. It shows that the total affected population 4732, 4893 and 1513 in the Contract 1, Contract 2 and Contract 3 respectively. The highest population is 7440 (49.81%) belong to 15-45 years age group followed by 3078 (20.61%) belong to 46 to 64 years age range in the project area. The first and second lowest population are 911 (6.10%) and 1002 (6.71%) belong to 65 and above years and 0 to 4 years respectively. Detailed information is presented in Table 4-29.

Table 4-29: Age Composition of the Affected Population in Contracts-1 & 2 of WeCARE Project

Age Range (Years)	Age Range Wise Affected Population						Age Range Wise Total Affected Male and Female Population				Grand Total	
	Contract 1		Contract 2		Contract 3		Male		Female			
	Male	Female	Male	Female	Male	Female	Popul ation	%	Popula tion	%	Populati on	%
0-4	185	171	159	170	150	167	494	6.47	508	6.95	1002	6.71
5-14	375	372	490	401	468	401	1333	17.46	1174	16.07	2507	16.78
15-45	1126	1228	1188	1183	1275	1440	3589	47.02	3851	52.72	7440	49.81
46-64	552	436	519	485	614	472	1685	22.08	1393	19.07	3078	20.61
65&above	158	129	184	114	190	136	532	6.97	379	5.19	911	6.10
Total	2396	2336	2540	2353	2697	2616	7633	100.00	7305	100.00	14938	100.00

Source: Census and IOL Survey, March –August 2022

4.4.3.3 DEPENDENCY RATIO

179. Number of dependent population is 4420 which belong to two age ranges, such as (i) 0 to 14 years, and (ii) 65 and above years. On the other hand, the active income earning population 10518 under two age

ranges (i) 15 to 45 years and (ii) 46 to 64 years age range. Total dependency ratio refers to ratio of dependant population and the active earning population in the project. According to this calculation ($4420 \times 100 / 10518$) dependency ratio is found 42.0232 only.

4.4.4 HOUSEHOLD CHARACTERISTICS

4.4.4.1 HOUSEHOLD SIZE

180. Table 4-30 shows that 61.20% of affected households belong to 4-6 household size followed by 30.28% of affected households belong to 1-3 household size. The lowest 8.52% of affected households belong to > 6 household size (Table 4-30). Overall household size is 4.31 in the project affected areas (Table 4-30).

Table 4-30: Contract Wise Distribution of Affected Households by Household Size					
Household Size	No. of Affected Households				
	Contract 1 No. of HH	Contract 2 No. of HH	Contract 3 No. of HH	Total No. & % of HHs	
1-3	273	325	451	1049	30.28
4-6	673	702	745	2120	61.20
>6	109	96	90	295	8.52
Total	1055	1123	1286	3464	100
Household Size	4.49	4.36	4.13	4.31	-

Source: Census and IOL Survey, March –May 2022

4.4.4.3 RELIGION

181. Table 4-31 presents package wise affected population by religion. Islam (91.63% followers) is found as the main religion followed by Hinduism (8.35% followers) in the project area. According to the Bangladesh Population and Demographic Indicators 2018, 88% of are Muslim and the remaining are of other religions in Bangladesh.

Table 4-31: Package Wise Affected Population by Religion within RoW					
Religion	Distribution of affected Population by Religion			Total	
	Package 1	Package 2	Package 3	No.	%
Islam	4311	4462	4914	13687	91.63
Hinduism	421	431	395	1247	8.35
Christian	0	0	4	4	0.03
Total	4732	4893	5313	14938	100.00

Source: Census and IOL Survey March-August 2022

4.4.4.4 EDUCATION LEVEL

182. The literacy rate in Bangladesh is 75%. The literacy rate in Jhenaidah district is 62% whereas the it is higher in Jessore district 80.49%. To assess the literacy during the primary data collection, data pertaining to education level of affected persons have also collected and is presented in Table 4-32. Among the surveyed population, that the total literacy level is 84.62% in (including Hafiz etc.) and 7.11% is illiterate and 8.27% is below 7 years in the project area. The literacy and illiteracy rates among male and female populations in Contracts 1, 2 and 3 are also presented in Table 4-32. Contract 1 whereas, in literate population is 91.15% population is literate while 8.85% is illiterate in Contract 2. Illiteracy rate is higher among the female population comparison to male population among the survey population in both the Contracts 1 and 2.

Table 4-32 : Package Wise Distribution of Affected Population (7 Years and Above) by Education Level

Sl. No.	Education Level	Package-1				Package-2				Package-3				Project Road	
		Male Population	Female Population	Total		Male Population	Female Population	Total		Male Population	Female Population	Total		Grand Total	
				Population	%			Population	%			Population	%	Population	%
1.	Illiterate	161	215	376	7.95	163	233	396	8.09	129	161	290	5.46	1062	7.11
2.	Total Literate	2026	1917	3943	83.33	2159	1906	4065	44.25	2380	2252	4632	87.18	12640	84.62
3.	Up to IV or Ebtedayee Madrasa	326	375	701	14.81	371	365	736	15.04	338	369	707	13.31	2144	14.35
4.	Primary Certificate	186	195	381	8.05	235	273	508	10.38	228	288	516	9.71	1405	9.41
5.	Class VI-VII	140	156	296	6.26	220	219	439	8.97	209	218	427	8.04	1162	7.78
6.	JSC Exam	229	228	457	9.66	267	265	532	10.87	235	261	496	9.34	1485	9.94
7.	Class IX-X	228	291	519	10.97	219	259	478	9.77	316	390	706	13.29	1703	11.40
8.	SSC Exam or equivalent/Dakhil	287	268	555	11.73	286	208	494	10.10	302	269	571	10.75	1620	10.84
9.	HSC Exam or Equivalent/Alim	280	215	495	10.46	228	175	403	8.24	480	346	826	15.55	1724	11.54
10.	B.A. or Equivalent/ Fazil	164	88	252	5.33	154	82	236	4.82	59	25	84	1.58	572	3.83
11.	M.A. or Equivalent/Kamil Pass	144	82	226	4.78	154	51	205	4.19	162	72	234	4.40	665	4.45
12.	Higher education	28	17	45	0.95	15	7	22	0.45	30	10	40	0.75	107	0.72
13.	Others (Hafiz)	14	2	16	0.34	10	2	12	0.25	21	4	25	0.47	53	0.35
14.	Population below 7 years	209	204	413	8.73	218	214	432	8.83	188	203	391	7.36	1236	8.27
15.	Grand Total	2396	2336	4732	100.00	2540	2353	4893	100.00	2697	2616	5313	100.00	14938	100.00

Source: Census and IOL Survey March-August 2022

4.4.4.5 AFFECTED EDUCATIONAL INSTITUTES

183. According to findings of census and IOL survey, a total of 27 educational institutions will be affected including 10, 10 and 7 in the Contracts 1, 2 and 3 respectively. Detailed information on affected educational institutions are presented in Annex 4-11.

4.4.5 MARITAL STATUS

184. A graphical presentation of marital status is presented in Figure 4-41 shows that the contract wise marital status in Contracts 1, 2 and 3 of proposed J-J road. Legally marriageable ages for the first marriage are 21 years for the male and 18 years for the female in Bangladesh. But the Child Marriage Act 2017 allows girls under 18 to marry with the consent of their parents. The marital status among the surveyed population of affected mouzas shows that mostly the marriage is solemnized above the marriageable age.

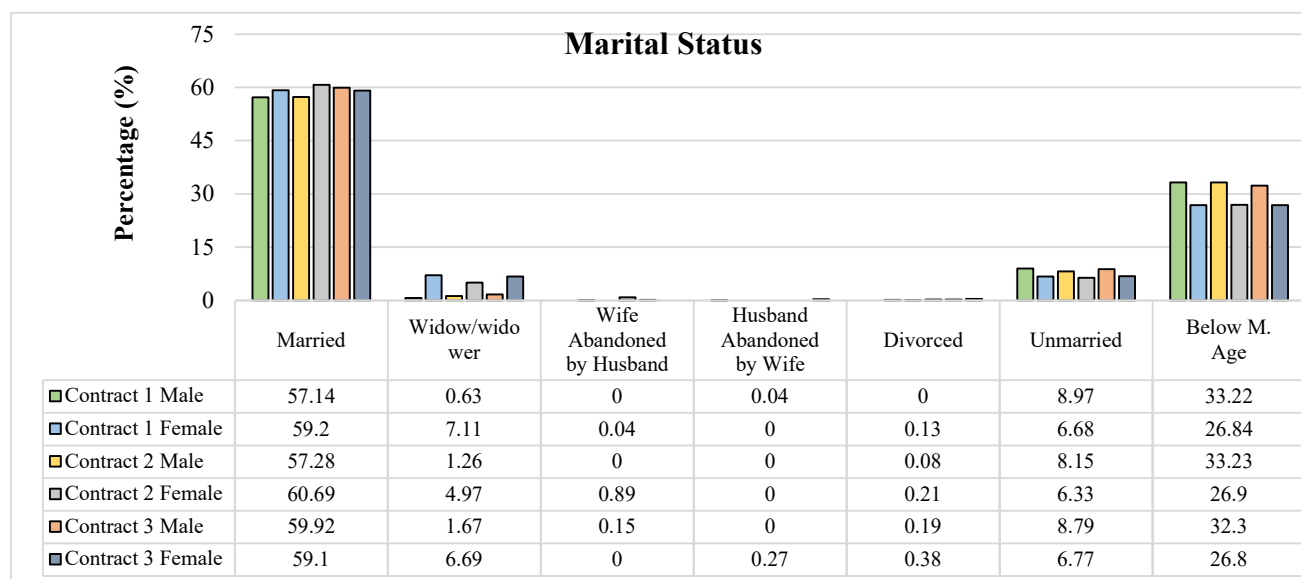


Figure 4-41: Marital Status of the Affected Population

Table 4-33: Contract Wise Marital Status of Affected Population by Sex in Contract 1, Contract 2 and Contract 3 within RoW

Marital Status	Marital Status of Affected Population within Marriageable Age (21 & 18 Years for Male & Female)																	
	Contract-1				Contract-2				Contract 3				Project Areas					
	Male		Female		Male		Female		Male		Female		Male		Female		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Married	1369	57.14	1383	59.20	1455	57.28	1428	60.69	1535	59.915	1546	59.10	4359	57.11	4357	59.64	8716	58.35
Unmarried	215	8.97	156	6.68	207	8.15	149	6.33	237	8.79	177	6.77	659	8.63	482	6.60	1141	7.64
Below m. age	796	33.22	627	26.84	844	33.23	633	26.90	871	32.30	701	26.80	2511	32.90	1961	26.84	4472	29.94
Widow/Widower	15	0.63	166	7.11	32	1.26	117	4.97	45	1.67	175	6.69	92	1.21	458	6.27	550	3.68
Wife abandoned by husband	0	0.00	1	0.04	0	0	21	0.89	4	0.15	0	0	4	0.05	22	0.30	26	0.17
Husband abandoned by wife	1	0.04	0	0.00	0	0	0	0	0	0	7	0.27	1	0.01	7	0.10	8	0.05
Divorced	0	0.00	3	0.13	2	0.08	5	0.21	5	0.19	10	0.38	7	0.09	18	0.25	25	0.17
Total	2396	100.00	2336	100.00	2540	100.00	2353	100.00	2697	100.00	2616	100.00	7633	100.00	7305	100.00	14938	100.00

4.4.6 ECONOMIC PROFILE

4.4.6.1 OCCUPATIONAL BACKGROUND

185. Table 4-34 shows that the highest primary occupation of affected male household-heads is businesses for 2126 HHHs (65.02%) followed by male household heads (269/8.23%) whose occupation is service (employment) and further followed by skilled laborers (106/3.24%).

Table 4-34: Contract Wise Distribution of Affected Households by Primary Occupation in the J-J Road Project					
Primary Occupations	Primary Occupations of Household Heads				
	Contract-1	Contract-2	Contract-3	Total	
				No.	%
Agricultural Farming	42	78	100	220	6.73
Business (Male)	613	738	775	2126	65.02
Business (Female)	14	6	16	36	1.10
Service (Male)	88	69	112	269	8.23
Service (Female)	6	2	2	10	0.31
Household Chores (Female)	39	22	46	107	3.27
Retired Employee	4	9	7	20	0.61
Doctor/Village Doctor	8	5	10	23	0.70
Kabiraj	0	2	2	4	0.12
Daily Labor (Unskilled)	32	42	47	121	3.70
Daily Labor (Unskilled) (Female)	2	1	1	4	0.12
Labor (Skilled)*	36	40	30	106	3.24
Migrant Works at Abroad	14	6	14	34	1.04
Maid Servant	4	0	3	7	0.21
Managing Household with House Rent by Man	17	5	6	28	0.86
Managing Household with House Rent (Female)	1	0	0	1	0.03
Rickshaw puller	8	15	11	34	1.04
Teacher	19	13	26	58	1.77
Driver	17	21	17	55	1.68
Imam	0	1	1	2	0.06
Fisherman	0	0	1	1	0.03
Total	965	1076	1229	3270	100.00

Source: Census and IOL Survey March – August 2022

Note: Skilled laborers include (i) carpenter, (ii) mason, (iii) barber, (iv) blacksmith, (v) driver, (vi) mechanic, (vii) rickshaw driver, (viii) tailor, (ix) imam, (x) cobbler, etc.

186. Whereas, Table 4-35 shows that the highest primary occupation of other active members of affected households is household chores by women (81.82%) in the project areas followed by business by men (6.26%) further followed by services by men (4.07%). Detailed information about primary occupations of other active members of the affected households is presented in the following table.

Table 4-35: Contract Wise Distribution of Primary Occupations of Other Members of Affected Households in the J-J Road Project					
Primary Occupations	Primary Occupations of Other Members of Affected Households				
	Contract 1	Contract 2	Contract 3	Total	
				No.	%
Agricultural Farming	10	12	23	45	0.88
Business (male)	104	126	91	321	6.26

Table 4-35: Contract Wise Distribution of Primary Occupations of Other Members of Affected Households in the J-J Road Project

Primary Occupations	Primary Occupations of Other Members of Affected Households				
	Contract 1	Contract 2	Contract 3	Total	
				No.	%
Business (female)	2	10	6	18	0.35
Service (male)	88	56	65	209	4.07
Service (female)	22	8	14	44	0.86
Household chores (female)	1310	1370	1518	4198	81.82
Retired Employee	0	1	3	4	0.08
Migrant Workers at Abroad	19	22	10	51	0.99
Daily Labor (Unskilled) (male)	34	35	26	95	1.85
Daily Labor (Unskilled) (female)	0	3	0	3	0.06
Labor (Skilled)*	21	0	0	21	0.41
Managing household with house rent by man	0	0	4	4	0.08
Managing household with house rent by woman	0	0	1	1	0.02
Village Doctor/Doctor (male)	4	4	0	8	0.16
Village Doctor/Doctor (female)	0	3	5	8	0.16
Kabiraj	0	1	0	1	0.02
Driver	17	14	3	34	0.66
Rickshaw puller	4	2	1	7	0.14
Teacher (male)	11	18	12	41	0.80
Teacher (female)		9	8	17	0.33
Maid servant	1	0	0	1	0.02
Lawyer	0	0	0	0	0.00
Total	1647	1694	1790	5131	100.00

Source: Census and IOL Survey March – August 2022

4.4.6.2 INCOME AND EXPENDITURE

187. The highest number of affected households is 1205 (38.10%) (401, 522 & 282 HHs in the Contracts 1, 2 & 3 respectively) belong to to BDT 135,001 to BDT 300,000 annual income range followed by 837 households (26.46%) belong to BDT 300,001 to BDT 500,000 annual income range. The lowest number of affected is 46 (1.45%) belong to up to BDT 60,000. Table 4-36 shows that 321 affected households (46 and 275 HHs in project area) belong to (i) up to BDT 60,000 and (ii) BDT 60,001 to BDT 135,000 income level. Higher number and percentage of affected poor households belong to annual income level (i) up to BDT 60,000 and (ii) BDT 60,001 to BDT 135,000 are found in the Contract 1 compared to Contract 2 and Contract 3. Detailed information on distribution of project affected households by annual income range in Contracts 1, 2 & 3 is presented in Table 4-36.

188. Table 4-37 shows distribution of project affected households by monthly expenditure in the Contracts 1, 2 and 3. The highest number of households is 1021 HHs (32.28%) belong to monthly expenditure range BDT 12151 to 20000 with monthly average expenditure is BDT 16560. The second highest number of households is 952 HHs (30.10%) whose monthly income range is BDT 20001 to 35000 and their average monthly expenditure is BDT 26744. The lowest number of households is 82 HHs (2.59%) whose monthly income range is BDT 55001 to 75000 and their average monthly expenditure is BDT 64993 only. Detailed information on households monthly expenditure is presented in Table 4-37.

Table 4-36: Distribution of Households by Annual Income in Contracts 1, 2 & 3

(BDT) Annual Income Level (BDT)	Annual Income (BDT) of Affected Households									Grand Total Annual Income				Average Annual Income (BDT)
	Contract 1			Contract 2			Contract 3							
	No. of HHs	Total Annual Income	Average Annual Income	No. of HHs	Total Annual Income	Average Annual Income	No. of HHs	Total Annual Income	Average Annual Income	No. of HHs	%	BDT	%	
Up to 60,000												2321000	0.14	49382.98
60,001 to 135,000	126	14028400	111336.51	80	9275200	115940.00	82	9111800	111119.51	288	8.31	32415400	1.92	112553.47
135,001 to 300,000	387	86891720	224526.41	517	112732714	218051.67	488	111196200	227861.07	1392	40.18	310820634	18.39	223290.69
300,001 to 500,000	257	104151000	405256.81	294	116185266	395187.98	356	142574800	400491.01	907	26.18	362911066	21.47	400122.45
500,001 to 1,000,000	180	121502200	675012.22	146	99038200	678343.84	252	169614600	673073.81	578	16.69	390155000	23.08	675008.65
1,000,001 and above	80	228674600	2858432.50	76	166293196	2188068.37	96	196863600	2050662.50	252	7.27	591831396	35.01	2348537.29
Total	1055	556489320	527478.03	1123	503986176	448785.55	1286	629979000	489874.81	3464	100.00	1690454496	100.00	488006.49

Table 4-37: Distribution of Households by Monthly Expenditure in Contracts 1, 2 and 3

Monthly Expenditure (BDT)	Monthly Expenditure (BDT) of Affected Households									Grand Total Monthly Expenditure				Average Monthly Expenditure (BDT)
	Contract 1			Contract 2			Contract 3							
	No. of HHs	Total Monthly Expenditure	Average Monthly Expenditure	No. of HHs	Total Monthly Expenditure	Average Monthly Expenditure	No. of HHs	Total Monthly Expenditure	Average Monthly Expenditure	No. of HHs	%	BDT	%	
Up to 12150	225	1893350	8,414.89	297	2840665	9,564.53	196	1810950	9,239.54	718	20.73	6544965	7.11	9115.55
12151 to 20000	337	5680423.34	16,855.86	380	6093593.34	16,035.77	474	7843150	16,546.73	1191	34.38	19617166.68	21.31	16471.17
20001 to 35000	299	8110356.67	27,124.94	304	7967396.67	26,208.54	409	10678306.67	26,108.33	1012	29.21	26756060.01	29.06	26438.79
35001 to 55000	119	5096405	42,826.93	86	3728333.33	43,352.71	145	6276217.67	43,284.26	350	10.10	15100956	16.40	43145.59
55001 to 75000	35	2281233.33	65,178.10	19	1226700	64,563.16	31	2009483.33	64,822.04	85	2.45	5517416.66	5.99	64910.78
75001 and	40	8345433.33	208,635.83	37	5958916.67	161,051.80	31	4233650	136,569.35	108	3.12	18538000	20.13	171648.15

Joint Venture of



STUP Consultant Pvt. Ltd.
On July 1st, 2021, STUP was acquired by Assystem and rebranded as Assystem STUP.



BCL Associates Limited, Bangladesh

Table 4-37: Distribution of Households by Monthly Expenditure in Contracts 1, 2 and 3

Monthly Expenditure (BDT)	Monthly Expenditure (BDT) of Affected Households									Grand Total Monthly Expenditure				Average Monthly Expenditure (BDT)
	Contract 1			Contract 2			Contract 3							
	No. of HHs	Total Monthly Expenditure	Average Monthly Expenditure	No. of HHs	Total Monthly Expenditure	Average Monthly Expenditure	No. of HHs	Total Monthly Expenditure	Average Monthly Expenditure	No. of HHs	%	BDT	%	
above														
Total	1055	31407201.67	369,036.54	1123	27815605.01	320,776.52	1286	32851757.67	296,570.26	3464	100.00	92074564.35	100.00	26580.42

4.4.7 VULNERABLE GROUPS

189. It has already mentioned earlier that vulnerable households and groups are likely affected due to the project. The vulnerable households and groups include (i) Woman headed households, (ii) Disabled woman headed households, (iii) Disabled man headed households, (iv) Elderly (>64 years) man headed households and (v) Man headed households under poverty line (annual income BDT 135,000). Total 335 vulnerable households have been identified through census and IOL survey. The highest vulnerable households are 187 (55.82%) elderly (>64 years) man headed households under poverty line (annual income BDT 135,000 and below) followed by 70 (20.90%) each case woman headed households and elderly (>64 years) man headed households followed by 6 disabled man headed households (1.79%). Special attention should be given for the affected vulnerable households and groups for ensuring payment of assistance, allowance and grant. The needs of affected vulnerable groups, such as the poor, woman headed, landless persons, there is no indigenous peoples, ethnic minorities, the elderly, and disabled persons will be properly addressed. They had been identified through census, IOL and SES survey (Table 4-38).

Table 4-38: Distribution of Vulnerable Households under Contracts 1, 2 and 3

Category of Vulnerable Households	No. & % of Affected Vulnerable Households							
	Contract 1		Contract 2		Contract 3		Total	
	No.	%	No.	%	No.	%	No.	%
Woman headed households	41	27.15	5	5.56	24	25.53	70	20.90
Disabled woman headed households	2	1.32	0	0.00	0	0.00	2	0.60
Disabled man headed households	2	1.32	0	0.00	4	4.26	6	1.79
Elderly (>64 years) man headed households	32	21.19	21	23.33	17	18.09	70	20.90
Man headed households under poverty line (annual income BDT 135,000 and below)	74	49.01	64	71.11	49	52.13	187	55.82
Total	151	100.00	90	100.00	94	100.00	335	100.00

4.4.8 AFFECTED COMMON PROPERTY RESOURCES (CPRs)

190. According to findings of census and IOL survey, a total of 59 affected common property resources (CPRs) including 24, 20 and 25 in the Contracts 1, 2 and 3 respectively are identified. The highest affected CPRs are mosques (32) including 10, 10 and 12 in the Contracts 1, 2 and 3 respectively. The second highest affected CPRs are schools & college (13) including 6, 4 and 3 in the Contracts 1, 2 and 3 respectively followed by affected CPRs are Madrasha (9) including 6, 0 and 3 in the Contracts 1, 2 and 3 respectively and 4 temples including 2, 0 & 2 in Contracts 1, 2 & 3 respectively. Contract wise number of Common Property Resources is given in Table 4-39 and detailed information on affected various CPRs are presented in Annex 4-11.

Table 4-39: Contract Wise No. of Common Property Resources (CPRs)

Contract No.	Different Types of CPRs							
	Mosque	School/College	Madrasha	Graveyard	Community Centre	Orphanage	Temple	Total
Contract 1	10	6	6	1	0	0	2	24
Contract 2	10	4	0	0	1	1 orphanage & 1 mosque	0	15
Contract 3	12	3	3	0	0	0	2	20
Total	32	13	9	1	1	1 orphanage & 1 mosque	4	59

4.4.9 SANITATION AND WATER SUPPLY

4.4.9.1 SANITATION

191. It was reported that the affected businessmen and their employees who stay and/or live at bazars in urban areas utilize sanitary latrines in most of the cases. However, some businessmen at rural market areas use both the sanitary and ring slab latrines. The affected households who have pucca structures, their household members utilize sanitary latrines attached inside their pucca structures. However, some affected households having semi-pucca structures which have ring slab latrines outside their semi-pucca structures. They utilized sanitary and ring slab latrines. Households living in tin made houses and katcha houses generally utilize the following types of latrines which were found in the findings of census and IOL survey shows that 60.85% such households utilize sanitary latrines followed by ring slab latrines (27.51%) in the project affected areas Table 4-40.

Table 4-40: Distribution of Affected Households by Type of Latrine Whose Latrines is Outside of Their Structures					
Type of Latrines	No. of Affected Households Utilize Latrines			Total	
	Contract 1	Contract 2	Contract 3	No.	%
Sanitary Latrine	118	51	61	230	60.85
Ring Slab Latrines	47	32	25	104	27.51
Katcha Latrines	6	10	2	18	4.76
Pit Latrines	0	26	0	26	6.88
Total	171	119	88	378	100.00

Source: Census and IOL Survey March – May 2022.

192. **Drainage:** There was no or negligible poor condition of drainage system found during census and IOL survey in Contracts 1 and 2. There is no sewage system developed by local government Union Parishad and Pourasabha in Contracts 1 and 2.

4.4.9.2 WATER SUPPLY

193. Almost 100% of affected households use underground water for their drinking, domestic, bathing, washing and other purposes in the Contracts 1 and 2. Ground water is lifted with the deep, shallow and hand tube wells. Commercial entities including businessmen, factory owners, CPRs also use ground water for drinking, washing, bathing and other necessary purposes. Underground water is lifted with motor pumps and store in the water tank in the ground and also on roof top as well.

4.4.10 UTILIZATION OF ELECTRICITY

194. Almost 100% of affected households, commercial entities& CPRs under Contracts 1 and 2 use electricity for various purposes, such as, various residential and commercial purposes including light, fan, lifting water with motor pumps, cooking, etc.

4.4.11 HEALTH FACILITIES

195. Land acquisition has impacts on drug shops/medicine shop/pharmacies, chambers of some doctors at different affected Bazars in the Contracts 1 and 2. It may be mentioned that land acquisition has impact on a very few health facilities only. Table 4-41 shows that Kaliganj Upazila Prani Sampad Veterinary Hospital at chainage 15 Km+460m in Contract 1 and Janani Asia Private Hospital at chainage 28 Km + 450m in Contract 2 are affected due to the project.

Table 4-41: Affected Health Facilities in Contract 1 and 2				
Sl. No.	Name of Affected Health Facilities	Chainage	Left Hand Side of the J-J Road	Contract
1.	Kaliganj Upazila Prani Sampad Veterinary Hospital	15Km+460m		Contract 1

Table 4-41: Affected Health Facilities in Contract 1 and 2

Sl. No.	Name of Affected Health Facilities	Chainage	Left Hand Side of the J-J Road	Contract
2.	Janani Asia Private Hospital	28Km + 450m		Contract 2

4.4.12 GENDER BASED VIOLENCE (GBV) IN JHENAIDAH AND JASHORE

196. The worst manifestation or existing forms of SEA/SH is child marriage, also known as early marriage. Child marriage and the dowry system puts girls at particular risk of sexual, physical and psychological violence throughout their lives. Bangladesh has one of the highest early marriage rates in the world at 59 percent in 2018 (UNFPA, 2019).

197. Early marriage nearly always results in school drop-outs or from to pursuing higher education and early childbirth, and is often used as a way for trafficking young girls. This is hazardous from a health perspective and is a hindrance to academic and economic development.

198. The provision of GBV services to the host communities in RHD has been limited. Only the One Crisis Center (OCC) at District Sadar Hospital (DSH) and a one stop cell at Jhenaidah and Jashore to serve the host communities. These are operated under the Multisectoral Program on Violence against Women (MSPVAW) led by the Ministry of Women and Children Affairs (MOWCA) in coordination with eleven other ministries and law enforcement, and legal agencies/organizations. However, the GBV issues are also serious among the local population and services to them are badly needed as well.

5 ANALYSIS OF ALTERNATIVE ALIGNMENTS

5.1 GENERAL

199. The proposed road widening and strengthening of J-J road will improve the economic and social welfare of people. Increased road capacity and improved pavements will reduce travel times and lower the costs of vehicle use, increase access to markets, jobs, education, and health services and reducing transport costs for both freight and passengers. For all these positive impacts of road projects, there will be also some significant negative impacts on nearby communities and the natural environment:

- ▶ Due to cuttings of avenue trees and vegetation,
- ▶ Impact on water bodies (ponds and rivers) and.
- ▶ Social impacts on people, which are in direct path of road alignment due to land acquisition in the form of loss of structures, relocation of residents and commercial entities.

200. There will be indirect impacts on the social environment, through the disruption of livelihood, loss of accustomed travel paths and community linkages. The land use pattern along the existing road alignment is predominantly agricultural followed by built-up areas including townships and commercial areas, major road intersections, parking areas, industrial etc. The project also has partial or full impacts on structures like houses, offices, mosques, temples, graves and educational institutes, existing utilities, health, and safety of workers during the construction. The right of way is inadequate for a 4-lane, there may be significant land acquisition resettlement problems. To widen the carriageway, the adjacent agricultural land, residential lands, markets, institutions etc. will be affected, these will need to be strictly managed during the construction phase. Some localized problems may occur due to many settlements alongside the project road and special management will be necessary during the construction phase. Project impacts on natural and social environments are inevitable due to their proximity to the project impacted area. The present section briefly analyzes the different alternatives/options from environmental and social point of views.

201. The proposed project of 47.8 km of design length follows the existing alignment except two realignment sections is considered under lying the idea with most socially acceptability and addressing the community safety concerns options with least impact on the environment. Whereas, during the design process some general environmental issues have been considered in the review of alternative alignments or structures as the best solution. However, there are several options that are considered during designing process with close coordination meeting with E&S Consultants and Engineering Design Team

202. For smooth flow of traffic and improved geometric different type of structures have been considered for the existing alignment for the appropriate alternatives. These structures are new bridges, new culverts with additional culverts, (VOP), Pedestrian over pass (POP), and fly overs Bridges (FOBs).

203. **Widening of RoW:** To construction of 4 lane and junction improvement requires land acquisition resulting in demolition of residences/commercial areas. This will have impact on the commercial activities, livelihood, and cause significant disturbance to the local population living adjacent to the road alignment. Government already declared ban on the use of agricultural land or minimize their loss. Thus, the excess land acquisition of agricultural lands for road extension has limitation and thus, the proposed design are carried out at minimum land acquisition as much as possible.

5.2 SUITABLE ROAD STRUCTURES AND REALIGNMENT CONSIDERATIONS

204. **Commercial and Market Areas:** Some sections of alignment pass through commercial areas. With some impacts on the adjacent land/buildings/commercial setups or other activities, the present ribbon development along the existing alignment will pose limitations for widening and strengthening of the existing road alignment. The health of the existing commercial area may be adversely affected by loss of trade-off for extra land acquisition. There will be increased risks to pedestrians and other road users if the proper mitigation

measures are not considered. For smooth and safe flow of traffic and improved geometric different type of structures have been considered in the design. These structures are, Vehicular over pass (VOP), Pedestrian over pass (POP), Foot over Pass (FOP), which are adopted in the design at built up areas and road intersections.

205. **Flyover:** Given the type of lands alongside project road in Jashore at Jashore Cantonment area, which is a restricted area. Considering the several consultations of the Design Team and E &S Consultant with the officials of Cantonment Board, public and the Client, and future the traffic flows and the characteristic of the local environment an elevated pass been proposed as a best option.

206. The flyover does have environmental impact on the visual appearance in the areas area due to an additional new elevated structures and not needs any cutting of roadside trees as well as this does not disturb the cantonment area. Thus, fly over at selected location have been considered as an alternative for improving the existing road alignment.

207. In addition, the present alignment between Jhenaidah-Jashore require numerous short distance straightening realignments to meet the design needs is in accordance with the RHD standards. The selection of these minor realignments will need to ensure the minimum disturbance to the local environment (and to ensure minimum disturbance to the built environment, land acquisition and resettlement

208. **Realignment or Bypass:** This is option that will have permanent impact on existing land use pattern from agricultural to paved road. Land and farmers need to be compensated as per Resettlement Action Plan (RAP). In this project two realignments have been identified and evaluated with considering the alternatives analysis. These two alternatives have been studied as follows

- ▶ Realignment at Bhutigati under Contract Contract-1
- ▶ Realignment at Kazi Nazrul Islam Collage, Contract Contract-3

5.2.1 REALIGNMENTS AT BHUTIGATI

Two alternatives are as follows

▶ Alternative 1: Widening the existing road

209. The existing road section from 0+800 Km to 1+600 Km has sharp curve and requires smoothening and also passes through the settlement area. The first alternative is just to widen and strengthen the exiting road. Widening and strengthening of the existing alignment will require larger land acquisition in urban and semi urban areas alongside road, results a significant number of dislocation of people.

▶ Alternative -2: Realignment at Bhutiargati

210. This second alternative is to introduce a realignment on this section. The second alternative is a realignment at this Km 0+800 Km and 1+600 Km from Gobindapur to Mondolpara-. This alternative requires some land acquisition but will provide better road safety, smooth flow of traffic, and reduced travel time due to improved geometrics and short distance. There also will be certain environmental and social risks and impacts due to land acquisition, which can be mitigated by adopting the mitigation measures in Section 7 and Resettlement Action Plan (RAP). Both alternative route map is shown in Figure 5-1. The analysis of these two alternatives is summarized in Table 5-1.

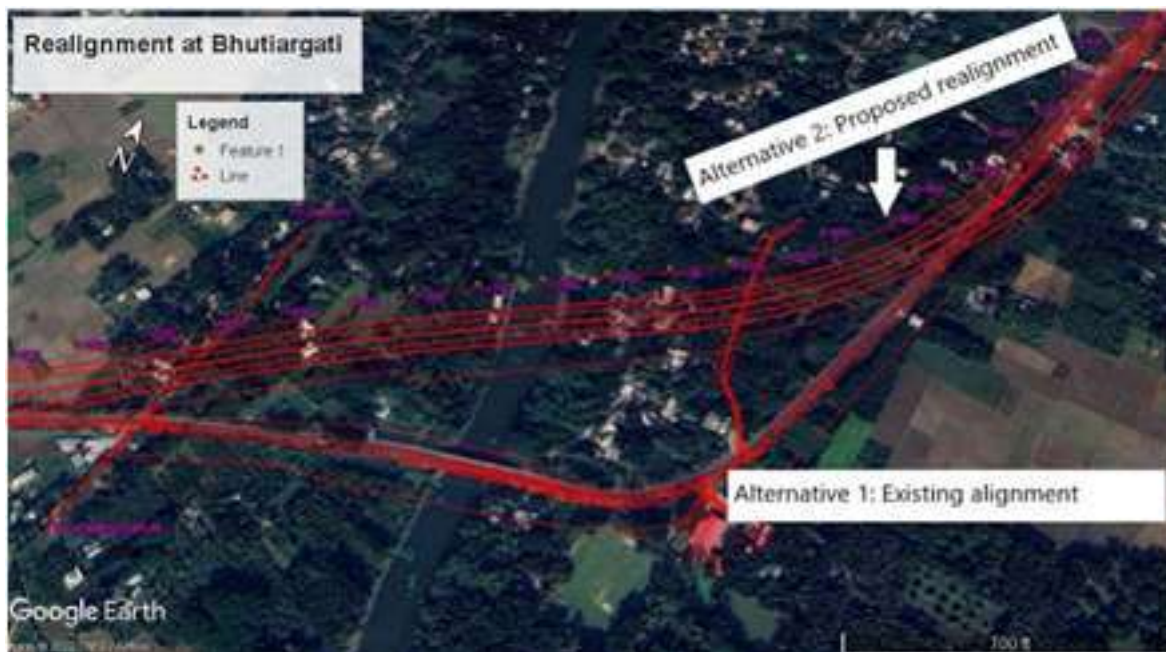


Figure 5-1: Alternative- 1 and Alternative- 2 Routes of the Project Road under Contract-1

Table 5-1: Characteristics and Impacts of the proposed Realignments-

Alternatives No	Routes Description	Characteristics	Environmental Issues	Other issues
Existing route- Alternative -1	Substandard existing alignment as it has sharp curve	The existing bent road passes through the urban and semi urban areas	Widening of this route will have significant adverse impacts on the human interest, since larger portions of land acquisition will be happened at urban and market area. It will cause more social impacts than environmental impact	Would have significant adverse impacts on livelihood of the affected persons.
Proposed Realignment Alternative -2	Thick line is the alternative 2 is passing through rural areas at Gobindapur and Mondolpara	All new sections would pass through predominantly low-lying agricultural land and village.	Significant impact of loss of private trees and permanent loss of agricultural land. Irreversibly likely to have impacts during construction phase; pollution of water and soil contamination etc.	Would provide better communication with shorter travel time and more direct route from Gobindapur to Mondolpara.

Thus, the preferred alignment is Alternative-2.

5.2.2 KAZI NAZRUL ISLAM COLLEGE

211. The following two alternatives are considered. Both the alternatives are shown in Figure 5-1 with their Chainages.

► Alternative 1=Widening the existing road

212. The existing road width is narrow. There is a monument of Shahid Lt. Anwar, located alongside road which is opposite to the Collage area, just before the Jashore cantonment area. In the proposed design, this monument will be saved about a narrow strip of lands within the premises of the college will be affected with a small building structure (Figure 5-2).



Figure 5-2: Cultural Property Resources along the Project Road Alignment (Shaheed Lt. Anwar Monument)

► **Alternative -2: Realignment behind the Kazi Nazrul Islam College**

213. In the previous study, in 2015, ADB the design suggested a realignment which was taking off from the area behind the collage, to save this monument and also collage area, but the proposed realignment requires huge amount of land acquisition on green field and have permanent impact due to change in land use pattern from agriculture to paved road. The summery of both are given in Table 5-2.

Table 5-2: Characteristics and Impacts of the Proposed Two Alternatives

Alternatives	Characteristics	Environmental issues	Other Issues
Realignment route at the back of area of the collage (Alternative 1)	This realignment road passes through the vast agricultural Land and rural area.	Realign and Widening of this route will have Significant impact of loss of trees and Agricultural land. Moreover, will have irreversibly Significant adverse impacts on the human interest, since larger portions of land acquisition will happen. It will cause significant environmental and social impacts as well.	Would have significant adverse impacts on livelihood of the affected persons.
Widening of Existing Road (Alternative 2)	The new section would pass in front of collage premises, just widening the existing road	Social impacts are more but less than alternative-1. The College authority will lose some lands and structures in their premises. Several times public consultations they request for the adequate and proper compensation should be paid them for reconstruction of their affected buildings However, there will be impacts during construction on noise and vibration which will be short term limited to construction phase and can be mitigated by adopting mitigation measures as suggested in Section 7 and Section 8 of this report.	Would provide better communication with shorter and more direct route.

Thus, the preferred alignment is Alternative-2.

5.3 TREES CUTTING ALTERNATIVES ANALYSIS

214. To save trees along entire existing road alignment, two alternatives are considered in points environmental and social benefits.

► Alternative- 1: With Cutting Trees

215. Proposed project on the existing road alignment needed to be cut down trees. These trees belong to RHD, Zila Parishad, and Forest Department. Trees of Forest Department are in already cutting list according to their plantation plan. Maximum trees are old, fragile and exotics. Even if there is no road corridor extension, these trees could be cut to distribute benefits among the stakeholders. However, tree cutting for the road extension along with existing road might have no significance impacts. Apart from this, RHD will use their own land in maximum cases and along with their land some extra land will acquire through land acquisition for the extension of road. Costing and damage of environment can keep as minimum as if properly planned. In few cases like oldest Banyan trees or large fish culture ponds can be saved if minor innovation can adapt in existing design. e.g., if the banyan tree existed on the right alignment that case to save the banyan tree left alignment can enlarge up to some extent or vice versa.

► Alternative-2: Without Cutting of Trees

216. Keeping trees in the existing alignment, new road alignment could be adopted for the lane extension at one side of the existing road. This will require extra more agricultural land but the volume of land will be measured by the design team if further required. Practically it is impossible. Such alignment will create huge involvements those cannot meet by RHD in the current situation. Such alignment will create plenty of impact on local socioeconomic condition and agriculture sector. The proposed project area is well known for robust agricultural production area. Farmers of this area have been supplying rice with different kind of vegetable to various parts of the country. Government already declared ban on the use of agricultural land for other uses. If possible, flyover could be constructed above the existing road alignment from Jhenaidah to Jashore as constructed in many countries to save green environment.

► Discussing on Alternatives

217. Alternative- I: the cutting trees is more justified. The development of new road corridor 14008 trees needs to be cut down. In RHD, 5853 trees will be removed from contract one, and 5270 trees will be removed contract two and 2885 trees will be removed from contract three. In RHD, three saplings will be planted for each tree cutting. For the 90% survival of tree saplings, caring will be provided up to six years along the road alignment. Earlier study ESIA (2019) estimated that 3000 trees needed to cut down from project. The number trees were the result of preliminary assessment in project site. In this project, ecological survey carried out in detailed and reported a total of 14008 trees of different species from the project site to cut down.

218. Alternative- II: If the current design of road alignment is changed by considering the save one or both sides road side trees the Project cost of RHD will be increased and it requires land acquisition for new road alignment. Agricultural or homestead land will be lost. Agriculture land is very demanding and scarce in term of population number of the country. Oldest and fragile trees will remain on the roadside which may create threats to vehicle movement and also pedestrian's movement. Trees on the roadside are mostly exotics and mainly used for timber yielding. If such trees will sustain, no scope will create to improve the current environmental condition using indigenous and multipurpose trees along the roadside

► Benefit of Tree Cutting

219. The trees along with the road alignment has already started cutting according to the Social Forestry Plan. Even if there is no road corridor extension these trees would be cut to distribute benefits among the stakeholders. Among the trees some are very oldest and fragile and during any simple disaster tree falls, uprooting, branches breaking is common accident and caused huge loss of resources and even lives. Apart from this, existing trees are exotics and their contribution to the local biodiversity, environment, primary

health care, food security and wildlife conservation are not adequate. Removal of such trees in this respect, opportunities will be created to make poly cultural plantation using indigenous trees those will be very helpful for local biodiversity enhancement, local heritage conservation, local climate improvement, meeting of local demand from roadside plantation including sources of primary healthcare materials, fruits and so on. The project already proposed tree plantation plan using indigenous tree species of different valuable categories including timber, fruits, medicines, ornamental and so on. The comparison between tree cutting and not cutting is given in Table 5-3.

Table 5-3: Comparison of Two Alternatives

Alternative-1 with trees Cutting	Alternative-2 without trees Cutting
Tree cutting on existence road will reduce project cost.	Keeping existing trees on the roadside, extra land will be enquired for the extension. project cost will be increased.
Trees are already in cutting list according to plantation plan.	If not cut by RHD for road extension, social forestry division must cut the trees for benefit sharing of tree plantation with local stakeholders.
Pedestrian and vehicles will be saved from old and fragile trees fall during disaster.	Vehicles and pedestrians will be always in danger from trees falling
Exotic monoculture trees will be eliminated and will be created an opportunity to make plantation using indigenous multipurpose trees.	Exotic trees will remain sustain. No opportunity will be created to improve the current situation of monoculture.
Local people need different products and services from trees. If cut trees, new plantation plan will be executed using native trees of different purposes including timber, fruits, ornamental, medicinal and so on.	Local people will be deprived from products and services of native trees.
<i>Thus, the preferred alignment is Alternative-2.</i>	

5.4 ENVIRONMENTAL IMPACT OF A “WITHOUT PROJECT” AND “WITH PROJECT” ALTERNATIVES

► Alternative -1: Without Project

220. With project scenario would involve new capital investment in the road and the present road would be capable to cater to future need of traffic demand. If the proposed road goes for “without project scenario” there will not only be environmental impacts due to regular traffic congestions, idling of vehicle, increased noise and air pollution due to increased traffic, but also will be road accidents on the existing road due to poor geometrics. However, with project scenario will cater to the future traffic demand. There will be certainly environmental and social impacts due to the with project scenario which can be mitigated by adopting mitigation measures as suggested in Section 7 and Section 8 of this report. The traffic analysis study report has indicated that the traffic will increase in coming years on this road and “without project scenario” would render the following problem in future:

- Crossing the road would become more hazardous
- Traffic congestion would increase
- The economic disadvantages will be due to idling of vehicles, increased travel time, operating cost of vehicles due to frequent wear and tear.

221. Overall, the quality of the environment and social conditions will deteriorate further if “without project scenario” is adopted with the present condition of the road.

5.4.1 CARBON SAVINGS DUE TO “WITH PROJECT” SCENARIO

222. Bangladesh is considered as one of the most vulnerable countries in terms of global warming and climate change. Thus, any development designated for this country needs to be environmentally sustainable as well as economically viable. Greenhouse gases emitted from the vehicles have a positive correlation with the global warming occurrence. Thus, by causing a decrease on the total amount of greenhouse gas emitted per year will also mean a reduced global warming. Which, would in long term prove to be environmentally beneficial both nationally and globally.

223. Thus, an attempt has been made to work out the carbon reduction due to with project scenario and is presented in Table 5-4. This table shows there is a positive difference between the two scenarios- “with project” and “without project”. It may be observed that the latter option “without project”, the amount of carbon emission is higher than that “With Project” scenario. Further it is worth to mention that with the with project option the difference gradually increases along the years. Which implies that over the years the amount of emission with project will continue to be less than that Without Project scenario.

Table 5-4: Year Wise Carbons Emission

Year Wise	With Project Carbon Emission (Kg)	Without Project Carbon Emission (Kg)	Difference (Kg)	In Tons
2022-2023-	124087.333	165153.9006	41066.56759	41.06657
2023-2024-	132301.4683	176057.7719	43756.30357	43.7563
2024-2025-	141052.4431	187679.0505	46626.60744	46.62661
2025-2026-	150417.9449	200115.502	49697.55712	49.69756
2026-2027-	165204.1277	219672.3165	54468.18881	54.46819
2027-2028-	182024.3809	241927.8732	59903.49232	59.90349
2028-2029-	201685.9063	267926.7817	66240.87546	66.24088
2031-2032-	249036.6897	330697.8255	81661.13576	81.66114
2036-2037-	366626.8564	486489.9673	119863.1109	119.8631
2041-2042-	511517.1939	678283.6994	166766.5054	166.7665
2046-2047-	670866.5464	889116.9557	218250.4093	218.2504
2051-2052-	846010.7151	1120704.186	274693.4713	274.6935

5.4.2 COMPARISON SCENARIO MATRIX

224. Following matrix describes the comparison scenarios including both environmental and social factors associated with the project. Comparison scenario of “with the project” and “without the project” is presented in Table 5-5.

Table 5-5: Comparison Scenario Matrix of With and Without the Project

Sl. No.	Factors	With the Project	Without the Project
1.	Connectivity and Economic growth	Will facilitate faster safer economic links as well as regional trade, commerce and industry between Mongla port, -Jashore-Dhaka and to the Indian border.	The current road system is not sufficient for the increasing traffic and thus is congested and unable to provide the adequate logistics supports to the regional economy.
2.	Social and environmental condition	An improved environmental and social conditions will be offered by the climate resilient four lane road network.	The existing road network is congested and is not sufficient to support the growing economic growth. It is causing an extra weight on the existing environment and social conditions.
3.	Community health and safety	The road will offer better and safer travel networks for the community. Travel time will be less. There will be safe road crossing, foot overs for the community people.	The existing road is already congested with the existing traffic moreover there it lacks proper public crossing, foot overs and such.
4.	Flooding and drainage	The upgrade intends to install necessary culverts, bridges and drainage lines so that the natural flow of water is undisturbed; As well as it will decrease the chance of flooding as will provide better water channels to support excess rainfall incidents	The project areas sensitive to the changes of rainfall patterns and sea-level rise. Hence issues such as flooding and water logging occurs
5.	Traffic congestion	The upgrade and improved road networks will cause wider roads enough to support the increased traffic flows.	The existing roads are insufficient to support the increased traffic flows, causing road overloading, and losing time in the roads.
6.	Topography and soil	The project road will mostly go through flat terrain thus there will be no major impact on the topography and soil.	There is no impact on the topography and landscape,
7.	Tress and vegetation	With the project there will tress cutting in the ROW, but most of those are involves	The project areas included numerous mature/ decline stage trees which are

Table 5-5: Comparison Scenario Matrix of With and Without the Project

Sl. No.	Factors	With the Project	Without the Project
		older trees which are mostly at the end of their lifespan therefore falls under the mature/decline or to the rotting stage of their life cycle. The replantation of trees will offer three times of the number of trees that were removed. These will be juvenile stage of tree which will be more beneficial to the environmental.	already rotting and broken. Thus, these are hazardous to the community and has caused various accidents.
8.	Wildlife and Aquatic biology	There are not any national reserved areas in the project area. Thus, the project will not cause any harm to the existing wildlife and aquatic biology.	The current wildlife and aquatic biology are getting impacts from the traffic congestions, flooding and water logging with which occurs with the existing road system.
9.	Climate	There will a decrease on greenhouse emission from the vehicles thus a positive impact on global warming.	The current road network is causing higher level of greenhouse gas emission from the vehicles.
10.	Noise pollution	The project will provide noise barriers (trees) in the necessary locations which will protect the community from noise pollution.	The current roads already overloaded with traffics and there are not any noise barriers the community is suffering from noise pollution.
11.	Carbon emission (Table 5-4)	With project a significant amount of decrease is anticipated in the carbon emission.	Whereas, without the project, with the increasing traffic flows, the level of carbon emission will also increase at an escalating rate

Thus, the preferred alignment is Alternative -2 With Project

6 CONSULTATIONS, PUBLIC PARTICIPATION, AND INFORMATION DISCLOSURE

6.1 INTRODUCTION

225. Stakeholder communication and engagement is an important process to ensure the effectiveness, accountability and transparency of any development program. Through the process of consultation and participation, people can participate in project activities, raise their voice and give their opinion in project design, planning and implementation. Environmental Social Standards (ESS10) discuss the importance of open and transparent engagement between project proponents and project stakeholders. According to world bank guideline (ESS 10), this consultation, public participation and information disclosure has been prepared and proposed guideline for implementing the consultation process and stakeholders' engagement throughout the life cycle of the project, started from preparation to implementation. The E&S consultant hold fresh consultations and incorporated their suggestions and recommendations in the project design.

226. This section describes the different methods of the consultations, issues discussed with the stakeholders, outcome of the exercise. The consultant used the methods for consultations, public participation and information disclosure include stakeholder's consultation meetings; Key Informant Interviews (KIIs), Focus Group Discussions (FGDs); individual contact etc. Total from March 2022 to June 2022 for updating the ESIA and RAP and disseminating relevant information to the PAPs Jhenaidah-Jashore Highway (N7) Improvement Project.

6.2 OBJECTIVES

227. The main objectives of public consultation meetings are (a) to disseminate relevant project related information to the project affected persons and entities including Common Property Resources (CPRs) and their communities and the beneficiaries about the namely, (i) project objectives and benefits; (ii) major environmental and social impacts of land acquisition and resettlement of the road development; (iii) mitigation measures of environmental and social impacts as per environmental and social management plan; and (iv) scope and objectives of updating RAP and implementation of the RAP. The process of engaged has facilitated different stakeholders to express their concerns, views, queries and perspectives on environmental and social impacts and their suggested mitigation measures.

6.3 RELEVANT STAKEHOLDERS

228. **Primary Stakeholders:** The Primary stakeholders of the propose development of road project are project affected persons (PAPs) and entities including affected land owners (agricultural land, commercial and industrial land, pond, etc.), owners of affected structures on private land or government land, affected commercial and business enterprises, wage income workers, day laborer group, squatters, encroachers vulnerable persons and groups, women groups, disadvantaged groups, drivers transport workers group etc.

229. **Secondary Stakeholders:** Secondary Stakeholders of the project are including, members and representatives of local government institutes, teachers, imams, civil society people, etc.

6.4 KEY INFORMANT INTERVIEWS (KII)

230. Total twenty-four (24) KIIs with the Project Affected People (PAPs), Landowners, Structure owners, share croppers, Lessee, Businessmen, Women Social institutions committee head /representatives of Mosque, Madrasah, School, College, Temple, graveyard etc. along the proposed alignment were conducted. KIIs have been done for secondary stakeholders such as public administrator, local government representatives (Municipal Mayor, Councilor and UP Chairmen, Members), Local champions, and influential personalities and other people who have stakes in the project.

231. The opinions were sought from the stakeholders and their opinion are as follows: -

- ▶ The widening of the Jhenaidah – Jashore (JJ) road, will boost the economic activity in the region.
- ▶ It is also explained to them that improved road and communication system will result in better quality of life.
- ▶ The stakeholders were expecting a guarantee of getting the fair and hassle-free compensation.
- ▶ They also opined that the improvement will bring about in their livelihood through livelihood restoration programs during the implementation of RAP.
- ▶ Old trees sometimes posing risks to their life, especially in the monsoon season and cyclones. They agreed for the removal of the trees to be compensated as well as plantation of trees should be undertaken as per the rules and regulations. They also informed that one Government Officer died due to fall of a tree branch when she was on the way to her office.

6.5 FOCUS GROUP DISCUSSIONS (FGDS)

232. Total Five (5) Focus Group Discussions (FGDs) were carried out with the project affected people with particular emphasize on different groups such as disadvantage/vulnerable people including Female Headed HHs, Daily Laborers group, Farmers group, Businessmen group, etc. A total of three women were seen running small businesses. One of them owns a tea shop. To know women's views about the project and their views on land acquisition, advantages, disadvantages and mitigation measures from June 10, 2022 to June 12, 2022, three consultation meetings with women and adolescent girls were held at three separate locations, which are included in the RAP.

233. The picture and signature of the participants list was included in Annex 6-1 and Annex 6-2. The inventory has identified total 824 vulnerable project affected people are vulnerable people in the project and they require extra support from the project for their livelihood restoration. To know in-depth information and project impacts on them including feedback/suggestions and recommendations by them to overcome the adverse effects. The project has considered the comments/concerns and feedbacks of the FGDs during preparation of the resettlement plan and upgraded ESMP.

- ▶ Total 88 (22 males and 42 females) project affected people from various groups were participated in the FGDs.
- ▶ The opinions were sought from the participants and their opinion are as follows:
- ▶ The beneficiaries' group opined for a hassle-free compensation contract for their properties
- ▶ Landowners and those impacted people by the project have raised the same concerns at every meeting: whether they will receive a fair price for their property, how to get it, and whether they would receive their compensation promptly without trouble. If their land related and other documentation are accurate, the project affected people wish to receive their compensation money without any problem.
- ▶ They were also looking for an employment in the JJ road project work, to earn their livelihood during construction phase.
- ▶ The participants were insisting for a safe alternate passage for their everyday movement.
- ▶ The project activity must not create water logging in their living areas,
- ▶ The safety and security of a female labor is to be ensured at the construction yard during construction phase.
- ▶ When peoples were asked about gender-based violence, they reply that there are very few incidents of violence. It is to be noted that main reason of such type of violence's non-harmonical relationship with in-laws, dowry, drug addiction, illicit relationships eve teasing etc. Usually attempts are made to resolve the problem at the family level and if it is beyond their control, they go to law enforcement agencies for justice. However, they requested to take strong initiative to stop the violence against women. It was informed to them that a Grievance Redress Mechanism (GRM) has been developed in the RAP of the project to prevent such incidents and good governance
- ▶ They ask to engaged the poor and vulnerable people in the construction work
- ▶ Livelihood restoration issues for the poor and proper have been discussed.
- ▶ Skill development training for the poor, rehabilitation, loan facility on easy terms etc.

6.6 STAKEHOLDER CONSULTATIONS

234. The stakeholder consultations have been carried out from March 2022 to April 2022 at Jhenaidah Sadar and Kaliganj in the District of Jhenaidah and Jashore. Public Consultation Meetings Total eight (8) stakeholder consultation meetings were conducted from April 2022 to June 2022, for the JJ Project along the project road. Total Number of participants attended in the meeting was 1069. out of the total 961 was male and 108 was female. The reason of low participation of women in three meeting may be due to their daily schedule of house chores such as cooking, cleaning, moping etc. Social and cultural taboo, and location of the meeting could also a reason of absenteeism. Some female participants attend the meeting and after a while they go back to their urgent work. Detailed information on venues, date, time frame and participation of stakeholders by gender is presented in Table 6-1. A few of stakeholder consultation photographs shows in Figure 6-1 and Figure 6-2.

Table 6-1: Venues, date, time frame and participants of Stakeholders' Consultation Meetings

Sl. No.	Venue	Date	Participants		
			Male	Female	Total
1.	Jhenaidah Central Bus Terminal Area (Bantu Mia Villa)	12/4/2022	69	0	69
2.	Moharajpur Union Parishad Auditorium, Jhenaidah	13/4/2022	271	15	286
3.	Kaliganj Poura Auditorium, Kaliganj. Jhenaidah	19/4/2022	289	70	359
4.	Baro Bazar Union Parishad Auditorium, Kaliganj, Jhenaidah	20/4/2022	172	13	185
5.	Nearby Banyan Trees at Jame Mosque, Laodia, Jhenaidah district	27/5/2022	24	0	24
6.	Jame Mosque, Salabhora in Jhenaidah district	27/5/2022	15	0	15
7.	Auditorium, Hoibatpur Union Parishad, Barinagar, Jashore	11/6/2022	48	3	51
8.	Satiyantola Alia Madrasha, 7 No. Churamankathi Bazar, Jashore	12/6/2022	73	7	80
9.	Total		961	108	1069

6.7 DISSEMINATION OF PROJECT RELATED INFORMATION

235. Project Manager and Deputy Project Manager of RHD briefed about the purpose of the stakeholders' consultation meeting held at the aforementioned venues. They provided the following project related information. Jhenaidah – Jashore two lanes Highway Road is very important as it has been linked with three land ports including (i) Benapol, (ii) Bhomra (iii) Darshona and extensive road networks with different districts and Upazilas under Khulna and Barisal Divisions and other districts of Bangladesh as well. List of participants are included in Annex 6-1.

- ▶ Tail backs of vehicles and fatal accidents etc is a common feature of JJ road.
- ▶ Traffic jam, slow movements of vehicle, road accidents etc. imparts a negative impact on the rural economy and in long run on the national economy.
- ▶ On principle the two-lane carriageway will be upgraded to four lane carriageways. To facilitate slow moving transportation system there will be an additional lane on both side of the road. Walkway (foot path) will be built in the market places.
- ▶ The target of this road project is to achieve the followings:
 - i. Design speed of vehicles will be 80 km/hour,
 - ii. Upgrade the road transportation system in such a way that it will facilitate additional transportation of passenger and freights,
 - iii. Reduce tailbacks,

- iv. Introduction of digitalized ITS system will assist in apprehending the victim and identifying the cause of road incidents.
- v. Police Patrol and ambulance will be there to uphold the law and order and to save and secure lives.
- vi. To save greenery and to uphold ecological balance and environmental harmony, mass tree plantation will be there.
- vii. Proper drainage system will be built to avert water logging.
- viii. It will drastically reduce the road accidents.

236. The above list contains positive impacts of upgrading the road.

6.7.1 LAND ACQUISITION IMPACTS AND ISSUES

It was discussed in these stakeholders' consultation meetings that there is an approval of acquisition of 373.13 acres (approx.) of land for implementation of the J-J road of WeCARE phase-1 Project. In fact, 298.6541 acres of land will be acquired for four Land Acquisition Plans (LAPs) under three Contracts such as Contract-1, Contract-2 and Contract-3. Details are given in subsection 2.2 Scope of Land Acquisition in Chapter 2 of the RAP. Acquisition of land will affect persons, households, businessmen, business enterprises and some other entities including Common Property Resources (CPRs), such as mosques, madrasahs, temples, schools, colleges, etc. Types of losses include the followings:

- ▶ Loss of land;
- ▶ Loss of residential, commercial and CPR structures,
- ▶ Loss of structures of squatters/encroachers/vendors,
- ▶ Loss of trees, crops, fish-cultivation, agricultural land,
- ▶ Environmental degradation, etc.

a. Social and Resettlement Impacts, and Risks and Mitigation Measures:

237. Proper compensation will be paid to the owner of the land, homesteads and affected water-bodies, structures, trees, CPRs, etc. to be acquired. This disbursement will be made as per the GoB rules and WB's ESS 5 on involuntary resettlement, clarified in the project's Resettlement Policy Framework (RPF). The social development and resettlement consultant, narrated the Regulatory Framework and Guidelines of the GoB and WB to the stakeholders. The affected persons and entities will be compensated for their incurred losses due to the implementation of the project. The titled PAPs will be paid by the DC office and that of non-titled PAPs will be by RHD.

238. For an efficient and proper disbursement of compensation money the following papers/documents is to be produced to collect compensation money from the DC office.

- ▶ A PAP owned property by inheritance should produce the documents (i) Succession (warishan) certificate, (ii) Porchas, (iii) Khatian, (iv) Mutation (Namjari), (v) Tax token (up dated) and DCR.
- ▶ A business man will be needed an up-to-date Trade License and e-TIN.
- ▶ A business man running his establishment in a rented land/structure, has to produce a "Deed of Agreement" with the owner in a 300-taka valued non-judicial stamp.
- ▶ A PAP owning a building need to submit the approved structural Design and Plan from the concern authority.
- ▶ The DC Office will assess the compensation money for the structure and it will be based on the rules and regulations set by GoB (PWD schedule of rates).

b. Resettlement and Rehabilitation Specialist of E and S Consultant firm briefed that: -

- a) Compensation will be paid by the concerned DC office to PAP for their incurred losses for the land, structures, business, ponds, crops and that of schools, colleges, mosques, Madrasa, mandir and graveyards will be paid to the committee. This compensation contract will be paid as per the "Entitlement Matrix of RAP".

- b) A joint verification committee (JVC) will finalize the ownership, volume and the valuation of the affected properties.
- c) The Property Valuation Assessment Committee (PVAC) will determine the Replacement Value (RV) of land, structures, tree, crops, etc.
- d) The Records of Rights (ROR) including all the documents for affected property ownership must be updated before submitting the same to DC Office for drawing compensation.

6.7.2 ENVIRONMENTAL IMPACTS ISSUES

a. Environmental Impact Assessment and Mitigation Measures.

239. The consultant has included the following environmental issues in the updated ESMP.

- (i) Steps to be taken to save the terrestrial flora and fauna and to uphold bio-diversity in the locality.
- (ii) Maintain the occupational health and safety during pre-construction and construction period;
- (iii) Steps to be taken to mitigate environmental degradation.

240. The following issues and its mitigation measures were discussed.

- ▶ The intensity of sound level should be within the acceptable/tolerable limit during the construction period
- ▶ The dust generated from the vehicles and stone/brick crushers will be minimized. It will be done by spraying water. The crushing machine will be made located far from the locality.
- ▶ Trespassing will be strictly prohibited through the construction site and yard. It will be done by fencing and by deploying guard.
- ▶ Ensuring the occupational health and safety (OHS) measure by providing PPE, first aid box, sanitization, sanitation. Supply of potable water and separate latrine facility for male and female workers will be ensured at the labor shed. Gender based violence (GBV) and sexual exploitation abuse and harassment will be strictly controlled through the measures suggested in RAP and updated ESMP.
- ▶ To facilitate smooth drainage of storm water, proper drainage facility will be provided along the side of the road.
- ▶ Adequate hydraulic structure will be provided as and where necessary.
- ▶ Underpass and/or foot over bridge will be provided to facilitate the movement of mass people together with the school and college going students.

6.8 OUTCOMES OF THE STAKEHOLDERS' CONSULTATION MEETINGS

241. Discussion at an open forum were arranged where the stakeholders expressed their opinion and views. They also provided remedial suggestions on adverse environmental and social issues. The cutting down of old trees was a hot topic, where they opined to remove the old trees from the RoW, as it becomes a hazardous matter for them specially in the stormy days. They advised to plant three for each removal of existing tree.

242. The issues raised by the stakeholders and remedial measures suggested by the E and S and PIU Consultants together with the RHD Representatives are as documented in Table 6-2.

Table 6-2: Summary of the Public Consultations

Public Level Consultation 1

Date-12/4/2022		Demand and Suggestions	Response of Authorities/incorporated in the Design
Jhenaidah Central Bus Terminal Area (Bantu Mia Villa)	Total: 69 Male: 69 Female: 0 (Annex 6-2)	The participants raised their concerns about environmental and social issues such as pollution from the construction activities, loss of livelihood, houses, and various diseases etc. Issues pertaining to the tree cutting of those falling within the OW have been discussed. The participants agreed for the removal of these trees since these are very old as well as outlived their live and posing the risks especially during the monsoon or cyclones. However, they proposed the loss of these trees' removal need to be compensated. Road safety issues due to widening of existing 2 lanes to 4 lanes have also been discussed and participant wanted to have foot over bridges etc. safe passage of community. Participant informed about the occurrence of unfortunate incidents in past losing the life of two students. The participants also raise concern about the insufficient drainage systems and water logging more than often. They were concerned about various water borne diseases such as Typhoid, Hepatitis, also logged water can become breeding ground for mosquitos. Vulnerable PAPs should be considered, such as safety of female workers, new skill trainings for the vulnerable groups etc. Other issues include –proper evaluation of lands, local level involvement during the construction phase of the project-which are detailed discussed in the RAP. Participant raised points on environmental and social risks and impacts on the disadvantaged and marginalized vulnerable groups and Labor Health and Safety (LHS)	1. According to the ESMP 1:3 ratios i.e., three (3) saplings will be planted for every tree cutting. This was the old and weaker tress will be removed and replaced with juvenile ones which would be more beneficial to the environment. 2. In response to the 1st public level consultations occurred in the Jhenaidah –Tetultala bazar area of contract 1; accommodating the participants demand (02+400.03+200, 05+512, 06+760,) various Pedestrian Over Pass, Vehicle Overpass and Foot Overpass have been incorporated the project design 3. Roadside drainage facilities are provided at number of locations where the road passes through markets and local markets (bazaars). The total length of rectangular footpath cum covered roadside drains under contract contracts 1(11010), 2(15280), and 3(24630) total 50,920 meter 4. Vulnerable PAPs will be considered in the construction phase. For example-livelihood restoration plan has been suggested to mitigate the impacts in Resettlement Action Plan (RAP) along with its budget. Skill Development Plan has also been included in LRP. Special support for the disadvantaged/marginalized groups has been kept in the RAP. Provision for compensation for squatters and encroachers have been made in the RAP. Despite potential female persons were also invited for attending the stakeholder consultation meeting. The female persons could not manage to attend the consultation meeting due to their household chores especially preparing and cooking foods (lunch) for their families. At least a few matters and issues related to GBV and gender equity were discussed with the participants. The male participants had expressed their views, opinion and perspectives based on their experiences of the said matter gained from intra-households and also inter households' interactions as well. The project and its management will incorporate the above-mentioned mitigation measures in the project design and

Table 6-2: Summary of the Public Consultations

			implementation as follows: Occupational Health and Safety Management Plan and Labour Management Plan has been prepared for the mitigation of these issues. Detailed in the Section 8 and 9 of the ESIA Report.
Public Level Consultation 2			
Date- 13/4/2022		Demand and Suggestions	Response of Authorities
Moharajpur Union Parishad Auditorium, Jhenaidah	Total: 286 Male: 271 Female: 15 (Annex 6-2)	The meeting was held at the auditorium, where large number of participants were present, among total audience both male and female participants were present. One of the major concerns raised by the female participants were that safe environment has to be ensured as there will be surge of outside labors in the community. Therefore, ensuring safety for the community females as well as female workers are very important. Female participants belong to vulnerable households/group expressed their willingness regarding job/working opportunity in the project implementation for suitable female and male active members of their households. Other major issue that was raised was, ensuring the health and safety of the community during the pre-construction and construction phase of the project-various water borne diseases such as Hepatitis, Typhoid etc., hearing problems, breathing problems due to higher level of noise, air pollution and such. The possible loss of wildlife and aquatic diversity and bio-diversity including replantation of trees – were another major issue raised by the conscious people of the community. Other social concerns include – appropriate evaluation and pricing of lands, clear and transparent compensation process- which are discussed in detail in the RAP. How to reduce Gender Based Violence and eve teasing	The Project authority assured that all kinds of safety measures for all sorts of health and safety measures to mitigate possible diseases (water borne) and pollution (air, noise etc.) will be taken care. Active female persons will be encouraged to be engaged for tree plantation, nursing of planted trees, turfing, also for suitable construction works. Thus, the concerns relating the safety issues of the female will be taken care off. The project will provide noise barriers (trees) in the necessary locations which will protect the community the form noise pollution. and with project a significant amount of decrease is anticipated in the carbon emission. Therein and other land related issues will be settled down according to ARIPA -17 and GOB policy. To protect Gender based Violence and eve teasing awareness is important. A Grievance Redress procedure has been developed in this project. A Gender Based Violence Action Plan (GBV) has been prepared Section 7. The consultant already proposed mitigation measures for wildlife and aquatic diversity in the ESMP section.
Public Level Consultation 3			
Date- 19/4/2022		Demand and Suggestions	Response of Authorities
Kaliganj Poura Auditorium, Kaligonj. Jhenaidah	Total: 185 Male: 172 Female: 13	A proper drainage system should be there to stop water logging, which will save crop and stop land sliding. To guarantee that their fertile top soil, not to be used in the	The existing bridges and culverts which are mostly 2-lanes will be replaced and four (4) bridges and 72 culverts no 4-lane are proposed with the design; to control drainage

Table 6-2: Summary of the Public Consultations

	(Annex 6-2)	earth work in the road construction. To replant trees to available places if the during construction they are cut. Concerns regarding the health and wellbeing of the local people, which might be affected by noise and air pollution generated during the construction period. The locals asked for an easy and hassle free compensate process and ensuring the proper valuation of land, if acquired, and other private assets which are discussed in detail in the RAP. Female headed households, disabled female headed households and squatters below poverty line are considered as vulnerable households. They requested to pay them equal compensation, assistance and resettlement benefits.	congestions catchment areas, and local water ways. Grass turfing on the side slopes and on the shoulder of road embankment of the project will be done to prevent the soil erosion. Bridge abutments/ approaches and culvert inlets shall be protected by CC blocks and geotextile filter fabric in accordance with the engineering specifications. The RHD representative, attended the meeting assured the safety of fertile top agricultural soil. He also ensured that a transparent and gender equal compensation procedure will be maintained. There will a storm water drainage system to facilitate water flow. It will cater land slide and save crop from inundation. They were assured that all kinds of safety measures for all sorts of pollution (air, noise etc.) and health concerns(diseases) will be taken care. To protect Gender based Violence and eve teasing awareness is important. A Grievance Redress procedure has been developed in this project. A Gender Based Violence Action Plan (GBV) has been prepared in Section 7
Public Level Consultation 4			
Date- 20/4/2022		Demand and Suggestions	Response of Authorities
Baro Bazar Union Parishad Auditorium, Kaliganj, Jhenaidah	Total: 899 Male: 801 Female: 98 (Annex 6-2)	One of the major issues raised by the conscious people of the community was the possibility of loss of wildlife and aquatic diversity and bio-diversity including replantation of trees. One of the major concerns raised by the female participants were that safe environment has to be ensured as there will be surge of outside labors in the community. Therefore, ensuring safety for the community females as well as female workers are very important. There have been incidents of eve teasing and harassment while travelling on bus, especially at the night time, thus, there needs to be safety measurements to ensure the female travelling. Female participants belong to vulnerable households/group expressed their willingness regarding job/working opportunity in the project implementation for suitable female and male active members of their households. Other issues include- proper safety measures, noise control	The Project representatives and the other presented consultants assured that their concerns will be shared with the proper authorities and officials and taken in to account. Based on this RHD principle the greenery will be given back to the locality by RHD. Thus, planting three trees for each removed tree. Proper steps will be taken to mitigate environmental degradation. To protect Gender based Violence and eve teasing awareness is important. A Grievance Redress procedure has been developed in this project. A Gender Based Violence Action Plan (GBV) has been prepared in Section 7. It was stated that an equal right and access will be ensure in the construction phase following no discrimination gender wise.

Table 6-2: Summary of the Public Consultations

		and waste and drainage management during construction period; proper evaluation of lands, local level involvement during the construction phase of the project- which are detailed discussed in the RAP.	
Public Level Consultation 5			
Date- 27/5/2022		Demand and Suggestions	Response of Authorities
Nearby Banyan Trees at Jame Mosque, Laodia, Jhenaidah district	Total: 24 Male: 24 Female: 0 (Annex 6-2) The women were invited in the meeting but they are not attending due to following reasons 1.The meeting was held nearby mosque 2. It was Friday 3. Religious barrier 4. Engaged with housework 5. Roadside 6.Few women were present but they leave earlier	This consultation was primarily conducted with the focus on the years old Banyan trees situated on the sides of the RoW. The consultation transpired by the tree itself, in order to capture the actual relevant locals and get their perceptions through the consultation. The participants included people of various backgrounds- Affected people, local people and elites etc. The major concerns raised during the consultation was, that tree has been a part of the locality for many years, however with passing years they have become shallow with rotten and broken from the inside. Thus, they have become more of a public hazard in the current period. However, as trees have been providing the community with shades for people and nests for various birds and insects- thus serves a great function in the ecology- therefore they requested that the removal of these trees should be accompanied with tree replantation to keep the existing ecology undisturbed as much as possible.	The Project representatives and the other presented consultants assured that their suggestions will be shared with the proper authorities and officials. They expressed their gratitude to the local people for their forthcoming participation, Also, for their choice to agree on removal of the tress in spite of the existing sentimental ties. They were assured that, the frail tress will be removed and replaced with juvenile ones which would be more beneficial to the environment. Based on this RHD principle the greenery will be given back to the locality by RHD. Thus, planting three trees for each removed tree.
Public Level Consultation 6			
Date- 27/5/2022		Demand and Suggestions	Response of Authorities/incorporate in the design
Jame Mosque, Salabhora in Jhenaidah district	Total: 15 Male: 15 Female: 0 (Annex 6-2) The women were invited in the meeting (No female participant was present the meeting due to religious barriers, the meeting was held near to the Mosque in Banyan tree is located near to the mosque, the pious man was	sides of the ROW. The consultation was conducted by the tree itself, in the consultation took place at near the mosque thus various people joined after the noon prayer. The participants included people of various backgrounds- Affected people, local people and elites etc. The main focus of this consultation was the years old Banyan trees situated on the order to capture the actual relevant locals and get their perceptions through the consultation. The major concerns raised during the consultation was, that tree has been a part of the locality for many years, as trees have been providing the community with shades for the	The Project representatives and the other presented consultants assured that their suggestions will be shared with the proper authorities and officials. Based on this RHD principle the greenery will be given back to the locality by RHD. Thus, planting three trees for each removed tree. They expressed their gratitude to the local people for their forthcoming participation. Also, for their choice to agree on removal of the tress in spite of the existing sentimental ties. They were assured that, the frail tress will be removed and replaced with juvenile ones which would be more beneficial

Table 6-2: Summary of the Public Consultations

	congregated at the mosque for Jumma prayer, those pious man were invited to participate in the consultation, two stakeholder consultation were held with different mosque and different groups. This time the women remain busy with their household works especially for food preparation and cooking.)	pedestrians, also sometimes small cultural events were arranged under the tress. They also provide nests for various birds and insects- thus serves a great function in the ecology. Thus, these tresses serve a great role in both socially and environmentally. However, with age, they have become shallow with broken branches hanging. Thus, they have become more of a public hazard in the current period. Therefore, they agreed on the removal idea but also requested that the removal of these trees should be accompanied with tree replantation to keep the existing ecology undisturbed as much as possible.	to the environment.
Public Level Consultation 7			
Date- 11/6/2022		Demand and Suggestions	Response of Authorities
Auditorium, Hoibatpur Union Parishad, Barinagar, Jashore	Total: 51 Male: 48 Female: 3 (Annex 6-2)	The headmaster of Manikdi Govt Primary School raised an important issue of safety of the pedestrians especially school students. There were also concerns for proper foot over or under pass for safe passing of community people. As there have been unfortunate cases involving loss of life before. The participants raised their concerns over various environmental and social issues including the possibility of loss of wildlife and aquatic diversity and bio-diversity. Therefore, the people asked to replantation program for the locality. The participants also raise concern about the insufficient drainage systems which results in water logging more than often. Other issues include –proper evaluation of lands, local level involvement during the construction phase of the project- which are detailed discussed in the RAP.	The Project representatives and the other presented consultants assured that their concerns will be shared with the proper authorities and officials. They were assured that all the sensitive locations will have necessary foot over/ under pass for the safety of the pedestrians. Based on this RHD principle the greenery will be given back to the locality by RHD. Thus, planting three trees for each removed tree
Public Level Consultation 8			
Date-12/6/2022		Demand and Suggestions	Response of Authorities
Satiyantola Alia Madrasha, 7 No. Churamankathi Bazar, Jashore	Total: 80 Male: 73 Female: 7 (Annex 6-2)	The participants also raise concern about the insufficient drainage systems which results in water logging more than often. It was pointed out by a Union Parishad Member that the nearest water passing channel for drainage system is the Buri Bhairab River. One of the major concerns that was raised was ensuring the health and safety of the community during the pre-	The Project representatives and the other presented consultants assured that their concerns will be shared with the proper authorities and officials. There will be proper water drainage system to facilitate water flow. It will cater land slide and save crop from inundation. They were assured that all kinds of safety measures for all

Table 6-2: Summary of the Public Consultations

		construction and construction phase of the project- higher level of noise, air pollution and such. To guarantee that their fertile top soil, not to be used in the earth work in the road construction Other issues include –proper evaluation of lands, local level involvement during the construction phase of the project- which are detailed discussed in the RAP They also demanded a hassle-free compensation also mentioned that the CP contract should be consider current market value. In the sensitive location there need to be necessary Underpasses, foot over bridges, adequate /sufficient Lighting system; Passenger shelter should be provided; Separate Toilets for men and women in the opposite direction; with adequate water facilities and light During the construction, the safety and security of women working on the construction site must be ensured.	sorts of pollution (air, noise etc.) and general health wise will be taken care The RHD representative, attended the meeting assured the safety of fertile top agricultural soil. They also promised that the compensation process will be unbiased and hazard free. Appropriate numbers of Pedestrian Over Pass, Vehicle Overpass and Foot Overpass, adequate lighting systems, and other facilities will be incorporated in the project



Meeting with the PD and RHD Official



Contract signing



Focus Group Meeting on Environmental and social issues



Project Team Members



Meetings With Public



Discussion With Design TEAM among team experts

Figure 6-1: Meetings with Client, Technical Design team members and public



Teams meet with INGO



Teams meet with RHD officials and individual Consultant at site office



Coordination Meeting with Design Team

Figure 6-2: Environment and Social Experts Team Discussion

6.9 INFORMATION DISCLOSURE

243. Primarily a few information on the project was disclosed verbally (without any formalities) during initial public consultations during the studies on safeguard. The E&S consultant and implementing agency RHD-PIU conducted several public consultations during final design phase, and further hearings with the local affected people and disclose information will be continued until finalization of the whole project design. It is essential to continue this consultation process to ensure that the community remains supportive and that they are fully informed of progress particularly before and during the construction period. In addition, the community will be given information on the grievance redress mechanism and that regular meetings with the community will be held in the future. Once the project has been approved and a construction program has been defined, further community meetings must be held to provide details of the construction program and to give information on the grievance redress committee. Thus, consultations process will remain as an integral part of Project management and implementation.

244. **Disclosure of ESIA:** The approved EISA will be disclosed on the RHD and World Bank external websites. Many of the community may not have access to the internet, therefore face to face meetings and hard

copy of the ESIA report and its summarized form in English and Bangla language must be made available to the local communities or other interested stakeholders. Both summarized reports will briefly present (i) the Project impacts; (ii) mitigation measures and entitlement matrix; (iii) grievance redress mechanisms; (iv) the institutional framework for Project implementation.

7 ENVIRONMENTAL AND SOCIAL IMPACTS, RISKS AND MITIGATION MEASURES

7.1 GENERAL

245. The objective of impacts and risks on the identification of the natural and social environment is to formulate the mitigation measures against adverse impacts associated with project activities for effectively implementing during project implementation stages for sustainable development of the J-J Road Improvement project. The interventions of the proposed project will have many impacts on the environment during implementation stages. Construction is not an environment friendly process by nature, construction and operations have massive direct and indirect impacts on the both environments. These impacts on the natural environment (physical and ecological resources) and social environment (economic development and social and cultural resources) will be either adverse or beneficial. Some of the adverse impacts can be attributed to the construction activities in the projects even though they are short lived. The common parameters to qualify an impact are its duration of existence, its spatial extent, its ability to reverse and to mitigate. For this project, each planned activity of project implementation phase are checked for its potential to cause negative as well as positive social, economic, environmental and ecological impacts in coordination with the Engineering Design Team. The impacts are defined based on the project activities for all phases of the project cycle i.e impact will likely take place, namely during the pre-construction, construction and operation phases of the project. These impacts may be as direct, indirect and cumulative in nature.

246. This chapter deals largely with direct negative impacts and its mitigation measures to be implemented during implementation stages to make the Project environmentally sustainable and friendly.

7.2 IMPACTS AND RISK SCREENING

247. The environmental and social anticipated impacts are screened to determine their level of significance without mitigation during the project design and pre-construction phase, construction phase and operation phase based on baseline condition of the project area

7.2.1 METHODOLOGY

248. The methodology of assessing environmental impacts from the project entailed clearly identifying the environmental components that will impacted, type of impacts, assessment area where the impacts will be felt and defining the criteria for assessing the significance of each type of impact. After defining these aspects, a screening of project impacts during design and pre- construction, construction and operation stages of the project was carried out to identify the minor, moderate and major impacts to guide development of mitigation measures and ensure that there are no or minimal residual impacts. A details environmental and social management guidelines has been incorporated in Chapter 10 (ESMP) of the ESIA.

- **Identification of Impacts:** The significant Valued Environmental Components (VEC) or Important Environmental Components (IEC) of the physical, biological and social environments are identified that are at risk of being impacted by the project. The VECs for this project, which are based on the environmental baseline condition of the project area.

249. **Type of Impact on the VECs:** The type of impact can be described as:

- Positive: - Improvement in the quality of the VECs because of the project,
- Negative: - Degradation or reduction in the quality of the VECs because of the project and
- Neutral: - No noticeable change in VECs

250. **Area of Impact Assessment.** The area covered for assessing direct impacts is proposed RoW and 500 m Corridor of Impact (CoI) for assessing the indirect impact of the project This covers 250 m on either side of the centerline studied for direct impacts;

- ▶ The significance of impacts is defined according to their severity, physical extent and effect duration as the following terms.
- ▶ Impact Severity/Magnitude: - The severity or seriousness of an impact entails understanding the consequence or risks posed by the impact. This is a subjective criterion, which is defined as major or high, moderate or medium and minor or low.
- ▶ Major = inability of the environment to recover from the damage, and degradation is permanent and fully degrade a habitat e.g., wetland filling, or clear cutting of trees/ Social permanent disruption
- ▶ Moderate = recover is slow with 40% recovery possible but taking >1 year
- ▶ Minor = entire affected component recovers within one season/Social impact barely noticeable
- ▶ Impact Physical Extent: - The area of impact entails the spatial scale of impact on one or more of the VECs. The terms limited, local and regional are used to describe the extent of impacts.
- ▶ Major = negative impact can be measured at least 2 times distance beyond the immediate COI boundary
- ▶ Moderate = impact extends beyond immediate project area, but recover expected once work is done within one growing season; or for the social component, once compensation is delivered
- ▶ Low or Minor = localized effect recovery very high
- ▶ Impact Duration: - This indicates the time dimension of the impact on the VECs. The terms permanent, temporary and short-lived are used to describe the duration of impact.
- ▶ Major or Long Terms = The impacts are felt throughout the life of the infrastructure. Highly destructive or extending through at least 1 life cycle if an indicator species affected
- ▶ Moderate = impact not extending to one Lifecycle and not impacting reproductive cycle or life necessity or very intermittent
- ▶ Minor or Short Term = Short term or Temporary but measurable change
- ▶ Negligible = observed change but measurable impact lasting less than 24 hours, with impacts well within national standards or documented threshold for damage.

7.2.2 SCREENING OF THE ANTICIPATED IMPACTS

251. In this ESIA study, the anticipation and identification of the significant VEC parameters is carried out based on the existing environmental condition following the existing policies, laws, and administrative framework applicable to the Jhenaidah and Jashore road project and relevant environmental and social safeguards policies of the World Bank. The impacts are identified according the development stages, when impacts will likely take place, namely the pre-construction, construction and operation stages of the Project in compliance of the World Bank's Environmental Social Safegurd Standard as follows;

- ▶ Related to Assessment and Management of E&S risk and impact (ESS 1)
- ▶ Relating to Labor and Working Conditions (ESS 2)
- ▶ Relating Resource Efficiency and Pollution Prevention and Management (ESS 3)
- ▶ E&S risks and impacts relating to Community Health and Safety (ESS 4)
- ▶ Related on land & assets (ESS 5)
- ▶ Relating to Bio-diversity & Living Natural Resources (ESS 6)
- ▶ Tribal/Indigenous Population (ESS 7)
- ▶ Related on Impacts on Cultural Heritage (ESS 8)
- ▶ Stakeholder Engagement and Information Disclosure (ESS10)

252. It is noted that the main objective of ESS1 is sets out the Borrower's responsibilities to identify, assess, evaluate and manage the environment and social risks and impacts of the Bank project in a manner consistent with the World Bank's ESSs and to adopt a mitigation hierarchy approach to avoid, minimize, mitigate and compensate the environmental and social risks.

253. The environmental anticipated impacts are screened to determine their level of significance without mitigation during the project design and pre-construction phase, construction phase and operation phase as shown in Table 7-1. This screening was carried out based on the rating criteria identified the significance of impacts by color of the cells in the last column of the table, those need to be mitigated during different implementation phases of the project. Major and moderate impacts have been given priority for identification of adequate mitigation measures to ensure that there are minimized or taken up with no residual impacts.

Table 7-1: Environmental and Social Impacts Screening During Project Implementation Phases as Without Mitigation Measures Sceneries						
VEC	Impact/Activity	Project Stage	Duration	Area	Severity	Significance of Impact
1. Physical Environment (Compliance of WB's ESS 3-Resource Efficiency and Pollution Prevention Management and Bangladesh ECR 1997)						
1.1 Air Quality	Location of project road alignment	D	+ve, P	+ve, L	+ve, Me	+ve, Mi
	Dust, PM, emissions from construction equipment and vehicles, transportation and storage of materials,	C	-ve, T	-ve, L	-ve, Me	-ve, Mo
	Emissions from road traffic	O	+ve, P	+ve, R	+ve, Lo	+ve, Mi
1.2 GHG Emissions	Emissions from construction equipment and vehicles	C	-ve, T	-ve, L	-ve, Me	-ve, Mo
	Emissions from road traffic	O	+ve, T	+ve, R	+ve, Lo	+ve, Mi
1.3 Hydrology and Surface Water Quality	Alteration of rivers/streams for construction of cross structures and drains	D	-ve, T	-ve, R	-ve, Me	-ve, Mo
	Pollution from liquid and solid waste disposal from camps and construction activities, Extraction of water for construction works and use in camps	C	-ve, T	-ve, L	-ve, Me	-ve, Mo
	Siltation in receiving water bodies due to construction of bridges and culverts activities /earthworks	C	-ve, P	-ve, R	-ve, H	-ve, Ma
	Leakage of oil and grease from vehicles and equipment	C	-ve, T	-ve, L	-ve, Me	-ve, Mo
	Accidental oil spillage of vehicles	O	-ve, P	-ve, R	-ve, H	-ve, Ma
1.4 Ground water quality	Pollution from liquid and solid waste from camps and construction activities;	C	-ve, T	-ve, L	-ve, L	-ve, Mi
1.5 Ground Water Quantity	Extraction of ground water for construction works and use in camps	C	-ve, T	-ve, L	-ve, Me	-ve, Mo
1.6 Land degradation/pollution	Opening of borrow area and quarries	D	-ve, P	-ve, L	-ve, Me	-ve, Mo
	Disposal of Solid waste from construction works and camps, muck disposal	C	-ve, T	-ve, L	-ve, Me	-ve, Mo
	Contamination of soil due to leakage/ spillage of oil, bituminous, and non-bituminous debris generated from demolition and road construction and non-bituminous debris generated from demolition and road construction	C	-ve, P	-ve, L	-ve, Lo	-ve, Mi
	Contamination of soil due to leakage/ spillage of oil due to road accidents	C & O	-ve, P	-ve, L	-ve, Lo	-ve, Mi
2. Biological Environment (Compliance of WB's ESS 6- Biodiversity-Conservation and Sustainable Management of Living Natural Resources and Bangladesh ECA 1995)						
2.1 Trees/Forest/ Terrestrial Vegetation	Location of project alignment in forest area and GIB sanctuary Boundary	D	-ve, P	-ve, L	-ve, Me	-ve, Mi

Table 7-1: Environmental and Social Impacts Screening During Project Implementation Phases as Without Mitigation Measures Sceneries						
VEC	Impact/Activity	Project Stage	Duration	Area	Severity	Significance of Impact
	Removal of trees, shrubs and grasses	C	-ve, P	-ve, L	-ve, Me	-ve, Mo
	Growth of the compensated trees and additional plantation and development of grassland for improvement of GIB habitat	O	+ve, P	+ve, L	+ve, Me	+ve, Mo
2.2 Terrestrial fauna (Mammals, Birds, Insects etc.)	Accident of wild mammals/birds/insects	D	-ve, P	-ve, L	-ve, Lo	-ve, Mi
		C	-ve, P	-ve, L	-ve, Lo	-ve, Mi
		O	-ve, P	-ve, L	-ve, Lo	-ve, Mi
2.3 Migratory birds and ecologically important areas	Small portion of 2 sub-projects (SH-204 and SH-68 A are passing through Boundary of GIB sanctuary.	D	-ve, P	-ve, L	-ve, Lo	-ve, Mi
	Habitat Loss and disturbance in feeding, breeding and migration of birds	C	-ve, T	-ve, L	-ve, Me	-ve, Mo
	None	O	N	N	N	N
3. Social Environment (Compliance of WB's ESS 5- Land Acquisition and Involuntary Resettlement)						
3.1 Private land and buildings	Location requiring removal of private structures/buildings	D	-ve, P	-ve, R	-ve, H	-ve, Ma
	Acquisition of private land. Demolition of private buildings. Possible complaints, opposition from disgruntled or unhappy affected persons	C	-ve, P	-ve, R	-ve, H	-ve, Ma
	Increase in value of land and property. Easier access to some areas and property.	O	+ve, P	+ve, L	+ve, H	+ve, Ma
3.2 Public property/infra structure/ utility structures	Location removal of public structures/buildings and utility structures	D	-ve, P	-ve, L	-ve, M	-ve, Mo
	Demolition of public buildings. Removal and shifting of utility structures. Possible complaints from local public due to disruption of utility services	C	-ve, P	-ve, L	-ve, H	-ve, Mo
4. Ethnic Group (Compliance of WB's ESS 7- Indigenous Peoples and Traditional Local Communities)						
4.1 Affected ethnic minority or indigenous people	The project will not have any ethnic minority PAPs, thus no impact on indigenous peoples, their traditional culture, land resources and territories. It does not require to adopt the FPIC process.	C & O	N	N	N	N
5. Tradition, Culture and Ethnicity (Compliance of WB's ESS 8-Cultural Heritage and CRPs)						
5.1 Removal of cultural heritage	Cultural Heritage, Archaeology and CPRs	C & O	N	N	N	N

Table 7-1: Environmental and Social Impacts Screening During Project Implementation Phases as Without Mitigation Measures Sceneries

VEC	Impact/Activity	Project Stage	Duration	Area	Severity	Significance of Impact
5.2 Noise	Location near residential areas, sensitive receptors (places of worship, hospitals, educational institutes, cultural/heritage sites etc.)	D	-ve, P	-ve, L	-ve, Me	-ve, Mo
	Disturbance caused to local residents from noise generated from construction activities, campsite activities using heavy equipment, movement of heavy-duty trucks during day and night time. Noise levels exceeding standards. Complaints from local residents near construction sites.	C	-ve, T	-ve, L	-ve, Me	-ve, Mo
	Noise levels exceeding baseline levels by more than 3dBA and causing disturbance to residents and sensitive receptors near project alignment	O	+ve, P	+ve, L	+ve, Lo	+ve, Mi
5.3 Vibration	Location near residential areas, sensitive receptors (places of worship, hospitals, educational institutes, cultural/heritage sites etc.)	D	-ve, P	-ve, L	-ve, Lo	-ve, Mi
	Vibration disturbance felt by local residents due to construction activities using heavy equipment and movement of heavy-duty trucks during day and night time.	C	-ve, T	-ve, L	-ve, Lo	-ve, Mi
6. Labor Management (Compliance of WB's ESS 2- Labor and Working Conditions and Bangladesh Labor Act 2006; Rules 2015)						
6.1 Occupational health and safety	Death, accident or injury of construction workers, due to poor safety standards. Illness of construction workers due to poor hygiene, health and sanitary facilities at the construction sites and camp sites.	C	-ve, T	-ve, L	-ve, H	-ve, Ma
	Accidents, injuries to operational staff	O	-ve, T	-ve, L	-ve, Lo	-ve, Mi
7. Community Awareness and HSE (Compliance of WB's ESS 4- Community Health and Safety and Bangladesh Labor Act 2006; Rules 2015)						
7.1 Public health and safety	Design of road safety features	D	-ve, P	-ve, L	-ve, H	-ve, Ma
	Dust and air pollution	C	-ve, T	-ve, L	-ve, H	-ve, Ma
	Accident or injury or death of local public living or moving near the project construction/camp sites due to poor safety standards. Illness of project construction/camp sites, mosquito breeding due to poor camp management, excessive dust/air pollution caused by project related activities. Traffic jams and accidents caused by project related activities.	C	-ve, T	-ve, L	-ve, H	-ve, Ma
	Accident, injury or death of public using the road. Health problems caused to people residing near road due to increased	O	-ve, P	-ve, L	-ve, H	-ve, Ma

Table 7-1: Environmental and Social Impacts Screening During Project Implementation Phases as Without Mitigation Measures Sceneries						
VEC	Impact/Activity	Project Stage	Duration	Area	Severity	Significance of Impact
	noise and air pollution					
8. Stakeholder Management (Compliance of WB's ESS 10- Stakeholder Engagement and Information Disclosure)						
8.1 Stakeholder Disclosure	Assess stakeholder interest and support for the project and enable stakeholders' views to be taken into account in project design	D	+ve, P	+ve, L	+ve, Lo	+ve, Mi
8.2 Engagement of Local People	Promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life-cycle	C	+ve, P	+ve, L	+ve, Lo	+ve, Mi
Note: +ve = Positive Impact; -ve = Negative Impact; H = High; Lo=Low; Medium = Me; AG = Above Ground; D = Design & Pre-Construction Stage; C = Construction Stage; O = Operation Stage; N = Neutral; PC = Pre-Construction; VEC = Valued Environmental Component; P = Permanent; T = Temporary; L = Localized/Limited; R = Regional; Mi = Minor; Mo = Moderate; Ma = Major.						

7.3 IMPACTS AND MITIGATION DURING DESIGN PRE-CONSTRUCTION PHASE

7.3.1 IMPACTS ON DESIGN CONSIDERATION

254. Design stage requires most surveys/field investigations/meeting and desktop works for designing the project, there will not be any major impacts on the existing environment. Because, the project corridor already changed the natural state and disturbed corridor, since most of the entire project road is existing road with a liner strip land acquisition will be carried. Similarly, the pre-construction stage is pertaining to the mobilization of contractor, Construction Supervision Consultant (CSC), engagement of NGO for supporting RHD for implementation of Resettlement Action Plan and Land acquisition work. However, prior to mobilization of contractor, RHD needs to undertake various activities to provide encumbrance free alignment which involves demolition of structures, tree cutting, utility shifting, compensation to be paid to the project affected persons (PAPs) etc. However, some of the activities do not require any specific mitigation but there are some activities requires mitigation measures.

255. Project Design Specifications: It is likely, poorly thought design parameters and construction planning may have negative implications on the infrastructure operations, degrade natural system like drainage, contamination from mismanagement of construction waste. Improper Project's geometrical improvement and pavement designs, realignment locations, sitting of construction/labor camps and other associated infrastructures, not the least of them being human waste draining into the river. construction methods applied can have significantly impacts on the biophysical, economic and socio-cultural environments of the project area in Jhenaidah – Jashore corridor. The natural hazards and climate change risks are also grave concern in designing due to damage the pavement, like rutting, embrittling, softening road migration of liquid asphalt, thermal expansion in bridge joints, etc.

256. Improper design of bridges and culverts will have adverse impacts on the physical environment as well national economic as ant cross drainage structures can be collapsing any time in case of design failure. Navigation clearance, free board over the design flood level, crest level of embankment, and climate change effect are important design parameters for construction bridges on the Naboganga river, Begobati river Chitra river and Bhairab river. The impact at bridge sites during pre-construction stage will also be due to improper sitting of construction yards, the concrete and steel fabrication areas as well as the batch mix plant(s) and workers camps could result in negative impacts.

257. In addition, the seismicity of the project area could have a significant effect on heavy infrastructures like VOP, POP, flyover and drainage structures particularly bridges. Therefore, the impacts on the design consideration are significant.

Mitigation Measures

- ▶ Considering the hydrology of area, 19 new culverts are proposed, and the size of culverts has also been increased to meet the cross-drainage requirement,
- ▶ Culverts of adequate spans have been provided to meet the requirement of animal crossing,
- ▶ Issues pertaining to Pedestrian safety and road safety measures have been addressed by providing such as vehicular underpass, pedestrian over pass (POP), Flyovers, etc.
- ▶ Ensure road design, embankment height; Pavement design to comply the relevant international and national approved design manual of RHD Geometric Design Standards Manual (Revised-2005); AASHTO "A policy on Geometric Design of Highway and Streets" 2001, etc.,
- ▶ The Bangladesh National Building Code (BNBC) should be considered for designing of road infrastructures, particular all buildings structures

7.3.2 ACQUISITION AND CLEARANCE OF PRIVATE STRUCTURES

258. Approve amount of land for acquisition is 373.13 acres land acquisition will be required. Quanta of land to be acquired are 298.6541 acres including 94.66 acres, 136.7791 acres, 67.2159 acres in Contracts 1, 2

and 3 respectively. The highest quantum of land 31.70% under acquisition process in Contract 1, while 45.80% and 22.51% of lands are being acquired in Contract 2 and Contract 3, respectively. In Jhenaidah the project corridor constitutes of mostly rural, where affected agricultural lands with rural homesteads are prominent. From Jhenaidah to Kaliganj, the agricultural lands are mainly used for rice cultivation. As per census, IOL and socioeconomic survey conducted from March 2022 to August 2022, total 14938 people belong to the 3464 households (HHs) will be affected. Total 3337 households are affected due to acquisition of primary structures in the project area (including 1011, 1071, and 1255 households in Contracts 1, 2 and 3 respectively) (Table 7-2).

259. Table 7-2 shows that total male population is 7633 including 2396, 2540 and 2697 in Contracts 1, 2 & 3 respectively. Total female population is 7305 including 2336, 2353 & 2616 in Contracts 1, 2 & 3 respectively. Total population is 14938 including 4732, 4093 and 5313 in Contracts 1, 2 & 3 respectively. Total affected HHs is 3464 including 1055, 1123 & 1286 in Contracts 1, 2 & 3 respectively.

Table 7-2: Contract Wise Household and Population Distribution

Contract	Population			HHs No
	Male	Female	Total	
1	2396	2336	4732	1055
2	2540	2353	4093	1123
3	2697	2616	5313	1286
Total	7633	7305	14938	3464

260. The Contract-wise distribution of affected population and HHs losing 616 residential structures (242, 192 and 182 in Contracts 1, 2 and 3 respectively), 2297 commercial structures (647, 718 and 932 in contracts 1, 2 and 3 respectively) and 424 residential- cum-commercial structures (122, 161 and 141 respectively) are presented in detailed in Table 7-3 below.

Table 7-3: Contract Wise Total TH, NTH and Encroacher Households Losing Residential, Commercial and Residential-cum-Commercial Primary Structures

Contract	HHs Losing Residential Structures				HHs Losing Commercial Structures				HHs Losing Residential-cum-Commercial Structures				Grand Total
	Title Holder HHs	Non-Title Holder HHs	HHs identified as encroachers	Total	Title Holder HHs	Non-Title Holder HHs	HHs identified as encroachers	Total	Title Holder HHs	Non-Title Holder HHs	HHs identified as encroachers	Total	
1	228	11	3	242	368	257	22	647	111	1	10	122	1011
2	183	1	8	192	311	363	44	718	108	7	46	161	1071
3	96	80	6	182	396	494	42	932	101	22	18	141	1255
Total	507	92	17	616	1075	1114	108	2297	320	30	74	424	3337

Mitigation Measures

- ▶ Implement Land Acquisition Plan (LAP) and updated Resettlement Plan (RAP) of the Project prepared in compliance with the national Acquisition and Requisition of Immovable Property Act (ARIPA), 1982, amended ARIPA, 2017.
- ▶ Payment of Cash Compensation under Law (CCL) to the PAPs by DC to compensate the impacts due to loss of lands, structures, ponds, trees, standing crops etc.
- ▶ Payment of compensation to Titled and Non-Titled households according to the entitlement matrix defined in the updated RAP by the RAP Implementing Non-Government Organization (INGO) on behalf of RHD
- ▶ Payment of Top UP (Replacement Value (RV)/Cost minus CCL where RV is higher than CCL) by RHD facilitate by INGO.
- ▶ Provide the resettlement benefits to the affected disadvantaged, marginalized and vulnerable households to restore their livelihood by implementing the Livelihood Restoration Plan as documented in updated RAP
- ▶ Loss of water bodies and trees, proper compensation will be given by DC/RHD with assistance from INGO.
- ▶ Ensure adequate compensation will provide to the Project Affected Persons (PAPs) in time and without any hassle;
- ▶ Affected HHs will be given cash compensation for the land and structures, and additional transfer grants for the relocation of each structure;
- ▶ The cash assistance will be provided, as per assessed value for dismantling and reconstruction;
- ▶ Vulnerable groups should be identified and provisions made for social and economic development support, employment, and means of subsistence to improve their status/livelihoods;
- ▶ Grievance Redress Committees (GRCs) of the project will ensure participation, speedy and out of court settlement of as many disputes as possible.

7.3.3 ISSUES FROM STAKEHOLDER CONSULTATIONS

261. Eight consultation meetings were carried in the project affected areas in Jhenaidah and Jashore districts. Participants raised the concerns about their adverse impacts regarding i) land acquisition, compensation, relocation options, cutting of trees, etc. and whether any provision of resettlement special benefits for the disadvantaged, marginalized and vulnerable households and groups of the project or not. ii) anticipated environmental pollution like dust and noise generation, water pollution, etc. due to construction works iii) expected for community exposure to water-borne, water based, water-related, and vector-borne diseases, and communicable and non-communicable diseases, and COVID-19, those could result from project activities, iv) road safety at the major and minor roads intersections, bazar areas and sensitive structures, v) improper labor management, occupational health and safety, and their risks during construction works were the grave concerned.

262. In addition, during construction works the probabilities project adverse impacts on the communities alongside the project road due to Sexual Exploitation and Abuse (SEA), Sexual Harassment (SH) and Gender Based Violence (GBV) are raised by the participants. The participants are annoyed if the occurrences of sexual harassment of women passengers in the public busses during operation of the project, if proper highway safety is not ensured by the competent authorities.

Mitigation Measures

- ▶ Different issues pertaining to compensation of land acquisition, loss of structures and assets as well resettlement and rehabilitations (R&R), etc. has been discussed in the meetings which are detailed presented in RAP to be implemented in the projects
- ▶ Ensured the compensation for impacts on infrastructure shall be provided in accordance with Entitlement Matrix of the Resettlement Action Plan (RAP).
- ▶ Ensured the proper designing of vehicles overpasses, pedestrian overpasses, foot overpasses, bus bays and etc. are considered by Technical Design Team, based on the outcomes of the consultations regarding the road safety.

- ▶ Mitigation measures for various impacts of the project shall be included in the CESMP which will have but not limited to the following:
 - Ensure implementation of mitigation measures suggested in ESMP (B4 through B6 and B13 through B-15) at site to control the environmental pollution.
 - Specific mitigation measures for risks and impacts can be encountered by the laborer's are included in Labor Management Plan.
 - Waste Management Plan will ensure sound environment.
 - Construction and Demolition waste, and Liquid Waste Management Plan Hazardous Waste Management Plan,
 - Workers' Camp Management Plan, Community Health and Safety Plan, Traffic Management Plan, Training schedule of staff
- ▶ Community Health and Safety
 - For community health and safety, the contractor shall plan activities in residential areas after having discussion with the community
 - Local shall be kept informed about the activities which the contractor is taking up in their areas.
 - Excavated areas shall be properly barricaded.
 - Trespassing of construction sites/construction camps/labor camps shall be prohibited.
 - OHS Plan. the prevention and management of HIV/AIDS and other STIs as suggested in B-22, and COVID-19 Prevention Measures Plan will be implemented
 - Contractor shall take all precautionary measures to prevent community exposure to water-borne, water based, water-related, and vector-borne diseases, and communicable and non-communicable diseases that could result from project activities.
- ▶ Control the accident,
 - Trained drivers having valid license shall be allowed to drive construction vehicles/heavy equipment.
 - Speed and fitness of the construction vehicles/equipment shall be defined by the contractor in the contractors' ESMP.
 - Vehicles/construction equipment need to be maintained and inspected/tested regularly,
- ▶ Highway Petrol / Police should be adequately deployed, particularly at night to prevent the harassment of women passengers in the public busses in the project road during operation the project
- ▶ Last but not the least regular consultation with the community to know the effectiveness of implementation of mitigation measures at construction sites/camps.

7.3.4 ISSUES PERTAINING TO THE CPRS

263. Inventory of Losses (IoL) survey identified 80 CPRs located alongside the existing road requiring relocation. Contract-wise affected CPRs are presented in Annex 4-11. Relocation or partial damage of these structures and or their primases will cause annoy and stress among the communities.

264. The project alignment donot revealed any historical, cultural and archeological resource during the IOL study, however, during site clearing and grubbing, excavation or digging for construction purposes may unearth chance artifacts. A rapid response procedure in assistance with officials of the Department of Archeology, Bangladesh shall be prepared to protect and preserve artifacts if found by change minimizing the disruption to project activities.

Mitigation Measures

- ▶ There are 80 number of CPRs such as mosques/schools/ temples/clubs etc. falling within the corridor of impact which need to be properly shifted.
- ▶ Implementation NGO (I-NGO) has been engaged to assist PIU/RHD in the overall resettlement and relocation process as well as facilitate the CPRs shifting
- ▶ Payment of Cash Compensation under Law (CCL) for affected structures by DC for relocation of the structures
- ▶ Payment of Top up (Replacement Value/Cost minus CCL where RV is higher than CCL) for structures by RHD with the assistance from INGO.

- Compensation must be provided in according with guidelines specified in the RAP, as well mutual understating between RHD and affected communities/committees;
- Affected CPRs must be rebuilt at the expense of RHD or payment of cash compensation in consultation with the affected communities.
- Affected communities will be given cash compensation for the land and structures, and additional transfer grants for the according to the entitlement policy as defined in the RAP

7.3.5 REMOVAL OF TREE-CUTTING

265. During the pre-construction period, about 14008 trees will cut down/cleared within Proposed RoW for the construction of road embankment, construction yards, workers' camp, and project site offices, resulting in ecological, aesthetic and economic loss. Construction of culverts and bridges will damage the aquatic biology. Amongst affected mature trees species (14008), the trees under Contract 1 are 5853, in Contract 2 are 5270 and Contract 3 are 2885 Table 7-4. According to IoL about 32368 privates are to be removed such as 20953 in Contract-1, 10199 in Contract-2 and 3116 in Contract-3 in Table 7-5. Loss of private affected trees will cause psychological stress of the owners. The loss of common species such as Rain tree, Mahagoni, babul, neem, mango jackfruit, debdaru, deoa, dumur, gamari, ipilipil, jalpai, jam, kanthal, khejure etc. No-endangered/threatened species are to be affected. The loss of nest/resting/feeding sites of birds are anticipated due to cutting of huge trees and vegetation.

Table 7-4: Affected Trees Within Govt Land alongside the Project Road

Contract No.	Girth Size Wise Trees															Total Tree s
	Girth size<30 cm			Girth size 30-80 cm			Girth size 81-120 cm			Girth size 120-180 cm			Size >180 cm			
	L	R	Tot.	L	R	Tot	L	R	Tot	L	R	Tot	L	R	Tot	
Contract 1	1562	1780	3342	980	920	1900	177	72	249	48	64	112	150	100	250	5853
Contract 2	1021	1003	2024	904	787	1691	479	633	1112	127	122	249	95	99	194	5270
Contract 3	655	882	1537	649	364	1013	103	41	144	29	22	51	106	34	140	2885
Total	3238	3665	6903	2533	2071	4604	759	746	1505	204	208	412	351	233	584	14008

Table 7-5: Affected Private Trees within the Proposed RoW

Contract No	Nos. of Affected Trees				
	Large	Medium	Small	Sapling	Total
Contract 1	5209	2543	4232	8969	20953
Contract 2	3092	2298	3216	1593	10199
Contract 3	692	674	750	1000	3116
Total	8993	5515	8198	11562	34268

Mitigation Measures

- Necessary permission from the concerned agency shall be obtained before cutting the trees.
- Identified/marked trees shall be removed
- No trees will be cut beyond the toe lines, if possible
- The tree plantation will be undertaken during construction phase in lieu of avenue of tree removal. It will be carried out in 1:3 ratio i.e., three (3) saplings for one tree cutting. About 42,000 trees are to be planted under the project.
- For private trees compensation will be paid by DC to titleholders and RHD will disburse to the non-titleholders
- 95% survival rate shall be considered for release of tree plantation.
- Contractor shall be responsible for six (6) years maintenance of tree plantations.
- Shrubs Plantation on medians 27000 (Contract 1), 20640 (Contract 2) and 5460 (Contract 3) & its

maintenance for six (6) years.

- ▶ Shrub Plantation and grass carpeting in embankment slopes including maintenance of trees for six (6) years. The number of shrubs in contract 1 (12000), Contract (9173), Contract (2427).
- ▶ Compensate trees plantation shall be done as 40% by Khulna Zone under RHD and 60% shall be done Social Forestation.
- ▶ A tree plantation Plan is enclosed in Annex 10-1
- ▶ Proper safety measures should be adopted during cutting and removal of trees during clearing sites so that accidents of contractors' workers and local people can be avoided. All workers and project personnel should use Personal Protective Equipment (PPE) at the site.

7.3.5.1 DECREASE IN CARBON SEQUESTRATION

266. About 14008 road sides trees will be cut down due the existing road widening as per proposed RoW. In addition, about 34268 private trees will affect by the project. Removal of these huge numbers of trees will cause sharp decrease in CO₂ sequestration. As a result, the amount of CO₂ in the atmosphere will be increased as well as the local temperature will be raised. The reduction of O₂ generation from the trees photosynthetic process will cause imbalance in local climatic condition for short time being.

Mitigation Measures

- ▶ Tree plantation will be carried out by the Forest Department under social forestry as well as Arboriculture Department of RHD.
- ▶ Watering of the tree plantation will be ensured.
- ▶ Necessary tree guards shall be provided to protect saplings.
- ▶ Cluster plantations need to be considered in the community lands such as ponds/mosques or at other locations desired by the community.
- ▶ All realignments shall be enhanced with the tree plantation,
- ▶ Trees will be planted as an enhancement measure around the ponds or LGED link roads and vegetative noise barriers along the sensitive receptors in consultation with the stakeholders as per the requirement.
- ▶ Tree plantation around the monuments along with other enhancement measures shall be undertaken.
- ▶ Fast growing native trees will be planted to improve the carbon sequestration
- ▶ The contractor shall take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora and fauna.
- ▶ While clearing vegetation it must be ensured that no faunal species like, mongoose, fox, squirrel etc. injure and/or die.
- ▶ While removing the tree, if any endangered or endemic species is sited immediately the work shall be stopped. The name of the species etc. need to be reported to the nearest forest department through RHD.
- ▶ Sacred tree (banyan etc.) will be cut as per the stakeholder consultations.
- ▶ About 6Km away in Mallikpur village there is a protected tree notified by the forest department, thus contractor shall take all necessary precautions in consultation with the forest department. Borrow areas/construction camp/labor camp shall be 3000m away from this protected tree. Cartage of construction material nearby this tree shall not be allowed.

7.3.6 UTILITIES SHIFTING

267. About 953 electric poles are to be shifted (Contract-1: 361 electric poles, Contract-2: 306 electric poles, Contract-3: 286). A discussion meeting has been conducted between the utility providers and the PIU along with E&S consultants for shifting the utilities falling within the corridor of impact. Additionally, the estimation from the utilities provider has been attached in Annex 7-4. In addition to this two-grid tower will be shifted within the government land (BADC) as per discussion with the PIU and the power grid. All of the electric poles and fiber cables will be shifted within the RoW and there will be no additional land needed for executing these shifting activities. Increase pollution in ambient air quality due to operation of heavy equipment and increase in ambient noise Levels due to operation of excavator, concrete mix, traction of electric lines will be carried out. Unsafe to the public while working near the residential/commercial areas and

shifting of utilities like electric poles may require temporary power cut which may disturb the life of common local people in terms of commercial activities and domestic life. But the impact will be of short term and daytime only. Sometime during shifting underground cable fault may be anticipated which will cause the dangerous situation of the locality. Generally shifting of Optical Fiber Cables may create any communication problem due to damage during relocation. In addition, shifting of utilities may block the access to the houses and business centers and health center. Erection of electric poles may cause inconvenience, block the access to the residents, shopkeepers, students and children. Possibilities of accidents and health hazard if piled near houses on road, market, schools and playground and parks without considering the safety. Occupational and public safety issues of the workers, technicians and residents are a serious concern during shifting of the utilities.

Mitigation Measures

- ▶ The above-mentioned risks and impacts associated with Utility shifting corresponding mitigation measures have been included detailed in the Updated RAP.
- ▶ Well maintained and good working condition machines and equipment meeting the pollution board requirement shall be deployed at site during erection of electrical poles.
- ▶ Warning signboards shall be placed at visibility locations.
- ▶ Proper safety measures should be adopted during implementation of the utility shifting so that accidents of workers, technicians and local people can be avoided. All workers and project personnel should use PPE at the site.
- ▶ A Utilities Shifting Plan will be prepared by the contractor in consultations with the responsible agencies like – West Zone Power Distribution Company Limited (OZOPADICO), Power Grid Company of Bangladesh, Jhenaidah Palli Biddut Samity (JPBS), Jashore Palli Biddut Samity (JPBS) and Bangladesh Telecommunication Company (BTCL) for relocation of the utilities. The concerned authorities JPBS of Jhenaidah and Jashore already have submitted budget for utilities shifting to RHD.
- ▶ Utility shifting shall be done as per the agreed Utility shifting plan
- ▶ The contractor in consultation with the responsible agencies and RHD will inform the local people about the schedule of the utility shifting prior to start of the work
- ▶ Any grievance / complain shall be recorded and resolved by the competent authority as soon as possible.
- ▶ To reduce the impacts, shifting shall be carried out in phases
- ▶ Excavation/concreting for erecting the electric poles shall be planned in such a way that it shall not disturb the movement of the local people and traffic.
- ▶ Installation of the electric poles and cables holders shall not be done in such a way that it shall not disturb or a concern of safety for the children playing in park or going to schools
- ▶ Shifting shall not disturb access to the religious place, community halls, municipal service, local water source etc. as well as tourist location/spot.
- ▶ No material shall be so placed which may pose a risk or cause inconvenience to any person or the public.

7.3.7 DRAINAGE AND CROSS-DRAINAGE STRUCTURES

268. There are four rivers, a few canals located in the project area of which most of the canals are seasonal in nature resulting in waterlogging/flood situation. Localized waterlogging occurs in several built-up sections and along majority of the road intersection due to heavy raining and inadequate drainage facilities at urban /market areas. One open drain (borrow pit) alongside the Project Road under Contract -3 is vulnerable to flooding if it is filled up due to widening of the proposed road. This may cause serious water congestion at the residential locality unless appropriate diversion channel or alternate water draining arrangement measures is adopted as mitigation measures to curtail during exigencies. One short distance realignment of the project viz; 0+800 Km and Km 0+1600 from Gobindapur to Mondolpara in Jhenaidah is considered to avoid a sharp curve and urban resettlement. This preferred alternative passes through the low-lying areas, ditches and canal, which requires proper drainage provision.

269. The poor design of bridges and culverts will cause adverse impacts on the hydrology. Besides, global climate change is likely to bring about sea-level rise and change in intensities and durations of rainfall and other extreme weather events; resulting in increase in magnitude and frequency of flooding. The project area, which is already a floodplain area, has already a significant phenomenon to create localized water logging in project area

Mitigation Measures

- ▶ To mitigate the drainage problem due to back filling the Open drain (borrow pit) alongside road - rectangular covered drains at each side (left and right) is proposed at the urban area. In rural areas, if water congestion occurs during monsoon season, the water will be dispersed through natural ways to low-lying agricultural lands, ditches located at both sides' road embankment and through proposed widened culverts, nearby;
- ▶ Adequate cross drainage structures 76 (74 culverts and 4 bridges) are provided to avoid impediment to natural flow of water. Out of them, under Contract-1, two bridges at Naboganga River at 1+200 km and Begobati River at 9+170 km including 22 reconstructions plus 8 newly proposed culverts. In Contract 2, one Bridge over Chitra River at 16+400 km including 17 culverts reconstruction plus 6 Newly culverts and Contract 3 one bridge over Lower Bhairab at 35+750 km including 14 reconstructions plus 6 newly are proposed
- ▶ Bridge/culverts construction should be scheduled, so that they are constructed during pre-monsoon season to avoid potential disaster caused by excessive rainfall and consequent flooding
- ▶ The embankment height needed to designed consistent with the existing topography of the region;
- ▶ Design must include increased height of road surface above the nearby areas and increased sizes of drainage channels and culverts to accommodate additional rainfall and potential flooding;
- ▶ Raise the road embankment height above the HFL. Provide sufficient box culverts and bridges on the road with adequate opening for cross drainage of the catchment area, so that they can safely handle a 100-year frequency of flood for major structures;
- ▶ Formation level of the embankment for any large bridge should be above the 50 years flood level by a free board of at least 0.5m and adjusted to account for climate change and the added dimensions of the widened road embankment;
- ▶ Effective drainage system will be provided to drain the storm water from the roadway and embankment and to ensure minimum disturbance to natural drainage of surface and subsurface water of the area, particularly filled up the roadside canal due to the widening the project road.
- ▶ Road level above the nearby urban and market areas with provision of adequate side drains to evacuate the rain water / storm water from roadway and embankment and to ensure minimum disturbance to natural drainage of surface and subsurface water of the area;

7.3.8 ENVIRONMENTAL MONITORING FOR BASELINE ESTABLISHMENT

270. The monitoring of air, noise soil and water has been carried out at different locations along the project corridor. This will serve as a benchmark for monitoring during construction and operational phases.

7.3.9 ROAD SAFETY ISSUES

271. The major bottleneck areas are identified based on social and engineering points of view in the project roads are: existing Roundabout at Ch.0+000, Bishoykhali Bazar at Ch .8+000, Kaliganj Bazar at Ch.17+000, Dulal Mundia Bazar at Ch.20+000, Baro Bazar at Ch.28+000, Mandar Tola at Ch.33+500, Bari Nagar Bazar at Ch. 34+500, Churamankathi Bazar at Ch.39.50 Km, Khairtola Bazar at Ch.42+000, Pal Bari More at Ch.44+000, Dharma tola Bazar at Ch.45+500 and Chachra T Junction at Ch.48+500. Eight bazar areas are in urban and semi urban setting with settlement and others are not suitable for in geometrical design due to safety reasons. Thus, requires appropriate countermeasures in the design of the project road. Poor road geometry and mixed Traffic like fast moving and slow moving will cause vehicles accidents, inconveniences to road users and pedestrian health hazards. Based on traffic and pedestrian demand, vehicular and pedestrian overpass needed to be provided.

272. In addition, many side roads will be joining the Service Road, and if entry is not properly controlled, these points become blackspots.

Mitigation Measures

- ▶ Geometric improvement has been incorporated by the design engineer. Slow moving vehicular traffic lane, Bus bays, five (5) Vehicular Over passes (VOP), one (1) foot over bridge (FOB), eight (8) pedestrians over pass (POP), one (1) rail over Bridge cum fly over and one elevated road section as flyover at cantonment area. These are given as per following details in Table 7-6.

Table 7-6: Proposed Road Safety Structures within three Contract Contracts

Contract 1	Contract 2	Contract 3
POP at 02+400 Km Intersection VOP at Alhera More, 03+200 km VOP at Tatul Tola Baza, 05+512 km FOB at Tatul Tola More, 06+760 km POP at Naldanga –Gariwala Road, 11+445 km POP at Bakulia, 14+970 km	VOP at Kaliganj, 16+822 km VOP at Roghunathpur 24+840 km POP at Amin Electronic More, 19+890 km POP at Keya Bagan Bazar, 22+740 km POP at Boor Bazar, 28+715 km	VOP at Samile Bazar, 35+770 km VOP at Churamon Kathi More, 38+445 km POP at Mandartula Bazar, 24+840 km FOB at Pabari More, 43+300 km Flyover at Cantonment Area, 41+025 ROP at Arabpur More (2 rail crossing) 44+448 & 46+398 km

- ▶ In design the VOPs have been catered and also safe roundabout proposed to safely transfer traffic to side road and also to slip road and two directional service road.
- ▶ Compliance with International highway for curvature and grading and safety curve at all at Grade U-Turn and bridges approaches
- ▶ Sidewalks/pedestrian zones along the road near habitat areas, schools, hospitals, and religious places are needed to be included in the design, which will be further reviewed by EPC contractor
- ▶ Separator between Service Road and Slip Road has been widened to cater the pedestrian protection. Service Road at junction influence area also has been widened to 7m to cater the swept path of turning vehicle

7.3.10 PERMISSION AND CLEARANCES

273. Smooth and safe construction works requires permission from different authorities prior to the commencement of civil works by the Contractor. Not fulfill the requirement as said in the approved DoE's Environmental Clearance Certificate of the J-J Road Project may be considered as violence of clauses and misconduct of the contractor. As few components/structures are added in the new design, DoE clearance to be obtained incorporating these along with the cleared version of ESIA.

Mitigation Measures

- ▶ Contractor shall follow the requirement of Environmental Clearance Certification (ECC) in addition to mitigation measures suggested in ESMP herein while establishing the construction camp sites, crusher units, hot mix plants, concrete batch mix plants, WMM plants, work force camps.
- ▶ Consent to establish and Consent to operate construction camp sites, crusher units, hot mix plants, concrete batch mix plants, WMM plants, work force camps.
- ▶ Permission to Establish Construction camps
- ▶ Permissions for sourcing of water for construction activities (Surface Water)
- ▶ Permissions for extraction of Groundwater, if requires
- ▶ layout approval for construction camps/labor camps other from CSC
- ▶ Permissions for sourcing of water for construction activities (Surface Water), if required
- ▶ Extraction of Groundwater, if required
- ▶ Contractor shall follow standard procedures as per Bangladesh Labor Act 2006 for labor recruitment

7.3.11 ORIENTATION TO CONTRACTORS

274. If proper orientation and training on the Environmental Assessment, ESMP implementation and safeguard process of national and funding Institution are not conducted to the contractors and RHD, then the implementation of ESMP and its compliances cannot be realized efficiently and effective. Without orientation

and the site induction trainings of Contractors, the objective to implement the ESIA and its ESMP will not be achieved.

Mitigation Measures

275. Orientation program for the contractor will be conducted by the RHD/PIU after appointment to meet the requirement of ESMP and ESS requirement of WB. The salient features of program are as follows:

- ▶ No works will be initiated by the contractor until the site induction training of workers/staff is carried out;
- ▶ Obligations under contract to submit and preparation of Contractor Environmental and Social Management Plan
- ▶ Regulatory compliance requirements
- ▶ Grievance redress mechanism for both social and environmental issues
- ▶ Various plans required under C-ESMP related to Occupations Health & safety, traffic and road safety, community health and safety, hazardous and nonhazardous waste, camp site management, emergency response, blasting, borrow area, muck disposal, restoration etc.
- ▶ Labor management procedures
- ▶ Community health & safety aspects at workplace and Reporting requirements etc. under the project.
- ▶ Stakeholder Engagement Plan Contractor shall appoint one Environmental safety and health Officer, Social-cum-Community Liaison Officer and one Health and Safety Officer, both of whom shall solely be responsible for implementation of all ESMP provisions in close co-ordination/consultation with Environmental and Social Specialist in the RHD
- ▶ Training includes discussion and review of ESMP and ESMoP detailing how specific environmental risks associated with their scope of work, legal compliance, inspection and audits, and progress tracking and reporting;
- ▶ Individual Environmental Consultants under Project Implementing Unit of RHD will monitor and supervise all training sessions and also provide training modules.

7.4 IMPACTS AND MITIGATION DURING CONSTRUCTION PHASE

276. Construction stage activities require careful management to avoid environmental impacts. Activities that trigger the need for environmental measures to be followed include:

- ▶ Implementation of site-specific mitigation/management measures
- ▶ Monitoring the quality of environment along the construction sites (as air, noise, water, and soil & Sediment).

277. There are several other environmental issues that have been addressed as part of good engineering practices, the costs for which have been accounted in the engineering costs. They include improvement of major & minor junctions, roadside drainage, provision of additional cross drainage structures or raising the road height in low-lying stretches, provision of bus stops, provision of soil erosion prevention measures etc. Therefore, these mitigation measures shall be included in the contract document of contractor for its implementation by the contractor and for the sustainable development of project.

278. To implement it properly, it is suggested that non-compliance shall be considered as major lapse from the contractor for which they need to be penalized. All lapses pertaining to the clearances/NOCs obtained by the contractor shall be deemed as a major non-compliance. They must ensure all these approval/NOCs are valid throughout the construction stage/liability/maintenance period. Contractor needs to follow the conditions stipulated in the environmental clearance (EC), consent to establish (CTE) and Consent to operate (CTO) other approvals given by the regulatory authorities.

7.4.1 SITTING HOT MIX PLANT/WMM/BATCHING PLANT/CRUSHERS

279. Poor siting of Hot mix, Wet Mix Macadam (WMM), Batching Plant and Crushers will (i) generate air pollution, (ii) fugitive Dust Emission, (iii) Noise Pollution, Surface water pollution in case sited nearby water body /water logging, (iv) drainage problem and (v) Safety Hazards for electrical and other safety risks of the

workers. Thus, pre-requisite consideration and measures should be taken care by the contractor for siting the construction equipment's

Mitigation Measures

- ▶ For installing different plants, the construction shall obtain necessary permission competent authorities
- ▶ Hot mix plant shall be installed on downwind side and at distance of 1000m away from the residential area.
- ▶ Batching plants/WMM shall be installed 1000m away from the residential area on the downwind side.
- ▶ These plants shall be at least 500m away from the water bodies or river/canals.
- ▶ No batching plant /labor camp/construction camps shall be allowed to establish on the banks of river/canal.
- ▶ To prevent water logging in the batching plant, drainage and sump shall be provided which shall be cleaned regularly.
- ▶ Hot mix plant shall be fitted with pollution control devices Bag filters etc.
- ▶ The stack height shall be at least 30m above the ground.
- ▶ The premises shall be enclosed, and trespassing shall not be allowed.
- ▶ The contractor shall submit the detailed layout plan for approval to the Engineer before getting into formal agreement with landowners for setting up of such site.
- ▶ Actions by Engineer and PIU against any non-compliance shall be borne by the Contractor at his own cost.

7.4.2 LABOR CAMP/CONSTRUCTION CAMPS

280. A CoC and GBV Action Plan has been prepared separately with provisions to comply with the construction/labor camp management. Labor Management Plan (LMP) has been prepared to take necessary action when construction camp and labor camp establishment. A provisional aspect on GRMs also incorporated in the labor management plan and also in ESMP to construct a sustainable construction camp of the proposed project. Improper and poor layout of worker's camp may cause loss of agricultural produce if (i) visited on cultivable land, (ii) health hazard to workers and nearby community, (iii) surface water pollution in case sited near water bodies, (iv) local drainage problem (v) wear and tear to haul routes if material is transported via village roads, and (vi), fire, electrical and other safety risks. The camp siting for construction workers is important as they may have significant impacts on health and possible hazards on sensitive environmental receptors, existing infrastructures of nearby communities.

281. Though, identification of location and setting of the worker's camp, construction yard with machineries layout, storage of construction materials and other facilities are in the scope of the Contractors' own arrangement, but the location, layout and basic facility provision of each labor camp will be submitted to CSC and PIU prior to their construction.

Mitigation Measures

- ▶ Labor camps shall be located away from the at least 500m away from the residential areas/waterbodies' like Chitra river, Bhairab river, Bishkhali river and Begobati river and wetland.
- ▶ A detailed layout plan for all such sites shall submit and get approval from the CSC.
- ▶ Contractor shall prefer to the non-productive lands which has access to the existing roads.
- ▶ Contractor must make an agreement with the land parcel owner along with the photographs of original land.
- ▶ Rooms of the labor camps must be properly ventilated.
- ▶ Hygienic conditions must be ensured in the labor camps
- ▶ To prevent soil erosion, the construction/labor camps shall not be established on the banks or river or waterbodies.
- ▶ No timber or wood shall be used for cooking purpose
- ▶ No illegal tree cutting shall be allowed.
- ▶ Mobile toilets or toilets with septic tanks shall be provided.
- ▶ Either canteen facility or cooking gas shall be provided.

- ▶ Labor/construction camps shall be properly fenced and informatory board as well as project details shall be displayed at the entrance and exit of the camp.
- ▶ Pre-requisite consideration and measures should be taken care by the contractor for siting the camps and other facilities.

7.4.3 POTABLE WATER AND SANITATION FACILITIES

282. In adequate supply of potable water, unsanitary toilets facilities and sanitary washing areas can lead to water borne/Faecal diseases out breaks in the workers camps. Poor sanitation may result to transmission of communicable diseases among the workers and the host community. Unsafe potable water facilities and washing areas can lead to water borne disease outbreaks.

Mitigation Measures

- ▶ Potable water shall be provided by the contractor in the construction camps/labor camps/construction sites.
- ▶ Water quality shall be tested to check its potability to meet the requirement of drinking water quality standards
- ▶ Drains shall be provided.
- ▶ Proper lavatory facilities for male and female workers shall be provided as shown in Table 7-7.
- ▶ Proper hygienic condition must prevail in such facilities.
- ▶ The mobile toilet shall be periodically replenished with fresh water
- ▶ for ablution purposes and wastewater shall be emptied through suction tankers and carried to the nearest municipal sewage treatment facilities or soak pits shall be provided.
- ▶ Untreated liquid waste shall not be allowed to discharge in to surface water bodies.

Table 7-7: Recommended Sanitary Toilets, Drinking Water and Bathing facilities			
Sl. No.	Sanitary Unit	For Male Personnel	For female Personnel
1.	Water Closet	1 for every 10 persons	1 for every 1-10 persons
2.	Ablution Taps	One in each W.C	One in each W.C.
3.	Urinals	1 for 6-20 persons 2 for 21-45 persons 3 for 46-70 persons 4 for 71-100 persons	--
4.	Washing Taps with draining arrangement	One for every 10 persons or part thereof	
5.	Drinking Water Fountains	One for every 30 persons	
6.	Baths preferably Showers	As required	

Note:

- i) One water tap with draining arrangement shall be provided for every 50 persons or part thereof in the vicinity of water closet and urinal or part thereof
- ii) Crèches where provided shall be fitted with water closets (One for 10 persons or part thereof), wash basins (1 for 15 persons or part thereof) and drinking water tap with drinking arrangement for every 50 persons or part thereof.
- iii) Toilets must have ventilation system and proper lightening arrangements.
- iv) Male and female toilets shall be clearly demarcated as “For Men Only” or “For Women Only” along with symbols etc.

Source: National Building Code, Bangladesh

7.4.4 SOLID WASTE MANAGEMENT

283. A wide range and substantial volumes of waste may be generated during construction works including gravel; concrete; miscellaneous structures such as poles and cables; steel; organic materials. Waste management and handling are grave concern of pollution to water and soil. Construction camp wastes are often poorly managed that can lead to chronic pollution of surface and ground water as well as soil contamination. Construction work creates areas of water stagnation during monsoon or heavy raining. These water ponding will be ideal place for the mosquitos breeding areas for malaria and dengue. This includes outdoor equipment storage, empty construction material drums, including used tyres.

Mitigation Measures

- ▶ Contractor shall undertake segregation of waste at source.
- ▶ Biological waste from the labor camp/construction camps/or other contractor facilities shall be collected for composting for gardening purpose.
- ▶ Intermingling of waste shall not be allowed.
- ▶ The municipal waste shall be disposed to the approved landfill sites only or contractor shall make necessary arrangements with the municipalities/Zila parishad.
- ▶ Construction and demolition (C&D) waste shall be disposed to identified and approved locations.
- ▶ C&D waste shall not be dumped into the water bodies.
- ▶ It is envisaged that about 40% of the scarified material will be reused in the sub-base preparation. Contractor shall store the usable material properly impervious to preventing mixing with the earth.
- ▶ Contractor shall prepare a waste management plan
- ▶ Open burning of solid wastes, whether hazardous or nonhazardous, shall not be allowed.
- ▶ E-waste shall be collected properly and disposed to approved vendors only.

7.4.5 HAZARDOUS MATERIAL MANAGEMENT

284. Likely, there will be oils, fuel, grease, chemicals from plant, equipment and vehicle servicing, construction camp wastes are often poorly managed and can lead to chronic pollution of surface water, groundwater and soil. The Contractor will mitigate these through following mitigations.

Mitigation Measures

- ▶ Oil/fuel shall be stored as approved design and safety protocol applicable in the country e.g., The Petroleum Act. 2016; The Petroleum Rules 2018; The Explosives Act. 1884 and The Explosives Rules 2004.
- ▶ If there is any spillage of hazardous waste, the contractor will remove it immediately.
- ▶ An area shall be assigned for storing the oil/oily waste or any flammable material.
- ▶ Smoking shall be prohibited such areas.
- ▶ Drip trays shall be provided at DG sets/below the nozzles for fueling the construction vehicles and equipment.
- ▶ Used oil or hazardous material/flammable material shall be collected in the drums and stored on the impervious platform which is that are sloped or beamed to contain a minimum of 25 percent of the total storage volume.
- ▶ It shall be disposed to the authorized/approved vendors as per the DOE norms.
- ▶ Tires shall be stored properly under the shed and shall be disposed to approved vendors.
- ▶ Transfer of hazardous materials from vehicle tanks to storage shall be carried out in areas with surfaces sufficiently impervious to avoid loss to the environment and sloped to a collection or a containment structure. This shall not be connected to municipal wastewater/stormwater collection system.
- ▶ Provision of secondary containment for components (tanks, pipes) of the hazardous material storage system, to the extent feasible, shall be made.
- ▶ Periodic (e.g., daily, or weekly) reconciliation of tank contents, and inspection of visible portions of tanks and piping for leaks shall be undertaken.
- ▶ Inform their employees about the hazards presented by their work
- ▶ Warning signboards shall be displayed at such locations.
- ▶ Awareness training shall be given to workers by Environmental safety health officer of the contractor.
- ▶ Material Safety Data Sheets (MSDS) shall be compiled.
- ▶ Standard operating procedures (SOPs) for fueling/storing or other operations pertaining to the hazardous material shall be prepared
- ▶ Contractor shall prepare a Hazardous Waste Management Plan

7.4.6 WATER RESOURCES AND WATER QUALITY

285. Uncontrolled dumping of wastes, sewage, excavated materials, and accidental spillage of fuels and chemicals into the water bodies may greatly pollute them. Disposal of sewage and wastes from the construction camps to surface water bodies without treatment will deteriorate the water quality. The seasonal ponds are unlikely to be affected from construction activities. In addition, there will be spillage oils, fuel, grease and chemicals from plant, equipment and vehicle servicing. However, the pollution of perennial water bodies can adversely affect the aquatic in them. Dumping of waste, sewage, excavated materials should be made at a particular place and also accidental spillage from vehicles can be checked through maintaining active surveillance of vehicles in operation. According IOL of survey under Contract-1 three (3) ponds, one (1) in Bhutiargati village, two (2) in Bishoykhali village, Jhenaidah district and under Contract-2 one (1) pond in Bededihi village, Jhenaidah district. All these ponds are cultured ponds and having economic value.

Mitigation Measures

- ▶ Loss of water body, the proper compensation will be given by DC/RHD with assistance from INGO.
- ▶ Contractor shall ensure that construction materials like earth, stone, ash, does not block the flow of water of any water course and cross drainage channels.
- ▶ No waste shall be allowed to be dumped in ponds. Any accidental spillage shall be reported to the project authorities for necessary action such as clearing and disposing the spilled material safely
- ▶ Workers will not be allowed to pollute the water body.
- ▶ No illegal excavation shall be allowed from the bunds of water bodies.
- ▶ The water flow will be restored soon after completion of the work.
- ▶ No waste will be dumped into the water bodies.
- ▶ Oil and grease separators shall be provided near the vehicle washing area/maintenance workshop.
- ▶ Drains shall be provided in labor camps/construction camps/workshops and other contractors facilities along with soak pits.
- ▶ Silt fencing at the mouth of water body shall be provided.
- ▶ Side drains have been provided in urban areas
- ▶ Dumping of waste, sewage, excavated materials should be made at a particular place and also accidental spillage from vehicles can be checked through maintaining active surveillance of vehicles in operation.
- ▶ No waste shall be allowed to be dumped in ponds. Any accidental spillage shall be reported to the project authorities for necessary action such as clearing and disposing the spilled material safely.
- ▶ Water Quality has been monitored during the baseline survey, during construction activities Contractor will undertake the water quality monitoring as per environmental monitoring program.

7.4.7 CLEARING AND GRABBING

286. Poor works on clearing and grabbing in the project site will create huge fugitive dust emission and cutting of trees and vegetation within the Row and its adjacent agricultural areas. As a results fertile top soils at upper layer of soil 5-6 inches or 13-25 cm will be removed, which has usually highest concentration of organic soil and microorganisms. The loss of organic matter can alter the soil's physical properties, especially soil density. Higher clay content at the surface can reduce infiltration of topsoil reducing soil recharge, thus reducing water availability to the plants.

Mitigation Measures

- ▶ Clearing and grabbing shall be restricted to the working area within the toe line.
- ▶ Further activities need to be planned/ started immediately to prevent fugitive dust emission and soil erosion during monsoon.
- ▶ Top (15cm) soil shall be preserved to redevelop the areas as per the requirement.
- ▶ Revegetation/turfing shall be started immediately after completion of the work.

7.4.8 BORROW AREAS

287. Huge borrow areas may be utilized during construction stage if construction of proposed embankment due to widened road within the RoW and realignments in green field areas, offices, worker's camps, stockyards, etc. The change in land use will insignificant since widening and improvement is mostly within available RoW except in the realignment sections, whereas, the degradation of landscaping will occur. The fertile soil will be removed from the agricultural cultivated lands and owners of borrow pits area will be affected due to lose of their produces. In addition, dust will be generated if dug will done at shallow level. Erosion will be occurred, which is risk to the nearby habitation, trees and other vegetation.

Mitigation Measures

- ▶ Only identified and approved borrow areas shall be used by the contractor
- ▶ Borrowing of earth from the cultivable land shall not be allowed.
- ▶ When borrowing earth from the cultivable lands, the depth of borrow earth shall not be more 45cm.
- ▶ The top 15cm soil shall be removed and store separately. Thereafter excavation shall not exceed 30cm and topsoil shall be spread over the land.
- ▶ Borrow areas shall be dug at least 800m away from the habitation. If unavoidable, the depth should not be more than 30cm and should be properly drained.
- ▶ Borrow pits shall not be dug continuously but will dig according to the necessity of the construction work.
- ▶ The borrowing of earth shall be used only after having an agreement between the contractor and land parcel owner and must include the photographs of original land.
- ▶ Haulage of borrow materials will be maintained dust free by sprinkling of water.
- ▶ The borrow areas shall be 500m away from the toe line of the road.
- ▶ If trees are there, it should be protected by providing slopes in 1:2 around them while borrowing the earth.
- ▶ Side slopes of 1:4 shall be maintained in the borrow areas.
- ▶ A redevelopment plan shall also be prepared and agreed by the land parcel owner and approved by the CSC.
- ▶ To reduce the earth requirement, about 40% of the scarified material will be reutilized in the subbase material

7.4.9 LOSS OF TOPSOIL

288. Clearing top soil in proposed road embankment area can lead to loss of nutrient and erosion particularly cut slopes. The proposed height of road embankment generally at 2-6 m will be main subjects to soft soil treatment and slope stability. Fill materials suitable for embankment fill will be obtained from locally available river sand instead use of top soil from agricultural land. The erosion risk at embankment slopes is possible. Gully erosion along the exposed track slope during rainy season may damage smother field crops in adjacent areas. It is assumed that sand will be used for embankment filling.

Mitigation Measures

- ▶ The topsoil (15cm) shall be removed and preserved for reuse for redevelopment purpose.
- ▶ Topsoil shall be preserved outside drainage lines and protect stockpiles from erosion by provision of silt fencing and diversion channels.
- ▶ Use stripped topsoil to cover all disturbed areas and along the proposed tree plantation sites.
- ▶ Limit equipment and vehicular movements to within the approved construction zone.
- ▶ Topsoil shall be distributed free to local people who need it for their own purpose.
- ▶ The residuals shall be reused to form the ground around the interchanges, the areas along the road within the acquired land, or
- ▶ Recover the vegetation in some affected areas due to the road project.
- ▶ The material stockpile sites shall be at 500m away from surface water bodies and areas prone to surface run-off.
- ▶ Loose materials shall be bagged and covered.

- ▶ Open ditch shall be built around the stockpile sites to intercept wastewater. If necessary, retarding basins shall be constructed to remove sands and other solids in storm water before it reaches the downstream rivers.
- ▶ Open stockpiles of construction materials (e.g., aggregates, sand and fill material) of more than 50 m³ shall be covered with tarpaulin or similar fabric during rainstorms.
- ▶ Measures shall be taken to prevent the washing away of construction materials, soil, silt, or debris into any drainage system.
- ▶ At the start of site establishment, perimeter cut-off drains to direct off-site water around the site shall be constructed and internal temporary drainage works, and erosion and sediment control facilities shall be implemented

7.4.10 SOIL EROSION

289. Slopes of the project roads are relatively unstable as the embankments of the roads are proposed to raise compared to the adjacent lands. Depending on the soil types or composition of soil structure different techniques will be applied for slope stabilization in the different part of the project road. Details stabilization techniques for various soils will be prepared by the contractor as following ESMP. Soil erosion may take place near cutting areas, at steep and un-compacted embankment slope, bridge locations and wherever vegetation is cleared. Slopes of the project roads are relatively unstable as the embankments of the roads are proposed to raise compared to the adjacent lands. Soil erosion may take place near cutting areas, at steep and un-compacted embankment slope, bridge locations and wherever vegetation is cleared. Soil erosion may have cumulative effect like siltation, embankment damage, bridge pier damage, drainage problem etc. Loss of soil due to runoff from earth stockpiles may also lead to siltation. Gully erosion along the exposed track slope during rainy season may damage mother field crops in adjacent areas.

Mitigation Measures

- ▶ The Contractor shall reuse the excavated soil as much as possible unless the soil is considered not suitable for filling.
- ▶ The Contractor shall plan his works to minimize surface excavation works during the rainy season where practicable
- ▶ Immediately after completion of work on bridges or high embankments, the slope stabilization measures such as turfing etc. shall be done.
- ▶ Excavation or similar activities will not be undertaken during the monsoon period.
- ▶ Construction and demolition waste shall not be stored near the bridge construction sites; it shall be disposed to approved landfill sites.
- ▶ Ground clearance area shall be minimum
- ▶ Approach road shall be provided in construction facilities to reduce soil erosion.
- ▶ All exposed earth areas shall be completed and revegetated as soon as possible after earthworks have been completed.
- ▶ If excavation of soil is unavoidable during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces shall be protected by temporary drainage measures.
- ▶ Working area shall be clearly marked to restrain the activity within the demarcation area only.
- ▶ Ensure that dredge materials do not contain heavy metals exceeding the international standards by testing prior to using.

7.4.11 SOIL QUALITY

290. Soil of the haulage roads and construction camp area may be compacted due to movement of construction vehicles, machineries and equipment, and due to siting of construction camps and workshops. Soil may get contaminated due to inappropriate disposal of liquid waste, like lubricant and fuel spills; washing effluent from vehicles and equipment) and solid waste (fuel filters, oily rags) likely to be generated from repair and maintenance of transport vehicles, construction equipment and machinery. Soil may also get contaminated due to inappropriate disposal of domestic solid waste and sewage from construction camps.

291. In addition, subsoil contamination may also be attributed to scarified bitumen wastes, operation of the emulsion sprayer and laying of hot mix, storage and stockyards of bitumen and emulsion, excess production of hot mix and rejected materials.

Mitigation Measures

- ▶ Fuel or other petroleum product shall be stored on the impervious platform.
- ▶ The movement of construction vehicles, machinery and equipment shall be restricted to the corridor or identified route.
- ▶ Soil contamination by bitumen, fuel and chemical storages shall be stored them on an impervious base
- ▶ Any spillage of hazardous material shall be removed and disposed to identified and approved sites.
- ▶ Soil quality monitoring shall be undertaken as per ESMP

7.4.12 AIR POLLUTION

292. Dust emission is one the issues in the construction phase of a road project. The dust emission/ air pollutant emissions due to movement of construction vehicles/plants during construction and the gaseous air pollutant emission from vehicular exhaust during operation phase will have impact on the existing air quality within the project area. The air quality of the area will be affected due to the transport of materials, quarry/borrow operations, movement of vehicles on haul roads/construction yards and fugitive emissions from the construction sites/plant sites. Construction activities that contribute to air pollution include land clearing, operation of diesel engines, demolition, loading and unloading of construction materials, movement of material transporting vehicles, and operation of hot mix plant. construction sites generate dust emission. Construction dust is classified as PM10 - particulate matter less than 10 microns in diameter. The construction phase impacts have been worked due to vehicle movement and operation of hot mix plant using mathematical equations in the following sub sections.

7.4.12.1 AIR POLLUTION FROM OPERATION OF HOT MIX PLNTS/ BATCHING PLANTS CRUSHER

Pollution from Hot Mix Plant Operations

293. The following assumptions have been made to work out the emission of air pollutants from Hot Mix Plant (HMP). Emissions rates of air pollutants from hot mix plant stack are as follows:

- ▶ PM10 emissions = 0.09 g/sec, (EPA, AP-42 methodology)
- ▶ CO Emissions= 3.8 g/sec (EPA, AP-42 methodology)
- ▶ NOx Emissions = 1.11 g/sec (EPA, AP-42 methodology)
- ▶ SO2 Emissions =0.008 g/sec (on IS Specifications)
- ▶ VOC Emissions = 0.00059 kg/sec = 0.59 g/sec (EPA, AP-42 methodology)

The following assumptions has been made to work out the pollution emission:

- ▶ Capacity of HMP =75 tph (assumed)
- ▶ Bulk density of hot mix (Ref workbook) =2.19 tones/m³
- ▶ Max duration of operation= 12 hrs.
- ▶ Height of Stack = 10m
- ▶ Efficiency of bag house filters/wet scrubbers= 99.5%
- ▶ Exit gas velocity= 15 m/sec²⁰
- ▶ HMP Stack diameter=1.2 m
- ▶ S in Furnace oil=50 mg/kg [Source: IS:1460-2005-Bharat Stage (IV)]
- ▶ Consumption of fuel oil (as per manufacturer literature) @350 liters per hour

²⁰ Technical Support Document for The Asphalt Plant (Portable and Stationary) General Order, Department of Ecology, State of Washington, 2011

294. Using the above data and Screen 3 model of Lakes environment was employed to determine the maximum concentration will be at distance of 300m - 450m from the HMP. Thus, a safe distance of 500m away in downwind of from the residential areas has been recommended for establishing the HMP.

Mitigation Measures

- ▶ Construction phase environmental impacts on air pollution will be short term and localized. It can be mitigated by adopting the following mitigation measures.
- ▶ HMP shall be installed on the downwind direction at 1500m away from the environmental/ecologically sensitive areas.
- ▶ HMP shall be installed at least 500m away from the nearest residential areas on the downwind side of prevalent wind direction.
- ▶ Low emission construction equipment, vehicles and generator sets shall be used at site.
- ▶ Transportation vehicles shall be covered by tarpaulin, if required.
- ▶ Pollution control monitoring of construction vehicles shall be carried out and fit certification must be valid for all equipment and vehicles.
- ▶ With adoption of regular sprinkling of water on the unpaved surfaces as well as covering the raw material and hot mix laden trucks with tarpaulin, the fugitive particulate generation can be brought down by about 70%.
- ▶ Adequate dust suppression measures such as regular water sprinkling on unpaved haul roads, borrow area vulnerable areas of the construction sites. Special attention during summer season shall be considered.
- ▶ The air pollution will also be greatly reduced by erecting wind screens of galvanized iron sheets cordoning off the construction sites to a height of about 5 meters from ground surface.
- ▶ Wind shields shall be provided around the periphery of the HMP area to a height of 5m to reduce the impact of fugitive dust emissions.
- ▶ HMP shall be fitted with pollution control devices (Wet Scrubber for stack emission)
- ▶ Wind shields shall be provided around the wet mix macadam (WMM) plant, stock yard and batching plants to prevent fugitive dust emissions.
- ▶ The stack height of HMP plant shall not be less 10m.
- ▶ Diesel generator shall be provided with proper stack height as per Department of Environment requirement.
- ▶ Ambient Air Quality Monitoring shall be carried out as per the Environmental Monitoring Program suggested in in the ESMP.

Mitigation Measures

- ▶ The stack height of the Hot Mix Plant shall be at least 10m from the ground.
- ▶ Regular maintenance of construction vehicles and equipment/plants shall be undertaken.
- ▶ The construction vehicles/machinery/equipment shall use only designated routes.
- ▶ DG sets shall be complied with the requirement of department of environment.
- ▶ Low emission construction equipment, vehicles and generator sets shall be used at site.
- ▶ The stack height of the Hot Mix Plant shall be at least 30m from the ground.
- ▶ Regular maintenance of construction equipment/plants shall be undertaken.
- ▶ The construction machinery/equipment shall use only designated sites.

7.4.12.2 MOVEMENT OF CONSTRUCTION VEHICLES (AIR POLLUTION)

a. Impact due to Vehicle Movement

295. The impact on air environment due to movement of hot mix laden trucks, raw materials such as cement, steel, fine and coarse aggregates, bitumen, and earth/over burden soil carrying trucks and tippers. It further depends on various factors like haulage capacity, condition of haul roads, dust suppression measures adopted and duration of operation & maintenance of vehicles and content of silt and fine dust on the unpaved and barren surfaces.

296. To work out dust emission, the road surface is assumed to be unpaved. The fugitive particulate generation due to vehicular wheels will be totally uncontrolled without adopting control measures on the unpaved haul roads.

b. Movement of Construction Vehicles for transportation of construction materials

297. The following assumptions have been made to work out emissions due to haulage of materials (wheel-based fugitive dust) on unpaved roads.

- ▶ Length of road for influence of fugitive dust = 20 km (10 +10)
- ▶ Total number of trucks in operation = 50 trucks per day
- ▶ Cumulative distance travelled by the trucks:1000km (Assumed about 20km in a day)

298. Emission Factor to be worked out using the following formula as per EPA, AP-42²¹

$$E = \frac{K \times \left(\frac{S}{12}\right)^A \times \left(\frac{W}{3}\right)^B}{\left(\frac{M}{0.2}\right)^C}$$

299. E= emission factor, lb/VMT (pounds per vehicle mile traveled); k=empirical constant 2.6 lbs/VMT for PM =10µm; A, B, C are empirical constants respectively 0.8, 0.40, 0.3²¹, S=Silt=5%, W=weight of vehicle=20 tonnes, M=moisture=0.75%

300. Based on the above, emission factor from the movement of construction vehicles on the unpaved roads has been worked to be 0.713 lb/vmt which is equal to 201.04 g/vkt. Fugitive dust generation = 201.04 x1000 =201040 g per day =2.33 g/sec. It is further assumed that the maximum 10 number of construction vehicles in an hour will move over the unpaved haul roads. The particulate matter concentration from the movement of construction vehicles on the unpaved haul roads have been worked using Cal3QHC of CalRoads view of Lakes Environment which is given in Table 7-8.

Table 7-8: PM10 Concentration due to movement of Construction Vehicles on Haul Roads		
Sl. No	Distance from haul road in (m)	Increment Concentration (µg/m3)
1.	50	123.8
2.	100	73.5
3.	200	40.5
4.	300	28.1

301. Highest incremental concentration of 123.4 µg/m³ is near the road at 50m whereas it is getting reduced and at 300m the incremental concentration is 28.1 µg/m³. Thus, it is suggested that sprinkling of water shall be routinely carried out on haul roads to keep the incremental concentration low.

Mitigation Measures

- ▶ Water sprinkling using sprays shall be done on the unmetallic haul roads.
- ▶ Water sprinkling shall also be carried out on the construction sites where the earthwork is unattended for four (4) day especially in summer season.
- ▶ Construction vehicles/equipment shall comply with national standards.
- ▶ Routine maintenance of pollution to control the emission.
- ▶ Low emission construction equipment, vehicles and generator sets shall be used at site.
- ▶ Only those construction vehicles shall be used which have valid fitness certificate.
- ▶ Only those construction vehicles shall be used which have valid fitness certificate.
- ▶ Vehicles transporting construction material shall be covered by tarpaulin.
- ▶ Speed of construction vehicles will be identified in contractors ESMP which will be approved the CSC.
- ▶ Vehicles transporting construction material shall be covered by tarpaulin.

²¹ AP-42, CH 13.2.2: Unpaved Roads (epa.gov)

- Speed of construction vehicles will be identified in contractors ESMP which will be approved the CSC.

7.4.13 NOISE ENVIRONMENT

302. Noise associated with construction phase are discussed in the following subsections.

Construction Camps/Yards/Construction Site

303. Operation of equipment/machinery or other activities such as piling, excavation etc. at construction site/camp will be the main source of increased sound levels in and around the area. The noise levels from the construction equipment depends on different factors such as type of equipment, condition of equipment, the operation which are undertaken at site, duration of the operation of equipment and specific model of the equipment²². The equivalent sound level (L_{eq}) of the construction activity also depends on the fraction of time that the equipment is operated over the time of construction²². Diesel engines are the main source of noise from the equipment when used without protection. The construction equipment is expected to produce noise levels in the range of 74 - 101 dB (A) at construction site, as presented in Table 7-9.

Table 7-9: Typical Noise from Construction Equipment

Equipment	Typical Noise Level (dBA) 50 ft from Source	Equipment	Typical Noise Level (dBA) 50 ft from Source
Air Compressor	81	Pile-driver (Impact)	101
Backhoe	80	Pile-driver (Sonic)	96
Ballast Equalizer	82	Pneumatic Tool	85
Ballast Tamper	83	Pump	76
Compactor	82	Rail Saw	90
Concrete Mixer	85	Rock Drill	98
Concrete Pump	82	Roller	74
Concrete Vibrator	76	Saw	76
Crane, Derrick	88	Scarifier	83
Crane, Mobile	83	Scraper	89
Dozer	85	Shovel	82
Generator	81	Spike Driver	77
Grader	85	Tie Cutter	84
Impact Wrench	85	Tie Handler	80
Jack Hammer	88	Tie Insertter	85
Loader	85	Truck	88
Paver	89		

304. With point source of a strength of 95 dB (A) at a reference distance of 2m, the noise produced will not exceed 45 dB (A) beyond 250 m from the boundary of construction yard (the drop off rate will be 6 dB (A) for doubling the receptor distance from a point source).

Mitigation Measures

305. The following mitigation measures shall be adopted to reduce the intensity of impacts.

- Construction camp/yard shall be located away at least 500m from the inhabitant/sensitive areas.
- Silencers and mufflers shall be fitted and regularly maintained on construction equipment.
- Servicing of all construction vehicles and machinery/plants shall be done regularly and during routine servicing operations, the effectiveness of exhaust silencers needs to be checked and if found defective shall be replaced.

²² Transit Noise and Vibration Impact Assessment, FTA

- ▶ Well maintained vehicles and machineries/equipment shall be deployed at site.
- ▶ Work shall be scheduled in such a way that high noise levels generating activities shall not be done simultaneously, and such activities shall be restricted to daytime only.
- ▶ Use of low noise generating equipment or construction vehicles near the sensitive receptors such as health centers/schools etc.
- ▶ Contractor shall hold meetings with neighborhood champions/locals/school or college management before start of high noise generating activities for example piling etc.
- ▶ Truck loading, unloading, and hauling operations shall be so scheduled as to minimize noise impact near sensitive locations and neighborhood communities.
- ▶ Placards shall be displayed near high noise areas.
- ▶ Earmuffs/Earplugs shall be made mandatory for workers working in high noise areas
- ▶ Construction equipment and vehicles shall be maintained regularly.
- ▶ 'No honking' board shall be placed near sensitive receptors
- ▶ Noise quality monitoring as suggested in Environmental Monitoring Plan as ESMP.
- ▶ The Contractor shall abide by the provisions of the Specifications of Contract regarding environmental protection and DoE regulations (≤ 60 dB levels at mosque, school, populated area and other sensitive sites).
- ▶ Noise generating equipment/plants shall be provided with dampeners.
- ▶ No noisy construction activities will be permitted around educational institutions/health centers (silence zones) up to 100 m distance from the sensitive receptors
- ▶ Diesel Generating must be enclosed with soundproof acoustic enclosures to meet the Noise standards.
- ▶ Construction vehicles/equipment must be fitted with silencers
- ▶ Routine maintenance of equipment and construction vehicles shall be carried out.
- ▶ Low noise generating equipment/construction vehicles shall be used.
- ▶ Noise monitoring shall be undertaken as per the Environmental Monitoring Program
- ▶ Workers working in the noisy areas shall be provided with the PPEs and shall wear earplugs
- ▶ No workers shall be allowed to work near equipment generating more than 90 dB (A) noise for more than 8 hrs.
- ▶ Contractors' facilities will be sited away from the residential areas/sensitive receptors as mentioned above.
- ▶ Near the sensitive receptors such as schools/mosques/hospitals noise generating activities shall be carried out after consultation with the management committee or low noise generating equipment shall be used only.
- ▶ In residential areas, hospitals etc. noise generating activities shall be prohibited and work shall be scheduled in consultation with neighborhood champions.
- ▶ Reducing construction vehicles through the residential area in consultation with the local champions
- ▶ Vegetative noise barriers in the sensitive receptor
- ▶ Any issue shall be resolved through grievance redressal mechanism (GRM) developed by the contractor.

7.4.14 BIO-DIVERSITY AND LIVING NATURAL RESOURCES (ESS 6)

7.4.14.1 TERRESTRIAL FLORA

306. The proposed activities in the road will cause removal of roadside vegetation and felling of Contract 1, 5853 Contract 2, 5270 and Contract 3, 2885 of roadside trees and private trees in Contract 1, 20953, Contract 2, 10199 and Contract 3, 3116 including the complete destruction of herbs, shrubs, climbers and aquatic plants of the project area. As there is no record of rare, endangered and threatened species in the project area.

307. However, the impact of such ecological disturbance will be less severe considering enough trees in other areas just out of the site. The potential impacts are loss of avenue trees felling along the existing project alignment, temporary loss of feeding, nesting and resting site of wildlife. In addition. The land filling loss of ground flora, homestead shifting loss of homestead flora, labor gathering, pressure on fire wood from local flora, local plant species loss, Reduce the aesthetic values of habitats/ecosystems. Pollution in both water and terrestrial environment, aquatic ecosystem will be hampered, river training will eliminate riverbank flora.

Mitigation Measures

- ▶ About 40% of the trees will be planted by the RHD through contractor and 60% of the trees will be by the forest department under social forestry.
- ▶ Trees shall be planted in the available space in between as per CSC directions.
- ▶ Compensation shall be provided to the owners of those trees.
- ▶ Free distribution of seedlings/saplings shall be done among the re-settlers according to RAP.
- ▶ A number of nurseries shall be developed along the road containing local timber, fruits, medicinal and ornamental species.
- ▶ Limit the construction works within the designated sites allocated to the contractors.
- ▶ No illegal tree felling shall be allowed at construction site/borrow areas/construction camps/ labor camps. (Refer to B-8 and B-9 above)
- ▶ The construction activity shall be restricted to only identified areas.
- ▶ Hot mix plant/construction camps/labor camp/stockyards shall be located away at safe distance (500m away from the water bodies)
- ▶ Awareness program shall be undertaken to make people understand the value of different plants and also about tree plantation.
- ▶ Some small gardens can be established along the project if space is available.
- ▶ Provide alternate to fire wood
- ▶ No untreated waste shall be allowed to discharge into the water bodies.
- ▶ Construction camps/labor camps etc. shall have proper drainage system
- ▶ Plants management program should be undertaken, awareness program can be created among the local stakeholders to care plants and increase plantation programs
- ▶ Nursery can be developed using native plants under plantation program
- ▶ Purification of all hazards before discharging, Compensation plantation should be done apart from the river training area, gardens can be established in both construction and dumping yards

7.4.14.2 AQUATIC FLORA

308. Filling of the seasonal wetlands, ponds and ditches along the roadside, bridge construction, piling, river bank training etc. will have some impacts on the aquatic flora. The potential impacts will be common aquatic vegetation will be removed and Water will be polluted due to project activities. Flow can be damaged, pollution may occur, sound and vibration will be produced. The production by primary producers may be hampered due to pollution.

Mitigation Measures

- ▶ If possible, rare aquatic flora shall be relocated in nearest wetlands.
- ▶ Enhancement plantation of aquatic species such as Shada Shapla, Lal Shapla, Padma, Panifol, Panikola shall be done in nearest suitable wetlands.
- ▶ Creation of artificial water bodies, if space is available. The aquatic species can be relocated there.
- ▶ Both solid and liquid pollutants shall be purified before discharging in the aquatic habitat.
- ▶ Invasive Alien Species (IAS) such as water hyacinth shall be destroyed completely.
- ▶ Without treatment, no pollutants shall be discharged in water.
- ▶ No blockage to the flow shall be created.
- ▶ Solid and liquid debris shall not be discharged in the water.
- ▶ Muddy water formed during piling shall be assigned to a designated place instead of flowing it to the river water directly.

7.4.14.3 TERRESTRIAL FAUNA/ WILDLIFE

309. Wildlife sanctuary, National Park, pristine habitats, natural wetlands with luxurious growth of aquatic vegetation, bats colonies, nesting bush etc. had not observed along the project corridor. Apart from this one

natural wetland (Moshihatir Baor) and one large banyan tree were found east side of road corridor 5-8 km away from the main road.

310. In case of fauna, some IUCN concerned species were mentioned in the district literature. But practically, the survey team didn't observe any such species along the roadside. Though occasionally, these species come to the road side, the road side is not their permanent habitat. So, ultimately these faunal species will not stay in the project site, rather they will return to their original habitats (may be Majdiya Baor, Marjat Baor) which are out of the impact zone of the project. So, the construction of the new road will not cause any harm to them, significantly. However, some impacts are anticipated during the temporary or long-term Project camp and construction yard preparation for the workforce, site clearance. The potential impacts include losing original habitat, wildlife can search for new habitat, disturbances to the wildlife (hunting, catching, torturing etc.) by the road constructors and laborers, losing original habitat, disturbance of migratory birds, etc.

Mitigation Measures

- ▶ The sites shall be well bordered, protected and well-lit to prevent the entry of wild fauna.
- ▶ No one shall be allowed to keep pet to avoid attracting prey animals.
- ▶ No killing and torturing of wildlife animals by the road constructors.
- ▶ No disturbance should be caused to them while passing through the road.
- ▶ Workers shall remain calm and quiet, should silently pass them in case of their sighting.
- ▶ Strict guideline regarding the treatment of the wildlife by the authority should be made.
- ▶ Hunting, trapping, poaching shall be strictly prohibited during constructed works.
- ▶ Nearby Wildlife Office of Forest Department shall be informed in case of rescuing any wildlife.
- ▶ Awareness program shall be undertaken to sensitize the workers and other relevant stakeholders to make them aware about the importance of wildlife such as birds, mammals, amphibians etc. animals. Poster and signs using animal image shall be hanged along the road alignments to make people conscious.

7.4.14.4 AQUATIC FAUNA/WILDLIFE / FISHES

311. Construction work and construction of protection wall along the river bank for bridge/ culvert construction will cause adverse impacts on the aquatic biology. About 30 ponds will be partially and/or fully affected as shown in Table 7-10.

312. The potential impacts on the aquatic fauna include due to erosion due to construction at pond sites, construction of protection wall along the river banks, catchment of fishes by the road workers and disturbance of local fishermen, dumping of wastes in the water bodies, like river site or canals or any aquatic body, vibration and noise will be produced during piling activities, river training and construction of embankment, potential disturbances to the wildlife (hunting, catching, torturing etc.) by the road constructors and laborers

Table 7-10: Affected Ponds within Project Area

Contract No	Affected Water bodies located within RoW					
	No. of Ponds	Area (ha)	Cultured Ponds	Area (ha)	Ditches	Area (ha)
1	14	1.939	2	0.501	10	1.03
2	12	0.935	7	0.381	3	0.331
3	4	0.181	5	0.588		
Total	30	3.054834	14	1.47	13	1.361

Mitigation Measures

- ▶ Erosion and siltation must be prevented
- ▶ The flow of water through the river / canal shouldn't be blocked completely
- ▶ Catchment of fishes should be prohibited at construction site.
- ▶ If possible, fish species should be preserved alive in the ponds
- ▶ Strict guidelines must be maintained and no such dumping should be done in both seasonal and perennial aquatic habitats
- ▶ To reduce vibration and sound pollution, mufflers shall be used with the instruments.

- ▶ The flow of water through the river shouldn't be blocked completely.
- ▶ All the holes along the banks of the rivers should be checked and safe passage and exits of the fishes and other aquatic animals from the holes shall be ensured.
- ▶ The construction wastes shall be discharged only after being treated.
- ▶ Strict guidelines must be maintained and no such dumping should be done in both seasonal and perennial aquatic habitats.
- ▶ To enhance fish population, alternative water bodies can be created.
- ▶ Strict guidelines must be followed while dumping garbage and wastes, the areas for such work should be designated in less impactful areas

7.5 SOCIOECONOMIC ENVIRONMENT

7.5.1 COMMUNITY HEALTH AND SAFETY

313. The risks and adverse impacts on the community's health and safety are expected during construction activities like excavation, earth working, dismantling the existing structures, pavement works, sitting of construction camps/labor camps, water logging, accidents, etc. at residential and commercial areas alongside the project roads.

Mitigation Measures

- ▶ For community health and safety, the contractor shall plan activities in residential areas after having discussion with the community.
- ▶ Local shall be kept informed about the activities which the contractor is taking up in their areas.
- ▶ Excavated areas shall be properly barricaded.
- ▶ Trespassing of construction sites/construction camps/labor camps shall be prohibited.
- ▶ Occupational Health and Safety Plan as well as Community Health and Safety (CHS) Plan
- ▶ The prevention and management of HIV/AIDS and other STIs as suggested below in B-22.
- ▶ Contractor shall take all precautionary measures to prevent community exposure to water-borne, water based, water-related, and vector-borne diseases, and communicable and non-communicable diseases that could result from project activities.
- ▶ Water logging shall not be allowed at construction site and minimize areas of standing water by providing effective drainage in construction areas to prevent vector borne disease such as malaria etc.
- ▶ Trained drivers having valid license shall be allowed to drive construction vehicles/heavy equipment.
- ▶ Speed of the construction vehicles/equipment shall be defined by the contractor in the contractors' ESMP.
- ▶ Vehicles/construction equipment need to be maintained and inspected/tested regularly,
- ▶ Drivers must have appropriate government licensing or certification and be provided with proper training.
- ▶ Last but not the least regular consultation with the community to know the effectiveness of implementation of mitigation measures at construction sites/camps

7.5.2 INFLUX OF LABOR

314. It is expected that around 200-250 skilled/non-skilled labor during the peak period will be engaged, mostly local will be encouraged to engaged in the project. There are certain social and environmental impacts due to influx of outside population/workforce at the project site such as, social conflicts, illicit behavior and crime, influx of additional population, communicable diseases, inflation of prices, pressure on accommodation and rents, unhygienic conditions, waste discharge etc. It has already been mentioned in public consultations that on matters and issues related to the anticipated project impacts on Sexual Exploitation and Abuse (SEA)/Sexual Harassment (SH) and Gender Based Violence (GBV), Labor Health and Safety; Occupation Health and Safety, are grave concern due to influx of labor. There would be impacts on local economy like, increase of rented house/accommodation, significant increase in demand for goods and services due to labor influx may lead to local price hikes and/or crowding out of community consumers

Mitigation Measures

- ▶ Trespassing to the contractors' facilities/construction camp/labor camps will be strictly prohibited.
- ▶ Contractor camps/construction camps/facilities will be located 500m away from residential areas.
- ▶ Any issue shall be resolved through grievance redressal mechanism (GRM) developed by the contractor.
- ▶ Contractor shall be encouraged to recruit local skilled/unskilled workers.
- ▶ Requirement of implementation of GBV Action Plan as ample presented in Annex 7-1 and Labor Management Procedure in Section 8.
- ▶ Install generator for power supply for meeting the emergency power requirement;
- ▶ Contractor will arrange either canteen facilities or gas for cooking to prevent illicit cutting of the trees;
- ▶ Arrange purchase of commodity from district level market or set up special shops for labor;
- ▶ Contractor will prepare a labor management plan in C-ESMP as per updated ESMP of the ESIA.

7.5.3 CHILD LABOR

315. The contractor should follow the code of conduct or term of reference for hiring or recruiting the workforce into the project. In keeping with internationally recognized standards, the project will make a distinction between child labor and young worker. The project will not tolerate child labor under any circumstances. The employment of young workers, i.e., minors aged from full 15 years to under 18 years who have reached the minimum age of employment and completed compulsory schooling, will be allowed under strict conditions and in compliance with requirements of internationally recognized standards and local relevant laws and regulations. The risk of child labor will be mitigated through Certification of laborers and will be confirmed by using the legally recognized documents such as the National Identification Card, and Birth Certificate.

Mitigation Measures

- ▶ Bangladesh labor Act 2006 section 34 prohibits the engagement of the child labor in any of activity of project.
- ▶ According to Section 44, any one below 14 years is considered as child & between 14 and 18 age is considered as adolescent.
- ▶ It is recommended that persons below 16 years of age shall not be employed in any type of work and shall be encouraged to go to schools.
- ▶ Between 16- and 18-year of age persons can be employed for lighter works/office works for 6 hours only with prior approvals.
- ▶ Company policy on the labor engagement rules shall be displayed at prominent locations such as contractor camps/labor camps/contractor office etc.
- ▶ Between 16- and 18-year of age persons shall not be deployed at any hazardous works such as painting/or other construction activity.
- ▶ To ensure the age, contractor must refer to Certification of laborers' age/National Identification Card/Birth Certificate etc.

7.5.1 PUBLIC SAFETY AND ACCESS

316. Temporary access and diversion, with proper drainage facilities

Mitigation Measures

- ▶ The contractor shall provide adequate warning signboards in local and English language.
- ▶ Flagmen shall be deployed to control the traffic during tree felling or removal/erection of electric poles.
- ▶ Local shall be kept informed about the activities which the contractor is taking up in the residential areas.
- ▶ Contractor shall provide temporary access to the local/religious place/schools/nursing home in consultation with the local champions.
- ▶ Excavated areas shall be properly barricaded.
- ▶ Tress passing of construction site shall be prohibited.
- ▶ Traffic management plan shall be prepared as per the activity schedules which will be approved CSC/RHD.

- ▶ Trained drivers having valid license shall be allowed to drive construction vehicles/heavy equipment.
- ▶ Speed of the construction vehicles/equipment shall be defined by the contractor in the contractors' ESMP.
- ▶ Grievance redressal mechanism shall be adopted, which need to be approved by the CSC, at site to address the issue at site.

7.5.2 HIV AND STD²³

317. Due to influx of workers in the Project area, AIDS/HIV may spread in local community. Different type of diseases related to communicable diseases needs to be controlled.

Mitigation Measures

- ▶ Awareness campaigns on HIV/AIDS/STD
- ▶ HIV/STD voluntary counselling, testing, and treatment.
- ▶ Ensuring that construction workers have access to condoms
- ▶ Provision of vending machines at identified location
- ▶ Monitoring of outcomes, in collaboration with National HIV/AIDS Authorities

7.5.3 LABOR MANAGEMENT

318. GRM with GRCs related to (i) Labor Health and Safety will facilitate smooth labor management through redressing any complaint/grievance raised by laborers/against any laborer, (ii) Gender Based Violence (GBV) related grievances will be redressed by GRC related to Sexual Exploitation and Abuse/Sexual Harassment (SH). Roles and functions of these GRC are presented in section 7.6.1 in this ESIA.

Mitigation Measures

- ▶ Contractor shall follow the national legislation
- ▶ Labor License from the Department of Inspection and Factories Establishment (DIFE) under MoLE shall be obtained by the contractor.
- ▶ Condition stipulated therein the license shall be followed by the contractor on labor management, workplace safety and health, and protection.
- ▶ Pooled transportation facilities as may be required, shall be provided by contractor.
- ▶ Contractors' company policy on prohibition of Child Labor shall be displayed at the construction camps/labor camps etc.
- ▶ All basic facilities like water supply, cooking gas facility, sanitation facilities including provision of mobile toilet (of adequate capacity for men and women separately) shall be provided within the labor camp.
- ▶ Crèche for female works to be made.
- ▶ Compensation, leave, working schedules etc. for different types of workers will be ensured following the Bangladesh Labor Rules 2015 and other related laws.
- ▶ A specific chapter (Chapter 8) of this ESIA has been induced on Labor Management Procedures (LMP) to clarify every aspect on the labor management and their facilities.

7.5.4 OCCUPATIONAL HEALTH AND SAFETY ASPECTS

319. Without Occupational Health and Safety (OHS) procedures, workers are in risk of temporary and sometimes permanent physical injury such as hearing and sight loss, a damage to limbs, etc. Due to continuous exposure to activities like lifting of heavy tools and tackles, construction equipment; cabling of electrical wires, the workers may suffer from various physical problems, stresses and risks, such as carpal tunnel syndrome, tendonitis, back pain, muscle soreness and nerve damage, chest pains, etc. These risks could create long-terms impacts for the health and safety of the construction workforce.

²³ FIDIC | HIV-AIDS in the Construction Sector | International Federation of Consulting Engineers

320. Lack of safety training by contractor can lead to accidents and lost productivity. Construction workers needs training on general health and safety matters and on specific hazards of their work.

7.5.4.1 PERSONAL SAFETY

- ▶ Safe work systems and administrative or institutional control measures shall be followed by the contractor.
- ▶ Measures such as job rotation, training safe work procedures, lock-out and tag-out, workplace monitoring, limiting exposure or work duration, etc. shall be adopted.
- ▶ No employee shall be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection.
- ▶ In addition, no unprotected ear shall be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C). Workers working in noisy area shall be provided earmuffs
- ▶ Exhaust ventilation, isolation rooms, machine guarding, acoustic insulating, etc. shall be provided as per the direction of CSC.
- ▶ The Contractor shall always take all reasonable precautions to maintain the health and safety of the contractor's personnel
- ▶ In collaboration with local health authorities, the contractor shall ensure that medical staff, first aid facilities and ambulance service are always available at the site.
- ▶ Protective footwear such as safety boots/gumboots, helmets and protective goggles shall be used by the workers.
- ▶ Welders shall use protective eye-shields or safety goggles, all electric wire must have proper insulation
- ▶ Lifesaving jacket shall be used by the workers and flagmen.
- ▶ Fall prevention and protection measures shall be implemented for the worker working at more than 2m height.
- ▶ Safety belts shall be provided and used by the workers working at heights (more than 2m) and use of ladders and scaffolds by the trained workers.
- ▶ Necessary lightening having proper illumination shall be provided if required to work site during nighttime.
- ▶ Potable water supplies to the workers, and water supplied to areas of food preparation or for the purpose of personal hygiene (washing or bathing) shall meet drinking water quality standards
- ▶ Induction training to the workers and subsequent training on safety aspects.
- ▶ Trained workers at hot mix plants/batching plant/Wet Mix Macadam (WMM) shall be deployed.
- ▶ Toolbox training to the workers
- ▶ Workers working in the dusty area shall be provided with nose mask.
- ▶ Sufficient fresh air shall be supplied for construction camps/labor rooms and confined workspaces.
- ▶ Construction/labor camps must receive natural light and be supplemented with sufficient artificial illumination, if required.
- ▶ Emergency lightening arrangement of proper illumination shall be installed at identified locations
- ▶ Eating areas such as canteen must be cleaned, and kitchen waste must be collected as per measure suggested above.
- ▶ Hand, knee, and foot railings shall be provided on stairs, fixed ladders, platforms, ramps or loading bays etc.
- ▶ Covers should, if feasible, be installed to protect against falling items.
- ▶ First aid box shall be provided at identified locations.
- ▶ Tie-up with local hospitals shall be maintained and ambulance facility shall be reserved for emergency purpose only.
- ▶ OHS training to all new workers and refresher training to the old workers/drivers shall be arranged by the contractor.
- ▶ Regular health check-up will be undertaken at construction camps/labor camps etc.
- ▶ Visitors such as CSC engineers or employer's official visiting the construction sites/camps shall use the helmets of approved color.
- ▶ Fire extinguishing devices shall be installed at the identified areas.

- ▶ Arrangement with the local firefighting department shall be made.
- ▶ Contractor shall prepare and get approved an emergency response plan and shall provide training to workers accordingly.

7.5.4.2 MEASURES FOR LABOR, MATERIALS HANDLING AND PAINTING ETC.

321. The use of chemicals (e.g., paint, thinner and solvents) in the fabrication and finishing of the Bridge may be carcinogenic, or detrimental in other ways e.g., the use of industrial solvents can cause anemia, liver and kidney damage, cardiovascular diseases and neurological disorder. Benzene, phenols, and carbon tetrachloride are examples of products widely used, but which are also dangerous to health. Other health problems can be caused by inhalation of exhausts gases from vehicles and machinery, which can impact lungs, eyes and skin, etc.

Mitigation Measures

- ▶ The Contractor shall always take all reasonable precautions to maintain the health and safety of the contractor's personnel
- ▶ In collaboration with local health authorities, the contractor shall ensure that medical staff, first aid facilities and ambulance service are always available at the site.
- ▶ Induction training on construction material handling and storing to the workers and subsequent training on safety aspects.
- ▶ Trained workers at hot mix plants/batching plant/Wet Mix Macadam (WMM) shall be deployed.
- ▶ Toolbox training to the workers
- ▶ OHS training to all new workers and refresher training to the old workers/drivers shall be arranged by the contractor.

7.6 GENDER BASED VIOLENCE (GBV)

322. The gender-based violence (GBV) and sexual exploitation and abuse/Sexual Harassment (SH) risks may increase to some extent within local communities when there are large influxes of male workers from outside the area. In addition, the create new risks (outlined in the SEA/SH mitigation plan) with activities under the project which may compound the broader contextual risks present at community level. The gender disparity can be attributed to structural barriers including women's domestic burden, employer discrimination, restricted mobility, limited access to trainings, lack of female friendly facilities at sites, sexual harassment at work, limited childcare provisions. Generally, the female employment tends to be more concentrated in low-paid and low-productivity occupations. Increasing women's labor force participation and improving the quality of female employment will require more significant support for women's access to employment opportunities and high-quality skills development programs.

323. Usually, the outsider workers come without their families and have large disposable incomes relative to the local community, and can pose a risk in terms of sexual harassment, violence and exploitative transactional relationships. The risks will be higher where workers come into close contact with the local community, for example on access routes or when living together in remote areas. During the construction phase, female workers are also vulnerable to various forms of harassment, indiscriminate wage rate exploitation and abuse, aggravated by traditionally-male working environments. Mostly the labor hiring companies do not have proper training on code of conduct and company policy on the GBV free work environment for all workers including skilled and non-skilled workers. Moreover, the contractors have lack of experience in management of GBV issues and there are currently limited awareness raising programs on GBV/SEA/SH in communication sector in Bangladesh.

324. In addition, the gender based violence may be occurred during payment of the compensation money and resettlement benefits of this project due to i) discrimination the sharing of compensated money between man and woman shareholders, (usually brothers are always depriving their sisters from parents property), ii) widow of the PAP sometime will not get actual share of compensation cash and resettlement benefits, iii)

Female HHs may get exploitation and harassment to get compensation by middleman / Brokers during collecting money from DD offices and RHD, etc.

Mitigation Measures

- ▶ Implementation of a GBV-free work environment shall be maintained by the contractor, RHD-PD Office, PIU site offices and concerned safety regulatory organizations.
- ▶ A Gender Based Violence Preventive Plan should be followed as presented in Annex 7-2. The purpose of this action plan is to identify the issues, stakeholders, possible service providers and assess their capacity that aid in accessing Grievance Redressal. The action plan has action, activities, indicators, responsibilities and risk management focus on some corresponding mitigation measures; sensitizing the communities and other stakeholders, strengthening the institutional capacities to mitigate project related potential risk of GBV in the project affected population
- ▶ Gender based discrimination shall be strictly prohibited and monitored.
- ▶ Any type of sexual harassment shall be dealt strictly with as per local law of the country and employee shall be terminated immediately from his duties.
- ▶ Training on code of conduct and company policy on the GBV free work environment shall be organized to all workers including skilled and non-skilled workers.
- ▶ It shall be ensured that above mentioned training has been attended by all including managers/engineer and other workers.
- ▶ Code of Conduct Preventing Gender Based Violence and Violence against Children/female workers shall be signed by the workers/managers/other staff. A sample Labor Code of Conduct (CoC) of the contractor covering the GBV/SEA/SH related risks during construction period is presented in Annex 8-1.
- ▶ Signed copy of the code of conduct shall be documented physically as well as scanned version shall be stored in computer.
- ▶ Company policy on GBV free work environment and code of conduct which was signed by the worker shall be displayed at labor camps/canteen and other contractor facilities.
- ▶ During recruitment process, the RH Specialist of contractor must undertake diligent reference checks of candidates who have a documented history of prohibited conduct are not hired.
- ▶ A Labor Management Procedure (LMP) shall be followed at site as presented in Chapter 8 of this ESIA to control the risks at site.
- ▶ Staff shall be encouraged to report suspected or actual GBV.
- ▶ Grievance redressal mechanism shall be established at site to address the issues immediately for GBV related to getting the compensation money and resettlement benefit
- ▶ During construction period of the J-J road project, it is expected that ESMP will be effectively followed which will ensure keeping/maintaining a low-risk environment for Gender-Based Violence (GBV) affecting community members, workers and service users and any other relevant sections of public.

7.6.1 GRIEVANCE REDRESS MECHANISM (GRM)

325. PIU, RHD will establish two separate Grievance Redress Committees, such as GRCs related to (i) Sexual Exploitation and Abuse/Sexual Harassment (SH) and (ii) Labor Health Safety. Details are presented in the Updated RAP. The GRC of SEA/SH has been presented in the following Table 7-11.

Table 7-11: GRC Members Related to SEA/SH		
Sl. No.	GRC Composition at the Field Level	Members of the GRC
1.	Concern Project Manager (PM), WeCARE: Phase-1	Convener
2.	Resident Engineer of construction supervision consultant	Member
3.	Gander and SEA/SH Specialist in the PIU	Member Secretary
4.	Project Manager of the contractor	Member
5.	Concern Deputy Project Manager, WeCARE: Phase-1	Member

7.6.1.1 THE SCOPE OF WORK AND THE TERMS OF REFERENCE (TOR) FOR THE GRC RELATED TO SEA/SH

- ▶ The GRC shall review, consider and resolve grievances related to SEA/SH issues received from the various stakeholders of WeCARE: Phase-1 and ensure confidentiality.

- ▶ Pay attention to the grievance of the victim,
- ▶ Register his/her allegation,
- ▶ Ensure the victim that GRC is the right place to get remedy.
- ▶ The GRC will attend those cases where the perpetrator and the victim both are associated with the project work. In other cases, they will be advised/assist to lodge complain with the concerned competent authority.
- ▶ All complain will be resolved following the “survivor centric approach” giving priority to the victim’s opinions.
- ▶ Strict confidentiality of the victim’s identity and related information will be ensured by the RHD/PIU.
- ▶ The GRC/PIU will designate a SEA/SH focal person and all related grievances will be received by him/her. The focal person will (i) verify and investigate the matter, (ii) provide support to the survivor, if necessary, by drawing support from external sources such as, police, qualified NGOs for psycho-social counseling, specialized health experts/establishments for treatment of SEA/SH victims, etc. (iii) investigate the genuine of the allegation (iv) implement sanction to the perpetrator (v) And finally solve the matter.
- ▶ GRC will monitor and evaluate the total scenario and report it to the PIU.

7.6.1.2 STEPS TO BE FOLLOWED

- ▶ Allegation may be received from the survivor/Kin/others orally, over phone or in a written form.
- ▶ Follow the “survivor centric approach” giving priority to the opinions of the victims.
- ▶ Maintain strict confidentiality of the identity and other related information of the victims
- ▶ Register the allegation/case with detailed information.
- ▶ Ranking the case as major or minor
- ▶ Depending on the nature of the case, sending the victim to a nearby medical center or to a law enforcing agency as soon as possible.
- ▶ Assistance should be reached to the victim/s within 24 hours.
- ▶ Decision should be taken up within 7 days, through an internal committee meeting.
- ▶ Collection of necessary evidence within 10 days.
- ▶ Legal assistance if required.
- ▶ Final settlement of the case within 15 days.

ESS2 on labor and working conditions requires the setting up of a complaints and grievance mechanism for project workers separate from the project wide-grievance redress mechanism (GRM). The GRC of SEA/SH has been presented in the following Table 7-12.

Table 7-12: GRC Members Related to Labor Health and Safety

Sl. No.	GRC Composition at the Field Level	Members of the GRC
1.	Concern Project Manager (PM), WeCARE: Phase-1	Convener
2.	Resident Engineer of construction supervision consultant	Member
3.	Individual Labor Safety & Health Expert from PIU	Member
4.	Project Manager of the construction contractor	Member
5.	Concern Deputy Project Manager, WeCARE: Phase-1	Member Secretary

7.6.1.3 THE OBJECTIVES OF ESS2

- ▶ To promote safety and health at work
- ▶ To promote the fair treatment, nondiscrimination and equal opportunity of project workers
- ▶ To protect workers which includes vulnerable workers such as women, persons with disabilities, migrant workers, contracted workers, community workers and workers through contract supplier.
- ▶ To prevent the use of all forms of forced labor and child labor
- ▶ All types of legitimate demands of the workers will be fulfilled and their grievances will be addressed as per the prevailing national labor law.

7.6.1.4 STEPS TO BE FOLLOWED FOR THE IMPLEMENTATION

- ▶ Labor Health and Safety (LHS) aspects will be explained to the workers, both at the labor camp and at the work site to aware them.
- ▶ Enforce the worker's Code of Conduct as adopted in the contractor's ESMP (C-ESMP). This is prepared with reference to the project ESIA/ESMP, LMP and SEA/SH Action Plan.
- ▶ Aware the laborer about the health and safety issue and the precautionary measures to be taken by them to uphold a congenial and healthy atmosphere at the site.
- ▶ Ensure the availability of a "First Aid Box" both at the labor camp and at the work site. Inform the laborer and keep the laborer acquainted about its use, as and when required. Emergency drugs, gauge and bandages etc. must be available in this "First Aid Box".
- ▶ Firstly, the availability of PPE is to be ensured. The laborer will be made acquainted with its use.
- ▶ A proper demonstration will be held about the technique of PPE use at work.
- ▶ Ensure the availability of separate latrine for both male and female workers, potable water, waste disposal system and well ventilated & well illuminated labor camp. This will be ensured through regular monitoring.

Mitigation Measures

- ▶ Implementation of a GBV-free work environment shall be maintained by the PIU/RHD, and the contractor. Role and functions of GRM has been mentioned above which will ensure mitigation measures as per ESMP.
- ▶ Gender based discrimination shall be strictly prohibited and monitored.
- ▶ Any type of sexual harassment shall be dealt strictly with as per local law of the country and employee shall be terminated immediately from his duties.
- ▶ Training on code of conduct and company policy on the GBV free work environment shall be organized to all workers including skilled and non-skilled workers.
- ▶ It shall be ensured that above mentioned training has been attended by all including managers/engineer and other workers.
- ▶ Code of Conduct Preventing Gender Based Violence and Violence against Children/female workers shall be signed by the workers/managers/other staff.
- ▶ The code of conduct needs to be get signed by each worker every six months.
- ▶ Signed copy of the code of conduct shall be documented physically as well as scanned version shall be stored in computer.
- ▶ Company policy on GBV free work environment and code of conduct which was signed by the worker shall be displayed at labor camps/canteen and other contractor facilities.
- ▶ Staff shall be encouraged to report suspected or actual GBV.
- ▶ Grievance redressal mechanism shall be established at site to address the issues immediately.

7.6.2 COVID-19

326. Minimizing the spread of COVID-19 has become a top priority for all workers and project personnel to the construction projects. The contractors of the J-J road project may face many challenges in coping with the effects of the COVID-19 pandemic on the economy and the construction work environment if they avoid or ignore the COVID-19 preventive measures to be taken at construction sites, camps and offices.

Mitigation Measures

- ▶ Contractor must apply or comply with the government guidelines in line with WHO to contain the outbreak of the infection at sites.
- ▶ Installation of dispensers for hand sanitizers in the labor camps/construction and other prominent location.
- ▶ Distribution of N95 mask etc. to labor.
- ▶ Awareness campaigns
- ▶ Contractor shall prepare COVID 19 preventive action plan as WHO norms for implementation
- ▶ Regular health check-up

- ▶ RHD will employ a consultant to prepare on COVID 19 prevention plan at construction site.

7.6.3 TRAFFIC DIVERSION AND DETOURING

327. Traffic generated by project-related activities can significantly inconvenience or disturb local community who reside near the areas adjacent to construction works. Movement of heavy vehicles for carrying construction materials and equipment will add congestion to existing traffic, and increase the risk of traffic accidents. Disruption of access to infrastructure or social resource due to construction activity will cause nuisance. It will also pose risk of accident for drivers at night if these blockage and disruption are not clearly demarcated. In addition, there are serious accident risk for pedestrians during crossing the road at sensitive receptors, like schools, mosques, temples, hospitals etc., and other CPRs.

Mitigation Measures

- ▶ To avoid disruption of the existing traffic due to construction activities, a comprehensive Traffic Management Plan (TMP) will be drawn up by the contractor and submit to Authority Engineer for approval before the commencement of construction;
- ▶ The traffic control plans shall contain details of diversions; traffic safety arrangements during construction safety measures for nighttime traffic.
- ▶ Temporary diversions shall be provided at Chachra Moor, Murali Moor, Churamankathi, Barobazar, Sat mile, Kaliganj Bazar, Sala bara, and Al-hera Moor.
- ▶ Detailed “Traffic and Road Safety management Plans” shall be prepared by the Contractor and submitted to CSC for approval.
- ▶ The traffic management and control plans shall contain details of temporary diversions, traffic safety arrangements for construction under traffic, details of traffic arrangement after cessation of work each day, Safety measures for night-time traffic and precaution for transportation of hazardous materials and arrangement of flagmen

7.7 IMPACTS AND MITIGATION DURING OPERATION PHASE

328. Environmental monitoring of the terrestrial ecology, water resources and water quality air, noise, etc. shall be undertaken periodically. Client will undertake monitoring and evaluation of the effectiveness of the ESMP/RAP through PIU during the project tenure and onward through Environmental and Social Division of RHD.

7.7.1 TERRESTRIAL ECOLOGY

329. The shrubs and trees to be planted on the median and along the road are to be maintained. Trimming of the shrubs shall be undertaken regularly.

7.7.2 WATER RESOURCES AND WATER QUALITY

330. Side drains will be regularly cleaned before the onset of monsoon. Water quality monitoring shall be undertaken

7.7.3 IMPACTS ON AIR ENVIRONMENT DURING OPERATION PHASE

331. Ambient air quality impacts have been working for peak hour traffic using Caline 4. It is used for predicting incremental values of air pollutant carbon mono-oxide (CO) etc. for line source. The model is requiring Job parameters, link geometry, Link traffic, run conditions, and location of receptors. Caline 4 predicts the concentration of pollutants at different receptors within 500m of width. The model was run for the worst-case scenario for predicting CO concentration at different receptors and locations. The following run conditions have been considered.

- ▶ As recommended by USEPA, 1 m/s wind speed has been considered for worst –case scenario.
- ▶ Rural aerodynamic conditions for roughness have been considered for the present project.
- ▶ Wind –direction: The models has adopted default value for worst-case scenario.

- ▶ Link geometry is at-grade.
- ▶ Link height is 1.8m.
- ▶ Mixing zone width is width of roadway plus 3m on each side.
- ▶ Peak hourly traffic is adopted for predicting the impacts.
- ▶ Receptors have taken as (X, Y) coordinates and height of receptor (Z).
- ▶ To predict the incremental CO concentrations, the Central Pollution Control Board (CPCB), India has emission norms²⁴ for heavy diesel vehicles have been used which are given in Table 7-13.

Table 7-13: Emission Norms for Heavy Diesel Vehicles		
Norms	CO (g/km-hr)	PM (g/km-hr)
Bharat Stage IV	1.5	0.02

The above figure has been multiplied by 1.6 to convert it g/miles-hr.
 Source: CPCB, India

332. The incremental increase of Carbon Mono-oxide (CO) using the section wise traffic data (Table 7-14) for the Years 2025, 2031, and 2053 has been studied for assessment for employing the caline-4 model Lakes Environment (CalRoads View).

Table 7-14: Section Wise Traffic for Prediction of Impacts on Air Quality		
Contract	Chainage	Traffic Details
		2053
		Peak hourly Traffic
1	0+000 - 15+900	4805
2	15+900 - 31+700	4086
3	31+700 - 47+480	6917

Source: Worked out from Traffic Analysis Report

Results and Discussion

333. The Caline 4 model was employed to predict the incremental values for different sections for peak hourly traffic as mentioned above data. The maximum concentration is as follows in Table 7-15.

Table 7-15: Prediction of Impacts on Air Quality					
Contract	Chainage	Concentration of Carbon Monoxide (CO) in ppm			Standards [#]
		Baseline	2053		
			Incremental	Cumulative	
1.	0+000 - 15+900	0.761	0.7	1.46	9
2.	15+900 - 31+700	0.607	0.7	1.31	9
3.	31+700 - 47+480	0.863	1.0	1.86	9

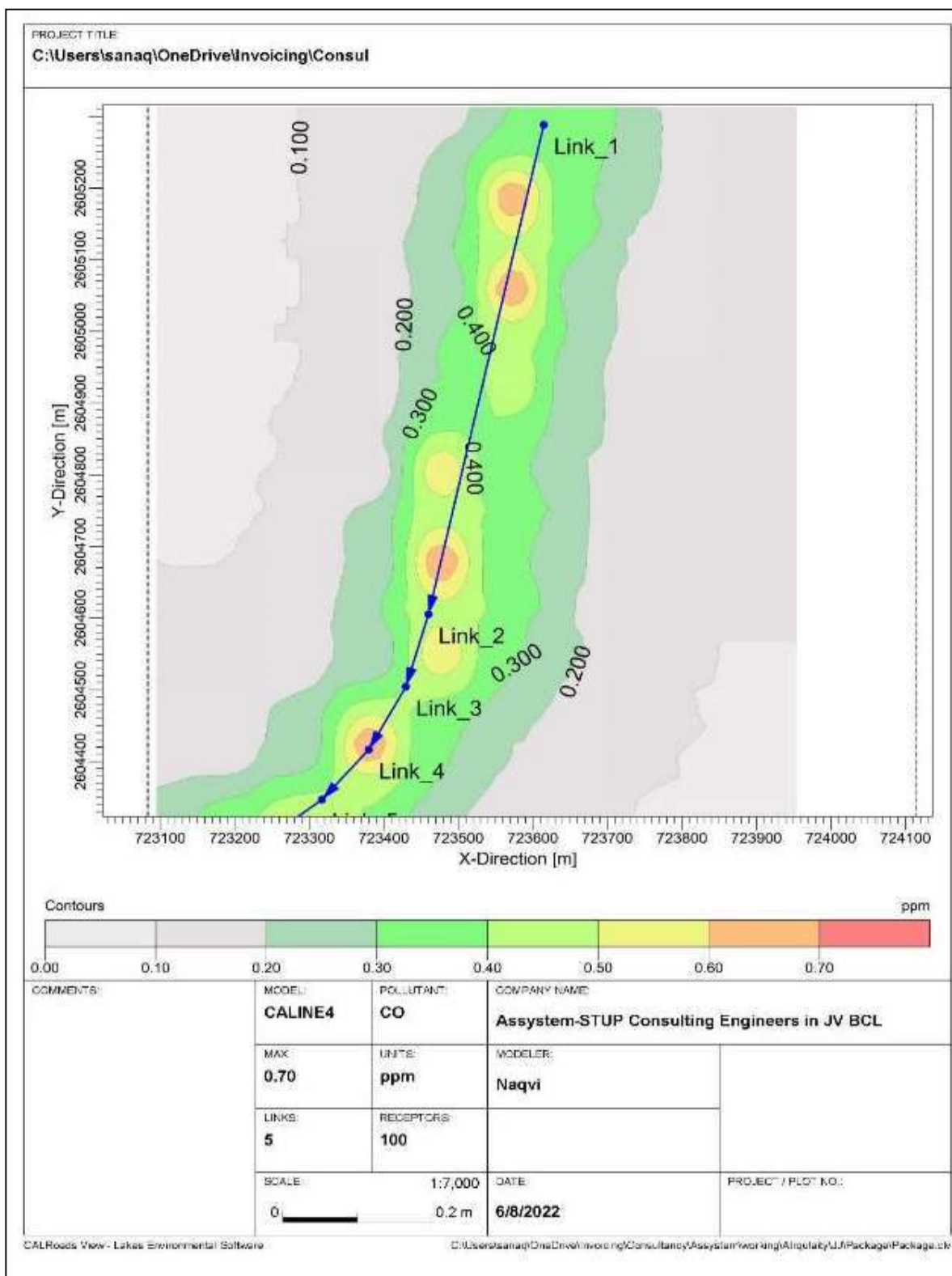
[#] *National Ambient Air Quality Standard (NAAQS) 2005, DoE*

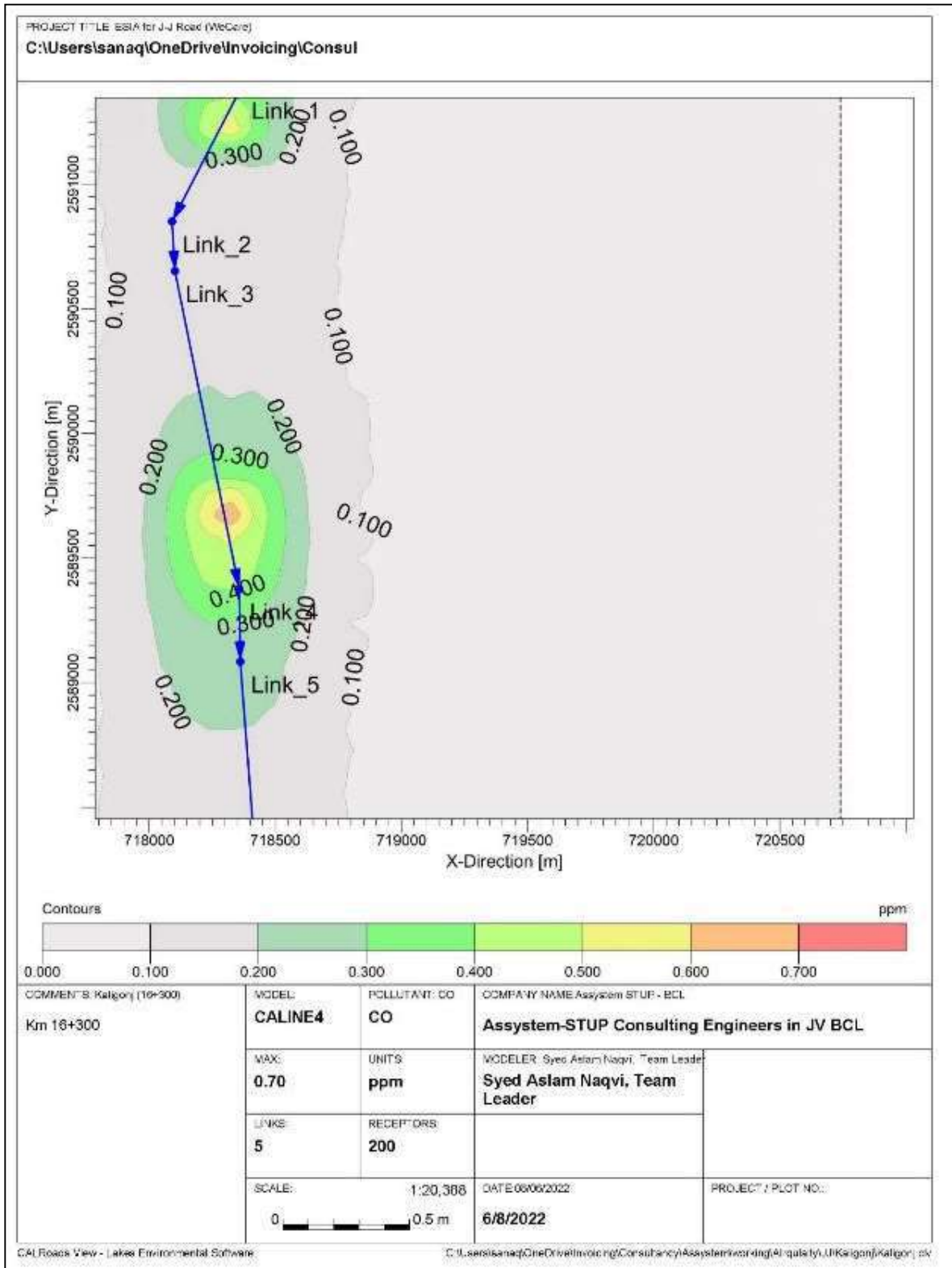
334. It is observed that the maximum ground level concentration of Carbon Monoxide is obtained to be 1.86 ppm in contract 3 near the alignment. The cumulative effect of the proposed project on the concentration of carbon monoxide will be less than limits prescribed by the (9ppm) during the peak hour traffic movement. The isopleths for the incremental values of CO are presented in Figure 7-1 for different the proposed three contracts in the year 2052 as discussed above.

Mitigation Measures

- ▶ Suggested Air Monitoring measures in the Environmental Monitoring Plan shall be undertaken.
- ▶ RHD shall advise DOE to implement the Schedule 4: Standards for Emission from motor vehicles of Environmental Conservation Rules 2017 (Draft DOE)

²⁴ CPCB | Central Pollution Control Board





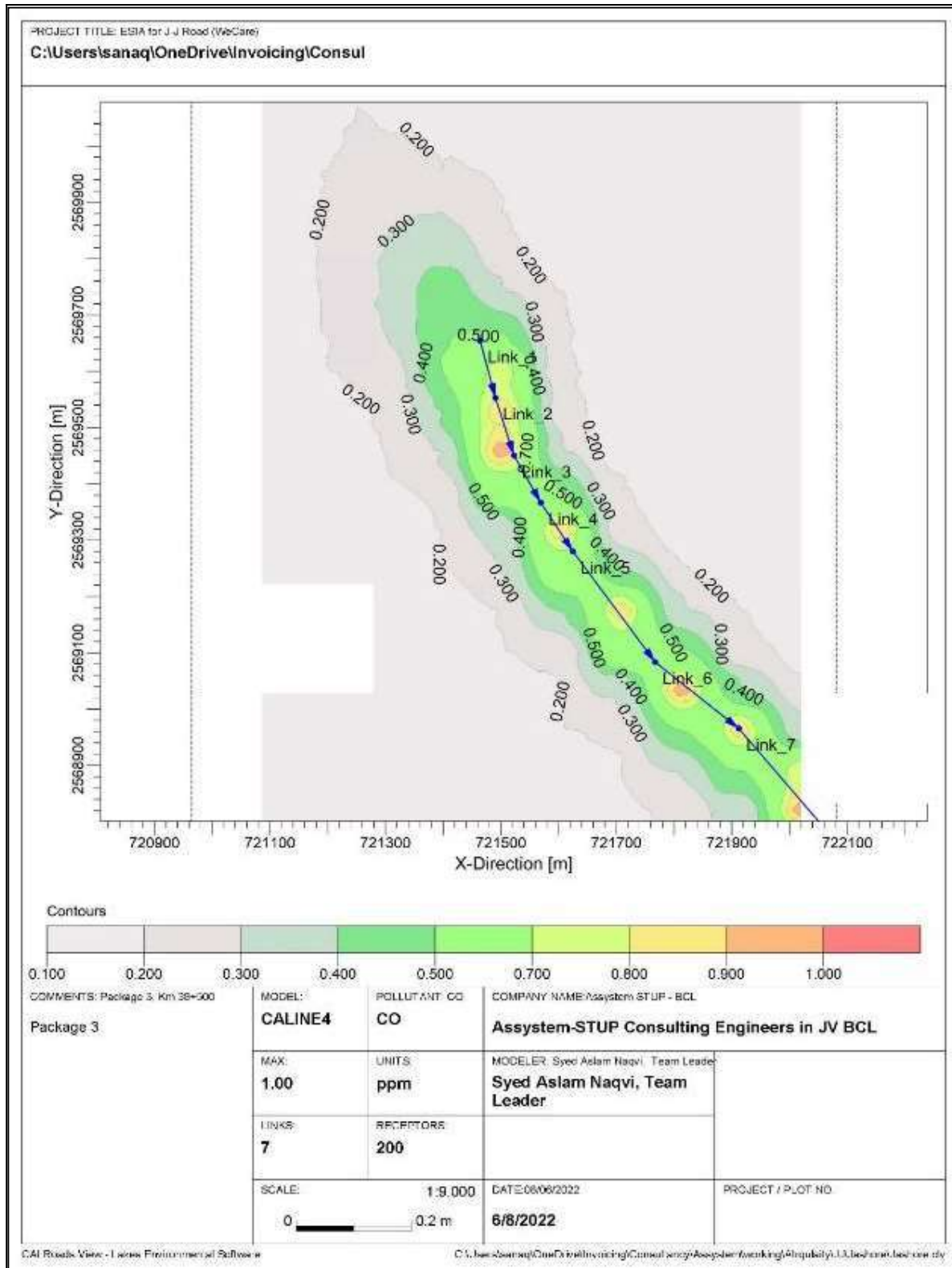


Figure 7-1: Isopleths Diagram for Incremental Concentration of CO

7.7.4 IMPACTS ON NOISE ENVIRONMENT DURING OPERATION PHASE

335. Motor vehicles are inherently noisy, and noise impacts are inevitable in any road development regardless of scale or character²⁵. The noise sources during the operation of road projects are namely, vehicle noise, friction between vehicles and road surface, driver behaviour, and maintenance of the road. Vehicles noise²⁵ is generated from engine, transmission, suspension, acceleration, stop and go traffic conditions and rough roads. Poor vehicle conditions are also one contributing factor²⁵.

336. The traffic analysis report prepared by design engineer has been used for working the incremental noise levels due to the increased traffic after improvement of the road conditions. Salient features of traffic analysis report²⁶ is presented in the following subsections.

337. Identification of Homogenous Sections: The road alignment has been divided into homogeneous sections based on traffic generation and dispersal nodes located along the alignment to carry out the traffic analysis. These homogeneous sections are as follows in Table 7-16 and Figure 7-2.

Table 7-16: Homogeneous Sections Under Jhenaidah-Jashore Road				
Homogeneous Section (HS)	Section		Length (Km)	Traffic Volume AADT (PCU)
	From	To		
HS – I	Jhenaidah Bus terminal Junction on N7 (km 100+000)	Kaliganj Bypass Road (km 115+800)	15.8	23533
HS – II	Kaliganj Bypass Road (km 115+800)	Churamankathi Bazar Junction (Z7031/N7) (km 138+600)	22.8	17653
HS – III	Churamankathi Bazar Junction (Z7031/N7) (km 138+600)	Monihar Circle Junction on N7, Jashore (km 147+700)	9.1	29419

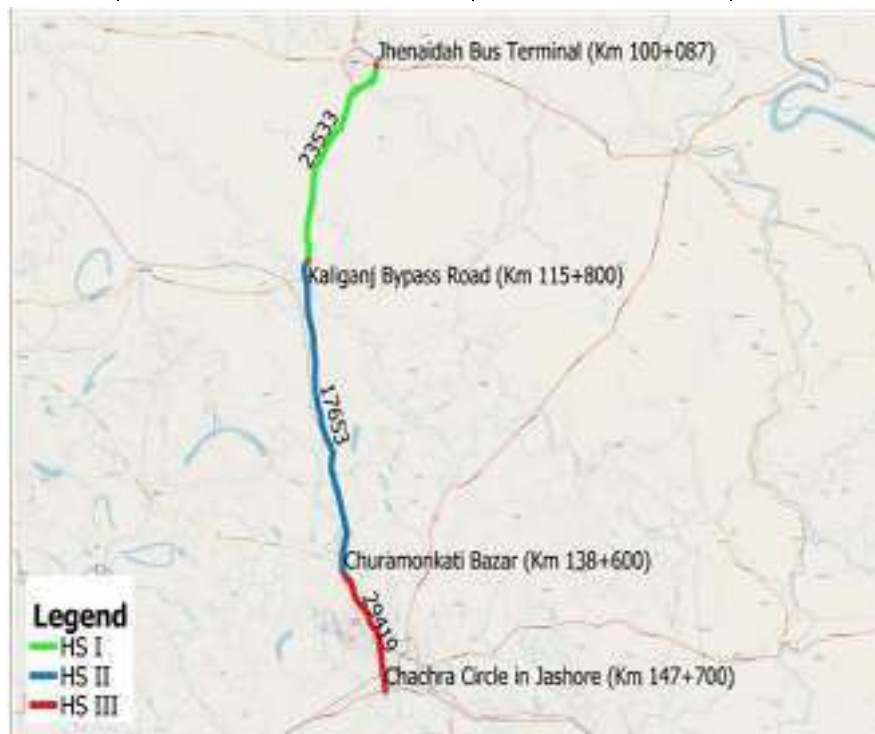


Figure 7-2: Homogenous Section and Traffic Volume of the Project under Phase I

²⁵ Roads and Environment a Handbook, The World Bank, 1997

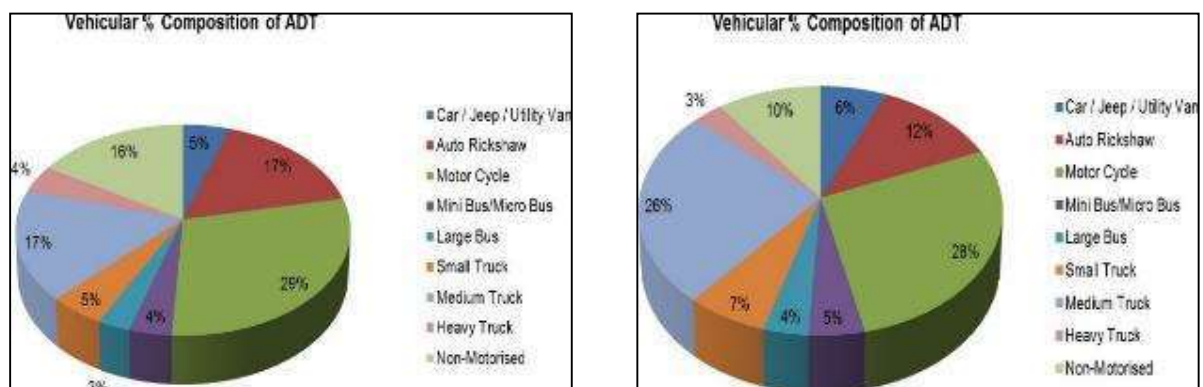
²⁶ Traffic Surveys and Analysis, Consultancy Services for Design Review Services for Jhenaidah – Jashore Road Section (Phase -1, Intercontinental Consultants & Technocrats Pvt. Ltd.

338. Composition of Traffic and Growth: Based on traffic survey the composition of traffic is Car / Jeep / Utility Van, Auto Rickshaw, Motor Cycle Mini Bus/Micro Bus Large Bus Small Truck Medium Truck Heavy Truck Non-Motorized. The composition of traffic on the existing road at different Automatic Traffic Classified Count (ATCC) is summarized in Table 7-17.

Survey Location	ATCC 1, Near Sadman Agro Food, N7	ATCC 2, Near Keya Bagan Jame Mosque N7	ATCC 3, Near BRAC Learning Centre	ATCC 4, Near Chayagiria New Market, N702, Jashore
Car / Jeep / Utility Van	5%	6%	8%	4%
Auto Rickshaw	17%	12%	19%	12%
Motor Cycle	29%	28%	22%	28%
Mini Bus/Micro Bus	4%	5%	6%	5%
Large Bus	3%	4%	2%	4%
Small Truck	5%	7%	7%	7%
Medium Truck	17%	26%	22%	16%
Heavy Truck	4%	3%	4%	1%
Non-Motorized	16%	10%	11%	22%

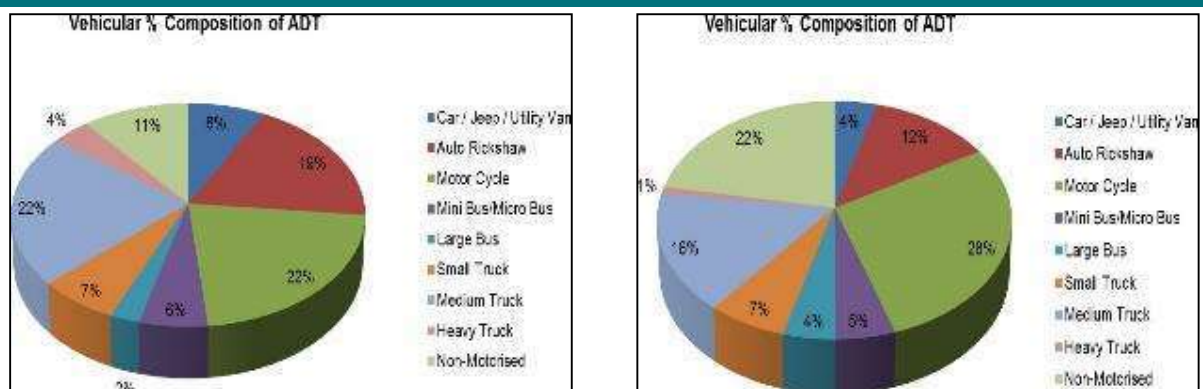
Source: Traffic Survey, ICT

The traffic composition on the existing road is presented graphically in Figure 7-3.



ATCC 1, Near Sadman Agro Food, N7

ATCC 2, Near Keya Bagan Juma Mosque N7



ATCC 3, Near BRAC Learning Centre

ATCC 4, Near Chayagiria New Market, N702

Figure 7-3: Vehicular Composition at different Automatic Traffic Classified Count on Existing Road

The growth rate of the for working out projected traffic in percentage year on year base for every year has been is presented in Table 7-18.

Up to 2020 from Previous Data	2022- 2027	2027- 2032	2032-2037	2037-2042	2042- 2047	Beyond 2047

Joint Venture of



STUP Consultant Pvt. Ltd.
 On July 1st, 2021, STUP was acquired by Assystem and rebranded as Assystem STUP.



BCL Associates Limited, Bangladesh

6.60%	6.50%	6.83%	7.23%	6.51%	5.86%	4.98%

Source: ICT

339. **Peak hours:** To predict incremental noise levels due to the increased traffic, peak hour traffic has been used in the noise model.

340. **SoundPLAN Noise Model:** SoundPLAN is a noise model which is compact to simulate the noise level impact due to various sources such as roads, railways, industry etc. The country noise modeling standards are inbuilt to simulate the noise level impacts. For this study, Traffic Noise Model (TNM2.5) of US Federal Highway Authority (USFHWA) has been used to work out the incremental noise levels.

341. To assess the impacts on ambient noise environment due to operation phase of this state highway development, simulation model (SoundPLAN essential 5.1) following TNM 2.5 standards in the model. Different vehicle²⁵ types produce different levels of noise. In general, heavy vehicles such as transport trucks make more noise than do light cars; they tend to have more wheels in contact with the road, and often use engine brakes while decelerating. The TNM 2.5 considers different vehicles such as passenger cars, medium trucks, heavy trucks (multi axles), Buses, Motorcycles.

342. The following is US FHWA noise equation 1 as follows:

$$L_{eq}(h)_i = L_{oci} + 10 \log [N_i / (S_i \times T_i)] + 10 \log (15/d)(1 + \alpha) + S_o - 13 \text{-----Equation 1}$$

Where,

$L_{eq}(h)_i$ = Leq at hour h for i^{th} vehicle type

L_{oci} = The reference mean energy level for the i^{th} vehicle type

N_i = The number of i^{th} class vehicles passing during the time T

S_i = The average speed of the i^{th} class vehicles, km/hr

T = The duration for which Leq is desired and must correspond to N_i the count of vehicles during the time T. Normally, T has been considered one hour but it could be longer or shorter.

D = The perpendicular distance, in meters, from the centreline of the traffic lane to the location of the receptor, i.e., the location where the noise level is desired

α = The factor which relates to the absorption characteristics of the ground cover between the roadway and the receptor

S_o = The shielding factor provided by a noise barrier if present.

The incremental noise levels at different distances from the road edge is for HS1 and HS2 are presented in Figure 7-4.

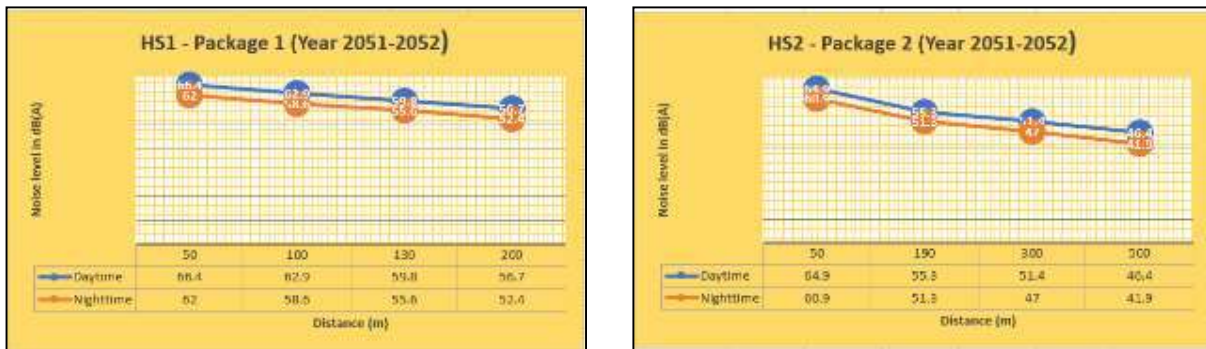


Figure 7-4: Incremental Noise Levels at Different Distance (m)

343. It is observed that incremental noise levels near the edge of road i.e., 50m to 80m are more than daytime and nighttime noise level standards of ECR 97. However, the incremental noise levels are reducing as the distance from the road edge is increasing. It can be visualized from the noise level maps which are

presented in Figure 7-5 for daytime and nighttime for the year project year 2051-2052. To study the impacts, the highest incremental noise levels have been added to the baseline monitoring results which has been discussed in the following subsections.

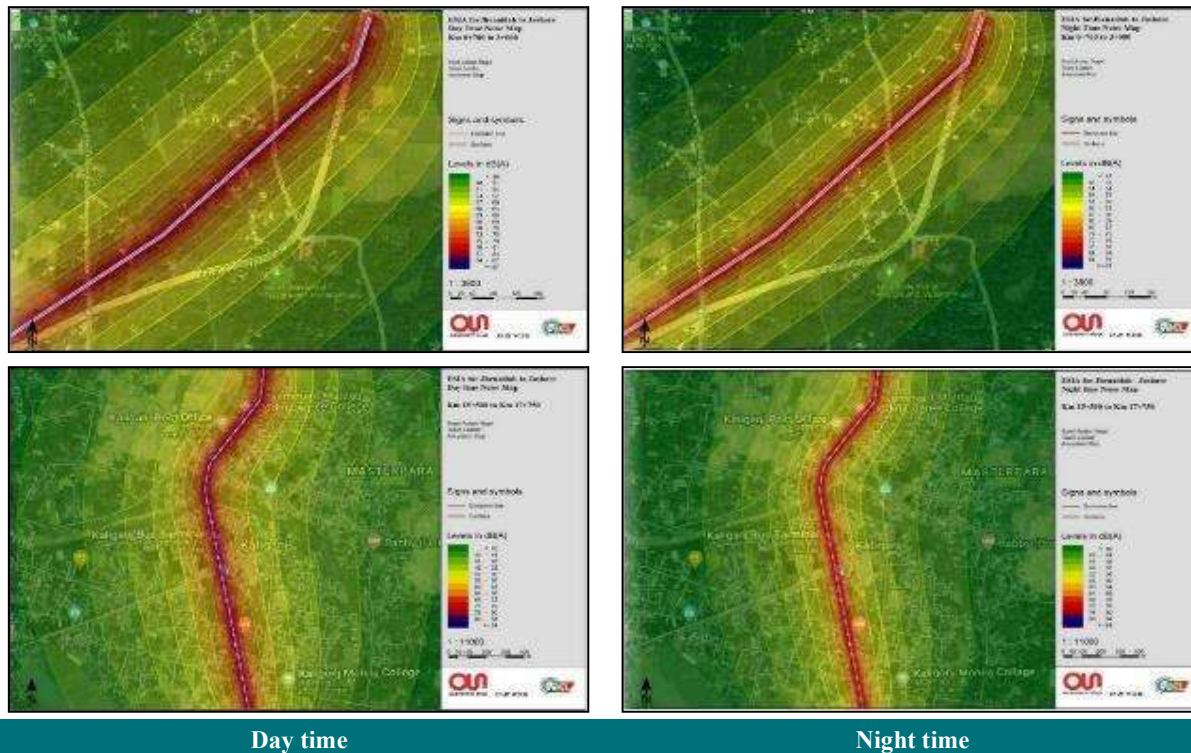


Figure 7-5: Incremental Noise Level

Cumulative Impacts

344. The cumulative impacts due to incremental noise levels due to increase traffic volume on the improved road alignment has been worked out and are presented in the following Table 7-19.

S. No.	Baseline Noise Levels	Incremental noise Levels	Cumulative Noise Levels at 50m distance from road	Remarks
1	68.2	66.4	70.4	Noise levels are increased by 3dB(A) -4 dB(A) Existing Noise level are more than the prescribed limits.
2	64	64.9	67.5	Noise barriers along the boundary shall be provided as per ESMP.

Mitigation Measures

- ▶ Vehicular noise and use of horns need be controlled through enforcement of laws and public awareness. It will be ensured that all the vehicles are using proper horn as per norms to keep noise within the permissible limits.
- ▶ Pressure horns shall not be allowed.
- ▶ Silence zones need to be demarcated and road signs prohibiting the honking of the horns will be displayed at residential areas, sensitive locations, and silence zones. No honking sign boards shall be place near the sensitive receptors
- ▶ At Mahtab Degree College (Km15+600) and AB collage (Km23+000) and Kazi Nazrul Islam Collage (Km35+600) biological noise barriers by planting the trees in three (3) layers of tree plantation to reduce the noise level. However, the existing noise levels are not below the prescribed limits.

- ▶ Other primary schools shall also be considered for noise barriers.
- ▶ Regular monitoring of noise level will be carried out as per the environmental monitoring plan suggested in Section ESMP of this report.
- ▶ In embankment slopes including maintenance of trees for six (6). The number of shrubs in contract 1 (12000), contract (9173), contract (2427).
- ▶ Design Consideration

7.7.5 SOIL AND SEDIMENTS

- ▶ Any Spillages or Accidental Vehicles Shall be Removed Immediately.

7.7.6 ROAD SAFETY

- ▶ Road furniture as provided in the operation phase need to be maintained properly.
- ▶ Potholes or any other damages shall be rectified immediately after post monsoon.
- ▶ Highway Petrol/ Police deployment sufficiently at the project road in operation to the overseeing, monitoring and enforcing traffic safety compliance on roads and highways as well accident investigation and sexual misconduct, particularly women SH in the public buses during night.

7.8 CUMULATIVE IMPACT

345. The improvements of Jashore-Jhenaidah road are also assessed to have no significant cumulative impacts as works are mainly within existing road and in an area that has already been altered, fragmented and highly disturbed for many decades as a result of human

346. Population growth, agricultural and aquaculture development, encroachment and establishment of new settlements along the highway, land transformation and other associated development. With or without improvement works in Jashore-Jhenaidah road, land use change and land transformation have already taken place and will continue to take place as a result of other factors such as urbanization and development of the western province.

347. There is currently no major on-going project on the J-J corridor and the cumulative impact of the project is likely to be during construction stage. Positive cumulative impacts, however, are expected to outweigh any negative cumulative impacts as once the project is completed the region is likely to be economically transformed. The environmental and social risk clauses emphasizing the requirements for environmentally responsible construction and specify the need for the contractor to apply the mitigation and monitoring measures as defined in the ESMP.

8 LABOR MANAGEMENT PROCEDURE

348. This Labor-Management Procedure (LMP) has been prepared to ensure that the project complied with the Bangladesh Labor Act of 2006, as well as the World Bank's Environmental and Social Framework (ESF), Environmental and Social Standard 2: Labor and Working Conditions (ESS2), and Environmental and Social Standard 4: Community Health and Safety (ESS4). In Bangladesh, the LMP took into account the use of nationally adopted health and safety norms. For civil and construction work, the project will require both direct and contractual employees. The LMP applies to all direct workers, contracted workers, and major supplier workers who will be working on the project.

349. This section explains the labor-management approach for project aspects while taking into account national and international norms. The labor laws are governed by the Bangladesh Labour Act 2006 as amended in 2010 and 2013 and Labour Rules 2015. Some of the national and international laws regarding occupational health and safety that are relevant to this project are presented below in Table 8-1.

Table 8-1: Summary of National and International Laws

Sl. No.	Acts	Objectives/Description
1.	Bangladesh Labor Act 2006 (Amendment 2013)	Provides safety for the workforce during the construction period. The act guides the employer's extent of responsibility and the workmen's right to <u>compensation in case of injury caused by an accident while working</u>
2.	Bangladesh Labor Rules 2015	Provides guidelines on Employment Policy/Service, Registration of Manpower supply agency, Establishment Organogram, Appointment Letter, Various Register, Misconduct and punishment, two festival bonuses, Provident fund elaborated, Holiday, Health and fire safety, Wages, etc.
3.	Water Supply and Sewerage Authority Act 1996	The act calls for ensuring water supply and sewerage system to the public, preservation of system, and other related health and environmental facilities for the community.
4.	Labor Relations Under Labor Laws, 1996 (revision to scattered Acts and Ordinance to formulate the unified code)	The general concern during the project implementation state that the project manager must recognize labor unions
5.	Public Health Emergency Provisions Ordinance, 1994	Calls for special provisions concerning public health. In case of emergency, it is necessary to make special provisions for preventing the spread of disease, safeguarding public health, and providing adequate medical services, and other services essential to the health of respective communities and workers during construction-related work.
6.	Bangladesh Factory Act, 1979	Workplace provisions: these Act and Labor Laws require medical facilities, first aid, accident, and emergency arrangements, and child care services to be provided to the workers at the workplace.
7.	The Employees State Insurance Act 1948	Health, injury, and sickness benefit should be paid.
8.	The Employees Liability Act, 1938	Covers accidents, risks, and damages concerning employment injuries.
9.	Maternity Benefit Act 1950	Framed rules for female employees, who are entitled to various benefits for maternity.
10.	The Equator Principles (III) 2013	Provide guidelines on environmental and social standards with considering project manpower and other stakeholders.
11.	International Labor Organization Rules and Guidelines:	
12.	Convention 029 (1930)	Guidelines on Forced or Compulsory Labor;
	Convention 098 (1949)	The Application of the Principles of the Right to Organize and to Bargain Collectively;
	Convention 100 (1951)	Equal Remuneration for Men and Women Workers for Work of Equal Value;
	Convention 111 (1958)	Discrimination in Respect of Employment and Occupation;
	Convention 138 (1973)	Minimum Age for Admission to Employment;
	Convention 182 (1999)	The Prohibition and Immediate Action for the Elimination of the Worst

Table 8-1: Summary of National and International Laws

Sl. No.	Acts	Objectives/Description
		Forms of Child Labor

350. To address the following points, the contractor will take necessary steps during the construction period according to the national laws relating to the labor-management procedures (occupational health and safety-relevant) as well as World Bank's (WB) Environmental and Social Framework (ESF), specifically Environmental and Social Standard (ESS2) and Community Health and Safety (ESS4) is presented respectively.

8.1 SELECTION AND LAYOUT OF CONSTRUCTION CAMP

351. Selection of labor camps and construction camps before starting the road construction depends on a few things including size, dimension, and time length of the project. The assigned contractor or responsible authority will select a certain location alongside the project area considering government-owned free land, barren land, river banks, etc. which have no consequence of environmental and social obligation. In terms of selecting the construction camp, it's recommended to avoid any specific land that could be socially or environmentally critical. A tentative construction camp layout has been drawn for specifying the temporary infrastructure establishment (Figure 8-1). Hot mixed plant, stockyard, stone crusher, batch plant, maintenance workshop, laboratory, etc. will be placed in the opposite direction of the maximum yearly wind flow in a certain place. All necessary temporary infrastructure will be well established or well-decorated considering the project requirement. The contractor will follow or comply with the tentative layout with proper procedure. The selection criteria for the construction camps can be presented below-

- **Land Selection:** Barren land, government free land, khas land, char land, etc. Avoid agricultural land, private land, vegetation area, public place, recreational area, etc.
- **Layout Placement:** Place environmentally or socially corrosive infrastructure (hot mixed plant, stockyard, stone crusher, batch plant, maintenance workshop, laboratory, etc.) far from the residential area, labor camps, office area, etc.

352. Selecting or drawing the construction camps in a certain place there have a few things that should be considered to maximize the productivity, reduce areas needed for temporary construction, and maximize utilization, such as-

- **Safety:** Ensuring the selected construction camp location is safe from any natural, social, regional, or environmental hazards.
- **Site Accessibility:** Giving priority to easily accessible areas for selecting as construction camps that will be feasible to prevent any emergency easily.
- **Security:** The selected location should be secure from any national, or regional conflicts or any other insecure activities.
- **Environmentally Sound:** The selected location should be considered as any barren land or free land that has a lower impact on the surrounding environment.
- **Socially Feasible:** Avoid the socially crowded place where there has no chance to affect any local community.
- **Economically Sustainable:** In the selection of the construction camp location, it is mandatory to meet up the economic aspects to borrow or buy the land.

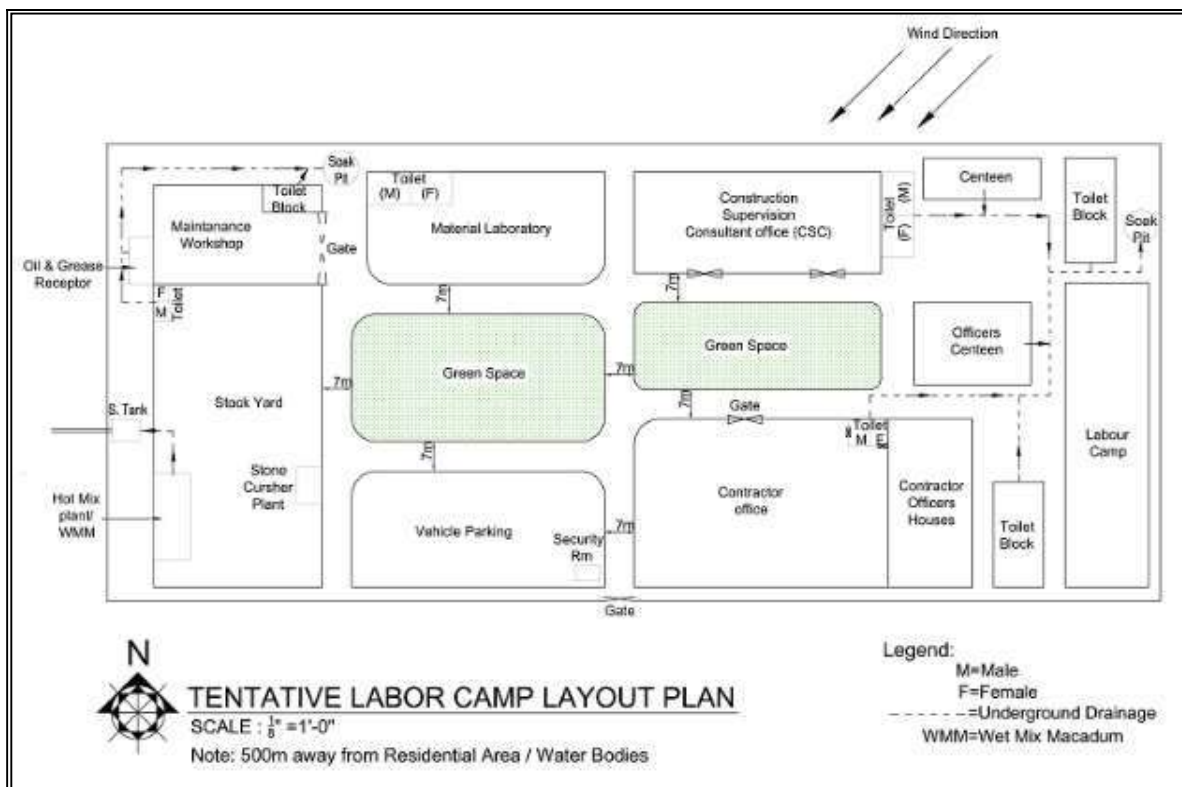


Figure 8-1: Tentative Layout of the Construction/Workers Camp

8.2 HIRING AND RECRUITMENT PROCEDURE

353. Hiring and recruitment of workers, staff, engineers, consultants, etc. will be depended on the project dimension and time scenario. According to the WeCARE program description, dimension, and length the contractor will have to appoint or recruit direct workers, contracted workers, primary supply workers, and also migrate workers on basis of expertise requirements. The whole process of hiring and recruitment will be conducted considering the standard procedure of Bangladesh Labor Act 2006, Labor Rules 2015, ILO Convention, World Bank's ESS2, and also ESS4. All of the procedure will be undertaken by following the CoC of the contractors which presented Annex 8-1. The LMP applies to all project workers whether full-time, part-time, temporary, seasonal, or migrant workers. There will be provisions to avoid the use or employment of children and forced labor at any level of the project. The major procedure of hiring and recruitment of workers has been depicted here as-

- ▶ **Selection of Workers:** The contractor will select skilled, non-skilled, semi-skilled, and armature workers, engineers, staff, consultants, etc. for engaging them in the various dimension of project activities following the proper code of conduct and standards.
- ▶ **Source of Workers:** Depending on the type of work the contractor will procure properly for sourcing the workers. Direct workers, contract workers, supply workers, and migrant workers will be engaged by the contractor before starting the project activities or when needed with the proper application of ILO, Bangladesh, and World Bank Standard.
- ▶ **Appointment of Workers:** The contractor has full independency to appoint full-time, part-time, contractual, or intermittent workers depending on their workload and activities. The contractor will appoint workers on a contract basis, probation basis, or permanent basis by enforcing the Labor Act 2013, Labor Rules 2015, ILO Convention, and also ESS2 & ESS4.
- ▶ **Contract Documentation:** Contract documentation means the agreement paper between the workers and the contractor providing proper guidelines on the term of references, period, probation time, wage, benefits, compensation, penalty, termination, and conclusion. Human resource personnel on behalf of the contractor will prepare the proper documentation and supply it to the workers before the appointment for

better understanding.

- ▶ **Probational Period:** A fixed probation period will be included in the contract document by following the guidelines of proper standards at the national or international level.
- ▶ **Services and Facilities:** The contractor will aware of the prospective workers about their services and facilities before processing any recruitment or hiring and also the workers will agree to obey the rules and regulations as well as commit to provide proper services to the project execution.
- ▶ **Conclusion of Probation:** The contractor may have the authority to monitor, evaluate, and conclude the probation period of every worker after completing the fixed probation period. According to the services from the workers the contractor will decide on permanent/contractual appointment or termination as following the Labor laws, rules and regulations.
- ▶ **Wage Adjustment:** After permanent/contractual appointment the contractor will adjust the worker's wages, benefits, services, and facilities as per standard rules, regulations, and laws which adopted for this project.
- ▶ **Project Execution:** The contractor will be the most prominent authenticated body to complete the project work following the supervision of the project owner, lender, and consultation organization. After executing the primary recruitment process (though the recruitment may run during the whole project lifetime) the contractor will properly execute the project work by compiling labor laws, standards and regulations. The contractor will maintain the workers' profiles for any avoiding unwanted situations (Annex 8-2).
- ▶ **Local Recruitment:** The preference for project employment will be given to local people, those who have been directly affected by Project-related displacement, and/ or those who have completed specific skills training under various programs offered and managed. To implement the local recruitment, a local recruitment process will be developed by the contractor including the following activities:
 - Collect and finalize the information for recruitment from the contractor and its subcontractors (e.g., type of position, number of positions, job description)
 - Conduct public disclosure of a summary of upcoming recruitment (both skilled and unskilled positions) and the process for application at the project area and nearby communes;
 - Collect the data of candidates who have applied or registered in seeking employment including personal background, contact information, expected position, training, and update of involvement;
 - Communication with the project's stakeholders and beneficiaries shall be clear to manage expectations.

354. The contractor should follow the below-explained code of conduct or term of reference for hiring or recruiting the workforce into the project-

- ▶ **Child Labor:** In keeping with internationally recognized standards, the project will make a distinction between child labor and young worker. The project will not tolerate child labor under any circumstances. The employment of young workers, i.e., minors aged from full 15 years to under 18 years who have reached the minimum age of employment and completed compulsory schooling, will be allowed under strict conditions and in compliance with requirements of internationally recognized standards and local relevant laws and regulations.
- ▶ **Forced Labor:** The Project defines forced labor in line with the ILO Convention as any work or service extracted from a person under threat or penalty, which includes penal sanctions and the loss of rights and privileges, that the person has not offered him or herself voluntarily. It includes slavery and abduction, misuse of public and prison works, forced recruitment, debt bondage, domestic workers under forced labor situations, and internal or international human trafficking.
- ▶ **Probation:** The probation period shall be negotiated by the contractor and candidates based on the candidates' jobs. Only one probation period is applied for a job. A copy of the probation contract will be provided to the candidate which outlines the working conditions and term of employment of the candidate during the probation period.
- ▶ **Labor Contract:** The labor contract is an agreement between the contractor and an employee on a paid job, salary, working conditions, rights, and obligations of each party in the labor relations. The labor contract is also a legally binding agreement between the contractor and an employee, which is the first basis to resolve conflicts and disputes arising in labor relations.
- ▶ **Termination of Labor Contract:** An employee and the Project shall have the right to unilaterally

terminate the labor contract, however, notification shall be given to each other in advance.

- ▶ **Harassment:** The Project prohibits harassment of any kind, including sexual harassment, and will take all appropriate measures to promote a harmonious work environment and to protect personnel from exposure to any form of prohibited conduct through preventive measures and the provision of effective remedies when prevention has failed. During the recruitment process, the HR Specialist must undertake diligent reference checks of candidates to ensure that individuals who have a documented history of prohibited conduct are not hired.
- ▶ **Non-Discrimination and Equal Opportunity:** Employees must be treated equally about gender, age, race, religion, disability, nationality, political beliefs, membership in unions, ethnic origin, religious beliefs, as well as sexual orientation. Equality in employment shall mean the absence of any form of discrimination, direct or indirect, for reasons specified as mentioned above. The Project builds its equal opportunity policy to ensure fairness in all aspects of employment, including hiring, training, evaluation performance, compensation, and benefits, as well as the termination of employment.
- ▶ **Compensation for Damage:** An employee who causes damage to equipment or otherwise damages the employer's assets shall have to pay compensation by enabling the laws. The contractor has the right to conduct a wage deduction from the employee's salary every month to make up for the loss. An investigation shall be conducted when an employee causes damage to the company equipment or assets (Annex 8-3).
- ▶ **Trade Union/Workers' Organizations:** The below requirements shall be followed when establishing a Trade Union/Workers' organization at the project. In the event of any practices that fall out of the requirements in this section, the Bangladesh Labor Rule 2015 and Trade Union Law shall be applied accordingly. Employees have the right to freely establish, associate, and participate in Trade Union or other Workers' Organizations at the workplace. The workers' organizations in the project can be Trade Union or other workers' organizations which has been established according to Bangladesh's labor regulations.
- ▶ **Wage:** Employees will be paid based on their performance and skills regardless of employees' characteristics such as gender, age, race, religion, disability, nationality, political beliefs, membership in unions, ethnic origin, religious beliefs, as well as sexual orientation. The base monthly salary shall be determined according to the wage scale and shall not be lower than the regional minimum wage.
- ▶ **Benefits:** The statutory benefits include medical examination, social security, and childcare assistance shall be ensured by the contractor.
- ▶ **Hours of Work and Breaks:** The regular working hours of all employees at the Project are 8 hours per day and/or 48 hours per week. Employees are entitled to have at least four (4) days off per month. Female employees who are in their 7th-month of pregnancy and who are nursing a child under 12 months of age will only work 7 hours per day but will be compensated for 8 hours.
- ▶ **Overtime Arrangements and Overtime Compensation:** The legal requirement on maximum overtime allowed shall be followed as not to exceed 4 hours per day, 40 hours per month, and 300 hours per year. The overtime premium shall be paid following the local regulatory requirements of Bangladesh.
- ▶ **Leaves:** The breaks and leave include statutory holiday, public leave, marriage leave, maternity leave, sick leave, work injuries leave, personal leave, bereavement leave, and annual leave
- ▶ **Retrenchment:** Retrenchment means the elimination of several positions or the dismissal or layoff of several workers by an employer, generally because of a plant closing or for cost savings. In the Project, retrenchment refers to a consequence of adverse economic circumstances or because of a reorganization or restructuring, it does not cover isolated cases of termination of employment for cause or voluntary departure.

8.3 FACILITIES AT WORKERS' CAMPS

355. According to the national and international labor laws, the contractor will ensure numerous facilities in the labor camps for good practices of environmental and social norms. A list of facilities in the worker's camps is listed below-

- ▶ **Lodging Facilities:** For all workers, the contractor will provide an adequate accommodation facility. Separate accommodations needed to be arranged for different caste and ethnic groups. A distinct location of the accommodation is required for men and women considering social security. The temporary campsite will not be located at a roadside to avoid/ minimize the danger of road accidents.

- ▶ **Drinking-Water Supply:** The availability and proper storage of potable water is also the responsibility of the contractor. The quality of water must be maintained by proper treatment and testing periodically. Water consumption by the site workers should not endanger the water right of the local population.
- ▶ **Sanitation and Waste Disposal:** The contractor is supposed to provide adequate sanitary facilities to the workers on site. There must be an adequate number of toilet and bathing facilities for all workers. A separate toilet and bathing facility for the women workers is mandatory. The proper outlet of wastewater is required to maintain the hygiene of the camp as well as workers. The camp should have a treatment facility for the wastewater to maintain public health.
- ▶ **Fuel Use:** The contractor will make fuel arrangements for cooking, lighting, and heating. Fuel usage from a public supply source should not affect its availability or cost to the local population. For environmental reasons, the contractor shall not use firewood for cooking and heating except legally authorized sources.
- ▶ **Fire Prevention Facilities:** Fire is a major cause of damage on construction sites. So, fire extinguishers are basic requirements for a construction project.
- ▶ **Medical Services:** The contractor must arrange first aid facilities and primary treatment facilities with a well-equipped medical room, ambulance (24/7) facilities, a trained doctor, nurse, OHS personnel, etc. The contractor will also ensure regular health checkups of the workers.
- ▶ **Construction Safety Clothing:** Basic safety supplies like safety shoes, hard hats, gloves, and goggles must be provided by the contractor for workers for the entire project time.
- ▶ **Food Supply/Kitchen or Dining Facilities:** The contractor will ensure proper food supply for the workers and a responsible person will be employed to monitor.
- ▶ **Information Signs:** Site maps should locate details of the project, and be displayed in the office of the site superintendent or project manager and posted at the entrance gate. Traffic regulatory signs should be displayed in every important location of the campsite. Labor relations policy and safety rules will be displayed to award the workers their responsibility.
- ▶ **Security:** It is necessary to have a proper guard entrance to the site provided by a booth. Also, it is necessary to keep track of all visitors to the project. It is necessary to have a standby generator to maintain site lighting. The boundary should be fenced off from a security point of view.
- ▶ **Offices:** The offices should be close together, close to the site, and in a safe area. Also, provide the offices with proper office equipment. The offices at the site may include job offices, general contractor offices, and sub-contractors and consultants Offices.

8.4 RECORD KEEPING AND MAINTENANCE

356. The control of documents and records related to labor management shall be conducted following the document control procedure of the contractor. The project owner, the contractor, and subcontractors shall retain the following documents and records-

- ▶ Employees' details information
- ▶ Internal Labor Regulation;
- ▶ Collective Bargain Agent (CBA) and other Trade Union/Workers' Organization's documents (minutes of Labor Conference, Social Dialogues, Trade Union/ Workers' Organization's Fund, records of Trade Union/ Workers' Organization's activities);
- ▶ Labor Contracts;
- ▶ Wage scale and pay slip;
- ▶ Documents on occupational accidents and diseases;
- ▶ Grievance documents;
- ▶ Training records;
- ▶ Discipline records;
- ▶ Monthly/Quarterly/Semi-Annual self-audit report of contractors, their subcontractors, and primary suppliers' performance
- ▶ Monthly performance report of subcontractors/ primary suppliers
- ▶ Quarterly/Semi-Annual report of the Project' Labor and Working Conditions Management
- ▶ Quarterly Reports on Utilization of non-local workers; and
- ▶ Annual Labor Compliance Self-Assessment Report.

357. All documents and records are required to be filed for at least five years or as per regulatory requirements, whichever is more stringent and kept in safe storage accessible only to authorized personnel. Records shall be made available for inspection and audit by the contractor and the project owner or its agents upon request.

8.5 MONITORING, AUDITING, AND INSPECTIONS

358. Monitoring and implementation follow the requirements are critical components to prevent issues from becoming problems in the first place and to ensure that action plans are implemented, and procedures are being followed. The monitoring program related to the LMP is presented in Table 8-2. Any major non-compliance (e.g., issues that could lead to a significant failure of structures, fatal accident, major injuries, authorities' notice/prosecution, or delay in project schedule) shall be corrected within one working day. Minor non-compliance issues (e.g., issues that do not lead to a breach of statutory requirements, bodily injuries/damage to properties, the environment, and surrounding communities) shall be corrected within one week. All checklist for monitoring is presented in Annex 8-2 to Annex 8-9.

Table 8-2: Internal Monitoring Program

Action	Performance Indicators	Monitoring Protocol	Responsibilities	Monitoring Records
Internal Monitoring	The number of child labor; Number of forced labors; Number of Trade Union/Workers' Organization members and activities; Number of Trade Union/Workers' Organization dialogues and no. of issues raised; Number of employees who sign the labor contract; Number of employees paid under regional minimum wage; Number of employees registered with social, health, and unemployment insurance; Type, number, and compensation of occupational accidents and diseases. Type and number of grievances; and Type and number of instances of disciplinary actions.	Quarterly	Contractor' Personnel; and HR Specialist.	Employees' information; Internal Labor Regulation; CBA and other Trade Union/Workers' Organization's documents (minutes of Labor Conference, Social Dialogues, Trade Union/Workers' Organization's Fund, records of Trade Union/Workers' Organization's activities); Labor Contracts; Wage scale and pay slip; Documents on social, health, and unemployment insurance payments; Documents on occupational accidents and diseases; Grievance documents; and Discipline documents.
	Number of local people (separated by gender) working at the Projects	Quarterly	Contractor' Personnel; and HR Specialist.	List of local people (separated by gender)
External monitoring	Performance indicators listed above; and Labor Audit Report; Other indicators upon request by Lender.	Quarterly	HR Specialist	Upon request by the Lender

8.5.1 INTERNAL AUDIT

359. Apart from daily inspection, internal audits at planned intervals will be scheduled to ensure appropriate preventive actions are being taken as planned, and corrective actions are being carried out on a timely basis. The internal auditing program is shown in Table 8-3.

360. The contractor' personnel shall conduct internal labor and working condition management audit quarterly during the construction phase and semi-annually during the operation phase to ensure the performance of the project complies with the applicable standard. The template of the audit checklist is presented in Table 8-3.

Table 8-3: Internal Auditing Program

Sl.	Audit/Inspection	Responsibilities

Joint Venture of



STUP Consultant Pvt. Ltd.
On July 1st, 2021, STUP was acquired by Assystem and rebranded as Assystem STUP.



BCL Associates Limited, Bangladesh

No.		The Project Owner/Lender	The Contractor/Subcontractor/Primary Supplier
1.	Monthly inspection		x
2.	Quarterly self-audit		x
3.	Quarterly audit of Subcontractor/Supplier Management (during the construction phase)	x	
4.	Semi-annual Labor Compliance Self-Assessment (during construction and operation phases)	x	

8.5.2 REPORTING

► Internal Reporting

361. Internal reporting is defined as communication between the project owner, the contractors, subcontractors, and primary suppliers. The internal reporting during construction shall include, but is not limited to:

- Quarterly self-audit report of contractor and primary supplier performance, including subcontractors' performance.
- Annual report of contractor/primary supplier management; and
- Annual report of the project's labor and working conditions management.

362. HR specialists/contractors and primary suppliers shall be responsible for the implementation of corrective actions for issued identified during the audits and assessments. A report on corrective actions implementation status shall be prepared and submitted to the contractor's personnel/HR specialist in the next audits

8.6 GRIEVANCE REDRESS MECHANISM

363. The contractor will assist and take necessary steps for collecting written complaints on behalf of the PIU and coordinate responses to all complaints. Both verbal and written complaints are to be entered into a Grievance Complaint Log as addressed when receiving a complaint all employees shall refer the complainant to the PIU or the resident engineer. The process of GRM is sorted out below-

- The person receiving a complaint shall ensure that the Grievance Complaint Log is completed.
- The form shall then be forwarded to the PIU expert who will assign it a number.
- The PIU expert shall ensure that all actions are made to close out the complaint.
- Information on proposed corrective action sent to complainant (if appropriate); the date the complaint was closed out; and Date response sent to the complainant.
- All complaints shall be responded to in writing, though a verbal response will be provided as well if this is more appropriate in the circumstances (e.g., where the complainant cannot read).
- All complaints must be responded to within two weeks of being received, even if the response is just a summary of what is planned and when it is likely to be implemented.
- Further correspondence should be given once the complaint is closed out.
- The PIU expert through the contractor will be responsible for providing a monthly report detailing the level of complaints and any outstanding issues to be addressed.
- Monthly reports will include an analysis of the type of complaints, levels of complaints, and action taken to reduce complaints.

364. The PIU expert shall file all documentation related to complaints in a file in his office.

8.7 CLOSURE OF THE CONSTRUCTION SITE AND CONSTRUCTION LABOR CAMPS

365. The contractor will hand over the borrowed land to the individuals or government after completing the entire project activities while with complying national or international standards. The closure of the construction site and construction labor camp will be done considering the below aspects-

- ▶ The temporary infrastructure should be demolished considering the baseline environmental aspects after completing the project time;
- ▶ Materials, scarps, debris, etc. should be relocated or vacuumed as per the standard procedure;
- ▶ All of the machinery, vehicles, and equipment should be relocated without hampering the existing environmental features;
- ▶ The land should be handed over by making its natural state like before borrowed;
- ▶ The labor camps should be ensured empty before demolishing and safe exit of the workers will also be ensured;
- ▶ Environmental and social assessment should be conducted after or during the closure of the construction site and construction labor camps for avoiding any environmental and social hazards;

366. Remain wastes from the construction camps should be properly dumped into a designated dumping yard during the closure of the labor camps.

9 EMERGENCY RESPONSE PLAN AND DISASTER MANAGEMENT

9.1 INTRODUCTION

367. Accidents or unforeseen risks to the workforce, local populations, and the environment may occur during project construction. As a result, proper planning from the inception is critical to ensuring a system of coordinated action between contractors, and local governments. Aside from giving emergency direction, unrecognized hazardous situations can exacerbate an emergency, and an emergency response plan can help eliminate them. The planning phase identifies prospective problems that can be addressed before an emergency arises. Furthermore, an emergency response plan raises safety awareness and demonstrates the contractors and sub-contractors' commitment to worker, community, and environment.

9.1.1 PURPOSE

368. The purpose of this Document is to describe the emergency response and crisis management system of project and to provide clear guideline to the Management Team and the Site construction Team for the response to and control of any emergency or crisis associated with company activities. This document is to comply with Jhenaidah-Jashore Road Section (Phase-1) For Western Economic Corridor and Regional Enhancement (WECARE) Program, RHD by implementing a visible management commitment and support in preventing all accidents.

369. The Emergency Response Plan (ERP) is an outline of the procedures to be followed by all workers, employees and visitors at the project area in the event of an emergency which include

- ▶ Control or limit the effect of a range of potential emergency incidents that may occur within the project area;
- ▶ Ensure safe, efficient and orderly evacuation of all persons if deemed necessary;
- ▶ Ensure the safety and well-being of all personnel on the premises at the time of an emergency incident which will include assigning responsibilities for specific actions;
- ▶ Outline the procedures to be followed including communication protocols to ensure all vital information is communicated to relevant stakeholders as soon as possible;
- ▶ Contain and control an emergency incident, so as to minimize the effects on people, property and the natural environment so that normal operations can be resumed; and
- ▶ Define & record emergency training requirements and emergency plan review.

9.1.2 SCOPE

370. This Emergency Response Plan (ERP) will be applicable for all workers, employees and visitors involved in the road construction activities.

9.1.3 REGULATORY FRAMEWORKS AND SAFEGUARDS

371. The relevant provisions under following regulations and guideline will be applicable towards the implementation of the Emergency Response Plan and these are placed in Table 9-1.

Table 9-1: Related Provision and Acts

Reference	Full Title
National Labor Laws	Bangladesh Labor Rules 2015
National Labor Rules	Bangladesh Labor Act 2006

9.2 ROLES AND RESPONSIBILITIES

9.2.1 INCIDENT COMMANDER (IC) - PROJECT MANAGER

- ▶ The Project Manager is the first person in charge of project safety, taking the overall and leading responsibility to manage the safety production works of the Contractor;
- ▶ According to the occupational health & safety plan, combining the actual situation of this project, the Project Manager will establish a sound project organization, perfect the distribution of resource required by this project, and constitute the responsibility system of occupational health & safety production.
- ▶ The Project Manager will ensure the implementation and improvement of safety & health plan/guidelines, also ensure the fulfillment of the related Act, laws and regulations and obligations required by the approved safety & health plan, taking the overall responsibility to the occupational health & safety accident.

9.2.2 SITE EMERGENCY CONTROLLER (SEC) – DEPUTY PROJECT MANAGER

- ▶ Overall control of personnel and resources.
- ▶ The EMT will support and advise the Site Safety Supervision as necessary.
- ▶ Serves as public relations spokes persons, or delegates to some staff member the responsibility for working with news media regarding any disaster or emergency. Also assure proper coordination of news release with appropriate corporate staff or other designated people.

9.2.3 SAFETY ADVISOR- PROJECT SAFETY SPECIALIST

- ▶ The Project Safety Specialist will take charge of the establishment, operation and supervision & inspection of health & safety management plan in the relationship of the Project Manager.
- ▶ The Project Safety Specialist will be in charge of the leading & directing works to occupational health & safety production in project site, taking the direct leadership responsibility to the production, organization and mobilization.
- ▶ The Project Safety Specialist will be in charge of the implementation and realization related to the occupational health & safety management.
- ▶ The Project Safety Specialist will organize training about occupational health & safety management and occupational health & safety knowledge, to enhance the employee's awareness to occupational health & safety, and to enrich the employee's knowledge about occupational health & safety, finally to promote the development of occupational health & safety management.
- ▶ The Project Safety Specialist will be in charge of the compilation and implementation of Safety Management Plan, preparation of monthly security reports, and safety inspection & assessment work in site.
- ▶ The Project Safety Specialist will be in charge of the investigation and settlement to health & safety accidents.

372. An important key to effective emergency response is a communications system that can relay accurate information quickly. To do this, reliable communications equipment must be used, procedures developed, and personnel trained.

9.2.4 SITE EMERGENCY RESPONSE TEAM (SERT)

- ▶ The SERT is an initial response team to any emergency incident onsite and comprises of personnel responsible for firefighting, rescue operations and first aid as specified in the applicable regulatory requirements. The role of the SERT is to:
- ▶ Provide immediate response.
- ▶ Assess the alert level.
- ▶ Make the initial notifications.
- ▶ Secure and contain the site.
- ▶ Co-ordinate with the SEC, Construction Area Supervisors and arriving off-site emergency response personnel.

- ▶ Respond to distress calls and assist in rescue and evacuation;
- ▶ Administer first aid as required and if required, arrange for medical evacuation and other back up as needed;
- ▶ Keep an accurate log of all treatments given and times; and
- ▶ Maintain the response until the situation is resolved.

9.2.5 CONSTRUCTIONS MANAGER

- ▶ To provide support to IC, SEC and SERT;
- ▶ To manage and task additional resources to support construction team;

9.2.5.1 SITE ENGINEERS:

- ▶ Initiate initial response actions if they are the first person on the scene;
- ▶ Restrict access to the incident scene and surrounding area as the situation demands. Take any other steps necessary to minimize any threat to health and safety;
- ▶ Request medical assistance, if necessary;
- ▶ Verify substance released and obtain Safety Data Sheets, as necessary;
- ▶ Coordinate further response actions with Constructions Manager, Site Emergency Controller and Emergency Response Team (SERT).

9.2.5.2 SECURITY COORDINATOR

- ▶ Manage the project security of the onsite workers, employees and visitors;
- ▶ Provide ongoing monitoring of the context and the risks during the emergency;
- ▶ Proactively adapt procedures and policies to the situation in hand;
- ▶ Monitor entry and exit of personnel into and out of premises;
- ▶ Provide security briefings to site workers and employees on a regular basis.

9.2.5.3 LOGISTICS COORDINATOR

- ▶ Coordinate logistic request and material request arrangement;
- ▶ Advises SEC and SERT on logistic issues;
- ▶ Make arrangement for requested transportation; and
- ▶ Coordinate arrangement of domestic requirement – food, refreshments etc.

373. The organogram of the Site Emergency Response Team (SERT) has been presented in Figure 9-1 and Emergency Action Procedure in Figure 9-2 below with the contact details of the SERT has been presented in Annex 9-1.

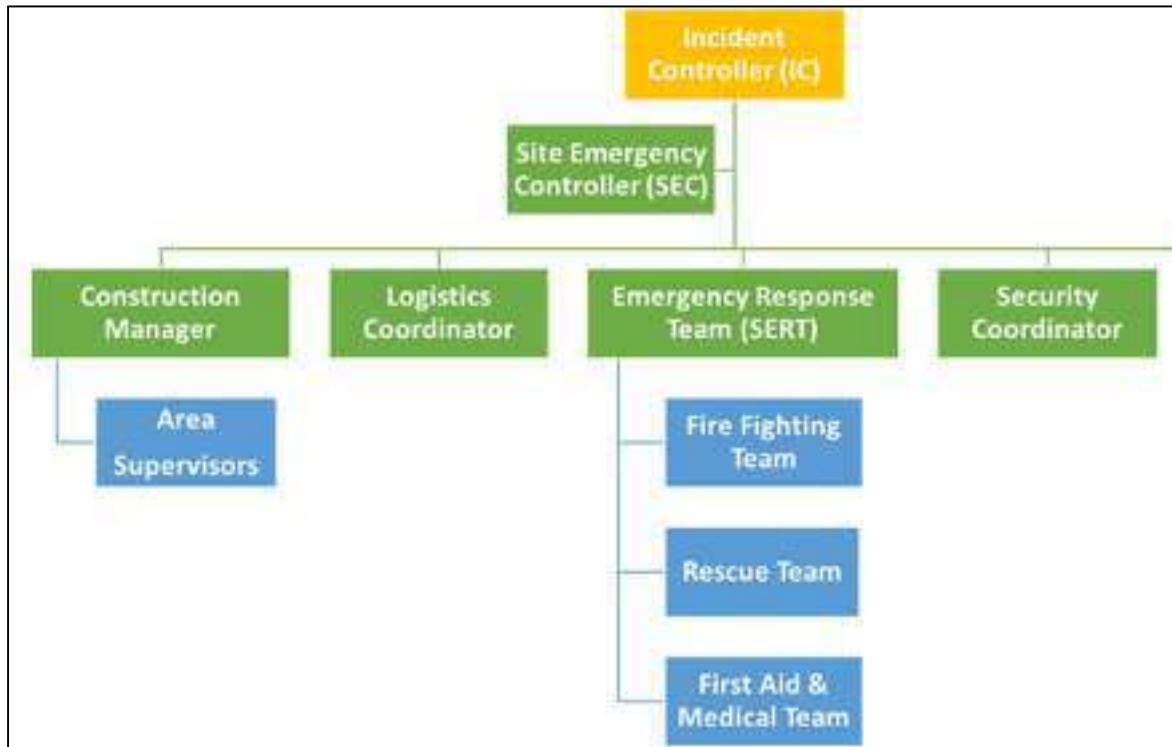


Figure 9-1: Organogram of the Onsite Emergency Management Team (EMT)

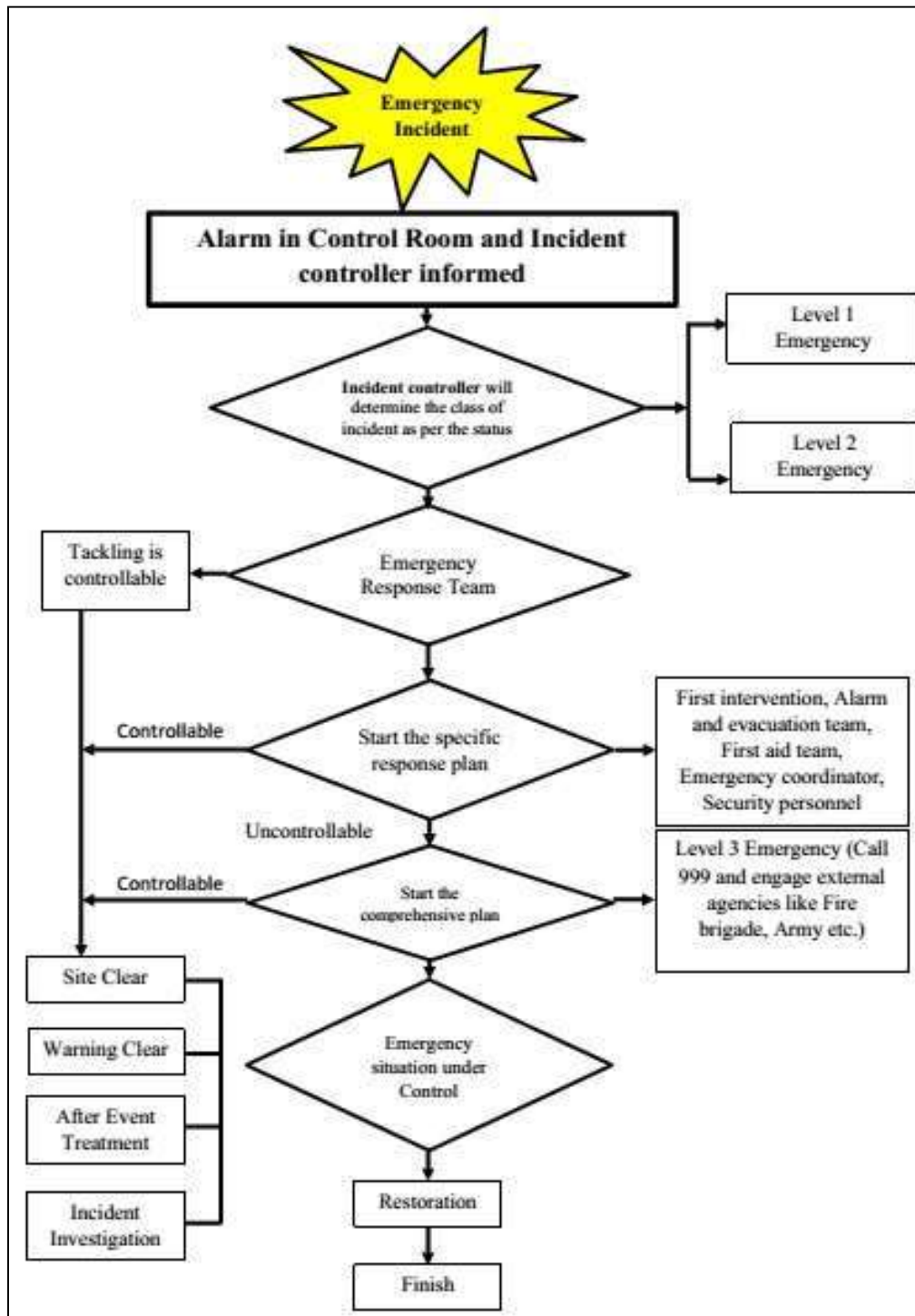


Figure 9-2: Emergency Action Procedures

9.3 PRE-EMERGENCY PLANNING

374. This section provides the potential emergency scenarios that has been identified during site risk assessment exercise and can be faced by sites supervisor/ mangers. Based on the working activities and likelihood, approximate emergency scenario has been presented in Annex 9-2.

9.4 EMERGENCY CLASSIFICATION

375. Jhenaidah-Jashore Road Section (Phase-1) For Western Economic Corridor and Regional Enhancement (WeCARE) Program, RHD project has differentiated the types of on-site emergency scenarios based on the magnitude and severity of the emergencies being considered in the earlier section. The site has categorized three broad levels of emergency scenarios namely:

- ▶ **Level 1:** The emergency is confined to the area of occurrence and can be effectively and safely managed by the emergency equipment and available resources; Site emergency team (SET) will active during this emergency. SET team information presented in Annex 9-3.
- ▶ **Level 2:** The emergency has occurred and has spread to a small area but can be managed by the emergency equipment and resources available at site. Management of head office will involve during this level 2 emergency. SERT team information presented in Annex 9-3.
- ▶ **Level 3:** This is an emergency or an incident which:
 - Cannot be effectively and safely managed or contained at the location of occurrence by available resource and emergency equipment;
 - Additional external support is required as it has the potential to exert effect beyond the site boundary and can be of catastrophic nature;
 - This level of incident and emergency is likely to affect the neighboring population, industries, property and environment outside of the site boundary.
 - The management and control of this emergency scenario requires active support and involvement from country level and district administration.
 - External agency will involve during this level 3 emergency. External agency team information presented in Annex 9-3.

9.5 LEVEL OF PRIORITY

376. The level of response required shall depend upon the seriousness of the incident. For any crisis or emergency occurrence, response priorities shall ensure the protection of:

- [1] First Priority: People
- [2] Second Priority: Environment
- [3] Third Priority: Assets
- [4] Fourth Priority: Contractual and/or commercial arrangements
- [5] Fifth Priority: Project and Partner reputation

377. The Incident Commander (IC) and Site Emergency Controller (SEC) will decide upon the level of emergency and deployment of external emergency responders during emergency scenario. The external agencies as identified by the site are:

- ▶ Fire Service & Civil Defense Station, Jashore
- ▶ Rapid Action Battalion (RAB) unit – 06;
- ▶ Jashore Police Station;
- ▶ Jashore General Hospital.

9.6 EMERGENCY NOTIFICATION & EVACUATION PROCESS

9.6.1 NOTIFICATION

378. The Project Manager must be informed of any incidents on site by the quickest possible means. The Project Director shall be notified of any incident with actual or potential significant off-site impacts on people or the biophysical environment within 12 hours of the Applicant, or other relevant party undertaking the development, becoming aware of the incident. Full written details of the incident shall be provided to the Project Director within seven days of the date on which the incident occurred. The Project Director may require additional measures to be implemented to address the cause or impact of any incident, as it relates to

this consent, reported in accordance with this condition, within such period as the Project Director may require. The emergency contact numbers have been furnished in the Annex 9-1 and Annex 9-3.

9.6.2 EVACUATION

- ▶ Any kind of emergency, evacuation must take place.
- ▶ All personnel and workers shall act in accordance with directions given by Site Supervisors and SERT personnel to evacuate the construction site immediately.
- ▶ All shall move calmly to the nominated assembly area and shall not leave the said area until the all clear has been given by the Site Emergency Controller (SEC) and SERT.
- ▶ If a clear danger exists, emergency services will be called by the Site Emergency Controller (SEC).
- ▶ The Incident Commander, Site Emergency Controller, Site Construction Manager and SERT may reassess the situation for immediate actions to take place.
- ▶ If the designated assembly point becomes endangered, or the evacuees need to remain outside the premises for an extended period, personnel will be relocated to a suitable alternate assembly point at the direction of the IC and SERT.

379. The whole process of evacuation has been depicted in Figure 9-3.

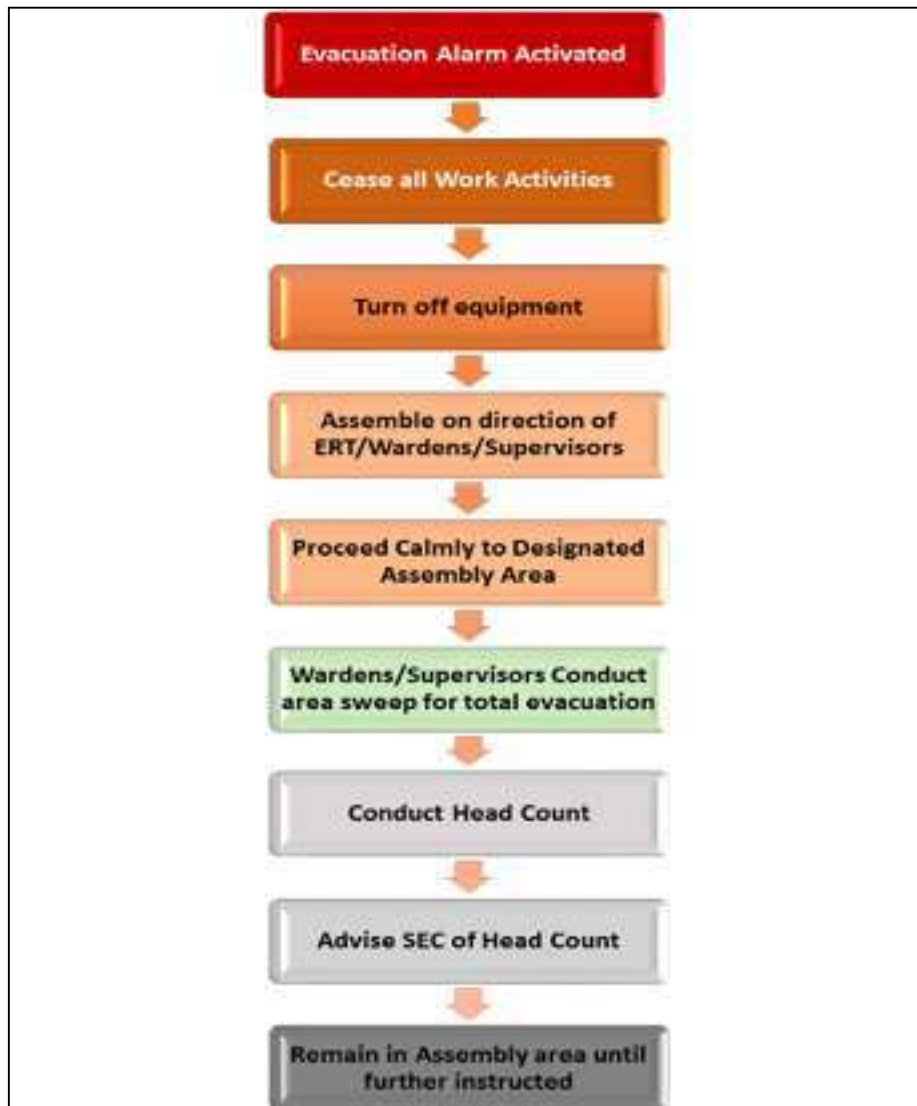


Figure 9-3: Evacuation Process Flow Char

9.6.3 HEAD COUNT

- ▶ After evacuation, all persons on site including visitors and contractors shall assemble at the assembly point.
- ▶ The SERT will conduct a roll call to ensure all persons are accounted for including visitors and workers. The muster roll and visitor register needs to be maintained by the contractor and these will be made readily available to SERT after an emergency.
- ▶ Missing persons list shall be advised to the Site Emergency Controller, who will then advise the Emergency services for their rescue and further action as necessary.
- ▶ No personnel shall undertake search and rescue for missing persons in endangered areas except for the specialized and trained SERT personnel along with external emergency services, if any.

9.6.4 RE-ENTRY

- ▶ Re-entry to the site will not take place until advised by the Emergency Services to do so. This will be relayed to all personnel by the Site Emergency Controller.

9.6.5 EMERGENCY MUSTER POINT

380. The emergency muster point of the Site in different location of the construction site. During an emergency, the personnel of the contractor/sub-contractor workers will be assembled at this emergency muster point. The following safety precautions will be taken with respect to the emergency muster point:

- ▶ The entry of goods vehicles will be stopped during an emergency to minimize exposure to the secondary emergency scenario such as accident owing to traffic movement near emergency muster point.
- ▶ The Site will use physical road barriers to separate this area from any internal traffic movement during an emergency;
- ▶ The SERT will assist the Site personnel (which includes visitors) to reach at the emergency muster point;
- ▶ The security guard at the main entrance will manage the movement of traffic on the site access road during emergency to prevent traffic congestion that may occur by the goods vehicle plying in and out of construction area.

9.6.6 PUBLIC COMMUNICATION DURING EMERGENCY

381. The following safety precautions will be taken with respect to the emergency which demand protection to public:

- ▶ Immediately block the public road for outside the factory and allow the emergency vehicle only.
- ▶ Continuously announce by mike in the nearest community for evacuation if necessary due to the severity of the emergency
- ▶ Call external govt. authority (Fire service & Civil defense, Union perished, Police etc.) to take control on the community according to govt. protocol.

9.6.7 ASSEMBLY POINTS

382. In case of emergency such as fire, non-essential persons and injured persons are evacuated from affected area to the safest area, i.e., at the assembly point. Assembly point is the least affected by down wind direction and near to the road. The senior officer will be in charge of this point. The total capacity of 04 assembly points is to accommodate about 300 persons.

383. Non-essential personnel shall assemble at Emergency Assembly Point as announced by Site Incident Controller. During handling the emergency if more work forces required then from assembly point non-essential person will be call as per the requirement, it will be decided by SMC. All the assembly Points should be identified with the suitable signage which is presented in Figure 9-4.



Figure 9-4: Signage of Emergency Assembly Point

9.7 EMERGENCY RESPONSE FOR TYPICAL EMERGENCIES IDENTIFIED

384. This section describes the emergency response procedure that needs to be implemented during typical emergency situations. The emergency contact number, agency, equipment and training etc. are presented Annex 9-1 to Annex 9-6.

9.7.1 FIRE

385. During any fire incident, the site needs to follow the following instructions to ensure resurrection of the safe working condition:

- ▶ The person who recognizes the fire must activate the nearest fire alarm or inform the construction Area Supervisor;
- ▶ The IC will declare the emergency and activate the Emergency Response Team (SERT);
- ▶ The SERT will assess the alert level and co-ordinate with the SEC, construction Area Supervisors and arriving off-site emergency response personnel;
- ▶ Apart from the trained fire fighters, no other personnel will be allowed at the place of incident. The fire fighters must ensure that they have wear essential PPEs such as safety suit, safety helmet, self-containing breathing apparatus (SCBA) based on the requirement and magnitude of the fire;
- ▶ Disconnect utilities and equipment unless doing so jeopardizes site safety;
- ▶ The fire will be isolated by removing the surrounding inflammable material. This will be done without compromising safety of the fire fighters to the extent possible;
- ▶ The small fires will be extinguished by using appropriate fire extinguisher (based on the class of the fire);
- ▶ The fire hydrant system and on-site fire tenders will be used for the extinguishing the big fires. Storm water lock gate should be remained closed during use of fire hydrant system to prevent exit of water used for fire extinguishing purpose;
- ▶ Rescue and attend the injured personnel and call the medical emergency number, if required.

386. The fire extinguishers to be used based on the types of fire has been enumerated in Table 9-2.

Table 9-2: Types of Fire Extinguisher			
Sl. No	Causing Agent	Classification of Fire	Type of Extinguisher
1.	Combustible Packing Material	Class "A" Fires	Dry Chemical Powder & Water
2.	Petroleum oil	Class "B" Fires	Foam Type
3.	Gas	Class "C" Fires	CO ₂
4.	Metal	Class "D" Fires	Dry Chemical Powder
5.	Electrical Panel	Class "E" Fires	Dry Chemical Powder
6.	Cooking Fire	Class "K" Fires	Wet Chemical Type

9.7.2 FUEL AND CHEMICALS SPILLAGE

387. In case a large chemical Spill has occurred:

- ▶ Immediately notify the designated official such as construction Area Supervisor;

- ▶ The IC will declare the emergency and activate the Emergency Response Team (SERT);
- ▶ The SERT member must wear adequate PPEs prior starting of the spill management procedure;
- ▶ Secure the area and alert other site personnel. If required initiate an emergency evacuation process;
- ▶ No person will be allowed to involve in spill containing activity unless they are trained to do so;
- ▶ Contain the spill with available equipment (e.g., pads, booms, absorbent powder etc.). In case of acid spillage spray, dilute sodium carbonate and plenty of water. In case of caustic spillage spray, dilute citric acid and plenty of water. In case of oil spillage try to stop its flow, close the main valve of the storage tank or isolate the pipeline (in case of leakage from flanges) by blinding. Collect the spilled chemical in container by use of spill kit;
- ▶ Do not allow the flow of spilled chemicals in the storm water drain. Channelize it to Waste water treatment plant through connecting drains after treatment send to ETP.
- ▶ Attend the injured personnel and call the medical emergency number, if required;
- ▶ Dispose of the spilled chemicals in environment friendly manner. If require, consult to the Department of Environment (DoE) Bangladesh in this regard.

388. In case a small chemical Spill has occurred:

- ▶ Immediately notify the designated official such as construct Area Supervisor;
- ▶ If toxic fumes are present, secure the area (with caution tapes or cones) to prevent other personnel from entering;
- ▶ Deal with the spill in accordance with the instructions described in the SDS.
- ▶ Small spills must not be handled without wearing the proper PPEs.

9.7.3 LEAKAGE OF GAS

389. The following procedure will be followed in case of leakage of gas:

- ▶ The person who smells the gas odor or identify the gas leak immediately inform the construction Area Supervisor or directly to IC or SEC; or automatic gas detectors installed in the process areas will activate the alarm automatically after detection of any gas in the process area.
- ▶ An emergency will be declared;
- ▶ Construction Area Supervisors will initiate the evacuation of the workers from the incident scene through safe exit in a disciplined manner. Workers will be instructed to calm and not to be panicked;
- ▶ The SERT will assess the alert level and co-ordinate with the SEC, Area Supervisors and arriving off-site emergency response personnel;
- ▶ For LPG Gas Leakage from the LPG cylinders:
 - Any LPG cylinder which develops a leak should be promptly removed to an isolated open place away from any source of ignition;
 - Cylinder with valve leakage needs must be capped immediately and tagged by mentioning the defect;
 - In case of leak from the LPG pipe, the cylinder regulator knob/ valve needs to be close;
 - Do not try to repair the appliance or any part of the system when pipe line or appliance in use;
 - Use adequate PPEs;
 - Do not use naked lights to detect the leak;
 - In case of heavy Leak, stop all ignition sources in the vicinity and evacuate all the people to a safe area;
 - In case of outbreak of fire, trigger the firefighting procedures as specified in previously.
 - Call first aid team and get medical attention as quickly as possible. In case of any accident such as burn and asphyxiation send the affected people to the OHC and hospital.

390. Risks of hazardous spills and uncontrolled pollution due to the plant's effluents of Construction, phase the mitigation impacts of a hazardous spill's information presented in Annex 9-6.

9.7.3.1 FOR NATURAL GAS LEAKAGE

- ▶ The person who smells the gas odor should inform the concern person;
- ▶ Do not use mobile phone or switch on electrical installation as this could cause an explosion.
- ▶ Evacuate the people from gas leakage surrounding area and send them to a safe area;
- ▶ Immediately contact respective operators who are handling the unit;
- ▶ Instruct operators to close all shutoff and isolation valves and identified the leakages;
- ▶ In case of outbreak of fire, trigger the firefighting procedures as specified in previously.
- ▶ Call first aid team and get medical Attention as quickly as possible in case of any accident such as burn and asphyxiation;
- ▶ Coordinate with the Emergency management team and take action as per their guideline

9.7.4 MEDICAL EMERGENCY

391. In case of any medical emergency

- ▶ If the person cannot walk, then call the emergency phone number for ambulance and assistant. Inform construction manager
- ▶ Provide the following information:
 - ▶ Nature of medical emergency;
 - ▶ Location of the emergency (building, area);
 - ▶ Name of the person, department.
- ▶ Do not move victim unless absolutely necessary.
- ▶ Call the personnel trained in CPR and First Aid to provide the required assistance prior to the arrival of the ambulance
- ▶ In case of rendering assistance to personnel exposed to hazardous materials, consult the Safety Data Sheet (SDS) and wear the appropriate personal protective equipment. Attempt first aid ONLY if trained and qualified
- ▶ Do remember:
 - In case of first and second-degree burn, exposed the affected area under cold water for 15-20 minutes. Do not put any chemical such as toothpaste etc. on the affected area and do not apply synthetic clothing on the burnt surface;
 - Do not use water in case the person is exposed to water reactive chemical;
 - In case of electrocution please follow the following steps to revive the person suffered from electrical shock:
 - Ensure that the source of electrocution is de-energized if the victim is still in contact with the source of electrocution. Do not touch the victim until the source has been removed or disconnected.
 - Apart from the trained first-aiders, do not allow any other person to go near to the victim.
 - Conduct a head-to-toe physical examination of the victim, which will include identification of the different contact points and thermal burn. Burn injuries caused by an arc or thermal wave must be managed as burn injuries.
 - Check if the victim is able to communicate and if he/she is able to talk then ask for if the victim is experiencing any pain or able to move.
 - Assess for any fractures and neurological deficits caused by the shock. Do not move victim in case of any neurologic deficit such as spinal injury; keep the person in lying position unless medical help arrives.
 - In case victim is not able to communicate, then monitor victim's cardiac rhythm. Provide respiratory support to the victim if he/she is not able to breathe properly (asphyxiation).
 - Monitor the cardiac rhythm of the victim and if required start cardiopulmonary resuscitation (CPR) to the victim. The CPR must be given by trained first-aider.

- Based on the impact of the injury transfer the person to the nearest hospital on priority basis

9.7.5 TERRORIST ATTACK OR BOMB THREAT

392. For terrorist attack and bomb threat

- ▶ The person perceiving the attack should immediately call emergency numbers of the police department as provided in the Annex 9-3.
- ▶ Upon receiving such information, the IC will initiate a short meeting with SERT, security and other department. All types of security aspect and safeguards, individual roles and responsibility will be discussed
- ▶ Strengthen security in all entrance along with arms.
- ▶ Prevent any associate from entering the factory.
- ▶ Tell the labors and visitors not to engage with any terrorists.
- ▶ Instruct general workers and management personnel not to touch any suspicious item.
- ▶ Inform SERT, area supervisor or security personnel about presence of any suspicious item.
- ▶ Weapons of mass destruction likely to be employed by terrorists. Do not try to remove, deactivate or detonate any explosive or bomb.
- ▶ If the source of the threat is outside, the SERT will:
 - Reverse-evacuate all people into pre-identified safe location i.e., all the Site personnel will be moved inside of the buildings near of the project (as the conditions inside the buildings are safer than outside)
 - Close all doors leading into such safe location to prevent entry of terrorist;
 - Shut down all utility systems to the building (gas and electricity are the priorities);
 - All people assume the duck, cover, and hold position on the ground;
 - Allow personal and staff to leave at their own discretion once cleared to do so by public safety, emergency management, or military authorities;
- ▶ If the source of the threat is inside the plant the SERT will:
 - Evacuate site personnel to a safe distance outside of building if possible;
 - Follow the primary fire drill route, or the alternate route if the primary route is too dangerous;
 - Instructors and managers take roll after evacuating;
 - Immediately notify the IC of any missing people;
 - No one may re-enter the building(s) until entire building(s) is declared safe by public safety, emergency management, or military authorities.
- ▶ Inform security supervisor about the required safety measures and communicate the same to down the level.
- ▶ Inform local police station and administrative officer immediately and take all types of help required.
- ▶ Call on administrative office of neighboring factory and request for help by providing additional security. Phone numbers are available in emergency contact diary.

9.7.5.1 WORKERS AND LOCAL COMMUNITY AGITATION

- ▶ The person who discovers the unrest should dial the emergency contact number and notify the IC or SEC;
- ▶ IC must warn the site personnel of the unrest and mobilize SERT.
- ▶ The SERT will ensure the safety of labor and site personnel in the immediate vicinity.
- ▶ IC will instruct to seal off the affected area, if possible.
- ▶ The IC will instruct the site security personal to isolate the agitated workers.
- ▶ In case the agitation caused by the local community, the security will close all the entry gates and prevent entry of outsiders inside the site.
- ▶ Based on the magnitude of the issue, IC will call the Jashore Police Station for help.

9.7.5.2 MALICIOUS ACT SUCH AS THEFT AND VANDALISM

393. If MGI receives any information on the malicious act or vandalism caused by the worker (s) then:

- ▶ The worker (s) involve in such activity will be identified and the site security, area supervisor and respective contractor agency must be informed.
- ▶ The designated department will issue a show cause notice.
- ▶ A formal hearing process inclusive of self-pleading will be conducted in presence of IC and other designated personal.
- ▶ If a person is suspected of carrying a weapon to site:
 - The person who believes someone has a weapon should immediately dial emergency number;
 - The person who believes someone has a weapon should immediately notify the IC and/or area supervisor and nearest security person;
 - If suspect threatens another person with a weapon, do not engage to disarm them and remain calm;
 - The security person will dis-weapon the worker in case they are carrying any weapons if possible;
- ▶ In case of any fight among workers:
 - The person who witnesses an assault or fight should dial emergency contact;
 - Notify the incident to Commander (IC);
 - IC will initiate emergency response and security and SERT will be deployed to diffuse the situation;
 - The security and SERT should seal off area where assault/fight took place, if possible;
 - The SERT will document all activities and ask victim(s)/witness (es) for their account of incident, including details such as weapon use, physical injury causing substantial pain or impairment of physical condition.
- ▶ Based on the magnitude of the issue the local police station will be involved and involved person may be handed over to them.

9.7.6 COVID-19 SITUATIONS

394. Coronavirus disease 2019 is a novel (new) strain of coronavirus that was first identified in Wuhan, Hebei Province, China. According to the updated clinical and epidemiological features of the emerging virus, the novel coronavirus is considered to be very similar to many coronaviruses that are typically transmitted from animals to humans. However, this novel virus is reported to have been transmitted from human to human with a course of illness that ranges from mild to moderate symptoms in the majority of people with the infection. Nevertheless, severe symptoms and complications or even death may occur in people who suffer chronic diseases and lowered immunity.

395. Official names have been announced for the virus responsible for COVID-19 (previously known as “2019 novel coronavirus”) and the disease it causes.

9.7.6.1 SYMPTOMS

396. The following symptoms may appear 2-14 days after exposure*

- ▶ Fever
- ▶ Cough
- ▶ Throat Sore
- ▶ Running nose
- ▶ Shortness of breath/ difficulty in breathing

*This is based on what has been seen previously as the incubation period of MERS-CoV viruses

9.7.6.2 MONITORING

- a) Once the workers reach the construction site, they are given a brief site safety training that includes the following:
 - ▶ The signs and symptoms of COVID-19 and how the disease is potentially spread, including the fact that infected people can spread the virus even if they do not have symptoms.

- ▶ Information on appropriate social distancing and hygiene practices, including:
 - ▶ Avoiding physical contact with others and maintaining a distance of at least 3 feet whenever possible.
 - ▶ Appropriate cleaning practices (i.e., washing hands frequently with soap and water for at least 20 seconds, or, if soap and water are not immediately available, using alcohol-based hand sanitizer and rubbing hands until they are dry;
 - ▶ Alternatives to shaking hands upon entry, and the importance of workers not touching their own faces (mouth, nose, eyes).
 - ▶ Wearing masks over their noses and mouths to prevent them from spreading the virus
 - ▶ Removal and disposal of any PPE being used.
 - ▶ The importance of staying home if they are sick.
 - ▶ The importance of cleaning and sanitizing the frequently touched surfaces like tools, handles and machines.
 - ▶ The need to report any safety and health concerns.
- b) Worker screening is done (checking body temperature with infrared thermometer) to reduce sick workers entering the job site;
- c) A record is maintained of who is at the construction site and when. In the event of a worker contracting COVID-19, these records will be utilized to inform those who may have come into contact with that person;
- d) While construction is ongoing supervisors keep a close watch and monitor adherence to social distancing by the workers. When required the workers are split into smaller groups to adhere to the 2m or 6ft social distancing rule;
- e) To the extent possible, lunch break times are also staggered so that large group of workers does not sit at one place

397. Social distancing and physical distancing are explained to the persons working the field. However, they were advised not to leave the working vicinity as well as the labor shed. If anyone have to leave the site, they must maintain quarantine.

9.7.6.3 EMERGENCY RESPONSE

398. All employees must use site emergency contact number and any sign of Covid-19 cases must be report to concern departments including Contractor, Sub- Contractor and other stakeholder. In case of any suspected cases, Corona specific call center No-**16263 (DGHS)** or **333** must be contacted.

9.7.7 EARTHQUAKE

▶ During an Earthquake event

- Stay calm and await instructions from the Emergency Coordinator or the designated official.
- Keep away from overhead fixtures, windows, filing cabinets, and electrical power.
- Assist people with disabilities in finding a safe place.
- Protect your head.
- Evacuate as instructed by the Emergency Coordinator and/or the designated official.

▶ After the Earthquake Event

- Visually inspect the structures such as buildings, storage tanks for any visible cracks. Identify critical and weak areas of the building and organize to support them adequately to prevent collapse.
- Isolate electrical supply if required.
- Isolate all pipelines of steam, natural gas etc. in case of any leakage.
- Empty such tanks, which are found in relatively unstable conditions.
- Take a review of material storage and ensure that stored materials are kept in safe manner.

- Ensure that LPG cylinders are removed from manufacturing areas and stored in the designated shed in safest manner. Also identify leaked cylinders if any
- Immediate ready to use all Emergency equipment like stretchers, breathing equipment, PPEs, Dewatering, portable welding gas cutting equipment, Spill kits, emergency lights, Battery-operated public-address equipment, ropes, lifting tackles, trolleys, emergency medical equipment, etc.
- Inspect hazardous chemicals storage area to comply with normal storage safety requirements. Also, inspect secondary containments and restore their integrity wherever necessary.
- Inspect the firefighting equipment provided at site.
- Inspect if the electrical panel and other sources of ignition for any fault and damage
- Ensure that flammable liquids i.e., Petrol, Diesel and other petroleum products are stored under secondary containment with due precautions.

399. After such inspection notify the top management about the damage that has been identified.

9.7.8 FLOOD

400. In case of any flood, incident flood alert communication procedure will be initiated as discussed below:

- ▶ Red Alert: This will be triggered when floodwater level will raise within 1 feet of working site level. All preparations for temporary protection to be started at this state. This includes:
 - Giving sufficient notice to evacuate prior to flooding;
 - Initiate protection of raw materials, finished good, critical equipment, records and electronic equipment as best as possible;
 - Take normal actions for building evacuation and proceed to safe location;
- ▶ Orange Alert: This will be triggered when floodwater level will raise within 2 feet of working site level. During red alert:
 - Evacuate all affected spaces immediately;
 - Relocate to a safe place on the upper floors of the building;
 - Prevent personnel to wade through flood waters of any depth;
 - Do NOT try to leave the building in a car. In case anyone needs to evacuate, he/ she must wear life-jackets or similar flotation devices.

401. The general emergency instruction for flood emergency is furnished below:

- ▶ Evacuate the people from flooded area and send them to a safe Area.
- ▶ Switch of the power supply from effected area.
- ▶ Remove obstructions from the drain.
- ▶ Coordinate with the SERT and take action as per their guideline.

402. Based on the magnitude of the flood incident the IC and SEC will decide upon involving outside agencies during flood scenario based on the emergency classification as mentioned above.

9.7.9 WIND STORM

403. The nature of the wind storm provides for more warning than other natural and weather disasters. The following responses needs to be implemented:

- ▶ **Once a storm alert has been issued**
 - Stay calm and await instructions from the Emergency Controller or the designated official
 - Continue to monitor local weather station and radio stations for instructions.
 - Stay away from the river side.
 - Collect drinking water in appropriate containers.
- ▶ **Once the storm has arrived**

- Remain indoors specifically in small interior rooms on the lowest floor and without windows,
- Stay away from doors and windows, and potential falling objects such as electrical poll, scaffoldings, cable tray etc.

► **After the cyclone**

- Inform to Emergency Management Team to investigate the property loss for further action;
- Immediately notify the SERT for any missing personnel

404. Based on the magnitude of the wind storm incident the IC and SEC will decide upon the level of emergency and deployment of external emergency responders.

9.8 EMERGENCY RESPONSE EQUIPMENT

405. The Site uses following emergency response equipment namely:

► **Firefighting Equipment:** The firefighting equipment includes:

- Fire extinguishers;
- Hose reel and fire hydrant boxes;
- Fire water tank;
- Fire pumps;
- Fire tenders;

► **Personal Protective Equipment (PPE)**

- Fire retardant suits;
- Self-Containing breathing apparatus;
- Safety helmet, safety goggles, safety vest.

► **Medical Aids**

- Ambulance;
- First aid boxes.

► **Spill Control kit.**

406. The detail list of the emergency equipment is furnished in the Annex 9-4 of this response plan. All the emergency response equipment specified in the Annex shall be inspected and maintained on a monthly basis and records maintained.

9.9 EMERGENCY RESPONSE TRAINING

407. The aim of emergency response training is to build the capacity of Project employees, to improve preparedness and response at all levels before during and after emergencies. The focus of emergency response training is generally on improving the technical skills of the participants, but also on personnel and team management. It also aims to improve coordination of emergency response and the quality and availability of emergency management tools/equipment.

408. In accordance to the relevant provision of the Bangladesh Labour Act, 2006 and Bangladesh Labour Rules, 2015 all workers or at least 18% of the workers employed in project shall be trained on the following emergency response aspects:

- Fire-fighting;
- Emergency rescue operation;
- First aid; and
- Portable fire-fighting equipment usage.

409. The trained workers shall be divided into fire-fighting team, rescue team and first aid team (6% members in each team) and records related herewith shall be preserved in accordance with Form 22 (Annex 9-5) of the previously mentioned Rules.

410. The members of firefighting team, rescue team and first aid team shall wear the prescribed uniform while conducting their respective operations and the dress code shall be as follows:

- ▶ Firefighting team: yellow coloured apron, in rear of which 'FIRE' shall be written in red colour.
- ▶ Rescue team: yellow coloured apron, in rear of which 'RESCUE' shall be written in red colour.
- ▶ First aid team: White coloured apron, in rear of which 'FIRST AID' shall be written in red colour.

9.10 EMERGENCY DRILLS/EXERCISES

411. Fire drills and emergency evacuation drills shall be arranged at least once in every six-month period and records of such drills shall be maintained in Form 22 in the Annex 9-5. In addition, the concerned Inspector and nearby Fire Service Station shall be informed minimum 15 days before such drills are held.

9.11 EMERGENCY COMMUNICATION

412. Clear communication is essential during an emergency. Multiple methods need to be use during an emergency as one single method of communication may not be able to communicate the emergency to the designated site personnel and off-site agencies in a timely manner. The Site has provided emergency and warning signage at conspicuous locations of Site to make Site personnel aware about the:

- ▶ Potential hazards and risks pertaining to their operation and activities;
- ▶ Pertinent risks present at a particular area;
- ▶ Emergency escape route.

413. The Site has displayed emergency related signage such as:

- ▶ Emergency exit signage;
- ▶ First Aid Box Signage;
- ▶ Flootation Device Signage;
- ▶ Fire Extinguisher & Hydrant Signage;
- ▶ Safe Mustering Point Signage

414. In case of an emergency, the emergency communication will be initiated. The emergency communication:

- ▶ Must be made in simple language;
- ▶ No code word should be used

415. The methods of communication at site to notify all personnel during an emergency include:

- ▶ Emergency siren;
- ▶ Manual Call Point
- ▶ Public address system;
- ▶ Mobile phone, land line and intercom;
- ▶ Two-way radio or wireless system;

416. The IC will evaluate the emergency and determine the best method to notify the site personnel of the emergency. The on-site and off-site emergency contact numbers are furnished in the Annex 9-1 and Annex 9-3 of the response plan.

9.12 AUDIT AND EMERGENCY RESPONSE PLAN REVIEW

417. IC and SEC will annually review this Plan along with the other members of the Emergency Response Team (SERT). In addition, IC will also be involved in monitoring the following performance indicators to assess the effective implementation of the procedure:

- ▶ Emergency drill records; and
- ▶ Training records.

418. **Audit:** A periodic audit dedicated to assessing the overall integrity of the emergency management system shall be conducted. Plant Managers shall be responsible for resolution of matters arising from such audits and for implementation of corrective action/s.

10 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

419. The objective of the environmental and social management plan (ESMP) is the effective implementation of the mitigation measures and is also a key to the sustainable development of the project. The desired result for achieving sustainable development is difficult to achieve without a management plan.

420. The proposed ESMP covers the potential impacts identified during the study, mitigation measures to reduce/mitigate intensity of impacts, responsibility matrix for mitigations, and budgetary cost estimates for the project construction and operation phase. The different agencies identified are as for proper implementation of ESMP.

421. The PIU of RHD will be the main coordination body for implementing the ESMP during the preconstruction, construction, and operation period (Table 10-1). The individual departments will be approached and coordinated by the PIU to carry out different task such as, tree cutting, tree planting, utility shifting, waste management etc. The ESIA/ESMP will be the RHD.

Table 10-1: Different Agencies for Implementation of ESMP		
Agencies Name	Responsibility	Period
Road and Highways Department	Overall implementation of Project	Overall Pre-construction and Construction Phase
Forest Department	Permission for tree cutting and tree-plantation under social forestry	Pre-construction and Construction Phase
Department of Environment (DoE)	For No Objection Certificate as per the requirement and renewal of ECC	Pre-construction and Construction Phase
Jhenaidah Palli Biddut Samity (JPBS), Jashore Palli Biddut Samity (JPBS), West Zone Power Distribution Company Limited, Bangladesh Telecommunications Company Limited (BTCL), Power Grid Company of Bangladesh (PGCB)	Electric Poles and Telephone Cables Shifting	Pre-construction
District Administration	For taking up joint verification	Pre-construction and construction phase
Zila Parishad	Tree cutting	Pre-construction stage
Municipalities	Solid Waste Management	Construction phase
Union Parishad	Solid Waste Management	Construction phase
Bangladesh Water Development Board (BWDB)	Permissions for sourcing of water for construction activities (Surface Water or groundwater), if required joint verification	Construction phase
Inland Water Transport Authority, Bangladesh	No Objection for construction of Bridges for maintaining clearance	Pre-construction stage

10.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

422. The environmental and social risk clauses emphasizing the requirements for environmentally responsible construction and specify the need for the contractor to apply the mitigation and monitoring measures as defined in the ESMP. The proposed plan covers the following phase project:

- Design/pre-construction phase
- Construction phase
- Operation phase

423. **Design/Preconstruction Stage Activities:** Design stage requires most surveys/field investigations/meeting and desktop work for designing the project, there will not be any major impacts on the

existing environment. Similarly, the pre-construction stage is pertaining to the mobilization of contractor, Construction Supervision Consultant (CSC), engagement of NGO for supporting RHD for implementation of Resettlement and Rehabilitation and Land acquisition work. However, prior to mobilization of contractor, RHD needs to undertake various activities to provide encumbrance free alignment which involves demolition of structures, tree cutting, utility shifting, compensation to be paid to the project affected persons (PAPs) etc. Some of the activities do not require any specific mitigation but activities tree cutting, and utility shifting requires mitigation measures which has been discussed in the proposed updated ESMP.

424. **Construction Phase:** Construction stage activities require careful management to avoid environmental impacts. Activities that trigger the need for environmental measures to be followed include:

- ▶ Implementation of site-specific mitigation/management measures
- ▶ Monitoring the quality of environment along the construction sites (as air, noise, water, and soil & Sediment).

425. There are several other environmental issues that have been addressed as part of good engineering practices, the costs for which have been accounted in the engineering costs. They include improvement of major & minor junctions, roadside drainage, provision of additional cross drainage structures or raising the road height in low-lying stretches, provision of bus stops, provision of soil erosion prevention measures etc.

426. Therefore, these mitigation measures shall be included in the contract document of contractor for its implementation by the contractor and for the sustainable development of project.

427. To implement it properly, it is suggested that non-compliance shall be considered as major lapse from the contractor for which they need to be penalized. All lapses pertaining to the clearances/NOCs obtained by the contractor shall be deemed as a major non-compliance. They must ensure all these approval/NOCs are valid throughout the construction stage/liability/maintenance period. Contractor needs to follow the conditions stipulated in the environmental clearance (EC), consent to establish (CTE) and Consent to operate (CTO) other approvals given by the regulatory authorities.

428. **Operation/Post Construction Phase:** it includes monitoring and evaluation of the ESMP measures, maintenance of shrubs and trees. An update ESMP for pre-construction, construction, and operation/postconstruction phase has been Table 10-2

Table 10-2: Environmental and Social Management Plan

Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
A	Design stage/Pre-construction Stage					
A-1	Design Consideration	▶ Regular interaction with the design team ▶ Considering the hydrology of area, 19 new culverts are proposed, and the size of culverts has also been increased to meet the cross-drainage requirement. ▶ Issues pertaining to Pedestrian safety and road safety measures have been addressed by providing such as vehicular underpass, pedestrian over pass (POP), Flyovers, etc. ▶ Culverts of adequate spans have been provided to meet the requirement of animal crossing. ▶ Ensure road design, embankment height; Pavement design to comply the relevant international and national approved design manual of RHD Geometric Design Standards Manual (Revised-2005); AASHTO “A policy on Geometric Design of Highway and Streets” 2001, etc.; ▶ The Bangladesh National Building Code (BNBC) should be considered for designing of road infrastructures, particular all buildings and building	Design consultant/ E&S consultant	PIU	Design stage/Pre-construction Phase	Geometric Design Standards Manual (Revised-2005); Bangladesh National Building Code; Road Master Plan; National Road Design Standard and Manual
A-2	Land Acquisition and clearance of Private structure	▶ Approximately 299 acres of land to be acquired for the widening and strengthening. ▶ Livelihood of affected persons will be affected due to LA. ▶ Livelihood restoration plan has been suggested to mitigate the impacts in Resettlement Action Plan (RAP) along with its budget. ▶ Skill Development Plan has also been included in LRP. ▶ Special support for the disadvantaged/marginalized groups has been kept in the RAP. ▶ Provision for compensation for squatters and encroachers have been made in the RAP. ▶ Payment of Cash Compensation under Law (CCL) by DC to compensate the impacts due loss of land as per RAP. ▶ As per RAP, payment of Top UP (Replacement Value (RV)/Cost minus CCL where RV is higher than CCL) by RHD with assistance from I-NGO.	INGO	PIU	Design stage/Pre-construction Phase	National Land Use Policy 2001; The Acquisition and Requisition of Immovable Property Act, 2017 (ARIPA); Khas Land Policy 1997; Vested Property (Repeal) Act 2013

Table 10-2: Environmental and Social Management Plan

Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
A-3	Issues from stakeholder Consultations	▶ The participant agreed for the project provided that proper compensation shall be given to them for their land etc. ▶ Fair and hassle-free compensation shall be paid as per RAP. ▶ A non-governmental organization namely “INGO” has been engaged for facilitating the implementation of RAP and LAP. ▶ Notice has been kept 3-4 months ▶ Participant agreed for removal of the trees since they are very old and could pose risk/injury/causality by falling tree branches during cyclone. ▶ As per demand of Stakeholders, VOP, POPs, fly over, ROB, and service roads are provided in the design. ▶ Side drains about 50km in length in urban or rural residential areas have been provided. ▶ Bridges and culverts of adequate capacity has been provided in the design, ▶ Road safety measures along with necessary road furniture are provided in the design. ▶ Compensation shall be paid; livelihood restoration measures are suggested in RAP.	NGO/RHD	PIU		
A-4	Issues pertaining to the CPRs	▶ There is total 80 number of CPRs (29 in contract -1, 26 in contract -2, 25 in contract -3) such as mosques/schools/ temples/clubs etc. falling within the corridor of impact which need to be shifted. ▶ A non-governmental organization namely “NGO” has been engaged to facilitate the CPRs shifting. ▶ Payment of Cash Compensation under Law (CCL) for affected structures by DC for relocation of the structures as per RAP ▶ Payment of Top up (Replacement Value/Cost minus CCL where RV is higher than CCL) for structures by RHD with the assistance from NGO as per RAP. ▶ If there is any loss of water body, proper compensation will be given by DC/RHD with assistance from NGO as per RAP.	NGO	PIU	Design stage/Pre-construction Phase	
A-5	Tree-cutting ▶ Loss of mature tree species (14008),	▶ Necessary permission from the concerned agency shall be obtained before cutting the trees. ▶ Identified/marked trees shall be removed	FD/Zila Parishad	PIU	Pre-construction Phase	National Environmental Policy 1992; The

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Table 10-2: Environmental and Social Management Plan

Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
	Contract 1: 5853 Contract 2: 5270 Contract 3: 2885 ➤ 34268 private trees are to be removed. Contract wise details is as follows” Contract 1: 20953 Contract 2: 10199 Contract 3: 3116 ➤ Loss of common species such as Rain tree, Mahagoni, babul, neem, mango jackfruit, debdarr, deoa, dumur, gamari, ipilipil, jalpai, jam, khejure etc, ➤ No-endangered/threatened species are to be affected. ➤ Loss of nest/resting/feeding sites of birds ➤ Decrease in carbon sequestration	➤ No trees will be cut beyond the toe lines ➤ The tree plantation will be undertaken during construction phase in lieu of avenue of tree removal. It will be carried out in 1:3 ratio i.e., three (3) saplings for one tree cutting. About 42,000 trees are to be planted under the project as given in subsection ➤ For private trees compensation will be paid by DC to titleholders and RHD will disburse to the non-titleholders as per RAP. ➤ 95% survival rate shall be considered for release of tree plantation. ➤ Contractor shall be responsible for six (6) years maintenance of tree plantations. ➤ Shrubs Plantation on medians 27000 (Contract 1), 20640 (Contract 2) and 5460 (Contract 3) & its maintenance by Khulna Zone. ➤ Shrub Plantation and grass carpeting in embankment slopes including maintenance of trees. ➤ Total 48,700 trees (18,000 in Contract 1, 27,000 in Contract 2, and 3700 in Contract 3) will be planted. ➤ 60% of Tree plantation (refer to Section 10.3) will be carried out by the Forest Department under social forestry as well as arboriculture department RHD. 40% of tree plantation will be undertaken in project by the contractor. ➤ Necessary tree guards shall be provided to protect saplings. ➤ The maintenance of trees will be carried out by the same contractor under supervision of Khulna Zone. ➤ Watering of the tree plantation will be ensured. ➤ Cluster plantations need to be considered in the community lands such as ponds/mosques or at other locations desired by the community. ➤ All realignments shall be enhanced with the tree plantation, ➤ Trees will be planted as an enhancement measure around the ponds or LGED link roads and vegetative noise barriers along the sensitive receptors in consultation with the stakeholders as per the requirement by the contractor ➤ Tree plantation around the monuments along with other enhancement measures shall be undertaken in the project.				Forest Act 2000; National Forest Policy 1994; The Private Forests Ordinance 1959; Bangladesh Wildlife (Conservation & Security) Act, 2012

Table 10-2: Environmental and Social Management Plan

Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		▶ Fast growing native trees will be planted to improve the carbon sequestration ▶ The contractor shall take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora and fauna. ▶ While clearing vegetation it must be ensured that no faunal species like, mongoose, fox, squirrel etc. injure and/or die. ▶ While removing the tree, if any endangered or endemic species is sighted immediately the work shall be stopped. The name of the species etc. need to be reported to the nearest forest department through RHD. ▶ Sacred tree (banyan etc.) will be cut as per the stakeholder consultations. ▶ About 6Km away in Mallikpur village there is a protected tree notified by the forest department, thus contractor shall take all necessary precautions in consultation with the forest department. Borrow areas/construction camp/labor camp shall be 3000m away from this protected tree. Cartage of construction material nearby this tree shall not be allowed. ▶ The responsible agency (Forest department, Zilla parishad etc.) to prepare tree cutting plan showing schedule of tree cutting, locations of dumping and transportation of log within their jurisdiction. Trees to be numbered/marked before cutting. ▶ During tree cutting proper OHS measures to be ensured by the contractors by arranging appropriate PPE (Helmet, gloves, eye shield, boots etc.) for the workers. In case of using any electrical/other types of saws, necessary safety measures must be taken to prevent accident. ▶ The trees should be cut in such a way so that pavement, nearby structures, utility lines, road furniture etc. are not damaged by fallen branches/logs. If needed local electric lines may be disconnected for a short period with prior intimation to the local authority/people.				

Table 10-2: Environmental and Social Management Plan

Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		▶ Tree-cutting to be coordinated with the local authority and Police for traffic control and to ensure CHS. ▶ Pits/holes created due to removal of trees must be filled up to avoid accident. ▶ Logs/chopped trees to be kept away from the shoulder and roadside so that it doesn't hinder smooth flow of traffic. ▶ Adequate safety measures need to be ensured by the contractors once these logs are loaded to vehicles and during transportation. ▶ First aid /medical facilities to be arranged by the contractors to deal with any accident/injury. ▶ RHD to regularly monitor the tree cutting activities and submit monthly progress report to WB				
A-6	Utilities Shifting ▶ About 953 electric poles are to be shifted (Contract 1 – 361 electric poles, Contract 306 electric poles, Contract 3 – 286) ▶ Increase in ambient air quality due to operation of heavy equipment ▶ Increase in Ambient Noise Levels due to operation of excavator, concrete mix, traction of electric lines ▶ Short term impacts due to temporary power cuts during	▶ Well maintained and good working condition machines and equipment meeting the pollution board requirement shall be deployed at site during erection of electrical poles. ▶ Warning signboards shall be placed at visibility locations. ▶ Proper safety measures should be adopted during implementation of the utility shifting so that accidents of workers, technicians and local people can be avoided. ▶ All workers and project personnel should use PPE at the site. ▶ Utility shifting plan will be prepared by the design team in consultation with the responsible agencies like - Jhenaidah Palli Biddut Samity (JPBS), Jashore Palli Biddut Samity (JPBS) and Bangladesh Telecommunication Company (BTCL) for relocation of the utilities ▶ Utility shifting shall be done as per the agreed Utility shifting plan ▶ The contractor in consultation with the responsible agencies and RHD will inform the local people about the schedule of the utility shifting prior to start of the work ▶ Any grievance / complain shall be recorded and resolved by the competent authority as soon as possible. ▶ To reduce the impacts, shifting shall be carried out in phases	Jhenaidah Palli Biddut Samity (JPBS), Jashore Palli Biddut Samity (JPBS), West Zone Power Distribution Company Limited, Bangladesh Telecommunications Company Limited (BTCL)	PIU	Design stage/Pre-construction Phase	

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	the shifting of utilities like electric poles. ► For a few days there may be problem of street lighting, residential, commercial and bazar areas ► Shifting of underground cable fault may be anticipated ► Generally shifting of Optical Fiber Cables may create any communication problem due to damage during relocation. ► Shifting of utilities may block the access to the houses and business centers and health center. ► Erection of electric poles may cause inconvenience, block the access to the Public/Community. ► Storage of construction material on road may pose risks. ► Safety issues of the	► Excavation/concreting for erecting the electric poles shall be planned in such a way that it shall not disturb the movement of the local people and traffic. ► Installation of the electric poles and cables holders shall not be done in such a way that it shall not disturb or a concern of safety for the children playing in park or going to schools ► Shifting shall not disturb access to the religious place, community halls, municipal service, local water source etc. as well as tourist location/spot. ► No material shall be so placed/stored which may pose a risk or cause inconvenience to any person or the public. ► Safety to the community while working near the residential/commercial areas ► Proper access to the community/public shall be provided.				

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	workers, technicians, and residents					
A-7	Cross-drainage Structures and drainage	Contract wise cross-drainage structures is follows: - Contract 1: Bridges: Nobo-Ganga River at 1+200 km Begobati River at 9+170 km Culverts: 22 reconstructions - Contract 2: Bridge: Chitra River at 16+400 km Culverts: 19 reconstruction - Contract 3: Bridges: Lower Bhairab at 35+750 km Culverts: 12 reconstructions +2 New Culverts Side drains in the urban areas have been provided.	Design Consultant	PIU	Design stage/Pre-construction Phase	The Embankment and Drainage Act 1952
A-8	Environmental Monitoring	The monitoring of air, noise soil and water has been carried out at different locations along the project corridor. This will serve as a benchmark for monitoring during construction and operational phases.	E&S consultant	PIU	Design stage	Environmental Conservation Act 1995; Environment Conservation Rules 1997; Environmental Courts Act 2000
A-9	Road safety issues. - Poor road geometry - Mixed Traffic (fast moving and Slow moving)	- Geometric improvement has been incorporated by the design engineer. Slow moving vehicular traffic lane, Bus bays, Vehicular Over passes (5#VOP), Two foot over bridges (FOB), pedestrian over pass six (6) numbers, One Rail over Bridge cum fly one and elevated section along cantonment area. - These are given as per following details: - Contract 1: POP: 2+320 VOP at Alhera More, 03+150 km VOP at Tatul Tola Baza, 05+512 km	Design Consultant	PIU	Design stage/Pre-construction Phase	National Land Transport Policy; RHD's Road Master Plan; National Road Design Standard

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		FOB at Tatul Tola More, 06+760 km POP at Naldanga –Gariwala Road, 11+445 km POP at Bakulia, 14+970 km ► Contract 2: VOP at Kaliganj, 16+822 km POP at Amin Electronic More, 19+890 km POP at Keya Bagan Bazar, 22+740 km VOP at Roghunathpur 24+840 km POP at Boro Bazar, 28+715 km POP at Mandartula ► Contract 3: POP at 34+610 VOP at Churamon Kathi More, 38+445 km Flyover at Cantonment Area, 41+025 FOB at Palbari More, 43+300 km POP at 44+260 ROP cum Flyover at Arabpur Moor and 2 rail crossing) 45+516.274 POP 46+659 km, ► Compliance with International highway for curvature and grading and safety curve at all At Grade U-Turn and bridges approaches ► Sidewalks/pedestrian zones along the road near habitat areas, schools, hospitals, and religious places are needed to be included in the design, which will be further reviewed by EPC contractor;				
A-10	Permission Clearances and	Contractor shall follow the requirement of Environmental Clearance Certification (ECC) in addition to mitigation measures suggested in ESMP herein while establishing the construction camp sites, crusher units, hot mix plants, concrete batch mix plants, WMM plants, work force camps. ► Layout approval for construction camps/labor camps other from CSC ► Permissions for sourcing of water for construction activities (Surface Water), if required ► Extraction of Groundwater, if required ► Contractor shall follow standard procedures as per Bangladesh Labor	Contractor	CSC/ PIU	Design stage/Pre-construction Phase	Environment Conservation Rules 1997; Environmental Courts Act 2000; Bangladesh Labor Act 2006; Bangladesh Labor Rules 2015; and Occupational Health and Safety

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		Act 2006 for labor recruitment				Policies 2013
A-11	Orientation to contractors	Orientation program for the contractor to meet the requirement of ESMP and ESS requirement of WB. The salient features of program are as follows: ▶ Obligations under contract to submit and preparation of Contractor Environmental and Social Management Plan ▶ Regulatory compliance requirements if there is any. ▶ Grievance redress mechanism for both social and environmental issues shall be developed to address the problem at site. ▶ Various plans required under C-ESMP related to standalone Contractors' Occupations Health & safety (C-OHS), standalone Contractors' traffic Management Plan (C- Traffic Management Plan) V, community health and safety, hazardous and nonhazardous waste, camp site management, emergency response, blasting, borrow area, muck disposal, restoration etc. ▶ These C-OHS and C-Traffic Management Plan will be approved before commencement reviewed by the WB. ▶ Labor management procedures to be adopted ▶ Community health & safety aspects at workplace and Reporting requirements etc. under the project. ▶ Stakeholder Engagement Plan, Contractor shall appoint one Environmental safety, Social-cum-Community Liaison Officer and one Health and Safety Officer, both of whom shall solely be responsible for implementation of all ESMP provisions in close co-ordination/consultation with Environmental and Social Specialist in the RHD. ▶ Contractor policy on Gender based violent free environment at construction site or contractor's facilities. ▶ Provision to prevent any form of sexual harassment (SH) or sexual exploitation and abuse (SEA) as per RAP. ▶ Company policy on labor employment.	Contractor	PIU /CSC	Pre-construction Phase	Bangladesh Labor Act 2006; Bangladesh Labor Rules 2015; and Occupational Health and Safety Policies 2013
B	Construction Phase					
B-1	Hot mix plant/WMM/Batching	▶ Hot mix plant shall be installed on downwind side and at distance of 500m away from the residential area.	Contractor	CSC/ PIU	Construction Phase before	Environment Conservation

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
	Plant/crushers ▶ Air pollution, ▶ Fugitive Emission ▶ Noise Pollution ▶ Water pollution/water logging ▶ Safety Hazards	Dust ▶ Batching plants/WMM shall be installed 500m away from the residential area on the downwind side. ▶ These plants shall be at least 500m away from the water bodies or river/canals. ▶ No batching plant /labor camp/construction camps shall be allowed to establish on the banks of river/canal. ▶ To prevent water logging in the batching plant, drainage and sump shall be provided which shall be cleaned regularly. ▶ Hot mix plant shall be fitted with pollution control devices Bag filters etc. ▶ The stack height shall be at least 10m above the ground. ▶ The premises shall be enclosed, and trespassing shall not be allowed. ▶ The contractor shall submit the detailed layout plan for approval to the Engineer before getting into formal agreement with landowners for setting up of such site. ▶ Actions by Engineer and PIU against any non-compliance shall be borne by the Contractor at his own cost. ▶ These plants need to be operated by the skilled and trained staffed which will be ensured by the CSC.			installing the plants	Rules 1997; Environmental Courts Act 2000; Bangladesh Labor Act 2006; Bangladesh Labor Rules 2015; and Occupational Health and Safety Policies 2013
B-2	Labor Camp/construction camps	▶ Labor camps shall be located away from the at least 500m away from the residential areas/waterbodies' like Chitra river, Bhairab river, Naboganga river and Begobati river and wetland. ▶ A detailed layout plan for all such sites shall submit and get approval from the CSC. ▶ Contractor shall prefer to the non-productive lands which has access to the existing roads. ▶ Contractor must make an agreement with the land parcel owner along with the photographs of original land. ▶ Rooms of the labor camps must be properly ventilated. ▶ Hygienic conditions must be ensured in the labor camps ▶ To prevent soil erosion, the construction/labor camps shall not be established on the banks or river or waterbodies. ▶ No timber or wood shall be used for cooking purpose ▶ No illegal tree cutting shall be allowed.	Contractor	CSC/RHD	Construction Phase while establishing the camps	Bangladesh Labor Act 2006; Bangladesh Labor Rules 2015; and Occupational Health and Safety Policies 2013

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		▶ Mobile toilets or toilets with septic tanks shall be provided. ▶ Separate facilities for women workers shall be provided as suggested in B-23. ▶ Either canteen facility or cooking gas shall be provided. ▶ Labor/construction camps shall be properly fenced and informatory board as well as project details shall be displayed at the entrance and exit of the camp. ▶ Water logging shall not be allowed at construction camps/batching plant/WMM plant etc. ▶ Contractor shall display company policy to prevent Sexual Harassment and Exploitation at the workplace or construction camp/site/labor camps. ▶ Gender based violence free environment shall be maintained at site/labor camps/construction camps. ▶ Code of conduct (COC) along with other terms and conditions of employment shall be provided to the workers in clear and vernacular language.				
B-3	Potable water	▶ Potable water meeting the World Health Standards (WHO) shall be provided by the contractor in the construction camps/labor camps/construction sites. ▶ Drinking water quality shall be tested to check its potability to meet the requirement WHO standards.	Contractor	CSC/PIU	Construction phase (entire period)	National Water Policy 1999; Water Reservoir Conservation Act 2000; The Water Act 2013
B-4	Sanitation Facilities	▶ Drains shall be provided. ▶ Proper lavatory facilities for male and female workers shall be provided. ▶ Proper hygienic condition must prevail in such facilities. ▶ The mobile toilet shall be provided at construction camps/labor camp of adequate capacity. ▶ These, if mobile toilets are provided, shall be periodically replenished with fresh water for ablution purposes and wastewater shall be emptied through suction tankers and carried to the nearest municipal sewage treatment facilities or soak pits shall be provided. ▶ Untreated liquid waste shall not be allowed to discharge in to surface water bodies.	Contractor	CSC/PIU	Construction Phase (entire period)	Bangladesh Labor Act 2006; Bangladesh Labor Rules 2015; and Occupational Health and Safety Policies 2013

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures			Implementation Agency	Supervision Agency	Timelines	Remarks	
		Sl. No.	Sanitary Unit	For Male Personnel	For female Personnel				
		1.	Water Closet	1 for every 10 persons	1 for every 1-10 persons				
		2.	Ablution Taps	One in each W.C	One in each W.C.				
		3.	Urinals	1 for 6-20 persons 2 for 21-45 persons 3 for 46-70 persons 4 for 71-100 persons	--				
		4.	Washing Taps with draining arrangement	One for every 10 persons or part thereof					
		5.	Drinking Water Fountains	One for every 30 persons					
		6.	Baths Preferably Showers	As required					
Note: i) One water tap with draining arrangement shall be provided for every 50 persons or part thereof in the vicinity of water closet and urinal or part thereof ii) Crèches where provided shall be fitted with water closets (One for 10 persons or part thereof), wash basins (1 for 15 persons or part thereof) and drinking water tap with drinking arrangement for every 50 persons or part thereof. iii) Toilets must have ventilation system and proper lightening arrangements. iv) Male and female toilets shall be clearly demarcated as “For Men Only” or “For Women Only” along with symbols etc. Source: National Building Code, India									
B-5	Solid Waste Management	▶ Contractor shall undertake segregation of waste at source. ▶ Biological waste from the labor camp/construction camps/or other contractor facilities shall be collected for composting for gardening purpose. ▶ Intermingling of waste shall not be allowed. ▶ The municipal waste shall be disposed to the approved landfill sites only or contractor shall make necessary arrangements with the municipalities/Zila Parishad. ▶ Construction and demolition (C&D) waste shall be disposed to identified and approved locations.			Contractor	CSC/PIU	Construction Phase (entire period)	Bangladesh Solid Waste Management Rules 2021	

Table 10-2: Environmental and Social Management Plan

Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		▶ C&D waste shall not be dumped into the water bodies. ▶ It is envisaged that about 40% of the scarified material will be reused in the sub-base preparation. Rest of the material will be disposed to the approved landfill in consultation with the Zila Parishad, etc. Contractor shall store the usable material properly on impervious platform to preventing mixing with the earth. ▶ Contractor shall prepare a waste management plan ▶ Open burning of solid wastes, whether hazardous or nonhazardous, shall not be allowed. ▶ E-waste shall be collected properly and disposed to approved vendors only.				
B-6	Hazardous Material Management	▶ Oil/fuel shall be stored as approved design and safety protocol applicable in the country. ▶ Entry of unauthorized person shall be prohibited in Hazardous Waste Management areas. ▶ If there is any spillage of hazardous waste, the contractor will remove it immediately. ▶ An area shall be assigned for storing the oil/oily waste or any flammable material. ▶ Smoking shall be prohibited in such areas. ▶ Drip trays shall be provided at DG sets/below the nozzles for fueling the construction vehicles and equipment. ▶ Used oil or hazardous material/flammable material shall be collected in the drums and stored on the impervious platform which is that are sloped or bermed to contain a minimum of 25 percent of the total storage volume. ▶ It shall be disposed to the authorized/approved vendors as per the DOE norms. ▶ Tires shall be stored properly under the shed and shall be disposed to approved vendors. ▶ Transfer of hazardous materials from vehicle tanks to storage shall be carried out in areas with surfaces sufficiently impervious to avoid loss to the environment and sloped to a collection or a containment structure. This shall not be connected to municipal wastewater/storm	Contractor	CSC/PIU	Construction Phase (entire period)	Bangladesh Solid Waste Management Rules 2011; National 3R Strategy

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		water collection system. ► Provision of secondary containment for components (tanks, pipes) of the hazardous material storage system, to the extent feasible, shall be made. ► Periodic (e.g., daily, or weekly) reconciliation of tank contents, and inspection of visible portions of tanks and piping for leaks shall be undertaken. ► Inform the employees about the hazards ► Warning signboards shall be displayed at such locations. ► Awareness training shall be given to workers by Environmental safety health officer of the contractor. ► Material Safety Data Sheets (MSDS) shall be compiled. ► Standard operating procedures (SOPs) for fueling/storing or other operations pertaining to the hazardous material shall be prepared. ► Contractor shall prepare a hazardous waste management plan.				
B-7	Water Resources and Water Quality The following ponds are getting affected: ► Contract-1 Three (3) ponds, one in Bhutiargati village, 2 in Bishoykhali village, Jhenaidah district. ► Contract-2 One (1) pond in Bededihi village, Jhenaidah district	► Water Quality has been monitored during the baseline survey. ► Contractor shall undertake the water quality monitoring as per environmental monitoring program. ► Contractor shall ensure that construction materials like earth, stone, ash, does not block the flow of water. ► Construction camps/facilities shall be kept away as per B2. ► If there is any loss of water body, proper compensation will be given by DC/PIU with assistance from NGO. ► Workers shall not be allowed to pollute the water body. ► No illegal excavation shall be allowed from the bunds of water bodies. ► The water flow will be restored soon after completion of the work. ► No waste will be dumped into the water bodies. ► Oil and grease separators shall be provided near the vehicle washing area/maintenance workshop. ► Drains shall be provided in labor camps/construction camps/workshops and other contractors facilities along with soak pits.	Contractor	CSC/PIU	Construction Phase	National Water Policy 1999; Water Reservoir Conservation Act 2000; The Water Act, 2013; Environment Conservation Rules 1997

Table 10-2: Environmental and Social Management Plan

Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		▶ Silt fencing at the mouth of water body shall be provided. ▶ Side drains have been provided in urban areas ▶ River protection works are provided in the design				
B-8	Clearing and grabbing	▶ Clearing and grabbing shall be restricted to the working area within the toe line. ▶ Further activities need to be planned/ started immediately to prevent fugitive dust emission and soil erosion during monsoon. ▶ Top (15cm) soil shall be preserved to redevelop the areas as per the requirement. ▶ Revegetation/turfing shall be started immediately after completion of the work	Contractor	CSC/PIU	Construction Phase during clearing and grabbing operation	The Forest Act 2000; and National Agriculture Policy 1999
B-9	Borrow Areas	▶ Only identified and approved borrow areas shall be used by the contractor ▶ Borrowing of earth from the cultivable land shall not be preferred. ▶ When borrowing earth from the cultivable lands, the depth of borrow earth shall not be more 45cm. ▶ The top 15cm soil shall be removed and store separately. Thereafter excavation shall not exceed 30cm and topsoil shall be spread over the land. ▶ Borrow areas shall be dug at least 800m away from the habitation. If unavoidable, the depth should not be more than 30cm and should be properly drained. ▶ Borrow pits shall not be dug continuously. ▶ The borrowing of earth shall be used only after having an agreement between the contractor and land parcel owner and must include the photographs of original land. ▶ Haulage of borrow materials will be maintained dust free by sprinkling of water. ▶ The borrow areas shall be 500m away from the toe line of the road. ▶ To reduce the earth requirement, about 40% of the scarified material will be reutilized in the subbase material. ▶ If trees are there, it should be protected by providing slopes in 1:2 around them while borrowing the earth.	Contractor	CSC/PIU	Construction Phase	National Land Use Policy, 2001

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		▶ Side slopes of 1:4 shall be maintained in the borrow areas. ▶ A redevelopment plan shall also be prepared and agreed by the land parcel owner which needs to be approved by the CSC.				
B-10	Loss of topsoil	▶ The topsoil (15cm) shall be removed and preserved for reuse for redevelopment purpose. ▶ Topsoil shall be preserved outside drainage lines and protect stockpiles from erosion by provision of silt fencing and diversion channels. ▶ Use stripped topsoil to cover all disturbed areas and along the proposed tree plantation sites. ▶ Limit equipment and vehicular movements to within the approved construction zone. ▶ Topsoil shall be distributed free to local people who need it for their own purpose. ▶ The residuals shall be reused to form the ground around the interchanges, the areas along the road within the acquired land, or recover the vegetation in some affected areas due to the road project. ▶ The material stockpile sites shall be at 500m away from surface water bodies and areas prone to surface run-off. ▶ Open ditch shall be built around the stockpile sites to intercept wastewater. If necessary, retarding basins shall be constructed to remove sands and other solids in storm water before it reaches the downstream rivers. ▶ Open stockpiles of construction materials (e.g., aggregates, sand and fill material) of more than 50 m³ shall be covered with tarpaulin or similar fabric during rainstorms. ▶ Measures shall be taken to prevent the washing away of construction materials, soil, silt, or debris into any drainage system. ▶ At the start of site establishment, perimeter cut-off drains to direct off-site water around the site shall be constructed and internal temporary drainage works, and erosion and sediment control facilities shall be implemented.	Contractor	CSC/PIU	Construction Phase	
B-11	Soil Erosion	▶ The Contractor shall reuse the excavated soil as much as possible unless the soil is considered not suitable for filling.	Contractor	CSC/PIU	Construction Phase	

Table 10-2: Environmental and Social Management Plan

Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		▶ The Contractor shall plan his works to minimize surface excavation works during the rainy season where practicable ▶ Immediately after completion of work on bridges or high embankments, the slope stabilization measures such as turfing etc. shall be done. ▶ Excavation or similar activities shall not be undertaken during the monsoon period. ▶ Construction and demolition waste shall not be stored near the bridge construction sites, it shall be disposed to approved landfill sites. ▶ Loose materials shall be bagged and covered. ▶ Ground clearance area shall be minimum ▶ Approach road shall be provided in construction facilities to reduce soil erosion. ▶ All exposed earth areas shall be completed and revegetated as soon as possible after earthworks have been completed. ▶ If excavation of soil is unavoidable during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces shall be protected by temporary drainage measures. ▶ Working area shall be clearly marker to restrain the activity within the demarcation area only.				
B-12	Soil Quality	▶ Fuel or other petroleum product shall be stored on the impervious platform. ▶ The movement of construction vehicles, machinery and equipment shall be restricted to the corridor or identified route. ▶ Soil contamination by bitumen, fuel and chemical storages shall be stored them on an impervious base ▶ Any spillage of hazardous material shall be removed and disposed to identified and approved sites. ▶ Soil quality monitoring shall be undertaken as per the Section 10.2	Contractor	CSC/PIU	Construction Phase	
B-13	Operation of Hot Mix Plants/Batching plants/crushers (Air Pollution)	▶ The stack height of the Hot Mix Plant shall be at least 10m from the ground. ▶ Regular maintenance of construction vehicles and equipment/plants shall be undertaken. ▶ The construction vehicles/machinery/equipment shall use only	Contractor	CSC/PIU	Construction Phase while installing plants and their	Environment Conservation Rules 1997; Environmental Courts Act 2000;

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		designated routes. ► DG sets shall be complied with the requirement of department of environment.			operation	Bangladesh Labor Act 2006; Bangladesh Labor Rules 2015; and Occupational Health and Safety Policies 2013
B-14	Movement of construction vehicles (Air Pollution)	► Water sprinkling using sprays shall be done on the unmetallic haul roads. ► Water sprinkling shall also be carried out on the construction sites where the earthwork is unattended for four (4) day especially in summer season. ► Construction vehicles/equipment shall comply with national standards. ► Routine maintenance of pollution to control the emission. ► Low emission construction equipment, vehicles and generator sets shall be used at site. ► Only those construction vehicles shall be used which have valid fitness certificate. ► Vehicles transporting construction material shall be covered by tarpaulin. ► Speed of construction vehicles will be identified in contractors ESMP which will be approved the CSC.	Contractor	CSC/PIU	Construction Phase	Environmental Conservation Act 1995; Environment Conservation Rules 1997; and Bangladesh National Ambient Air Quality Standards 2005
B-15	Noise Environment	► The Contractor shall abide by the provisions of the Specifications of Contract regarding environmental protection and DoE regulations (≤ 60 dB levels at mosque, school, populated area and other sensitive sites). ► Noise generating equipment/plants shall be provided with dampeners. ► Diesel Generating must be enclosed with soundproof acoustic enclosures to meet the Noise standards. ► Construction vehicles/equipment must be fitted with silencers ► Routine maintenance of equipment and construction vehicles shall be carried out. ► Low noise generating equipment/construction vehicles shall be used.	Contractor	CSC/PIU	Construction Phase	Environmental Conservation Act 1995; Environment Conservation Rules 1997; and Noise Pollution Control Rules 2006

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		- Noise monitoring shall be undertaken as per the Environmental Monitoring Program - Workers working in the noisy areas shall be provided with the PPEs and shall wear earplugs. - Contractors' facilities will be sited away from the residential areas/sensitive receptors as mentioned above. - Near the sensitive receptors such as schools/mosques/hospitals noise generating activities shall be carried out after consultation with the management committee or low noise generating equipment shall be used only. - In Residential areas, hospitals etc. noise generating activities shall be prohibited and work shall be scheduled in consultation with neighborhood champions. - Reducing construction vehicles through the residential area in consultation with the local champions - Vegetative noise barriers in the sensitive receptor - Any issue shall be resolved through grievance redressal mechanism (GRM) developed by the contractor.				
B-16	Terrestrial Ecology (Flora and Fauna)	- About 40% of the trees will be planted by the PIU through contractor and 60% of the trees will be by the forest department under social forestry immediately during implementation phase. - Trees shall be planted in the available space in between as per CSC directions. - Limit the construction works within the designated sites allocated to the contractors. - No illegal tree felling shall be allowed at construction site/borrow areas/construction camps/ labor camps. (Refer to B-8 and B-9 above) - The construction activity shall be restricted to only identified areas. - Hot mix plant/construction camps/labor camp/stockyards shall be located away at safe distance (500m away from the water bodies) - No untreated waste shall be allowed to discharge into the water bodies. - Construction camps/labor camps etc. shall have proper drainage system	Contractor	CSC/PIU	Construction Phase	National Environmental Policy 1992; National Environmental Management Action Plan 1995; Environmental Conservation Act 1995; Environment Conservation Rules 1997; Bangladesh Wildlife (Conservation & Security) Act, 2012; National

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
						Fisheries Policy, 1998; Protection and Conservation of Fish Act 1950
B-17	Aquatic Ecology	▶ Passage to the free water flow shall be provided. ▶ Contractor shall clear the site immediately after the construction activity is over. ▶ Water Quality and sediment quality testing shall be undertaken as per the monitoring plan. ▶ Bentonite slurry, if is proposed to be used, shall not be allowed to the dispose, or dumped into the waterbody or agricultural land. ▶ Bentonite slurry shall be stored in container and need to be disposed to identified/approved sites in consultation with the Zill Parishad or Local Government office. ▶ Washing of construction vehicles/equipment shall not be allowed near the waterbodies.	Contractor	CSC/PIU	Construction Phase	Environment Conservation Rules 1997; Bangladesh Wildlife (Conservation & Security) Act, 2012; National Fisheries Policy, 1998; Protection and Conservation of Fish Act 1950
Socioeconomic Environment						
B-18	Influx of Labor	▶ Trespassing to the contractors' facilities such as construction camp/labor camps shall be strictly prohibited. ▶ Contractor facilities shall be located 500m away from residential areas. ▶ Any issue shall be resolved through labor grievance redressal mechanism (GRM) developed by the PIU and run with assistance from the contractor. ▶ Contractor shall be encouraged to recruit local skilled/unskilled workers. ▶ Minimum 10-15% of female workers shall be given preference in the employment. ▶ Separate lodging arrangement for female along with appropriate facilities as mentioned above in B1, B2, B3, B4, ▶ The CoC will be strictly enforced by the contractor	Contractor	CSC/PIU	Construction Phase	Bangladesh Labor Act 2006; Bangladesh Labor Rules 2015; and Occupational Health and Safety Policies 2013
B-19	Child Labor	▶ Bangladesh labor Act 2006 section 34 prohibits the engagement of the child labor in any of activity of project. ▶ According to Section 44, any one below 14 years is considered as	Contractor	CSC/PIU	Construction Phase while recruiting the	Bangladesh Labor Act 2006; Bangladesh Labor

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		child & between 14 and 18 age is considered as adolescent. ▶ It is recommended that persons below 16 years of age shall not be employed in any type of work and shall be encouraged to go to schools. ▶ Between 16- and 18-year of age persons can be employed for lighter works/office works for 6 hours only with prior approvals from the Engineer ▶ Company policy on the labor engagement rules shall be displayed at prominent locations such as contractor camps/labor camps/contractor office etc. ▶ Between 16- and 18-year of age persons shall not be deployed at any hazardous works such as painting/or other construction activity. ▶ To ensure the age, contractor must refer to Certification of laborers' age/National Identification Card/Birth Certificate etc.			labor	Rules 2015
B-20	Community Health and Safety	▶ The contractor shall plan activities in residential areas after having discussion with the community. ▶ Local shall be kept informed about the activities which the contractor is taking up in the residential areas. ▶ Trained drivers having valid license shall be allowed to drive construction vehicles/heavy equipment/plants. ▶ Speed of the construction vehicles/equipment shall be defined by the contractor in the contractors' ESMP. ▶ Excavated areas shall be properly barricaded. ▶ Trespassing of construction site shall be prohibited. ▶ Traffic management plan shall be prepared as per the activity schedules which will be approved CSC/PIU. ▶ Regular Consultation with the Community to know the effectiveness of implementation of mitigation measures at construction sites/camps ▶ Ensure implementation of mitigation measures suggested in B4 through B6 and B13 through B-15 at site to control the environmental pollution. ▶ Compensation for impacts on infrastructure shall be provided in accordance with the Resettlement Action Plan (RAP). ▶ Water logging shall not be allowed at construction site and minimize areas of standing water by providing effective drainage in construction areas to prevent vector borne disease such as malaria	Contractor	CSC/PIU	Construction Phase	Bangladesh Labor Act 2006; Bangladesh Labor Rules 2015; and Occupational Health and Safety Policies 2013

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		etc. ▶ Access to public shall be provided as per measures suggested in B-21. ▶ The prevention and management of HIV/AIDS and other STIs as suggested below in B-22. ▶ Vehicles/construction equipment need to be maintained and inspected/tested regularly, ▶ Drivers must have appropriate government licensing or certification and be provided with proper training. ▶ During operation of construction equipment minimum safety distance from this equipment must be ensured for movement of local community to avoid any accident. ▶ Contractor shall take all precautionary measures to prevent community exposure to water-borne, water based, water-related, and vector-borne diseases, and communicable and noncommunicable diseases that could result from project activities.				
B-21	Access to the Public	▶ The contractor shall provide adequate warning signboards in local and English language and with messages in picture / drawing so those who cannot read will be able to understand. ▶ Flagmen shall be deployed to control the traffic during tree felling or removal/erection of electric poles. ▶ Contractor shall provide temporary access to the local/religious place/schools/nursing home in consultation with the local champions. ▶ Grievance redressal mechanism shall be adopted, which need to be approved by the CSC, at site to address the issue at site.	Contractor	CSC/PIU	Construction Phase	Bangladesh Labor Act 2006; Bangladesh Labor Rules 2015
B-22	HIV and STD ²⁷	▶ Awareness campaigns on HIV/AIDS/STD ▶ HIV/STD voluntary counselling, testing, and treatment. ▶ Ensuring that construction workers have access to condoms ▶ Provision of vending machines at identified location ▶ Monitoring of outcomes, in collaboration with National HIV/AIDS Authorities	Contractor	CSC/PIU	Construction Phase	Occupational Health and Safety Policies 2013

²⁷ FIDIC | HIV-AIDS in the Construction Sector | International Federation of Consulting Engineers

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
B-23	Labor Management	▶ Contractor shall follow the national legislations. ▶ Condition stipulated labor management procedures shall be followed by the contractor on labor management, workplace safety and health, and protection. ▶ Pooled transportation facilities as may be required, shall be provided by contractor. ▶ Contractors' company policy on prohibition of Child Labor shall be displayed at the construction camps/labor camps/contractors' office etc. ▶ All basic facilities like water supply, cooking gas facility, sanitation facilities including provision of mobile toilet (of adequate capacity for men and women separately) shall be provided within the labor camp. ▶ Creche facilities for women workers to be made with separate toilet, washing and cleaning (if possible) ▶ 1-2 caregiver for creche shall be employed. ▶ Women security guard at labor shade shall be deployed. ▶ Feeding corner for lactating mothers, if required to be provided ▶ Separate labor shade for men and women shall be provided. ▶ Contractor shall prepare Labor Management Plan in its C-ESMP as per the procedures stipulated in Chapter 8 of this ESIA.	Contractor	CSC/PIU	Construction Phase	Bangladesh Labor Act 2006; Bangladesh Labor Rules 2015
B-24	Occupational Health and Safety Aspects ▶ Personnel Safety ▶ Measures for Labor, Material, handling, Painting etc.	▶ Contractor will prepare a standalone Contractors OHS plan which needs to be approved by the CSC before commencement of activities. ▶ Contractor shall update the OHS plan regularly as and when required or as directed by the CSC. ▶ Contractor shall plan the activities to prevent any untoward accidents at site. ▶ Induction training to the workers and subsequent training on safety aspects. ▶ Trained workers at hot mix plants/batching plant/Wet Mix Macadam (WMM) shall be deployed. ▶ Toolbox (including its maintenance) training to the workers. such as job rotation, training safe work procedures, lock-out and tag-out, workplace monitoring, limiting exposure or work duration, etc. shall	Contractor	CSC/PIU	Construction Phase	Occupational Health and Safety Policies 2013

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		be adopted. ▶ Safe work systems and administrative or institutional control measures shall be followed by the contractor. ▶ No employee shall be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. ▶ In addition, no unprotected ear shall be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C). ▶ Exhaust ventilation, isolation rooms, machine guarding, acoustic insulating, etc. shall be provided as per the direction of CSC. ▶ The Contractor shall always take all reasonable precautions to maintain the health and safety of the contractor's personnel. ▶ In collaboration with local health authorities, the contractor shall ensure that medical staff, first aid facilities and ambulance service are always available at the site. ▶ Protective footwear such as safety boots/gumboots, helmets and protective goggles shall be used by the workers. ▶ Welders shall use protective eye-shields or safety goggles. ▶ All electric wire must have proper insulation ▶ Lifesaving jacket shall be used by the workers and flagmen. ▶ Workers working in noisy area shall be provided earmuffs. ▶ Fall prevention and protection measures shall be implemented for the worker working at more than 2m height. ▶ Safety belts along with connectors and anchorage shall be provided and used by the workers working at heights (more than 2m). ▶ Ladder and scaffold shall be provided with guardrails system and safety net system shall be provided when activities are going on at height more than 2m ▶ Proper use of ladders and scaffolds by the trained workers. ▶ Necessary lightening having proper illumination shall be provided if required to work site during nighttime. ▶ Potable water supplies to the workers. ▶ Water supplied to areas of food preparation or for the purpose of personal hygiene (washing or bathing) shall meet drinking water				

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		quality standards ▶ Workers working in the dusty area shall be provided with nose mask. ▶ Sufficient fresh air shall be supplied for construction camps/labor rooms and confined workspaces. ▶ Construction/labor camps must receive natural light and be supplemented with sufficient artificial illumination, if required. ▶ Emergency lightening arrangement of proper illumination shall be installed at identified locations. ▶ Sufficient lightening arrangement shall be provided in toilets having doors along with locks. ▶ Eating areas such as canteen must be cleaned, and kitchen, toilet/human waste must be segregated at source and collected separately as per measure suggested above. ▶ Hand, knee, and foot railings shall be provided on stairs, fixed ladders, platforms, ramps or loading bays etc. ▶ Covers should, if feasible, be installed to protect against falling items. ▶ First aid box shall be provided at identified locations. ▶ First Aid training to at least 25% of workers both female and male. ▶ Tie-up with local hospitals shall be maintained and ambulance facility shall be reserved for emergency purpose only. ▶ OHS training to all new workers and refresher training to the old workers/drivers shall be arranged by the contractor. ▶ Regular health check-up shall be undertaken at construction camps/labor camps etc. ▶ Visitors such as CSC engineers or employer's official visiting the construction sites/camps shall use the helmets of approved color. ▶ Fire extinguishing devices shall be installed at the identified areas. ▶ Arrangement with the local firefighting department shall be made. ▶ Contractor shall prepare and get approved an emergency response plan including evacuation plan in consultation with Fire Service & Civil Defense department (FSCD) and shall provide training to workers accordingly.				

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
B-25	SEA-SH	▶ Implementation of a GBV-free work environment shall be maintained at project assisted by PIU ▶ PIU will be having gender specialist to monitor the GBV free environment. ▶ Gender based discrimination shall be strictly prohibited and monitored. ▶ Any type of sexual harassment including homophobic slurs or using social media against a colleague shall be dealt strictly with as per local law of the country and employee shall be terminated immediately from his duties. ▶ Training on code of conduct and company policy on the SEA-SH free work environment shall be organized to all workers including skilled and non-skilled workers. ▶ It shall be ensured that above mentioned training has been attended by all including managers/engineer and other workers. ▶ Minimum standards of behavior with which project actors agree to comply on an individual basis shall be frame in the Code of Conduct (COC) by the contractor. ▶ COC Preventing SEA-SH and Violence against Children/female workers shall be rolled out among the indivual and signed by each worker/manager/other staff. ▶ The COC needs to be get signed by each worker every six months. ▶ Signed copy of the COC shall be documented physically as well as scanned version be stored digitally. ▶ Company policy on GBV free work environment and COC shall be displayed at labor camps/canteen and other contractor facilities. ▶ Staff shall be encouraged to report suspected or actual GBV. ▶ Grievance redressal mechanism (GRM) shall be established at site to	PIU/Contractor/CSC	PIU	Construction Phase	Bangladesh Labor Act 2006; Bangladesh Labor Rules 2015, SEA-

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		address the issues immediately. ► Provision of separate, safe and easily accessible facilities (e.g., toilets, sleeping areas) for male and female users, which can be locked from the inside²⁸; ▪ Provision of Safe, accessible, well-lit waiting areas and other public spaces (such as parking lots, construction sites); ▪ Visibly displaying signs around the project site that signal to workers and the community that the project site is an area where SEA/SH is prohibited; or is a safe, SEA/SH free zone. ► Gender Specialist has been hired by the PIU to monitor indicators: (a) number of training courses related to SEA/SH delivered; (b) percentage of staff who have agreed to a CoC; (c) percentage of project actors who have attended CoC or SEA/SH trainings; or (d) percentage of SEA/SH cases handled in line with quality requirements/established protocols.				
B-26	COVID-19	► Contractor must apply or comply with the government guidelines in line with WHO to contain the outbreak of the infection at sites. ► Installation of dispensers for hand sanitizers in the labor camps/construction and other prominent location. ► Distribution of N95 mask etc. to labor. ► Awareness campaigns through posters shall be periodically conducted in labor camps/construction camps/other contractor facilities. ► Provision of isolation rooms in labor camps ► Contractor shall prepare COVID 19 preventive action plan as WHO norms for implementation ► Regular health check-up ► PIU will employ a consultant to prepare a COVID-19 prevention plan at construction site.	Contractor	CSC/PIU	Construction Phase	
B-27	Traffic Diversion and Detouring Plan	► Detailed “Traffic and Road Safety Management Plans” shall be prepared by the Contractor and submitted to CSC for approval. The	Contractor	CSC/PIU	Construction Phase	Bangladesh Road Sign Manual,

²⁸ Good Practices Note on addressing Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) in Investment Project Financing involving Major Civil Works Second Edition, the World Bank

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		traffic diversion plan shall contain but not limited to the following: ▪ Traffic safety arrangements for carrying out construction activities in congested urban areas. ▪ Arrangement of Signaling system and warning Signs system ▪ Traffic routes for construction vehicles/equipment ▪ Construction vehicles/equipment speed ▪ Traffic control Arrangements at site ▪ Parking of construction vehicles/equipment/trucks ▪ Temporary Traffic diversion and detouring arrangement ▪ Traffic arrangement after cessation of work each day, ▪ Safety measures for night-time traffic ▪ Precaution for transportation of hazardous materials ▪ Arrangement of flagmen/walkie-talkie/mobile phones etc. ▶ Temporary diversions shall be provided at Chachra Moor, ROB locations in Jashore, Murali Moor, Churamankathi, Barobazar, Sat mile, Kaliganj Bazar, Salabara, and Al hera Moor. ▶ Contactor has to prepare C-Traffic Management Plan which is to be approved by CSC. ▶ A guideline for Developing C-traffic Management Plan is given in Annex 10-1.				Bangladesh Road Transport Authority Ministry of Communication, March 2000
B-28	Archaeology and cultural heritage management	▶ Contactor shall ensure that all archaeological and cultural heritage site are protected from the construction activities. ▶ Contractor shall clearly spell out the mitigation measures and chance find measures in consultation with the local champions. ▶ If an important site/potentially significant asset is uncovered during contractor, contractor shall immediately stop the work temporarily and report the finding to the project authorities. ▶ Contractor shall take necessary steps to protect chance finds from the impacts of any further project activities. ▶ Where necessary, signage and fencing shall be installed to protect known heritage sites close to construction areas. ▶ Contractors' code of conduct with rules and guidance on how to address chance finds and training of contracted workers shall be	Contractor	CSC	Construction Phase	The Antiques Law of 1968; Environment Conservation Rules 1997

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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		included in the CESMP. ► Enhancement measures in the form of tree plantation are suggested in Section 10.3 for monuments which have been identified during the study.				
C	Operational Phase					
C-1	Environmental Monitoring	► Environmental monitoring of the air, noise, water etc. shall be undertaken as per Section 10.2	Monitoring agency	Khulna Zone	Operational Phase	Environmental Conservation Act 1995; Environment Conservation Rules 1997
C-2	Monitoring and Evaluation of ESMP/RAP	► Client will undertake monitoring and evaluation of the effectiveness of the ESMP/RAP through Environmental and Social division of PIU.	Monitoring agency	Khulna Zone	Operational Phase	
C-3	Terrestrial Ecology	► Shrubs and trees are planted on the median and along the road are to be maintained. ► Trimming of the shrubs shall be undertaken regularly as per Section 10.3	Monitoring agency	Khulna Zone	Operational Phase	National Environmental Policy 1992; Environmental Conservation Act 1995; Environment Conservation Rules 1997; Bangladesh Wildlife (Conservation & Security) Act 2012
C-4	Water resources and Water Quality	► Side drains will be regularly cleaned before the onset of monsoon ► Water quality monitoring shall be undertaken.	Monitoring agency	Khulna Zone	Operational Phase	National Water Policy 1999; Water Reservoir Conservation Act 2000; The Water Act 2013
C-5	Air Quality	► Air Monitoring as suggested in the Environmental Monitoring Plan shall be undertaken.	Monitoring agency	Khulna Zone	Operational Phase	Environmental Conservation Act

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On July 1st, 2021, STUP was acquired by Assystem and rebranded as Assystem STUP.



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Sl. No.	Impacts/Issues	Mitigation/Enhancement Measures	Implementation Agency	Supervision Agency	Timelines	Remarks
		PIU shall advise DOE to implement the Schedule 4: Standards for Emission from motor vehicles of Environmental Conservation Rules 2017 (Draft).				1995; Environment Conservation Rules 1997; and Bangladesh National Ambient Air Quality Standards 2005
C-6	Noise and Vibration	Noise and Vibration Monitoring as suggested in the Environmental Monitoring Plan shall be undertaken.	Monitoring agency	Khulna Zone	Operational Phase	Environmental Conservation Act 1995; Environment Conservation Rules 1997; and Noise Pollution Control Rules 2006
C-7	Soil and Sediments	Any spillages or accidental vehicles shall be removed immediately.	Monitoring agency	Khulna Zone	Operational Phase	
C-8	Road Safety	- Road furniture as provided in the operation phase need to be maintained properly. - Potholes or any other damages shall be rectified immediately after post monsoon. - Road safety audits shall be undertaken regularly. - Public awareness campaign shall be regularly conducted using various Information, Education, and Communication (IEC) techniques such as Media (Television, newspaper) Display boards safety weeks and event organization etc.	Khulna Zone	Khulna Zone	Operational Phase	National Land Transport Policy; RHD's Road Master Plan; National Road Design Standard

10.2 ENVIRONMENTAL MONITORING PLAN

429. To evaluate the effectiveness of the mitigation measures to reduce the environmental impacts, it is necessary to monitor the environmental parameters during project construction and operation phase. The proposed monitoring plan provides information to ensure that development initiative of this national highway is complying the regulatory standards and helps define the thresholds that would signal the need for immediate corrective actions.

430. From the environmental monitoring point of view, it is proposed to monitor ambient air quality, ambient air with respect to noise, water quality and soil and sediment quality during the construction and operation of the project. Contractor can collect the meteorology data from the nearest Meteorology Station located in Jashore or otherwise it can be monitored at site by installing the equipment.

431. The following subsections presents an environmental monitoring plan covering the parameter to be monitored, sampling locations, and frequency.

10.2.1 AMBIENT AIR QUALITY

432. The ambient air quality is proposed to be carried out at three (3) locations in addition to villages in vicinity of construction camp/Hot mix plant/stock yard and borrow areas and near the sensitive receptors such as schools/hospital/mosques, during the construction phase. In total contractor is required to carry out ambient air quality at seven (7) locations. However, the ambient air quality monitoring will be carried out at three (3) locations in consultation with Department of Environment (DOE) during operation phase. The ambient air quality monitoring details are given in Table 10-3.

Table 10-3: Ambient Air Quality Details		
Sl. No.	Items	Description of Items
1.	Monitoring Parameters	Particulate Matter (PM10 and PM2.5), Sulphur Dioxide, Nitrogen Oxide, Carbon Monoxide (CO)
2.	Monitoring Locations	One in each contract (Jessore, Kaliganj, Jhenaidah) plus three (3) locations as per suggestion of the Environmental Engineer of CSC/RHD
3.	Monitoring Frequency	Continuous 24-hourly monitoring twice in a week for summer, winter, and post monsoon season
4.	Total number of samples	4-locations x 1-days per week x 4-week x3-season x 2.5 years Total number of samples 120 during construction phase per contract. Total number of samples during operation phase 36 per annum.

10.2.2 AMBEINT AIR QUALITY WITH RESPECT TO NOISE AND VIRATION MONITORING

433. Similarly, the ambient air with respect to noise shall be monitored at three (3) locations plus the in addition to villages in vicinity of construction camp/Hot mix plant/stock yard and borrow areas and near the sensitive receptors such as schools/hospital/mosques, during the construction phase. Total at nine locations noise monitoring will be carried out by the contractor during the construction phase whereas the noise monitoring will be carried out at four (4) locations near sensitive receptor in consultation with DOE officials during the operation phase of the project. The noise quality monitoring details are presented in Table 10-4.

Table 10-4: Ambient Air Quality with respect to Noise Monitoring Details		
Sl. No.	Items	Description of Items
1.	Monitoring Parameters	Noise and Vibration quality monitoring (L_{eqday} and $L_{eqnight}$, L_{10} , L_{98} , L_{max} and L_{min})
2.	Monitoring Locations	Jashore, Kaliganj, Jhenaidah plus three 3 locations such as construction camps/maintenance workshop/labor camps and one (1) location in at sensitive receptors/residential area near the construction site as per suggestion of the Environmental Engineer of CSC/RHD. During operation phase, near the four (4) sensitive receptors in consultation with the DOE officials.
3.	Monitoring Frequency	Continuous 24-hourly monitoring using Integrated Sound level meter having data logger.

Table 10-4: Ambient Air Quality with respect to Noise Monitoring Details

Sl. No.	Items	Description of Items
4.	Total number of samples	Throughout the construction period Total number of samples = 6-locations x 12-month x 2.5-years=180 per contract Total number of samples during operation phase 72 per annum.

10.2.3 SURFACE WATER QUALITY

434. As presented in the Table 10-5, surface water samples will be collected from the four (4) surface water bodies during construction and operation phase of the project. The sampling will be done once in a season except monsoon season.

Table 10-5: Surface Water Quality Monitoring Details

Sl. No.	Items	Description of Items
1.	Monitoring Parameters	pH, DO, BOD5, Temperature TSS, Oil and grease, free ammonia, etc. Total Coliforms, and E-coli form per 100ml
2.	Monitoring Locations	2 surface water bodies (river/canal)
3.	Monitoring Frequency	Once in a season except monsoon season
4.	Total number of samples	Throughout the construction period Total number of samples = 2-locations x 1-sample per season x3-season x 2.5-years=15 samples Total number of samples during operation phase 12 per annum.

10.2.4 GROUNDWATER QUALITY

435. The groundwater samples will be collected from the four (2) locations during construction phase of the project. The samples will be collected and analyzed every season except monsoon season, as presented in Table 10-6.

Table 10-6: Groundwater Monitoring Details

Sl. No.	Items	Description of Items
1.	Monitoring Parameters	pH, EC, TDS, Temperature, Taste, TSS, Oil and grease, Heavy metals
2.	Monitoring Locations	2 Groundwater samples Construction Camps Labor camps
3.	Monitoring Frequency	Every season one sample from each location except monsoon season
4.	Total number of samples	Total number of samples = 2-locations x 1-sample per season x3-season x 2.5-years=15 samples per contract Total number of samples during operation phase 6 per annum in consultation of DOE officials.

10.2.5 SOIL AND SEDIMENT QUALITY

436. The soil samples will be collected from the three (3) locations during construction phase of the project. The samples will be collected and analyzed every season except monsoon season, as presented in Table 10-7.

Table 10-7: Soil Monitoring Details

Sl. No.	Items	Description of Items
1.	Monitoring Parameters	pH, electrical conductivity, organic matter (%), nitrogen (mg/1000g), potassium (mg/1000g), phosphorous, (mg/1000g), sulphates and sodium sulphates and oil & grease
2.	Monitoring Locations	3 Soil samples Construction Camps Labor camps Maintenance workshop
3.	Monitoring Frequency	Every season one sample from each location except monsoon season
4.	Total number of samples	Total number of samples = 3-locations x 1-sample per season x3-season x 2.5-years=22 samples

437. The sediment samples will be collected and analyzed every season except monsoon season from the four (2) sediment samples near the bridges of river/canal, as presented in Table 10-8.

Table 10-8: Sediment Monitoring Details		
Sl. No.	Items	Description of Items
1.	Monitoring Parameters	pH, electrical conductivity, organic matter (%), oil & grease, Heavy metals
2.	Monitoring Locations	2 Sediment samples from river
3.	Monitoring Frequency	Every season one sample from each location except monsoon season
4.	Total number of samples	Total number of samples = 2-locations x 1-sample per season x3-season x 2.5-years=15 samples per contract

10.2.6 ENVIRONMENTAL MONITORING BUDGETARY COST ESTIMATES

438. To carry out the monitoring along project alignment during construction and operation phase, the contract wise environmental monitoring budgetary cost estimates have been worked out and is presented in the following Table 10-9.

Table 10-9: Environmental Monitoring Budgetary Cost Estimates per contract				
Sl. No.	Environmental Parameters	Number of samples	Unit Cost (BDT)	Amount (BDT)
1.	Ambient Air Quality	120	35000	4,200,000
2.	Ambient air quality with respect to noise and Vibration	180	5000	900,000
3.	Surface Water Quality	15	30000	450,000
4.	Groundwater Quality	15	30000	450,000
5.	Soil Quality	22	32000	704,000
6.	Sediment Quality	15	32000	704,000
Subtotal of Construction phase Environmental Monitoring Cost				7,408,000 Say 7,400,000

439. The construction phase environmental monitoring cost is 7,400,000 BDT (Bangladesh Taka).

440. In addition to above-discussed environment monitoring plan, it is proposed that the contractor will purchase under an obligatory requirement of contractor to implement ESMP, a set of portable equipment for PIU and CSC staff carrying out the monitoring as an emergency/ad hoc or when there is any grievance from the community. Thus, it is not included in BOQ item of the bidding document. The budgetary cost estimate for the following equipment is as follows in Table 10-10.

Table 10-10: Budgetary Cost Estimates for Environmental Monitoring Equipment per contract	
Name of Equipment	Approximate Cost
Portable Handheld Integrated Noise level meter with data logger measuring range of 30dB(A) – 140 dB(A)	4,00,000
Vibration Monitor with Data Logger (Measuring Range: 30 ~ 120 dB)	5,90,000
Water Quality Monitoring Kit having pH meter, EC, Temperature, DO Pen etc.	400,000
Portable Air Quality Meter (PM10 and PM2.5) with data logger and sensor heads to monitor gaseous pollutants (CO, NOx, and SO2).	4,00,000
Total	1,790,000

441. The total operation phase of environmental pollution monitoring of different parameter is presented in the Table 10-11.

Table 10-11: Environmental Monitoring Budgetary Cost Estimates for Operation Phase					
Sl. No.	Environmental Parameters	Period	Number of samples	Unit Cost (BDT)	Amount (BDT)
1.	Ambient Air Quality	Operation	9	40000	360,000
2.	Noise and Vibration Quality	Operation	9	10000	90,000
3.	Surface Water Quality	Operation	4	35000	140,000

Table 10-11: Environmental Monitoring Budgetary Cost Estimates for Operation Phase

Sl. No.	Environmental Parameters	Period	Number of samples	Unit Cost (BDT)	Amount (BDT)
4.	Groundwater Quality	Operation	2	35000	70,000
Subtotal of Operation Phase environmental Monitoring					660,000

10.2.7 TREE PLANTATION ALONG THE ROAD ALIGNMENT

442. For making the development of the project sustainable a tradeoff approach has been adopted by planting three saplings for each tree to be removed for the widening and strengthening of the road. Tree plantation is not only the most economical and effective, and useful mitigation measure measures to control the pollution but also provide shadow to the user especially during summer. Since it is unavoidable to safeguard these trees, it is suggested that local, fast-growing trees will be planted in lieu of trees removed for the project road development.

443. The development of project road requires about 14,000 trees to be removed. Some of them are very old/sacred trees and have also outlived its life.

444. Large trees are proposed to be planted on the available space of the road. In addition to this biological noise barrier have been considered near the sensitive receptors such as schools/institutions and temples to meet the target of tree plantation. It is also proposed that landscaping will be carried out on two monuments including an informatory signboard about the legendary. These biological measures will be taken up only after having consultation with the stakeholders through NGO. This will also help meeting the target of tree plantation requirement along the alignment.

445. **Shrubs Plantation on Medians:** It is also proposed that shrubs will be provided on the medians to reduce the glaring the road. While planting the shrubs on the medians the following consideration have been made for all three contracts.

- ▶ The shrubs will be planted in 2 rows.
- ▶ The spacing will 1m apart.
- ▶ To maintain a height of 2m of a shrub, it is recommended to trim these proposed shrubs at least once in year before monsoon period under the maintenance item during the operation phase.

The suggested shrubs planation on median for each contract is as follows in Table 10-12.

Table 10-12: Plantation details of shrubs on Median

Contract	Length of space available (m)	Spacing/Row Details	Number of shrubs to be planted	Species
1	9300	1m spacing and in 2-rows	18,600	Korobi Radhachura Konokchapa Akondo Dad mordon Dhai ful Dat ranga Alamanda Hasna hena Rangan Arhar
2	6880		13760	<i>Nerium oleander</i> <i>Caesalpinia pulcherrima</i> <i>Ochna squarrosa</i> <i>Calotropis gigantea</i> <i>Cassia alata</i> <i>Woodfordia fruticosa</i> <i>malabar melastome</i> <i>Allamanda schottii</i> <i>Cestrum nocturnum</i> <i>Ixora coccinea</i> <i>Cajanus cajan</i>
3	5460		10920	

446. **Biological Barriers:** It is worth to mention that the predominant land use pattern along the road is mixed areas comprising residential cum commercial area. The standard noise levels for this land pattern are 60dB(A). These schools/mosques are in the mixed land use pattern and are partially getting affected due to loss of boundary wall. Provision of compensation for constructing the boundary wall along the schools has

been made in RAP. The boundary wall of brick masonry of approximately 1.5m height will help break the line of sight between receiver and source²⁹. It is also reported that breaking of line of sight will be able to reduce the noise of 5db(A) and the material weight of 4.5-inch brick wall³⁰ is more than 4-pounds per square feet³¹. It is also reported that for effective reduction a greenbelt (of 15m to 30m wide and 4m to 5m tall plant)³² along with shrubs having dense foliage is suggested to be planted along the boundary wall of the schools. Thus, it is proposed to plant a dense tree plantation in three (3) rows along boundary wall of the school shall be undertaken to reduce the intensity of the noise levels which will also enhance landscape of the affected school. However, it is reported³³ that tree plantation contributes very little to actual noise reduction but confer a psychological benefit in reducing the perceived nuisance of traffic noise. Other options such as construction of earthen mounds will require land, which is not available in school premises, to construct and concrete barrier are very costly. Thus, only tree plantation along boundary wall has been considered to reduce the intensity of noise. A 30 meter of dense vegetation can reduce noise by five decibels.³⁴ The details are discussed in Section 7 and plan for plantation the trees are shown in Annex 10-1. The tree plantation along the boundary wall is presented as follows in Table 10-13.

Table 10-13: Biological Noise Barriers in the Form of Tree Plantation details

Contract	Number of institutions	Spacing/Row Details	Number of Trees to be planted	Suggested Species	
1	20	3m spacing between 3-rows	1000	Jarul Aam Nageshwar Kalojam	<i>Lagerstroemia speciosa</i> <i>Mangifera indica</i> <i>Mesua nagassarium</i> <i>Syzygium cumini</i>
2	15		900	Kathal Hijal Lichu Chatim	<i>Artocarpus heterophyllus</i> <i>Barringtonia acutangula</i> <i>Litchi chinensis</i> <i>Alstonia scholaris</i>
3	9		450	Menda Korocho Dewa	<i>Litsea glutinosa</i> <i>Pongamia pinnata</i> <i>Artocarpus lacucha</i>

447. **Enhancement Measures:** One big pond on Left hand side in contract 1 and one monument in Contract 3 have been selected for enhancement measures by taking up tree plantation. To ensure implementation of the proposed plan, the NGO engaged by the RHD shall be assigned to conduct stakeholder consultation for taking up these enhancement measure with them. The details are as follows in Table 10-14.

Table 10-14: Enhancement Measures in the Form of Tree Plantation details

Contract	Number of institutions	Spacing/Row Details	Number of Trees to be planted	Suggested Species	
1	600	3m spacing between 1-row	200	Khejur Tal Barun	<i>Phoenix dactylifera</i> <i>Borassus flabellifer</i> <i>Crataeva nurvala</i>
2	-		-	Korocho Hijal	<i>Pongamia pinnata</i> <i>Barringtonia acutangula</i>
3	21		7	Jarul Narikel	<i>Lagerstroemia speciosa</i> <i>Cocos nucifera</i>

448. **Plantation Works:** The contractor will take the following steps for plantation of shrubs and trees.

449. **Site preparation:** This activity need be undertaken well in advance before monsoon for rainy season species and during October-November for winter species. Thorny bushes and weeds need to be removed

²⁹ Transit Noise and Vibration Impact Assessment, FTA

³⁰ [What is the weight of brick wall per sq ft and sq m - Civil Sir](#)

³¹ [Noise walls & barriers | WSDOT](#)

³² A guide to the Reduction of Traffic Noise, VicRoad, 2003

³³ Roads and the Environment- A Handbook. World Bank Technical Paper No. 376, 1997

³⁴ [Highway Traffic Noise Barriers at a Glance - Design Construction - Noise Barriers - Noise - Environment - FHWA \(dot.gov\)](#)

completely from the site. It should be followed by soil and water conservation work using physical measures, such as, surface rainwater harvesting, trenches, stone bunds; engineering structures, such as small check dams and biological devices, such as, planting of fast spreading grass and leguminous species and bushy materials. For planting seedling/sapling, pits of appropriate size (1×1×1m for tree species, 0.5×0.5×0.5 m for shrub species) need be prepared well in advance. The topsoil of 30 cm depth need be kept aside for mixing with Farmyard Manure (FYM) to promote microbial growth for nutrient recycling.

450. **Seeding and Transplanting:** For grass and leguminous species plantation, direct seeding could be practiced establishing a surface cover to check soil loss and grass growth for herbivores and nesting sites for birds. The plantation should be done in rows as per IRC guideline both row to row and plant to plant using healthy seedling/sapling. While planting, the poly bag should be moistened first. The poly bag should not be removed completely, only the bottom part of it should be removed by cutting it with a sharp blade without disturbing planting material. The planted material should be watered slowly to avoid soil disturbances.

451. Multi-purpose tree plant and shrubs species have a special significance in fulfilling the objectives of improving environment as well as needs of the people. During lean periods of spring and summer trees come to the rescue of livestock. The young leafy succulent material serves highly nutritive and rich in crude protein and minerals. The tree species can be planted along the boundaries and in rows in the grassland. The trees must be planted as per above schedule during monsoon. The fodder from the trees is available after 4-5 years. Tree guards shall be provided during the initial growth period.

452. The species include leguminous species, pollution tolerant plants, soil stabilizing species, multipurpose plants and fruit bearing trees are suggested to be planted.

453. **Plantation cost Break-up:** It is proposed that total 48,700 trees (18,000 in Contract 1, 27,000 in Contract 2, and 3700 in Contract 3) will be planted. Out of the total tree plantation, about 40% of trees plantation will be undertaken by RHD through contractors in the project and rest 60% of the trees will be planted through Forest Department under social forestry program. A budgetary breakup for tree plantation plan during construction phase is given in Table 10-15.

Sl#	Description	Rate (BDT)	Contract 1		Contract 2		Contract 3		Total Amount in BDT	Remark
			Units	Amount	Units	Amount	Units	Amount		
1.	Plantation of trees & including pit, watering, mulching fertilizer, planting the saplings and fencing)	700	7200	5,040,000	10800	7,560,000	1480	1,036,000	13,636,000	Project BOQ Item
2.	Shrubs Plantation on median including pit, watering, mulching fertilizer, planting the saplings and	30	18600	558,000	13760	412,800	10920	327,600	1,298,400	Project BOQ Item
3.	Biological Noise Barrier	660	1000	660,000	900	594,000	450	297,000	1,581,600	Project BOQ Item
4.	Enhancement Measures	660	200	132,000			7	4,620	136,620	Project BOQ Item
5.	Grass		The cost has been considered in engineering BOQ.							

Table 10-15: Budgetary Cost Estimates in BDT for Tree and Shrub Plantation										
Sl#	Description	Rate (BDT)	Contract 1		Contract 2		Contract 3		Total Amount in BDT	Remark
			Units	Amount	Units	Amount	Units	Amount		
	plantation									
6.	Plantation of trees & including pit, watering, mulching fertilizer, planting the saplings and fencing)	700	10,800	7,560,000	16,200	11,340,000	2220	1,036,000	19,936,000	Forest Department (social Forestry)
Total number of tree plantation +Noise Barriers + Enhancement Measures							51257	Tree plantation in Project BOQ item		
Maintenance cost 10,000BDT per km per month for 2 years								9,120,000	Will be done by the contractor under the supervision of Khulna Zone	
Total Tree Plantation cost by RHD through Contractor in the project BOQ item =15,354,220										
About 29,200 trees (10,800 in Contract 1, 16,200 in Contract 2, and 2220) will be planted by Forest Department under Social Forestry scheme immediately during the implementation phase.										
Total Shrub Plantation Cost (project BOQ item) =1,298,400										
Note: About 40% of tree plantation will be taken up by the RHD as Project BOQ item, Noise Barriers and Enhancement measures will be undertaken RHD through Contractor in the Project BOQ item; Rest 60% will be by Forest Department and Arboriculture Department of RHD under social forestry immediately during implementation phase. Shrubs Plantation on median will be taken up the Contractor.										

10.3 INSTITUTIONAL RESPONSIBILITY AND ARRANGMENT FOR ESMP IMPLEMENTATION

454. The RHD has established a PIU to oversee the implementation and management of project-related activities. An organogram for implementation of environmental and social management is presented in Figure 10-1.

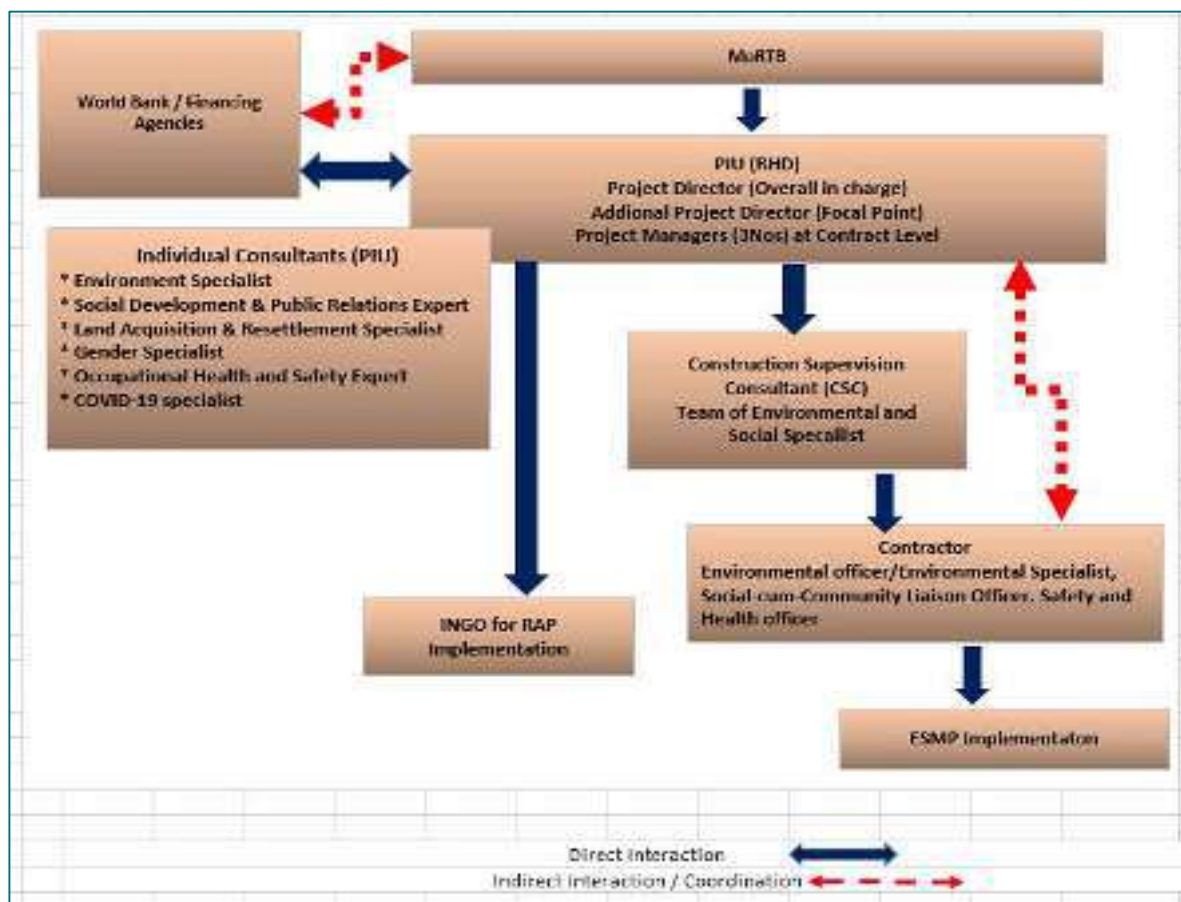


Figure 10-1: Organogram for the Implementation of ESMP

455. The institutional set-up is as follows:

456. Environmental officer/Environmental Specialist, Social-cum-Community Liaison Officer. Safety and Health officer of the Contractors will be responsible for implementation ESMP at site.

457. CSC will be the Engineer for the project and will be reporting to the PIU. He will be directly responsible for contract administration and day-to-day project supervision including implementation of environmental and social management plan. The CSC will consist of an environmental and social expert. It is suggested that team of environmental and social experts of national level for each contract which will be comprising of senior environmental specialist, Public Health Specialist, Gender specialist, senior Resettlement, and rehabilitation specialist/ senior social development specialist the CSC team.

458. Project Implementation Unit (PIU) of RHD is responsible agency for overall implementation of project activities. Since the project road has been divided in three contracts, Project Managers at contract level has been assigned for implementation of the project activities including ESMP. Thus, there are total three (3) number of Project Managers in the PIU. PIU has hired Subject Matter Experts namely, Environment Specialist, Social Development and Public Relations Expert, Land Acquisition/Resettlement & Rehabilitation Specialist, Gender Specialist, Occupation health and Safety, and COVID -19 specialist, for assisting the PIU on implementation ESMP and RAP. In PIU, Additional Project Director (APD) has deployed who will be focal point for implementation of ESMP as well as the supervisor of the Project Managers. The head of PIU is the Project Director.

459. RHD – is the responsible for the construction and the maintenance of the major road and bridge network of Bangladesh. To implement this project, RHD has established a Project Implementation Unit (PIU).

460. MoRTB is umbrella agency and have overall responsibility of ensuring that the project is being development in sustainable manner meeting the World Banks's environmental and social safeguards.

461. The roles and responsibilities of different designated staff at project are given in Table 10-16.

Table 10-16: Roles and Responsibilities of Different Designated Staff		
Institution	Designation	Role and Responsibility
MoRTB	-	▶ Ensure that the project, regardless of financing source, complies with the provisions of the ESMP, World Bank ESS and GoB laws and policies ▶ Ensure that project implementation complies with government environmental policies and regulations. ▶ Ensure that project environmental and social management is implemented and reported to the Steering Committee and the financing agency as required.
PIU	Project Director, PIU of RHD	▶ Overall implementation of the project ▶ Coordination among the high-level committees to obtain regulatory clearance/permissions. ▶ Participate in high level meeting. ▶ Review of progress of project and ESMP ▶ Approved to release the funds
	APD, PIU of RHD	▶ Updating the PD on various aspects of the project ▶ Coordination with the World Bank and regulatory authorities on EMP implementation with assistance from PIU ▶ Recommendation to PD for release of funds ▶ Responsible for regulatory obligations for the project. ▶ Review the monthly progress of the contractor ▶ Grievance redressal at project level
	Project Manager (PM) - PIU	▶ Overall implementation of the project at site ▶ Check and verify Interim Payment Certificates (IPCs) for contractors' payment ▶ Coordination among the different district level committees to obtain regulatory clearance/permissions. ▶ Participate in district level meeting. ▶ Monthly review of progress ▶ Grievance Redressal at field level
	Environment Specialist (PIU)	▶ Planning and implementation of ESMP ▶ Review the monthly progress of the contractor on ESMP implementation ▶ Reviewing the periodic progress reports on ESMP ▶ Assisting PIU on Environmental Safeguards issues and ESMP implementation ▶ Conducting field visit, as and when, required ▶ Assisting PIU in coordinating with the regulatory authorities. ▶ Supervision and monitoring of the progress of activities of the consultants and contractors for the implementation of different components of ESMP ▶ Provide guidance to PIU, CSC, and contractors in conducting subsequent monitoring and reporting and in undertaking corrective options ▶ Imparting training to the field staff and contractor on ESMP. ▶ Ensuring that the CSC commits and retains dedicated staff as social and environmental managers to oversee CESMP implementation ▶ Ensuring that submission of periodical environmental and social management and monitoring reports to the steering

Table 10-16: Roles and Responsibilities of Different Designated Staff

Institution	Designation	Role and Responsibility
		committee and co-financiers through RHD; ▶ Preparation and submission of semi-annual monitoring reports on ESMP implementation for the WB review through RHD ▶ Implementation of environmental monitoring measures (such as environmental quality monitoring, tree plantation, landscaping, wildlife monitoring) during the O/M stage of the Project. ▶ Grievance Redressal
	Social Development and Public Relations Expert	▶ Liaison with district administration (DC) to support land acquisition and RAP implementation activities;
	Land Acquisition/Resettlement & Rehabilitation Specialist (PIU)	▶ Assist the PMU on RAP implementing iNGO; in setting up a baseline and monitoring system. ▶ Review and finalize RAP additions when necessary and Monitor activities of the NGO (iNGO); ▶ Conduct internal monitoring of the resettlement process to ensure smooth implementation. ▶ Ensure that timely payments of compensation and other entitlements as per the RAP are made before physical relocation or the commencement or civil works occurs. ▶ Participate, record and address grievances at project level ▶ Coordinate with the project cell to ensure availability of funds for all R&R activities. ▶ Monitor the effectiveness of entitlement contracts and payment modality. ▶ Promote improved social and environmental performance through the effective use of management systems; ▶ Ensure that proper implementation of Livelihood restoration plan and gender action plan including ▶ Grievance Redressal ▶ Liaison with relevant government authorities for protecting archeological and cultural heritage sites.
	Gender Specialist (PIU)	▶ Review and prepare the project Gender Action Plan (GAP) & support PIU for its implementation. ▶ Coordination with WB task team and PIU ▶ Organize/facilitate initial training of PIU staff on GBV & support the PIU with the development of GBV action plan ▶ Develop or adapt standard operating procedures for GRM ▶ Assess the need & support the implementation of community consultations & stakeholders' engagement to take place during upcoming implementation support missions. ▶ Support the adaptation of code of conduct (CoC) for workers. ▶ Carrying out advocacy for promoting equal rights for women as skill and unskilled labor force, day-care centers at worksite etc.
	Occupation health and Safety (OHS) expert (PIU)	▶ Review and prepare the project OHS plans ▶ Review the progress of OHS implementation at site and safety arrangements made by the contractor to prevent untoward incident. ▶ To interact with regulatory agency on the environmental social, occupational and safety issues including safety aspects ▶ Review the Contractor's OHS plan and its updates
	COVID – 19 Specialist (PIU)	▶ Undertake necessary tasks to develop Emergency Response and Action Plans (ERAP) for COVID-19 ▶ Support PIU implementation of COVID-19 prevention

Table 10-16: Roles and Responsibilities of Different Designated Staff		
Institution	Designation	Role and Responsibility
		measures and Emergency Response Action Plan (ERAP). ▶ Support PIU to monitor COVID-19 situation in country and project locations ▶ Training project personnel on infection prevention and response
Construction Supervision Consultant	Environmental Engineer/Specialist	▶ Responsible for ensuring that effective measures of implementation of ESMP are being taken at construction site. ▶ Prior to construction, review and approve CESMPs/method statements prepared by the contractors ▶ Inspection and reporting of Contractor activities to ensure effective implementation of the ESMP. ▶ Suggesting mitigation measures or action, followed by inspections and evaluation. ▶ Ensuring that the social and environmental mitigation measures are incorporated in the Contractors Environmental and Social Management Plan (CESMP), etc. ▶ Monitor the implementation of the CESMP and review the environmental management and monitoring reports prepared by the contractor ▶ Review of progress reports and periodic reporting to PIU ▶ Interaction with Environment and R&R Specialist (PIU) ▶ Overall, CSC is responsible for ensuring the proper and timely implementation of all their tasks specified in the ESMP
	Social Team (Social Development Specialist/Resettlement and rehabilitation (R&R) Expert/Gender Specialist, Public Health Expert)	▶ Inspection and reporting of Contractor activities to ensure effective implementation of the ESMP (social aspects) ▶ Implementation of RAP, Interaction with INGO and reporting of progress of LAP/RAP ▶ Audits of Construction camps/labor camps and other facilities to monitor the health/hygiene issue including HIV/AIDs ▶ Monitoring report
Contractor	1- Environmental officer/Environmental Specialist 2- Social-cum-Community Liaison Officer 3- Safety and Health officer	▶ Responsible for preparation Contractor's site-specific Construction Environmental and Social Management Plan (CESMP) based on the ESMP of Project. The CESMP will have but not limited to the following: - Labor Management Plan, - Waste Management Plan - , GBV Action Plan, - COVID 19 Prevention Measures - Construction and Demolition waste, and Liquid Waste Management Plan Hazardous Waste Management Plan, - Workers' Camp Management Plan, - Construction Materials Sourcing Plan - Community Health and Safety Plan - Chance finds procedures - Training schedule of staff ▶ The CESMP need to be get approved from the CSC before commencement of work. ▶ Responsible for preparation of Standalone C-OHS which needs to be approved before commencement of work at site. However, it may be modified as per the requirement of site. ▶ Responsible for preparation of standalone C-Traffic Management Plan meeting the requirement of Bangladesh Traffic Rules Manual, 2000. (Guidelines for Developing

Table 10-16: Roles and Responsibilities of Different Designated Staff		
Institution	Designation	Role and Responsibility
		Traffic Management Plan is given in Annex10-3) ▶ Flow Chart and Reporting Mechanism of Incidents for development emergency response action plan is presented in Annex 10-4. ▶ Direct Reporting to Project Manager of the contractor ▶ Assisting to ensure that the environmentally sound practices are adopted at construction site. ▶ To prepare redevelopment plan in consultation with CSC and land parcel owner for all the sites of identified project related ancillary facilities like (i) construction camp, (ii) labor camp, (iii) stone crusher unit, (iv) borrow area and (v) waste including debris disposal site. ▶ Ensure that all valid permits and approval are in place ▶ To have regular interaction with CSC and provide data of implantation of ESMP. ▶ To ensure that all the waste is being managed as per the DOE rules and regulations. ▶ To ensure that Hazardous waste or chemicals are managed at construction site/construction camps as per the DOE's rules and regulations. ▶ To ensure that traffic management plan and road safety issues are attended at site. ▶ To interact with regulatory agency on the environmental social, occupational and safety issues including safety aspects. ▶ Imparting training to the staff on environmental safety and health issues and ESMP measures. ▶ Implementation of Environmental Monitoring Plan being done at site. ▶ Taking corrective action measures at site. ▶ Ensuring that all the permits/approvals are valid. ▶ Prepare and submit monthly ESMP implementation progress reports as per the format given in annexes. ▶ Contractor will report to CSC within 24 hours any incident fatalities, injuries, gender-based violence, etc. including measures taken at site. ▶ Prepare a monthly progress on ESMP, OHS, etc. and submit it in the first week of every month.

a) Environmental Engineer/Specialist:

462. The Environmental engineer/specialist of CSC shall be well experienced and qualified in his field. The qualification and experience of the Environmental Engineer shall be as follows:

463. **Qualification and Experience:** Bachelor of Engineering with Civil Engineering or Environmental Engineering having experience of 10 years in the same field or Master of Science in Environmental discipline having experience of 15 years. He/she should have experience of at two (2) Environmental Impact Assessment study for Highway projects and should have knowledge of Policy, Legal and Administrative frameworks of Environment.

b) Environmental Health and Safety officer – Contractor

464. To implement the ESMP at construction site/construction camp/borrow areas or other contractors' facilities, Contractor shall engage a full time Environmental and safety Engineer. The qualification of environmental and safety engineer of contractor shall be Bachelor of Engineering with Civil Engineering or Environmental Engineering or master's in environmental science having 7 years of experience in construction

industry preferably road construction. If he is possessing any diploma in safety aspects from recognized institute in addition to his master will be given preference to normal candidates.

10.4 REPORTING

- ▶ The Contractor will submit the monthly progress report on ESMP implementation to CSC as per the check list given Section 10.6.
- ▶ The CSC will valid the report based on observation/audit carried out by the Environmental Engineer/Specialist on implementation of ESMP. The CSC will submit monthly progress report and quarterly progress to PIU. The PIU will transmit the monthly progress report regularly to the World Bank as stipulated in Environmental and Social Commitment Plan (ESCP). Besides, quarterly report on monitoring the ESHS performance of the PIU will submit regularly to WB by the PIU as per the requirement of ESCP.

10.5 CAPACITY BUILDING

465. To strengthen the capacity of Staff, the following training of target groups such PIU staff, stakeholder, community, project workers, consultants, contractors, sub-contractors is suggested as per Environmental and Social Commitment Plan (ESCP). The proposed capacity building training of different target groups will be carried out by Individual Consultant of PIU. Total training budgetary cost for capacity building for each contract has been worked out to be BDT2,50,000 in Table 10-17.

Target Group	Subject(s)	Method	Time Frame	Cost (BDT)
All concerned PIU /project staff (6 Numbers) in Dhaka	▶ Environmental and Social Standards Overview ▶ Environmental regulations, and national standards, ▶ Process of impact assessment and identification of mitigation measures, ▶ Importance of ESMP & its monitoring, ▶ Occupation Health and Safety (OHS) ▶ Community Health and safety (CHS) ▶ Road Safety and Traffic Management at construction site ▶ ERAP on COVID-19 including prevention, mitigation, and response	Lectures	Before beginning of the implementation of the project	50,000
Project Workers, Environmental Engineers, field officers, contractors, Sub-contractors' stakeholders, community, supervision consultants (50 Number at Jashore/Jhenaidah)	▶ Basic features of an ESMP, planning, Implementation of ESMPs: ▶ Occupation Health and Safety (OHS) ▶ Community Health and safety (CHS) ▶ designing and execution of social and environmental mitigation (SEA/SH, GBV, COC) ▶ Road Safety and Traffic Management at construction site ▶ Enhancement measures, ▶ monitoring and evaluation of environmental conditions – during construction and operation ▶ ERAP on COVID-19 including prevention, mitigation, and response	Workshops and Seminars	Before the construction	1,25,000
Project staff field officers, contractors, Sub-contractors' stakeholders, community, dealing in social/lands matters	Social awareness: Monitoring consultants/organizations, Land acquisition and compensation related Grievance Redressal Mechanism (GRM) and SEA/SH related GRM, Redressal Mechanism	Lectures, Workshops and Seminars	Before implementation of R&R and LA	75,000

Table 10-17: Training Schedule and Training Cost for 2 days				
Target Group	Subject(s)	Method	Time Frame	Cost (BDT)
(30Number in Jashore/Jhenaidah)				
Total training budgetary cost for capacity building for each contract				2,50,000

10.6 CHECKLIST FOR MONITORING ESMP

466. For effective implementation of ESMP provisions, checklists for different parameter monitoring and reporting format for various activities (EC-1 to EC-13) are presented in Annex 10-2.

10.7 ENVIRONMENTAL MANAGEMENT COST

467. The budgetary cost estimates for implementation of construction and operation phase ESMP is presented in **Table 10-18**. The Environmental Budgetary cost estimates is also including a 2-day training cost per contract before implementation of the project. The construction phase ESMP budgetary cost estimates are BDT 27,700,000 for contract-1, BDT 29,718,000 for contract -2, and BDT 22,150,000 for contract 3. The operation phase ESMP budget cost estimate for the total road is BDT 5,820,000.

Table 10-18: Budgetary Cost Estimates for ESMP Provisions in BDT						
Component	Items	Estimated Rate	Contract 1	Contract 2	Contract 3	Remarks
Pre-Construction Stage						
A)	2 days Training in Dhaka/Jashore/Jhenaidah Budget for PIU staff Cost will be borne RHD for target group (Refer Table 10-17)	Lumpsum	250,000	250,000	250,000	RHD
B) Construction Phase ESMP Cost						
	Environmental Health and Safety Training	Lump Sum	10,00,000	10,00,000	10,00,000	Obligatory requirement of contractor to implement ESMP
Environmental Monitoring	Monitoring of air, water, soil, and noise (Refer Table 10-9)	As per environmental monitoring plan	7,400,000	7,400,000	7,400,000	Project BOQ Cost
	Provision of portable Environmental monitoring Equipment for ad hoc use by PIU and CSC staff	Refer Table---	1,790,000	1,790,000	1,790,000	Obligatory requirement of contractor to implement ESMP
Air	Dust Suppression at construction sites/stockyard/construct ion camps/haul roads	Lumpsum	440,000	440,000	440,000	Obligatory requirement of contractor to implement ESMP
Shrubs	Shrubs Plantation including 6 years maintenance cost	Refer Table 10-15	558,000	412,800	327,600	Project BOQ Cost
Tree Planation	Tree plantation	Refer Table 10-15	5,040,000	7,560,000	1,036,000	Project BOQ Cost
Noise Barriers	Biological Noise Barriers	Refer Table 10-15	660,000	594,000	297,000	Project BOQ Cost
Enhancement Measures	Tree Plantation	Refer Table 10-15	132,000	0	4,620	Project BOQ Cost
Maintenance of Plantation	Maintenance of trees and plantation for 2 years @10,000 per km per month		2,232,000	1,920,000	1,440,000	Will be done by the contractor through Khulna

Table 10-18: Budgetary Cost Estimates for ESMP Provisions in BDT						
Component	Items	Estimated Rate	Contract 1	Contract 2	Contract 3	Remarks
						zone
Safety	Demarcation of borrow area clearly, using fencing if needed.	Lumpsum	500,000	500,000	500,000	Obligatory requirement of contractor to implement ESMP
	Traffic Management Plan including Pedestrian Crossing	Lumpsum	1,500,000	1,500,000	2,000,000	
	Provision of Hoarding/Posters at construction camps and provision of health checkup at construction sites	Lumpsum	800,000	800,000	800,000	
	Provision for PPEs, such as helmet, gumboots, jackets, goggles etc. to labors	Lumpsum	600,000	600,000	600,000	
Construction Camps	Sanitary Facilities	Lumpsum	1,500,000	1,500,000	1,500,000	Obligatory requirement of contractor to implement ESMP
Waste Management	Solid/hazardous/C&D/Liquid	Lumpsum	1,000,000	1,000,000	1,000,000	Obligatory requirement of contractor to implement ESMP
Total for construction phase for contractor			25,152,000	27,016,800	20,135,220	
Contingency @ 10%			2,515,200	2,701,680	2,013,522	
Total construction phase for contractor			27,667,200	29,718,480	22,148,742	
Say			27,700,000	29,718,000	22,150,000	
C) Tree plantation through forest department under social forestry as per Section 10.3						
D) Operation Phase Cost of ESMP per Annum for 47.5 Km Road length						
Environmental Pollution Monitoring	Refer Table 10-9				660,000	Operation and maintenance will be taken up Khulna zone through GoB funding.
Shrubs and Trees	Maintenance of trees and shrubs including trimming of shrubs, watering and clearing of weeds	BDT 10,000 per Km per month			4,560,000	
Sanitation and sanitary facilities	Sanitation and sanitary facilities including waste (liquid and solid) as per DoE requirement	LS			600,000	
Operation Phase Cost of ESMP per Annum					5,820,000	

ANNEXES

Joint Venture of



STUP Consultant Pvt. Ltd.
On July 1st, 2021, STUP was acquired by Assystem and rebranded as Assystem STUP.



BCL Associates Limited, Bangladesh

ANNEX 1

Joint Venture of



STUP Consultant Pvt. Ltd.
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BCL Associates Limited, Bangladesh

Annex 1-1: Pandemic (Covid 19) Response Plan

INTRODUCTION

The COVID-19 virus is easily spread by contact with infected people who have discharged droplets into the air (through breathing, talking, coughing, or sneezing), which subsequently produce airborne aerosols that can move up to 27 feet away and through cross-contamination of surfaces. Therefore, it is crucial to assess the risk factors at a workplace that affect the spread of COVID-19 among employees (and the general public, including family members of those employees), and to create and put into practice control measures to lower those risks. A person's risk of infection will vary depending on a variety of circumstances, some of which will also reduce the risk. Whether or not a person being among ill people is the biggest risk factor for infection. If they often deal with possibly sick or infected individuals and/or operate in environments where surface contamination may be prevalent, those who are employed during the COVID-19 pandemic are at a higher risk. Sadly, it is conceivable for someone who has COVID-19 to remain symptom-free or only have minor symptoms while still spreading the infection to others. As a result, a variety of safeguards will be used in this plan to lower the danger of COVID-19 transmission as much as feasible.

SCOPE OF THE PLAN

Visitors and all site workers are obliged to follow the terms of this Plan. The Contractors' compliance policy shall be put into place for site personnel who violate the rules and procedures of this Plan due to the high transmission potential of the COVID-19 virus and its ability to affect several workers on any site.

The COVID-19 virus can spread anywhere that employees are, thus this plan applies to all areas of the job site, including active work areas, staging spaces, break areas, changing places, restrooms, and others.

RESPONSIBILITY

All stakeholders must have a clear understanding of the obligations that come with their job responsibilities in order for this Plan to be developed, implemented, and maintained to be effective. The minimal standards listed below must be met in order for this COVID-19 Construction Site Management Plan to continue to be in compliance:

a. Contractots Responsibilities

- ▶ Develop, implement and maintain COVID-19 Construction Site Management Plan;
- ▶ Designate a worksite COVID-19 Officer;
- ▶ Develop, deliver and maintain a training course as outlined in the Plan for all site personnel and visitors;
- ▶ Fund to the level appropriate the Plan to ensure compliance with this Plan and the applicable standards and applicable Government Rules; this includes funds for purchasing of vital equipment, disinfectants and cleaners and additional workers where necessary as well as funding of all related procedures.

Contractors must make sure that all relevant and up-to-date parts of COVID-19 transmission risk reduction are included in this plan and that they are successfully communicated to all site employees and visitors during training sessions.

b. Covid-19 Officer (CO)

- ▶ Communicate to contractors the level of resources required to ensure compliance with this Plan (PPE, cleaning products, work staff, work schedules, etc.);
- ▶ Conduct Jobsite Hazard Analysis (JHA)/Jobsite Safety Analysis (JSA) for COVID-19 exposure and implement controls where necessary to reduce transmission risk;
- ▶ Develop and implement a procedure to conduct daily worker symptom screenings;
- ▶ Establish a "return to work" policy based on current guidance;
- ▶ Provide the appropriate amount of time for training and other Plan elements to supervisors, workers, and visitors to ensure compliance with this Plan;
- ▶ Work with Supervisors, and Workers to ensure Plan compliance and effectiveness;

- ▶ Review and revise the Plan according to the standards guidelines for the implementation of best practices.

c. Supervisor Responsibilities

- ▶ Ensure that workers receive training on this Plan;
- ▶ Assure that personal protective equipment required for compliance with this plan are accessible to all site personnel and visitors;
- ▶ Ensure site-wide compliance with this Plan;
- ▶ Identify and document Plan deficiencies;
- ▶ Provide authority to affected workers and contractors to “stop work” when their health and safety is at risk due to Plan deficiencies;
- ▶ Investigate, document and control Plan deficiencies which may increase transmission spread and seek worker input for improvement.

d. Workers

- ▶ Workers will fulfill all Plan related requirements (e.g. reading the Plan, training, accessing PPE, etc.) on work time;
- ▶ Read and understand the Plan and sign/date that they have done so;
- ▶ Comply with this Plan and its procedures to help reduce the spread of COVID-19;
- ▶ Workers will consult with their supervisor or CO whenever there are any questions regarding implementation of COVID-19 transmission risk reduction procedures;
- ▶ Employees will report any concerning deficiencies in the Plan to their Supervisor or CO;
- ▶ Follow appropriate safe work practices including use of engineering, administrative and personal protective equipment (PPE) controls;
- ▶ Report all hazards, near-misses, incidents and accidents to supervisors as soon as it is safe to do so;
- ▶ Exercise “stop work” when Plan deficiencies are assumed or identified; record the deficient situation and immediately communicate “stop work” reasoning to Supervisor.

e. Visitors

- ▶ Visitors shall read, understand and receive training on this Plan;
- ▶ Visitors will adhere to and follow applicable worker requirements as listed above;
- ▶ Visitors shall not modify Plan procedures.

TRAINING PROGRAM

The comprehension and execution of this Plan and the COVID-19 transmission reduction measures outlined in it depend on worker training. Lack of or inadequate training may contribute to COVID-19 outbreaks. Before returning to work or visiting the site, personnel must receive training on this Plan, which must be conducted in accordance with this Plan's standards for social distancing.

A COVID-19 transmission risk reduction training course developed, delivered, and maintained by contractors shall satisfy any applicable requirements of this Plan. When the strategy is revised or when new important information or advice becomes available, the training course must also be updated. The instruction program must cover:

- ▶ Curriculum focused on the aspects of the Plan, with the overarching goal of developing the skills to effectively carryout the COVID-19 transmission risk reduction control methods;
- ▶ The training must be long enough to ensure participants understand the Plan (this includes time for questions and control method hands-on if necessary);
- ▶ Course Agenda;
- ▶ Training certificates;
- ▶ Training records for each course given consisting of participants name, trainer, place, date, contact hours and copy of the course agenda;
- ▶ Qualified trainers;

In addition to initial training, the CO shall provide workers with up-to-date COVID-19 information through daily “tool box talks”.

WORKSITE CONTROL MEASURES

It has been demonstrated that the COVID-19 virus may spread by airborne exposure, droplet contact, and COVID-19-contaminated surfaces (such as doorknobs, keypads, and tools) when a person comes into contact with the contamination and subsequently contacts their mucous membranes (eyes, nose, mouth). The following controls will assist in lowering the danger of such transmission. Worker risk of catching and transmitting the COVID-19 virus can be decreased by putting these safeguards into place and adhering to them as strictly as feasible.

Social Distancing

Social segregation, which aims to lessen interactions between infected and susceptible (those who do not have the virus) persons, may be the greatest risk reduction measure. The current recommendations state that if you must go out in public, keep at least 6 feet between you and other people. However, research has shown that the virus may travel up to 27 feet and remain contagious in the air for up to 16 hours. Therefore, the lower your chance of contracting an infection is, the more space you may create between you and another person. Additionally, according to recent research, up to 25–50% of the populace may have the virus undetected or with just moderate symptoms, making it difficult to tell if someone is infected. I'll say it again: the farther you can keep yourself from other people, the better defense you are providing for yourself. The following transmission reduction controls will be followed on the worksite:

- ▶ Working from home: for workers who can perform their job at home (e.g. office staff), arrangements will be made for them to do so;
- ▶ The CO will be identifying opportunities to stagger work shifts, alternate work days, schedule jobs, etc. in an effort to reduce the number of workers on site at any given time; the supervisor will inform the workers of any work shift changes;
- ▶ The CO shall ensure work groups have no more than 10 workers or, establish workgroups in accordance with their requirements if more stringent in addition to social distancing of 6 feet;
- ▶ Commuting: do not commute to work on public transportation or in groups (e.g. avoid bus, rail, ridesharing, etc.);
- ▶ The CO will establish Controlled Access Zones to the work area to prevent access from other trades, site visitors and the public in an effort to limit personal contact;
- ▶ Checking in/out from the work site: upon checking into the worksite, maintain at least six feet distance. Do not congregate in groups while waiting to enter or leave the worksite;
- ▶ Work site meetings: meeting will be held with no more than 10 participants (or fewer) and a distance of at least 6 feet between each participant shall be maintained;
- ▶ Breaks and Lunch: the CO will establish a plan to stagger breaks and lunches to ensure no groups of more than 10 (or fewer) congregate, site personnel shall not take breaks and eat lunch together maintain at least 6 feet between each other this will help maintain limited contact between workers;
- ▶ Bathroom visits: do not cointegrate or wait in line while waiting to use bathrooms or portable toilets;
- ▶ Avoid working in groups of more than 10 (or fewer): work (at least 6 feet apart) if possible and if it is safe to do so; for jobs requiring close contact (e.g. hanging wallboard, stabilizing ladders, working in enclosed or confined spaces, etc.) workers will wear at least N95 respirators and eye protection;
- ▶ Interactions between workers when picking up or delivering equipment/materials will be minimized: schedule deliveries during times when worksite occupancy is low and organize staging of equipment/materials to minimize movement on site;
- ▶ In an effort to help ensure at least six feet is maintained at common congregation areas (e.g. worksite check-in/out locations, at elevators, etc.); distance identifiers (tape on floors, cones, etc.) shall be placed every six feet to guide site social distancing efforts;

If at any time it is deemed unsafe to conduct certain work tasks with one or a limited number of workers, that task will be evaluated to determine if a safer method of execution is possible or that work will be suspended

until a future time where the social distancing requirements are lifted.

Sick Policy

The following procedures will be placed at the worksite:

- ▶ The contractor COVID-19 sick policy will be followed while the pandemic is on-going;
- ▶ If the workers have been exposed to COVID-19 or if have symptoms of infection call the healthcare provider immediately and stay home except to get medical care and separate from other people in home until expert medical advice is given from the medical care provider;
- ▶ Workers shall stay at home and not come to work if they are experiencing COVID-19 symptoms or otherwise feel sick or if they have had close contact with workers on site who are COVID-19 positive;
- ▶ A worker will be asked to leave the worksite when they start feeling sick or when they have been in close contact with a confirmed positive COVID-19 case. If someone goes home from the site due to sickness, the area where that person worked will be immediately disinfected with an approved disinfectant;
- ▶ The CO shall notify the Local Health Department concerning worksite COVID-19 cases;
- ▶ Workers are strongly encouraged to self-identify symptoms of fever, coughing, or shortness of breath each day, before the shift, mid-shift, and at home to their supervisor or the sites CO;
- ▶ CO will ask sick work if they have been in close contact with other personnel on site that day;
- ▶ The contractor may implement a symptom check for workers upon arrival at the site which will include no contact thermometers and a questionnaire asking if the worker has experienced any fever, trouble breathing, shortness of breath; if the worker presents a fever of 100.4 or answers yes to any of the symptom questions, they will be asked to go home and contact their medical care provider;
- ▶ The guidelines for when the workers can discontinue home isolation and return to work will be followed for recovered sick workers wishing to resume work.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Workers that use a respirator must follow the rules when doing so. The PPE Program of the contractor shall control all PPE use. On this worksite, PPE shall be administered to all personnel on site for required use as follows:

- ▶ Approved respirator certified as N95 or higher and eye protection for those working in close contact with others;
- ▶ Facemasks (e.g. medical facemask, cloth masks, etc.) with an efficiency lower than an N95 respirator, such as a medical facemask, will be worn by all other personnel while on site (e.g. workers who are not in close contact with others, visitors, etc.); medical and cloth facemask are not respirators and do not replace physical distancing or respirators required when workers are in close proximity. They should be provided based governments' requirements;
- ▶ Respirators designated as "disposable" shall not be worn more than one shift; and a new disposable respirator will be given to workers at the beginning of each shift;
- ▶ Protective gloves may also be assigned by the CO or Supervisor if contact with high-touch areas is possible;
- ▶ All reusable respirators and PPE shall be decontaminated and stored in accordance with the contractor PPE Programs;
- ▶ All other worksite required PPE, for use in protecting workers against general and task specific construction hazards, must also be worn as required and in accordance with the contractors PPE Programs.

DISINFECTION

The risk of contracting COVID-19 through contamination transfer from our hands to our eyes, nose, and mouth is decreased by limiting our contact with high contact items and areas and cleaning and disinfecting them to the extent necessary. This is because COVID-19 may survive outside of the body for up to 72 hours. The following contamination reduction, cleaning and disinfection methods will be used at the worksite:

- ▶ Workers are encouraged not share other workers' PPE, phones, or other work tools and equipment;
- ▶ The site has a "non-contact policy", site personnel are not to shake hands, high five, etc. while the pandemic is on-going;

- ▶ Workers are required to use their own food containers and water bottles from home;
- ▶ Soap and water wash stations will be placed outside of portable toilets and located at common areas (e.g. break areas, tool cribs, etc.);
- ▶ Signs reminding site personnel to avoid touching their eyes, nose, and mouth, frequently washing their hands, covering coughs/sneezes, locations of wash stations and social distancing policies will be posted around the site in common areas;
- ▶ Hand washing guidelines will be posted at each wash station which will include: wash your hands often with soap and water for at least 20 seconds;
 - Before entering the jobsite and before you go home;
 - After touching high-touch areas such as door knobs, handles, atm key pad, etc.;
 - When hands are visibly dirty;
 - After going to the bathroom;
 - After blowing your nose, coughing, or sneezing;
 - Before eating or drinking.
- ▶ Hand-sanitizer stations with at least 60% ethanol or 70% isopropanol may provided only if soap and water wash stations cannot be acquired for the site or if limited soap and water wash stations are available on site;
- ▶ Frequently touched objects (including tools), surfaces and areas will be cleaned and disinfected frequently; the CO shall designate a disinfecting and cleaning personnel for each work shift (disinfecting and cleaning personnel shall receive necessary training);
- ▶ Change out areas will be designated for PPE donning/doffing and for workers wanting to change out of work clothing before they leave the site.

RECORDS

In line with the contractors record program and all relevant legislation, the CO is responsible for maintaining all records pertaining to this Plan, including those pertaining to training, hazard identification, and sickness tracking.

PLAN REVIEW AND UPDATES

The CO shall monitor pertinent laws, regulations, and guidelines, as well as the best practices published through standards of care, regarding the COVID-19 pandemic and the preservation of worker health and safety on a daily basis, and shall amend this Plan as necessary.

ANNEX 2

Joint Venture of



STUP Consultant Pvt. Ltd.
On July 1st, 2021, STUP was acquired by Assystem and rebranded as Assystem STUP.



BCL Associates Limited, Bangladesh

November 2022

Annex 2-1: Permission Regarding Tree Cutting and Clearance



গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
প্রকল্প ব্যবস্থাপক-৩ (নিগ্রহ, সড়ক) এর কার্যালয়
উইকেয়ার ফোক-১: বিনাইলহাট-যশোর মহাসড়ক (এন-৩) উন্নয়ন প্রকল্প
এসেনবাহী, তেজগাঁও, ঢাকা-১২১৫।
ফোন: ০২০২০-০২১২৭৬
Email: p3.3@wecarebhel@gmail.com



তারিখ: ২৬/০৪/২০২২

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বিষয়: উইকেয়ার ফোক-১: বিনাইলহাট-যশোর মহাসড়ক (এন-৩) উন্নয়ন প্রকল্প বাস্তবায়নের বিষয়ে মহাসড়কের (খানাপড়া) বাম -
পালংকী-চীড়াঘাট) দুই পাশে হতে বৃক্ষ কটন ঘূর্ণিত করার প্রার্থনা।

উপর্যুক্ত বিষয়ে যথাযথ সন্ধান অনুসারে জানতে পার্শ্বে যে, সড়ক পরিবহন ও মহাসড়ক বিভাগের কারতব্য সড়ক ও জনপথ (সওক) অধিদপ্তর কর্তৃক WORLD BANK এর অর্থায়নে বাস্তবায়নের জন্য প্রস্তুতি "উইকেয়ার ফোক-১: বিনাইলহাট-যশোর মহাসড়ক (এন-৩) উন্নয়ন প্রকল্প" প্রকল্পটি ২৬/০২/২০২০ তারিখে একমত কর্তৃক অনুমোদিত হয়। বর্ণিত মহাসড়কটির বিনাইলহাট-যশোর মহাসড়কের (খানাপড়া) বামপাশের পালংকী-চীড়াঘাট) অংশে এ-সে-এস এবং উক্ত অংশে এ-সে-এসের চেইনকে বরা ০২১৫ টি সেন্সার স্থাপন করে উন্নীত করা হবে। কাজটি বাস্তবায়নের জন্য সড়কের দুই পাশে বর্ধিত মাধ্যমিক উন্নয়ন প্রকল্পের অধীনে মাটিমালিকানা বৃক্ষ সন্নিবেশ করা হবে। কিন্তু WORLD BANK হতে সম্পত্তি আদায়ের প্রার্থনা যে, প্রকল্প কর্তৃক প্রস্তুত Environmental and Social Management Plan (ESMP), যা বৃক্ষ অনুমোদন না হওয়া পর্যন্ত বিষয়ে বর্ণিত স্থানে বৃক্ষ কটন ঘূর্ণিত করতে হবে এবং এর পর কর্তৃক বিশেষজ্ঞ টিমের মাধ্যমে বৃক্ষ কটনের সময় Occupational and Health Safety (OHS) ব্যবস্থা গ্রহণ পূর্বক বৃক্ষ অপসারণের কাজ সম্পূর্ণ করা হবে।

একইভাবে, সড়কের উন্নয়ন কাজ বাস্তবায়নের পক্ষে সড়ক পাশে বর্ধিত মাটিমালিকানা বর্ণিত বৃক্ষ সন্নিবেশ করা হবে। WORLD BANK কর্তৃক Environmental and Social Management Plan (ESMP) অনুমোদন না হওয়া পর্যন্ত বিষয়ে বর্ণিত স্থানে বৃক্ষ কটন ঘূর্ণিত এবং ESMP অনুমোদনের পর পুনরায় বৃক্ষ কটনের সময় বিশেষজ্ঞ টিমের মাধ্যমে Occupational and Health Safety (OHS) ব্যবস্থা গ্রহণ করে বৃক্ষ অপসারণের জন্য প্রকল্পটি প্রকল্পের অধীনে বর্ণিত প্রকল্পের জন্য অনুমোদন করা হবে।

বাস্তব
প্রকল্পের
ফোক পরিবহন

অনুমতি সহ অর্থায়নের জন্য প্রেরণ করা হল।

- ০১: প্রকল্প পরিচালক, উইকেয়ার ফোক-১: বিনাইলহাট-যশোর মহাসড়ক (এন-৩) উন্নয়ন প্রকল্প, এসেনবাহী, তেজগাঁও, ঢাকা।
- ০২: পরিচালক প্রকল্প পরিচালক, উইকেয়ার ফোক-১: বিনাইলহাট-যশোর মহাসড়ক (এন-৩) উন্নয়ন প্রকল্প, এসেনবাহী, তেজগাঁও, ঢাকা।
- ০৩: নির্বাহী প্রকল্প পরিচালক, সড়ক, সড়ক বিভাগ, ঢাকা।
- ০৪: টিম সিস্টার, STUP-BCL (৩), বুরাই টিমার, মহাসড়ক, ঢাকা।
- ০৫: Social Development and Public Relation Expert/Environmental Specialist/Land Acquisition and Resettlement Specialist এসেনবাহী, তেজগাঁও, ঢাকা।
- ০৬: অফিসার।



গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
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এসেনবাহী, তেজগাঁও, ঢাকা-১২১৫।
ফোন: ০২০২০-০২১২৭৬
Email: p3.3@wecarebhel@gmail.com



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বিষয়: উইকেয়ার ফোক-১: বিনাইলহাট-যশোর মহাসড়ক (এন-৩) উন্নয়ন প্রকল্প বাস্তবায়নের বিষয়ে মহাসড়কের (খানাপড়া) বাম -
পালংকী-চীড়াঘাট) দুই পাশে হতে বৃক্ষ কটন ঘূর্ণিত করার প্রার্থনা।

উপর্যুক্ত বিষয়ে যথাযথ সন্ধান অনুসারে জানতে পার্শ্বে যে, সড়ক পরিবহন ও মহাসড়ক বিভাগের কারতব্য সড়ক ও জনপথ (সওক) অধিদপ্তর কর্তৃক WORLD BANK এর অর্থায়নে বাস্তবায়নের জন্য প্রস্তুতি "উইকেয়ার ফোক-১: বিনাইলহাট-যশোর মহাসড়ক (এন-৩) উন্নয়ন প্রকল্প" প্রকল্পটি ২৬/০২/২০২০ তারিখে একমত কর্তৃক অনুমোদিত হয়। বর্ণিত মহাসড়কটির বিনাইলহাট-যশোর মহাসড়কের (খানাপড়া) বামপাশের পালংকী-চীড়াঘাট) অংশে এ-সে-এস এবং উক্ত অংশে এ-সে-এসের চেইনকে বরা ০২১৫ টি সেন্সার স্থাপন করে উন্নীত করা হবে। কাজটি বাস্তবায়নের জন্য সড়কের দুই পাশে বর্ধিত মাধ্যমিক উন্নয়ন প্রকল্পের অধীনে মাটিমালিকানা বৃক্ষ সন্নিবেশ করা হবে। কিন্তু WORLD BANK হতে সম্পত্তি আদায়ের প্রার্থনা যে, প্রকল্প কর্তৃক প্রস্তুত Environmental and Social Management Plan (ESMP), যা বৃক্ষ অনুমোদন না হওয়া পর্যন্ত বিষয়ে বর্ণিত স্থানে বৃক্ষ কটন ঘূর্ণিত করতে হবে এবং এর পর কর্তৃক বিশেষজ্ঞ টিমের মাধ্যমে বৃক্ষ কটনের সময় Occupational and Health Safety (OHS) ব্যবস্থা গ্রহণ পূর্বক বৃক্ষ অপসারণের কাজ সম্পূর্ণ করা হবে।

একইভাবে, সড়কের উন্নয়ন কাজ বাস্তবায়নের পক্ষে সড়ক পাশে বর্ধিত মাটিমালিকানা বর্ণিত বৃক্ষ সন্নিবেশ করা হবে। WORLD BANK কর্তৃক Environmental and Social Management Plan (ESMP) অনুমোদন না হওয়া পর্যন্ত বিষয়ে বর্ণিত স্থানে বৃক্ষ কটন ঘূর্ণিত এবং ESMP অনুমোদনের পর পুনরায় বৃক্ষ কটনের সময় বিশেষজ্ঞ টিমের মাধ্যমে Occupational and Health Safety (OHS) ব্যবস্থা গ্রহণ করে বৃক্ষ অপসারণের জন্য প্রকল্পটি প্রকল্পের অধীনে বর্ণিত প্রকল্পের জন্য অনুমোদন করা হবে।

বাস্তব
বিনাইলহাট-যশোর
সড়ক পরিবহন
ফোক পরিবহন

- অনুমতি সহ অর্থায়নের জন্য প্রেরণ করা হল।
- ০১: প্রকল্প পরিচালক, উইকেয়ার ফোক-১: বিনাইলহাট-যশোর মহাসড়ক (এন-৩) উন্নয়ন প্রকল্প, এসেনবাহী, তেজগাঁও, ঢাকা।
- ০২: পরিচালক প্রকল্প পরিচালক, উইকেয়ার ফোক-১: বিনাইলহাট-যশোর মহাসড়ক (এন-৩) উন্নয়ন প্রকল্প, এসেনবাহী, তেজগাঁও, ঢাকা।
- ০৩: নির্বাহী প্রকল্প পরিচালক, সড়ক, সড়ক বিভাগ, ঢাকা।
- ০৪: টিম সিস্টার, STUP-BCL (৩), বুরাই টিমার, মহাসড়ক, ঢাকা।
- ০৫: Social Development and Public Relation Expert/Environmental Specialist/Land Acquisition and Resettlement Specialist এসেনবাহী, তেজগাঁও, ঢাকা।
- ০৬: অফিসার।

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BCL Associates Limited, Bangladesh



संविनाद २५/०८/२०२२ई३



ଆମିନୋ ଏସିଡ୍ ସଂଶ୍ଳେଷଣର ପ୍ରକାର

০১: জাতীয় পরিকল্পনা, ইকোটেক্স সেক্টর-৩। বিনিয়োগ-প্রদান সহায়তা প্রকল্প (এনএস)। চাক্ষুণ্য শীর্ষক গ্রন্থ। এজনাবাতি, ঢাকা।
 ০২: অর্থনৈতিক প্রবন্ধ পরিকাঠামো, ইকোটেক্স প্রকল্প-৩। বিনিয়োগ-প্রদান সহায়তা প্রকল্প (এনএস)। চাক্ষুণ্য শীর্ষক গ্রন্থ। এজনাবাতি, ঢাকা।
 ০৩: জাতীয় পরিকল্পনা, ইকোটেক্স সেক্টর-৩। বিনিয়োগ-প্রদান সহায়তা প্রকল্প (এনএস)। চাক্ষুণ্য শীর্ষক গ্রন্থ। এজনাবাতি, ঢাকা।
 ০৪: টিম লিডার, STUP-BCL (j), বৃহত্তম উন্নয়ন, স্বাধীনতা, ঢাকা।
 ০৫: Social Development and Public Relation Expert/Environmental Specialist and Acquisition and Restoration Specialist
 এজনাবাতি, ঢাকা।
 ০৬: পরিচালনা।

[illegible][illegible]

[illegible]

কম্পিউটার: বাংলাদেশ সরকার
মিলিটারি ওন কন্ট্রোলিং অফিস
সংস্কৃতিক ওন বিভাগ, ঢাকা।

पृष्ठसंख्या: १२

ਅੰਤਿਮ ੦੨/੦੨/੨੦੨੩ ਤੋਂ

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সংগীত বন্যজনের আওতাধীন সঙ্গীতমোহনোদীপ বঙ্গোপদেয় বায়ান্নশতের লই বিজ্ঞানের শর্তকর্তী

- [illegible]

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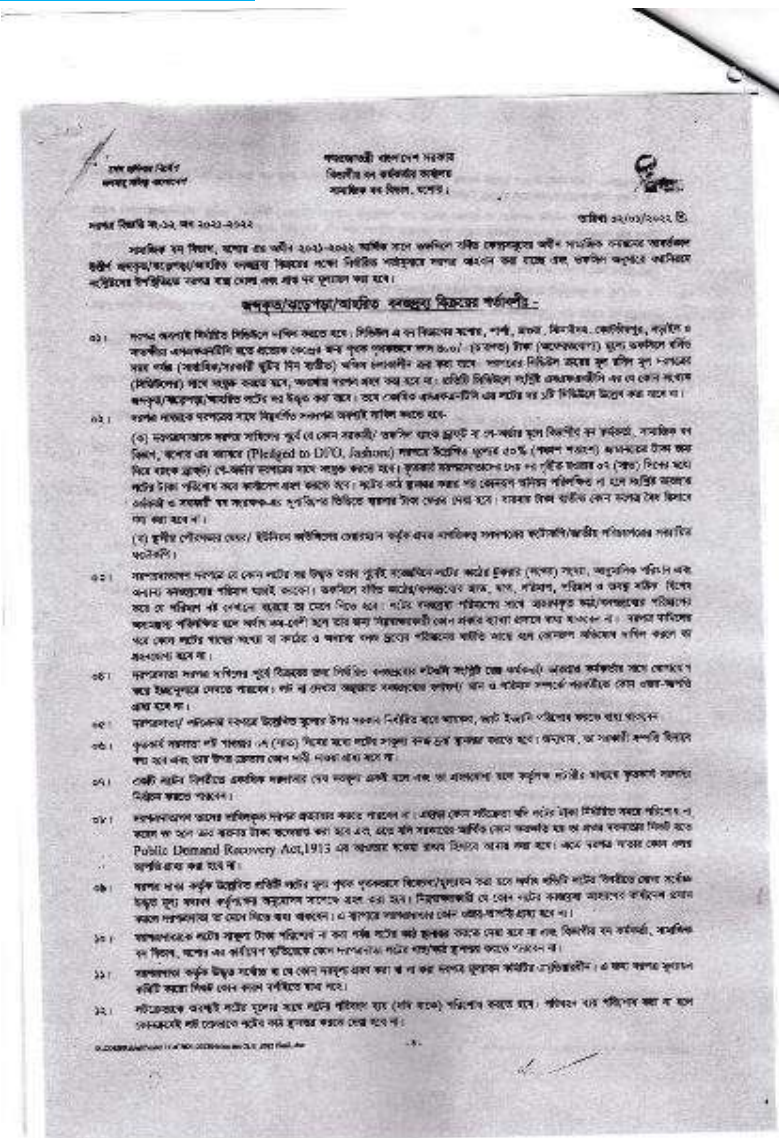
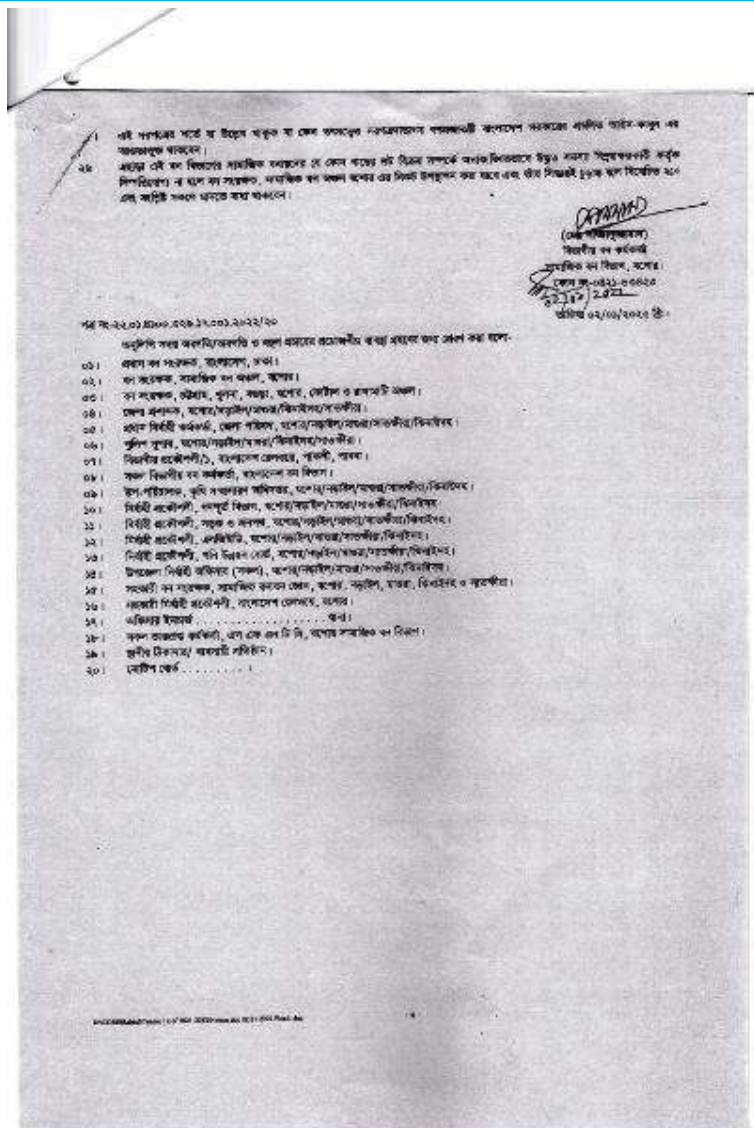
54

11000117, <http://www.fishbase.org/ID/Species/Details.cfm?SpeciesID=11000117>, 1912년 개항 이래 최초로 발행된 『대정지리지』 부록 114호

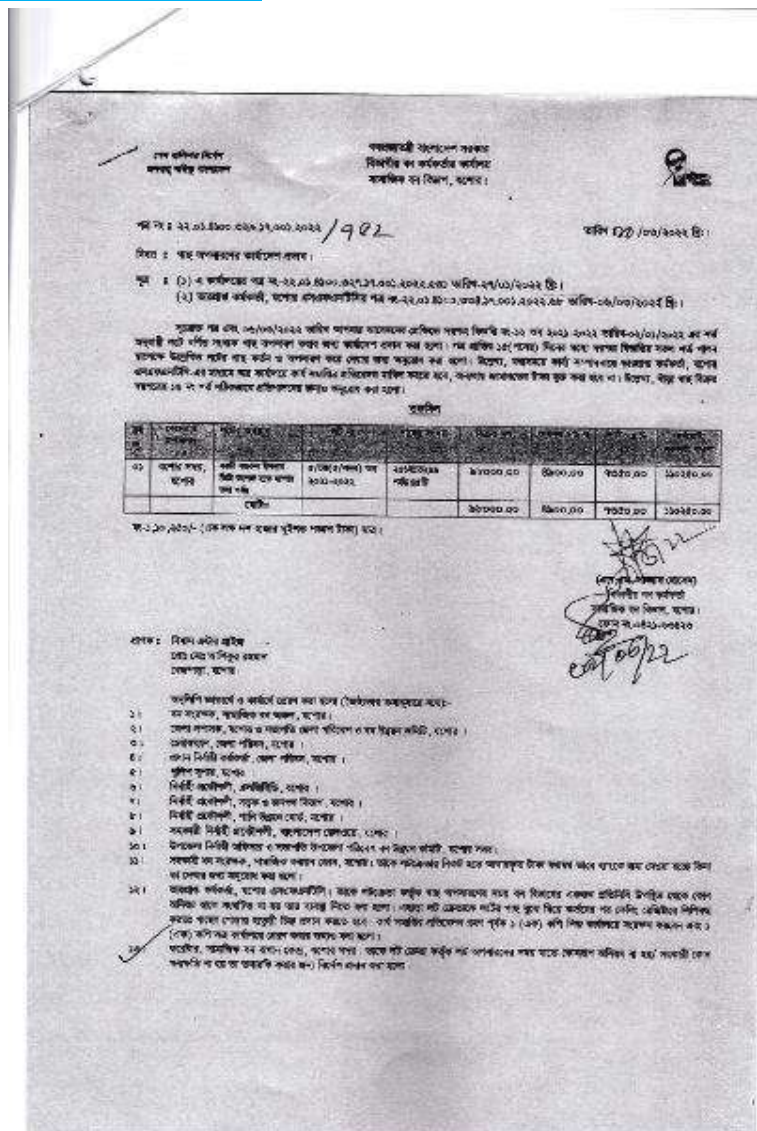
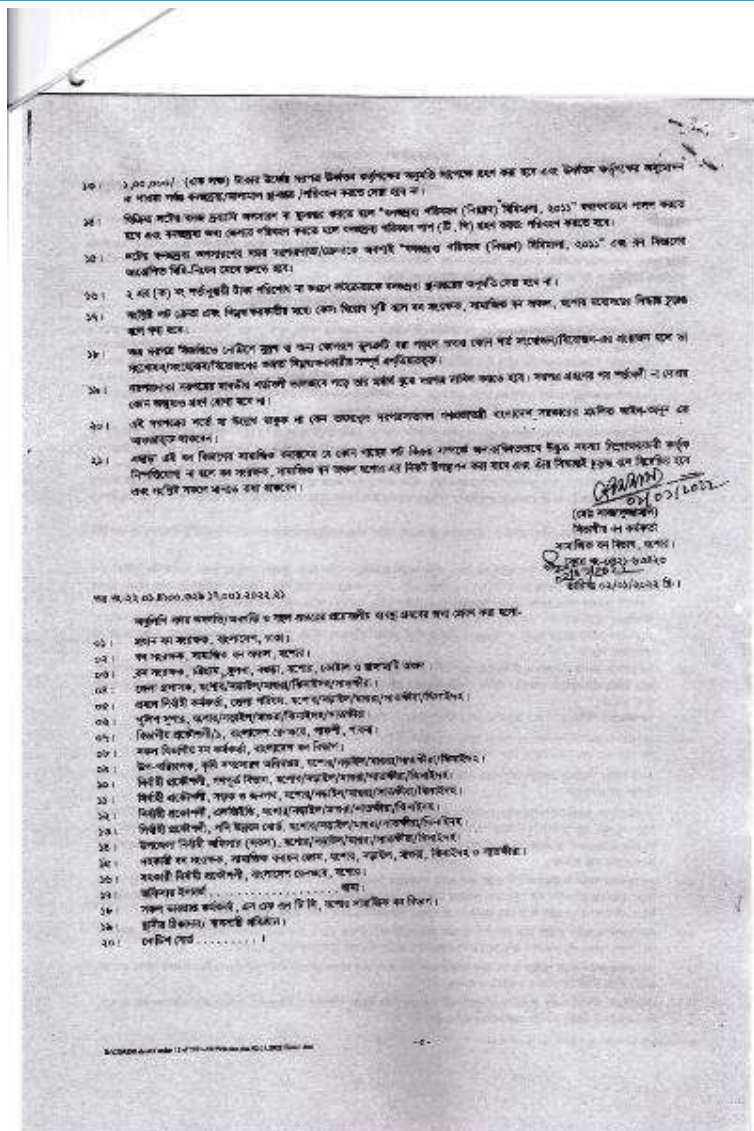
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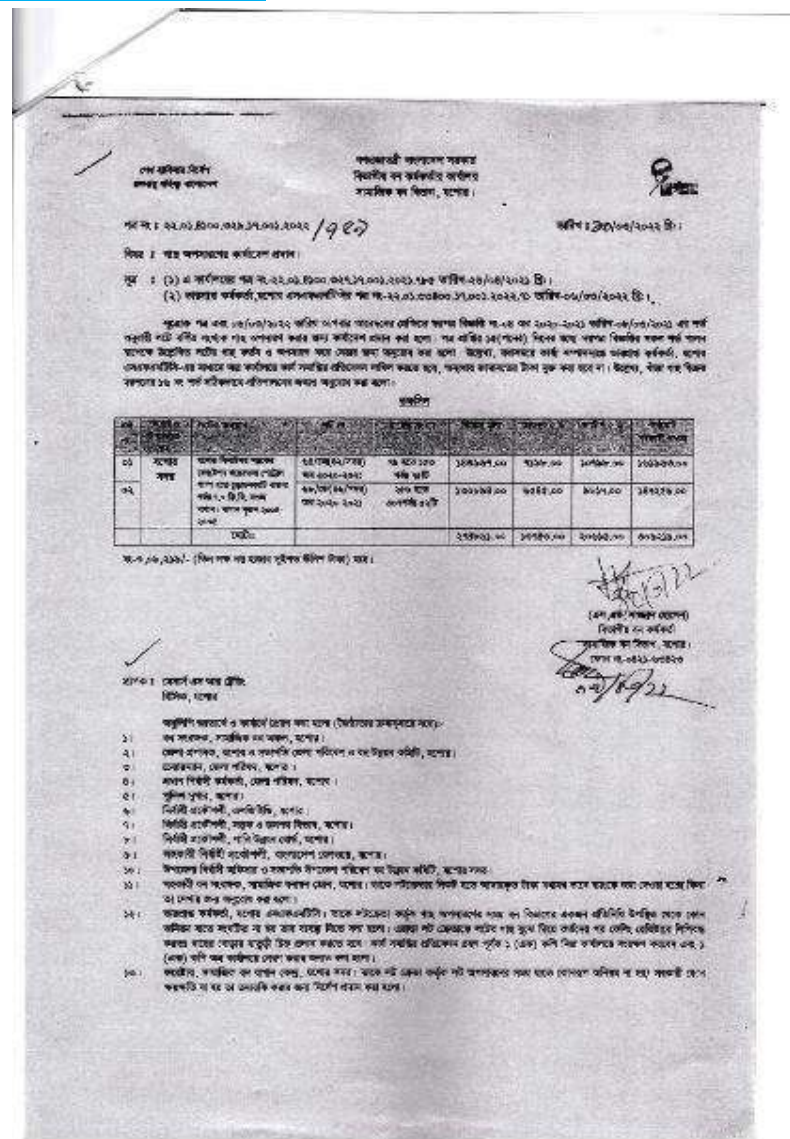
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November 2022





November 2022

STUP Consultants Pvt Ltd., India in Joint-Venture with
BCL Associates Limited, Bangladesh
Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) and Bhomra-Satkhira-Navaron Road Section (Phase-3) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program
Memo No: 4882/1/16 Date: 26 May 2022

To
The Project Director,
WeCARE Phase-1, Jhenaidah-Jashore
Highway (N-7) Improvement Project
Allenbari, Tejgaon, Dhaka-1215

Project: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) and Bhomra-Satkhira-Navaron Road Section (Phase-3) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

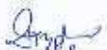
Subject: Submission of Proceedings of Stakeholder's Consultation Meetings.

Dear Sir,

We are pleased to submit herewith the proceedings of stakeholder's consultation meetings for your kind perusal.

Thanking you and assuring of our best services all times for your desired satisfaction.

Yours faithfully,


Md Asaduzzaman Chowdhury
Deputy Team Leader (TL in charge)
WeCARE Phase-1, Jhenaidah-Jashore
Highway (N-7) Improvement Project

End: As above.

Copy to:

1. Additional Project Director (SE, RHD), WeCARE Phase-1: Jhenaidah-Jashore Highway (N-7) Improvement Project, Allenbari, Tejgaon, Dhaka-1215.
2. Project Manager 1, 2 & 3 WeCARE program Phase-1
3. Syed Aslam Naqvi, Project Coordinator, STUP-BCL JV
4. Dr. Nahid Amin, Director, BCL Associates Limited, for information.
4. Managing Director, BCL Associates limited, for kind information.
5. Master File.

Project Office: Nazim Tower (2nd Floor), 1 Mohakhali CA, Bir Uttam AK Khondaker Sarak, Dhaka 1212, Bangladesh.
Tel: 4881 0072-5, e-mail: stup.bcl@bcl.com

Intercontinental Consultants and Technocrats Pvt. Ltd
(An ISO 9001:2015 Certified Company)
Innovative, Creative & Technologically Sustainable Infrastructure Solutions
In association with:
Delight Engineers & Consultants Ltd. (DECL)
House No. 21/B, (1st Floor), Road No. 16 New Old 27,
Dhanmondi, Dhaka-1209 our Sub-Consultant

In joint venture with:
Rough International Ltd.
A2 Omega Park, Eastern Ave,
Gardens East, Mirpur-10, 1212
and
BCL Associates Limited
Nazim Tower (2nd Floor), Bir Uttam
AK Khondaker Sarak, 1 Mohakhali Commercial Area,
Dhaka-1212, Bangladesh

Consultancy Services for Design Review Services for Jhenaidah - Jashore Road Section (Phase-1) and Feasibility Study, Detail Design of Bhomra - Satkhira-Navaron Road Section (Phase-3), Bangladesh – Regarding the Commencement of Services

Ref: WeCare/TL/RHD/32

8th May, 2022

Md. Zahid Hasan
Additional Chief Engineer, RHD
Project Director,
WeCARE Phase-1.
Subject: Consultancy Services for Design Review Services for Jhenaidah - Jashore Road Section (Phase-1) and Feasibility Study, Detail Design of Bhomra - Satkhira-Navaron Road Section (Phase-3), Bangladesh – Regarding the Tree Cutting in the Existing Road Alignment
Ref : Memo No: 35.01.0000.072.05.06.22-111 Dated 05.05.2022
Dear Sir,
Please refer to your Memo No (referenced above) vide which you had sought the Consultant opinion whether it is possible to innovate the design so that trees (especially trees with Social and Cultural Values) in the existing road alignment, can be saved. In this connection, the following is communicated from our side:
(1) Firstly it is mentioned that the current assignment is the review of the previous design. The Feasibility of the Corridor in terms of Environmental and Social Assessment was already previously done and the Land Acquisition as per the previous study has already been planned.
(2) Secondly, it can be mentioned that the majority portion of the Alignment is following the Existing Road Alignment (except Geotechnical up gradation) and is therefore optimal in terms of Project implementation.
(3) Any further innovative effort to save the trees in the existing alignment will trigger realignment/bypasses which will involve acquisition of Fresh Agricultural and the current policy of the Government is to acquire minimum agricultural land.
(4) Furthermore it is mentioned that some of the trees which are being cut along the Existing Alignment has outlived their useful life and in some case hazardous to the commuting traffic.
(5) The Loss of trees can be compensated by compulsory plantation in the New Corridor and also community planting relocation of trees with social and cultural values (if any) by Community Consultation.
Thanking you and assuring you of our highest consideration.
Yours truly,
On behalf of Consultant Consortium


Sandip Bhattacharya
(Sandip Bhattacharya)
Team Leader
Copy forwarded for information to:

1. APD/DPD
2. PM1/PM2/PM3
3. Dy. Team Leader.

Innovative, Creative & Technologically Sustainable Infrastructure Solutions
CIN: U35990WB1905PTC024915
Corporate Office: Telephone: Fax: Email: Website:
A-8 Green Park, +91-11-40664900 +91-11-25855253 business@icconline.com <http://www.icconline.com>

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BCL Associates Limited, Bangladesh

November 2022

Government of the People's Republic of Bangladesh
Office of the Project Director (ACE, RHD)
WeCARE Phase-1:
Jhenaidah-Jashore Highway (N-7) Improvement Project
Atientari, Tejgaon, Dhaka-1215.
E-mail: pd.ressareeb.rhd@gmail.com



Memo no : 35.01.0000.072.07.06.22 **111** Date : **05-05-2022**

Subject: Consultancy Services for Design Review Services for Jhenaidah-Jashore Road Section (Phase-1) and Feasibility Study, Detail Design of Bhomora-Satkhira-Navaron Road Section (Phase-3)- Regarding the tree cutting in the existing road alignment.

It is to inform that recently during a meeting held on 24 April, 2022, World Bank team has expressed their concern over the tree cutting at the project location. They have asked whether it is possible to introduce innovative design which can save trees, especially trees with social and cultural value (Copy attached).

In this regard, you are requested to provide your detailed opinion whether it is possible to innovate design so that trees (especially trees with social and cultural values) in the existing road alignment, can be saved.

This is urgent.

Enclosure: As stated above

M. Zahid Hasan
(Md. Zahid Hasan)
ID No 000010
Project Director (ACE, C.C), RHD

Sandeep Bhattacharjee
Team Leader
Intercontinental Consultants &
Technocrats Pvt. Ltd.

Distribution:

1. Additional Project Director (SE, RHD), WeCARE Phase-1, Jhenaidah-Jashore Highway (N7) Improvement Project.
2. Deputy Project Director (EE, RHD), WeCARE Phase-1, Jhenaidah-Jashore Highway (N7) Improvement Project.
3. Project Manager 1/2/3 (EE, RHD), WeCARE Phase-1, Jhenaidah-Jashore Highway (N7) Improvement Project.

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ANNEX 3

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November 2022

Annex 3-1: Approved ECC of the Project

শেখ হাসিনার নির্দেশ
জলবায়ু সচিবালয় বাংলাদেশ

09.12.2021

Government of the People's Republic of Bangladesh
Department of Environment
Head Office, Paribesh Bhavan
E-16 Agargaon, Sher-e-Bangla Nagar Dhaka-1207
www.doe.gov.bd

Memo No: 22.02.0000.018.72.047.21-167 Date: December 09, 2021

Subject: Environmental Clearance for WeCARE: Phase-1: Jhenaidah-Jashore Highway (N7) Improvement Project.

Ref: Your application on 27.10.2021

With reference to your above application, the Department of Environment (DoE) hereby approves Environmental Impact Assessment (EIA) report and accords Environmental Clearance to WeCARE: Phase-1: Jhenaidah-Jashore Highway (N7) Improvement Project.

A copy of the said Environmental Clearance is attached herewith for your kind information and necessary action at your end.

(Signature)
(Masud Iqbal Md. Shameem)
Director (Environmental Clearance)
Phone: 8181673

Project Director
WeCARE: Phase-1: Jhenaidah-Jashore Highway (N7) Improvement Project
Allenbari, Tejgaon, Dhaka.

Copy Forwarded to:

1. Director, Department of Environment, Khulna Divisional Office, Khulna,
2. Assistant Director, Office of the Director General, Department of Environment, Head Office, Dhaka.

শেখ হাসিনার নির্দেশ
জলবায়ু সচিবালয় বাংলাদেশ

Government of the People's Republic of Bangladesh
Department of Environment
Head Office, Paribesh Bhavan
E-16 Agargaon, Sher-e-Bangla Nagar Dhaka-1207
www.doe.gov.bd

Environmental Clearance Certificate
Section 12 of the Environment Conservation Act, 1995 (Amended 2010)

Clearance Certificate Number: 167
File number: 22.02.0000.018.72.047.21-167
Clearance Certificate Issue Date: 09 December 2021
Renewal date not later than: 09 December 2022

A. Clearance Certificate Type
Environmental Clearance

B. Clearance Certificate Holder
Project Director
WeCare Phase-1: Jhenaidah-Jashore Highway (N7) Improvement Project
Allenbari, Tejgaon, Dhaka.

C. Premises to which this Clearance Applies
Proposed Jashore-Jhenaidah National Highway (N7) starts at Alberta Mor in Jhenaidah and continues till Murali Mor, Jashore (48.5km). The route connects with the existing N7 National Highway heading in a westerly direction through Magura on to Jhenaidah before turning south to Jashore and finally south-east to Khulna.

D. Activities for which this Clearance Authorizes and Regulates

- Widening of Jashore-Jhenaidah National Highway (N7) two way 4 lane divided Highway pavement for 48.5km.
- Strengthening of existing two lanes pavement's (48.5km) underlying layers to match the standard of new construction.
- To construct flyover/interchanges (01 No. 1647.29m). Bridges (04 Nos. 198.12m). Culverts (55 Nos. 198.10m)/ Foot over bridge (12 Nos. 439m): Bus hey (11 Nos.). Underpass (01 No. 16.00m)
- Plan, design, construct and encourage safe highway operation by incorporating all available road safety features following the safe system approach to reduce road safety hazard and establish the corridor as a model road safety demonstration corridor.
- Design of Intelligent Transportation System (ITS) features and Optical Fiber Cable (OFC) to upgrade this corridor to "Smart Highway" which will enhance safety, mobility and travel time reliability for the users of the highway.
- Achieve greater access control, safety, benefits and operational advantages by constructing Slow Moving Vehicular Traffic (SMVT) lane on both side of 48.5km project road.

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BCL Associates Limited, Bangladesh

শেখ হাসিনার নির্দেশ
অসমত্ম স্বতন্ত্র বাংলাদেশ



E. Terms and Conditions for Environmental Clearance

1. **Limit Condition for Discharges to Air and Water:** The Environmental Clearance Certificate must comply with schedules 2 and 10 of the Environment Conservation Rules, 1997.

2. **Noise Limit:** The Environmental Clearance Certificate must comply with the Noise Pollution (Control) Rules, 2006.

In case of non-coverage of ECR 1997 the World Bank Environment, Health and Safety Guideline and JICA Guidelines for Environmental and Social Considerations, 2010 shall be adhered to.

3. Operating conditions:

- 3.1 Activities must be carried out in a competent manner. This includes:
 - (a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
 - (b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.
- 3.2 All plant and equipment installed at the premises or used in connection with the Environmental Clearance activity:
 - (a) must be maintained in a proper and efficient condition; and
 - (b) must be operated in a proper and efficient manner.
- 3.3 Construction works shall be carried out with proper traffic management and control to avoid/mitigate the disturbance of local lives as well as implementation schedules of the works shall be notified in advance to nearby residents.
- 3.4 Storage area for construction materials shall be carefully selected to avoid disturbance of the natural drainage. To avoid soil contamination at labour camp and work site chemical, cement and petroleum derivatives shall be handled cautiously.
- 3.5 This shall be ensured that soil is obtained from nearby areas, which are free of invasive plants. Re-vegetation and replanting shall be undertaken if rehabilitation works involve extensive vegetation clearance.
- 3.6 Proper and adequate sanitation facilities shall be ensured in labor camps throughout the proposed project period.
- 3.7 In order to control noise pollution, vehicles & equipment shall be maintained regularly, working during sensitive hours and locating machinery close to sensitive receptor shall be avoided.
- 3.8 No solid waste can be burnt in the project area. An environment friendly solid waste management should be in place during whole the period of the project in the field.
- 3.9 Full and adequate utilization of the system for mitigation of pollution and environmental damage as well as that for treatment of wastes shall be ensured.
- 3.10 Spent lubricating oil and oil filters shall be disposed off in environment friendly manner or can be sold to factories those have environmental Clearance Certificate from DOE.
- 3.11 Proper and adequate on-site precautionary measures and safety measures shall be ensured.
- 3.12 Soil and other construction material should be sprayed with water prior to any loading, unloading or transfer. The excavation work area should be sprayed with water. Excavated materials, soil/construction materials should be carried by vehicle covered with impervious sheet.

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- 3.13 Any heritage sight, ecological critical area, and other environmentally and/or religious sensitive places shall be avoided during project construction phase.
- 3.14 Resettlement plan should be properly implemented and people should be adequately compensated, where necessary.
- 3.15 Construction material should be properly disposed off after the construction work is over.
- 3.16 Stringent control measures and procedures to be adopted to avoid traffic congestion during construction activities.
- 3.17 There should be provision of elevator, escalator, tactile road tile, etc. in the stations for handicaps, disable and blind passengers.
- 3.18 Provision of traffic display panel, proper signs and announcement for the passengers shall be ensured.
- 3.19 A fully functional fire fighting equipment shall be kept on site through out the project period and at the stations during operation stage.
- 3.20 Proper counter measures shall be taken for controlling noise pollution.
- 3.21 There should be proper environmental monitoring program and ensure proper implementation during construction of the project.
- 3.22 All the required mitigation measures suggested in the Environmental Management Plan (EMP) included in the EIA report along with the emergency response plan are to be strictly implemented and kept operative/functioning on a continuous basis.
- 3.23 Comprehensive Environmental Performance report, upon completion of the project shall have to be submitted to both the concerned Regional/Divisional offices of DoE and head office of DoE describing actual intervention and rehabilitation at the project site.
- 3.24 Appropriate permission would be required to obtain from the Forest Department in favor of cutting/felling of any plant/tree/sapling forested by any individual or government before doing such type of activity.
- 3.25 No activity of cutting/razing/ dressing of hill or hilly land is endorsed under this Environmental Clearance. In case of indispensable to national interest, the project authority shall obtain the necessary permission/Clearance for cutting/razing hill/hillock from the competent authority concerned.

4. Monitoring and Recording conditions:

- 4.1.1 The results of any monitoring required to be conducted by this Clearance Certificate must be recorded.
- 4.1.2 The following records must be kept in respect of any samples required to be collected for the purposes of this Clearance Certificate:
 - (a) the date(s) on which the sample was taken;
 - (b) the time(s) at which the sample was collected;
 - (c) the point at which the sample was taken; and
 - (d) the name of the person who collected the sample.

4.2. Requirement to monitor concentration of pollutants discharged

- 4.2.1 For each monitoring, the Clearance Certificate holder must monitor (by sampling and obtaining results by analysis) the following parameter: air quality, water quality and Noise.

5. **Reporting Conditions:** Environmental Monitoring Reports shall be made available simultaneously to Head Office and respective concerned Regional/Divisional offices of

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অবশ্যই সর্মিক্ত বাংলাদেশ

the Department of Environment on a quarterly basis during the whole period of the project.

6. **Notification of environmental harm:** The Clearance Certificate holder or its employees must notify the Department of Environment of incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident.

F. Recording of pollution complaints

The certificate holder must keep a legible record of all complaints made to the certificate holder or any employee or agent of the certificate holder in relation to pollution arising from any activity to which this Environmental certificate applies. The record must include details of the following:

- (a) the date and time of the complaint;
- (b) the method by which the complaint was made;
- (c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- (d) the nature of the complaint;
- (e) the action taken by the certificate holder in relation to the complaint, including any follow-up contact with the complainant; and
- (f) if no action was taken by the certificate holder, the reasons why no action was taken.

The record of a complaint must be kept for at least 4 years after the complaint was made. The record must be produced to any authorized officer of the DOE who asks to see them.

G. Validity of the Clearance Certificate

This Environmental Clearance is valid for one year from the date of issuance and the Project Authority shall apply for renewal to the Head office of DoE with a copy to the concerned Regional/Divisional offices of DoE at least 30 days ahead of expiry.

Violation of any of the above conditions shall render this clearance void.

This Environmental Clearance has been issued with the approval of the appropriate authority.


(Masud Iqbal Md. Shameem)
Director (Environmental Clearance)
Phone: 8181673

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Annex 3-2: List of Proposed Culverts of J-J Road Improvement Project

Sl. No.	Design Chainage	Culvert ID as per Inventory	Culvert ID as per Design	Existing Structure size	Calculated Area, A=Q/V m ²	Remarks	Recommendations
Contract No 1							
1	00+031	BC-1	BC-1	1x3.1x3	7.4	Adequate	1v-3.00x3.00m
2	00+312	BC-2	BC-2	1x2.1x2.7	5.96	Inadequate	1v-3.00x3.00m
3	00+578	BC-3	BC-3	1x3x2.5	5.97	Adequate	1v-3.00x3.00m
4	00+808	BC-4	BC-4	1x2x2	4.77	Inadequate	1v-3.00x3.00m
5	01+055	BC-5	BC-5	1x2x2	4.77	Inadequate	1v-3.00x3.00m
6	01+455	BC-6	BC-6	1x3x3.25	7.76	Adequate	1v-3.00x3.00m
7	01+625	BC-7	BC-7	1x2.9x2.9	6.69	Adequate	1v-3.00x3.00m
8	01+895	BC-8	BC-8	2x3x3.8	15.6	Adequate	1V-4.00x4.00m
9	02+578	BC-9	BC-9	2x3x3	14.32	Adequate	2V-3.00x3.00m
10	03+138	BC-10	BC-10	1x3x2.5	5.97	Inadequate	1v-3.00x3.00m
11	03+355	BC-11	BC-11	1x2x2	10.62	Inadequate	1v-3.00x3.00m
12	04+240	--	BC-12	--	--	--	1V-3.00x3.00m
13	05+088	BC-12	BC-13	1x3x3.6	13	Inadequate	1V-4.00x4.00m
14	05+660	BC-13	BC-14	5-2.50-R	39	--	4V-4.00x3.00m
15	05+795	BC-14	BC-15	1x6.1x4	19.42	Inadequate	1V-5.00x5.00m
16	06+535	BC-15	BC-16	1x3.1x3.1	10.12	Adequate	1v-3.00x3.00m
17	06+890	--	BC-17	--	--	--	1V-3.00x3.00m
18	07+666	BC-16	BC-18	1x1.3x2.1	15.95	Inadequate	1v-3.00x3.00m
19	08+490	--	BC-19	--	--	--	1V-3.00x3.00m
20	09+460		BC-20	--	--	--	1V-2.00x2.00m
21	10+394	BC-17	BC-21	1x3x3	7.16	Adequate	1v-3.00x3.00m
22	10+932	BC-18	BC-22	1x1.5x1.5	3.9	Inadequate	1v-3.00x3.00m
23	11+231	BC-19	BC-23	1x.9x1.9	8.08	Inadequate	1v-3.00x3.00m
24	12+120	--	BC-24	--	--	--	1V-2.00x2.00m
25	12+785	BC-20	BC-25	1x6x5.1	24.35	Inadequate	2V-4.00x4.00
26	12+974	BC-21	BC-26	1x6.2x4.5	37.48	Inadequate	2V-4.00x4.00
27	13+720	--	BC-27	--	--	--	1v-3.00x3.00m
28	14+105		BC-28	--	--	--	1v-3.00x3.00m
29	14+320	BC-22	BC-29	1x2.1x2	15.51	Inadequate	1v-3.00x3.00m
30	15+445	--	BC-30	--	--	--	1V-2.00x2.00m
31	15+870		BC-31	--	--	--	1V-2.00x2.00m
Contract No 2							
32	17+445	BC-23	BC-32	1x3.2x2.4	6.11	Adequate	1v-3.00x3.00m
33	18+797	BC-24	BC-33	1x2x2	3.18	Adequate	1V-2.00x2.00m
34	19+178	BC-25	BC-34	1x1.2x1.1	2.17	Inadequate	1V-2.00x2.00m
35	19+518	BC-26	BC-35	1x3x2	4.78	Adequate	1V-3.00x2.00m
36	20+686	BC-27	BC-36	1x3.2x3	7.64	Adequate	1V-3.00x3.00m
37	21+649	BC-28	BC-37	--	--	--	1V-2.00x2.00m
38	21+789	BC-29	BC-38	1x3x3	7.16	Adequate	1V-3.00x3.00m
39	22+207	BC-30	BC-39	--	--	--	1V-2.00x2.00m
40	22+859	BC-31	BC-40	1x3.15x2	5.01	Adequate	1V-3.00x3.00m
41	23+107	BC-32	BC-41	2x4.6x3	32.5	Inadequate. High water level congestion and high velocity observed during wet season. Previously it was connected with a small canal.	3V-4.00x3.00m
42	23+575	BC-33	BC-42	1x3x3	7.16	Adequate	1V-3.00x3.00m
43	23+860	BC-34	BC-43	1x3x2	4.77	Adequate	1V-3.00x3.00m
44	23+995	BC-35	BC-44	1x1.5x1.65	3.25	Inadequate. High water level congestion & high velocity during wet season observed.	1V-3.00x3.00m

Sl. No.	Design Chainage	Culvert ID as per Inventory	Culvert ID as per Design	Existing Structure size	Calculated Area, $A=Q/V \text{ m}^2$	Remarks	Recommendations
45	24+325	BC-36	BC-45	1x3x2.3	8.13	Inadequate. High water level congestion and high velocity during wet season is observed.	1V-3.00x3.00m
46	24+625	BC-37	BC-46	0.90m-dia	6.97	Inadequate, Required addl. Box culvert	1V-2.00x2.00m
47	25+120	--	BC-47	--	--	Newly proposed.	1V-2.00x2.00m
48	25+930	BC-38	BC-48	1x1.6x2.3	11.99	Inadequate. Upstream water congestion. Required addl. Box Culvert.	1v-3.00x3.00m
49	26+800	--	BC-49	--	--	Newly proposed.	1V-2.00x2.00m
50	27+642	BC-39	BC-50	1x2x2.1	12.13	Inadequate. High water level, during wet season water stands on road top. Required addl. Box Culvert.	1v-3.00x3.00m
51	28+305	--	BC-51	--	--	Newly proposed.	1V-2.00x2.00m
52	29+325	BC-40	BC-52	1x1.8x1.7	14.2	Inadequate, Required addl. Box Culvert.	1V-4.00x3.00m
53	30+955	--	BC-53	--	--	Newly proposed.	1V-2.00x2.00m
Contract No 3							
54	31+442	BC-41	BC-54	1x1.8x2.1	14.98	Inadequate, Required addl. Box Culvert.	2V-3.00x2.00m
55	32+535	--	BC-55	--	--	Newly proposed.	1V-2.00x2.00m
56	33+494	BC-42	BC-56	1x1.7x1.2	9.64	Inadequate. High water level and velocity during wet season.	2V-3.00x2.00m
57	34+380	BC-43	BC-57	1x1.5x1.5	10.44	Inadequate, Required addl. 2-nos box culvert	1V-2.00x2.00m
58	35+450	--	BC-58	--	--	Newly proposed.	1V-2.00x2.00m
59	36+450	--	BC-59	--	--	Newly proposed.	1V-2.00x2.00m
60	37+536	BC-44	BC-60	1x1.5x1.7	26.74	Inadequate. High amount of scour during wet season at d/s, required addl. 2-nos culvert.	1V-3.00x3.00m
61	38+840	--	BC-61	--	--	Newly proposed.	1V-2.00x2.00m
62	39+550	--	BC-62	--	--	Newly proposed.	1V-2.00x2.00m
63	41+325	--	BC-63	--	--	Newly proposed.	1V-2.00x2.00m
64	42+075	BC-45	BC-64	1x1.6x2	13.15	Inadequate, reqd. 1-no box culvert at upper chainage.	1V-2.00x2.00m
65	42+461	BC-46	BC-65	1x1.5x2	6.76	Inadequate. Invert level above water level.	1V-3.00x3.00m
66	43+775	BC-47	BC-66	1x1x1.1	9.06	Inadequate	1V-3.00x3.00m
67	44+450	BC-48	BC-67	1x2x2	7.07	Inadequate but downstream blocked due to sedimentation.	2V-2.00x2.00m
68	44+979	BC-49	BC-68	1x1.6x1.5	6.53	Inadequate. Outfall at urban drain.	2V-2.00x2.00m
69	45+775	BC-50	BC-69	1x2x2	6.2	Inadequate but water level near to the soffit during wet season.	1V-3.00x3.00m
70	46+052	BC-51	BC-70	0.90m-dia	4.05	Inadequate. Goes under water during wet season.	1V-2.00x2.00m
71	46+616	BC-52	BC-71	1x1.5x1.5	5.73	Inadequate. At urban area. Remains fully immersed during wet season.	1V-3.00x3.00m

Sl. No.	Design Chainage	Culvert ID as per Inventory	Culvert ID as per Design	Existing Structure size	Calculated Area, $A=Q/V \text{ m}^2$	Remarks	Recommendations
72	47+470	BC-53	BC-72	1x3x3.3	13.22	Inadequate. At urban area. Remains fully immersed during wet season.	1V-4.00x4.00m

ANNEX 4

Joint Venture of



STUP Consultant Pvt. Ltd.
On July 1st, 2021, STUP was acquired by Assystem and rebranded as Assystem STUP.



BCL Associates Limited, Bangladesh

উদ্ভিদ, পানি ও পরিবেশ বিভাগ
স্বচ্ছ নিউজপল, ১০০১ ১০০১, ঢাকা-১০০১

Department of Soil Water and Environment
University of Dhaka, Dhaka 1000, Bangladesh

৫) Soil Physical Attributes:

Soil Sample code	% Clay	% silt	% Sand	Textural class	Particle Density (g/cc)	Bulk Density (g/cc)	Porosity (%)	Water holding capacity (%) by Vol.]	Permeability (cm/hr)
1A1 (Inceptisols)	58.48	33.93	7.59	Clay	2.56	1.50	29.3	21.77	Negative
2A1 (Sands)	40.78	56.04	13.22	Silty clay loam	2.47	1.37	44.5	31.30	5.4
1A2 (Inceptisols)	48.07	44.94	7.09	Silty clay	2.58	1.46	35.8	29.36	Negative
2B1 (Sands)	30.76	58.68	10.56	Silty clay	2.46	1.34	49.3	47.47	3.0
1B1 (Inceptisols)	52.23	38.38	9.39	Clay	2.59	1.48	42.9	36.10	19.4
1B2 (Sands)	35.56	65.63	10.58	Silt loam	2.45	1.35	49.5	32.47	0.2
1B22 (Inceptisols)	57.64	36.53	5.87	Clay	2.57	1.57	38.8	25.87	0.2
2B22 (Sands)	36.45	69.93	4.01	Silty clay	2.54	1.42	43.3	31.88	0.8
1C1 (Inceptisols)	55.50	55.97	2.44	Clay	2.49	1.46	41.2	35.09	19.2
2C1 (Sands)	26.43	64.38	2.12	Silt loam	2.49	1.49	40.2	32.01	19.3
1C2 (Inceptisols)	44.45	46.53	9.02	Silty clay	2.54	1.42	43.7	34.04	19.2
2C2 (Sands)	25.72	64.29	9.99	Silt loam	2.63	1.49	44.4	31.02	19.4
1A (Top soil)	59.04	34.24	6.72	Silty clay loam	2.54	-	-	-	-
1B (Sub soil)	23.08	61.50	15.46	Silt loam	2.58	-	-	-	-
2C (Substratum)	9.95	70.09	19.96	Silt loam	2.65	-	-	-	-

Methodology Used for physical properties:
Particle size: Hydrometer method
Particle density: Pycnometer method
Bulk Density: Core method
Water holding capacity: 17 bar pressure
Permeability: Constant Head method

Thanks and regards,

(Professor Dr. Md. Harunur Rashid Khan)
Chairman
(Dr. Md. Harunur Rashid Khan)
Professor & Chairman
Dept. of Soil, Water & Environment
University of Dhaka
Dhaka-1000, Bangladesh

Telephone : 9661920 72/7479, Fax: (R&D) 9667222, e-mail: swed@du.ac.bd

Soil sample code	% Clay	% Silts	% Sand	Fractured class	Particle Geometry (µm)	Bulk Density (g/cc)	Porosity (%)	Water holding capacity (%, by Vol.)	Permeability (cm/s)
1A5 (100m2)	58.48	33.82	7.50	Clay	2.55	2.20	39.4	21.77	Highly fine
1A6 (100m)	60.78	36.04	3.22	Silty clay	2.57	1.87	66.5	51.30	0.4
1A8 (100m2)	48.97	44.03	7.00	Silty clay	2.58	1.88	55.8	29.80	Highly fine
2A6 (100m)	58.76	38.68	3.56	Silty clay	2.68	1.50	49.1	41.42	0.0
2B3 (100m2)	62.22	38.38	0.10	Clay	2.80	1.48	42.9	30.10	0.0
2B21 (100m)	26.50	62.83	10.58	Silt loam	2.80	1.45	30.5	32.67	0.2
1A22 (100m)	57.91	36.23	5.87	Clay	2.87	1.57	36.8	25.87	0.2
2A32 (100m)	56.45	55.53	4.01	Silty clay	2.84	1.42	46.1	31.90	0.0
1C1 (100m2)	55.26	35.77	9.48	Clay	2.84	1.45	41.5	35.09	0.2
2C3 (100m)	29.43	58.25	7.23	Silt loam	2.89	1.49	40.2	28.70	0.2
1C2 (100m)	44.45	48.55	0.10	Silty clay	2.84	1.45	45.7	24.00	0.2
2C2 (100m)	25.72	64.29	9.04	Silt loam	2.93	1.46	44.8	33.02	0.4
1A (Top 10m)	30.04	54.24	0.72	Silty clay loam	2.54	-	-	-	-
2B (100m)	23.88	61.36	14.68	Silt loam	2.88	-	-	-	-
2C (100m)	38.85	50.99	10.36	Silt loam	2.65	-	-	-	-

Thaule and regalis

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Annex 4-2: Air Quality Lab Reports

SL No.: 0001



BCL ASSOCIATES LIMITED
Air Quality Monitoring Report

Reference No.: AAQ/EC/17/03/2021

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Air Quality Monitoring

Sampling ID and Location: AA01: Infront of Rahim's Stationary Shop, Al-Hanu Mout, Jhenaidah

Field Officer/Manager: Md. Abdur Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date: 30.05.2022

Reporting Date: 31.06.2022

Description of Results:

Sampling ID	Date and Time	GPS Coordinates	Concentrations (µg/m³)						CO (ppm)	CO ₂ (ppm)
			PM ₁₀	PM _{2.5}	SPM	NO ₂	SO ₂	O ₃		
AA01	30.05.2022 08:20:25 AM	23°21'22.17"N 89°10'3.89"E	10.0	10.1	38.8	38.2	167.2	27.8	0.161	150.3
*Standard			45	150	200	-	395	157	0	-
Methods			Light Scattering Nephelometer			High Sensitivity Electrochemical				

*Note: *Environmental Concentration Refer (ISO 180, Schedule 2 and Subsequent Amendment as National Ambient Air Quality Standard (NAQS)/BS)*
Legend: PM₁₀-Particulate Matter of a diameter of 10 micron or less; PM_{2.5}-Particulate Matter of a diameter of 2.5 micron or less; SPM-Suspended Particulate Matter including 2.5 and 10 microns; NO₂-Nitrogen Dioxide; SO₂-Sulphur Dioxide; O₃-Ozone; CO-Carbon Monoxide; CO₂-Carbon Dioxide

Meteorological Monitoring

Parameters	Air Temperature	Relative Humidity	Air Pressure	Wind Speed	Wind Direction
Unit	°C	%	hPa	m/s	Degree
Concentration	35.3	62.8	1003.0	0.44	110.67 (ESE)

Analyzed By: 
Md. Abdur Rahman
Environmentalist
BCL Associates Limited

Approved By: 
Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited



Roostari Tower (2nd Floor), 1 Mahabul Commercial Area,
Bir Uttam A K Khondaker Sarak, Dhaka-1212, Bangladesh
Telephone: +880 2 4881 3072-5
Fax: +880 2 485 3032
E-mail: bcl@bclgroup.com




SL No.: 0002



BCL ASSOCIATES LIMITED
Air Quality Monitoring Report

Reference No.: AAQ/EC/17/03/2021

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Air Quality Monitoring

Sampling ID and Location: AA02, Presence of Rahim's Stationary Shop, Al-Hanu Mout, Jhenaidah

Field Officer/Manager: Md. Abdur Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date: 30.05.2022

Reporting Date: 31.06.2022

Description of Results:

Sampling ID	Date and Time	GPS Coordinates	Concentrations (µg/m³)						CO (ppm)	CO ₂ (ppm)
			PM ₁₀	PM _{2.5}	SPM	NO ₂	SO ₂	O ₃		
AA02	30.05.2022 14:35:23 PM	23°25'41.00"N 89°10'13.36"E	11.9	22.2	43.7	22.6	189.8	22.8	0.088	150.1
*Standard			45	150	200	-	395	157	0	-
Methods			Light Scattering Nephelometer			High Sensitivity Electrochemical				

*Note: *Environmental Concentration Refer (ISO 180, Schedule 2 and Subsequent Amendment as National Ambient Air Quality Standard (NAQS)/BS)*
Legend: PM₁₀-Particulate Matter of a diameter of 10 micron or less; PM_{2.5}-Particulate Matter of a diameter of 2.5 micron or less; SPM-Suspended Particulate Matter including 2.5 and 10 microns; NO₂-Nitrogen Dioxide; SO₂-Sulphur Dioxide; O₃-Ozone; CO-Carbon Monoxide; CO₂-Carbon Dioxide

Meteorological Monitoring

Parameters	Air Temperature	Relative Humidity	Air Pressure	Wind Speed	Wind Direction
Unit	°C	%	hPa	m/s	Degree
Concentration	35.8	61.5	1003.0	0.42	113.75 (ESE)

Analyzed By: 
Md. Abdur Rahman
Environmentalist
BCL Associates Limited

Approved By: 
Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited



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November 2022

SL No.: 0003

Reference No.: AAO/BCL/13E/202003

BCL ASSOCIATES LIMITED
Air Quality Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Air Quality Monitoring

Sampling ID and Locations: AAO3, Premises of Govt. Mahab Uddin Degree College, Kaliguri, Jhenaidah

Monitoring/Sampling Date: 30.05.2022

Reporting Date: 07.06.2022

Description of Results:

Sampling ID	Date and Time	GPS Coordinates	Concentrations (µg/m³)						CO (ppm)	CO ₂ (ppm)
			PM ₁₀	PM _{2.5}	SPM	NO _x	SO ₂	O ₃		
AAO3	30.05.2022 01:44:12 PM	23°24'53.00"N 89°17'03.82"E	18.6	30.7	70.3	27.4	145.2	13.6	0.620	193.1
*Standard			50	150	200	-	265	157	9	-

Methods: Light Scattering Nephelometer High Sensitivity Electrochemical

Note: "Environmental Conservation Rules (ECR) 1997, Schedule 2 and Subsequent Amendment as National Ambient Air Quality Standard (NAQS) 2007"

Legend: PM₁₀-Particulate Matter of a diameter of 10 microns or less; PM_{2.5}-Particulate Matter of a diameter of 2.5 microns or less; SPM-Suspended Particulate Matter including 2.5 and 10 microns; NO_x-Nitrogen Dioxide; SO₂-Sulphur Dioxide; O₃-Ozone; CO-Carbon Monoxide; CO₂-Carbon Dioxide

Meteorological Monitoring

Parameters	Air Temperature	Relative Humidity	Air Pressure	Wind Speed	Wind Direction
Unit	°C	%	hPa	m/s	Degree
Concentration	34.5	83.3	1003.0	0.50	104.88 (ESE)

Analyzed By: 
Md. Abdul Rahman
Environmentalist
BCL Associates Limited

Approved By: 
Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited

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SL No.: 0004

Reference No.: AAO/BCL/13E/202004

BCL ASSOCIATES LIMITED
Air Quality Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Air Quality Monitoring

Sampling ID and Locations: AAO4, Premises of Bazar Mosque, Dabamara Bazar, Saliganj, Jhenaidah

Monitoring/Sampling Date: 31.05.2022

Reporting Date: 07.06.2022

Description of Results:

Sampling ID	Date and Time	GPS Coordinates	Concentrations (µg/m³)						CO (ppm)	CO ₂ (ppm)
			PM ₁₀	PM _{2.5}	SPM	NO _x	SO ₂	O ₃		
AAO4	31.05.2022 02:42:17 PM	23°22'58.47"N 89°17'17.37"E	15.3	29.3	41.2	23.4	146.4	16.9	0.543	192.5
*Standard			50	150	200	-	265	157	9	-

Methods: Light Scattering Nephelometer High Sensitivity Electrochemical

Note: "Environmental Conservation Rules (ECR) 1997, Schedule 2 and Subsequent Amendment as National Ambient Air Quality Standard (NAQS) 2007"

Legend: PM₁₀-Particulate Matter of a diameter of 10 microns or less; PM_{2.5}-Particulate Matter of a diameter of 2.5 microns or less; SPM-Suspended Particulate Matter including 2.5 and 10 microns; NO_x-Nitrogen Dioxide; SO₂-Sulphur Dioxide; O₃-Ozone; CO-Carbon Monoxide; CO₂-Carbon Dioxide

Meteorological Monitoring

Parameters	Air Temperature	Relative Humidity	Air Pressure	Wind Speed	Wind Direction
Unit	°C	%	hPa	m/s	Degree
Concentration	36.7	88.2	1003.2	0.54	106.00 (ESE)

Analyzed By: 
Md. Abdul Rahman
Environmentalist
BCL Associates Limited

Approved By: 
Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited

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BCL Associates Limited, Bangladesh

November 2022

SL No: E005



Reference No: AAIL/BCL/1706/022022

BCL ASSOCIATES LIMITED
Air Quality Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Air Quality Monitoring

Sampling ID and Locations: AAO5, Premises of Naein's House, Jhenaidah-Nagpur, Katiganj, Jhenaidah

Field Officer/Manager: Md. Abdul Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date: 31.05.2022

Reporting Date: 07.06.2022

Description of Results:

Sampling ID	Date and Time	GPS Coordinates	Concentrations (µg/m³)						CO (ppm)	CO ₂ (ppm)
			PM _{2.5}	PM ₁₀	SPM	NO _x	SO ₂	O ₃		
AAO5	31.05.2022 12:52:33 PM	23°19'18.22"N 89°0'47.43"E	14.1	27.3	61.2	22.8	167.6	15.8	0.937	179.73
*Standard			65	150	206	-	365	157	9	-
Methods			Light Scattering Nephelometer			High Sensitivity Electrochemical				

Note: "Environmental Conservation Rules (ECR) 1997, Schedule 2 and Subsequent Amendment as National Ambient Air Quality Standard (NAQAAS) 2021"
Legend: PM_{2.5}-Particulate Matter of a diameter of 2.5 microns or less; PM₁₀-Particulate Matter of a diameter of 10 microns or less; SPM-Suspended Particulate Matter including 2.5 and 10 microns; NO_x-Nitrogen Dioxide; SO₂-Sulphur Dioxide; O₃-Ozone; CO-Carbon Monoxide; CO₂-Carbon Dioxide

Meteorological Monitoring:

Parameters	Air Temperature	Relative Humidity	Air Pressure	Wind Speed	Wind Direction
Unit	°C	%	hPa	m/s	Degree
Concentration	26.7	66.04	1003.0	0.72	115.88 (ESE)

Analyzed By: 
Md. Abdul Rahman
Environmentalist
BCL Associates Limited

Approved By: 
Dr. Nafid Amin
Director
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BCL Associates Limited




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SL No: E006



Reference No: AAIL/BCL/1706/022022

BCL ASSOCIATES LIMITED
Air Quality Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Air Quality Monitoring

Sampling ID and Locations: AAO6, Premises of Rai Baranbar High School, Katiganj, Jhenaidah

Field Officer/Manager: Md. Abdul Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date: 31.05.2022

Reporting Date: 07.06.2022

Description of Results:

Sampling ID	Date and Time	GPS Coordinates	Concentrations (µg/m³)						CO (ppm)	CO ₂ (ppm)
			PM _{2.5}	PM ₁₀	SPM	NO _x	SO ₂	O ₃		
AAO6	31.05.2022 10:45:18 AM	23°18'3.32"N 89°0'16.43"E	33.2	35.2	97.8	33.4	145.9	23.5	0.385	146.34
*Standard			65	150	206	-	365	157	9	-
Methods			Light Scattering Nephelometer			High Sensitivity Electrochemical				

Note: "Environmental Conservation Rules (ECR) 1997, Schedule 2 and Subsequent Amendment as National Ambient Air Quality Standard (NAQAAS) 2021"
Legend: PM_{2.5}-Particulate Matter of a diameter of 2.5 microns or less; PM₁₀-Particulate Matter of a diameter of 10 microns or less; SPM-Suspended Particulate Matter including 2.5 and 10 microns; NO_x-Nitrogen Dioxide; SO₂-Sulphur Dioxide; O₃-Ozone; CO-Carbon Monoxide; CO₂-Carbon Dioxide

Meteorological Monitoring:

Parameters	Air Temperature	Relative Humidity	Air Pressure	Wind Speed	Wind Direction
Unit	°C	%	hPa	m/s	Degree
Concentration	26.4	64.5	1006	0.82	125.88 (SE)

Analyzed By: 
Md. Abdul Rahman
Environmentalist
BCL Associates Limited

Approved By: 
Dr. Nafid Amin
Director
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BCL Associates Limited, Bangladesh

November 2022

SL No.: E007

Reference No.: AAQ/BCU/7/0022007

BCL ASSOCIATES LIMITED
Air Quality Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Air Quality Monitoring

Sampling ID and Locations: AAQ7, Premises of Kazi Nazimul Islam College, Damragor, Jashore

Field Officer/Manager: Md. Abdul Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date: 01.05.2022

Reporting Date: 07.05.2022

Description of Results:

Sampling ID	Date and Time	GPS Coordinates	Concentrations (µg/m³)						CO (ppm)	CO₂ (ppm)
			PM₁₀	PM₂.₅	SPM	NOₓ	SO₂	O₃		
AAQ7	01.05.2022 09:26:18 AM	23°14'38.39"N 89°19'58.21"E	23.8	47.1	112.8	31.7	139.1	22.4	0.168	122.54
*Standard			55	150	200	-	350	157	8	-

Methods: Light Scattering Nephelometer

High Sensitivity Electrochemical

Note: "Environmental Conservation Rules (ECR) 1997, Schedule 2 and Subsequent Amendment as Notified Under Air Quality Standard (AQAS) 2007"
Legend: PM₁₀-Particulate Matter of a diameter of 10micron or less; PM₂.₅-Particulate Matter of a diameter of 2.5micron or less; SPM-Suspended Particulate Matter including 2.5 and 10 micron; NOₓ-Nitrogen Dioxide; SO₂-Sulphur Dioxide; O₃-Ozone; CO-Carbon Monoxide; CO₂-Carbon Dioxide

Meteorological Monitoring:

Parameters	Air Temperature	Relative Humidity	Air Pressure	Wind Speed	Wind Direction
Unit	°C	%	hPa	m/s	Degree
Concentration	34.4	67.5	1009.21	0.62	106.75 (SSE)

Analyzed By: Md. Abdul Rahman, Environmentalist, BCL Associates Limited

Approved By: Dr. Nahid Amin, Director, Socio-Economic and Environmental Safeguard, BCL Associates Limited

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SL No.: E008

Reference No.: AAQ/BCU/7/0022008

BCL ASSOCIATES LIMITED
Air Quality Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Air Quality Monitoring

Sampling ID and Locations: AAQ8, Surrounding Area of Jashore Customs, Khayrulla, Jashore

Field Officer/Manager: Md. Abdul Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date: 01.05.2022

Reporting Date: 07.05.2022

Description of Results:

Sampling ID	Date and Time	GPS Coordinates	Concentrations (µg/m³)						CO (ppm)	CO₂ (ppm)
			PM₁₀	PM₂.₅	SPM	NOₓ	SO₂	O₃		
AAQ8	01.05.2022 01:06:25 PM	22°11'25.57"N 89°11'4.42"E	27.9	48.8	115.5	34.8	184.1	28.7	0.337	152.1
*Standard			55	150	200	-	350	157	8	-

Methods: Light Scattering Nephelometer

High Sensitivity Electrochemical

Note: "Environmental Conservation Rules (ECR) 1997, Schedule 2 and Subsequent Amendment as Notified Under Air Quality Standard (AQAS) 2007"
Legend: PM₁₀-Particulate Matter of a diameter of 10micron or less; PM₂.₅-Particulate Matter of a diameter of 2.5 micron or less; SPM-Suspended Particulate Matter including 2.5 and 10 micron; NOₓ-Nitrogen Dioxide; SO₂-Sulphur Dioxide; O₃-Ozone; CO-Carbon Monoxide; CO₂-Carbon Dioxide

Meteorological Monitoring:

Parameters	Air Temperature	Relative Humidity	Air Pressure	Wind Speed	Wind Direction
Unit	°C	%	hPa	m/s	Degree
Concentration	34.1	67.5	1004.6	1.10	112.88 (ESE)

Analyzed By: Md. Abdul Rahman, Environmentalist, BCL Associates Limited

Approved By: Dr. Nahid Amin, Director, Socio-Economic and Environmental Safeguard, BCL Associates Limited

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BCL Associates Limited, Bangladesh



Sl. No.: 5027

Reference No.: AAD/EL/1706/89286

BCL ASSOCIATES LIMITED

Air Quality Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Air Quality Monitoring

Sampling ID and Locations: AAD5, in Front of Bait Ashraf Islam Market, Bhomora Moor, Jashore

Field Officer/Manager: Md. Abdur Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date: 01.06.2022

Reporting Date: 03.06.2022

Description of Results:

Sampling ID	Date and Time	GPS Coordinates	Concentrations (µg/m³)						CO (ppm)	CO ₂ (ppm)
			PM ₁₀	PM _{2.5}	SPM	NO _x	SO _x	O ₃		
AAD5	01.06.2022 04:04:03 PM	23° 3'52.51" N 89° 11'36.21" E	17.9	38.9	89.1	28.4	150.4	28.2	0.863	147.3
*Standard			50	150	200	-	300	157	8	-

Methods: Light Scattering Nephelometer; High Sensitivity Electrochemical

Note: "Electrochemical" Concentration Analyser (ECM) BCL Schedule 2 and Subsequent Amendment as Reported in National Ambient Air Quality Standard (NAQS) 202

Legend: PM₁₀-Particulate Matter of a diameter of 10 microns or less; PM_{2.5}-Particulate Matter of a diameter of 2.5 microns or less; SPM-Suspended Particulate Matter including 2.5 and 10 microns; NO_x-Nitrogen Dioxide; SO_x-Sulphur Dioxide; O₃-Ozone; CO-Carbon Monoxide; CO₂-Carbon Dioxide.

Metereological Monitoring

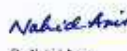
Parameters	Air Temperature	Relative Humidity	Air Pressure	Wind Speed	Wind Direction
Unit	°C	%	hPa	m/s	Degree
Concentration	33.3	81.1	1003.3	0.02	113.89 (ESE)

Analyzed By



Md. Abdur Rahman
Environmentalist
BCL Associates Limited

Approved By



Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
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Annex 4-3: Noise Level Analysis Lab Reports


SL No.: 0010

Reference No.: ANL/BCL/1705/2021/0

BCL ASSOCIATES LIMITED

Noise Level Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Noise Level Monitoring

Location Settings: Mixed Zone (Including Residence, Commercial and Silent Area)

Sampling ID and Locations: ANL1, Infront of Rahim's Stationary Shop, 4-Hera Moor, Jhenaidah

Field Officer/Manager: Md. Abdur Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date: 30.05.2022

Reporting Date: 07.06.2022

Description of Results:

Code	GPS Coordinates	Category of Locations	Noise Level (dBA)								*Standard (dBA)	
			L _{eq,10}	L _{eq,15}	L _{eq,30}	L _{eq,60}	L _{eq,90}	L _{max}	L _{min}	Day	Night	
ANL1	23°31'22.68"N 89°12'0.89"E	Mixed Zone	63.2	57.5	70.6	53.0	62.2	79.2	41.2	60	50	

*Noise Pollution (Control) Rules, 2006		
Silent Area	Day (dB (A))	Night (dB (A))
Residential Area	55	45
Mixed Area	60	50
Commercial Area	70	60
Industrial Area	75	70

Note: *Environmental Conservation Rules 1997, Schedule 4 and Subsequent Amendment as Noise Pollution Control Rules 2006, Schedule 1

Analyzed By:



Md. Abdur Rahman
Environmentalist
BCL Associates Limited

Approved By:



Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited



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SL No.: 0011

Reference No.: ANL/BCL/1705/2021/1

BCL ASSOCIATES LIMITED

Noise Level Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Noise Level Monitoring

Location Settings: Industrial Zone (Including a Live Site Project)

Sampling ID and Locations: ANL2, Premises of Nursh Siro Project, Bistaykhail, Jhenaidah

Field Officer/Manager: Md. Akbar Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date: 30.05.2022

Reporting Date: 07.06.2022

Description of Results:

Code	GPS Coordinates	Category of Locations	Noise Level (dBA)								*Standard (dBA)	
			L _{eq,10}	L _{eq,15}	L _{eq,30}	L _{eq,60}	L _{eq,90}	L _{max}	L _{min}	Day	Night	
ANL2	23°26'41.53"N 89°11'17.36"E	Industrial Zone	61.6	50.5	63.5	48.6	66.5	74.5	45.6	75	70	

*Noise Pollution (Control) Rules, 2006		
Silent Area	Day (dB (A))	Night (dB (A))
Residential Area	55	45
Mixed Area	60	50
Commercial Area	70	60
Industrial Area	75	70

Note: *Environmental Conservation Rules 1997, Schedule 4 and Subsequent Amendment as Noise Pollution Control Rules 2006, Schedule 1

Analyzed By:



Md. Abdur Rahman
Environmentalist
BCL Associates Limited

Approved By:



Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited



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SL No.: 0012

Reference No.: ANL/BCL/1705/02012

BCL ASSOCIATES LIMITED

Noise Level Monitoring Report

Project Name : Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities : Noise Level Monitoring

Location Settings : Silent Zone

Sampling ID and Locations : ANL3, Premises of Govt. Maftab Uddin Degree College, Kaliganj, Jhenaidah

Field Officer/Manager : Md. Asrar Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date : 30.05.2022

Reporting Date : 31.05.2022

Description of Results :

Code	GPS Coordinates	Category of Locations	Noise Level (dBA)								*Standard (dBA)	
			Leq1p	Leq10p	Leq	Leq	Leq	Leq	Leq	Leq	Day	Night
ANL3	23°24'57.63"N 89° 8'16.55"E	Silent Zone	64.0	57.2	57.3	47.7	57.4	72.6	40.3	50	40	

*Noise Pollution (Control) Rules, 2006			Day (dB (A))	Night (dB (A))
Silent Area			50	40
Residential Area			55	45
Mixed Area			60	50
Commercial Area			70	60
Industrial Area			75	70

Note: *Environmental Conservation Rules 1997, Schedule 4 and Subsequent Amendment as Noise Pollution Control Rules 2006, Schedule 1

Analyzed By : 
Md. Asrar Rahman
Environmentalist
BCL Associates Limited

Approved By : 
Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited




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SL No.: 0013

Reference No.: ANL/BCL/1705/02013

BCL ASSOCIATES LIMITED

Noise Level Monitoring Report

Project Name : Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities : Noise Level Monitoring

Location Settings : Commercial Zone

Sampling ID and Locations : ANL4, Infront of Bazar Mosque, Dufelmundia Bazar, Kaliganj, Jhenaidah

Field Officer/Manager : Md. Asrar Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date : 31.05.2022

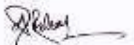
Reporting Date : 31.05.2022

Description of Results :

Code	GPS Coordinates	Category of Locations	Noise Level (dBA)								*Standard (dBA)	
			Leq1p	Leq10p	Leq	Leq	Leq	Leq	Leq	Leq	Day	Night
ANL4	23°22'50.17"N 89° 8'17.46"E	Commercial Zone	61.7	49.2	63.6	41.6	54.5	71.4	37.4	70	60	

*Noise Pollution (Control) Rules, 2006			Day (dB (A))	Night (dB (A))
Silent Area			50	40
Residential Area			55	45
Mixed Area			60	50
Commercial Area			70	60
Industrial Area			75	70

Note: *Environmental Conservation Rules 1997, Schedule 4 and Subsequent Amendment as Noise Pollution Control Rules 2006, Schedule 1

Analyzed By : 
Md. Asrar Rahman
Environmentalist
BCL Associates Limited

Approved By : 
Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
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November 2022


SL No.: 0014

Reference No.: ANL/BGL/176262816

BCL ASSOCIATES LIMITED

Noise Level Monitoring Report

Project Name : Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities : Noise Level Monitoring

Location Settings : Residential Zone

Sampling ID and Locations : ANLS, Premises of Nazir's House, Jantola-Propur, Kaliganj, Jhenaidah

Field Officer/Manager : Md. Abdul Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date : 31.05.2022

Reporting Date : 07.06.2022

Description of Results :

Code	GPS Coordinates	Category of Locations	Noise Level (dBA)								*Standard (dBA)	
			L _{eq} 1	L _{eq} 2	L _{eq} 3	L _{eq} 4	L _{eq} 5	L _{eq} 6	L _{eq} 7	L _{eq} 8	Day	Night
ANLS	23°19'18.06"N 89°8'47.50"E	Residential Zone	63.3	46.7	66.5	45.2	58.1	69.8	35.1	55	45	

*Noise Pollution (Control) Rules, 2008			Day [dB (A)]	Night [dB (A)]
Silent Area			50	40
Residential Area			55	45
Mixed Area			60	50
Commercial Area			70	60
Industrial Area			75	70

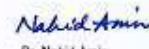
Note: *Environmental Conservation Rules 1997, Schedule 4 and Subsequent Amendment as Noise Pollution Control Rules 2008, Schedule 1

Analyzed By



Md. Abdul Rahman
Environmentalist
BCL Associates Limited

Approved By



Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited




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SL No.: 0015

Reference No.: ANL/BGL/176262815

BCL ASSOCIATES LIMITED

Noise Level Monitoring Report

Project Name : Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities : Noise Level Monitoring

Location Settings : Silent Zone

Sampling ID and Locations : ANLS, Premises of Hat Baratar High School, Kaliganj, Jhenaidah

Field Officer/Manager : Md. Asrar Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date : 31.05.2022

Reporting Date : 07.06.2022

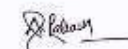
Description of Results :

Code	GPS Coordinates	Category of Locations	Noise Level (dBA)								*Standard (dBA)	
			L _{eq} 1	L _{eq} 2	L _{eq} 3	L _{eq} 4	L _{eq} 5	L _{eq} 6	L _{eq} 7	L _{eq} 8	Day	Night
ANLS	23°18'3.01"N 89°9'16.30"E	Silent Zone	55.1	45.4	57.6	38.6	52.1	62.2	35.4	50	40	

*Noise Pollution (Control) Rules, 2008			Day [dB (A)]	Night [dB (A)]
Silent Area			50	40
Residential Area			55	45
Mixed Area			60	50
Commercial Area			70	60
Industrial Area			75	70

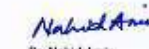
Note: *Environmental Conservation Rules 1997, Schedule 4 and Subsequent Amendment as Noise Pollution Control Rules 2008, Schedule 1

Analyzed By



Md. Abdul Rahman
Environmentalist
BCL Associates Limited

Approved By



Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited




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BCL Associates Limited, Bangladesh

Sl. No.: 0016

Reference No: ANL/BCL/17652/2016

BCL ASSOCIATES LIMITED

Noise Level Monitoring Report

Project Name : Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities : Noise Level Monitoring

Location Settings : Silent Zone

Sampling ID and Locations : ANL7, Premises of Kazi Nazim Islam College, Baranagar, Jashore

Field Officer/Manager : Md. Abdur Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date : 01.06.2022

Reporting Date : 07.06.2022

Description of Results :

Code	GPS Coordinates	Category of Locations	Noise Level (dBA)								*Standard (dBA)	
			L _{avg day}	L _{avg night}	L ₁₀	L ₅	L ₁	L _{max}	L _{min}	L ₉₀	Day	Night
ANL7	23°14'36.53"N 89°15'59.88"E	Silent Zone	58.3	45.3	62.6	42.8	53.0	85.9	41.5	50	40	

*Noise Pollution (Control) Rules, 2008		Day [dB (A)]	Night [dB (A)]
Silent Area		50	40
Residential Area		55	45
Mixed Area		60	50
Commercial Area		70	60
Industrial Area		75	70

*Note: *Environmental Conservation Rules 1982, Schedule 4 and Subsequent Amendment as Noise Pollution Control Rules 2008, Schedule 1*

Analyzed By : 
Md. Abdur Rahman
Environmentalist
BCL Associates Limited

Approved By : 
Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited



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Sl. No.: 0017

Reference No: ANL/BCL/13652/2017

BCL ASSOCIATES LIMITED

Noise Level Monitoring Report

Project Name : Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities : Noise Level Monitoring

Location Settings : Mixed Zone (Including Commercial and Residential Spaces)

Sampling ID and Locations : ANL8, Surrounding Area of Jashore Cantonment, Khayerbela, Jashore

Field Officer/Manager : Md. Abdur Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date : 01.06.2022

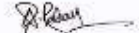
Reporting Date : 07.06.2022

Description of Results :

Code	GPS Coordinates	Category of Locations	Noise Level (dBA)								*Standard (dBA)	
			L _{avg day}	L _{avg night}	L ₁₀	L ₅	L ₁	L _{max}	L _{min}	L ₉₀	Day	Night
ANL8	23°11'23.02"N 89°11'4.73"E	Mixed Zone	59.1	47.8	63.1	42.3	53.2	64.9	38.8	60	50	

*Noise Pollution (Control) Rules, 2008		Day [dB (A)]	Night [dB (A)]
Silent Area		50	40
Residential Area		55	45
Mixed Area		60	50
Commercial Area		70	60
Industrial Area		75	70

*Note: *Environmental Conservation Rules 1982, Schedule 4 and Subsequent Amendment as Noise Pollution Control Rules 2008, Schedule 1*

Analyzed By : 
Md. Abdur Rahman
Environmentalist
BCL Associates Limited

Approved By : 
Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited



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E-mail: bcl@bclgroup.com






SL No: 0010

Reference No.: ANU/BCL/1765/2018

BCL ASSOCIATES LIMITED

Noise Level Monitoring Report

Project Name : Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities : Noise Level Monitoring

Location Settings : Commercial Zone

Sampling ID and Locations : ANLB, In Front of Hazi Ashraf Islam Market, Dharmatala Moor, Jashore

Field Officer/Manager : Md. Abrur Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date : 01.05.2022

Reporting Date : 07.05.2022

Description of Results :

Code	GPS Coordinates	Category of Locations	Noise Level (dBA)								*Standard (dBA)	
			L _{max}	L _{eq, 10}	L ₁	L ₂	L ₅	L ₁₀	L ₅₀	L ₉₀	Day	Night
ANLB	23° 5'32.37"N 89°11'36.45"E	Commercial Zone	65.5	56.1	68.0	48.0	60.6	74.8	43.0	70	60	

*Noise Pollution (Control) Rules, 2006	Day (dB (A))	Night (dB (A))
Silent Area	50	40
Residential Area	55	45
Mixed Area	60	50
Commercial Area	70	60
Industrial Area	75	70

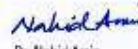
Note: *Environmental Conservation Rules 2006, Schedule 4 and Subsequent Amendment as Inserted Pollution Control Rules 2006, Schedule 1

Analyzed By



Md. Abrur Rahman
Environmentalist
BCL Associates Limited

Approved By



Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited




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Annex 4-4: Vibration Level Analysis Lab Reports



Sl No.: 0013

Reference No.: VL/BCL/1062022/13

BCL ASSOCIATES LIMITED
Vibration Level Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Vibration Level Monitoring

Location Settings: Mixed Zone

Sampling ID and Location: VL1, Infront of Reiner's Stationary Shop, Air-Ways Moor, Jhenaidah

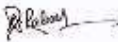
Field Officer/Manager: Md. Abdul Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date: 30.05.2022

Reporting Date: 07.06.2022

Description of Results: -

Code	Date and Time	GPS Coordinates	Vibration Level (mm/s)			Standard (mm/s)
			Average	Maximum	Minimum	
VL1	30.05.2022 09:35:35 AM	23°31'22.40"N 89°10'9.55"E	0.63	1.2	0.13	Not Set Yet

Analyzed By:

Md. Abdul Rahman
Environmentalist
BCL Associates Limited

Approved By:

Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited



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Sl No.: 0014

Reference No.: VL/BCL/1062022/14

BCL ASSOCIATES LIMITED
Vibration Level Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Vibration Level Monitoring

Location Settings: Industrial Zone

Sampling ID and Location: VL2, Promises of Narai 28s Project, Sakhepail, Jhenaidah

Field Officer/Manager: Md. Abdul Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date: 30.05.2022

Reporting Date: 07.06.2022

Description of Results: -

Code	Date and Time	GPS Coordinates	Vibration Level (mm/s)			Standard (mm/s)
			Average	Maximum	Minimum	
VL2	30.05.2022 04:40:55 PM	23°26'41.40"N 89°8'16.40"E	0.67	1.55	0.12	Not Set Yet

Analyzed By:

Md. Abdul Rahman
Environmentalist
BCL Associates Limited

Approved By:

Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited



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November 2022

Sl. No.: 0021

Reference No.: VL/BC/11/06/2022

BCL ASSOCIATES LIMITED
Vibration Level Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Vibration Level Monitoring

Location Settings: Silent Zone

Sampling ID and Locations: V/L3, Premises of Govt. Mahabub Uddin Degree College, Keliganj, Jhenaidah

Field Officer/Manager: Md. Abdul Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date: 31.05.2022

Reporting Date: 07.06.2022

Description of Results:

Code	Date and Time	GPS Coordinates	Vibration Level (mm/s)			Standard (mm/s)
			Average	Maximum	Minimum	
V/L3	31.05.2022 01:47:08 PM	23°24'37.78"N 89° 8'10.17"E	0.96	1.91	0.23	Not Set Yet

Analyzed By: 
Md. Abdul Rahman
Environmentalist
BCL Associates Limited

Approved By: 
Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited

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Fax: +880 2 985 3032
E-mail: info@bclgroup.com

Sl. No.: 0022

Reference No.: VL/BC/11/06/2022

BCL ASSOCIATES LIMITED
Vibration Level Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Vibration Level Monitoring

Location Settings: Residential Zone

Sampling ID and Locations: V/L4, Infront of Bazar Moogre, Beldamunda Sagar, Keliganj, Jhenaidah

Field Officer/Manager: Md. Abdul Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date: 31.05.2022

Reporting Date: 07.06.2022

Description of Results:

Code	Date and Time	GPS Coordinates	Vibration Level (mm/s)			Standard (mm/s)
			Average	Maximum	Minimum	
V/L4	31.05.2022 03:43:00 PM	23°22'49.98"N 89° 8'17.82"E	0.74	1.27	0.11	Not Set Yet

Analyzed By: 
Md. Abdul Rahman
Environmentalist
BCL Associates Limited

Approved By: 
Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited

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BCL Associates Limited, Bangladesh

November 2022

Sl. No.: 0023

Reference No.: VL/BCL/7062/2022

BCL ASSOCIATES LIMITED
Vibration Level Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Vibration Level Monitoring

Location Settings: Residential Zone

Sampling ID and Locations: VLS, Premises of Nook's House, Jantely-Propur, Kaliganj, Jhenaidah

Field Officer/Manager: Md. Abdur Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date: 31.05.2022

Reporting Date: 07.06.2022

Description of Results:

Code	Date and Time	GPS Coordinates	Vibration Level (mm/s)			Standard (mm/s)
			Average	Maximum	Minimum	
VLS	31.05.2022 12:54:08 PM	23°19'17.57" N 89° 8'47.01" E	0.71	1.50	0.27	Not Set Yet

Analyzed By: 
Md. Abdur Rahman
Environmentalist
BCL Associates Limited

Approved By: 
Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited

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Sl. No.: 0024

Reference No.: VL/BCL/7062/2022

BCL ASSOCIATES LIMITED
Vibration Level Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Vibration Level Monitoring

Location Settings: Silent Zone

Sampling ID and Locations: VLS, Premises of Hat Sarobar High School, Kaliganj, Jhenaidah

Field Officer/Manager: Md. Abdur Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date: 31.05.2022

Reporting Date: 07.06.2022

Description of Results:

Code	Date and Time	GPS Coordinates	Vibration Level (mm/s)			Standard (mm/s)
			Average	Maximum	Minimum	
VLS	31.05.2022 10:45:00 AM	23°18'12.44" N 89° 9'13.19" E	0.64	1.02	0.28	Not Set Yet

Analyzed By: 
Md. Abdur Rahman
Environmentalist
BCL Associates Limited

Approved By: 
Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited

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BCL Associates Limited, Bangladesh

November 2022



SL No: 0029

Reference No: VL/BL/1/05/2022

BCL ASSOCIATES LIMITED

Vibration Level Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Vibration Level Monitoring

Location Settings: Silent Zone

Sampling ID and Location: VL7, Premises of Khan Mahmud Islam College, Barhagari, Jashore

Field Officer/Manager: Md. Abdur Rahman, Environmentalist, BCL Associates Limited

Monitoring/Sampling Date: 01.06.2022

Reporting Date: 07.06.2022

Description of Results:

Code	Date and Time	GPS Coordinates	Vibration Level (mm/s)			Standard (mm/s)
			Average	Maximum	Minimum	
VL7	01.06.2022 09:22:25 AM	23°14'39.05"N 89°10'1.9"E	0.62	1.23	0.00	Not Set Yet

Analyzed By:



Md. Abdur Rahman
Environmentalist
BCL Associates Limited

Approved By:



Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited




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SL No: 0028

Reference No: VL/BL/1/05/2022

BCL ASSOCIATES LIMITED

Vibration Level Monitoring Report

Project Name: Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program

Activities: Vibration Level Monitoring

Location Settings: Mixed Zone

Sampling ID and Location: VL8, Surrounding Area of Jashore Cantonment, Khaperkhola, Jashore

Field Officer/Manager: Md. Abdur Rahman, Environmentalist, BCL Associates Limited

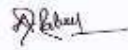
Monitoring/Sampling Date: 01.06.2022

Reporting Date: 07.06.2022

Description of Results:

Code	Date and Time	GPS Coordinates	Vibration Level (mm/s)			Standard (mm/s)
			Average	Maximum	Minimum	
VL8	01.06.2022 01:06:00 PM	23°11'24.77"N 89°11'2.57"E	0.79	1.37	0.00	Not Set Yet

Analyzed By:



Md. Abdur Rahman
Environmentalist
BCL Associates Limited

Approved By:



Dr. Nahid Amin
Director
Socio-Economic and Environmental Safeguard
BCL Associates Limited




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BCL Associates Limited, Bangladesh



SI No.: 0027

Reference No.: VL/BCL/7662/2021

BCL ASSOCIATES LIMITED
Vibration Level Monitoring Report

Project Name Activities Location Settings Sampling ID and Locations Field Officer/Manager Monitoring/Sampling Date Reporting Date Description of Results	Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program Vibration Level Monitoring Commercial Zone VL5, In Front of Hazi Ashraf Islem Market, Dharmatola Moor, Jashore Md. Abdur Rahman, Environmentalist, BCL Associates Limited 21.06.2022 27.06.2022

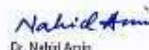
Code	Date and Time	GPS Coordinates	Vibration Level (mm/s)			Standard (mm/s)
			Average	Maximum	Minimum	
VL5	01.06.2022 03:51:55 PM	23° 9' 52.39" N 89° 11' 36.87" E	0.91	1.67	0.23	Not Set Yet

Analyzed By



Md. Abdur Rahman
Environmentalist
BCL Associates Limited

Approved By



Dr. Nahid Armin
Director
Socio Economic and Environmental Safeguard
BCL Associates Limited




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Annex 4-5: Surface Water Analysis Lab Reports

EQMS	EQMS Consulting Limited Flat # Fl, House # Ta - 134/A, Seishokhi Sarani, Gulshan - Badda Link Road, Dhaka- 1212, Bangladesh	
FOPN-12	LABORATORY TEST REPORT	Page 1 of 17

TEST REPORT OF WATER SAMPLE

Test Report No: **SW20220425E151** Issue Date: 10 May 2022

Client ID : EQMS/BCL/April, 2022

Contact Information of the Client : Mr. Md. Abdur Rahman, Environmentalist, BCL Associates Limited, Noorani Tower (2nd Floor), 1 Mohakhali Commercial Area, Bir Uttam A K Khandakar Sarak, Dhaka-1212

Sample ID : SW20220425E151

Date of Sample Received : 25 April 2022

Number/Received Sample Amount : 08

Sampling Method and/or Sampling Plan : N/A

Date of Testing (Initiate) : 26 April 2022

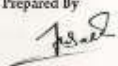
Date of Report Submit : 10 May 2022

Ambient Temperature (°C) : 22°C

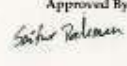
Humidity % : 65%

Disclaimer

- This report is not valid for whole product's quality. This is only done for product sample which not been submitted by client for testing.
- This report has not been supposed to using as advertisement, materials for judgment etc. without written consent from EQMS laboratory. This report is strictly forbidden to use other purpose.
- This report has included the test result according to the testing methods or standard structure suggested from client or Laboratory.
- This report fully prepared base on physical occurred testing result & repeatability is fully guaranteed.

Prepared By : 
Laboratory Technical Manager
Ahmed Jubair

Test Performed By : 
Laboratory Chemist
Md. Abdur Rab

Approved By : 
Laboratory Quality Manager
Md. Saifur Rahman

Revision No: 01 Rev. Date: 10-05-2022 Issue No:  Issue Date: 10-05-2022

EQMS	EQMS Consulting Limited Flat # Fl, House # Ta - 134/A, Seishokhi Sarani, Gulshan - Badda Link Road, Dhaka- 1212, Bangladesh	
FOPN-12	LABORATORY TEST REPORT	Page 2 of 17

TEST REPORT OF WATER SAMPLE

Sample Type: Surface Water / Up Stream Sample ID: SW20220425E151 / SW1

Properties	SL	Testing Specification	Method	Unit	Test Result	Bangladesh Standard	Statement to the effect of Result
Physical Property	1.	Turbidity	Turbidimetric Photometric Method	NTU	2.7	-	
	2.	pH	Ion electrode method	-	7.87	6.5-8.5 Water usable by fisheries	
	3.	TDS	Ion electrode method	mg/L	260	-	
Chemical Properties	4.	DO	Ion electrode method	mg/L	8.6	5 of more Water usable by fisheries	
	5.	BOD ₅ (at 20°C)	5 Day incubation followed by Ion electrode method	mg/L	0.8	6 of less Water usable by fisheries	
	6.	Phosphate	Amino acid Method	mg/L	7.1	-	
	7.	Nitrate	Cadmium Reduction Method	mg/L	8.0	-	
	8.	Oil & Grease	USEPA Hexane Extractable Gravimetric Method	mg/L	13.11	-	
	9.	Total Suspended Solid (TSS)	Standard Methods (2005), 2540D and EPA (1983) Method 160.2	mg/L	61	-	

Revision No: 01 Rev. Date: 10-05-2022 Issue No:  Issue Date: 10-05-2022

November 2022

EQMS Consulting Limited		
Flat # 10, House # 1a - 134/A, Baitakhali Sarani, Gulshan - Badda Link Road, Dhaka- 1212, Bangladesh		
F-OPN-12	LABORATORY TEST REPORT	Page: 3 of 17

			followed by Gravimetric analysis			
Bacteriological Properties	10.	Total Coliform	AFNOR approved method compared to ISO 4832 method	n/100 ml	65	3000 or less Water usable by fisheries
	11.	Fecal Coliform	AFNOR approved method compared to NF V08-017 method	n/100 ml	27	-

--End--

Revision No: 01
Rev. Date: 10-05-2022
Issue No: 01
Date: 10-05-2022

EQMS Consulting Limited		
Flat # 10, House # 1a - 134/A, Baitakhali Sarani, Gulshan - Badda Link Road, Dhaka- 1212, Bangladesh		
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TEST REPORT OF WATER SAMPLE

Sample Type: Surface Water/Up Stream Sample ID: SW20220425E151/SW2

Properties	SL	Testing Specification	Method	Unit	Test Result	Bangladesh Standard	Statement to the effect of Result
Physical Property	1.	Turbidity	Turbidimetric Photometric Method	NTU	2.7	-	
	2.	pH	Ion electrode method	-	7.47	6.5-8.5 Water usable by fisheries	
	3.	TDS	Ion electrode method	mg/L	320	-	
Chemical Properties	4.	DO	Ion electrode method	mg/L	6.9	5 or more Water usable by fisheries	
	5.	BOD ₅ (at 20°C)	5 Day incubation followed by Ion electrode method	mg/L	0.9	6 or less Water usable by fisheries	
	6.	Phosphate	Amino acid Method	mg/L	2.8	-	
	7.	Nitrate	Cadmium Reduction Method	mg/L	1.1	-	
	8.	Oil & Grease	USEPA Hexane Extractable Gravimetric Method	mg/L	10.02	-	
	9.	Total Suspended Solid (TSS)	Standard Methods (2005), 2540D and EPA (1983) Method 180.2	mg/L	20	-	

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Properties	SL	Testing Specification	Method	Unit	Test Result	Bangladesh Standard	Statement to the effect of Result
Bacteriological Properties	10.	Total Coliform	followed by Gravimetric analysis AFNOR approved method compared to ISO 4852 method	n/100 ml	64	5000 or less Water usable by fisheries	
	11.	Fecal Coliform	AFNOR approved method compared to NF V08-017 method.	n/100 ml	31	-	

--End--

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TEST REPORT OF WATER SAMPLE

Sample Type: Surface Water/Up Stream Sample ID: SW20220425E151/SW3

Properties	SL	Testing Specification	Method	Unit	Test Result	Bangladesh Standard	Statement to the effect of Result
Physical Property	1.	Turbidity	Turbidimetric Photoelectric Method	NTU	129.3	-	
	2.	pH	Ion electrode method	-	7.62	6.5-8.5 Water usable by fisheries	
	3.	TDS	Ion electrode method	mg/L	310	-	
	4.	DO	Ion electrode method	mg/L	8.14	5 or more Water usable by fisheries	
Chemical Properties	5.	BOD ₅ (at 20°C)	5 Day incubation followed by Ion electrode method	mg/L	1.2	6 or less Water usable by fisheries	
	6.	Phosphate	Amino acid Method	mg/L	11.8	-	
	7.	Nitrate	Cadmium Reduction Method	mg/L	15.3	-	
	8.	Oil & Grease	USEPA Hexane Extractable Gravimetric Method	mg/L	24.01	-	
	9.	Total Suspended Solid (TSS)	Standard Methods (2005), 2540D and EPA (1983) Method 160.2 followed	mg/L	1011	-	

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Properties	SL	Testing Specification	Method	Unit	Test Result	Bangladesh Standard	Statement to the effect of Result
Bacteriological Properties	10.	Total Coliform	by Gravimetric analysis AFNOR approved method compared to ISO 4832 method	n/100 ml	96	5000 or less Water usable by fisheries	
	11.	Fecal Coliform	AFNOR approved method compared to N: V08-017 method.	n/100 ml	42	-	

--End--

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TEST REPORT OF WATER SAMPLE

Sample Type: Surface Water/Up Stream Sample ID: SW20220425E151/SW4

Properties	SL	Testing Specification	Method	Unit	Test Result	Bangladesh Standard	Statement to the effect of Result
Physical Property	1.	Turbidity	Turbidimetric Photoelectric Method	NTU	2.3	-	
	2.	pH	Ion electrode method	-	7.81	6.5-8.5 Water usable by fisheries	
	3.	TDS	Ion electrode method	mg/L	230	-	
	4.	DO	Ion electrode method	mg/L	8.1	5 or more Water usable by fisheries	
Chemical Properties	5.	BOD ₅ (at 20°C)	5 Day incubation followed by ion electrode method	mg/L	1.0	5 or less Water usable by fisheries	
	6.	Phosphate	Amino acid Method	mg/L	1.7	-	
	7.	Nitrate	Cadmium Reduction Method USEPA	mg/L	2.1	-	
	8.	Oil & Grease	Hexane Extractable Gravimetric Method	mg/L	7.81	-	
	9.	Total Suspended Solid (TSS)	Standard Methods (2005), 2540D and EPA (1985) Method 60.2	mg/L	130	-	

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Bacteriological Properties	10.	Total Coliform	followed by Gravimetric analysis	n/100 ml	52	5000 or less Water usable by fisheries
	11.	Fecal Coliform	AFNOR approved method compared to ISO 4832 method	n/100 ml	21	—

--End--

Revision No: 00

Rev. Date: 10-05-2022

Issue No: 02

Issue Date: 10-05-2022

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TEST REPORT OF WATER SAMPLE

Sample Type: Surface Water/Drown Stream

Sample ID: SW20220425E1S1/SW1

Properties	SL	Testing Specification	Method	Unit	Test Result	Bangladesh Standard	Statement to the effect of Result
Physical Property	1.	Turbidity	Turbidimetric Photoelectric Method	NTU	1.7	—	
	2.	pH	Ion electrode method	—	7.98	6.5-8.5 Water usable by fisheries	
	3.	TDS	Ion electrode method	mg/L	250	—	
Chemical Properties	4.	DO	Ion electrode method	mg/L	8.3	5 or more Water usable by fisheries	
	5.	BOD5 (at 20°C)	5 Day incubation followed by ion electrode method	mg/L	0.3	6 or less Water usable by fisheries	
	6.	Phosphate	Amino acid Method	mg/L	6.8	—	
	7.	Nitrate	Cadmium Reduction Method	mg/L	7.0	—	
	8.	Oil & Grease	Hexane Extractable Gravimetric Method	mg/L	8.21	—	
	9.	Total Suspended Solid (TSS)	Standard Methods (2005), 2540D and EPA (1983) Method 101	mg/L	71	—	

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Issue No: 02

Issue Date: 10-05-2022

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Bacteriological Properties	10.	Total Coliform	followed by Gravimetric analysis AFNOR approved method compared to ISO 4832 method	n/100 ml	58	5000 or less Water usable by fisheries
	11.	Fecal Coliform	AFNOR approved method compared to NF V08-017 method	n/100 ml	23	-

--End--

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TEST REPORT OF WATER SAMPLE

Sample Type: Surface Water/ Down Stream Sample ID: SW20220425E151/SW2

Properties	SL	Testing Specification	Method	Unit	Test Result	Bangladesh Standard	Statement to the effect of Result
Physical Property	1.	Turbidity	Turbidimetric Photoelectric Method	NTU	1.2	-	
	2.	pH	Ion electrode method	-	7.86	6.5-8.5 Water usable by fisheries	
	3.	TDS	Ion electrode method	mg/L	320	-	
Chemical Properties	4.	DO	Ion electrode method	mg/L	8.0	5 or more Water usable by fisheries	
	5.	BCD ₅ (at 20°C)	5 Day incubation followed by Ion electrode method	mg/L	0.7	6 or less Water usable by fisheries	
	6.	Phosphate	Amino acid Method	mg/L	1.2	-	
	7.	Nitrate	Cadmium Reduction Method	mg/L	0.8	-	
	8.	Oil & Grease	US EPA Hexane Extractable Gravimetric Method	mg/L	6.05	-	
	9.	Total Suspended Solid (TSS)	Standard Methods (2005), 2540D and EPA (1983) Method 160.2	mg/L	37	-	

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Properties	SL	Testing Specification	Method	Unit	Test Result	Bangladesh Standard	Statement to the effect of Result
Bacteriological Properties			followed by Gravimetric analysis				
	10.	Total Coliform	APNOR approved method compared to ISO 4832 method	n/100 ml	58	5000 or less Water usable by fisheries	
	11.	Fecal Coliform	APNOR approved method compared to NE V08-017 method	n/100 ml	28		

--End--

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TEST REPORT OF WATER SAMPLE

Sample Type: Surface Water/ Down Stream Sample ID: SW20220425E151/SW3

Properties	SL	Testing Specification	Method	Unit	Test Result	Bangladesh Standard	Statement to the effect of Result
Physical Property	1.	Turbidity	Turbidimetric Photoelectric Method	NTU	1.0	-	
	2.	pH	Ion electrode method	-	7.94	6.5-8.5 Water usable by fisheries	
	3.	TDS	Ion electrode method	mg/L	300	-	
Chemical Properties	4.	DO	Ion electrode method	mg/L	8.0	5 or more Water usable by fisheries	
	5.	BOD ₅ (at 20°C)	5 Day incubation followed by Ion electrode method	mg/L	0.6	6 or less Water usable by fisheries	
	6.	Phosphate	Amino acid Method	mg/L	8.7	-	
	7.	Nitrate	Calcium Reduction Method USEPA	mg/L	11.4	-	
	8.	Oil & Grease	Hexane Extractable Gravimetric Method	mg/L	16.19	-	
	9.	Total Suspended Solid (TSS)	Standard Methods (2005), 2540C and EPA (1983) Method 160.2 followed	mg/L	968	-	

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Properties	SL	Testing Specification	Method	Unit	Test Result	Bangladesh Standard	Statement to the effect of Result
Bacteriological Properties	10.	Total Coliform	by Gravimetric analysis AFNOR approved method compared to ISO 4832 method	n/100 ml	79	5000 or less Water usable by fisheries	
	11.	Fecal Coliform	AFNOR approved method compared to NF V08-017 method.	n/100 ml	37	-	

-End-

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TEST REPORT OF WATER SAMPLE

Sample Type: Surface Water/ Down Stream Sample ID: SW20220425E151/SW4

Properties	SL	Testing Specification	Method	Unit	Test Result	Bangladesh Standard	Statement to the effect of Result
Physical Property	1.	Turbidity	Turbidimetric Photoelectric Method	NTU	1.0	-	
	2.	pH	Ion electrode method	-	7.90	6.5-8.5 Water usable by fisheries	
	3.	TDS	Ion electrode method	mg/L	230	-	
	4.	DO	Ion electrode method	mg/L	7.9	5 or more Water usable by fisheries	
Chemical Properties	5.	BOD ₅ (at 20°C)	5 Day incubation followed by Ion electrode method	mg/L	0.5	6 or less Water usable by fisheries	
	6.	Phosphate	Amino acid Method	mg/L	1.2	-	
	7.	Nitrate	Cadmium Reduction Method	mg/L	1.8	-	
	8.	Oil & Grease	USEPA Hexane Extractable Gravimetric Method	mg/L	6.19	-	
	9.	Total Suspended Solid (TSS)	Standard Methods (2005), 2540D and LPA (1983) Method 1062	mg/L	127	-	

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Annex 4-6: Ground Water Analysis Lab Reports

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TEST REPORT OF WATER SAMPLE

Test Report No: **GW20220425E150** Issue Date: 10 May 2022

Client ID: **EQMS/BCL/April, 2022**

Contract Information of the Client: **Mr. Md. Abdur Rahman, Environmentalist, BCL Associates Limited, Noorani Tower (2nd Floor), 1 Mohakhali Commercial Area, Bir Uttam A. K. Khondakar Sarak, Dhaka-1212**

Sample ID: **GW20220425E150**

Date of Sample Received: **25 April 2022**

Number/Received Sample Amount: **04**

Sampling Method and/or Sampling Plan: **N/A**

Date of Testing (Initiate): **26 April 2022**

Date of Report Submit: **10 May 2022**

Ambient Temperature (°C): **22°C**

Humidity %: **65%**

Disclaimer

- This report is not valid for whole product's quality. This is only done for product sample which had been submitted by client for testing.
- This report has not been supposed to using as advertisement, materials for judgement etc. without written consent from EQMS laboratory. This report is strictly forbidden to use other purpose.
- This report has included the test result according to the testing methods or standards which are suggested from client or Laboratory.
- This report fully prepared base on physical occurred testing result & responsibility is fully maintained.

Prepared By: **Ahmed Jubair** Test Performed By: **Md. Abdur Rab** Approved By: **Saifur Rahman**

Laboratory Technical Manager
Ahmed Jubair

Laboratory Chemist
Md. Abdur Rab

Laboratory Quality Manager
Md. Saifur Rahman

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TEST REPORT OF WATER SAMPLE

Sample Type: Ground Water Sample ID: **GW20220425E150/GW1**

Properties	SL	Testing Specification	Method	Unit	Test Result	Bangladesh Standard	Statement to the effect of Result
Chemical Properties	1.	pH	Ion Electrode Method	-	7.48	6.5 - 8.5	
	2.	Iron	Photometric Method	mg/L	0.09	0.3 - 1.0	
	3.	Manganese	Photometric Method	mg/L	0.3	0.1	
	4.	Arsenic	Modified Gutzeit Method	mg/L	0.00	0.05	
	5.	Phosphate	Photometric Method	mg/L	2.5	6.0	
	6.	Chloride	Photometric Method	mg/L	0.9	150 - 600*	
	7.	Nitrate	Photometric Method	mg/L	1.7	10.0	
	8.	Sulfate	Photometric Method	mg/L	7.0	300	
Bacteriological Properties	9.	Total Coliform	AFNOR Approved Method Compared to ISO 4832 Method	N/10 0 ml	0	0	
	10.	Fecal Coliform	AFNOR Approved Method Compared to NF V08-017 Method	N/10 0 ml	0	0	

-End-

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TEST REPORT OF WATER SAMPLE

Sample Type: Ground Water

Sample ID: GW20220425E150/GW2

Properties	SL	Testing Specification	Method	Unit	Test Result	Bangladesh Standard	Statement to the effect of Result
Chemical Properties	1.	pH	Ion Electrode Method	-	7.69	6.5 - 8.5	
	2.	Iron	Photometric Method	mg/L	0.08	0.3 - 1.0	
	3.	Manganese	Photometric Method	mg/L	1.0	0.1	
	4.	Arsenic	Modified Gutzeit Method	mg/L	0.00	0.05	
	5.	Phosphate	Photometric Method	mg/L	0.1	6.0	
	6.	Chloride	Photometric Method	mg/L	0.8	150 - 600*	
	7.	Nitrate	Photometric Method	mg/L	1.7	10.0	
	8.	Sulfate	Photometric Method	mg/L	7.0	400	
Bacteriological Properties	9.	Total Coliform	AFNOR Approved Method Compared to ISO 4832 Method	N/100 ml	0	0	
	10.	Fecal Coliform	AFNOR Approved Method Compared to NF V08-017 Method	N/100 ml	0	0	

-End-

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TEST REPORT OF WATER SAMPLE

Sample Type: Ground water

Sample ID: GW20220425E150/GW3

Properties	SL	Testing Specification	Method	Unit	Test Result	Bangladesh Standard	Statement to the effect of Result
Chemical Properties	1.	pH	Ion Electrode Method	-	7.53	6.5 - 8.5	
	2.	Iron	Photometric Method	mg/L	0.00	0.3 - 1.0	
	3.	Manganese	Photometric Method	mg/L	0.3	0.1	
	4.	Arsenic	Modified Gutzeit Method	mg/L	0.00	0.05	
	5.	Phosphate	Photometric Method	mg/L	0.8	6.0	
	6.	Chloride	Photometric Method	mg/L	1.2	150 - 600*	
	7.	Nitrate	Photometric Method	mg/L	16.2	10.0	
	8.	Sulfate	Photometric Method	mg/L	10	400	
Bacteriological Properties	9.	Total Coliform	AFNOR Approved Method Compared to ISO 4832 Method	n/100 ml	0	0	
	10.	Fecal Coliform	AFNOR Approved Method Compared to NF V08-017 Method	n/100 ml	0	0	

-End-

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TEST REPORT OF WATER SAMPLE							
Sample Type: Ground water				Sample ID: GW20220425E150/GW4			

Properties	SL	Testing Specification	Method	Unit	Test Result	Bangladesh Standard	Statement to the effect of Result
Chemical Properties	1.	pH	Ion Electrode Method	-	7.52	6.5 - 8.5	
	2.	Iron	Photometric Method	mg/L	0.01	0.3 - 1.0	
	3.	Manganese	Photometric Method	mg/L	0.4	0.1	
	4.	Arsenic	Modified Gutzeit Method	mg/L	0.00	0.05	
	5.	Phosphate	Photometric Method	mg/L	1.9	6.0	
	6.	Chloride	Photometric Method	mg/L	30	150 - 600*	
	7.	Nitrate	Photometric Method	mg/L	8.7	10.0	
	8.	Sulfate	Photometric Method	mg/L	9	400	
Bacteriological Properties	9.	Total Coliform	AFNOR Approved Method Compared to ISO 4832 Method	N/100 ml	0		
	10.	Focal Coliform	AFNOR Approved Method Compared to NF V08-017 Method	N/100 ml	0	-	

-End-

*According to the Schedule-3(8) of Environmental Conservation Rules, 1997, Government of Bangladesh.



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Issue No: 01 Date: 10/05/2022

Annex 4-7: List of Terrestrial Flora Species Recorded from the Road Alignment

Bangla/Local name	Scientific Name	Family	Uses
[M = Medicine, O = Ornamental, T = Timber, F = Fruit]			
Bel	<i>Aegle marmelos</i>	Rutaceae	F
Ata fol	<i>Annona squamosa</i>	Annonaceae	F
Supari	<i>Areca catechu</i>	Arecaceae	F
Kathal	<i>Artocarpus heterophyllus</i>	Moraceae	F
Deoa	<i>Artocarpus lacucha</i>	Moraceae	F
Bilimbi	<i>Averrhoa bilimbi</i>	Averrhoaceae	F
Kamranga	<i>Averrhoa carambola</i>	Averrhoaceae	F
Taal	<i>Borassus flabellifer</i>	Arecaceae	F
Pepe	<i>Carica papaya</i>	Caricaceae	F
Karamcha	<i>Carissa carandas</i>	Apocynaceae	F
Lebu	<i>Citrus limon</i>	Rutaceae	F
Jambura	<i>Citrus maxima</i>	Rutaceae	F
Narikel gach	<i>Cocos nucifera</i>	Arecaceae	F
Chalta	<i>Dillenia indica</i>	Dilleniaceae	F
Gab	<i>Diospyros peregrina</i>	Luciaceae	F
Jolpai	<i>Elaeocarpus serratus</i>	Elaeocarpaceae	F
Erioglossum	<i>Erioglossum</i>	Sapindaceae	F
Kodbel	<i>Feronia limonia</i>	Rutaceae	F
Jogdumur	<i>Ficus racemosa</i>	Moraceae	F
Joba	<i>Hibiscus diversifolius</i>	Malvaceae	F
Lichu	<i>Litchi chinensis</i>	Sapindaceae	F
Apel gach	<i>Malus domestica</i>	Rosaceae	F
Aam	<i>Mangifera indica</i>	Anacardiaceae	F
Sopheda	<i>Manilkara zapota</i>	Sapotaceae	F
Kola	<i>Musa paradisiaca</i>	Musaceae	F
Khejur	<i>Phoenix dactylifera</i>	Arecaceae	F
Peyara	<i>Psidium guajava</i>	Myrtaceae	F
Dalim	<i>Punica granatum</i>	Punicaceae	F
Dragon fruit	<i>Selenicereus undatus</i>	Cactaceae	F
Amra	<i>Spondias mombin</i>	Anacardiaceae	F
Piyala	<i>Spondias pinnata</i>	Anacardiaceae	F
Jamrul	<i>Syzygium aqueum</i>	Myrtaceae	F
Jam	<i>Syzygium cumini</i>	Myrtaceae	F
Khudi jaam	<i>Syzygium fruticosum</i>	Myrtaceae	F
Tetul gach	<i>Tamarindus indica</i>	Caesalpiniaceae	F
Kath badam	<i>Terminalia catappa</i>	Combretaceae	F
Boroi	<i>Ziziphus mauritiana</i>	Rhamnaceae	F
Boroi	<i>Ziziphus mauritiana</i>	Rhamnaceae	F
Ulotkombol	<i>Abroma augusta</i>	Sterculiaceae	M
Nim	<i>Azadirachta indica</i>	Meliaceae	M
Jafran	<i>Bixa orellana</i>	Bixaceae	M
Akondo	<i>Calotropis gigantea</i>	Asclepiadaceae	M
Vat	<i>Clerodendrum viscosum</i>	Capparaceae	M
Dhutura	<i>Datura metel</i>	Solanaceae	M
Khoksha	<i>Ficus hispida</i>	Moraceae	M
Motkila	<i>Glycosmis arborea</i>	Rutaceae	M
Bog verenda	<i>Jatropha curcas</i>	Euphorbiaceae	M
Lal bherenda	<i>Jatropha gossypifolia</i>	Euphorbiaceae	M
Jogotmodon	<i>Justicia gendarussa</i>	Acanthaceae	M
Mehedi gach	<i>Lawsonia inermis</i>	Lythraceae	M
Menda	<i>Litsea glutinosa</i>	Lauraceae	M
Mohuya	<i>Madhuca longifolia</i>	Sapotaceae	M
Boro chad	<i>Morinda citrifolia</i>	Rubiaceae	M
Sajina	<i>Moringa oliefera</i>	Moringaceae	M
Tut	<i>Morus alba</i>	Moraceae	M

Bangla/Local name	Scientific Name	Family	Uses
[M = Medicine, O = Ornamental, T = Timber, F = Fruit]			
Boro tulshi	<i>Ocimum gratissimum</i>	Lamiaceae	M
Tulshi	<i>Ocimum sanctum</i>	Lamiaceae	M
Ramtulshi	<i>Ocimum tenuiflorum</i>	Lamiaceae	M
Amloki	<i>Phyllanthus emblica</i>	Euphorbiaceae	M
Sitki	<i>Phyllanthus reticulatus</i>	Euphorbiaceae	M
Dad mordon	<i>Senna alata</i>	Leguminaceae	M
Kolkasunda	<i>Senna sophora</i>	Caesalpiniaceae	M
Solanum sisimbrifolium	<i>Solanum sisimbrifolium</i>	Solanaceae	M
Arjun	<i>Terminalia arjuna</i>	Combretaceae	M
Bohera	<i>Terminalia bellerica</i>	Combretaceae	M
Horitoki	<i>Terminalia chebula</i>	Combretaceae	M
Guloncho	<i>Tinospora cordifolia</i>	Menispermaceae	M
Bon okra	<i>Urena lobata</i>	Malvaceae	M
Nishinda	<i>Vitex negundo</i>	Verbenaceae	M
Tolla bash	<i>Bambusa vulgaris</i>	Poaceae	O
Bagan bilash	<i>Bougainvillea spectabilis</i>	Nyctaginaceae	O
Radhachura	<i>Caesalpinia pulcherrima</i>	Caesalpiniaceae	O
Shonalu	<i>Cassia fistula</i>	Caesalpiniaceae	O
Patabahar	<i>Codiaeum variegatum</i>	Euphorbiaceae	O
Krishnochura	<i>Delonix regia</i>	Fabaceae	O
Kata mehedi	<i>Duranta repens</i>	Verbenaceae	O
Parijat	<i>Erythrina variegata</i>	Fabaceae	O
Sada joba	<i>Hibiscus rosa-sinensis</i>	Malvaceae	O
Rongon	<i>Ixora coccinea</i>	Rubiaceae	O
Jesmine	<i>Jasminum officinale</i>	Oleaceae	O
Cherry	<i>Lagerstroemia indica</i>	Lythraceae	O
Putush	<i>Lantana camara</i>	Verbenaceae	O
China palm	<i>Livistona chinensis</i>	Arecaceae	O
Swarno chapa	<i>Mikania champaca</i>	Magnoliaceae	O
Bakul	<i>Mimusops elengi</i>	Sapotaceae	O
Kamini	<i>Murraya paniculata</i>	Rutaceae	O
Nagchompa	<i>Plumeria pudica</i>	Apocynaceae	O
Debdaru	<i>Polyalthia longifolia</i>	Annonaceae	O
Pathopadop	<i>Ravenala madagascariensis</i>	Strelitziaceae	O
Golap	<i>Rosa abietina</i>	Rosaceae	O
Royal palm	<i>Roystonea regia</i>	Arecaceae	O
Ashok	<i>Saraca asoca</i>	Fabaceae	O
Togor	<i>Tabernaemontana divaricata</i>	Apocynaceae	O
Jhau	<i>Thuja occidentalis</i>	Cupressaceae	O
Akashmoni	<i>Acacia auriculiformis</i>	Fabaceae	T
Babla	<i>Acacia nilotica</i>	Mimosaceae	T
Shil koro	<i>Albizia lebbek</i>	Mimosaceae	T
Sada koro	<i>Albizia procera</i>	Mimosaceae	T
Chambol	<i>Albizia richardiana</i>	Mimosaceae	T
Chatim	<i>Alstonia scholaris</i>	Apocynaceae	T
Rona	<i>Aphanamixis polystachya</i>	Meliaceae	T
Borak bash	<i>Bambusa balcooa</i>	Poaceae	T
Shimul	<i>Bombax ceiba</i>	Bombacaceae	T
Chikrashi	<i>Chukrasia tabularis</i>	Meliaceae	T
Barun	<i>Crataeva nurvala</i>	Capparaceae	T
Shishu	<i>Dalbergia sissoo</i>	Fabaceae	T
Mandar	<i>Erythrina frusca</i>	Fabaceae	T
Eucalyptus	<i>Eucalyptus obliqua</i>	Myrtaceae	T
Bot	<i>Ficus benghalensis</i>	Moraceae	T
Bot	<i>Ficus infectoria</i>	Moraceae	T

Bangla/Local name	Scientific Name	Family	Uses
[M = Medicine, O = Ornamental, T = Timber, F = Fruit]			
Ossoth bot	<i>Ficus religiosa</i>	Moraceae	T
Moni raj	<i>Ficus rumphii</i>	Moraceae	T
Gamari	<i>Gmelina arborea</i>	Verbenaceae	T
Lombu	<i>Khaya ivorensis</i>	Meliaceae	T
Jarul	<i>Lagerstroemia speciosa</i>	Lythraceae	T
Geol gach	<i>Lannea coromandelica</i>	Anacardiaceae	T
Ipil ipil	<i>Leucaena leucocephala</i>	Fabaceae	T
Ghora nim	<i>Melia azedarach</i>	Meliaceae	T
Nageshwaar	<i>Mesua ferrea</i>	Clusiaceae	T
Kodom	<i>Neolamarckia cadamba</i>	Rubiaceae	T
Sada korobi	<i>Nerium oleander</i>	Apocynaceae	T
Khoiya babla	<i>Pithecellobium dulce</i>	Mimosaceae	T
Raintree	<i>Samanea saman</i>	Mimosaceae	T
Shegun	<i>Shorea robusta</i>	Dipterocarpaceae	T
Mehogoni	<i>Swietenia mahagoni</i>	Meliaceae	T
Segun	<i>Tectona grandis</i>	Lamiaceae	T
Rongil	<i>Toona ciliata</i>	Meliaceae	T
Jibon gach	<i>Trema orientalis</i>	Ulmaceae	T
Pidali	<i>Trewia nudiflora</i>	Euphorbiaceae	T
Babla	<i>Vachellia nilotica</i>	Fabaceae	T

Annex 4-8: List of Aquatic Flora Species Recorded from the Road Alignment

Bangla/Local name	Scientific Name	Family	Uses
[D = Duckweed, E = Edible, F = Fodder, M = Medicinal, O = Ornamental]			
Azolla	<i>Azolla filiculoides</i>	Azollaceae	D
Lemna	<i>Lemna minor</i>	Araceae	D
Limnophila	<i>Limnophila heterophylla</i>	Scrophulariaceae	D
Pistia	<i>Pistia stratiotes</i>	Araceae	D
Wolfia	<i>Wolfia orrhiza</i>	Lemnaceae	D
Pani kola	<i>Ottelia alismoides</i>	Hydrocharitaceae	E
Kolmi	<i>Ipomoea aquatica</i>	Convolvulaceae	E
Helencha	<i>Enhydra fluctuans</i>	Asteraceae	E
Haicha	<i>Alternanthera sessilis</i>	Amaranthaceae	E
Helencha	<i>Tillanthera philoxeroides</i>	Amaranthaceae	E
Shyamaghas	<i>Echinochloa colona</i>	Poaceae	F
Malankuri	<i>Eleusine indica</i>	Poaceae	F
Chailla	<i>Hemarthria protensa</i>	Poaceae	F
Chachra	<i>Schoenoplectus articulatus</i>	Cyperaceae	F
Nukha	<i>Monochoria vaginalis</i>	Pontederiaceae	F
Boro nukha	<i>Monochoria hastata</i>	Pontederiaceae	F
Shotomuli	<i>Asparagus racemosus</i>	Liliaceae	M
Hydrilla	<i>Hydrilla verticillata</i>	Hydrocharitaceae	M
Hydrolia	<i>Hydrolia zeylanica</i>	Hydroleaceae	M
Mulchi	<i>Ludwigia adscendens</i>	Onagraceae	M
Limnophila	<i>Limnophila indica</i>	Scrophulariaceae	M
Getu	<i>Potamogeton pectinatus</i>	Potamogetonaceae	M
Pani morich	<i>Persicaria eciliata</i>	Polygonaceae	M
Pani morich / Bishkatali	<i>Polygonum hydropiper</i>	Polygonaceae	M
Polygonum lapathifolium	<i>Polygonum lapathifolium</i>	Polygonaceae	M
Chemtisag	<i>Polygonum plebium</i>	Polygonaceae	M
Eticularia	<i>Utricularia exoleata</i>	Lentibulariaceae	M
Utricularia	<i>Utricularia sp.</i>	Lentibulariaceae	M
Commelina	<i>Commelina benghalensis</i>	Commelinaceae	O
Kachuripana	<i>Eichhornia crassipes</i>	Pontederiaceae	O
Sada shapla	<i>Nymphaea stellata</i>	Nymphaeaceae	O
Chad mala	<i>Nymphoides indica</i>	Nymphoidesaceae	O
Kash	<i>Saccharum spontaneum</i>	Poaceae	O

Annex 4-9: List of Faunal Species Observed in the Study Area

Species	Scientific name	Common name	Status
Amphibia (8 species)			
	<i>Hoplobatrachustigerinus</i>	Indian bull frog	Least Concern
	<i>Euphylyctiscyanophlyctis</i>	Skipper frog	Least Concern
	<i>Duttaphrynusmelanostictus</i>	Asian common toad	Least Concern
	<i>Fejervaryaasmati</i>	Asmat's cricket frog	Least Concern
	<i>Microhylaornata</i>	Ornate narrow- mouthed frog	Least Concern
	<i>Polypedatesleucomystax</i>	Common tree frog	Least Concern
	<i>Microhyla sp.</i>	Narrow-mouthed frog	Least Concern
	<i>Polypdates maculatus</i>	Maculated tree frog	Least Concern
Reptilia (13 species)			
	<i>Hemidactylus flaviviridis</i>	House lizard	Least Concern
	<i>Xenochrophis piscator</i>	Checkered keelback	Least Concern
	<i>Calotes versicolor</i>	Common garden lizard	Least Concern
	<i>Eutropiscarinata</i>	Common skink	Least Concern
	<i>Varanus flavescens</i>	Yellow monitor	Near Threatened
	<i>Amphiesmastolatum</i>	Striped keelback	Least Concern
	<i>Gekko gekko</i>	Tokay gecko	Least Concern
	<i>Najanaja</i>	Binocellate cobra	Near Threatened
	<i>Ahaetullanasuta</i>	Vine snake	Least Concern
	<i>Typhlopsdiardii</i>	Diard's Blind snake	Least Concern
	<i>Hemidactylus brookii</i>	Brook's house gecko	Least Concern
	<i>Varanus bengalensis</i>	Bengal monitor	Near Threatened
	<i>Ptyas mucosa</i>	Indian rat snake	Least Concern
Aves (86 species)			
	<i>Upupa epops</i>	Common Hoopoe	Least Concern
	<i>Acridotheres tristis</i>	Common myna	Least Concern
	<i>Pycnonotuscafer</i>	Red-vented bulbul	Least Concern
	<i>Dicrurusmacrocerus</i>	Black drongo	Least Concern
	<i>Acridotheresfuscus</i>	Jungle myna	Least Concern
	<i>Apus affinis</i>	House swift	Least Concern
	<i>Sturnus contra</i>	Pied myna	Least Concern
	<i>Passer domesticus</i>	House sparrow	Least Concern
	<i>Coracinamacei</i>	Large cuckoo shrike	Least Concern
	<i>Centropus sinensis</i>	Greater coucal	Least Concern
	<i>Cyornisrubeculoides</i>	Blue-throated blue flycatcher	Least Concern
	<i>Copsychussaularis</i>	Oriental magpie-robin	Least Concern
	<i>Dinopiumbenghalense</i>	Black-rumpedFlameback	Least Concern
	<i>Coracinamelanoptera</i>	Black-headed cuckooshrike	Least Concern
	<i>Spilopelia chinensis</i>	Eastern spotted dove	Least Concern
	<i>Ardeolagrayii</i>	Pond heron	Least Concern
	<i>Halcyon smyrnensis</i>	White-breasted kingfisher	Least Concern
	<i>Cerylerudis</i>	Pied Kingfisher	Least Concern
	<i>Alcedoatthis</i>	Common kingfisher	Least Concern
	<i>Aegithina tiphia</i>	Common iora	Least Concern
	<i>Dicaeumerythrorhynchos</i>	Pale-bellied flowerpecker	Least Concern
	<i>Micropternusbrachyurus</i>	Rufous woodpecker	Least Concern

Species	Scientific name	Common name	Status
	<i>Bubulcus ibis</i>	Cattle egret	Least Concern
	<i>Phylloscopus affinis</i>	Tickell's leaf-warbler	Least Concern
	<i>Turdoides striata</i>	Jungle babbler	Least Concern
	<i>Oriolus xanthornus</i>	Black-hooded oriole	Least Concern
	<i>Sturnus malabaricus</i>	Chestnut-tailed starling	Least Concern
	<i>Lonchura striata</i>	White-rumped munia	Least Concern
	<i>Coracias benghalensis</i>	Indian roller	Least Concern
	<i>Lonchura malabarica</i>	Indian silverbill	Least Concern
	<i>Milvus migrans</i>	Black kite	Least Concern
	<i>Ardea alba</i>	Great white egret	Least Concern
	<i>Hierococcyx varius</i>	Common hawk-cuckoo	Least Concern
	<i>Cacomantis merulinus</i>	Plaintive cuckoo	Least Concern
	<i>Cypsiurus balasensis</i>	Asian palm swift	Least Concern
	<i>Nectarinia asiatica</i>	Purple sunbird	Least Concern
	<i>Cyanecula vecica</i>	Blue throat	Least Concern
	<i>Athene brama</i>	Spotted owl	Least Concern
	<i>Anastomus oscitans</i>	Asian Openbill	Least Concern
	<i>Copsychus malabaricus</i>	White-rumped shama	Least Concern
	<i>Dendrocopos macei</i>	Fulvous-breasted woodpecker	Least Concern
	<i>Haliastur indus</i>	Brahmany kite	Least Concern
	<i>Motacilla madagascariensis</i>	White-browed wagtail	Least Concern
	<i>Parus major</i>	Great tit	Least Concern
	<i>Megalaima haemacephala</i>	Coppersmith barbet	Least Concern
	<i>Prinia inornata</i>	Plain prinia	Least Concern
	<i>Nectarinia zeylonica</i>	Purple-rumped sunbird	Least Concern
	<i>Streptopelia tranquebarica</i>	Red turtle dove	Least Concern
	<i>Tyto alba</i>	Barn owl	Least Concern
	<i>Acrocephalus dumetorum</i>	Blyth's reed-warbler	Least Concern
	<i>Corvus splendens</i>	House crow	Least Concern
	<i>Pericrocotus cinnamomeus</i>	Small minivet	Least Concern
	<i>Megalaima asiatica</i>	Blue-throated barbet	Least Concern
	<i>Dendrocitta vagabunda</i>	Rufous treepie	Least Concern
	<i>Psilopogon lineata</i>	Lineated barbet	Least Concern
	<i>Ardea intermedia</i>	Intermediate egret	Least Concern
	<i>Pellorneum ruficeps</i>	Puff-throated babbler	Least Concern
	<i>Orthotomus sutorius</i>	Common tailorbird	Least Concern
	<i>Otus lettia</i>	Collared scops owl	Least Concern
	<i>Lonchura punctulata</i>	Scaly-breasted munia	Least Concern
	<i>Merops orientalis</i>	Asian Green bee-eater	Least Concern
	<i>Egretta garzetta</i>	Little egret	Least Concern
	<i>Eudynamis scolopacea</i>	Western koel	Least Concern
	<i>Clamator jacobinus</i>	Jacobin cuckoo	Least Concern
	<i>Picoides canicapillus</i>	Grey-capped woodpecker	Least Concern
	<i>Gecinulus grantia</i>	Pale-headed woodpecker	Least Concern
	<i>Picus guerini</i>	Black-naped woodpecker	Least Concern
	<i>Ficedula albicilla</i>	Taiga flycatcher	Least Concern

Species	Scientific name	Common name	Status
	<i>Laniuscristatus</i>	Brown shrike	Least Concern
	<i>Psittaculacyanocephala</i>	Plum-headed parakeet	Least Concern
	<i>Motacilla alba</i>	White wagtail	Least Concern
	<i>Picusxanthopygaeus</i>	Streak-throated woodpecker	Least Concern
	<i>Ploceusphillippinus</i>	Baya weaver	Least Concern
	<i>Corvus levaillantii</i>	Jungle crow	Least Concern
	<i>Dicrurus aeneus</i>	Bronzed drongo	Least Concern
	<i>Psittaculakrameri</i>	Rose-ringed parakeet	Least Concern
	<i>Saxicola caprata</i>	Pied bushchat	Least Concern
	<i>Oriolusoriolus</i>	Eurasian golden oriole	Least Concern
	<i>Jynx torquilla</i>	Eurasian wryneck	Least Concern
	<i>Phalacrocorax niger</i>	Little cormorant	Least Concern
	<i>Centropus bengalensis</i>	Lesser coucal	Least Concern
	<i>Tephrodornispondicerianus</i>	Common woodshrike	Least Concern
	<i>Zosteropsalpebrosus</i>	Oriental white- eye	Least Concern
	<i>Acrocephalusagricola</i>	Paddyfield warbler	Least Concern
	<i>Meropsphilippinus</i>	Blue-tailed bee- eater	Least Concern
	<i>Zootheracitrina</i>	Orange-headed thrush	Least Concern

Mammalia (18 species)

	<i>Bandicota indica</i>	Large bandicoot rat	Least Concern
	<i>Funambuluspennantii</i>	Northern palm squirrel	Least Concern
	<i>Bandicota bengalensis</i>	Lesser bandicoot rat	Least Concern
	<i>Herpestesedwardsii</i>	Common mongoose	Least Concern
	<i>Suncus murinus</i>	Asian house shrew	Least Concern
	<i>Rattus rattus</i>	Common house rat	Least Concern
	<i>Mus musculus</i>	House mouse	Least Concern
	<i>Herpestesauiropunctatus</i>	Small Indian mongoose	Endangered
	<i>Megaderma lyra</i>	Greater false vampire	Least Concern
	<i>Mus booduga</i>	Little Indian field mouse	Least Concern
	<i>Pipistrellus coromandra</i>	Indian pipistrelle	Least Concern
	<i>Rattus norvegicus</i>	Brown rat	Least Concern
	<i>Pteropus giganteus</i>	Indian flying fox	Least Concern
	<i>Pipistrellus tenuis</i>	Least pipistrelle	Least Concern
	<i>Felis chaus</i>	Jungle cat	Near Threatened
	<i>Vulpes bengalensis</i>	Bengal fox	Vulnerable
	<i>Canis aureus</i>	Asiatic jackel	Least Concern
	<i>Prionailurusviverrinus</i>	Fishing cat	Endangered

Annex 4-10: List of Aquatic Fauna Including Fish Found in the Study Area

Sl. No.	Local Name	Common Name	Scientific Name	Category
1	Kakila	Indian needle fish	<i>Xenentodon Cancila</i>	Least Concern
2	Taki	Spotted snakehead	<i>Channa punctatus</i>	Least Concern
3	Cheng	Barb	<i>Channa orientalis</i>	Least Concern
4	Bhol	Walking snakehead	<i>Raiamas bola</i>	Endangered
5	Gajar	bullseye snakehead.	<i>Channa marulius</i>	Endangered
6	Tit punti	Ticto barb	<i>Puntius ticto</i>	Least Concern

Sl. No.	Local Name	Common Name	Scientific Name	Category
7	Sarputi	Punta Olive barb	<i>Puntius sarana</i>	Critically Endangered
8	Shing	Stinging catfish	<i>Heteropneustes fossilis</i>	Least Concern
9	Magur	Walking catfish	<i>Clarias batrachus</i>	Vulnerable
10	Tengra	Day's mystus	<i>Mystus bleekeri</i>	Least Concern
11	Kolisha	Banded gourami	<i>Trichogaster fasciata</i>	Least Concern
12	Koi	Climbing perch	<i>Anabus testudineus</i>	Least Concern
13	Tara baim	Lesser spiny cel	<i>Macrogathus aculeatus</i>	Near Threatened
14	Rui	Rohu	<i>Labeo rohita</i>	Least Concern
15	Catol	Catla	<i>Catla catla</i>	Least Concern
16	Kalibaus	Orange-fin labeo	<i>Labeo calbasu</i>	Least Concern
17	Snake eel	Longfin snake-eel	<i>Pisodonophis cancrivorus</i>	Least Concern
18	Mrigol	Mrigal	<i>Cirrhinus cirrhosus</i>	Near Threatened
19	Pangas	Yellowtail catfish	<i>Pangasius pangasius</i>	Endangered
20	Bele	Giant mudskipper	<i>Periophthalmodon schlosser</i>	Least Concern
21	Tepa	Ocellated pufferfish	<i>Tetraodon cutcutia</i>	Least Concern
22	Bata machh	Tade gray mullet	<i>Planiliza planiceps</i>	Least Concern
23	Baila	Peters's goby	<i>Oxyurichthys petersii</i>	Least Concern
24	Potka	Stellate puffer	<i>Arothron stellatus</i>	Least Concern
25	Raik/Tatkini	Reba Carp	<i>Cirrhinus reba</i>	Near Threatened
26	Baim	Mottled eel	<i>Anguilla bengalensis</i>	Vulnerable
27	Pata chela	Silver hatchet chela	<i>Chela cachius</i>	Vulnerable
28	Chital	Knifefish	<i>Chitala chitala</i>	Endangered
29	Boal	Helicopter catfish	<i>Wallago attu</i>	Vulnerable

Annex 4-11: Contract Wise List of Common Property Resources (CPRs)

List of Common Property Resources (CPRs) with Title to Land in Contract-1; Upazila: Jhenaidah Sadar; District: Jhenaidah										
Sl. No.	CPR/H No.	Chainage (km)	Name of CPR	Type of Structure	Area (Sft.)	Degree of Impact		Relocation Requirement (Yes/No)	Relocation Plan of the Affected CPR/ Structures *	Pictorial View
						in %	Impact			
1.	0304	103+400	Zuba Training Center, Jhenaidah Sadar Jhenaidah	Mosque with Gate Pucca	2000	Mosque 100% Gate and boundary 100% Land 25%	Fully	Yes	Mosque can be relocated on residual land within the campus	
2.	0308	103+950	Baytul Mamur Jame Mosque, Shurat, Jhenaidah Sadar, Jhenaidah	Mosque Semi Pucca	896	100%	Fully	Yes	The affected mosque will be relocated in the residual land within the campus of the existing Madrasha	
3.	0399	106+900	Tetultala Bazar Jame Mosque, 7 No. Moharazpur, Jhenaidah Sadar	Mosque Pucca	360	Only two toilets	Partially	No	Expecting adequate Compensation	
4.	0562	109+100	Bishoykhali Bazar Central Mosque, Moharazpur, Jhenaidah Sadar	Mosque Pucca	1610	100%	Fully	Yes	Mosque Committee is looking an alternative land to relocate the mosque	
5.	0650	109+350	Kanuhorpur jame Mosque, 7 no Moharazpur, Jhenaidah Sadar	Mosque Pucca	3120	Will be affected 100%	Fully	Yes	Talking with a land owner in the vicinity of the mosque; We need adequate compensation only	
6.	747	110+600	Nreeshingapur Uttarpara Jame Mosque, Moharazpur, Jhenaidah Sadar	Mosque Pucca	1440	Land and structure be affected 100%	Fully	Yes	The mosque can be relocated within 75 m of the mosque	

List of Common Property Resources (CPRs) with Title to Land in Contract-1; Upazila: Jhenaidah Sadar; District: Jhenaidah										
Sl. No.	CPR/H No.	Chainage (km)	Name of CPR	Type of Structure	Area (Sft.)	Degree of Impact		Relocation Requirement (Yes/No)	Relocation Plan of the Affected CPR/ Structures *	Pictorial View
						in %	Impact			
7.	0802	111+600	Dokanghar Jame Mosque, 7 no Moharazpur, Jhenaidah Sadar	Mosque Pucca	1026	Structure of mosque 100% Madrasha 10%	Fully	Yes	Mosque will be relocated in the back side of the present location. They want building constructed by the project	
8.	0842	112+000	Khayergachi Jame Mosque, Moharazpur, Jhenaidah Sadar	Mosque Pucca	2420	Land and Structure will be affected 100%	Fully	Yes	Having no residual land inside the mosque premises; Demanding adequate compensation for buying and constructing the mosque	
9.	868	113+000	Salabhara Jame Mosque, Sundarpir Durgapur, Kaligonj	Mosque Pucca	1530	Structure will be affected 100%	Fully	Yes	Mosque will be constructed in the residual land in the eastern side of the affected mosque.	
10.	0955	115+000	Khayertola Bakulia Hafezia Madrasha & Mosque, Ward-2, Kaligonj	Mosque Pucca	1219	Structure will be affected 75%	Partially	Yes	Mosque will be constructed in the residual land in the western side of the affected mosque.	
11.	0992	115+500	Animal resources Hospital Jame Mosque, Ward-2, Kaligonj	Mosque Pucca	2052	Will be affected 100%	Fully	Yes	Will be relocated in the premises of the Livestock campus; the committee have submitted an	

List of Common Property Resources (CPRs) with Title to Land in Contract-1; Upazila: Jhenaidah Sadar; District: Jhenaidah										
Sl. No.	CPR/H No.	Chainage (km)	Name of CPR	Type of Structure	Area (Sft.)	Degree of Impact		Relocation Requirement (Yes/No)	Relocation Plan of the Affected CPR/ Structures *	Pictorial View
						in %	Impact			
									application to Ministry for giving a piece of land to establish a mosque.	
12.	0312	103+950	Laudia Mir Dewan Dakhil Madrasa, Shurat, Jhenaidah Sadar, Jhenaidah	Madrasa Semi Pucca	147	Will be affected only the boundary wall 15%	Partially	No	Expecting adequate compensation	
13.	0283	103+400	Bangladesh Open University Jhenaidah, Jhenaidah Sadar Jhenaidah	Office Pucca	4064	Land 50% Structure 75%	Fully	Yes	Submitted a letter to DC office for relocating the campus	
14.	0331	104+400	Laudia High School, Shurat, Jhenaidah Sadar	School Semi Pucca	782	School building 20%	Partially	No	Expecting adequate compensation	
15.	0320	104+200	41 No. Laudia Govt. Primary School, 16 No. Shurat, Jhenaidah Sadar	School Semi Pucca	580	Only boundary wall 100% and land 5%	Partially	No	DC and education officer is the main authority and they will take decision	
16.	0441	107+100	M.K. High School, Noldanga, Jhenaidah Sadar	School Pucca	1800	Land 10% Structure 15%	Partially	No	Already built a 5 storied building, compensation will be used for the other development work.	

List of Common Property Resources (CPRs) with Title to Land in Contract-1; Upazila: Jhenaidah Sadar; District: Jhenaidah										
Sl. No.	CPR/H No.	Chainage (km)	Name of CPR	Type of Structure	Area (Sft.)	Degree of Impact		Relocation Requirement (Yes/No)	Relocation Plan of the Affected CPR/ Structures *	Pictorial View
						in %	Impact			
17.	0649	109+350	Kanuhorpur Hazi Ali Akhter Dakhil Madrasa, Jhenaidah Sadar	Madrasha Pucca	1024	Building 50% Land 50%	Partially	No	Will be relocated in the residual land of the western side of existing Madrasa campus	
18.	0740	110+300	Kharikhali Govt. Primary School, Moharazpur, Jhenaidah Sadar	School Semi Pucca	1340	Structure will be affected 25% Land will be affected 55%	Partially	No	UNO and education officer is the main authority, they will take decision	
19.	0774	110+900	Mondir Ponchalon Tala, Moharazpur, Jhenaidah Sadar	Mondir Pucca	125	Only gate will be affected (5%)	Partially	No	Expecting adequate compensation	
20.	0810	111+600	Shop House Hafejia Madrasa, 7 No. Moharazpur, Jhenaidah Sadar	Madrasa Semi Pucca	156	Will be affected 30% of the structure and land	Partially	No	Expecting adequate compensation	
21.	0926	114+200	Bejpara Nurani & Hafezia Madrasa, 1 no Sundarpur Durgapur, Kaliganj	Hafezia Madrasa Pucca	840	Structure will be affected 60%	Partially	No	Decision has not been taken to purchase land, the same will be considered after getting compensation	
22.	1078	116+000	Govt. Mahtab Uddin Collage, 1 No. Ward, Kaliganj	Collage Pucca	440+ 1400	Structure will be affected 20% (only conference building) Gate 100%, and Boundary wall 100%	Partially	No	Will be relocated inner side of the college campus	

List of Common Property Resources (CPRs) with Title to Land in Contract-1; Upazila: Jhenaidah Sadar; District: Jhenaidah										
Sl. No.	CPR/H H No.	Chainage (km)	Name of CPR	Type of Structure	Area (Sft.)	Degree of Impact		Relocation Requirement (Yes/No)	Relocation Plan of the Affected CPR/ Structures *	Pictorial View
						in %	Impact			
23.	N-37	000+000	Aus Sonnhu Trust Madrashs, Hopaghata, Gobindapur, Jhenaidah Pourashava	RCC & Bricks Pillar Pucca	40+11=51	Only RCC column structure will be affected	Partially	No	Adequate compensation	
CPR without Title to Land										
1.	0335	104+400	Bytul Nur Mosque, Shurat, Jhenaidah Sadar	Mosque Tin made	320	Fully	100% structure will be affected	Yes	Compensation	
2.	0906	113+900	Bejpara Govt. Primary School, Sundarpur, Kaligonj	School and Gate Pucca		Partially	Only Gate will be affected	No	Compensation	
3.	1106	116+400	Neemtala Upzilla Pari: Jame Mosque, Kaligonj Poura:1, Kaligonj	Mosque Pucca		Fully	Will be affected 100%	Yes	UNO will take necessary action	
Number of Other Entities under Contract-1										
1.	0242	103+200	Pouro (Municipal) Toilet, 3 No. Ward, Jhenaidah Sadar	Pucca		Fully	100	Yes	Mayor and Parishad members of Municipality make decision to construct a passenger shed at suitable place	
2.	0281	103+400	Passenger Shed, 3 No. Ward, Jhenaidah Sadar	Passenger Shed Pucca	168	Fully	100	Yes	RHD will make relevant decision for necessary action	
3.	0314	104	Bangladesh Sarak Paribahan Corporation, Shurat, Jhenaidah Sadar	Office Semi Pucca	1564	Partially	50	No	Adequate compensation for relocate the structure	
4.	0360	106+200	Power Plant, Shurat, Jhenaidah Sadar	Power Plant	1000	Partially	Boundary wall will be affected	No	Government will make decision for the relocation of the structure	
5.	0374	106+850	Progoti Farmer Co- operative Society, Moharazpur, Jhenaidah Sadar	Market Pucca	1080	Fully	100	Yes	Require adequate Compensation	
6.	0428	106+900	Zilla Porishad Market, Moharazpur, Jhenaidah Sadar	Zilla Porishad Market Tin Made	615	Fully	100	Yes	Government will take necessary action	

List of Common Property Resources (CPRs) with Title to Land in Contract-1; Upazila: Jhenaidah Sadar; District: Jhenaidah										
Sl. No.	CPR/H H No.	Chainage (km)	Name of CPR	Type of Structure	Area (Sft.)	Degree of Impact		Relocation Requirement (Yes/No)	Relocation Plan of the Affected CPR/ Structures *	Pictorial View
						in %	Impact			
7.	0484	108+700	Bishoykhali Zubasangha, Moharazpur, Jhenaidah Sadar	Bishoykhali Zubasangha Tin made	230	Fully	100	Yes	Adequate compensation for relocating the structure	
8.	0484	108+700	Bishoykhali Club, Moharazpur, Jhenaidah Sadar	Club Tin made	504	Fully	100	Yes	Adequate compensation	
9.	0537	108+900	Bangladesh Agriculture Office, Moharazpur, Jhenaidah Sadar	Agriculture land(past) Pucca	912	Fully	100	Yes	Government will take necessary action	
10.	0539	108+900	Union Porishod, Moharazpur, Jhenaidah Sadar	Office Pucca	1680	Fully	100	Yes	Will be relocate in the vicinity of the present union Parishad Office	
11.	0765	110+900	Jagory Club, 7 No. Moharazpur, Jhenaidah Sadar	Club Pucca	162	Fully	100	Yes	Seeking compensation	
12.	0792	111+600	Shop Housepara Committee Office Moharazpur, Jhenaidah Sadar	Office Pucca		Fully	100	Yes	Require adequate compensation	
13.	0824	111+900	Mukto Mongal Abashon, 7 No. Moharazpur, Jhenaidah Sadar	Building Tin made	875	Fully	100	Yes	Require adequate compensation	
14.	0972	115+400	BRAC Office, 2 No. Ward, Kaligonj	Office Room Tin made	2100	Partially	80	Yes	Require adequate compensation	
15.	0993	115+500	Upzila Animal resources, Kaligonj, Ward-2, Kaligonj	Office Room Pucca	2010	Partially	35	Yes	Will be relocated inner side of the livestock office	
CPR with Non-Title to Land										
1.	1064	115+900	Bangabondhu Baskorza, Kaligonj Poura:1, Kaligonj	Structure Pucca	1200	Fully	100% structure will be affected	Yes	Municipal Mayor will take necessary action	
2.	540	108+900	Land Office, Moharazpur, Jhenaidah Sadar	Office Pucca	1100	Fully	100% structure will be affected	Yes	DC office will take necessary action	
3.	0905	113+900	Bejpara Eidgah, Sundarpur Durgapur, Kaligonj	Minar Pucca	1200	Fully	100% will be affected	Yes	Demanding adequate compensation	
4.	0929	114+350	Kaligonj Powrashova Shimana Pilar, Kaligonj Powrashova, Kaligonj	Gate Pucca	102	Fully	100 structures will be	Yes	Mayor will take necessary action	

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List of Common Property Resources (CPRs) with Title to Land in Contract-1; Upazila: Jhenaidah Sadar; District: Jhenaidah										
Sl. No.	CPR/H H No.	Chainage (km)	Name of CPR	Type of Structure	Area (Sft.)	Degree of Impact		Relocation Requirement (Yes/No)	Relocation Plan of the Affected CPR/ Structures *	Pictorial View
						in %	Impact			
							affected			

List of Common Property Resources (CPRs) with Title to Land in Contract 2 Upazila: Kaliganj; District: Jhenaidah										
Sl. No.	CPR/H Hs No.	Chainage Km	Name of CPR	Affected of CPRs	Area of Structure (sft)	Type of Impact		Requirement of Relocation (Yes/No)	Relocation plan of the Affected CPR/ Structures	Pictorial View
						Degree of Impact	Affected Structure with Percenta ge (%)			
1.	520	119+00	Dulal Mundia Bazar Jame Mosque, Raygram	Mosque Pucca	1332	Fully	Will be fully affected	Yes	Option 1: Will be relocated to the opposite site of the road Option 2: Donor agrees to provide land within 200m to the western of the mosque	
2.	567	119+0	Dulal Mundia Ward Community Clinic, Raygram	Community Clinic Pucca	375	Fully	Will be Fully affected	Yes	Looking land to nearby place for shifting	
3.	589	121+350	Ambagan Jame Masjid, Raygram	Mosque and Eidgah Pucca	1073	Fully	Will be fully affected	Yes	Committee has decided to replace the mosque just opposite site to the road	
4.	612	122+200	Agmundia Jame Masjid, 7 No. Raygram	Mosque Pucca	1326	Fully	Will be fully affected	Yes	Donor is agreed upon to replace the mosque opposite side to the road	
5.	626	122+580	Agmundia Govt. Primary School, Raygram	Primary School Semi- Pucca	1378	Partially	Old Building will be Partially affected; Gate and boundary wall 100%	No	Shifting will be done within the campus	

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Sl. No.	CPR/Hs No.	Chainage Km	Name of CPR	Affected of CPRs	Type of Impact			Requirement of Relocation (Yes/No)	Relocation plan of the Affected CPR/ Structures	Pictorial View
					Area of Structure (sft)	Degree of Impact	Affected Structure with Percentage (%)			
6.	635	122+800	Agmundia & Bujidanga Ideal Orphanage & Mosque Madrasa, Raygram	Orphanage & Mosque Madrasa Pucca	1600	Fully	Will be fully affected	Yes	Accommodation will be done within the madrasah and orphanage campus	
7.	657	122+800	Asaduzzan Hossain Kaya Garden Ideal Collage, Raygram	Collage Semi Pucca	1200	Partially	Class room will be partially affected	No	Accommodating will be done within the college campus	
8.	675	124+900	Rostom Ali Govt. High School, Rakhalgachi	High School Pucca	2100	Partially	Class room. will be partially affected	No	Accommodating will be done within the school campus	
9.	676	124+900	Raghnathpur Jame Masjid, Rakhalgachi	Mosque Semi Pucca	1128	Fully	Will be fully affected	Yes	Talking with the school committee to replace the mosque and simultaneously looking alternative land	
10.	756	126+100	Pirojpur West para-Jame Masjid, Babu Bazar	Mosque Pucca	750	Partially	Will be fully affected	No	Looking land within the 500m area in the eastern side of the mosque	
11.	915	128+900	Baro Bazar Bus Stand Aowlia Jame Masjid & Madrasha, Baro Bazar	Jame Mosque & Madrasha Pucca	6348	Partially	Will be partially affected of Mosque	No	Accommodation will be done within the mosque area	
List of CPRs without Title to Land in Contract -2										
12.	114	117+700	Kaligonj Arepara Jame Masjid Busterminal, Kaligonj, Pourashava	(Mosque +Market) Pucca	19200	Fully	Structure will be affected fully	Yes	Need relocation The mosque is built on government land. Committee members and Musally(pious) has stated that they are willing to relocate the mosque in suitable	

List of Common Property Resources (CPRs) with Title to Land in Contract 2 Upazila: Kaliganj; District: Jhenaidah										
Sl. No.	CPR/Hs No.	Chainage Km	Name of CPR	Affected of CPRs	Type of Impact			Requirement of Relocation (Yes/No)	Relocation plan of the Affected CPR/ Structures	Pictorial View
					Area of Structure (sft)	Degree of Impact	Affected Structure with Percentage (%)			
									government land, otherwise they will not allow to remove the mosque from the Right of Way (ROW)	
13.	270	117+800	South Arepara Jame Mosjid, Kaligonj	Mosque Pucca	2752	Fully	Structure will be affected fully	Yes	Need relocation Mosque committee is looking a new land to set up the mosque	
14.	418	118+200	Balida Para Govt. Primary School, Pourashava-6 No. Ward	Govt. Primary School Pucca	243	Partially	Land will be affected 75% and structure 10%	No	President of the school committee is searching a suitable new land and discussing with head Teacher to relocate the primary school building	
15.	421	118+400	Hazrat Aysha Siddika(Ra:) Mahila Madrasa, Pourashava-6 No. Ward	Mahila Madrasa Pucca	4608	Fully	Structure will be fully affected	Yes	Authority is looking a new land to relocate the madrasah in a suitable place	
Number of Other Entities under Contract -2										
1.	0153	117+200	Telephone Office	24 (Telephone Office)- Pucca	-	Partially				
2.	0232	117+630	Teachers Association	(Association Office)	4800	Partially				
3.	0261	117+700	South Arepara Oikka Sangha	Oikka Sangha-Tin-Shed	429	Fully				
4.	0262	117+700	Manash Liberation Library	24 (Library)- Pucca	484	Fully				
5.	0294	117+700	RHD Passenger Shed	24(Passanger Shed)- Pucca	120	Fully				
6.	0303	117+800	Adarsha Para Club	Club	320	Fully				
7.	0408	116+900	Bujrok Fire Service Station	24(Fire Service)	1	Partially				
8.	0417	118+200	Mobarak Gonj Sugar Mill	Boundary wall with water tank - Pucca		Partially				
9.	0557	119+000	Eidgah Minar Dulal Mundia Bazar	24 (Eidgah)	95	Partially				
10.	0560	119+000	Dulal Mundia Bazar Motor Labor Association	(Motor Labor Association) Tin-Shed	221	Fully				
11.	0641	1226+800	RHD Passenger Shed	(R.H.D Passanger Shed)- Pucca	221	Fully				
12.	0658	122+900	Aug Mundia Bujidanga Eidgah	Eidgah	398	50				

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List of Common Property Resources (CPRs) with Title to Land in Contract 2 Upazila: Kaliganj; District: Jhenaidah										
Sl. No.	CPR/Hs No.	Chainage Km	Name of CPR	Affected of CPRs	Type of Impact			Requirement of Relocation (Yes/No)	Relocation plan of the Affected CPR/ Structures	Pictorial View
					Area of Structure (sft)	Degree of Impact	Affected Structure with Percentage (%)			
				Pucca						
13.	0685	123+100	Raghnathpur Bus Stand Passenger Shed	24 (Passenger Shed) Pucca	320	Fully				
14.	0780	128+000	Kavi Indoor Upkandra, Electricity Bhaban	24 (Electricity Bhaban) Pucca	-	Partially				
15.	0800	128+400	Baro Bazar Food Storage	24 (Food Storage) Pucca	1020	Partially				
16.	0849	128+880	Baro Bazar Fish Arat	24 (Fish Arat)- Pucca	1073	Fully				
17.	0857	128+880	Party Office Bangladesh Awami League	24 (Party Office) Pucca	336	Fully				
18.	0929	128+950	Passenger Shed, Baro Bazar, Kaligonj	24 (Passenger Shed) Pucca		Fully				
19.	0933	128+950	Baro Bazar Micro Car Renttaker Center	24 (Car Renttaker Center)	99	Fully				
Non-Title HHs										
20.	0115	117+000	24 (Motor Labour Union Office)	Motor Workers Union Office Pucca	3500	Fully				

List of Common Property Resources (CPRs) with Title to Land in Contract-3 Upazila: Jashore Sadar; District: Jashore										
Sl. No.	CPR/ HH No.	Chainage (km)	Name of CPR	Type of structure	Area (Sft.)	Type of Impact		Relocation Requirement (Yes/No)	Relocation plan of the Affected CPR/ Structures	Pictorial View
						Degree of Impact	Affected Structure with Percentage (%)			
						Fully	Structure will be affected fully	Yes	Relocation is required There are 2 options: Option 1: Opposite site of the road Option 2: Adjacent east side of the mosque	
2.	52	134+50	6 No. Manikdih Govt. Primary School, Haibatpur	Primary School- Pucca	Partially	Partially	Affected boundary wall & Gate fully	No	Having own land (92decimale) to accommodate within the campus	

List of Common Property Resources (CPRs) with Title to Land in Contract-3 Upazila: Jashore Sadar; District: Jashore

Sl. No.	CPR/HH No.	Chainage (km)	Name of CPR	Type of structure	Area (Sft.)	Type of Impact		Relocation Requirement (Yes/No)	Relocation plan of the Affected CPR/ Structures	Pictorial View
						Degree of Impact	Affected Structure with Percentage (%)			
3.	103+104	134+500	Modinatul Monoyar Jaem Mosque & Manikdih Nosriya & Nehariya Siddikiya Hafizia & khanka Sharif with one (1) Graveyard, 1 No. Haibatpur	Mosque Pacca	1440	Fully	Mosque, Madrasah and Graveyard	Yes	Graveyard will be relocated in their own family graveyard land The authority is planning to build a 5 storied new building where the ground floor will be used as Market, 2 nd floor mosque and 3 rd floor to above will be used as Madrasha	
4.	104	134+500	Nesaria Hafizia Madrasha, 1 No. Haibatpur	Madrasah Pacca	320	Partially		No	Same as above	Same as above
5.	342	135+500	Kazi Nazrul Islam College, Haibatpur	Collage Pacca	7556	Partially	Administrative Building, Masque, bicycle Garage; 2 Gates and Boundary wall	No	College authority has requested to RHD to build a new building against their affected building and it have to be made before demolishing the present building so that teaching activities remain undisturbed.	
6.	358	136+100	Churamonkathi Ideal Colonypara Jame Mosque, Churamonkathi	Mosque Pucca	250	Partially	Wash room will be affected	No	Accommodation will be within the mosque area.	
7.	379	134+400	Churamonkati Northpara Jame Mosque, Churamonkathi	Mosque Pucca	1104	Partially	Veranda and Wash room	No	Accommodation will be within the mosque area.	
8.	816	138+700	Abdul Aziz Hafizia Madrasha, Churamonkathi	Madrasah Pucca	1800	fully	Madrasah campus, Office room, Bathroom, Wash room Gate with Boundary wall	Yes	The present land is a donation land, donor have another land and they willing to replace the structure in their other land if get compensation	
9.	1034	28+800	Hat Baro Bazar Secondary High School	School Pucca	4000	Partially	Structure will be affected 50%, land 30%	No	Accommodation will be done within the campus	

List of Common Property Resources (CPRs) with Title to Land in Contract-3 Upazila: Jashore Sadar; District: Jashore										
Sl. No.	CPR/HH No.	Chainage (km)	Name of CPR	Type of structure	Area (Sft.)	Type of Impact		Relocation Requirement (Yes/No)	Relocation plan of the Affected CPR/ Structures	Pictorial View
						Degree of Impact	Affected Structure with Percentage (%)			
10	1075	29+000	Modinapara Jame Mosque	Mosque Pucca	1306	Fully	Structure will be fully affected	Yes	Relocation is required Authority not yet found any land Looking alternative land to set up the mosque	
11	1082	142+300	Cantonment Khayertola Jame Mosque, Jashore Pourashava	Mosque Pucca	6000	Fully	Structure will be fully affected.	Yes	Relocation is required Authority not yet found any land Looking alternative land to set up the mosque	
12	1298	142+300	Taqwa Jame Mosjid, Jashore Pourashava	Mosque Pucca	100	partially	Will be partially affected	No	Relocation is not required	
13.	1333	143+300	Baitul Mamur Jame Mosjid & Madrasah, Jashore Pourashava	Mosque & Madrasah Pucca	368+1200	Partially	Partially affected the Masque shops, Residential Building and Gate	No	Relocation is not required Shifting will be done within the Mosque premises	
14.	1404	144+700	124 No. Somota Govt. Primary School, Jashore Pourashava	School Pucca	120	Partially	Boundary wall will be affected	No	Accommodation will be done within the school area	
15.	1417	143+800	Sre-Sre Kali Mondir, Jashore Pourashava	Temple Semi Pucca	140	Partially	Partially affected the kali Mondir (Temple)	No	Accommodation will be done within the Temple area	
16	1425	143+900	Baitul Salam Jame Mosjid, Jashore Pourashava	Mosque Semi Pucca	250	Partially	Partially affected	No	Relocation is not required	
17.	1438	145+100	Dormatola Baitul Arafat Jame Mosjid, Arabpur	Mosque Pucca	5950	Fully	Structure will be fully affected	Yes	Relocation is required Committee has opined that the mosque will be built within 200m if the compensation will be available	

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Sl. No.	CPR/HH No.	Chainage (km)	Name of CPR	Type of structure	Area (Sft.)	Type of Impact		Relocation Requirement (Yes/No)	Relocation plan of the Affected CPR/ Structures	Pictorial View
						Degree of Impact	Affected Structure with Percentage (%)			
18.	1486	144+100	Al-Imam Mosjid & Madrasha, Arabpur	Mosque & Madrasah Pucca	2607	partially	Structure will be affected Partially	No	Will be accommodated in the mosque area	
19	1406	144+700	Arabpur Mathpara Sorbajonin Pujamondir, Jashore Pourashava	Temple Semi Pucca	700	Fully	Will be affected Fully	Yes	Committee has agreed to self-relocation. Committee has donated half a decimal of land within 100m west side of Puja mondir (temple) to resettle the Temple	
List of CPRs without Title to Land										
20	791	138+700	Choramonkati Bazar Jame Mosque, Churamankathi	Mosque Pucca	3000	Fully	Will be affected fully	Yes	Required to Relocation Committee not yet decided to relocate the mosque	
Number of Other Entities under Contract -3										
1.	0056	134+200	LGD Go down	Gate- Pacca	96	Fully				
2.	0134	-	Haibatpur Union Land Office	Office	1160	Fully				
3.	0351	136+100	Churamonkathi Colony para Eidgah	Eidgah	20	Partially				
4.	0755	138+700	Churamonkathi Land Office	Office Bhabon Pacca	750	Fully				
5.	0844	138+700	Satiantola Khademul Islam Atimkhana, Market	Market Pacca	1200	Fully				
6.	0954	140+400	Bangladesh Railway Guard Room	Railway Guard Room		Fully				
7.	1146	142+800	Bangladesh Agricultural Research Institute	Research Institute Pacca	56	Partially				
8.	1184	142+900	Joyanti Society	Society- Pacca		Fully				
9.	1216	143+100	Horticulture	Gate- Pacca	324	Fully				
10.	1259	143+200	Regional Jubo	Jubo League		Fully				

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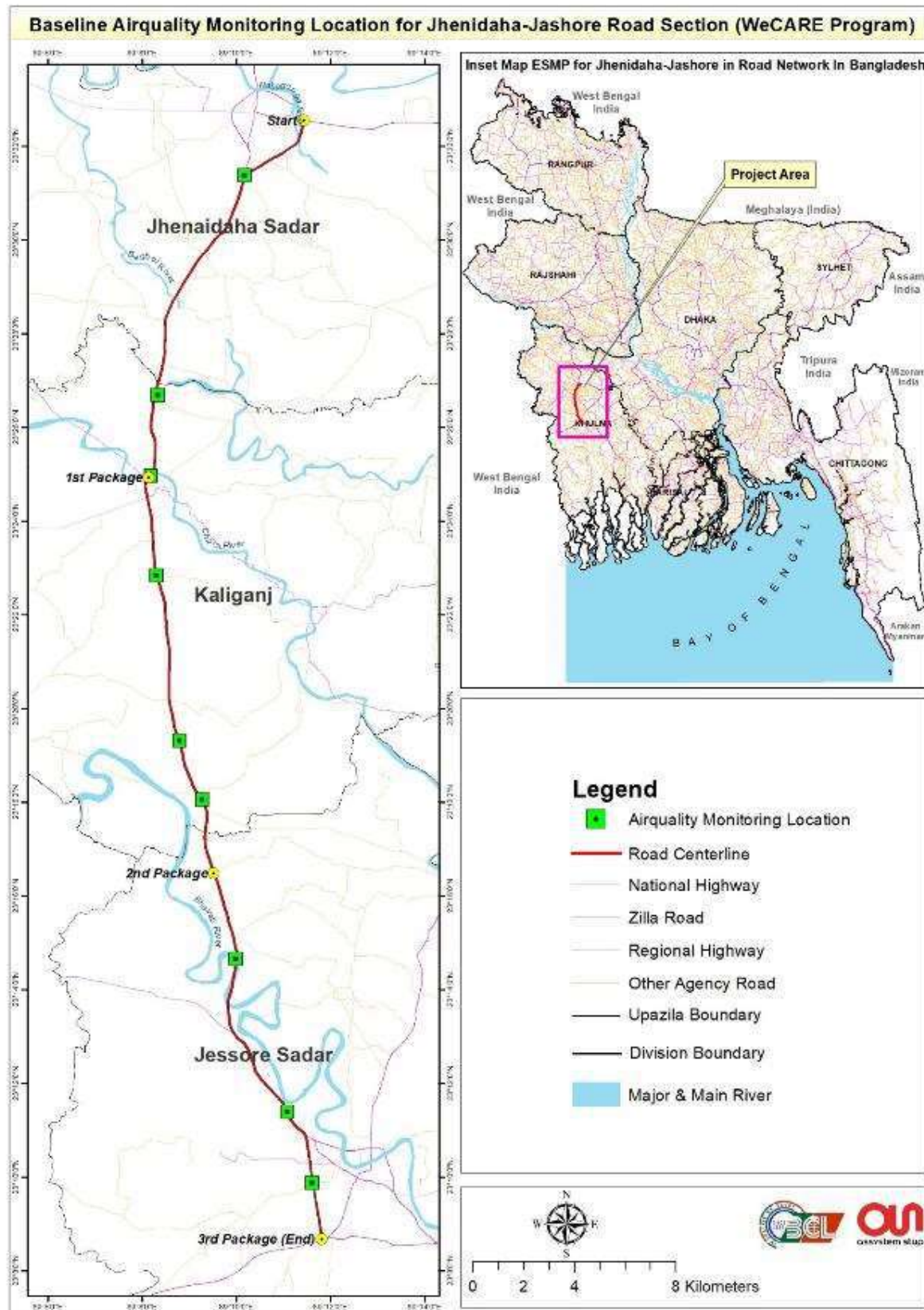


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List of Common Property Resources (CPRs) with Title to Land in Contract-3 Upazila: Jashore Sadar; District: Jashore										
Sl. No.	CPR/HH No.	Chainage (km)	Name of CPR	Type of structure	Area (Sft.)	Type of Impact		Relocation Requirement (Yes/No)	Relocation plan of the Affected CPR/ Structures	Pictorial View
						Degree of Impact	Affected Structure with Percentage (%)			
			League Office	Office						
11.	1273	143+200	(Polly Bari) Passenger Shed	Veranda -Tin	336	Fully				
12.	1314	143+200	LGED	Gate- Pacca	112	Fully				
13.	1328	143+300	33/11 Kavi Khairtola Substation	Substation		Partially				
14.	1401	144+700	Arobpur Passenger Shed	Passenger Shed		Fully				
15.	1426	143+900	Dormatola Passenger Shed	Passenger Shed		Fully				
16.	1472	145+200	Bangladesh Railway Guard Room	Railway Guard Room		Fully				
17.	1483	144+100	Bangladesh Railway Guard Room	Railway Guard Room		Fully				
18.	1502	144+500	Bangladesh Railway Guard Room	Railway Guard Room		Fully				
19.	1511	144+500	Bangladesh Awami Regional Office Secretary	Awami Regional Office		Fully				
20.	1519	146+900	RRF Chachra Training Center	Office Room-Tin	270	Partially				
21.	1520	147+100	Bangladesh Fishery Research Institute	Fishery Research Institute		Partially				
22.	1536	147+500	Bangladesh Agriculture Development Corporation	Agriculture Development Corporation		Partially				
23.	1552	-	Mathpara Development Somity	Development Somity		Fully				
Non- Title										

List of Common Property Resources (CPRs) with Title to Land in Contract-3 Upazila: Jashore Sadar; District: Jashore										
Sl. No.	CPR/HH No.	Chainage (km)	Name of CPR	Type of structure	Area (Sft.)	Type of Impact		Relocation Requirement (Yes/No)	Relocation plan of the Affected CPR/ Structures	Pictorial View
						Degree of Impact	Affected Structure with Percentage (%)			
24.	0051	134+050	Manikdihi Eidgah	Eidgah		Partially				
25.	0343	135+600	Passenger Shed	Passenger Shed		Fully				
26.	0344	135+600	Grave Yard (Mejor Mostafijur Rahman)	Grave Yard		Fully				
27.	0561	138+600	Churamonkathi Passenger Shed	Passenger Shed		Fully				
28.	0790	138++700	Choramonkathi Union Porishad	Union Porishad		Fully				

Annex 4-12: Baseline Environmental Monitoring Maps



Baseline Ambient Air Quality Monitoring Location for Jhenaidah-Jashore Road Section (WeCARE Program)

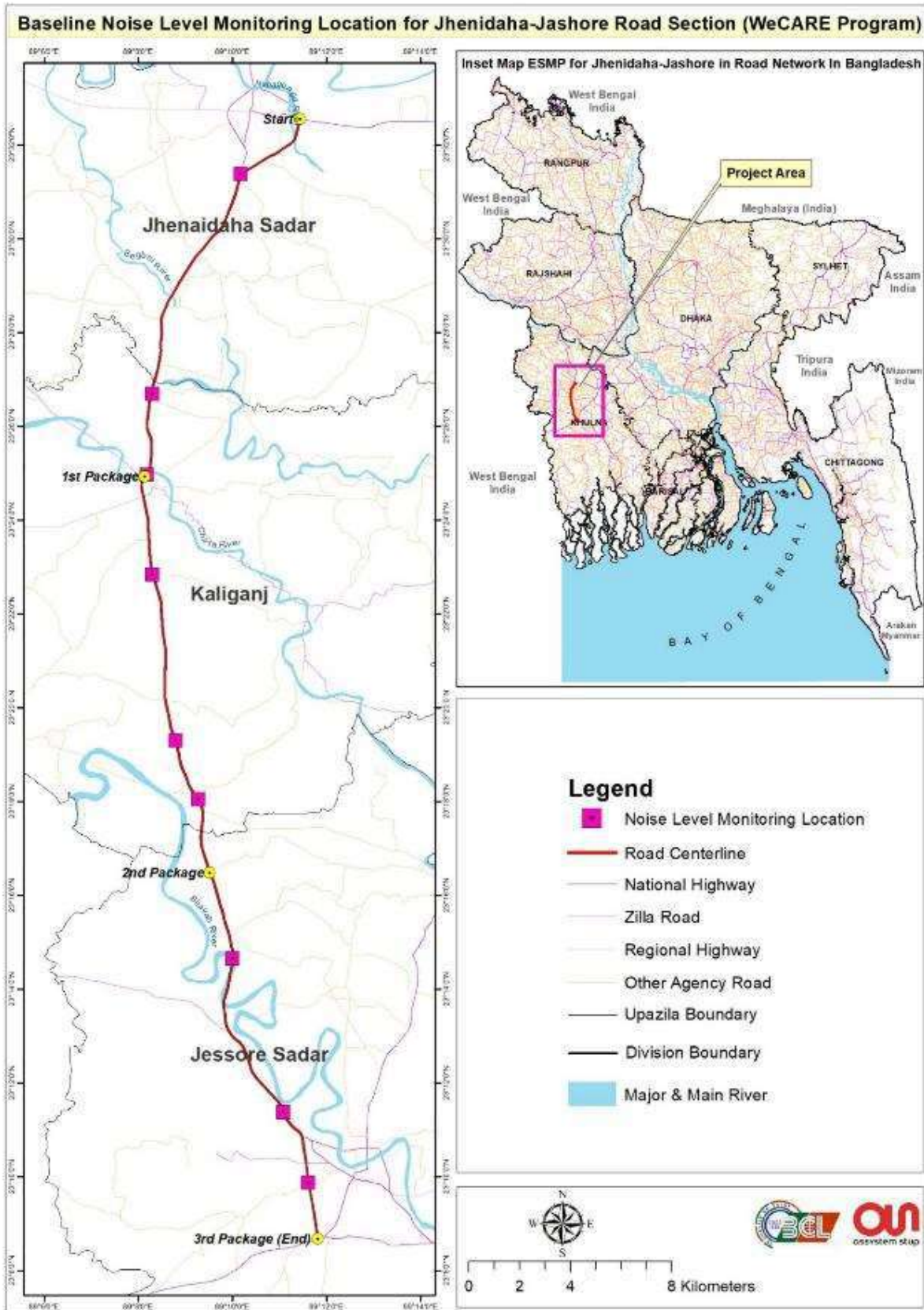
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Baseline Ambient Noise Level Monitoring Location for Jhenaidah-Jashore Road Section (WeCARE Program)

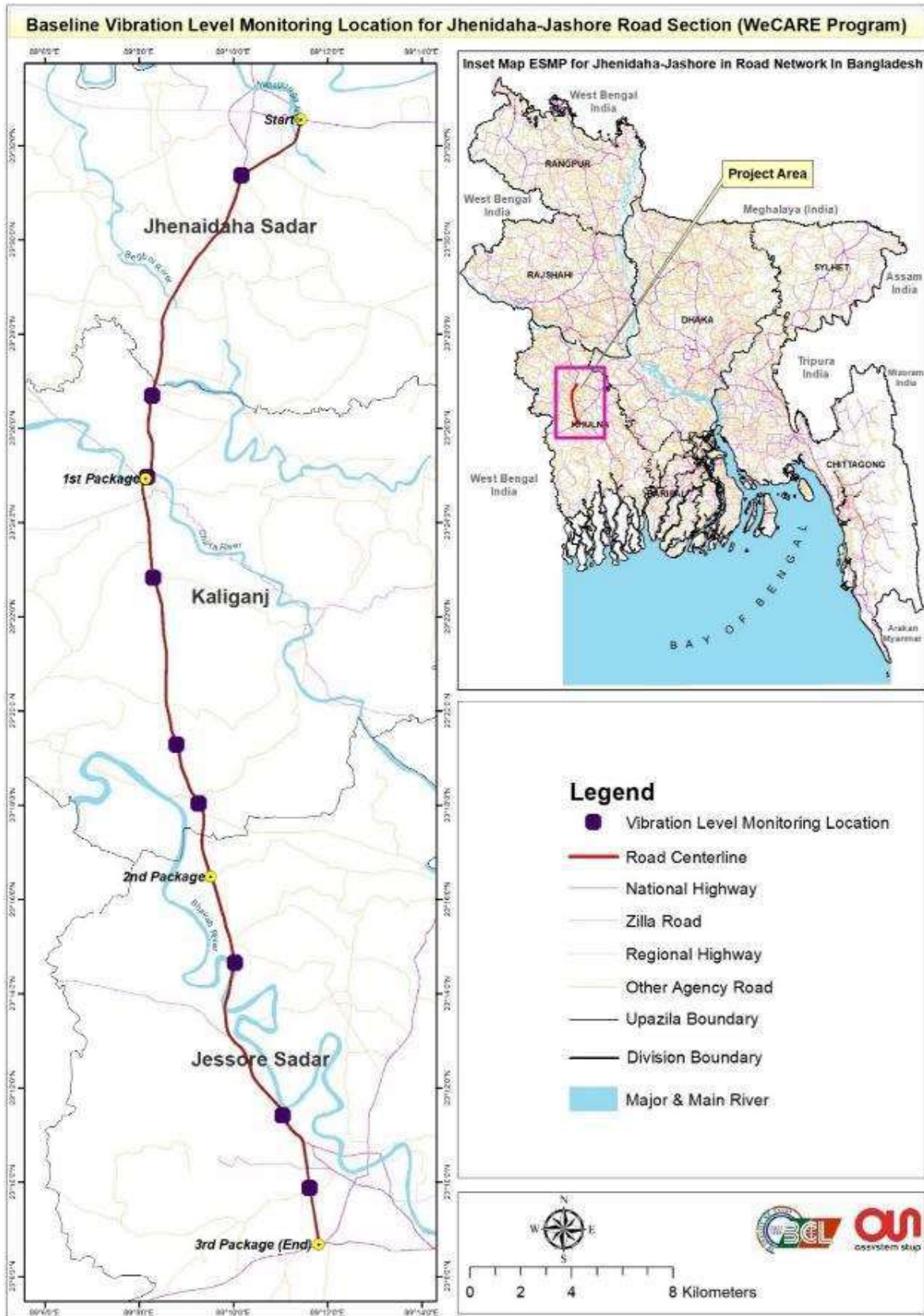
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Baseline Vibration Level Monitoring Location for Jhenaidah-Jashore Road Section (WeCARE Program)

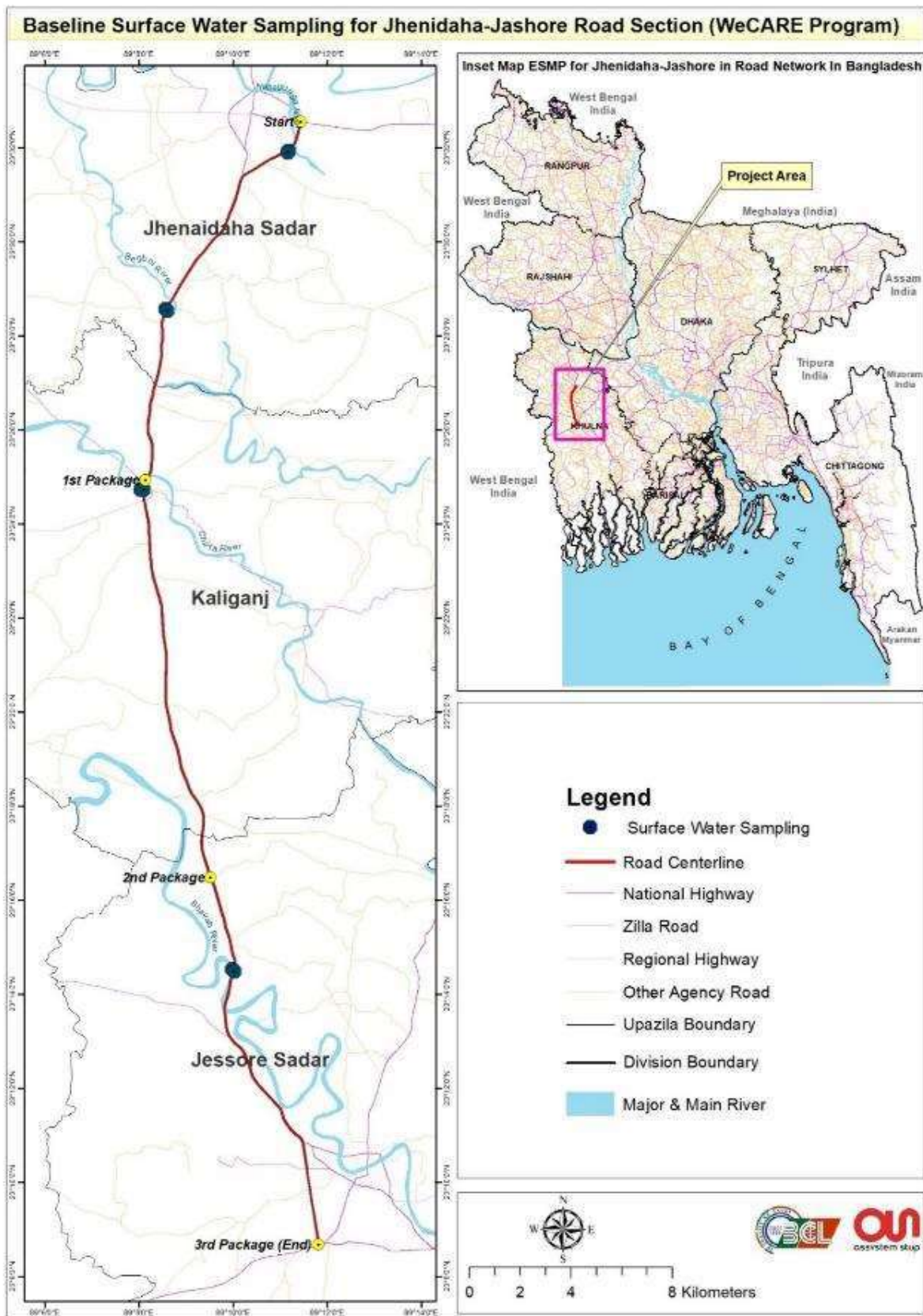
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Baseline Surface Water Sampling for Jhenaidah-Jashore Road Section (WeCARE Program)

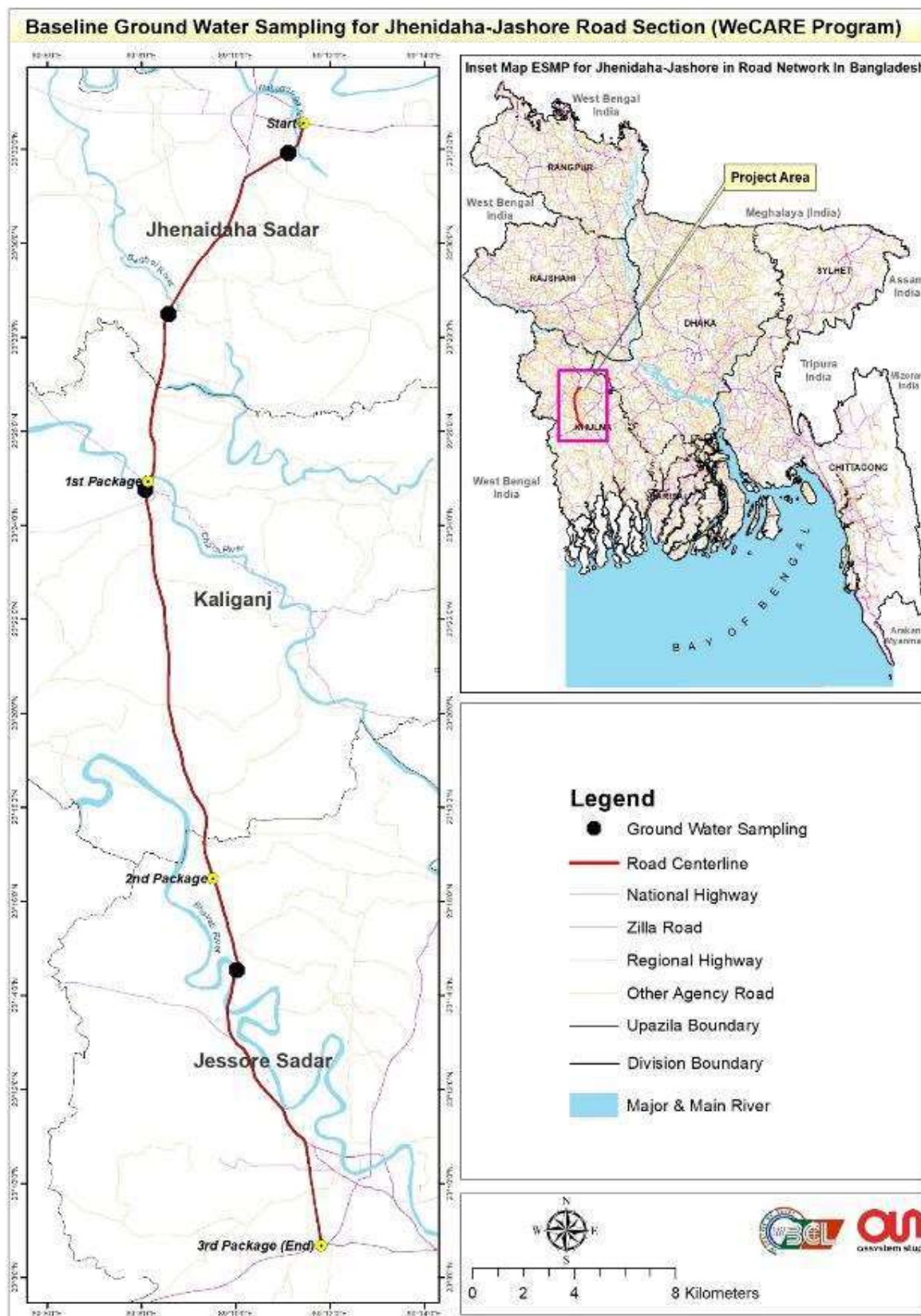
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Baseline Ground Water Sampling for Jhenaidah-Jashore Road Section (WeCARE Program)

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ANNEX 6

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Annex 6-1: Stakeholder Participation Lists with Signature

Stakeholder Consultation Meeting On Environment and Social management for Jhenaidah-Jashore Road Section (Phase 1) under WeCARE Project

Location: Jhenaidah Sadar, Jhenaidah
Venue: Bhutiarghati, Central Bus Terminal of Jhenaidah

Date: 12 April, 2022

SN	Name of the Participant	Occupation	Mobile Number	Signature
1	মোঃ মোস্তাফিজুর রহমান	Project Manager		
2	মোঃ জাহাঙ্গীর হক	Project Manager		
3	মোঃ জাহাঙ্গীর হক	Project Manager		
4	মোঃ জাহাঙ্গীর হক	Project Manager		
5	মোঃ জাহাঙ্গীর হক	Project Manager		
6	মোঃ জাহাঙ্গীর হক	Project Manager		
7	মোঃ জাহাঙ্গীর হক	Project Manager		
8	Saifur Rahman	Teacher		
9	মোঃ জাহাঙ্গীর হক	Project Manager		
10	মোঃ জাহাঙ্গীর হক	Project Manager		
11	মোঃ জাহাঙ্গীর হক	Project Manager		
12	মোঃ জাহাঙ্গীর হক	Project Manager		
13	মোঃ জাহাঙ্গীর হক	Project Manager		
14	মোঃ জাহাঙ্গীর হক	Project Manager		
15	মোঃ জাহাঙ্গীর হক	Project Manager		
16	মোঃ জাহাঙ্গীর হক	Project Manager		
17	মোঃ জাহাঙ্গীর হক	Project Manager		

Stakeholder Consultation Meeting On Environment and Social management for Jhenaidah-Jashore Road Section (Phase 1) under WeCARE Project

Location: Jhenaidah Sadar, Jhenaidah
Venue: Bhutiarghati, Central Bus Terminal of Jhenaidah

Date: 12 April, 2022

SN	Name of the Participant	Occupation	Mobile Number	Signature
18	মোঃ জাহাঙ্গীর হক	Project Manager		
19	মোঃ জাহাঙ্গীর হক	Project Manager		
20	মোঃ জাহাঙ্গীর হক	Project Manager		
21	মোঃ জাহাঙ্গীর হক	Project Manager		
22	মোঃ জাহাঙ্গীর হক	Project Manager		
23	মোঃ জাহাঙ্গীর হক	Project Manager		
24	মোঃ জাহাঙ্গীর হক	Project Manager		
25	মোঃ জাহাঙ্গীর হক	Project Manager		
26	মোঃ জাহাঙ্গীর হক	Project Manager		
27	মোঃ জাহাঙ্গীর হক	Project Manager		
28	মোঃ জাহাঙ্গীর হক	Project Manager		
29	মোঃ জাহাঙ্গীর হক	Project Manager		
30	মোঃ জাহাঙ্গীর হক	Project Manager		
31	মোঃ জাহাঙ্গীর হক	Project Manager		
32	মোঃ জাহাঙ্গীর হক	Project Manager		
33	মোঃ জাহাঙ্গীর হক	Project Manager		
34	মোঃ জাহাঙ্গীর হক	Project Manager		

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Stakeholder Consultation Meeting
On
Environment and Social management for Jhenaidah-Jashore Road Section
(Phase 1) under WeCARE Project

Location: Jhenaidah Sadar, Jhenaidah
Venue: Bhutiarghati, Central Bus Terminal of Jhenaidah

Date: 12 April, 2022

SN	Name of the Participant	Occupation	Mobile Number	Signature
35	১০. জাফর হোসেন	লেকচার		
36	১১. কৃষ্ণাচরণ	অফিসি		
37	১২. মোঃ মোঃ	বাংলাদেশ		
38	১৩. মোঃ মোঃ	বাংলাদেশ		
39	১৪. মোঃ মোঃ	বাংলাদেশ		
40	১৫. মোঃ মোঃ	বাংলাদেশ		
41	১৬. মোঃ মোঃ	বাংলাদেশ		
42	১৭. মোঃ মোঃ	বাংলাদেশ		
43	১৮. মোঃ মোঃ	বাংলাদেশ		
44	১৯. মোঃ মোঃ	বাংলাদেশ		
45	২০. মোঃ মোঃ	বাংলাদেশ		
46	২১. মোঃ মোঃ	বাংলাদেশ		
47	২২. মোঃ মোঃ	বাংলাদেশ		
48	২৩. মোঃ মোঃ	বাংলাদেশ		
49	২৪. মোঃ মোঃ	বাংলাদেশ		
50	২৫. মোঃ মোঃ	বাংলাদেশ		
51	২৬. মোঃ মোঃ	বাংলাদেশ		
52	২৭. মোঃ মোঃ	বাংলাদেশ		

Stakeholder Consultation Meeting
On
Environment and Social management for Jhenaidah-Jashore Road Section
(Phase 1) under WeCARE Project

Location: Jhenaidah Sadar, Jhenaidah
Venue: Bhutiarghati, Central Bus Terminal of Jhenaidah

Date: 12 April, 2022

SN	Name of the Participant	Occupation	Mobile Number	Signature
53	২৮. মোঃ মোঃ	বাংলাদেশ		
54	২৯. মোঃ মোঃ	বাংলাদেশ		
55	৩০. মোঃ মোঃ	বাংলাদেশ		
56	৩১. মোঃ মোঃ	বাংলাদেশ		
57	৩২. মোঃ মোঃ	বাংলাদেশ		
58	৩৩. মোঃ মোঃ	বাংলাদেশ		
59	৩৪. মোঃ মোঃ	বাংলাদেশ		
60	৩৫. মোঃ মোঃ	বাংলাদেশ		
61	৩৬. মোঃ মোঃ	বাংলাদেশ		
62	৩৭. মোঃ মোঃ	বাংলাদেশ		
63	৩৮. মোঃ মোঃ	বাংলাদেশ		
64	৩৯. মোঃ মোঃ	বাংলাদেশ		
65	৪০. মোঃ মোঃ	বাংলাদেশ		
66	৪১. মোঃ মোঃ	বাংলাদেশ		
67	৪২. মোঃ মোঃ	বাংলাদেশ		
68	৪৩. মোঃ মোঃ	বাংলাদেশ		
69	৪৪. মোঃ মোঃ	বাংলাদেশ		

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Stakeholder Consultation Meeting
On
Environment and Social Management for Jhenaidah-Jashore Road Section
(Phase-1) under WeCARE Project

Location: Moharajpur, Union Parishad, Jhenaidah Sadar, Jhenaidah
Venue: Moharajpur Union Parishad Auditorium

Date: 13 April, 2022

S.N	Name of the Participant	Occupation	Mobile Number	Signature
1	Md. Nura Shukur	PHD		
2	Md. Sajedur Rahman	DPH-1		
3	Md. Wazed Ali	Consultant		
4	Md. Rashedul Alam	RHD		
5	Md. Rashedul Alam	PHD, BCL		
6	Md. Omar Gani	Service		
7	Md. Hosnur Rahman	R&RS		
8	Md. Rashedul Alam	BCL Ass. Ltd		
9	Md. Rashedul Alam	PHD		
10	Md. Rashedul Alam	PHD		
11	Md. Rashedul Alam	PHD		
12	Md. Rashedul Alam	PHD		
13	Md. Saiful Islam	Social		
14	Md. Rashedul Alam	PHD		
15	Kakoly Khatun	computer		
16	Md. Rashedul Alam	PHD		
17	Md. Rashedul Alam	PHD		
18	Md. Rashedul Alam	PHD		

Stakeholder Consultation Meeting

On
Environment and Social Management for Jhenaidah-Jashore Road Section
(Phase-1) under WeCARE Project

Location: Moharajpur, Union Parishad, Jhenaidah Sadar, Jhenaidah
Venue: Moharajpur Union Parishad Auditorium

Date: 13 April, 2022

S.N	Name of the Participant	Occupation	Mobile Number	Signature
19	Md. Rashedul Alam	PHD		
20	Md. Rashedul Alam	PHD		
21	Md. Rashedul Alam	PHD		
22	Md. Rashedul Alam	PHD		
23	Md. Rashedul Alam	PHD		
24	Md. Rashedul Alam	PHD		
25	Md. Rashedul Alam	PHD		
26	Md. Rashedul Alam	PHD		
27	Md. Rashedul Alam	PHD		
28	Md. Rashedul Alam	PHD		
29	Md. Rashedul Alam	PHD		
30	Md. Rashedul Alam	PHD		
31	Md. Rashedul Alam	PHD		
32	Md. Rashedul Alam	PHD		
33	Md. Rashedul Alam	PHD		
34	Md. Rashedul Alam	PHD		
35	Md. Rashedul Alam	PHD		
36	Md. Rashedul Alam	PHD		

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On
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(Phase-1) under WeCARE Project

Location: Moharajpur, Union Parishad, Jhenaidah Sadar, Jhenaidah
Venue: Moharajpur Union Parishad Auditorium

Date: 13 April, 2022

S.N.	Name of the Participant	Occupation	Mobile Number	Signature
37	শ্রী. রমান	কৃষক		
38	শ্রী. রমান	কৃষক		
39	শ্রী. রমান	কৃষক		
40	শ্রী. রমান	কৃষক		
41	শ্রী. রমান	কৃষক		
42	শ্রী. রমান	কৃষক		
43	শ্রী. রমান	কৃষক		
44	শ্রী. রমান	কৃষক		
45	Kausik Das			
46	শ্রী. রমান	কৃষক		
47	শ্রী. রমান	কৃষক		
48	শ্রী. রমান	কৃষক		
49	শ্রী. রমান	কৃষক		
50	শ্রী. রমান	কৃষক		
51	শ্রী. রমান	কৃষক		
52	শ্রী. রমান	কৃষক		
53	শ্রী. রমান	কৃষক		
54	শ্রী. রমান	কৃষক		

Stakeholder Consultation Meeting

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Venue: Moharajpur Union Parishad Auditorium

Date: 13 April, 2022

S.N.	Name of the Participant	Occupation	Mobile Number	Signature
55	শ্রী. রমান	কৃষক		
56	শ্রী. রমান	কৃষক		
57	শ্রী. রমান	কৃষক		
58	শ্রী. রমান	কৃষক		
59	শ্রী. রমান	কৃষক		
60	শ্রী. রমান	কৃষক		
61	শ্রী. রমান	কৃষক		
62	শ্রী. রমান	কৃষক		
63	শ্রী. রমান	কৃষক		
64	শ্রী. রমান	কৃষক		
65	শ্রী. রমান	কৃষক		
66	শ্রী. রমান	কৃষক		
67	শ্রী. রমান	কৃষক		
68	শ্রী. রমান	কৃষক		
69	শ্রী. রমান	কৃষক		
70	শ্রী. রমান	কৃষক		
71	শ্রী. রমান	কৃষক		
72	শ্রী. রমান	কৃষক		

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Venue: Mohanpur Union Parishad Auditorium

Date: 13 April, 2022

S.N.	Name of the Participant	Occupation	Mobile Number	Signature
73	মুহু বিহার	ব্যবসায়ী		
74	শ্রী রুমার	ব্যবসায়ী		
75	শ্রী মাহমুদ	কৃষক		
76	শ্রী রুমার	কৃষক		
77	শ্রী রুমার	কৃষক		
78	শ্রী মাহমুদ মাহমুদ	কৃষক		
79	মাহমুদ	কৃষক		
80	শ্রী মাহমুদ	কৃষক		
81	শ্রী মাহমুদ মাহমুদ	ব্যবসায়ী		
82	শ্রী মাহমুদ মাহমুদ	কৃষক		
83	শ্রী মাহমুদ মাহমুদ	কৃষক		
84	শ্রী মাহমুদ	কৃষক		
85	শ্রী মাহমুদ মাহমুদ	কৃষক		
86	শ্রী মাহমুদ মাহমুদ	কৃষক		
87	শ্রী মাহমুদ মাহমুদ	কৃষক		
88	শ্রী মাহমুদ মাহমুদ	কৃষক		
89	শ্রী মাহমুদ মাহমুদ	কৃষক		
90	শ্রী মাহমুদ	কৃষক		

Stakeholder Consultation Meeting
On

Environment and Social Management for Jhenaidah-Jashore Road Section (Phase-1) under WeCARE Project

Location: Mohanpur, Union Parishad, Jhenaidah Sadar, Jhenaidah
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Date: 13 April, 2022

S.N.	Name of the Participant	Occupation	Mobile Number	Signature
91	শ্রী মাহমুদ	কৃষক		
92	শ্রী মাহমুদ	কৃষক		
93	শ্রী মাহমুদ মাহমুদ	কৃষক		
94	শ্রী মাহমুদ মাহমুদ	কৃষক		
95	শ্রী মাহমুদ	কৃষক		
96	শ্রী মাহমুদ	কৃষক		
97	শ্রী মাহমুদ মাহমুদ	কৃষক		
98	শ্রী মাহমুদ মাহমুদ	কৃষক		
99	শ্রী মাহমুদ	কৃষক		
100	শ্রী মাহমুদ	কৃষক		
101	শ্রী মাহমুদ	কৃষক		
102	শ্রী মাহমুদ মাহমুদ	কৃষক		
103	শ্রী মাহমুদ মাহমুদ	কৃষক		
104	শ্রী মাহমুদ মাহমুদ	কৃষক		
105	শ্রী মাহমুদ মাহমুদ	কৃষক		
106	শ্রী মাহমুদ মাহমুদ	কৃষক		
107	শ্রী মাহমুদ মাহমুদ	কৃষক		
108	শ্রী মাহমুদ মাহমুদ	কৃষক		

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Date: 13 April, 2022

S.N.	Name of the Participant	Occupation	Mobile Number	Signature
109	শ্রীঃ আতিয়া রহমান	কাজ		
110	শ্রীঃ সিরাজুল হক	কাজ		
111	শ্রীঃ সিরাজুল হক	কাজ		
112	শ্রীঃ আতিয়া রহমান	কাজ		
113	শ্রীঃ সিরাজুল হক	কাজ		
114	শ্রীঃ সিরাজুল হক	কাজ		
115	শ্রীঃ সিরাজুল হক	কাজ		
116	শ্রীঃ সিরাজুল হক	কাজ		
117	শ্রীঃ সিরাজুল হক	কাজ		
118	শ্রীঃ সিরাজুল হক	কাজ		
119	শ্রীঃ সিরাজুল হক	কাজ		
120	শ্রীঃ সিরাজুল হক	কাজ		
121	শ্রীঃ সিরাজুল হক	কাজ		
122	শ্রীঃ সিরাজুল হক	কাজ		
123	শ্রীঃ সিরাজুল হক	কাজ		
124	শ্রীঃ সিরাজুল হক	কাজ		
125	শ্রীঃ সিরাজুল হক	কাজ		
126	শ্রীঃ সিরাজুল হক	কাজ		

Stakeholder Consultation Meeting
On
Environment and Social Management for Jhenaidah-Jashore Road Section
(Phase-1) under WeCARE Project

Location: Mohanpur, Union Parishad, Jhenaidah Sadar, Jhenaidah
Venue: Mohanpur Union Parishad Auditorium

Date: 13 April, 2022

S.N.	Name of the Participant	Occupation	Mobile Number	Signature
127	শ্রীঃ সিরাজুল হক	কাজ		
128	শ্রীঃ সিরাজুল হক	কাজ		
129	শ্রীঃ সিরাজুল হক	কাজ		
130	শ্রীঃ সিরাজুল হক	কাজ		
131	শ্রীঃ সিরাজুল হক	কাজ		
132	শ্রীঃ সিরাজুল হক	কাজ		
133	শ্রীঃ সিরাজুল হক	কাজ		
134	শ্রীঃ সিরাজুল হক	কাজ		
135	শ্রীঃ সিরাজুল হক	কাজ		
136	শ্রীঃ সিরাজুল হক	কাজ		
137	শ্রীঃ সিরাজুল হক	কাজ		
138	শ্রীঃ সিরাজুল হক	কাজ		
139	শ্রীঃ সিরাজুল হক	কাজ		
140	শ্রীঃ সিরাজুল হক	কাজ		
141	শ্রীঃ সিরাজুল হক	কাজ		
142	শ্রীঃ সিরাজুল হক	কাজ		
143	শ্রীঃ সিরাজুল হক	কাজ		
144	শ্রীঃ সিরাজুল হক	কাজ		
145	শ্রীঃ সিরাজুল হক	কাজ		
146	শ্রীঃ সিরাজুল হক	কাজ		
147	শ্রীঃ সিরাজুল হক	কাজ		
148	শ্রীঃ সিরাজুল হক	কাজ		
149	শ্রীঃ সিরাজুল হক	কাজ		
150	শ্রীঃ সিরাজুল হক	কাজ		
151	শ্রীঃ সিরাজুল হক	কাজ		
152	শ্রীঃ সিরাজুল হক	কাজ		
153	শ্রীঃ সিরাজুল হক	কাজ		
154	শ্রীঃ সিরাজুল হক	কাজ		
155	শ্রীঃ সিরাজুল হক	কাজ		
156	শ্রীঃ সিরাজুল হক	কাজ		
157	শ্রীঃ সিরাজুল হক	কাজ		

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November 2022

Stakeholder Consultation Meeting
On
Environment and Social Management for Jhenaidah-Jashore Road Section
(Phase-1) under WeCARE Project

Location: Mohanpur, Union Parishad, Jhenaidah Sadar, Jhenaidah
Venue: Mohanpur Union Parishad Auditorium

Date: 13 April, 2022

S.N.	Name of the Participant	Occupation	Mobile Number	Signature
158	কেন্দ্র ডায়	চাষা		
159	স্বামীজী চন্দ্র	কৃষক		
160	গুরুজী চন্দ্র	কৃষক		
161	মো: হুমায়ুন	কৃষক		
162	মো: নজরুল ইসলাম	কৃষক		
163	মো: জাহিদা হোসেন	কৃষক		
164	মো: সালেহা হোসেন	কৃষক		
165	মো: সালেহা হোসেন	কৃষক		
166	মো: সালেহা হোসেন	কৃষক		
167	মো: সালেহা হোসেন	কৃষক		
168	মো: সালেহা হোসেন	কৃষক		
169	মো: সালেহা হোসেন	কৃষক		
170	মো: সালেহা হোসেন	কৃষক		
171	মো: সালেহা হোসেন	কৃষক		
172	মো: সালেহা হোসেন	কৃষক		
173	মো: সালেহা হোসেন	কৃষক		
174	মো: সালেহা হোসেন	কৃষক		
175	মো: সালেহা হোসেন	কৃষক		

Stakeholder Consultation Meeting
On
Environment and Social Management for Jhenaidah-Jashore Road Section
(Phase-1) under WeCARE Project

Location: Mohanpur, Union Parishad, Jhenaidah Sadar, Jhenaidah
Venue: Mohanpur Union Parishad Auditorium

Date: 13 April, 2022

S.N.	Name of the Participant	Occupation	Mobile Number	Signature
176	মো: সালেহা হোসেন	কৃষক		
177	মো: সালেহা হোসেন	কৃষক		
178	মো: সালেহা হোসেন	কৃষক		
179	মো: সালেহা হোসেন	কৃষক		
180	মো: সালেহা হোসেন	কৃষক		
181	মো: সালেহা হোসেন	কৃষক		
182	মো: সালেহা হোসেন	কৃষক		
183	মো: সালেহা হোসেন	কৃষক		
184	মো: সালেহা হোসেন	কৃষক		
185	মো: সালেহা হোসেন	কৃষক		
186	মো: সালেহা হোসেন	কৃষক		
187	মো: সালেহা হোসেন	কৃষক		
188	মো: সালেহা হোসেন	কৃষক		
189	মো: সালেহা হোসেন	কৃষক		
190	মো: সালেহা হোসেন	কৃষক		
191	মো: সালেহা হোসেন	কৃষক		
192	মো: সালেহা হোসেন	কৃষক		
193	মো: সালেহা হোসেন	কৃষক		

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Stakeholder Consultation Meeting
On
Environment and Social Management for Jhenaidah-Jashore Road Section
(Phase-1) under WeCARE Project

Location: Moharajpur, Union Parishad, Jhenaidah Sadar, Jhenaidah
Venue: Moharajpur Union Parishad Auditorium

Date: 13 April, 2022

S.N.	Name of the Participant	Occupation	Mobile Number	Signature
194	শ্রী. সফর হোসেন	কৃষক		
195	শ্রী. মোহাম্মদ হোসেন	কৃষক		
196	শ্রী. মোহাম্মদ হোসেন	কৃষক		
197	শ্রী. মোহাম্মদ হোসেন	কৃষক		
198	শ্রী. মোহাম্মদ হোসেন	কৃষক		
199	শ্রী. মোহাম্মদ হোসেন	কৃষক		
200	শ্রী. মোহাম্মদ হোসেন	কৃষক		
201	শ্রী. মোহাম্মদ হোসেন	কৃষক		
202	শ্রী. মোহাম্মদ হোসেন	কৃষক		
203	শ্রী. মোহাম্মদ হোসেন	কৃষক		
204	শ্রী. মোহাম্মদ হোসেন	কৃষক		
205	শ্রী. মোহাম্মদ হোসেন	কৃষক		
206	শ্রী. মোহাম্মদ হোসেন	কৃষক		
207	শ্রী. মোহাম্মদ হোসেন	কৃষক		
208	শ্রী. মোহাম্মদ হোসেন	কৃষক		
209	শ্রী. মোহাম্মদ হোসেন	কৃষক		
210	শ্রী. মোহাম্মদ হোসেন	কৃষক		
211	শ্রী. মোহাম্মদ হোসেন	কৃষক		

Stakeholder Consultation Meeting
On

Environment and Social management for Jhenaidah-Jashore Road Section
(Phase 1) under WeCARE Project

Location: Central Bus Terminal of Jhenaidah
Venue: Central Bus Terminal of Jhenaidah
Date: 13 April, 2022

SN	Name of the Participant	Occupation	Mobile Number	Signature
194	শ্রী. মোহাম্মদ হোসেন	কৃষক		
195	শ্রী. মোহাম্মদ হোসেন	কৃষক		
196	শ্রী. মোহাম্মদ হোসেন	কৃষক		
197	শ্রী. মোহাম্মদ হোসেন	কৃষক		
198	শ্রী. মোহাম্মদ হোসেন	কৃষক		
199	শ্রী. মোহাম্মদ হোসেন	কৃষক		
200	শ্রী. মোহাম্মদ হোসেন	কৃষক		
201	শ্রী. মোহাম্মদ হোসেন	কৃষক		
202	শ্রী. মোহাম্মদ হোসেন	কৃষক		
203	শ্রী. মোহাম্মদ হোসেন	কৃষক		
204	শ্রী. মোহাম্মদ হোসেন	কৃষক		
205	শ্রী. মোহাম্মদ হোসেন	কৃষক		
206	শ্রী. মোহাম্মদ হোসেন	কৃষক		
207	শ্রী. মোহাম্মদ হোসেন	কৃষক		
208	শ্রী. মোহাম্মদ হোসেন	কৃষক		

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BCL Associates Limited, Bangladesh

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Stakeholder Consultation Meeting
On
Environment and Social management for Jhenaidah-Jashore Road Section
(Phase I) under WeCARE Project

67 No. Maharatapuri Union Parishad, Jhenaidah Sadar.

Location: Central Bus Terminal of Jhenaidah

Venue: Central Bus Terminal of Jhenaidah

Date: 12 April, 2022

SN	Name of the Participant	Occupation	Mobile Number	Signature
209	শ্রীমতি সুলতা	গৃহস্থ		
210	শ্রীমতি সুলতা	গৃহস্থ		
211	শ্রীমতি সুলতা	গৃহস্থ		
212	শ্রীমতি সুলতা	গৃহস্থ		
213	শ্রীমতি সুলতা	গৃহস্থ		
214	শ্রীমতি সুলতা	গৃহস্থ		
215	শ্রীমতি সুলতা	গৃহস্থ		
216	শ্রীমতি সুলতা	গৃহস্থ		
217	শ্রীমতি সুলতা	গৃহস্থ		
218	শ্রীমতি সুলতা	গৃহস্থ		
219	শ্রীমতি সুলতা	গৃহস্থ		
220	শ্রীমতি সুলতা	গৃহস্থ		
221	শ্রীমতি সুলতা	গৃহস্থ		
222	শ্রীমতি সুলতা	গৃহস্থ		
223	শ্রীমতি সুলতা	গৃহস্থ		

Stakeholder Consultation Meeting
On

Environment and Social management for Jhenaidah-Jashore Road Section
(Phase I) under WeCARE Project

67 No. Maharatapuri Union Parishad, Jhenaidah Sadar.

Location: Central Bus Terminal of Jhenaidah

Venue: Central Bus Terminal of Jhenaidah

Date: 12 April, 2022

SN	Name of the Participant	Occupation	Mobile Number	Signature
224	শ্রীমতি সুলতা	গৃহস্থ		
225	শ্রীমতি সুলতা	গৃহস্থ		
226	শ্রীমতি সুলতা	গৃহস্থ		
227	শ্রীমতি সুলতা	গৃহস্থ		
228	শ্রীমতি সুলতা	গৃহস্থ		
229	শ্রীমতি সুলতা	গৃহস্থ		
230	শ্রীমতি সুলতা	গৃহস্থ		
231	শ্রীমতি সুলতা	গৃহস্থ		
232	শ্রীমতি সুলতা	গৃহস্থ		
233	শ্রীমতি সুলতা	গৃহস্থ		
234	শ্রীমতি সুলতা	গৃহস্থ		
235	শ্রীমতি সুলতা	গৃহস্থ		
236	শ্রীমতি সুলতা	গৃহস্থ		
237	শ্রীমতি সুলতা	গৃহস্থ		
238	শ্রীমতি সুলতা	গৃহস্থ		

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Stakeholder Consultation Meeting
On
Environment and Social management for Jhenaidah-Jashore Road Section
(Phase 1) under WeCARE Project

Location: *Bisoykhali Bazar, Jhenaidah Sadar,*
Location: Central Bus Terminal of Jhenaidah

Venue: Central Bus Terminal of Jhenaidah
of No. Mohalepur Union, Perutkha

Date: 12 April, 2022

SN	Name of the Participant	Occupation	Mobile Number	Signature
239	শ্রী সত্যজিৎ চন্দ্র	কৃষক		
240	আবু হাশিম	কৃষক		
241	শ্রী: সত্যজিৎ	কৃষক		
242	শ্রী: সত্যজিৎ	কৃষক		
243	শ্রী সত্যজিৎ	কৃষক		
244	শ্রী: সত্যজিৎ	কৃষক		
245	শ্রী: সত্যজিৎ	কৃষক		
246	শ্রী: সত্যজিৎ	কৃষক		
247	শ্রী: সত্যজিৎ	কৃষক		
248	শ্রী: সত্যজিৎ	কৃষক		
249	শ্রী: সত্যজিৎ	কৃষক		
250	শ্রী: সত্যজিৎ	কৃষক		
251	শ্রী: সত্যজিৎ	কৃষক		
252	শ্রী: সত্যজিৎ	কৃষক		
253	শ্রী: সত্যজিৎ	কৃষক		

Stakeholder Consultation Meeting
On
Environment and Social management for Jhenaidah-Jashore Road Section
(Phase 1) under WeCARE Project

Location: *Bisoykhali Bazar, Jhenaidah Sadar,*
Location: Central Bus Terminal of Jhenaidah

Venue: Central Bus Terminal of Jhenaidah
of No. Mohalepur Union, Perutkha

Date: 13 April, 2022

SN	Name of the Participant	Occupation	Mobile Number	Signature
254	শ্রী: সত্যজিৎ	কৃষক		
255	শ্রী: সত্যজিৎ	কৃষক		
256	শ্রী: সত্যজিৎ	কৃষক		
257	শ্রী: সত্যজিৎ	কৃষক		
258	শ্রী: সত্যজিৎ	কৃষক		
259	শ্রী: সত্যজিৎ	কৃষক		
260	শ্রী: সত্যজিৎ	কৃষক		
261	শ্রী: সত্যজিৎ	কৃষক		
262	শ্রী: সত্যজিৎ	কৃষক		
263	শ্রী: সত্যজিৎ	কৃষক		
264	শ্রী: সত্যজিৎ	কৃষক		
265	শ্রী: সত্যজিৎ	কৃষক		
266	শ্রী: সত্যজিৎ	কৃষক		
267	শ্রী: সত্যজিৎ	কৃষক		
268	শ্রী: সত্যজিৎ	কৃষক		

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On
Environment and Social management for Jhenaidah-Jashore Road Section
(Phase 1) under WeCARE Project

Location: *Bishoppethy Bazar, Jhenaidah Sadar*
Central Bus Terminal of Jhenaidah

Venue: Central Bus Terminal of Jhenaidah
07. No. Mohurajpur bazar perished

Date: 12 April, 2022

SN	Name of the Participant	Occupation	Mobile Number	Signature
269	মোঃ রশিদুল হক	স্বতন্ত্র		
270	মোঃ আব্দুল ওসমান			
271	মোঃ মাসুদ	স্বতন্ত্র		
272	মোঃ মাসুদ	স্বতন্ত্র		
273	মোঃ মাসুদ	স্বতন্ত্র		
274	মোঃ মাসুদ	স্বতন্ত্র		
275	মোঃ মাসুদ	স্বতন্ত্র		
276	মোঃ মাসুদ	স্বতন্ত্র		
277	মোঃ মাসুদ	স্বতন্ত্র		
278	মোঃ মাসুদ	স্বতন্ত্র		
279	মোঃ মাসুদ	স্বতন্ত্র		
280	মোঃ মাসুদ	স্বতন্ত্র		
281	মোঃ মাসুদ	স্বতন্ত্র		
282	মোঃ মাসুদ	স্বতন্ত্র		

Stakeholder Consultation Meeting
On
Environment and Social management for Jhenaidah-Jashore Road Section
(Phase 1) under WeCARE Project

Location: Central Bus Terminal of Jhenaidah

Venue: Central Bus Terminal of Jhenaidah

Date: 12 April, 2022

SN	Name of the Participant	Occupation	Mobile Number	Signature
283	মোঃ মাসুদ	স্বতন্ত্র		
284	মোঃ মাসুদ	স্বতন্ত্র		
285	মোঃ মাসুদ	স্বতন্ত্র		
286	মোঃ মাসুদ	স্বতন্ত্র		
287	মোঃ মাসুদ	স্বতন্ত্র		
288	মোঃ মাসুদ	স্বতন্ত্র		
289	মোঃ মাসুদ	স্বতন্ত্র		
290	মোঃ মাসুদ	স্বতন্ত্র		
291	মোঃ মাসুদ	স্বতন্ত্র		
292	মোঃ মাসুদ	স্বতন্ত্র		
293	মোঃ মাসুদ	স্বতন্ত্র		
294	মোঃ মাসুদ	স্বতন্ত্র		
295	মোঃ মাসুদ	স্বতন্ত্র		
296	মোঃ মাসুদ	স্বতন্ত্র		
297	মোঃ মাসুদ	স্বতন্ত্র		
298	মোঃ মাসুদ	স্বতন্ত্র		
299	মোঃ মাসুদ	স্বতন্ত্র		
300	মোঃ মাসুদ	স্বতন্ত্র		

Joint Venture of



STUP Consultant Pvt. Ltd.
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BCL Associates Limited, Bangladesh

November 2022

Stakeholder Consultation Meeting
On
Environment and Social management for Jhenaidah-Jashore Road Section
(Phase 1) under WeCARE Project

Location: Central Bus Terminal of Jhenaidah

Venue: Central Bus Terminal of Jhenaidah

Date: 12 April, 2022

SN	Name of the Participant	Occupation	Mobile Number	Signature
01	Md. Asimul Islam	MSR		
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				

Stakeholder Consultation Meeting
On

Environmental and Social Management System for Jhenaidah-Jashore Road
Section (Phase-1) under WeCARE Project

Location: Kaligonj Upazila,

Venue: Kaligonj Pura Auditorium

Date: 19 April, 2022. Time:

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
01	MD. Anwarul Asim	H.P.		
02	M.D. ASHRAFUL	Mayor		
03	MD. TANIMUL HOQUE	Project Manager		
04	Iftakher Islam	Deputy Project Manager - 2		
05	MD. Sajedul Rahman	DDM - 3		
06	MD. Asimul Islam	DDM - 3		
07	MD. Asimul Islam	DDM - 3		
08	MD. Asimul Islam	DDM - 3		
09	MD. Shibly Nazim	Vice Chairman		
10	MD. Rashidul Haque	Commissioner		
11	MD. Asimul Islam	DDM - 3		
12	MD. Asimul Islam	DDM - 3		
13	MD. Asimul Islam	DDM - 3		
14	MD. Asimul Islam	DDM - 3		
15	MD. Asimul Islam	DDM - 3		
16	MD. Asimul Islam	DDM - 3		
17	MD. Asimul Islam	DDM - 3		
18	MD. Asimul Islam	DDM - 3		
19	MD. Asimul Islam	DDM - 3		
20	MD. Asimul Islam	DDM - 3		

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November 2022

Stakeholder Consultation Meeting
On
Environmental and Social Management System for Jhenaidah-Jashore Road
Section (Phase-1) under WeCARE Project

Location: Kaligonj Upazila, Venue: Kaligonj Poura Auditorium
Date: 19 April, 2022, Time:

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
১১	শ্রী: মাহবুব হোসেন	কৃষক		
১২	আবু হাশিম	কৃষক		
১৩	শ্রী: মাহবুব হোসেন	কৃষক		
১৪	শ্রী: মাহবুব হোসেন	কৃষক		
১৫	শ্রী: মাহবুব হোসেন	কৃষক		
১৬	শ্রী: মাহবুব হোসেন	কৃষক		
১৭	শ্রী: মাহবুব হোসেন	কৃষক		
১৮	শ্রী: মাহবুব হোসেন	কৃষক		
১৯	শ্রী: মাহবুব হোসেন	কৃষক		
২০	শ্রী: মাহবুব হোসেন	কৃষক		
২১	শ্রী: মাহবুব হোসেন	কৃষক		
২২	শ্রী: মাহবুব হোসেন	কৃষক		
২৩	শ্রী: মাহবুব হোসেন	কৃষক		
২৪	শ্রী: মাহবুব হোসেন	কৃষক		
২৫	শ্রী: মাহবুব হোসেন	কৃষক		
২৬	শ্রী: মাহবুব হোসেন	কৃষক		
২৭	শ্রী: মাহবুব হোসেন	কৃষক		
২৮	শ্রী: মাহবুব হোসেন	কৃষক		
২৯	শ্রী: মাহবুব হোসেন	কৃষক		
৩০	শ্রী: মাহবুব হোসেন	কৃষক		
৩১	শ্রী: মাহবুব হোসেন	কৃষক		
৩২	শ্রী: মাহবুব হোসেন	কৃষক		
৩৩	শ্রী: মাহবুব হোসেন	কৃষক		
৩৪	শ্রী: মাহবুব হোসেন	কৃষক		
৩৫	শ্রী: মাহবুব হোসেন	কৃষক		
৩৬	শ্রী: মাহবুব হোসেন	কৃষক		
৩৭	শ্রী: মাহবুব হোসেন	কৃষক		
৩৮	শ্রী: মাহবুব হোসেন	কৃষক		
৩৯	শ্রী: মাহবুব হোসেন	কৃষক		
৪০	শ্রী: মাহবুব হোসেন	কৃষক		

Stakeholder Consultation Meeting
On
Environmental and Social Management System for Jhenaidah-Jashore Road
Section (Phase-1) under WeCARE Project

Location: Kaligonj Upazila, Venue: Kaligonj Poura Auditorium
Date: 19 April, 2022, Time:

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
৪১	শ্রী: মাহবুব হোসেন	কৃষক		
৪২	শ্রী: মাহবুব হোসেন	কৃষক		
৪৩	শ্রী: মাহবুব হোসেন	কৃষক		
৪৪	শ্রী: মাহবুব হোসেন	কৃষক		
৪৫	শ্রী: মাহবুব হোসেন	কৃষক		
৪৬	শ্রী: মাহবুব হোসেন	কৃষক		
৪৭	শ্রী: মাহবুব হোসেন	কৃষক		
৪৮	শ্রী: মাহবুব হোসেন	কৃষক		
৪৯	শ্রী: মাহবুব হোসেন	কৃষক		
৫০	শ্রী: মাহবুব হোসেন	কৃষক		
৫১	শ্রী: মাহবুব হোসেন	কৃষক		
৫২	শ্রী: মাহবুব হোসেন	কৃষক		
৫৩	শ্রী: মাহবুব হোসেন	কৃষক		
৫৪	শ্রী: মাহবুব হোসেন	কৃষক		
৫৫	শ্রী: মাহবুব হোসেন	কৃষক		
৫৬	শ্রী: মাহবুব হোসেন	কৃষক		
৫৭	শ্রী: মাহবুব হোসেন	কৃষক		
৫৮	শ্রী: মাহবুব হোসেন	কৃষক		
৫৯	শ্রী: মাহবুব হোসেন	কৃষক		
৬০	শ্রী: মাহবুব হোসেন	কৃষক		

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BCL Associates Limited, Bangladesh

November 2022

Stakeholder Consultation Meeting
On

Environmental and Social Management System for Jhenaidah-Jashore Road
Section (Phase-1) under WeCARE Project

Location: Kaligonj Upazila, Venue: Kaligonj Poura Auditorium
Date: 19 April, 2022, Time:

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
61	৩৯৫ গুজাতি	কৃষক		
62	কুমারী	কৃষক		
63	শ্রী: জাহাঙ্গীর হোসেন	কৃষক		
64	শ্রী: নাসির উদ্দিন	কৃষক		
65	শ্রী: কামরুল হক	কৃষক		
66	শ্রী: নাসির উদ্দিন	কৃষক		
67	শ্রী: জাহাঙ্গীর হোসেন	কৃষক		
68	শ্রী: নাসির উদ্দিন	কৃষক		
69	শ্রী: নাসির উদ্দিন	কৃষক		
70	শ্রী: নাসির উদ্দিন	কৃষক		
71	শ্রী: নাসির উদ্দিন	কৃষক		
72	শ্রী: নাসির উদ্দিন	কৃষক		
73	শ্রী: নাসির উদ্দিন	কৃষক		
74	শ্রী: নাসির উদ্দিন	কৃষক		
75	শ্রী: নাসির উদ্দিন	কৃষক		
76	শ্রী: নাসির উদ্দিন	কৃষক		
77	শ্রী: নাসির উদ্দিন	কৃষক		
78	শ্রী: নাসির উদ্দিন	কৃষক		
79	শ্রী: নাসির উদ্দিন	কৃষক		
80	শ্রী: নাসির উদ্দিন	কৃষক		

Stakeholder Consultation Meeting
On

Environmental and Social Management System for Jhenaidah-Jashore Road
Section (Phase-1) under WeCARE Project

Location: Kaligonj Upazila, Venue: Kaligonj Poura Auditorium
Date: 19 April, 2022, Time:

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
81	শ্রী: নাসির উদ্দিন	কৃষক		
82	শ্রী: নাসির উদ্দিন	কৃষক		
83	শ্রী: নাসির উদ্দিন	কৃষক		
84	শ্রী: নাসির উদ্দিন	কৃষক		
85	শ্রী: নাসির উদ্দিন	কৃষক		
86	শ্রী: নাসির উদ্দিন	কৃষক		
87	শ্রী: নাসির উদ্দিন	কৃষক		
88	শ্রী: নাসির উদ্দিন	কৃষক		
89	শ্রী: নাসির উদ্দিন	কৃষক		
90	শ্রী: নাসির উদ্দিন	কৃষক		
91	শ্রী: নাসির উদ্দিন	কৃষক		
92	শ্রী: নাসির উদ্দিন	কৃষক		
93	শ্রী: নাসির উদ্দিন	কৃষক		
94	শ্রী: নাসির উদ্দিন	কৃষক		
95	শ্রী: নাসির উদ্দিন	কৃষক		
96	শ্রী: নাসির উদ্দিন	কৃষক		
97	শ্রী: নাসির উদ্দিন	কৃষক		
98	শ্রী: নাসির উদ্দিন	কৃষক		
99	শ্রী: নাসির উদ্দিন	কৃষক		
100	শ্রী: নাসির উদ্দিন	কৃষক		

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November 2022

Stakeholder Consultation Meeting
On
Environmental and Social Management System for Jhenaidah-Jashore Road
Section (Phase-1) under WeCARE Project

Location: Kaligonj Upazila, Venue: Kaligonj Poura Auditorium
Date: 19 April, 2022, Time:

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
101	আঃ জাহিদ হান্নান	কৃষক		
102	জাহিদুল হুসেন সিদ্দিক	কৃষক		
103	আমিন	কৃষক		
104	আব্দুল মান্নান	কৃষক		
105	আঃ শাহীন	কৃষক		
106	আঃ জাহিদুল হুসেন	কৃষক		
107	আঃ জাহিদুল হুসেন	কৃষক		
108	জি ডি হুসেন	কৃষক		
109	আব্দুল হুসেন	কৃষক		
110	আব্দুল হুসেন	কৃষক		
111	আব্দুল হুসেন	কৃষক		
112	আব্দুল হুসেন	কৃষক		
113	আব্দুল হুসেন	কৃষক		
114	আব্দুল হুসেন	কৃষক		
115	আব্দুল হুসেন	কৃষক		
116	আব্দুল হুসেন	কৃষক		
117	আব্দুল হুসেন	কৃষক		
118	আব্দুল হুসেন	কৃষক		
119	আব্দুল হুসেন	কৃষক		
120	আব্দুল হুসেন	কৃষক		

Stakeholder Consultation Meeting
On
Environmental and Social Management System for Jhenaidah-Jashore Road
Section (Phase-1) under WeCARE Project

Location: Kaligonj Upazila, Venue: Kaligonj Poura Auditorium
Date: 19 April, 2022, Time:

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
121	আঃ জাহিদুল হুসেন	কৃষক		
122	আঃ জাহিদুল হুসেন	কৃষক		
123	আঃ জাহিদুল হুসেন	কৃষক		
124	আঃ জাহিদুল হুসেন	কৃষক		
125	আঃ জাহিদুল হুসেন	কৃষক		
126	আঃ জাহিদুল হুসেন	কৃষক		
127	আঃ জাহিদুল হুসেন	কৃষক		
128	আঃ জাহিদুল হুসেন	কৃষক		
129	আঃ জাহিদুল হুসেন	কৃষক		
130	আঃ জাহিদুল হুসেন	কৃষক		
131	আঃ জাহিদুল হুসেন	কৃষক		
132	আঃ জাহিদুল হুসেন	কৃষক		
133	আঃ জাহিদুল হুসেন	কৃষক		
134	আঃ জাহিদুল হুসেন	কৃষক		
135	আঃ জাহিদুল হুসেন	কৃষক		
136	আঃ জাহিদুল হুসেন	কৃষক		
137	আঃ জাহিদুল হুসেন	কৃষক		
138	আঃ জাহিদুল হুসেন	কৃষক		
139	আঃ জাহিদুল হুসেন	কৃষক		
140	আঃ জাহিদুল হুসেন	কৃষক		

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BCL Associates Limited, Bangladesh

November 2022

Stakeholder Consultation Meeting
On

Environmental and Social Management System for Jhenaidah-Jashore Road
Section (Phase-1) under WeCARE Project

Location: Kaligonj Upazila, Venue: Kaligonj Poura Auditorium
Date: 19 April, 2022, Time:

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
141	কি. মো. হুমায়ুন কবীর	কৃষক		
142	কি. ইকবাল হোসেন	কৃষক		
143	কি. মো. হুমায়ুন কবীর	কৃষক		
144	কি. মো. হুমায়ুন কবীর	কৃষক		
145	কি. মো. হুমায়ুন কবীর	কৃষক		
146	কি. মো. হুমায়ুন কবীর	কৃষক		
147	কি. মো. হুমায়ুন কবীর	কৃষক		
148	কি. মো. হুমায়ুন কবীর	কৃষক		
149	কি. মো. হুমায়ুন কবীর	কৃষক		
150	কি. মো. হুমায়ুন কবীর	কৃষক		
151	কি. মো. হুমায়ুন কবীর	কৃষক		
152	কি. মো. হুমায়ুন কবীর	কৃষক		
153	কি. মো. হুমায়ুন কবীর	কৃষক		
154	কি. মো. হুমায়ুন কবীর	কৃষক		
155	কি. মো. হুমায়ুন কবীর	কৃষক		
156	কি. মো. হুমায়ুন কবীর	কৃষক		
157	কি. মো. হুমায়ুন কবীর	কৃষক		
158	কি. মো. হুমায়ুন কবীর	কৃষক		
159	কি. মো. হুমায়ুন কবীর	কৃষক		
160	কি. মো. হুমায়ুন কবীর	কৃষক		

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On

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Location: Kaligonj Upazila, Venue: Kaligonj Poura Auditorium
Date: 19 April, 2022, Time:

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
161	কি. মো. হুমায়ুন কবীর	কৃষক		
162	কি. মো. হুমায়ুন কবীর	কৃষক		
163	কি. মো. হুমায়ুন কবীর	কৃষক		
164	কি. মো. হুমায়ুন কবীর	কৃষক		
165	কি. মো. হুমায়ুন কবীর	কৃষক		
166	কি. মো. হুমায়ুন কবীর	কৃষক		
167	কি. মো. হুমায়ুন কবীর	কৃষক		
168	কি. মো. হুমায়ুন কবীর	কৃষক		
169	কি. মো. হুমায়ুন কবীর	কৃষক		
170	কি. মো. হুমায়ুন কবীর	কৃষক		
171	কি. মো. হুমায়ুন কবীর	কৃষক		
172	কি. মো. হুমায়ুন কবীর	কৃষক		
173	কি. মো. হুমায়ুন কবীর	কৃষক		
174	কি. মো. হুমায়ুন কবীর	কৃষক		
175	কি. মো. হুমায়ুন কবীর	কৃষক		
176	কি. মো. হুমায়ুন কবীর	কৃষক		
177	কি. মো. হুমায়ুন কবীর	কৃষক		
178	কি. মো. হুমায়ুন কবীর	কৃষক		
179	কি. মো. হুমায়ুন কবীর	কৃষক		
180	কি. মো. হুমায়ুন কবীর	কৃষক		

Joint Venture of



STUP Consultant Pvt. Ltd.
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BCL Associates Limited, Bangladesh

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On

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Location: Kaligonj Upazila, Venue: Kaligonj Poura Auditorium
Date: 19 April, 2022, Time:

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
181	আবদুল মালিক	শ্রমিক		
182	আবদুল হক	হ		
183	আবদুল	হ		
184	আবদুল মালিক	শ্রমিক		
185	আবদুল	হ		
186	আবদুল	হ		
187	আবদুল	হ		
188	আবদুল	হ		
189	আবদুল	হ		
190	আবদুল	শ্রমিক		
191	আবদুল	হ		
192	আবদুল	শ্রমিক		
193	আবদুল	হ		
194	আবদুল	হ		
195	আবদুল	হ		
196	আবদুল	হ		
197	আবদুল	হ		
198	আবদুল	শ্রমিক		
199	আবদুল	হ		
200	আবদুল	হ		

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Location: Kaligonj Upazila, Venue: Kaligonj Poura Auditorium
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S.N	Name of the Participant	Occupation	Mobile No.	Signature
201	আবদুল	শ্রমিক		
202	আবদুল	শ্রমিক		
203	আবদুল	শ্রমিক		
204	আবদুল	শ্রমিক		
205	আবদুল	শ্রমিক		
206	আবদুল	শ্রমিক		
207	আবদুল	শ্রমিক		
208	আবদুল	শ্রমিক		
209	আবদুল	শ্রমিক		
210	আবদুল	শ্রমিক		
211	আবদুল	শ্রমিক		
212	আবদুল	শ্রমিক		
213	আবদুল	শ্রমিক		
214	আবদুল	শ্রমিক		
215	আবদুল	শ্রমিক		
216	আবদুল	হ		
217	আবদুল	হ		
218	আবদুল	হ		
219	আবদুল	শ্রমিক		
220	আবদুল	হ		

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Location: Kaligonj Upazila, Venue: Kaligonj Pura Auditorium
Date: 19 April, 2022, Time:

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
১১১	আব্দুল্লাহ আল-বাকি	গৃহিণী		
১১২	ছবি বানী	শিল্পী		
১১৩	আবু বাকি	গৃহিণী		
১১৪	মিনা আল-বাকি	শিল্পী		
১১৫	বাহা মাকি	গৃহিণী		
১১৬	আবু বাকি	।।		
১১৭	আবু বাকি	।।		
১১৮	আবু বাকি	।।		
১১৯	আবু বাকি	।।		
১২০	আবু বাকি	।।		
১২১	আবু বাকি	।।		
১২২	আবু বাকি	।।		
১২৩	আবু বাকি	।।		
১২৪	আবু বাকি	।।		
১২৫	আবু বাকি	।।		
১২৬	আবু বাকি	।।		
১২৭	আবু বাকি	।।		
১২৮	আবু বাকি	।।		
১২৯	আবু বাকি	।।		
১৩০	আবু বাকি	।।		

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S.N	Name of the Participant	Occupation	Mobile No.	Signature
১৩১	আবু বাকি	।।		
১৩২	আবু বাকি	।।		
১৩৩	আবু বাকি	।।		
১৩৪	আবু বাকি	।।		
১৩৫	আবু বাকি	।।		
১৩৬	আবু বাকি	।।		
১৩৭	আবু বাকি	।।		
১৩৮	আবু বাকি	।।		
১৩৯	আবু বাকি	।।		
১৪০	আবু বাকি	।।		
১৪১	আবু বাকি	।।		
১৪২	আবু বাকি	।।		
১৪৩	আবু বাকি	।।		
১৪৪	আবু বাকি	।।		
১৪৫	আবু বাকি	।।		
১৪৬	আবু বাকি	।।		
১৪৭	আবু বাকি	।।		
১৪৮	আবু বাকি	।।		
১৪৯	আবু বাকি	।।		
১৫০	আবু বাকি	।।		

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Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
১৬১	মোহাম্মদ হুসেইন	ফোন মাস্টার		
১৬২	মোঃ ওসমান আলী	ফোন মাস্টার		
১৬৩	মোঃ হুমায়ুন কবীর	ফোন মাস্টার		
১৬৪	মোঃ জিয়া	ফোন মাস্টার		
১৬৫	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৬৬	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৬৭	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৬৮	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৬৯	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৭০	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৭১	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৭২	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৭৩	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৭৪	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৭৫	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৭৬	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৭৭	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৭৮	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৭৯	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৮০	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		

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১৮১	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৮২	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৮৩	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৮৪	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৮৫	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৮৬	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৮৭	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৮৮	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৮৯	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৯০	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৯১	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৯২	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৯৩	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৯৪	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৯৫	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৯৬	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৯৭	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৯৮	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
১৯৯	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		
২০০	মোঃ মাহমুদ হুসেইন	ফোন মাস্টার		

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S.N	Name of the Participant	Occupation	Mobile No.	Signature
৩০১	স্বপ্না	গৃহিণী		
৩০২	মিরাজুল হক	শ্রমিক		
৩০৩	মিরাজুল হক	শ্রমিক		
৩০৪	বিশ্ব	শ্রমিক		
৩০৫	এম. এ. হক	শ্রমিক		
৩০৬	এম. এ. হক	শ্রমিক		
৩০৭	এম. এ. হক	শ্রমিক		
৩০৮	এম. এ. হক	শ্রমিক		
৩০৯	এম. এ. হক	শ্রমিক		
৩১০	এম. এ. হক	শ্রমিক		
৩১১	এম. এ. হক	শ্রমিক		
৩১২	এম. এ. হক	শ্রমিক		
৩১৩	এম. এ. হক	শ্রমিক		
৩১৪	এম. এ. হক	শ্রমিক		
৩১৫	এম. এ. হক	শ্রমিক		
৩১৬	এম. এ. হক	শ্রমিক		
৩১৭	এম. এ. হক	শ্রমিক		
৩১৮	এম. এ. হক	শ্রমিক		
৩১৯	এম. এ. হক	শ্রমিক		
৩২০	এম. এ. হক	শ্রমিক		

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৩২১	এম. এ. হক	শ্রমিক		
৩২২	এম. এ. হক	শ্রমিক		
৩২৩	এম. এ. হক	শ্রমিক		
৩২৪	এম. এ. হক	শ্রমিক		
৩২৫	এম. এ. হক	শ্রমিক		
৩২৬	এম. এ. হক	শ্রমিক		
৩২৭	এম. এ. হক	শ্রমিক		
৩২৮	এম. এ. হক	শ্রমিক		
৩২৯	এম. এ. হক	শ্রমিক		
৩৩০	এম. এ. হক	শ্রমিক		
৩৩১	এম. এ. হক	শ্রমিক		
৩৩২	এম. এ. হক	শ্রমিক		
৩৩৩	এম. এ. হক	শ্রমিক		
৩৩৪	এম. এ. হক	শ্রমিক		
৩৩৫	এম. এ. হক	শ্রমিক		
৩৩৬	এম. এ. হক	শ্রমিক		
৩৩৭	এম. এ. হক	শ্রমিক		

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Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
349	শ্রী: ফজলুর রহমান	কৃষক		
350	শ্রী: আলী হোসেন	কৃষক		
351	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
352	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
353	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
354	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
355	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
356	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
357	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
358	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
359	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		

Stakeholder Consultation Meeting
On
Environmental and Social Management System for Jhenaidah-Jashore Road
Section (Phase-1) under WeCARE Project

Location: 12 Bazar, Venue: Union Parishad Auditorium
Date: 20 April, 2022, Time:

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
1	শ্রী: ফজলুর রহমান	কৃষক		
2	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
3	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
4	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
5	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
6	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
7	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
8	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
9	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
10	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
11	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
12	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
13	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
14	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
15	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
16	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
17	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
18	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
19	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		
20	শ্রী: মোহাম্মদ আলী হোসেন	কৃষক		

Joint Venture of



STUP Consultant Pvt. Ltd.
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BCL Associates Limited, Bangladesh

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Stakeholder Consultation Meeting
On
Environmental and Social Management System for Jhenaidah-Jashore Road
Section (Phase-1) under WeCARE Project

Location: 12 Bazar
Date: 20 April, 2022. Time:

Venue: Union Parishad Auditorium

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
১০	মো: মাহিনুর রহমান	ব্যবসায়িক		
১১	মো: ইদ্রিস আলী	কৃষক		
১২	মো: মোহাম্মদ হোসেন	কৃষক		
১৩	মো: মোহাম্মদ হোসেন	কৃষক		
১৪	মো: মোহাম্মদ হোসেন	কৃষক		
১৫	মো: মোহাম্মদ হোসেন	কৃষক		
১৬	মো: মোহাম্মদ হোসেন	কৃষক		
১৭	মো: মোহাম্মদ হোসেন	কৃষক		
১৮	মো: মোহাম্মদ হোসেন	কৃষক		
১৯	মো: মোহাম্মদ হোসেন	কৃষক		
২০	মো: মোহাম্মদ হোসেন	কৃষক		
২১	মো: মোহাম্মদ হোসেন	কৃষক		
২২	মো: মোহাম্মদ হোসেন	কৃষক		
২৩	মো: মোহাম্মদ হোসেন	কৃষক		
২৪	মো: মোহাম্মদ হোসেন	কৃষক		
২৫	মো: মোহাম্মদ হোসেন	কৃষক		
২৬	মো: মোহাম্মদ হোসেন	কৃষক		
২৭	মো: মোহাম্মদ হোসেন	কৃষক		
২৮	মো: মোহাম্মদ হোসেন	কৃষক		
২৯	মো: মোহাম্মদ হোসেন	কৃষক		
৩০	মো: মোহাম্মদ হোসেন	কৃষক		

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Location: 12 Bazar
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Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
১০	মো: মাহিনুর রহমান	ব্যবসায়িক		
১১	মো: ইদ্রিস আলী	কৃষক		
১২	মো: মোহাম্মদ হোসেন	কৃষক		
১৩	মো: মোহাম্মদ হোসেন	কৃষক		
১৪	মো: মোহাম্মদ হোসেন	কৃষক		
১৫	মো: মোহাম্মদ হোসেন	কৃষক		
১৬	মো: মোহাম্মদ হোসেন	কৃষক		
১৭	মো: মোহাম্মদ হোসেন	কৃষক		
১৮	মো: মোহাম্মদ হোসেন	কৃষক		
১৯	মো: মোহাম্মদ হোসেন	কৃষক		
২০	মো: মোহাম্মদ হোসেন	কৃষক		
২১	মো: মোহাম্মদ হোসেন	কৃষক		
২২	মো: মোহাম্মদ হোসেন	কৃষক		
২৩	মো: মোহাম্মদ হোসেন	কৃষক		
২৪	মো: মোহাম্মদ হোসেন	কৃষক		
২৫	মো: মোহাম্মদ হোসেন	কৃষক		
২৬	মো: মোহাম্মদ হোসেন	কৃষক		
২৭	মো: মোহাম্মদ হোসেন	কৃষক		
২৮	মো: মোহাম্মদ হোসেন	কৃষক		
২৯	মো: মোহাম্মদ হোসেন	কৃষক		
৩০	মো: মোহাম্মদ হোসেন	কৃষক		

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Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
৩৪	উন্নয়ন	অধিনায়ক		
৩৫	রাজেশ্বরী	অধিনায়ক		
৩৬	মোহা. বানী	অধিনায়ক		
৩৭	সম্পত্তি	গৃহিনী		
৩৮	মুনিয়া	লেনাপদা		
৩৯	মুজিব	লেনাপদা		
৪০	মুনিয়া	লেনাপদা		
৪১	মুজিব	লেনাপদা		
৪২	মুজিব	লেনাপদা		
৪৩	মুজিব	লেনাপদা		
৪৪	মুজিব	লেনাপদা		
৪৫	মুজিব	লেনাপদা		
৪৬	মুজিব	লেনাপদা		
৪৭	মুজিব	লেনাপদা		
৪৮	মুজিব	লেনাপদা		
৪৯	মুজিব	লেনাপদা		
৫০	মুজিব	লেনাপদা		
৫১	মুজিব	লেনাপদা		
৫২	মুজিব	লেনাপদা		
৫৩	মুজিব	লেনাপদা		

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Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
৫৪	মুজিব	লেনাপদা		
৫৫	মুজিব	লেনাপদা		
৫৬	মুজিব	লেনাপদা		
৫৭	মুজিব	লেনাপদা		
৫৮	মুজিব	লেনাপদা		
৫৯	মুজিব	লেনাপদা		
৬০	মুজিব	লেনাপদা		
৬১	মুজিব	লেনাপদা		
৬২	মুজিব	লেনাপদা		
৬৩	মুজিব	লেনাপদা		
৬৪	মুজিব	লেনাপদা		
৬৫	মুজিব	লেনাপদা		
৬৬	মুজিব	লেনাপদা		
৬৭	মুজিব	লেনাপদা		
৬৮	মুজিব	লেনাপদা		
৬৯	মুজিব	লেনাপদা		
৭০	মুজিব	লেনাপদা		
৭১	মুজিব	লেনাপদা		
৭২	মুজিব	লেনাপদা		
৭৩	মুজিব	লেনাপদা		

Joint Venture of



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Section (Phase-1) under WeCARE Project

Location: 12 Bazar
Date: 20 April, 2022. Time: Venue: Union Parishad Auditorium

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
৭৪	মোঃ আরশাদুল ইসলাম	কৃষক		
৭৫	মোঃ আরশাদুল ইসলাম	কৃষক		
৭৬	মোঃ আরশাদুল ইসলাম	কৃষক		
৭৭	মোঃ আরশাদুল ইসলাম	কৃষক		
৭৮	মোঃ আরশাদুল ইসলাম	কৃষক		
৭৯	মোঃ আরশাদুল ইসলাম	কৃষক		
৮০	মোঃ আরশাদুল ইসলাম	কৃষক		
৮১	মোঃ আরশাদুল ইসলাম	কৃষক		
৮২	মোঃ আরশাদুল ইসলাম	কৃষক		
৮৩	মোঃ আরশাদুল ইসলাম	কৃষক		
৮৪	মোঃ আরশাদুল ইসলাম	কৃষক		
৮৫	মোঃ আরশাদুল ইসলাম	কৃষক		
৮৬	মোঃ আরশাদুল ইসলাম	কৃষক		
৮৭	মোঃ আরশাদুল ইসলাম	কৃষক		
৮৮	মোঃ আরশাদুল ইসলাম	কৃষক		
৮৯	মোঃ আরশাদুল ইসলাম	কৃষক		
৯০	মোঃ আরশাদুল ইসলাম	কৃষক		
৯১	মোঃ আরশাদুল ইসলাম	কৃষক		
৯২	মোঃ আরশাদুল ইসলাম	কৃষক		
৯৩	মোঃ আরশাদুল ইসলাম	কৃষক		
৯৪	মোঃ আরশাদুল ইসলাম	কৃষক		
৯৫	মোঃ আরশাদুল ইসলাম	কৃষক		
৯৬	মোঃ আরশাদুল ইসলাম	কৃষক		
৯৭	মোঃ আরশাদুল ইসলাম	কৃষক		
৯৮	মোঃ আরশাদুল ইসলাম	কৃষক		
৯৯	মোঃ আরশাদুল ইসলাম	কৃষক		
১০০	মোঃ আরশাদুল ইসলাম	কৃষক		

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Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
৭৪	মোঃ আরশাদুল ইসলাম	কৃষক		
৭৫	মোঃ আরশাদুল ইসলাম	কৃষক		
৭৬	মোঃ আরশাদুল ইসলাম	কৃষক		
৭৭	মোঃ আরশাদুল ইসলাম	কৃষক		
৭৮	মোঃ আরশাদুল ইসলাম	কৃষক		
৭৯	মোঃ আরশাদুল ইসলাম	কৃষক		
৮০	মোঃ আরশাদুল ইসলাম	কৃষক		
৮১	মোঃ আরশাদুল ইসলাম	কৃষক		
৮২	মোঃ আরশাদুল ইসলাম	কৃষক		
৮৩	মোঃ আরশাদুল ইসলাম	কৃষক		
৮৪	মোঃ আরশাদুল ইসলাম	কৃষক		
৮৫	মোঃ আরশাদুল ইসলাম	কৃষক		
৮৬	মোঃ আরশাদুল ইসলাম	কৃষক		
৮৭	মোঃ আরশাদুল ইসলাম	কৃষক		
৮৮	মোঃ আরশাদুল ইসলাম	কৃষক		
৮৯	মোঃ আরশাদুল ইসলাম	কৃষক		
৯০	মোঃ আরশাদুল ইসলাম	কৃষক		
৯১	মোঃ আরশাদুল ইসলাম	কৃষক		
৯২	মোঃ আরশাদুল ইসলাম	কৃষক		
৯৩	মোঃ আরশাদুল ইসলাম	কৃষক		
৯৪	মোঃ আরশাদুল ইসলাম	কৃষক		
৯৫	মোঃ আরশাদুল ইসলাম	কৃষক		
৯৬	মোঃ আরশাদুল ইসলাম	কৃষক		
৯৭	মোঃ আরশাদুল ইসলাম	কৃষক		
৯৮	মোঃ আরশাদুল ইসলাম	কৃষক		
৯৯	মোঃ আরশাদুল ইসলাম	কৃষক		
১০০	মোঃ আরশাদুল ইসলাম	কৃষক		

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S.N	Name of the Participant	Occupation	Mobile No.	Signature
১১৬	মোঃ জাহিদুল	কাজ		
১১৮	মোঃ জাহিদুল	কাজ		
১১৯	রাজীব	সেবাস		
১২১	মোঃ জাহিদুল	কাজ		
১২২	মোঃ জাহিদুল	কাজ		
১২৩	মোঃ জাহিদুল	কাজ		
১২৪	মোঃ জাহিদুল	কাজ		
১২৫	মোঃ জাহিদুল	কাজ		
১২৬	মোঃ জাহিদুল	কাজ		
১২৭	মোঃ জাহিদুল	কাজ		
১২৮	মোঃ জাহিদুল	কাজ		
১২৯	মোঃ জাহিদুল	কাজ		
১৩০	মোঃ জাহিদুল	কাজ		
১৩১	মোঃ জাহিদুল	কাজ		
১৩২	মোঃ জাহিদুল	কাজ		
১৩৩	মোঃ জাহিদুল	কাজ		
১৩৪	মোঃ জাহিদুল	কাজ		
১৩৫	মোঃ জাহিদুল	কাজ		
১৩৬	মোঃ জাহিদুল	কাজ		
১৩৭	মোঃ জাহিদুল	কাজ		
১৩৮	মোঃ জাহিদুল	কাজ		
১৩৯	মোঃ জাহিদুল	কাজ		
১৪০	মোঃ জাহিদুল	কাজ		

Stakeholder Consultation Meeting
On
Environmental and Social Management System for Jhenaidah-Jashore Road
Section (Phase-1) under WeCARE Project

Location: 12 Bazar
Date: 20 April, 2022. Time:

Venue: Union Parishad Auditorium

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
১১৬	মোঃ জাহিদুল	কাজ		
১১৮	মোঃ জাহিদুল	কাজ		
১১৯	রাজীব	সেবাস		
১২১	মোঃ জাহিদুল	কাজ		
১২২	মোঃ জাহিদুল	কাজ		
১২৩	মোঃ জাহিদুল	কাজ		
১২৪	মোঃ জাহিদুল	কাজ		
১২৫	মোঃ জাহিদুল	কাজ		
১২৬	মোঃ জাহিদুল	কাজ		
১২৭	মোঃ জাহিদুল	কাজ		
১২৮	মোঃ জাহিদুল	কাজ		
১২৯	মোঃ জাহিদুল	কাজ		
১৩০	মোঃ জাহিদুল	কাজ		
১৩১	মোঃ জাহিদুল	কাজ		
১৩২	মোঃ জাহিদুল	কাজ		
১৩৩	মোঃ জাহিদুল	কাজ		
১৩৪	মোঃ জাহিদুল	কাজ		
১৩৫	মোঃ জাহিদুল	কাজ		
১৩৬	মোঃ জাহিদুল	কাজ		
১৩৭	মোঃ জাহিদুল	কাজ		
১৩৮	মোঃ জাহিদুল	কাজ		
১৩৯	মোঃ জাহিদুল	কাজ		
১৪০	মোঃ জাহিদুল	কাজ		

November 2022

Stakeholder Consultation Meeting
On
Environmental and Social Management System for Jhenaidah-Jashore Road
Section (Phase-1) under WeCARE Project

Location: 12 Bazar

Date: 20 April, 2022. Time:

Venue: Union Parishad Auditorium

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
১৪০	শ্রী: কামরুজ্জামান (শ্রী: কামরুজ্জামান)	কৃষক		
১৪১	শ্রী: মুনীর চন্দ্র	কৃষক		
১৪২	শ্রী: মনিরুল কাদের	কৃষক		
১৪৩	শ্রী: মনিরুল কাদের	কৃষক		
১৪৪	শ্রী: মনিরুল কাদের	কৃষক		
১৪৫	শ্রী: মনিরুল কাদের	কৃষক		
১৪৬	শ্রী: মনিরুল কাদের	কৃষক		
১৪৭	শ্রী: মনিরুল কাদের	কৃষক		
১৪৮	শ্রী: মনিরুল কাদের	কৃষক		
১৪৯	শ্রী: মনিরুল কাদের	কৃষক		
১৫০	শ্রী: মনিরুল কাদের	কৃষক		
১৫১	শ্রী: মনিরুল কাদের	কৃষক		
১৫২	শ্রী: মনিরুল কাদের	কৃষক		
১৫৩	শ্রী: মনিরুল কাদের	কৃষক		
১৫৪	শ্রী: মনিরুল কাদের	কৃষক		
১৫৫	শ্রী: মনিরুল কাদের	কৃষক		
১৫৬	শ্রী: মনিরুল কাদের	কৃষক		
১৫৭	শ্রী: মনিরুল কাদের	কৃষক		
১৫৮	শ্রী: মনিরুল কাদের	কৃষক		
১৫৯	শ্রী: মনিরুল কাদের	কৃষক		
১৬০	শ্রী: মনিরুল কাদের	কৃষক		

Stakeholder Consultation Meeting
On
Environmental and Social Management System for Jhenaidah-Jashore Road
Section (Phase-1) under WeCARE Project

Location: 12 Bazar

Date: 20 April, 2022. Time:

Venue: Union Parishad Auditorium

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
১৭১	MD. ANWARUL AZIM ANNA	MP-Jhenaidah		
১৭২	শ্রী: মনিরুল কাদের	কৃষক		
১৭৩	শ্রী: মনিরুল কাদের	কৃষক		
১৭৪	শ্রী: মনিরুল কাদের	কৃষক		
১৭৫	শ্রী: মনিরুল কাদের	কৃষক		
১৭৬	শ্রী: মনিরুল কাদের	কৃষক		
১৭৭	শ্রী: মনিরুল কাদের	কৃষক		
১৭৮	শ্রী: মনিরুল কাদের	কৃষক		
১৭৯	শ্রী: মনিরুল কাদের	কৃষক		
১৮০	শ্রী: মনিরুল কাদের	কৃষক		
১৮১	শ্রী: মনিরুল কাদের	কৃষক		
১৮২	শ্রী: মনিরুল কাদের	কৃষক		
১৮৩	শ্রী: মনিরুল কাদের	কৃষক		
১৮৪	শ্রী: মনিরুল কাদের	কৃষক		
১৮৫	শ্রী: মনিরুল কাদের	কৃষক		
১৮৬	শ্রী: মনিরুল কাদের	কৃষক		
১৮৭	শ্রী: মনিরুল কাদের	কৃষক		
১৮৮	শ্রী: মনিরুল কাদের	কৃষক		
১৮৯	শ্রী: মনিরুল কাদের	কৃষক		
১৯০	শ্রী: মনিরুল কাদের	কৃষক		

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BCL Associates Limited, Bangladesh

November 2022



Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) and Bhomra-Satkira-Navaron Road Section (Phase-3) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program



Stakeholder Consultation Meeting

Location : Churamankathi Union, Jashore
Venue : Satiantala Madrasa
Date : 12 June, 2022
Time : 11:00 AM to 12:00 PM

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
1	মুহাম্মদ আলী	ছাত্র		
2	রুম্মা আতুল	ছাত্রী		
3	রাহিম আলম	ছাত্র		
4	নাসিমা আলম	ছাত্রী		
5	নাসিমা আলম	ছাত্রী		
6	রুম্মা আলম	ছাত্রী		
7	সাদিয়া	ছাত্রী		
8	সাদিয়া	ছাত্রী		
9	সাদিয়া	ছাত্রী		
10	সাদিয়া	ছাত্রী		
11	সাদিয়া	ছাত্রী		
12	সাদিয়া	ছাত্রী		
13	সাদিয়া	ছাত্রী		
14	সাদিয়া	ছাত্রী		
15	সাদিয়া	ছাত্রী		
16	সাদিয়া	ছাত্রী		
17	সাদিয়া	ছাত্রী		
18	সাদিয়া	ছাত্রী		
19	সাদিয়া	ছাত্রী		
20	সাদিয়া	ছাত্রী		



Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) and Bhomra-Satkira-Navaron Road Section (Phase-3) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program



Stakeholder Consultation Meeting

FGD: Remote

Location : KI Series Alim Madrasa
Venue : Satiantala Madrasa
Date : 12.6.2022
Time : 11 AM

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
1	Falestunessa	Housewife		
2	Ahla Begum	"		
3	Rashida	"		
4	Shamoli	"		
5	Shamoli	"		
6	Nurjahan	"		
7	Natima	"		
8	Rakha	"		
9	Sharifa	"		
10	Kamrunnagar	"		
11	Julekka	"		
12	Rima	"		
13	Khadiza	"		

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 Environmental and Social Management for Jhenaidah-Jashore Road Section (Phase-1) and Bhomra-Satkhira-Navaron Road Section (Phase-3) for Bangladesh Western Economic Corridor & Regional Enhancement (WeCARE) Program 

Stakeholder Consultation Meeting

Location : Village: *Chandpur* Upazila: *Satkhira* (F&D)
Venue :
Date :
Time :

Participant List

S.N	Name of the Participant	Occupation	Mobile No.	Signature
১	মোঃ মাসুদুল হক	গ্রহীতা		
২	মোঃ নাজিমুল হক	গ্রহীতা		
৩	মোঃ হুমায়ুন কবীর	গ্রহীতা		
৪	মোঃ হুমায়ুন কবীর	গ্রহীতা		
৫	মোঃ হুমায়ুন কবীর	গ্রহীতা		
৬	মোঃ হুমায়ুন কবীর	গ্রহীতা		
৭	মোঃ হুমায়ুন কবীর	গ্রহীতা		
৮	মোঃ হুমায়ুন কবীর	গ্রহীতা		
৯	মোঃ হুমায়ুন কবীর	গ্রহীতা		
১০	মোঃ হুমায়ুন কবীর	গ্রহীতা		
১১	মোঃ হুমায়ুন কবীর	গ্রহীতা		
১২	মোঃ হুমায়ুন কবীর	গ্রহীতা		

Annex 6-2: Photographs of Consultation



Stakeholder Consultation -1 in the Proposed Project Site



Stakeholder Consultation -2 in the Proposed Project Site

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Stakeholder Consultation -3 in the Proposed Project Site



Stakeholder Consultation -4 in the Proposed Project Site



Stakeholder Consultation -5 in the Proposed Project Site



Stakeholder Consultation -6 in the Proposed Project Site

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Stakeholder Consultation -7 in the Proposed Project Site



Stakeholder Consultation -8 in the Proposed Project Site



FGD with Local Women in Uttar Para
Churamankathi, Jashore



FGD with Local Woment in Union Parishad,
Churamonkathi Bazar, Jashore



FGD with the Students of Satiyantola Madrasa,
Jashore

ANNEX 7

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Annex 7-1: Gender Based Violence Prevention Plan

Introduction

The Government of Bangladesh (GoB) is implementing the Western Economic Corridor & Regional Enhancement (WeCARE) Program with the Roads and Highways Department (RHD) and the Local Government Engineering Department (LGED) as the main implementing agencies. The WeCARE program aims to work on up-gradation and improvement of national highways along with utilities for improved digital connectivity, development of complementary infrastructure and services along with up-gradation of trunk infrastructure that would contribute to serving selected markets. The program is envisaged to be implemented in multiple phases for a period of around 10 years. Under Phase 1 of the program, RHD will upgrade the 48.7 km long Jhenaidah -Jashore road section as a smart, resilient and safe highway.

The project may potentially exacerbate the existing risks of Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) or create new risks (outlined in the SEA/SH mitigation plan) due to undertaking some specific activities under the project which may compound the existing broader contextual risks at community level. Project-related risks include emerging risks due to potential labor influx in order to meet requirement of the project interventions. Against such background, the contract(s) would need to set up labor camps. It is necessary to assess capacity of the neighboring communities to absorb labor influx and potential risks before labor influx is occurred. In this connection, effective mitigation measures regarding SEA/SH should also be undertaken and implemented.

Women Labor Force Participation in Bangladesh

Bangladesh's Women Labor Force Participation (WLFP) has been increased substantially. It is evident that WLFP and quality of their jobs are still lagging behind. Remarkable improvements in WLFP have been achieved in Bangladesh in the contemporary time. It is found that the WLFP rate increased from 26% in 2002 to 35.6% in 2012. One of the key factors behind it was expansion of garment manufacturing industries. On the other hand, male labor force participation is much higher over 80%. The improvement in WLFP rates has almost been unchanged (e.g., 36% only up to 2017). The above-mentioned gender disparity may be associated with structural barriers. These structural barriers include women's compulsory domestic burden, less importance of women and girls in their educational attainments and low-paid occupations, and also discriminatory attitudes of employer towards them, their restricted mobility and limited access to attend trainings, more specifically lack of woman friendly facilities, risks of potential sexual harassment at work places and negligible childcare provisions. The existing social norms and values which frame social construction of gender have profound impact on women's limited choices as well as a lack of a supportive policy environment. WLFP and quality of women's employment depend on increased supports for their access to employment opportunities which may be facilitated through their high-quality skills development.

GBV Prevention Plan

The term 'GBV' is most commonly used to describe violence perpetrated against women and girls. The United Nations Declaration on the Elimination of Violence against Women defines GBV as "a manifestation of historically unequal power relations between men and women, which have led to the domination over and discrimination against women by men and to the prevention of the full advancement of women." In defining GBV, the Inter-agency Standing Committee (IASC) Guidelines for Integrating Gender-based Violence Interventions in Humanitarian Action (2015) highlight that "women and girls everywhere are disadvantaged in terms of social power and influence, control of resources, control of their bodies and participation in public life—all as a result of socially determined gender roles and relations," and therefore GBV against women and girls must be understood in the context of this power imbalance between men and women.

- GBV in all of its forms has tremendous physical, emotional and social consequences for the person victimized by it, who is often referred to as a 'survivor.'

- ▶ Survivors of GBV have the right to receive quality, compassionate care and support that addresses the harmful consequences of violence in order to help them heal and recover.
- ▶ GBV results in harmful physical, emotional and social consequences that often require information and care from multiple service providers, social work case management has become an integral part of the response to GBV in normal as well in humanitarian settings.

The GBV Prevention Plan takes a comprehensive approach to include both prevention and mitigation measures as the existing policies and measures on mitigation are limited to address GBV. The proposed project involves construction work in the project areas which may have the potential GBV risks in the following four areas:

- ▶ Sexual exploitation and abuse,
- ▶ Workplace sexual harassment,
- ▶ Non-sexual exploitation and
- ▶ Abuse.

Therefore, the purpose of this action plan is to (i) identify relevant issues, stakeholders, and potential service providers, and (ii) to assess their capacity prior to building the same to certain level so as to ensure accessing grievance redress concerning GBV. The action plan will focus on some corresponding mitigation measures—sensitizing the communities and other stakeholders, strengthening the institutional capacities—to mitigate project related potential risks of GBV among the project affected population.

A survivor-centric approach will be followed - all through, victim/survivors' care and providing access to different referral mechanisms are considered as key aspects of this plan. The approach aims to create a supportive environment in which each survivor's rights are respected and in which the person is treated with dignity and respect. This project will include a general Code of Conduct (CoC) as well as a Labor Code of Conduct, covering the GBV/SEA/SH related risks for the contractors, sub-contractors, and laborers who will be employed in the project.

Grievance Redress Mechanism (GRM)

The PIU will use the approved GRM system as presented in the updated RAP. It is expected that confidentiality will be maintained for receiving the GBV/SEA/SH related allegations to redress the same considering their sensitive connotation. The GRC/PIU will designate a GBV/SEA/SH focal person and all related complaints/grievances will be received by him/her. More specifically, the focal person will (i) verify and investigate the matter with GBV/SEA/SH, (ii) provide necessary support to the victim/survivor.

The complainant will be informed about their prospective link with potential local service providers on the eve of getting their consent. The selected service providers will be given responsibility to make the link effective. Special emphasis will be given to those who are mainly active remotely in COVID situation. GRM regarding SEA/SH and GBV issues will be dealt carefully so as to ensure the highest quality in management of the sensitive cases with maintaining confidentiality.

RHD may maintain (i) intake register, (ii) resolution register and (iii) closing register for partial fulfillment of the GRM related to GBV/SEA/SH. Pseudonym of the survivor/complainant will be documented for ensuring confidentiality. Intake register will mainly contain complaint/objection related to GBV/SEA/SH with specific story and supportive evidences as well. Resolution register will be used to document results of necessary hearing and field investigation and decision of the GRC. Closing register focuses on decisions regarding grievance redress and confirmation of survivor's/victim's satisfaction. GRM will include hotlines, place community leaders and facilitate community 'help center' to ensure access to the service. Safety and well-being of women and girls will be promoted to tackle the COVID situation.

Actions, Activities Indicators and Responsibilities and Risk Management under GBV Prevention Plan

Action	Activities	Indicators	Responsibilities	Risk Management
Addressing Awareness raising on GBV-related risk in project				
To be developed awareness raising program on SEA/SH	Publication of brochures/materials on GBV/SEA/SH and dissemination among the community people. There are Conduct 8 awareness raising workshop has already been conducted in the project areas on the activities that will be induced due to construction activities. ▶ To be developed content and will be conducted targeted training and orientation session. ▶ Will be organized training/orientation sessions to raise conscientious on importance of addressing GBV/SEA/SH risks on the project and the mechanisms that will be implemented. ▶ Will be organized training/orientation session to sensitize other stakeholders on the importance of addressing GBV/SEA/SH risks including cyber harassment. The training will be targeted at stakeholders identified in SEP.	▶ Communication material related to GBV/SEA/SH disseminated ▶ Awareness raising campaign on GBV/SEA/SH conducted among all stakeholders ▶ Number of project actors trained and oriented on GBV/SEA/SH	PIU, INGO and Contractor	Monitor the activities and provide additional guidance as necessary
Develop capacity building for labors, contractors, sub-contractors and stakeholders on anti-GBV/harassment policies.	Basic ethics and CoC; ▶ Contractors, consultants, labor, sub-contractors and community people's rights and responsibilities, positive discipline. ▶ Prepare Code of Conduct (CoC) ▶ Measures for dealing with GBV, complaints and reporting mechanisms, services for survivors, referral mechanisms and redress procedures;	▶ CoC is prepared ▶ All contractors, labor and relevant stakeholders are aware of the CoC	PIU, INGO and Contractor	Monitor the activities and provide additional guidance as necessary.
RHD and PIU will play a proactive role for addressing GBV on the project, and the mechanisms that will be implemented.	To be developed deep-dive trainings to build capacity of PIU-RHD on safeguarding mechanisms including CoC, GRM, GBV response protocols on and reporting and procedures to handle cases.	Deep-dive trainings conducted.	WB Task Team	Monitor the activities and provide additional guidance as necessary.
Addressing GBV-related risk in project				
Adequate consultations meeting with community members will be organized to inform them properly	▶ Consultations carried out with different stakeholders and local communities. ▶ Share the GBV risk of the project with the relevant stakeholders. ▶ Visibly display signs around the project site (if applicable) that	Project actors and community members sensitized	Contractor and PIU	Monitor the implementation of Stakeholder Engagement Plan.

Actions, Activities Indicators and Responsibilities and Risk Management under GBV Prevention Plan

Action	Activities	Indicators	Responsibilities	Risk Management
about the potential GBV risks and project activities.	signal to workers and the community that the project site is an area where GBV is prohibited.			
Will be functionalize effective GBV GRM	As the SEP proposed in the RAP explicitly entails addressing GBV/SEA/SH, ensure beneficiaries, community members and labor are informed of GBV grievance mechanisms. ▶ Will prepare a Map on local services providers in project affected areas and develop referral protocol to GBV response services. ▶ GRM will be operated by the Train personnel i.e., proper documentation for complaint registration and management; and confidential reporting with safe and ethical documenting of GBV cases. ▶ Will be communicated with local service provider to provide referral and support services to survivors as per Grievance Mechanism guidance on SEA/SH. ▶ Will organize a stakeholder engagement with CSOs to ensure that they are aware about the SEA/SH and related activities.	Will be taken an initiative to make the GRM with multiple channels to initiate a complaint / parallel GBV.	PIU, INGO and Contractor	Ongoing monitoring and reporting on GRM to verify it is working as intended.
Integration of GBV in project documents				
Will be clearly defining the GBV requirements and expectations in the bidding documents for contractor	▶ Will be formulate and adopt GBV informed bidding document. ▶ Will be inform the contractors and provide orientation program ▶ Will be included GBV costs in the bill of quantities (BOQ)	GBV requirement and expectation are adapted in bid document.	PIU-RHD and ESU	Review by WB
Will be maintained a Codes of Conduct (CoC) signed which will be understood by all those engaged in the project directly receiving project financing	CoC will be finalized on- ▶ Sensitize project related staff and workers about CoC requirements and obligations. ▶ Ensure requirements in CoCs are clearly understood by those signing. ▶ Have CoC signed by all those with a physical presence at the project site. ▶ Disseminate CoCs (including visual illustrations) and discuss with employees and surrounding communities. ▶ Sensitize project related staff and laborers about what constitutes as CoC breaching. ▶ Ensure repercussions are understood by project related staff and workers.	Project-related staff trained and oriented on CoC.	PIU, INGO and Contractor	Review implementation during supervision missions.

Actions, Activities Indicators and Responsibilities and Risk Management under GBV Prevention Plan

Action	Activities	Indicators	Responsibilities	Risk Management
Codes of Conduct (CoC) for all laborers signed and understood	CoC will be finalized on- ▶ Sensitize project related workers about CoC requirements and obligations. ▶ Ensure requirements in CoCs are clearly understood by those signing. ▶ Have CoCs signed by all those with a physical presence at the project site. ▶ Disseminate CoCs (including visual illustrations) and discuss with employees and surrounding communities.	Will inform the project-related activities to the laborers trained and oriented in CoC of laborers who signed CoCs	PIU, INGO and Contractor	Review implementation during supervision missions.
GBV Prevention				
Will implement an appropriate project related civil works for laborer to reduce GBV risks.	▶ Will have a separate, safe and easily accessible facilities for women and men working on the site include security measures such as ensuring adequate security personnel. ▶ Will be set up Latrines in separate areas for male and female, which will be well-lit, ventilated and include the ability to be strongly locked from the inside. ▶ Will keep separate feeding corner for lactating mothers ▶ Will manage improve lighting system around the project ▶ Will maintain a follow up refurbishment construction activity (Safely demarcated, appropriate signage and lighting).	Documentation of measures taken to reduce GBV risks.	PIU, INGO and Contractor	• Ongoing reporting. • Monitor the activities and provide additional guidance as necessary.
Will undertake a regular M&E of progress on SEA/SH/GBV activities.	▶ Frequent field visits to be conducted for M&E ▶ Will be reviewed quarterly the action plan and progress against indicators listed ▶ Will be provided quarterly report on regular basis	Successful implementation of agreed GBV Action Plan. Quarterly report	PIU, INGO and Contractor	Ongoing reporting

Labor Code of Conduct (CoC) Covering the GBV/SEA/SHA Related Risks

Introduction

The project sponsor is committed to ensuring a work environment which minimizes any negative impacts on the local environment, communities, and its workers. The company also strongly commits to creating and maintaining an environment in which Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) have no place, and where they will not be tolerated by any employee, sub-contractor, supplier, associate, or representative of the company. The purpose of this Code of Conduct is to:

- ▶ Create a common understanding of what constitutes Sexual exploitation and abuse, and sexual harassment
- ▶ Create a shared commitment to standard behaviors and guidelines for company employees to prevent, report, and respond to SEA and SH, and
- ▶ Create understanding that breach of this code of conduct will result in disciplinary action.

Purpose of CoC

The purpose of the CoC is:

- ▶ To establish expectations for behavior within a company and within the community which the company serves or works
- ▶ To clearly define obligations, values, behavior of all project staff (including sub-contractors and day workers) regarding: Policies related to GBV, specifically SEA and workplace SH;
- ▶ To comply with applicable labor legislation;
- ▶ To identify the norms and regulations of conduct for all personnel;

Potential Risks

The Labor Code of Conduct (CoC) covering the GBV/SEA/SHA Related Risks of the project involve during construction work in the project implemented areas which may have the potential risks in four areas:

- ▶ **Sexual Violence:** Sexual Violence is defined as “any sexual act, attempt to obtain a sexual act, unwanted sexual comments or advances, or acts to traffic, or otherwise directed, against a person’s sexuality using coercion, by any person regardless of their relationship to the victim, in any setting, including but not limited to home and work.”
- ▶ **Sexual Exploitation:** Is defined as any actual or attempted abuse of a position of vulnerability, differential power, or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another.
- ▶ **Sexual Abuse:** The actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions.”
- ▶ **Sexual Harassment:** Unwelcome sexual advances, request for sexual favors, and other verbal or physical conduct of sexual nature. Sexual harassment typically occurs in the context of employment, between personnel and staff.

Gender based Violence – Code of Conduct (CoC)

A code of conduct is a set of values, rules, standards, and principles outlining what employers expect from staff within an organization. It is closely related to a code of ethics, to the extent where the phrases are often interchangeable. It offers principles defining the ethics of a business, but it also contains specific rules for employee actions and behavior. The CoC is defined below:

- ▶ Compliance with applicable National and Company laws, policies, rules, and regulations (including policy on sexual harassment).
- ▶ Will not indulge in Sexual Harassment (for example prohibition of the use of language or behaviour, in particular towards women and/or children, that is inappropriate, abusive, sexually provocative, demeaning or culturally inappropriate).
- ▶ No Violence, including sexual and/or gender-based violence (for example acts that inflict physical, mental

- or sexual harm or suffering, threats of such acts, coercion, and deprivation of liberties).
- ▶ SEA constitute acts of gross misconduct and are grounds for termination of employment.
 - ▶ Sexual activity with children (persons under the age of 18) is prohibited.
 - ▶ Mistaken belief regarding the age of the child and consent is not a defense for engaging in sexual activity with minors.
 - ▶ Exchange of money, employment, goods, or services for sex is prohibited.
 - ▶ Sexual relationships between contractor, RHD staff and beneficiaries are strongly discouraged.
 - ▶ Staff members/ workers must report concerns regarding SEA by a fellow staff member/worker. Reports must be made through the GRM setup for this purpose.
 - ▶ Staff members, especially those in leadership positions, are obliged to create and maintain an environment that prevents SEA.
 - ▶ Prohibition of inappropriate use or trespassing of gender specific facilities.
 - ▶ Avoid conflict of interest (such that benefits, contracts, or employment, or any sort of preferential treatment or favours, are not provided to any person with whom there is a financial, family, or personal connection).
 - ▶ Respect reasonable work instructions (including environmental and social norms).
 - ▶ Protection and proper use of property (for example, to prohibit theft, carelessness or waste).
 - ▶ Will attend training for the duration of the contract for understanding this Code of Conduct.
 - ▶ Do not under any circumstance undertake an independent investigation of an incident of GBV, including SEA, individually, through the project.
 - ▶ Do not seek out survivors of GBV and question them about incidents.
 - ▶ Sanctions may be applied if an employee is confirmed to be a gender-based violence perpetrator. The sanctions will be proportional to the transgression and in accordance with applicable laws and policies.
 - ▶ Non- retaliation against workers who report violations of the Code, if that report is made in good faith.
 - ▶ Compliance with applicable health and safety requirements to protect the Local Community (including vulnerable and disadvantaged groups), the Employer's Personnel, and the Contractor's Personnel (including wearing prescribed personal protective equipment, preventing avoidable accidents and a duty to report conditions or practices that pose a safety hazard or threaten the environment).

Sanctions

A key element of the CoC is the sanctions that may be applied if an employee is confirmed as a SEA/SH perpetrator. The sanctions need to be proportional to the violation. Prior to imposition of sanctions, if a worker raises a credible challenge to alleged violation with the CoC, the worker's employer should place the worker on administrative leave pending a full and fair review to determine the veracity of said allegation(s). Examples of potential sanctions include the following:

- ▶ Informal warning;
- ▶ Formal warning;
- ▶ Additional training;
- ▶ Loss of salary;
- ▶ Suspension of employment (either administrative leave as above or without payment of salary), for a minimum period of one month up to a maximum of six months;
- ▶ Termination of employment; and/or,
- ▶ Referral to the police or other authorities as warranted.

Examples of sexual exploitation and abuse include, but are not limited to:

- ▶ A project worker tells women in the community that he can get them jobs related to the work site (cooking and cleaning) in exchange for sex.
- ▶ A worker that is connecting electricity input to households says that he can connect women headed households to the grid in exchange for sex.
- ▶ A project worker gets drunk after being paid and rapes a local woman.
- ▶ A project worker denies passage of a woman through the site that he is working on unless she performs a

sexual favor.

- ▶ A manager tells a woman applying for a job that he will only hire her if she has sex with him.
- ▶ A worker begins a friendship with a 17-year-old girl who walks to and from school on the road where project related work is taking place. He gives her rides to school. He tells her that he loves her. They have sex.

Examples of sexual harassment in a work context include, but are not limited to:

- ▶ Male staff comment on female staffs' appearances (both positive and negative) and sexual desirability.
- ▶ When a female staff member complains about comments male staff are making about her appearance, they say she is "asking for it" because of how she dresses.
- ▶ A male manager touches a female staff members' buttocks when he passes her at work.
- ▶ A male staff member tells a female staff member he will get her a raise if she sends him naked photographs of herself.

Individual signed commitment (to be translated in a language understood by the person signing):

I, Mr./Ms _____, acknowledge that Sexual Exploitation and Abuse (SEA) and sexual harassment, are prohibited. As an (employee/contractor) of (contracted agency / sub-contracted agency) in (country), I acknowledge that SEA and SH activities on the work site, the work site surroundings, at workers' camps, or the surrounding community constitute a violation of this Code of Conduct. I understand SEA and SH activities are grounds for sanctions, penalties or potential termination of employment. Prosecution of those who commit SEA and SH may be pursued if appropriate.

I commit and abide that while working in the project I will:

- ▶ Adhere to the provisions of this code of conduct both on and off the project site.
- ▶ Attend and actively partake in training courses related to preventing SEA and SH as requested by my employer.
- ▶ If I am aware of or suspect SEA and SH, at the project site or surrounding community, I understand that I am encouraged to report it to the Grievance Redress Committee (GRC) or to my manager.
- ▶ The safety, consent, and consequences for the person who has suffered the abuse will be part of my consideration when reporting.
- ▶ I understand that I will be expected to maintain confidentiality on any matters related to the incident to protect the privacy and security of all those involved.

I understand that it is my responsibility to adhere to this code of conduct. That I will avoid actions or behaviors that could be construed as SEA and SH. Any such actions will be a breach of this Individual Code of Conduct. I acknowledge that I have read the Individual Code of Conduct, do agree to comply with the standards contained in this document, and understand my roles and responsibilities to prevent and potentially report SEA and SHA issues. I understand that any action inconsistent with this Individual Code of Conduct or failure to act mandated by this Individual Code of Conduct may result in disciplinary action and may affect my ongoing employment.

Signature: _____

Printed Name: _____

Title: _____

Date: _____

[illegible]

	স্মিত নং-	সদর- ৪১০৭
	তারিখঃ	১৮/০৮/২০২২
	নামঃ	মোঃ তালিমুল হক
		প্রথম ব্যবস্থাপক, সারথ, ইকোয়ার কেজ-১
ওয়ার্ড পরিষদের	প্রাক	বিনাইদহ সিটি কর্পোরেশন
ক্রমিক নং অনুমোদন প্রেরণ	প্রাক	ডিপার্টমেন্ট
সংক্রান্ত রপ্তা পরিষদ	পরি নং-	২১২৪২০-০৬ (সেট ০৮ টি)

সদর ও মাননীয় বিশেষায়িত নং-৪১০৭, ৪১০৮, ৪১০৯, ৪১১০, ৪১১১, ৪১১২, ৪১১৩, ৪১১৪, ৪১১৫, ৪১১৬, ৪১১৭, ৪১১৮, ৪১১৯, ৪১২০, ৪১২১, ৪১২২, ৪১২৩, ৪১২৪, ৪১২৫, ৪১২৬, ৪১২৭, ৪১২৮, ৪১২৯, ৪১৩০, ৪১৩১, ৪১৩২, ৪১৩৩, ৪১৩৪, ৪১৩৫, ৪১৩৬, ৪১৩৭, ৪১৩৮, ৪১৩৯, ৪১৪০, ৪১৪১, ৪১৪২, ৪১৪৩, ৪১৪৪, ৪১৪৫, ৪১৪৬, ৪১৪৭, ৪১৪৮, ৪১৪৯, ৪১৫০, ৪১৫১, ৪১৫২, ৪১৫৩, ৪১৫৪, ৪১৫৫, ৪১৫৬, ৪১৫৭, ৪১৫৮, ৪১৫৯, ৪১৬০, ৪১৬১, ৪১৬২, ৪১৬৩, ৪১৬৪, ৪১৬৫, ৪১৬৬, ৪১৬৭, ৪১৬৮, ৪১৬৯, ৪১৭০, ৪১৭১, ৪১৭২, ৪১৭৩, ৪১৭৪, ৪১৭৫, ৪১৭৬, ৪১৭৭, ৪১৭৮, ৪১৭৯, ৪১৮০, ৪১৮১, ৪১৮২, ৪১৮৩, ৪১৮৪, ৪১৮৫, ৪১৮৬, ৪১৮৭, ৪১৮৮, ৪১৮৯, ৪১৯০, ৪১৯১, ৪১৯২, ৪১৯৩, ৪১৯৪, ৪১৯৫, ৪১৯৬, ৪১৯৭, ৪১৯৮, ৪১৯৯, ৪২০০, ৪২০১, ৪২০২, ৪২০৩, ৪২০৪, ৪২০৫, ৪২০৬, ৪২০৭, ৪২০৮, ৪২০৯, ৪২১০, ৪২১১, ৪২১২, ৪২১৩, ৪২১৪, ৪২১৫, ৪২১৬, ৪২১৭, ৪২১৮, ৪২১৯, ৪২২০, ৪২২১, ৪২২২, ৪২২৩, ৪২২৪, ৪২২৫, ৪২২৬, ৪২২৭, ৪২২৮, ৪২২৯, ৪২৩০, ৪২৩১, ৪২৩২, ৪২৩৩, ৪২৩৪, ৪২৩৫, ৪২৩৬, ৪২৩৭, ৪২৩৮, ৪২৩৯, ৪২৪০, ৪২৪১, ৪২৪২, ৪২৪৩, ৪২৪৪, ৪২৪৫, ৪২৪৬, ৪২৪৭, ৪২৪৮, ৪২৪৯, ৪২৫০, ৪২৫১, ৪২৫২, ৪২৫৩, ৪২৫৪, ৪২৫৫, ৪২৫৬, ৪২৫৭, ৪২৫৮, ৪২৫৯, ৪২৬০, ৪২৬১, ৪২৬২, ৪২৬৩, ৪২৬৪, ৪২৬৫, ৪২৬৬, ৪২৬৭, ৪২৬৮, ৪২৬৯, ৪২৭০, ৪২৭১, ৪২৭২, ৪২৭৩, ৪২৭৪, ৪২৭৫, ৪২৭৬, ৪২৭৭, ৪২৭৮, ৪২৭৯, ৪২৮০, ৪২৮১, ৪২৮২, ৪২৮৩, ৪২৮৪, ৪২৮৫, ৪২৮৬, ৪২৮৭, ৪২৮৮, ৪২৮৯, ৪২৯০, ৪২৯১, ৪২৯২, ৪২৯৩, ৪২৯৪, ৪২৯৫, ৪২৯৬, ৪২৯৭, ৪২৯৮, ৪২৯৯, ৪৩০০, ৪৩০১, ৪৩০২, ৪৩০৩, ৪৩০৪, ৪৩০৫, ৪৩০৬, ৪৩০৭, ৪৩০৮, ৪৩০৯, ৪৩১০, ৪৩১১, ৪৩১২, ৪৩১৩, ৪৩১৪, ৪৩১৫, ৪৩১৬, ৪৩১৭, ৪৩১৮, ৪৩১৯, ৪৩২০, ৪৩২১, ৪৩২২, ৪৩২৩, ৪৩২৪, ৪৩২৫, ৪৩২৬, ৪৩২৭, ৪৩২৮, ৪৩২৯, ৪৩৩০, ৪৩৩১, ৪৩৩২, ৪৩৩৩, ৪৩৩৪, ৪৩৩৫, ৪৩৩৬, ৪৩৩৭, ৪৩৩৮, ৪৩৩৯, ৪৩৪০, ৪৩৪১, ৪৩৪২, ৪৩৪৩, ৪৩৪৪, ৪৩৪৫, ৪৩৪৬, ৪৩৪৭, ৪৩৪৮, ৪৩৪৯, ৪৩৫০, ৪৩৫১, ৪৩৫২, ৪৩৫৩, ৪৩৫৪, ৪৩৫৫, ৪৩৫৬, ৪৩৫৭, ৪৩৫৮, ৪৩৫৯, ৪৩৬০, ৪৩৬১, ৪৩৬২, ৪৩৬৩, ৪৩৬৪, ৪৩৬৫, ৪৩৬৬, ৪৩৬৭, ৪৩৬৮, ৪৩৬৯, ৪৩৭০, ৪৩৭১, ৪৩৭২, ৪৩৭৩, ৪৩৭৪, ৪৩৭৫, ৪৩৭৬, ৪৩৭৭, ৪৩৭৮, ৪৩৭৯, ৪৩৮০, ৪৩৮১, ৪৩৮২, ৪৩৮৩, ৪৩৮৪, ৪৩৮৫, ৪৩৮৬, ৪৩৮৭, ৪৩৮৮, ৪৩৮৯, ৪৩৯০, ৪৩৯১, ৪৩৯২, ৪৩৯৩, ৪৩৯৪, ৪৩৯৫, ৪৩৯৬, ৪৩৯৭, ৪৩৯৮, ৪৩৯৯, ৪৪০০, ৪৪০১, ৪৪০২, ৪৪০৩, ৪৪০৪, ৪৪০৫, ৪৪০৬, ৪৪০৭, ৪৪০৮, ৪৪০৯, ৪৪১০, ৪৪১১, ৪৪১২, ৪৪১৩, ৪৪১৪, ৪৪১৫, ৪৪১৬, ৪৪১৭, ৪৪১৮, ৪৪১৯, ৪৪২০, ৪৪২১, ৪৪২২, ৪৪২৩, ৪৪২৪, ৪৪২৫, ৪৪২৬, ৪৪২৭, ৪৪২৮, ৪৪২৯, ৪৪৩০, ৪৪৩১, ৪৪৩২, ৪৪৩৩, ৪৪৩৪, ৪৪৩৫, ৪৪৩৬, ৪৪৩৭, ৪৪৩৮, ৪৪৩৯, ৪৪৪০, ৪৪৪১, ৪৪৪২, ৪৪৪৩, ৪৪৪৪, ৪৪৪৫, ৪৪৪৬, ৪৪৪৭, ৪৪৪৮, ৪৪৪৯, ৪৪৫০, ৪৪৫১, ৪৪৫২, ৪৪৫৩, ৪৪৫৪, ৪৪৫৫, ৪৪৫৬, ৪৪৫৭, ৪৪৫৮, ৪৪৫৯, ৪৪৬০, ৪৪৬১, ৪৪৬২, ৪৪৬৩, ৪৪৬৪, ৪৪৬৫, ৪৪৬৬, ৪৪৬৭, ৪৪৬৮, ৪৪৬৯, ৪৪৭০, ৪৪৭১, ৪৪৭২, ৪৪৭৩, ৪৪৭৪, ৪৪৭৫, ৪৪৭৬, ৪৪৭৭, ৪৪৭৮, ৪৪৭৯, ৪৪৮০, ৪৪

- ১১) ইকোকার ফোন-১২, ফিউইং-১২-র যাবত মালিকানা (এন-৭) উপার্জন প্রত্যয় এর অন্তর্গত। ফিউইং-১২-র যাবত টার্মিনাল হতে কালীপুত্র পর্যন্ত সড়কের পাশে বিদ্যমান লাইন নতুন স্থানান্তরের জন্য নিম্ন-বর্ণিত ভাবে কাজ সম্পাদন করতে হবে।
- ১২) বিদ্যমান ৩.৭৩ কিঃ মিঃ (২-কেস ও ৩-কেস সহ) ১১ কেভি লাইন রিস্ট্রাকচার করতে হবে এবং ৪.০৭ কিঃ মিঃ (২-কেস ও ৩-কেস সহ) নতুন ১১ কেভি লাইন নির্মাণ করতে হবে। এর জন্য = ৭৬০৬১৯৯.০০ (ছাত্তর মূল তথ্যটি ছাত্তর অফিসে শিরাবাই) টাকা ব্যয় হতে পারে।
- ১৩) বিদ্যমান ৪.৪৪ কিঃ মিঃ ৩৩ কেভি লাইন রিস্ট্রাকচার করতে হবে এবং ৮.১৯ কিঃ মিঃ নতুন ৩৩ কেভি লাইন নির্মাণ করতে হবে। এর জন্য = ৪,০০,০২,১৭২.০০ (সাত কোটি অষ্টান শতাব্দে একশত পঁচাত্তর) টাকা ব্যয় হতে পারে।
- ১৪) বর্ণিত কাজ সম্পাদনের জন্য বরখাস্ত = (৭৬০৬১৯৯.০০ + ৪,০০,০২,১৭২.০০) = ৪,৭৬,১৮,৩৭১.০০ (চার কোটি ছাত্তর মূল তথ্যটি ছাত্তর অফিসে শিরাবাই) টাকার ডিমান্ড নোট ইস্যু করা হবে।
- ১৫) সর্বমোট ৩০ জনের কর্মচারী মোট উপস্থাপন করা হলে।

 ১৯/১০/২১
 (মোঃ কামরুল হোসেন মালিক)
 সহকারী মুনিয়্যর ইঞ্জিনিয়ার (টেকিং)

 ১৯/১০/২১
 (মুখবার ওয়ালা ষিল আসাম)
 অফিসম (উপস্থান)

लिखित । समर-कारिणी । अहोमह

বর্ধিত প্রজাবনা সমূহ সচরা অনুমোদনের জন্য উপস্থাপন করা হলো।

07-10-21
(প্রকৌ. ইন্সট্রুস ভাণী)
ডিজিটাল (সদর-কারিগরি)

কোনো প্রকারেই শাসনকার্যে ব্যাধাধীন

गुप्त विभाग
२५/१२/७७
१५/१२/७७
गुप्त विभाग
२५/१२/७७
१५/१२/७७

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CS CamScanner

ANNEX 8

Joint Venture of



STUP Consultant Pvt. Ltd.
On July 1st, 2021, STUP was acquired by Assystem and rebranded as Assystem STUP.



BCL Associates Limited, Bangladesh

Annex 8-1: Code of Contact (CoC)

As part of the Environmental and Social Management Plans (ESMP) the E&S consultant has committed to develop a Code of Conduct on half of Project Executing Agency, RHD. The Code of Conduct for the Environmental and Social Code of Practice (ESCP) will be prepared by the Contractor (referred to as “the Company” in this document) with support from the based on this guidance and will be implemented during construction activities.

The Code of Conduct establishes clear guidelines for daily business conduct and ethical behavior. Each employee shall be informed of this document and bound by it while employed by the Project (which includes employment by Project partners/sub-contractors). The Code of Conduct shall be publicly disclosed and made available to local communities in appropriate locations.

Introduction, Purpose and Scope

The purpose of the Code of Conduct of the Jhenaidah- Jashore Improvement Project Road is to provide guidance to all employees (including those of sub-contractors) on how the Company expects them to behave in the workplace, and how they should conduct themselves with Project stakeholders (employees, customers, suppliers and members of the public). The purpose and scope of the Code of Conduct will outline the Company management commitments, values and core operating principles. The Code shall make reference to other relevant management plans (e.g., Health and Safety).

Responsibilities And Implementation of The Code of Conduct

Describe how the Company will implement the Code and details the responsibilities of managers and employees.

- ▶ Commitment that the Code will be shared with employees during onboarding and training (i.e., that the Code is not read only once).
- ▶ Include a requirement for all employees to sign an Acknowledgement Form attached to the Code.
- ▶ Commitment to promptly communicate changes/updates to the Code.
- ▶ Commitment to training and continuous improvement.
- ▶ Include a list of other policies and procedures linked to the Code of Conduct.

Violations And Feedback

Describe how violations of the Code of Conduct and feedback about it will be handled.

- ▶ Commitment for all personnel to prevent violation of the Code, to identify and raise potential issues before they lead to problems, to seek guidance when necessary and to report circumstances that are in violation of the Code.
- ▶ Describe feedback mechanisms and encourages employees to raise any concerns or provide feedback. Develop safe and confidential ways to report concerns of misconduct and ensure zero tolerance on retaliation.
- ▶ Describes the action that will be taken against those who violate the Code. These may include performance or disciplinary consequences including termination of employment, subject to local laws and regulations. Where an action is also in breach of the law, the employee may be subject to prosecution under civil or criminal law. Include a commitment to value the help of employees who identify possible legal or ethical business misconduct. This will include whistleblowing (i.e., the reporting of wrongdoing that is in the public interest, such as a criminal offence, danger posed by a H&S risk, or a miscarriage of justice).

Human Rights and Labor Practices

We will protect human rights as defined in the Universal Declaration of Human Rights (UDHR). No person shall be subject to any discrimination in employment, including hiring, compensation, advancement,

discipline, termination or retirement, on the basis of gender, race, religion, age, disability, sexual orientation, nationality, political opinion, social group or ethnic origin.

- ▶ We will treat all employees and community members with dignity, respect and justice, taking into consideration their different cultural sensitivities.
- ▶ We will not permit any form of violence, harassment or abuse at the workplace or local community.
- ▶ We will work with public and private security providers to avoid security arrangements that cause or contribute to human rights violations.

Health And Safety

The Company will provide a clean, safe and healthy work environment, taking measures that are considered reasonable to maximize prevention of occupational risk. Measures will be taken to continuously improve the Health and Safety (H&S) performance. Violence and threatening behavior are not permitted.

All Project partners, consultants, agents, sub-contractors and suppliers, will be required to respect and adhere to the Company's H&S requirements.

Please include specific rules around H&S practices (e.g., from ESMP/ESCOP), such as:

- ▶ All of us will commit to our roles and responsibilities to ensure a healthy and safe working environment.
- ▶ We will report incidents and accidents. These will be investigated and corrective actions will be taken.

Environment

The Company will do any work-related activities in an environmentally sound manner for the benefit of all Project stakeholders and the environment in which the Project operates and provides service. The Company will adhere to any environmental management plans and programs throughout all activities performed. Any environmental management plans will be shared by the Company with its employees.

Please include a list of key commitments, e.g.

- ▶ We will not do informal harvesting of plants or plant products (such as fruits and nuts);
- ▶ We will not dispose solid and liquid wastes of any kind in unauthorized manner while in transit on company business or while living in Project-provided accommodation of any kind; and
- ▶ We will not deal with artefacts that may be of cultural heritage value.

Fair Dealing / Supplier and Client Relationships

The Company will deal responsibly, honestly and fairly with other project stakeholders the customers, suppliers, authorities, competitors and other third parties.

Please include specific commitments related to:

- ▶ Bribery and corruption;
- ▶ Conflicts of interest;
- ▶ Fair competition;
- ▶ Confidential information; and
- ▶ Insider trading.

The Company will not establish business relationships with companies or individuals that are not in compliance with ethical, H&S, and human rights standards compatible with those adopted by the Company.

Relations With the Communities Neighboring the Project

The Company will engage, cooperate and maintain good neighbor relations with local communities.

Please include specific commitments, e.g.:

- ▶ Prohibition of illegal substances, weapons and firearms;
- ▶ Prohibition of harassment or abuse (physical or verbal);

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- ▶ Prohibition of nuisance and disturbance in or near communities.
- ▶ Respecting the diversity of ethnic or cultural minorities and acknowledging their unique and important interests in lands, waters and environment as well as their history and traditions; and
- ▶ Maintaining appropriate standards of dress and personal hygiene.

Communication

We will communicate with each other in a fair, open, respectful and responsible manner. This Code of Conduct will be disclosed to all workers at site in the relevant languages. It will also be shared with sub-contractors and partners of the Company for them to distribute in their organizations accordingly.

Contact

Please provide contact details of the person responsible for the implementation of the Code of Conduct.

Acknowledgement & Commitment to the Workforce Code of Conduct

I acknowledge that I have received, read and will comply with the Code of Conduct as it may be amended from time to time. I also acknowledge that I will read and comply with all policies and management plans referenced in this Code, as they may be amended from time to time, to the extent that they apply to my employment activities.

First Name	Last Name	Signed	Date DD/MM/YY	Location	Company	Direct Manager

Sample Labor Code of Conduct (CoC) Covering the GBV/SEA/SHA Related Risks

The company is committed to ensuring a work environment which minimizes any negative impacts on the local environment, communities, and its workers. The company also strongly commits to creating and maintaining an environment in which Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) have no place, and where they will not be tolerated by any employee, sub-contractor, supplier, associate, or representative of the company. The purpose of this *Code of Conduct* is to:

- ▶ Create a common understanding of what constitutes Sexual exploitation and abuse, and sexual harassment
- ▶ Create a shared commitment to standard behaviors and guidelines for company employees to prevent, report, and respond to SEA and SH, and
- ▶ Create understanding that breach of this code of conduct will result in disciplinary action.

The Labor Code of Conduct (CoC) covering the GBV/SEA/SHA Related Risks of the project involve during construction work in the project implemented areas which may have the potential risks in four areas:

- ▶ **Sexual Exploitation and Abuse (SEA)**
Is defined as any actual or attempted abuse of a position of vulnerability, differential power, or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another.
- ▶ **Sexual Abuse**
The actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions.”
- ▶ **Sexual Harassment**
Unwelcome sexual advances, request for sexual favors, and other verbal or physical conduct of sexual nature.
- ▶ **Sexual Harassment versus SEA**
SEA occurs against a beneficiary or member of the community. Sexual harassment occurs between personnel/staff of an organization or company and involves any unwelcome sexual advance or unwanted verbal or physical conduct of a sexual nature. The distinction between the two is important so that agency policies and staff trainings can include specific instruction on the procedures to report each. Consent is the choice behind a person’s voluntary decision to do something. Consent for any sexual activity must be freely given, ok to withdraw, made with as much knowledge as possible, and specific to the situation. If agreement is obtained using threats, lies, coercion, or exploitation of power imbalance, it is not consent.

Under this Code of Conduct consent cannot be given by anyone under the age of 18, regardless of the age of majority or age of consent locally. Mistaken belief regarding the age of the child is not a defense.

There is no consent when agreement is obtained through:

- ▶ the use of threats, force or other forms of coercion, abduction, fraud, manipulation, deception, or misrepresentation
- ▶ the use of a threat to withhold a benefit to which the person is already entitled, or
- ▶ a promise is made to the person to provide a benefit.

While all forms of violence against a community resident or a co-worker are forbidden, this code of conduct is particularly concerned with the prevention and reporting of sexual exploitation and abuse (SEA) and sexual harassment which constitute gross misconduct, are grounds for termination or other consequences related to employment and employment status:

(1) Examples of sexual exploitation and abuse include, but are not limited to:

- ▶ A project worker tells women in the community that he can get them jobs related to the work site (cooking and cleaning) in exchange for sex.
- ▶ A worker that is connecting electricity input to households says that he can connect women headed households to the grid in exchange for sex.
- ▶ A project worker gets drunk after being paid and rapes a local woman.
- ▶ A project worker denies passage of a woman through the site that he is working on unless she performs a sexual favor.
- ▶ A manager tells a woman applying for a job that he will only hire her if she has sex with him.
- ▶ A worker begins a friendship with a 17-year-old girl who walks to and from school on the road where project related work is taking place. He gives her rides to school. He tells her that he loves her. They have sex.

(2) Examples of sexual harassment in a work context include, but are not limited to:

- ▶ Male staff comment on female staffs' appearances (both positive and negative) and sexual desirability.
- ▶ When a female staff member complains about comments male staff are making about her appearance, they say she is "asking for it" because of how she dresses.
- ▶ A male manager touches a female staff members' buttocks when he passes her at work.
- ▶ A male staff member tells a female staff member he will get her a raise if she sends him naked photographs of herself.

Individual signed commitment (to be translated in a language understood by the person signing):

I, _____, acknowledge that sexual exploitation and abuse (SEA) and sexual harassment, are prohibited. As an (*employee/contractor*) of (*contracted agency / sub-contracted agency*) in (*country*), I acknowledge that SEA and SH activities on the work site, the work site surroundings, at workers' camps, or the surrounding community constitute a violation of this *Code of Conduct*. I understand SEA and SH activities are grounds for sanctions, penalties or potential termination of employment. Prosecution of those who commit SEA and SH may be pursued if appropriate.

I agree that while working on the project I will:

- ▶ Treat all persons, including children (persons under the age of 18), with respect regardless of sex, race, color, language, religion, political or other opinion, national, ethnic or social origin, gender identity, sexual orientation, property, disability, birth or other status.
- ▶ Commit to creating an environment which prevents SEA and SH and promotes this code of conduct. In particular, I will seek to support the systems which maintain this environment.
- ▶ **Not** participate in SEA and SH as defined by this *Code of Conduct* and as defined under (*country*) law (*and other local law, where applicable*).
- ▶ **Not** use language or behavior towards women, children or men that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
- ▶ **Not** participate in sexual contact or activity with anyone below the age of 18. Mistaken belief regarding the age of a child is not a defense. Consent from the child is also not a defense. I will not participate in actions intended to build a relationship with a minor that will lead to sexual activity.
- ▶ **Not** solicit/engage in sexual favors in exchange for anything as described above.
- ▶ Unless there is the full consent by all parties involved, recognizing that a child is unable to give consent and a child is anyone under the age of 18, I will not have sexual interactions with members of the surrounding communities. This includes relationships involving the withholding or promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex—such sexual activity is considered "non-consensual" under this Code.

I commit to:

- ▶ Adhere to the provisions of this code of conduct both on and off the project site.
- ▶ Attend and actively partake in training courses related to preventing SEA and SH as requested by my employer.

If I am aware of or suspect SEA and SH, at the project site or surrounding community, I understand that I am encouraged to report it to the Grievance Reporting Mechanism (GRM) or to my manager. The safety, consent, and consequences for the person who has suffered the abuse will be part of my consideration when reporting. I understand that I will be expected to maintain confidentiality on any matters related to the incident to protect the privacy and security of all those involved.

Sanctions: I understand that if I breach this Individual Code of Conduct, my employer will take disciplinary action which could include:

- ▶ Informal warning or formal warning
- ▶ Additional training
- ▶ Loss of salary
- ▶ Suspension of employment (with or without payment of salary)
- ▶ Termination of employment
- ▶ Report to the police or other authorities as warranted

I understand that it is my responsibility to adhere to this code of conduct. That I will avoid actions or behaviors that could be construed as SEA and SH. Any such actions will be a breach this Individual Code of Conduct. I acknowledge that I have read the Individual Code of Conduct, do agree to comply with the standards contained in this document, and understand my roles and responsibilities to prevent and potentially report SEA and SHA issues. I understand that any action inconsistent with this Individual Code of Conduct or failure to act mandated by this Individual Code of Conduct may result in disciplinary action and may affect my ongoing employment.

Signature: _____

Printed Name: _____

Title: _____

Date: _____

N.B.: Project Grievance Mechanism to address SEA/SH Allegations 18 (this model will be further tailored to the project needs)

Operating Procedures and Response Protocol for SEA/SH Allegations

Uptake the Case	•Review the case through reporting channels (need to decide on them). •Need to ensure confidentiality of the case and handle it with respect and care.
Sorts and Process	•Register the case. •Document only the following information: •The nature of the allegation; •if, to the best of the survivor's knowledge, the perpetrator is associated with the project; •the age of the survivors; •information about whether the survivor is referred to services.
Acknowledge and Follow Up	• Refer to relevant GBV service providers • Consent of survivors must be documented; • It is up to the survivors whether to take up the proposed
Verify and Instigate the Act	• Provide support services to survivors. • Determine the likelihood that allegation is project related. • Implement sanctions to perpetrator, if needed.
Monitor and Evaluation	• DPM compiles data about reported project related allegations while making sure the confidentiality. • PM issues monthly report to IPU with detail data such as allegation, alleged perpetrators.
Provide Feedback	•Respond to survivor •Allegation recipient needs to provide ongoing feedback to the survivor throughout the process; •Investigation's conclusions are communicated to the offender, particularly when sanctions will be taken by the survivors

Annex 8-2: Checklist of Contractor's/ Subcontractor's/Primary Supplier's Employees/Workers Profile

CHECKLIST OF CONTRACTOR'S/SUBCONTRACTOR'S/PRIMARY SUPPLIER'S EMPLOYEES/WORKERS PROFILE												
Name of Contractor:										Code:		
Date of Submission:										Issued date:.....		
*Note: Please tick as “√” if the document is provided and check “X” if the document is NOT provided										Version:.....		
No.	Name of Employee	Position	Gender	Date of Birth	Date Hired	Nationality	If the personnel have been hired locally	Copy of labor contract	Copy of Identity Card	Copy of Health Certificate	Copy of Insurance Certificate	Copy of relevant Health and Safety (H&S) Training Certificate (Please specify what kind of H&S training certificates are provided)
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												

[illegible]

Annex 8-4: Employees' Information

No.	Full Name	Gender	Date of Birth	Nationality	Address	Identity Card (NID) Number	Qualification	Job Title	Labor Contract			Date of Hiring	Gross Salary	Number of annual leave	Occupational Health and Disease	Remarks
									Type	Starting Date	Termination Date					

Annex 8-5: Contractor/Subcontractor/Supplier Management Audit Checklist

CONTRACTOR/SUBCONTRACTOR/SUPPLIER MANAGEMENT AUDIT CHECKLIST			
	Name of Contractor: Date of Audit: Auditor:	Code: Issued date: Version:	
No.	Findings	Compliance (Yes/No)	Description
1.	Are employees provided with the term of the labor contract in compliance with the legal requirement? Note: In-defined term-labor contract shall be provided after two (02) defined term-labor contracts.		
2.	Are employees provided with a copy of the labor contract in a language the employee understands?		
3.	Do/does the contractor and its subcontractors/supplier maintain sufficient employee profiles, including a copy of the aging document?		
4.	Do/does the contractor and its subcontractors/supplier's practices on child labor are in line with the Projects' Labor-Management Plan and Applicable Standards?		
5.	Do/do the contractor and its subcontractors/supplier's practices on prison labor or slave labor are in line with the Projects' Labor-Management Plan and Applicable Standards?		
6.	Do/does the contractor and its subcontractors/supplier's practices on human trafficking are in line with the Projects' Labor-Management Plan and Applicable Standards?		
7.	Do/do the contractor and its subcontractors/supplier not retain original documents of employees?		
8.	Do employees not pay a deposit during the recruitment process?		
9.	Do/do the contractor and its subcontractors/supplier not withhold any part of the worker's salary, benefits, properties, or documents?		
10.	Do employees have the right to leave the workplace premises after completing the standard working hours?		
11.	Do employees free to terminate their employment that they inform the contractor promptly in line with legal requirements?		
12.	Do/dose the contractor and its subcontractors/supplier's practices on non-discrimination are in line with the Projects' Labor-Management Plan and Applicable Standards?		
13.	Do/does the contractor and its subcontractors/supplier's practices on gender equity are in line with the Projects' Labor-Management Plan and Applicable Standards?		

14.	Do/does the contractor and its subcontractors/supplier provide employees with equal opportunities?		
15.	Do/does the contractor and its subcontractors/supplier's practices on harassment and abuse are in line with the Projects' Labor-Management Plan and Applicable Standards?		
16.	Do/does the contractor and its subcontractors/supplier's practices on freedom of association and workers' organization are in line with the Projects' Labor-Management Plan and Applicable Standards		
17.	Do employees free to join their union or workers' organization?		
18.	Are employees paid at least meet the regional minimum wage?		
19.	Are employees provided with sufficient compulsory benefits? Confirm insurance coverage of all employees/workers.		
20.	Are employees paid on time?		
21.	Is overtime payment sufficient?		
22.	Does the contractor maintain adequate timesheets and payrolls for the past 05 years?		
23.	Are employees' working hours recorded sufficiently?		
24.	Are employees provided with an adequate break?		
25.	Are employees' overtime hours in compliance with the legal requirement? Note: Not excess 4 hours/day, 40 hours/month, 300 hours/ year.		
26.	Are employees provided with adequate monthly rest days? (at least 4 days/month)		
27.	Do/does the contractor and its subcontractors/supplier develop a worker grievance mechanism in line with the Projects' Labor-Management Plan and Applicable Standards		
28.	Do/does the contractor and its subcontractors/supplier record all employees' grievances adequately?		
29.	Are all employees' grievances resolved promptly?		
30.	Are all labor-related incidents/issues (including employee relations and occupational health and safety) resolved?		
31.	Do the termination practices of the contractor and its subcontractors/supplier follow the legal requirement and the Project's Applicable Standards?		
32.	Have/has the contractor and its subcontractors/supplier not been involved in retrenchment practices during the past 05 years? If yes, does the contractor follow legal requirements and the Project's Labor-Management Plan and Applicable Standards of doing retrenchment?		
33.	Do/does the contractor and its subcontractors/supplier use safety equipment to separate around project sites to protect the public from major hazards associated with hazardous materials incidents or process failure, as well as nuisance		

	issues related to noise, odors, or other emissions?		
34.	Do/does the contractor and its subcontractors/supplier apply locally regulated or internationally recognized building codes to ensure structures are constructed following sound architectural and engineering practice, including aspects of fire prevention and response?		
35.	Are the contractor and its subcontractors/supplier's engineers and architects responsible for constructing facilities, buildings, plants, and other structures certified for the applicability and appropriateness of the structural criteria employed		
36.	Do/does the contractor and its subcontractors/supplier use hazardous material? If yes, does the contractor they're a procedure for handling hazardous material properly?		
37.	Do/does the contractor and its subcontractors/supplier have a pre-employment screening process to check the health of workers before recruiting?		
38.	Do the contractor and its subcontractors use a worker's camp? If yes, do the contractor develop and implement a worker's camp management procedure in place?		
39.	Do/does the contractor and its subcontractors/supplier prepare an EPRP corresponding to their risks and impacts and in line with the Projects' EPRP and Applicable Standards? Is the EPRP's drill conducted promptly?		

Annex 8-6: Subcontractor's/ Primary Supplier's Monthly Performance Report

SUBCONTRACTOR'S/PRIMARY SUPPLIER'S MONTHLY PERFORMANCE REPORT		
(Construction Phase)		
Name of Contractor/Primary Supplier:	Code:.....	Issued date:
Date of Submission:	Version:.....	
Prepared by:	Position:	
Approved by:	Position:	
CONTRACTOR'S/PRIMARY SUPPLIER'S LABOR AND WORKING CONDITION PERFORMANCE		
The number of workers working on the Projects in the reported period:	Total:	
	No. of male:	No. of female:
The number of workers working on the Projects in the reported period is local people:	Total:	
	No. of male:	No. of female:
The number of workers working on the Projects in the reported period is members of ethnic minority groups:	Total:	
	Name of ethnic minority group 1:	
	No. of male:	No. of female:
	Name of ethnic minority group 2:	
	No. of male:	No. of female:
	(Please add more rows when needed)	
The number of workers working on the Projects who have conducted health check-ups in the reported period:	Total:	
	No. of male:	No. of female:
The number of workers working on the Projects who have been vaccinated against diseases:	Total:	
	No. of male:	No. of female:
Type of diseases that workers have been vaccinated for:		
The number of workers working on the Projects in the reported period who are under 18 years old:	Total:	
	No. of male:	No. of female:
The number of workers working for the Projects in the reported period is members of Trade Union/Workers' Organization:	Total:	
	No. of male:	No. of female:
The number of workers working for the Projects in the reported period who have signed labor contracts:	Total:	
	No. of male:	No. of female:
The number of workers working for the Projects in the	Total:	

reported period is under probation period:	No. of male:	No. of female:
The number of workers working on the Projects in the reported period has been provided with compulsory insurance:	No. of workers provided with Social, Health, and Unemployed Insurance: No. of workers provided with Accident Insurance:	
The number of workers working for the Projects in the reported period working excess legal monthly overtime hours and what department:	Total:	
	No. of male:	No. of female:
The number of workers working for the Projects in the reported period is paid under the regional minimum wage:	Total:	
	No. of male:	No. of female:
The number of grievances in the reported period:	The total number of grievances: Number of resolved grievances: Number of pending grievances:	
The number of workers working for the Projects provided with accommodation:	Total:	
	No. of male:	No. of female:
The number of security guards working for the Projects:	Total: Please specify the location of monitoring:	
Hazardous material being used for the Projects:	Please specify the name of hazardous material, and location of use (which area) and provide a full safety data sheet in both English and the local language.	
What kind of disease was identified related to the contractor's operation concerning the Projects? Please list all activities taken by the contractor during the reporting period to prevent disease exposure to the community.		
Date and type of emergency drills taken. Please attach drill minutes and photo evidence.		
CORRECTIVE ACTIONS TAKEN AND TIMELINE		

Annex 8-7: Internal Labor and Working Conditions Management Audit Checklist

INTERNAL LABOR AND WORKING CONDITIONS MANAGEMENT AUDIT CHECKLIST			
Name of the Projects:		Code:.....	
Date of Audit:		Issued date:.....	
Auditor:		Version:	
No.	Findings	Compliance (Yes/No)	Description
1	Do the Projects have an updated ILR approved by the local authority?		
2	Do the Projects have an updated wage scale approved by the local authority?		
3	Do the Projects have valid C&B Procedures in compliance with the legal requirements?		
4	Do the Projects have valid R&T Procedures in compliance with the legal requirement?		
5	Do the Projects have valid CBA in compliance with the legal requirement?		
6	Are employees provided with the term of the labor contract in compliance with legal requirements? Note: In-defined term-labor contract shall be provided after two (02) defined term-labor contracts.		
7	Are employees provided with a copy of the labor contract?		
8	Do the Projects maintain sufficient employee profiles, including a copy of the aging document?		
9	Do the Projects not employ child labor?		
10	Do the Projects not employ prison labor or slave labor?		
11	Do the Projects not involve human trafficking?		
12	Do the Projects not retain the original document of employees?		
13	Do employees not pay a deposit during the recruitment process?		
14	Do the Projects do not withhold any part of the worker's salary, benefits, properties, or documents?		
15	Do employees have the right to leave the workplace premises after completing the standard working hours?		
16	Are employees free to terminate their employment that they inform VAPCO promptly in line with legal requirements?		
17	Do the Projects recruit employees with no discrimination?		

18	Do the Projects provide employees with equal opportunities?		
19	Do the Projects free from harassment and abuse?		
20	Do employees free to join their union or workers' organizations?		
21	Are employees paid at least the legal minimum wage?		
22	Are employees provided with sufficient compulsory benefits?		
23	Are employees paid on time?		
24	Is overtime payment sufficient?		
25	Do the Projects maintain adequate timesheets and payrolls for the past 05 years?		
26	Are employees' working hours recorded sufficiently?		
27	Are employees provided with adequate breaks?		
28	Are employees' overtime hours in compliance with the legal requirement? Note: Not more than 4 hours/day, 40 hours/month, 300 hours/ year.		
29	Are employees provided with adequate monthly rest days? (at least 4 days/month)		
30	Do the Projects monitor their contractor in terms of labor and working condition management and maintain the records?		
31	How many percentages of female employees work for the contractor/ subcontractors?		
32	How many percentages of local people work for the contractor/ subcontractors? In which, how many percentages of female employees?		
33	How many percentages of members of ethnic minority working for the contractor/ subcontractors? In which, how many percentages of female employees?		
34	Are all labor-related incidents/issues (including employee relations and occupational health and safety) resolved?		

Annex 8-8: Template of Corrective Actions Implementation Status Report

CORRECTIVE ACTIONS IMPLEMENTATION STATUS REPORT								
Name of the Projects/Contractor/Subcontractor/Primary Suppliers: Date of Audit: Auditor name:								Code:..... Issued date: Version:
No.	Audit/Assessment	Identified Issue	Root causes	Corrective Actions				Status (In process/ Closed)
				Action	Person In-charge	Starting Date	Completion Date	

Annex 8-9: Template of Corrective Actions Implementation Status Report

CORRECTIVE ACTIONS IMPLEMENTATION STATUS REPORT								
Name of the Projects/Contractor/Subcontractor/Primary Suppliers: Date of Audit: Auditor name:								Code:..... Issued date: Version:
No.	Audit/Assessment	Identified Issue	Root causes	Corrective Actions				Status (In process/ Closed)
				Action	Person In-charge	Starting Date	Completion Date	

ANNEX 9

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STUP Consultant Pvt. Ltd.
On July 1st, 2021, STUP was acquired by Assystem and rebranded as Assystem STUP.



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Annex 9-1: Emergency Contact Numbers

Incident Command Center (ICC)			
Name	Designation	Designation in ICC (Incident Command Center)	Contact No.

Site Emergency Response Team SERT (First Aid Team)			
Name	Designation	Department	Contact Number

Ambulance Contact Number	

Site Emergency Response Team SERT (Fire Fighting and Rescue Team)			
Sl. No.	Name	Designation	Fire Control Room Number.
1.			0130-7773525; 30156
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			

Annex 9-2: Emergency Scenario

Hazardous materials that generally used at construction project as below:

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- ▶ LPG gas cylinders
- ▶ Paints
- ▶ Solvents
- ▶ Petroleum products including:
 - Fuel
 - Oil
 - Grease
- ▶ Curing compounds
- ▶ Soil stabilizers and binders
- ▶ Plaster
- ▶ Asphalt components and concrete components
- ▶ Pesticides and herbicides.

Storage: The site has stored some diesel for construction purposes. Repeated or prolonged contact with diesel may result in defatting, inflammation, and possible secondary infection. This is a potential carcinogenic agent and triggers slip-trip hazard as well.

Identification of Potential Source of Spills

The hazard management process requires the identification of reasonably foreseeable hazards. Once a potential chemical spill hazard has been identified a risk assessment must be completed. This risk assessment intended to identify risk control measures to reduce the risk and harm to people and the environment.

Primarily, the Site EHS Manager shall identify specific areas on the worksite that have the potential for the occurrence of spill-related incidents during construction and commissioning operations.

Below are the identified areas that need to be focused in view of high hazards:

- a. Area
 - ▶ Fuel Storage
 - ▶ Oil Storage
 - ▶ Hazardous Material and Waste Accumulation
 - ▶ Fuel Delivery and Handling
 - ▶ Electrical Switch Yard and Transformer
- b. Equipment
 - ▶ Crane, Excavator, Rig Machine
 - ▶ Grease at equipment's
 - ▶ Other Mobile Equipment or Plant

The utmost potential for spills of hazardous materials will be at tanks / containers storage, loading / unloading areas, and spills from plant and equipment (e.g., hydraulic leaks, liquid fuel spills).

Gas Leakage / Fire Scenarios

For the construction sites the following Gas leakage / fire scenarios are anticipated:

LPG Gas Leakage from Cylinder and Fire

The site has a storage of approximately 9-10 numbers LPG cylinders at construction site for the purpose of hot work.

- ▶ Any LPG cylinder which develops a leak should be promptly removed to an isolated open place away from any source of ignition;
- ▶ Area Supervisors will inform fire station on phone.
- ▶ Firefighting crew will reach at incident site as per Area Supervisor guidance.

- ▶ Cylinder with valve leakage needs must be capped immediately and tagged by mentioning the defect;
- ▶ In case of leak from the LPG pipe, the cylinder regulator knob/ valve needs to be close;
- ▶ Do not try to repair the appliance or any part of the system when pipe line or appliance in use;
- ▶ Use adequate PPEs;
- ▶ Do not use naked lights to detect the leak;
- ▶ In case of heavy Leak, stop all ignition sources in the vicinity and evacuate all the people to a safe area.
- ▶ In case of outbreak of fire, trigger the firefighting procedures as specified in section 6.1 of this manual.
- ▶ Call first aid team and get medical attention as quickly as possible. In case of any accident such as burn and asphyxiation send the affected people to the OHC and hospital.

Medical Emergency

The site has identified the sudden onset of a medical condition manifesting itself by acute symptoms of sufficient severity including severe pain as medical emergency scenario. The following medical emergencies as identified by the site resulting from:

- ▶ Major injuries caused by traffic accident caused by on-site vehicular movement.
- ▶ Fall from height.
- ▶ Burn injury from electrocution, fire, exposure to hot steam and lightening.
- ▶ Exposure to gas and other chemical.
- ▶ Apart from the above-mentioned medical emergencies, the site has also identified following health crisis:
- ▶ Difficulty and shortness of breathing.
- ▶ Fainting.
- ▶ Chest pain or and high/ fluctuation in blood pressure.
- ▶ Uncontrolled bleeding after injury.
- ▶ Sudden severe pain.

Anthropogenic Emergency Sources

The following emergencies have been identified under this section:

- ▶ Terrorist attack.
- ▶ Workers and local community agitation;
- ▶ Malicious act such as theft and vandalism.

Natural Calamities

The following emergencies have been identified under this section:

- ▶ Earthquake: Earthquakes are unpredictable natural disasters which are of short duration but the consequences can be severe. Based on the information available in the public domain and research publications indicates that the Jashore district comes under the seismic zone – II which indicates that this district falls under the ‘Low Damage Risk Zone’.

Annex 9-3: The Emergency Contact Numbers for External Agencies

Emergency Telephone Numbers:	
Police Contact Number	
Police Helpline	999
Police Headquarter (Operation control Room)	01769-690033
Police control Room Jashore	0421-65031 01320-144098
Superintendent of Police, Jashore (SP)	0421-68622, 0421-66713, 0421-73004, 01320-143100
Addl. SP (Crime & Ops)	0421-66139; 01320-143104
Kowari Model Thana	01713-374161
OC (Korowai PS)	0421-65034; 01320-143180
OC (Jhenaidah PS)	04225-71303; 01320-143206
Inspector (Investigation) Kotwali PS	01320-143181

RAB	
Fire Service	
Fire Service Head Quarter	02-223355555, 02-9555555, 9556666-7, 01713-038181
Jashore Fire Station	0421-65114
Fire Service and Civil Defense, Jhenaidah	024777-61330; 01712437927
Hospital Contact Number	
Jashore 250 bed General Hospital	042161090, 01730324795
Jashore Medical College Hospital	01714812092
Ad-Din Sakina Medical College Hospital	01713488460
Ambulance	01713488460
Army Medical College Hospital, Jashore,	01769 555745
Jhenaidah Upazilla Health Complex	01766896724

Annex 9-4: List of Emergency Equipment

Sl. No.	Equipment Name	Unit	Total
List of Equipment for Fire Emergency			
1.	Fully Equipped Water Fire Truck	Set	10
2.	Fully Equipped Foam Fire Truck	Set	08
3.	Torch Light	PCS	04
4.	Lock Cutter	PCS	03
5.	Fire Hydrant	Liter	41
6.	Fire Bitter	Liter	12
7.	Fire Blanket	NOS	12
8.	Fire Hook	Liter	12
9.	Fire Bucket	PCS	24
10.	Fire Drum	PCS	6
11.	DCP Fire Extinguisher	Liter	498
12.	Co ₂ Fire Extinguisher	Liter	68
13.	Foam Fire Extinguisher	Liter	18
14.	Fixed Fire Foam (Tank Farm Area)	Liter	01 ()
15.	Riser Point	NOS	73
16.	Fire Hose	NOS	185
17.	Hose Box	NOS	140
18.	Fire Water Pump	Set	2
Medical Aid			
1.	Ambulance	NOS	4
2.	First Aid Box	PCS	25
Safety Device & Equipment's			
1.	Life Jacket	PCS	20
2.	Life Buoy	PCS	8
3.	Multi Gas Detector (O ₂ , LEL, H ₂ S, CO)	NOS	03
4.	Single Gas Detector (VOC)	NOS	03
5.	Single Gas Detector (Cl ₂)	NOS	02

Annex 9-6: Risks of Hazardous Spills and Uncontrolled Pollution

Sl. No.	Work area/ Possible Incident	Rescue Operations as part of Emergency	Responsible Persons	Location of Emergency Response equipment and tools	Action of the emergency services
1.	Chemical Spill	1. Emergency Action Procedures will follow steps in	Operator: Dispatcher on duty at the Emergency Control Center		▶ Reconnaissance-rescue team; first aid team and SERT Perform reconnaissance Remove any injured persons out of the gas impact area Administer first aid Mark the gas impact area; ▶ Regional Fire Service and Civil Defense Dept. A team arrives at the incident scene Perform reconnaissance and identifies the fire potential Conduct preliminary dislocation of forces assist the accountable manager to ensure the fire safety and use of the special firefighting equipment as part of the emergency response operation. Emergency Medical Services (EMS) ▶ Provide emergency medical services Transport victims to medical facilities monitors the health condition of emergency team members and provides assistance in case of injuries Local Police Department Cordon off the gas impact area ▶ Provide access to persons involved in the emergency response only Perform visual inspection and collects evidence to identify the cause of the accident.
		2. Prepare PPE	All managers/supervisors		
		3. Check for injured people and if any, provide air breathers and remove them from the area	Emergency Rescue Service		
		4. Suspend are all hazardous activities and evacuate any unauthorized persons	Operator: security guards		
		5. Shut off the power supply at the respective workshop/work area if required	Shift In Charge		
		6. Shut off the power supply of any buildings and facilities or the entire site if required	Electrical technician on duty		
		7. Summon an emergency team	Operator:		
		8. Brief the emergency team about the specific measures to isolate the accident and the relevant hazards and inspect their PPE	Rescue operations accountable manager		
		9. Collect the spilled material and clean the area	Emergency response team		
		10. Identify recovery measures, provide safety induction and access to repair and construction work teams	Rescue operations accountable manager		
		11. Accept repair/construction works and authorize reopening of the facility	Area Manager		
		12. Investigate the cause and suggest measures to prevent recurrence	SERT		
		13. Final recovery measures	Area Manager		
2.	Waste Rock/Product Spill	1. Notification of the entire personnel	Operator: Dispatcher on duty at the Emergency Control Center		▶ Reconnaissance-rescue team ; ERS 1. Perform reconnaissance 2. Remove any injured persons 3. Administer first aid ▶ Emergency Rescue Service ▶ A team arrives at the incident scene
		2. Summon the emergency response team	Accountable manager; Operator:		
		3. Check equipment and PPE of the emergency response team	Accountable manager;		
		4. Arrange for monitoring of the scene; discontinue	Patrol personnel Security		

Sl. No.	Work area/ Possible Incident	Rescue Operations as part of Emergency	Responsible Persons	Location of Emergency Response equipment and tools	Action of the emergency services
		hazardous activities and keep unauthorized persons off the site	personnel		▶ Perform reconnaissance and identifies the fire potential ▶ Conduct preliminary dislocation of forces ▶ Assist the Executive Director to ensure the fire safety and use of the special firefighting equipment as part of the emergency response operations ▶ Emergency Rescue Service ▶ Provide emergency medical service ▶ Transport victims to medical facilities ▶ Monitors the health condition of emergency team members and provides assistance in case of injuries ▶ Local Police Department Cordon off the gas impact area ▶ Provide access to persons involved in the emergency response only ▶ Perform visual inspection and collects evidence to identify the cause of the accident.
		5. In case the incident scene has not been identified, perform reconnaissance by: notifying the rescue team involving an emergency response team in the patrol	Security: Operator: Accountable manager;		
		6. Check for injured people and if any, provide air breathers, remove them from the area and transport to emergency medical service	Accountable manager;		
		7. Assess the incident and any risk for humans and the environment	Accountable manager;		
		8. Assessment report including requirements for additional equipment and forces for emergency localization, isolation and response	Accountable manager;		
		9. Provide extra equipment and forces	Dispatcher on-duty Departmental manager		
		10. Brief the emergency team about the specific measures to isolate the accident and the relevant hazards and inspect their PPE	Accountable manager;		
		11. Collect and haul the spilled material	Accountable manager;		
		12. Accept repair/construction works and authorize reopening of the facility	Accountable manager;		
		13. Investigate the cause and suggest measures to prevent recurrence	SERT		
		14. Final recovery measures	Construction Manager		

ANNEX 10

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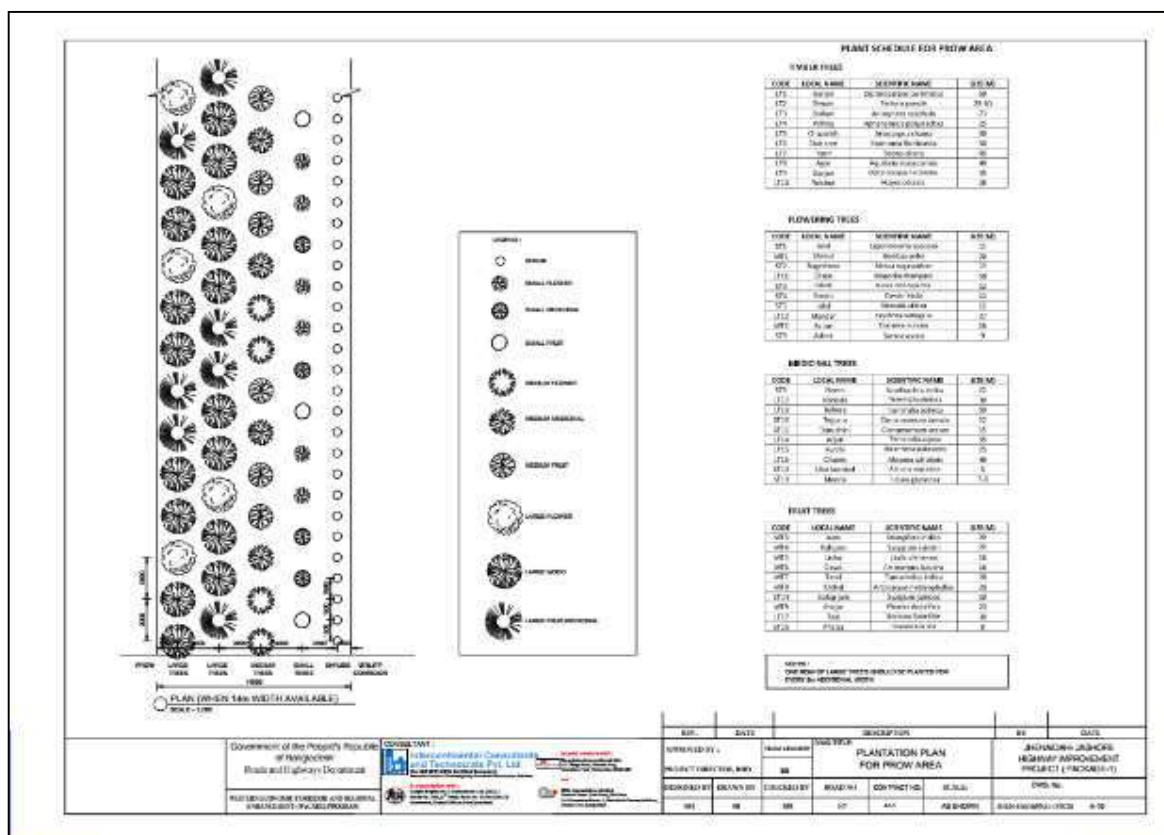


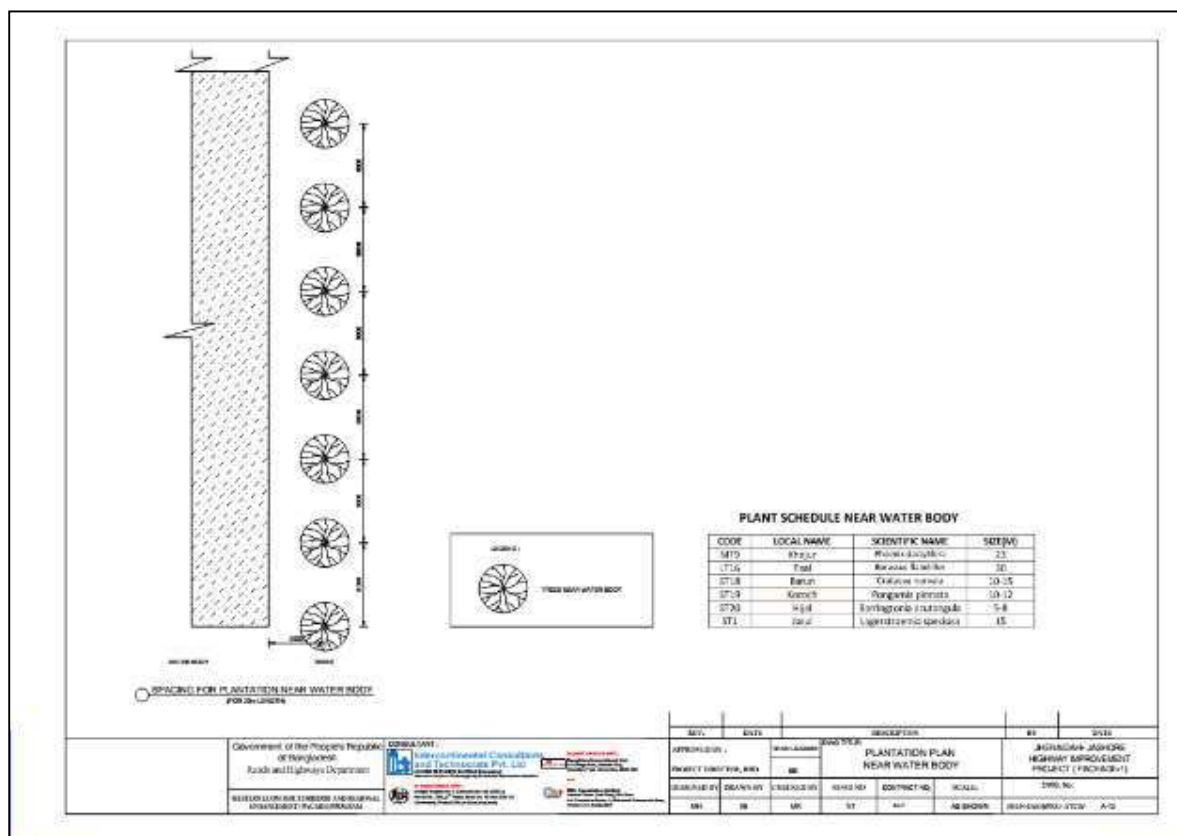
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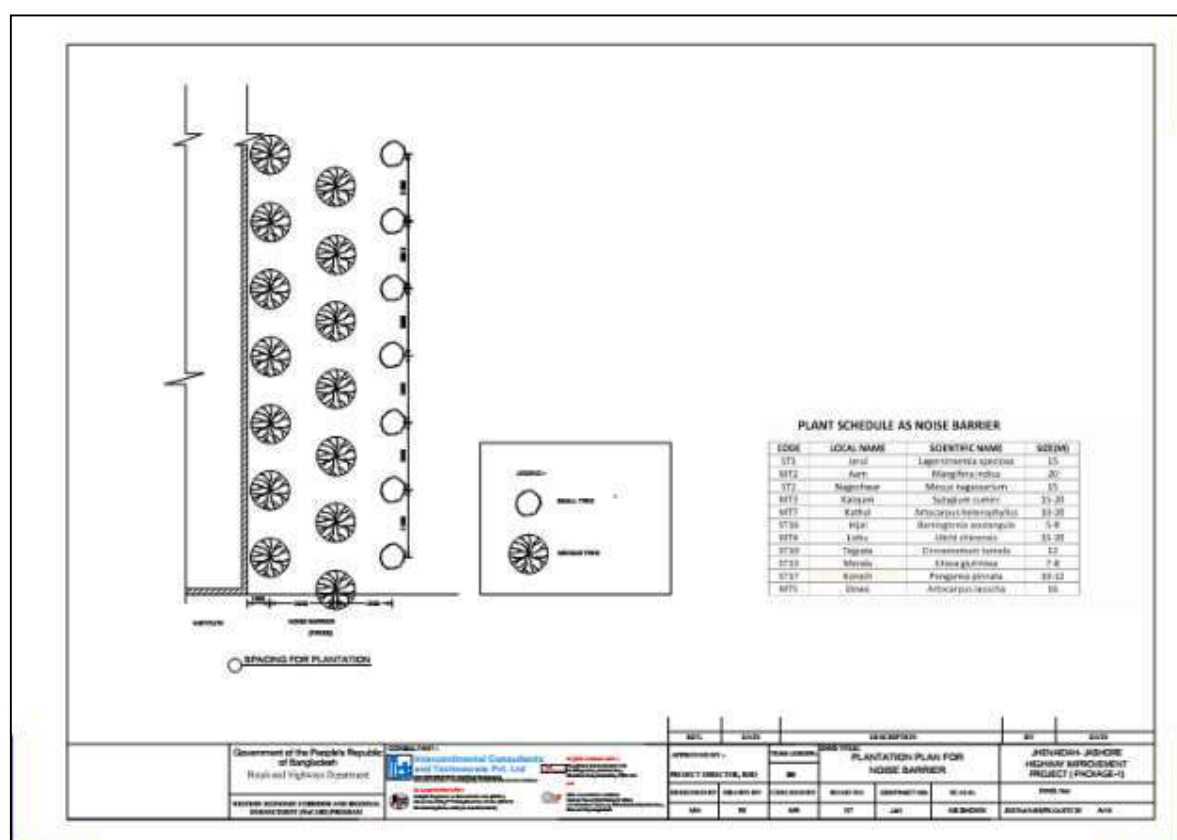
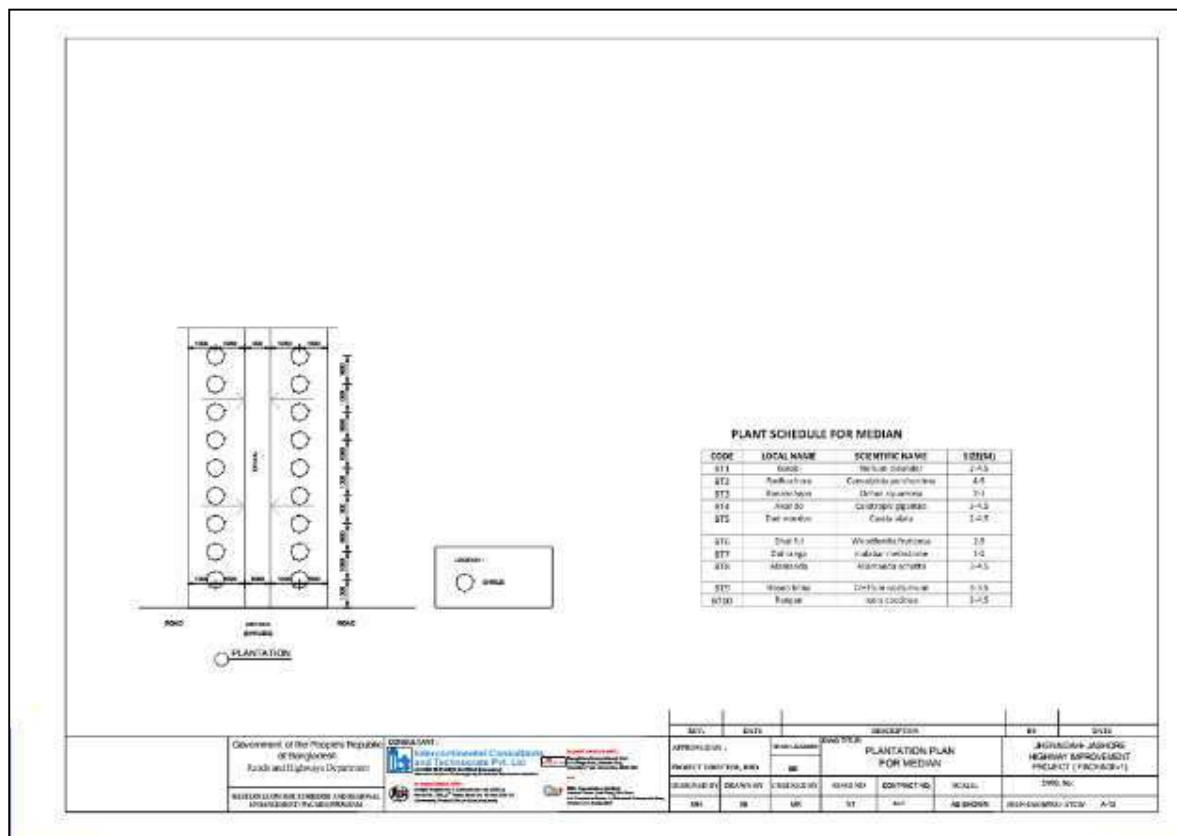
Annex 10-1: Tree Plantation Plan for the Jhenaidah- Jashore Road

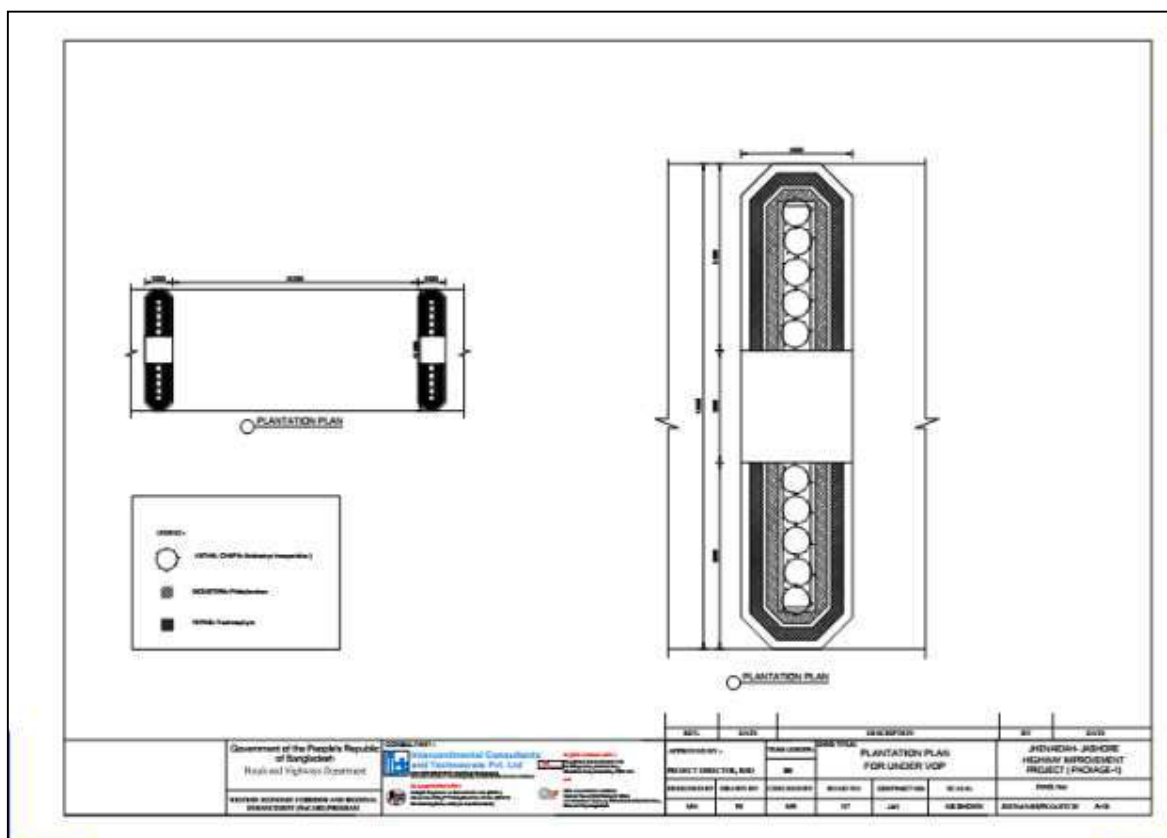
Calculation for Shrub Plantation at Median		
Contract- 1	Contract- 2	Contract- 3
MEDIAN Length- 9.3 km or, 9300m Proposed planting row- 2 2 rows of shrubs planting 1m apart- (9300/1) x2 or, 18600 plants	MEDIAN Length- 6.88 km or, 6880m Proposed planting row- 2 2 rows of shrubs planting 1m apart- (6880/1) x2 or, 13760 plants	MEDIAN Length- 5.46 km or, 5460m Proposed planting row- 2 2 rows of shrubs planting 1m apart- (5460/1) x2 or, 10920 plants

Calculation for shrub plantation and tree plantation at the roadsides		
Contract Contracts	Number of Plants	
	Median	Roadside
	Shrubs 2 Row	Tree at the slope 3 row
CONTRACT I Median length 9300m Shoulder length 7625m Slope length 7625m	18600	18000
CONTRACT II Median length 6880m Shoulder length 2830m Slope length 2830m	13760	27500
CONTRACT III Median length 1820m Shoulder length 1820m Slope length 1820m	10920	3700
Plants for noise barrier Length 2350m		2350
Plants near water bodies Length 600m		600
Monument one		7

[illegible]







Plant Schedule for Median			
Code	Local Name	Scientific Name	Mature Plant Height(m)
ME1	Korobi	<i>Nerium oleander</i>	2-4.5
ME2	Radhachura	<i>Caesalpinia pulcherrima</i>	4-5
ME3	Konokchapa	<i>Ochna squarrosa</i>	2-3
ME4	Akondo	<i>Calotropis gigantea</i>	3-4.5
ME5	Dad mordon	<i>Cassia alata</i>	2-4.5
ME6	Dhaiful	<i>Woodfordia fruticosa</i>	2.5
ME7	Datranga	<i>Melastoma malabarica</i>	1-2
ME8	Alamanda	<i>Allamanda schottii</i>	3-4.5
ME9	Hasnahena	<i>Cestrum nocturnum</i>	3-3.5
ME10	Rangan	<i>Ixora coccinea</i>	3-4.5
ME11	Arhar	<i>Cajanus cajan</i>	3-3.5

Recommended Plant Species for Planation on the slope (All Trees)

Timber Trees			
Code	Local Name	Scientific Name	Mature Plant Height(m)
LT1	Garjan	<i>Dipterocarpus costatus</i>	50-60
LT2	Shegun	<i>Tectona grandis</i>	30-40
LT3	Boilum	<i>Anisoptera scaphula</i>	60-75
LT4	Pitraj	<i>Aphanamixis polystachya</i>	25-30
LT5	Chapalish	<i>Artocarpus chama</i>	30-35
LT6	Civit	<i>Swintonia floribunda</i>	50-55
LT7	Toon	<i>Toona ciliata</i>	40-45
LT8	Agar	<i>Aquilaria malaccensis</i>	35-40
LT9	Telsur	<i>Hopea odorata</i>	40-50
LT10	Teligarjon	<i>Dipterocarpus turbinatus</i>	55-60

Ornamental Trees			
Code	Local Name	Scientific Name	Mature Plant Height(m)
ST1	Jarul	<i>Lagerstroemia speciosa</i>	15-17
MT1	Shimul	<i>Bombax ceiba</i>	20-25
ST2	Nageshwar	<i>Mesua nagassarium</i>	15-17
LT11	Champa	<i>Michaellia champaka</i>	50-55
ST3	Polash	<i>Butea monosperma</i>	15-17
ST4	Sonalu	<i>Cassia fistula</i>	14-16
ST5	Udal	<i>Sterculia villosa</i>	15-20
LT12	Mander	<i>Erythrina variegata</i>	25-30
MT2	Borun	<i>Crataeva nurvala</i>	16-20
ST8	Ashok	<i>Saraca asoca</i>	12-Oct

Medicinal Trees			
Code	Local Name	Scientific Name	Mature Plant Height(m)
ST9	Neem	<i>Azadirachta indica</i>	15-20
LT12	Haritaki	<i>Terminalia chebula</i>	30-32
LT13	Bohera	<i>Terminalia bellirica</i>	40-42
ST10	Tejpata	<i>Cinnamomum tamala</i>	25-27
ST11	Daruchini	<i>Cinnomum verum</i>	15-17
LT14	Arjun	<i>Terminalia arjuna</i>	30-35
LT15	Kurchi	<i>Holarrhena antidysenterica</i>	12-15
LT16	Chatim	<i>Alstonia scholaris</i>	40-45
ST12	Utotkombol	<i>Abroma augusta</i>	4-5
ST13	Chapaitta/Menda	<i>Litsea glutinosa</i>	15-20

Fruit trees			
Code	Local Name	Scientific Name	Mature Plant Height(m)

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Fruit trees			
Code	Local Name	Scientific Name	Mature Plant Height(m)
MT3	Aam	<i>Mangifera indica</i>	20-25
MT4	Kalojam	<i>Syzygium cumini</i>	20-26
MT5	Litchu	<i>Litchi chinensis</i>	15-17
MT6	Deoa	<i>Artocarpus lacucha</i>	16-20
MT7	Tentul	<i>Tamarindus indica</i>	20-25
MT8	Kantal	<i>Artocarpus heterophyllus</i>	15-20
ST14	Golapjam	<i>Syzygium jambos</i>	12-15
MT9	Khejur	<i>Phoenix dactylifera</i>	20-25
LT17	Taal	<i>Borassus flabellifer</i>	25-30
ST15	Phalsa	<i>Grewia asiatica</i>	8-10

Plant Schedule as Noise Barrier

Code	Local Name	Scientific Name	Mature Plant Height(m)
MT1	Jarul	<i>Lagerstroemia speciosa</i>	15
MT2	Aam	<i>Mangifera indica</i>	15-20
MT3	Nageshwar	<i>Mesua nagassarium</i>	15
MT4	Kalojam	<i>Syzygium cumini</i>	15-20
MT5	Kathal	<i>Artocarpus heterophyllus</i>	10-20
MT6	Hijal	<i>Barringtonia acutangula</i>	5-8
MT7	Lichu	<i>Litchi chinensis</i>	15-20
MT8	Chatim	<i>Alstonia scholaris</i>	40
MT9	Menda	<i>Litsea glutinosa</i>	7-8
MT11	Karoz	<i>Pongamia pinnata</i>	10-12
MT12	Dewa	<i>Artocarpus lacucha</i>	10-15

Plant Schedule Near Water Body

Code	Local Name	Scientific Name	Mature Plant Height(m)
MT13	Khejur	<i>Phoenix dactylifera</i>	23
MT14	Tal	<i>Borassus flabellifer</i>	30
MT15	Barun	<i>Crataeva nurvala</i>	10-15
MT11	Koroch	<i>Pongamia pinnata</i>	10-12
MT6	Hijal	<i>Barringtonia acutangula</i>	5-8
MT1	Jarul	<i>Lagerstroemia speciosa</i>	15
MT16	Narikel	<i>Cocos nucifera</i>	18

Plants Schedule for Monument

Code	Local Name	Scientific Name	Mature Plant Height(m)
LT1	Garjan	<i>Dipterocarpus costatus</i>	50-60
LT3	Boilum	<i>Anisoptera scaphula</i>	60-75
LT5	Chapalish	<i>Artocarpus chama</i>	30-35
LT6	Civit	<i>Swintonia floribunda</i>	50-55
LT9	Telsur	<i>Hopea odorata</i>	40-50
LT10	Teligarjon	<i>Dipterocarpus turbinatus</i>	55-60

Annex 10-2: Contractors Reporting Formats

EC-1: POLLUTION MONITORING (CONSTRUCTION)

(To be submitted by the Contractor)

Name of the Corridor : _____

Contract Name/No : _____

Construction Stage: Monthly Report: Date _____ Month _____ Year _____

(Site Layout of all locations to be attached with format)

Sl. No.	Chainage (Km)	Details of Location	Duration of Monitoring	Instruments Used	Parameters	Standards	Results	Reason for exceeding std, if any	Mitigation Measures Suggested	Category of Zone	Remarks
		Air Quality Monitoring									
1.											
2.											
		Water Quality Monitoring									
1.											
2.											
		Noise Level Monitoring									
1.											
2.											
		Soil Quality Monitoring									
1.											
2.											

Remarks

Submitted

Signature
Name
Designation
Contractor

Checked

Signature
Name
Environmental Specialist
CSC

Approved

Signature
Name
Resident Engineer/Team Leader
CSC

EC-2: ARRANGEMENT OF TEMPORARY LAND

(To be submitted by the Contractor)

Name of the Corridor : _____

Contract Name/No : _____

Construction Stage: Monthly Report:

Date _____ Month _____ Year _____

(Site Layout of all locations to be attached with format)

Sl. No.	Item	Location					Present Land Use	Size (Lx W)	Existing trees (>30m girth)	Dist from nearest settlement	Dist from nearest water source	Site Approved (Y/N)	Remarks by CSC/PIU
		Village Name	Chainage (Km)	Side of the road (LHS/RHS)	Area m ²	Haul Road (m)							
Borrow Areas													
1.	BA-1												
2.	BA-2												
Construction Camp													
1.	CC-1												
Batching Plant													
1.	BP-1												
2.	BP-2												
Hot Mix Plant													
1.	HMP-1												
Stock Yard													
1.	SY-1												
2.	SY-2												

Remarks

Submitted

Signature
Name
Designation
Contractor

Checked

Signature
Name
Environmental Specialist
CSC

Approved

Signature
Name
Resident Engineer/Team Leader
CSC

EC-3: ESTABLISHMENT OF HOT MIX PLANT /BATCHING PLANT

(To be submitted by the Contractor)

Name of the Corridor : _____

Contract Name/No : _____

Construction Stage: Monthly Report: Date _____ Month _____ Year _____

(Site Layout of all locations to be attached with format)

Sl. No.	Location				Area (m ²)	Distance from nearest Water Course (m)	Distance from nearest settlement	Existing land use	Prevalent wind direction	If settlements are in down wind direction (Y/N)	Photograph of the proposed site enclosed?	Approved by EO (Y/N)
	Village Name	Chainage (Km)	Side (LHS /RHS)	Haul road length (m)								

Remarks

Submitted

Signature
Name
Designation
Contractor

Checked

Signature
Name
Environmental Specialist
CSC

Approved

Signature
Name
Resident Engineer/Team Leader
CSC

EC-4: SAFETY (CONSTRUCTION) CHECK LIST

(To be submitted by the Contractor)

Name of the Corridor : _____
Contract Name/No : _____
Construction Stage: Monthly Report : _____ Date _____ Month _____ Year
Name of the Safety Officer : _____
Date of Inspection : _____

Particulars	Location-1			Location-2			Location-3			Remarks
	A	B	C	A	B	C	A	B	C	
General										
House Keeping										
Stacking of Material										
Passageway										
Lighting										
Ventilation										
Others										
Electrical										
Switches										
Wiring										
Fixed Installation										
Portable Lighting										
Portable Tool										
Welding Machine										
Others										
Fire Prevention										
Fire Fighting Appliances										
Inflammable Good Store										
Gas Welding Cylinders										
Others										
Personal Protection										
Helmet										
Eye Protector										
Ear Protector										
Respirator										
Safety Shoes										
Safety Belts										
Others										
First Aid Equipment										
Washing Facility										
Latrine										
Canteen										
Dust Control										
Noise Control										

Submitted

Signature
Name
Designation
Contractor

Checked

Signature
Name
Environmental Officer
CSC

Approved

Signature
Name
Resident Engineer/Team Leader
CSC

EC-5: ROAD SAFETY

(To be submitted by the Contractor)

Name of the Corridor : _____

Contract Name/No : _____

Sketch of construction zone showing all sub zones and location of signs etc. to be attached with format

Format on Acquisition of Temporary diversion to be attached with this format.

Construction Stage: Monthly Report. Date Month Year

Diversion No _____ Location (Km _____)

Sl. No.	Item	Unit	Compliance	Remarks
	Details of Construction Zone			
1.	Length of Construction Zone	Km		
2.	Distance between this and next construction zone	Km		
3.	Length of transition sub zone (should be min 50m for a speed of 50 Km/hr.)			
4.	Length of work sub zone in urban stretch (should be < 2 Km)	Km		
5.	Length of work sub zone in rural stretch (5-10 Km)	Km		
6.	Distance between two work sub zones			
	Signages in Construction Zones			
1.	Sign saying 'Men at Work' 1 Km ahead of transition sub zone	Y/N		
2.	Supplementary sing saying diversion 1 Km provide	Y/N		
3.	Sign Saying 'Road Closed Ahead' provide	Y/N		
4.	Compulsory Right Turn/Left Turn sing provide	Y/N		
5.	Detour sing placed	Y/N		
6.	Sharp deviation sign place at end of advance warning sub zone	Y/N		
	Signage in Transition Sub Work Zone			
1.	Signage saying 'Keep Right /Left' provided	Y/N		
2.	Delineators placed along lengh of transition	Y/N		
	Signage in work sub zone			
1.	Hazard Marker placed where railing for CD structure on diversion starts	Y/N		
2.	Barricade on either side of work sub zone	Y/N		
	Signage in Termination of Sub Zone			
1.	Sign for indication of end of wok zone 120 m form end of termination sub zone	Y/N		
	Road Delineator			
1.	Roadway indicator provided	Y/N		
2.	Hazard Markers Provide	Y/N		
3.	Object Markers Provided	Y/N		

Submitted

Checked

Approved

Signature

Signature

Signature

Name

Name

Name

Designation

Environmental Officer

Resident Engineer/Team Leader

Contractor

CSC

CSC

EC-6: ACCIDENT REPORTING

(To be submitted by the Contractor)

Name of the Corridor : _____

Contract Name/No : _____

Construction Stage: Monthly Report. Date Month

Part-I: Type of Accident

D01 ()	Fall of person from a height	D11 ()	Explosion
D02 ()	Slip, trip or fall on same level	D12 ()	Fire
D03 ()	Struck against fixed objects	D13 ()	Contact with hot or corrosive substance
D04 ()	Struck by faying or falling objects	D14 ()	Contact with poisonous gas or toxic substances
D05 ()	Stuck by moving objects	D15 ()	Hand tool accident
D06 ()	Struck/caught by cable	D16 ()	Vehicles/mobile plant accident
D07 ()	Stepping on nail etc.	D17 ()	Machinery operation accident
D08 ()	Handling without machinery	D18 ()	Other (please specify)
D09 ()	Crushing/burying	D19 ()	
D10 ()	Drowning or Asphyxiation	D20 ()	

Agent involved in accident

E01 ()	Machinery	E11 ()	Excavation /underground working
E02 ()	Portable power appliance	E12 ()	Ladder
E01 ()	Vehicle or associated equipment/ machinery	E13 ()	Scaffolding/gondola
E01 ()	Material being handled, used or stored	E14 ()	Construction framework, shuttering and false work
E01 ()	Gas, vapor, dust fume or oxygen	E15 ()	Electricity supply cable, wiring switch board and associate equipment
E01 ()	Hand tools	E16 ()	Nail, slinter or chipping
E01 ()	Floor edge	E17 ()	Other (please specify)
E01 ()	Floor opening	E18 ()	
E01 ()	Left shaft	E19 ()	
E10 ()	Stair edge	E20 ()	

Unsafe action Relevant to the accident			
F01 ()	Operating without authority	F11 ()	Failure to use eye protector
F02 ()	Failure to secure objects	F12 ()	Failure to use respirator
F03 ()	Making safety devices inoperative	F13 ()	Failure to use proper clothing
F04 ()	Working on moving or dangerous equipment	F14 ()	Failure to use warn others or given proper signals
F05 ()	Using un-safe equipment	F15 ()	Horseplay
F06 ()	Adopting unsafe position or posture	F16 ()	No unsafe action
F07 ()	Operating or working at unsafe speed	F17 ()	Others (please specify)
F08 ()	Unsafe loading, placing, mixing etc.	F18 ()	
F09 ()	Failure to use helmet	F19 ()	
Accident Reporting Format			
F10 ()	Failure to use proper footwear	F20 ()	
G01 ()	No protective gear	G08()	Unsafe layout of job, traffic etc.
G02 ()	Defective protective gear	G09()	Unsafe process of job methods
G03 ()	Improper dress /foot wear	G10()	Poor housekeeping
G04 ()	Improper guarding	G11()	Lack of warming system
G05 ()	Improper ventilation	G12()	Defective tool, machinery or material
G06 ()	Improper illumination	G13()	No unsafe condition
G07 ()	Improper procedure	G14()	Others (please specify)
Personal Factor Relevant to the Accident			
H01()	Incorrect Attitude/motive	H04()	Others (please specify)
H02()	Unsafe act by another person	H05()	
H03()	No unsafe personal factor	H06()	

Submitted

Checked

Approved

Signature

Signature

Signature

Joint Venture of



STUP Consultant Pvt. Ltd.
On July 1st, 2021, STUP was acquired by Assystem and rebranded as Assystem STUP.



BCL Associates Limited, Bangladesh

Name	Name	Name
Designation	Environmental Officer	Resident Engineer/Team Leader
Contractor	CSC	CSC

Part-II: Completed upon Finalization of Employee's Compensation Claim

101 () No permanent incapacity
 102 () Less than 5% incapacity
 103 () More than 5% incapacity
 104 () Final

Submitted	Checked	Approved
Signature	Signature	Signature
Name	Name	Name
Designation	Environmental Officer	Resident Engineer/Team Leader
Contractor	CSC	CSC

EC-7: DETAILS OF MACHINERY IN OPERATIONS

(To be submitted by the Contractor)

Name of the Corridor : _____

Contract Name/No : _____

Construction Stage: Monthly Report: Date _____ Month _____ Year _____

[Copies of the Pollution under Control (PUC) Certificates to be enclosed]

Details of the Machinery in Operation

Sl. No.	Name of the Machinery	No	Servicing due	Remarks
1.	Excavator			
2.	Grader/Dozers			
3.	Stone Crushing Plant			
4.	WMM Plant			
5.	Asphalt Plant			
6.	Concrete Batching Plants			
7.	Concrete Pumps			
8.	Pneumatic Tyre Rollers			
9.	Vibratory Rollers			
10.	Tandem Rollers			
11.	Cranes			
12.	Piling Equipment			
13.	Transit Mixers			
14.	Emulsion Distributors			
15.	Pay loader			
16.	Dumper			
17.	D G Set			

Remarks

Submitted

Signature
Name
Designation
Contractor

Checked

Signature
Name
Environmental Officer
CSC

Approved

Signature
Name
Resident Engineer/Team Leader
CSC

EC-8 RESTORATION OF CONSTRUCTION SITES

(To be submitted by the Contractor)

Name of the Corridor : _____

Contract Name/No : _____

Construction Stage: Monthly Report: Date _____ Month _____ Year _____

Sl. No.	Labour Camp		Construction Camp		Plant Site		Borrow Areas		Disposal Locations		Top Soil stockyard	
	O	R										
1												

O= Operational, R=Restored

Sl. No	Particulars	Status
1	Is the restoration as per with negotiation between the parties	
2	Has all the debris/unwanted material been removed by Contractor?	
3	Has the slope protection/erosion control been taken into consideration?	
4	Has the drainage been taken into consideration?	
5	Has to top soil been spread on the restored site?	
6	Is the handing over letter enclosed by Contractor	
7	Any other issues to be addressed by Contractor	

Remarks:

Submitted

Signature
Name
Designation
Contractor

Checked

Signature
Name
Environmental Officer
CSC

Approved

Signature
Name
Resident Engineer/Team Leader
CSC

EC-9: FORMAT FOR REGISTER OF SITES OPENED AND CLOSED AND IT'S REPORTING

(To be submitted by the Contractor)

Name of the Corridor : _____

Contract Name/No : _____

Construction Stage: Monthly Report: Date _____ Month _____ Year _____

Contract date and duration _____

Site Details

Sl. No.	Site opening date	Type of Site*	Address of site (Place name – Village name, Revenue No., Survey No. Panchyat	Name and address of the owner	List of approval required	Issue date of approval	Expiry date of approval	Site closing date	Redevelopment status	Remarks	Signature of EO of Contractor
1.											
2.											
3.											

- Construction Camp/Labour Camp/Quarry area & Stone crusher/Borrow Area/Debris/Water Source.
- Remarks

Submitted

Signature
Name
Designation
contractor

Checked

Signature
Name
Environmental Officer
CSC

Approved

Signature
Name
Resident Engineer/Team Leader
CSC

EM-1: IDENTIFICATION OF DUMPING SITES LOCATIONS

Name of the Corridor : _____

Contract Name/No : _____

Criteria on which information for each site is to be collected			
Area covered (m ²)			
Total Material that can be dumped in that site (m ³)			
Depth to which dumping is feasible (m)			
Distance of nearest watercourse (m)			
Nearest Settlement (m)			
Date(s) of Community Consultation(s)			
Whether the community is agreeable to siting of dumping site (Y/N)			
Date of Permission from Land Owner			
Proposed future use of the Site			

Certified that the above information is correct to the best of my knowledge and belief.

(Contractor)

Verified:

Date:

Recommendation on the suitability of the site

Signed:

Date:

Name & Designation:

Decision Taken:

Approved/Not Approved

Signed:

Date:

Name and Designation of Deciding Authority

Enclosures

(Tick as appropriate)

- 1 Lay out plan of dumping site
- 2 Photographs
 - a Land use of proposed site
 - b Each community consultation
- 3 Copy of the negotiation between individual land owner/community and Contractor
- 4 Slope protection measures details
- 5 Contractors' methodology to compact at stages to avoid any future slides from the dumping sites

EM-2: IDENTIFICATION OF WATER STORAGE LOCATION

Name of the Corridor : _____

Contract Name/No : _____

Construction Stage: One time Reporting. Date Month Year

Location of the dumping site - Geo-reference: - Name of village:	
Type of owner ship (Private/Community/Government)	
Whether copy of negotiation enclosed?	
Lay out plan of the proposed site enclosed?	
Detailed methodology and sketch for proposed storage enclosed?	
Area likely to be covered (m ²)	
Likely storage capacity of the proposed site (m ³)	
Any chance of submergence of agricultural /jhum or residential area?	
Details on the safety of the check dam/bund taken into consideration enclosed?	
Distance of the nearest house? (m)	
Is there any likely damage to the any property due to storage of water?	
Does the negotiation cover during for Contractor's usage and future hand over?	

Certified that the above information is correct to the best of my knowledge and belief.

(Contractor)

Verified:

Date:

Recommendation on the suitability of the site

Signed:

Date:

Name & Designation:

Decision Taken:

Approved/Not Approved

Signed:

Date:

Name and Designation of Approving Authority

Enclosures

(Tick as appropriate)

- 1 Lay out plan of water storage site
- 2 Photographs
 - a Land use of proposed site
 - b Each community consultation
- 3 Copy of the negotiation between individual land owner/community and Contractor
- 4 Detailed methodology and sketch of the proposed storage
- 5 Safety of check dam/ bund taken into consideration

EM-3: SETTING UP OF LABOUR CAMP

(To be submitted by the Contractor)

Name of the Corridor : _____

Contract Name/No : _____

Construction Stage: _____ . Date Month Year

(Site Layout of labor camp and working drawings of dwelling units with allied facilities to be attached with format)

Format to be submitted at least 15 days before date of expected operation of camp

Location of Camp (Km) _____

Sl. No.	Item	Unit	Details	Remarks by Engineer if any
1	Detail of item camp			
a	Size of Camp	Mxm		
b	Area of Camp	sq.m		
c	Distance from Nearest Settlement			
d	Distance from Nearest Water Source	Type/Size/Capacity/Present Use/Ownership		
e	Date of camp being operational dd/mm/yy			
f	Present land use			
g	No other trees with girth > 0.03m.			
h	Details of Storage area (Availability of impervious surface)	mxm		
i	Availability of separate waste disposal from storage area	Cum		
2	Details of top soil stacking			
a	Quantity of top soil removed from the site	sq.m		
b	Detail of storage of topsoil	Describe stacking arrangement		
3	Details of workforce			
a	Total No of Laborer	nos		
b	Total no of Male Workers	nos		
c	No of Male Workers below 18 years of age	nos		
d	Total No of Female Workers	nos		
e	No of Female workers below 18 years of age	nos		
f	No of children	nos		
4	Details of dwelling units			
a	No of dwellings/huts	nos		
b	Minimum Size of Dwelling	mxm		
c	No of openings per dwelling	nos		
d	Minimum size of opening	mxm		
e	Walls	specifications		
f	Roofing	specifications		
g	Flooring	specifications		
h	Drinking Water Tank	specifications		
i	Capacity of Drinking water Tank	cum		
j	Size of Drinking Water Tank	mxmxm		
k	Total no of WC	nos		
l	No of Wcs for female workers	nos		
m	Minimum Size of WC	mxm		
n	Total No of Bathrooms for female workers	nos		
o	Size of septic tank for WC/Baths	mxmxm		
p	Capacity of Water Tank for WCs/ Bathrooms and general purpose			
q	Fencing around camp	Y/N		
5	Details of facilities			
a	Availability of security guard 24 hrs a day	Yes/No		
b	Details of First Aid Facility	Yes/No		
c	Availability of Day Care Centre	Yes/No		
d	Availability of dust bins (capacity 60 Ltrs)	nos		
e	Canteen facilities for labors	Yes/No		

Remarks

Submitted

Signature
Name
Designation
Contractor

Checked

Signature
Name
Environmental Officer
CSC

Approved

Signature
Name
Resident Engineer/Team Leader
CSC

Joint Venture of



STUP Consultant Pvt. Ltd.
On July 1st, 2021, STUP was acquired by Assystem and rebranded as Assystem STUP.



BCL Associates Limited, Bangladesh

EM-4: TOPSOIL AND EARTH WORK MANAGEMENT

(To be submitted by the Contractor)

Name of the Corridor : _____

Contract Name/No : _____

Construction Stage: Monthly Report: Date _____ Month _____ Year _____

Details of the Top Soil

Sl. No.	Particulars	Details
1.	TOPSOIL DETAILS	
a.	Topsoil stock before start of the reporting month?	
b.	Topsoil collected and stored during reporting month	
c.	Quantity of topsoil collected from the Borrow Areas	
d.	Quantity of topsoil collected from clearing and grubbing	
e.	Quantity of topsoil collected from other locations (specify location)	
f.	Location of the topsoil stored	
g.	Quantity of the topsoil utilized during reporting month?	
h.	Details on location and reason for usage?	
i.	Anticipated period of storage	
j.	Slope of the pile (V:H)	
k.	Whether site fencing is provided?	
l.	Is any other covering / measure provided? If yes, what is it?	
m.	Improvements required (Y/N)	
n.	Extent of Compliance as on date of report	
o.	Location(s) where topsoil has been utilized (specify in a location plan)	
2	EARTH WORK	
a.	Quantity of the earth excavated from existing road	
b.	Total quantity of earth work reused in cu m	
c.	Location of disposal /utilization (if other than sites) (specify clearly on a location plan)	
d.	Quantity of earth work re-used in the fill operation	

Remarks

Submitted

Signature
Name
Designation
Contractor

Checked

Signature
Name
Environmental Officer
CSC

Approved

Signature
Name
Resident Engineer/Team Leader
CSC

EM-5: TREE CUTTING /STUMP REMOVAL

(To Be Submitted by The Contractor)

Name of the Corridor : _____

Contract Name/No : _____

Construction Stage: Monthly Report: Date _____ Month _____ Year _____

Sl. No.	Chainage (Km)/Geo-reference coordinate	Distance from edge of existing road	Identification number marked in field (Tree/Stump)	Species		Girth (cm)	Dry/Green	Average Height (m)	Remarks
				Local Name	Botanical Name				
1.									
2.									
3.									
4.									
5.									

Remarks

Submitted

Signature
Name
Designation
Contractor

Checked

Signature
Name
Environmental Officer
CSC

Approved

Signature
Name
Resident Engineer/Team Leader
CSC

EM 6: BORROW AREA IDENTIFICATION

(To be submitted by the Contractor)

Name of the Corridor : _____

Contract Name/No : _____

Construction Stage Report : Date ____ Month ____ Year ____

Site Layout of Borrow Area and Proposed Redevelopment Plan to be attached with format

Format to be submitted with complete documents at least 15 days before operation of Borrow Areas

Borrow Area No. _____

Location of Borrow Area (geo-reference coordinate and name of the village):

Borrow Area Identification				
Sl. No.	Item	Unit	Details	Remarks by Contractor, if any
1	Statutory Clearance			
a	If copy of the environmental clearance enclosed?			
b	If copy of permission enclosed for tree felling?			
c	If copy of Consent from MPCB enclosed?			
2	Details of Borrow Area			
a	Date of Borrow area becoming operational dd/mm/yy			
b	Current land use			
c	Distance from Nearest Settlement	Km		
d	No of houses within 200m of Haul Road	No.		
e	No of houses within 500m of Borrow Area	No.		
f	Total Capacity	cum		
g	No of Trees affected with girth more than 0.03 m	No.		
h	Length of Haul Road	Km		
i	Width of Haul Road	m		
j	Type of Haul Road	metal/dirt		
k	Size of Borrow Area	sqkm		
l	Area of Borrow Area	Km x Km		
m	Quantity Available	cum		
n	Distance of Nearest Water Source	Type/Size/Capacity/Present Use/Ownership		
o	Daily/occasional use of the Borrow Area by the community, if any	-		
p	Drainage channels/slope/characteristics of the area	-		
3	Enhancement Elements			
a	Preventive measures for			
i	Mosquito Breeding			
ii	Water run-off/contamination			
iii	Any other environmental degradation			
b	Health and safety issues			
i	Details of PPE arranged for workforce?			
ii	Details of first aid arrangement for workers?			
iii	Details of toilet and urinal arrangement for workers?			
iv	Details of drinking water facilities proposed for workers?			
4	Details of workforce			
a	Total No of Laboure's	No.		
b	Total no of Male Workers	No.		
C	No of Male Workers below 18 years of age	No.		
d	Total No of Female Workers	No.		
e	No of Female workers below 18 years of age	No.		

Borrow Area Identification				
Sl. No.	Item	Unit	Details	Remarks by Contractor, if any
5	Details of redevelopment/rehabilitation Plan enclosed			

Remarks

Submitted

Signature
 Name
 Designation
 Contractor

Checked

Signature
 Name
 Environmental Officer
 CSC

Approved

Signature
 Name
 Resident Engineer/Team Leader
 CSC

EM-7: AGGREGATE QUARRY IDENTIFICATION

(To be submitted by the Contractor)

Name of the Corridor : _____

Contract Name/No : _____

Construction Stage Report: Date ____ Month ____ Year ____

Site Layout of Quarry Area and Proposed Redevelopment Plan to be attached with format

Format to be submitted with complete documents at least 15 days before operation of Quarry Areas

Quarry Area No. _____

Location of Quarry Area (geo-reference coordinate and name of the village):

Aggregate Quarry Identification				
Sl. No.	Item	Unit	Details	Remarks by Contractor, if any
1	Statutory Clearance			
a	If copy of the environmental clearance enclosed?			
b	If copy of permission enclosed for tree felling?			
c	If copy of Consent from MPCB enclosed?			
d	If copy of permission under Bangladesh Explosive Act enclosed?			
2	Details of Quarry Area			
a	Date of quarry area becoming operational dd/mm/yy			
b	Current land use			
c	Distance from Nearest Settlement	Km		
d	No of houses within 200m of Haul Road	No.		
e	No of houses within 500m of Quarry Area	No.		
f	Total Capacity	cum		
g	No of Trees affected with girth more than 0.03 m	No.		
h	Length of Haul Road	Km		
i	Width of Haul Road	m		
j	Type of Haul Road	metal/dirt		
k	Size of Quarry Area	sqkm		
l	Area of Quarry Area	Km x Km		
m	Quantity Available	cum		
n	Distance of Nearest Water Source	Type/Size/Capacity/Present Use/Ownership		
o	Daily/occasional use of the Quarry Area by the community, if any	-		
p	Drainage channels/slope/characteristics of the area	-		
3	Enhancement Elements			
a	Preventive measures for			
i	Mosquito Breeding			
ii	Water run-off/contamination			
iii	Any other environmental degradation			
b	Health and safety issues			
i	Details of PPE arranged for workforce?			
ii	Details of first aid arrangement for workers?			
iii	Details of toilet and urinal arrangement for workers?			
iv	Details of drinking water facilities proposed for workers?			
4	Details of workforce			
a	Total No of Labourers	No.		
b	Total no of Male Workers	No.		
c	No of Male Workers below 18 years of age	No.		

Aggregate Quarry Identification				
Sl. No.	Item	Unit	Details	Remarks by Contractor, if any
d	Total No of Female Workers	No.		
e	No of Female workers below 18 years of age	No.		
5	Details of redevelopment/rehabilitation Plan enclosed			

Remarks:

Submitted

Signature
Name
Designation
Contractor

Checked

Signature
Name
Environmental Officer
CSC

Approved

Signature
Name
Resident Engineer/Team Leader
CSC

EM-8: SETTING UP OF CONSTRUCTION CAMP

(To be submitted by the Contractor)

Name of the Corridor : _____
Contract Name/No : _____
Construction Stage : _____ Date Month Year
(Site Layout of Construction camp and working drawings of dwelling units with allied facilities to be attached with format)
Format to be submitted at least 15 days before date of expected operation of camp
Location of Camp (Km _____)

Construction Camp				
Sl. No.	Item	Unit	Details	Remarks by CSC if any
1	Detail of item camp			
a	Size of Camp	Mxm		
b	Area of Camp	sq.m		
c	Distance from Nearest Settlement			
d	Distance from Nearest Water Source		Type/Size/Capacity/Present Use/Ownership	
e	Date of camp being operational dd/mm/yy			
f	Present land use			
g	No other trees with girth > 0.03m.			
h	Details of Storage area (Availability of impervious surface)	mxm		
i	Availability of separate waste disposal from storage area	Cum		
2	Details of top soil stacking			
a	Quantity of top soil removed from the site	sq.m		
b	Detail of storage of topsoil		Describe stacking arrangement	
3	Details of workforce			
a	Total No of laborer	nos		
b	Total no of Male Workers	nos		
c	No of Male Workers below 18 years of age	nos		
d	Total No of Female Workers	nos		
e	No of Female workers below 18 years of age	nos		
4	Other Details			
a	Drinking Water	mxmxm		
b	Total no of Toilets	nos		
c	No of toilets for female workers	nos		
d	Total No of Bathrooms for female workers	nos		
e	Size of septic tank for WC/Baths	mxmxm		
f	Capacity of Water Tank for WCs/ Bathrooms and general purpose			
g	Fencing around camp	Y/N		
5	Details of facilities			
a	Availability of security guard 24 hrs a day	Yes/No		
b	Details of First Aid Facility	Yes/No		
c	Availability of Day Care Centre	Yes/No		
d	Availability of dust bins (capacity 60 ltr)	nos		
e	Canteen facilities for labours	Yes/No		
6	Plant and Machinery			
a	If HMP to be located in camp	Yes/No		
b	If workshop for maintenance of vehicles and machinery to be located in camp	Yes/No		
c	If fuel refilling station to be in camp	Yes/No		
d	If aggregate batching plant to be in camp	No		
e	If canteen waste to be dumped in camp?	Yes/No		
7	Statutory Clearance			
a	If copy of consent from PPCB enclosed?	Yes/No		
b.	If copy of permission for each plant / fuel refilling station enclosed?	Yes/No		

Remarks

Submitted

Signature
Name
Designation
Contractor

Checked

Signature
Name
Environmental Officer
CSC

Approved

Signature
Name
Resident Engineer/Team Leader
CSC

Joint Venture of



STUP Consultant Pvt. Ltd.
On July 1st, 2021, STUP was acquired by Assystem and rebranded as Assystem STUP.



BCL Associates Limited, Bangladesh

EM-9: MONITORING OF CONSTRUCTION CAMP

(To be submitted by the Contractor)

Name of the Corridor : _____

Contract Name/No : _____

Construction Stage: _____ Date Month Year

(Site Layout of Construction camp and working drawings of dwelling units with allied facilities to be attached with format)

Name of Construction Camp with Sl.No. in register of Site

Monitoring of Construction Camp				
Sl. No.	Environmental Management Measure	CSC Observation (Y/N/Not Applicable)	Corrective Action Taken	Remarks
1.	Whether concrete flooring and oil interceptors are provided for hot mix plant area and workshop, vehicle washing and fuel handling area?			
2.	Are all the first aid facilities provided in the camp?			
3.	Whether the plant is in such a way that there are no residences, public institutions, or hospital within a radius of 500 M from the center of the plant?			
4.	Whether the vehicle movement in and out of the camp is in a controlled manner?			
5.	Does water in cross drainage channels block?			
6.	Whether all the plant and machineries are well maintained and regularly serviced?			
7.	Whether a green belt is provided along the periphery of camp?			
8.	Whether water is stored for dust suppression in the camp?			
9.	Whether sanitation facilities are provided for male and female?			
10.	Whether separate garbage bins are provided to collect the garbage?			
11.	Whether septic tanks with soak pits are provided?			
12.	Whether the location of soak pit is in such a way that it does not pollute the ground water?			
13.	Whether a qualified safety officer is appointed for ensuring safety?			
14.	Whether noise barriers near sensitive receptors are provided?			
15.	Whether personal protective equipment are provided?			
16.	Whether warning sign boards are set up at the entrance gate for the public?			
17.	Whether all applicable clearances are obtained and valid till date?			
18.	Whether Notices boards construction related information displayed or not			
19.	Whether Labor engagement policy is displayed			
20.	Whether COC/VOC policy is displayed or not			

Submitted

Signature

Name

Designation

Contractor

Checked

Signature

Name

Environmental Officer

CSC

Approved

Signature

Name

Resident Engineer/Team Leader

CSC

EM-10: MONITORING OF LABOR CAMP

(To be submitted by the Contractor)

Name of the Corridor : _____

Contract Name/No : _____

Construction Stage : _____ Date Month Year

(Site Layout of Construction camp and working drawings of dwelling units with allied facilities to be attached with format)

Name of Labor Camp with Sl. No. in register of Site

Monitoring of Labor Camps				
Sl. No	Environmental Management Measure	CSC's Observation (Y/N/Not Applicable)	Corrective Action Taken	Remarks
1.	Whether the camps are floored with concrete?			
2.	Are all the first aid facilities provided in the camp?			
3.	Whether the plant is in such a way that there are no residences, public institutions or hospital within a radius of 500 M from the center of the plant?			
4.	Whether the vehicle movement in and out of the camp is in a controlled manner?			
5.	Whether LPG for cooking is provided?			
6.	Whether safe drinking water is provided?			
7.	Whether all the drains and channels are covered?			
8.	Whether a green belt is provided along the periphery of camp?			
9.	Whether day care centers are provided with in the camp?			
10.	Whether sanitation facilities are provided for male and female?			
11.	Whether separate garbage bins are provided to collect the garbage?			
12.	Whether septic tanks with soak pits are provided?			
13.	Whether the location of soak pit is in such a way that it does not pollute the ground water?			
14.	Whether a qualified safety officer is appointed for ensuring safety?			
15.	Whether proper fencing of the camp is done?			
16.	Whether the workers are aware of cleanliness, hygiene, community livings, AIDS etc.?			
17.	Whether Labour engagement policy is displayed			
18.	Whether COC/VOC policy is displayed or not			

Submitted

Checked

Approved

Signature

Signature

Signature

Name

Name

Name

Designation

Environmental Officer

Resident Engineer/Team Leader

Contractor

CSC

CSC

EM-11: MONITORING OF STONE CRUSHER MANAGEMENT

(To be submitted by the Contractor)

Name of the Corridor : _____
Contract Name/No : _____
Construction Stage: _____ Date Month Year

(Site Layout of Construction camp and working drawings of dwelling units with allied facilities to be attached with format)

Name of Disposal Site with Sl. No. in register of Site

State of Completion of Project

Monitoring Parameters of Stone Crusher

Sl. No	Environmental Management Measure	Applicability	Corrective Action Taken	Remarks
1.	Whether the construction operations are carrying out in such a manner that no waste material is dumped or disposed of in an unhealthy manner that causes any environmental hazard?			
2.	Whether the debris forming work close to the streams and water bodies are generally avoided during the monsoon period?			
3.	Whether the debris disposal site is at least 500 meters away from the surface water body?			
4.	Whether the debris disposal site is at least 500 meters away from the ecologically sensitive area, residential area or main road?			
5.	Whether the debris disposal along the water courses and close to the drainage channels are in such a manner that it does not cause any blockage to the flow of water?			
6.	Whether the bituminous waste is used as a surfacing material to the access roads to base camps, quarries, borrow area, temporary diversion, haulage routes etc.?			
7.	Whether the waste disposal details are submitted to the ENGINEER in the prescribed format?			
8.	Whether the spoils from excavation of the river bed are disposing off at specified area suggested by the engineers?			
9.	Whether the debris generated due to dismantling of existing permanent structure is reused in the temporary diversion?			
10.	Whether the preserved topsoil is used for redevelopment of the area?			
11.	Whether green belt is developed?			
12.	Whether all applicable clearances are obtained and valid till date?			

Submitted

Signature
Name
Designation
Contractor

Checked

Signature
Name
Environmental Officer
CSC

Approved

Signature
Name
Resident Engineer/Team Leader
CSC

EM-12: MONITORING OF REDEVELOPMENT OF BORROW AREA

(To be submitted by the Contractor)

Name of the Corridor : _____

Contract Name/No : _____

Construction Stage : Date Month Year

(Site Layout of Construction camp and working drawings of dwelling units with allied facilities to be attached with format)

Name of Borrow Area Site with Sl. No. in register of Site

State of Completion of Project

Monitoring Details of Redevelopment of Borrow Area				
Sl. No.	Environmental Management Measure	Engineer's Observation (Y/N/Not Applicable)	Corrective Action Taken	Remarks
1.	Has slope stabilization been undertaken along the edges (if there is a level difference)?			
2.	Is all the waste material raised from the borrow area disposed of properly?			
3.	Has the preserved top soil been used in redevelopment of site?			
4.	Has the borrow areas been re-vegetated properly?			
5.	Is the cross-drainage system and the flood water drains managed properly to avoid occurrence of flooding?			
6.	Are the borrow area pits re-developed?			
7.	Is the leveling of depression after filling-in of waste undertaken?			
8.	Selection of Species as per Project area for plantation.			
9.	Has bund creation and temporary fencing been undertaken?			
10.	Has additional tree plantation been undertaken as mentioned in the re-development plan?			

Submitted

Checked

Approved

Signature

Signature

Signature

Name

Name

Name

Designation

Environmental Officer

Resident Engineer/Team Leader

Contractor

CSC

CSC

EM-13: MONITORING OF REDEVELOPMENT OF DISPOSAL SITE

(To be submitted by the Contractor)

Name of the Corridor : _____
Contract Name/No : _____
Construction Stage: _____ Date Month Year
(Site Layout of Construction camp and working drawings of dwelling units with allied facilities to be attached with format)
Name of Disposal Site with Sl. No. in register of Site
State of Completion of Project

Monitoring Details

Sl. No	Environmental Management Measure	Engineer's Observation (Y/N/Not Applicable)	Corrective Action Taken	Remarks
1	Rehabilitation of the dump site by planting local shrubs and other plant species.			
2	Conversion of debris site into farm land, playground, parking area, block plantation area etc.			
3	Maintenance of the hydrological flow in the area.			

Submitted

Signature
Name
Designation
Contractor

Checked

Signature
Name
Environmental Officer
CSC

Approved

Signature
Name
Resident Engineer/Team Leader
CSC

Annex 10-3: Guidelines for Developing Construction Phase Traffic Management Plan

The road construction activities require construction zones to be created at site for undertaking various activities such as movement of construction vehicles/equipment and workers. During the construction phase due to such construction zones are the source of nuisance to normal traffic without proper traffic management plan. The traffic management plan will ensure not only smooth flow of construction activities on the road but also provide conflict free environment with the normal traffic or pedestrian movement. Thus, contractor must prepare and get approved, from CSC, a traffic management plan before commencement of the work or creating construction zones and contractor must plan activities in advance.

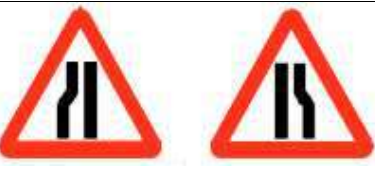
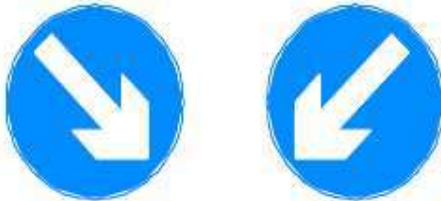
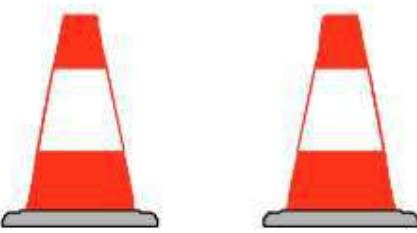
While preparing traffic management for carrying out the construction work the following shall be kept in mind that good signage WARNS, INFORMS and DIRECTS the traffic or road user. Thus, the contractor shall adopt the following good practices³⁵ while demarcating the construction zones.

- ▶ Plan: It is the responsibility to sign construction works safely, so plan what signs and cones are needed for carrying out the work. Get Police advice in difficult or dangerous situations.
- ▶ Be seen: All persons working on or near the road must wear brightly-colored clothing, preferably an orange or yellow waistcoat
- ▶ Face the traffic when setting out signs - Put the Road Works Ahead warning sign out first and then move towards the works site, and always try and face the traffic when set out the signs and cones.
- ▶ Check the signs carefully - Check it before “Will someone coming along the road in either direction understand exactly what is happening and what is expected of them?” As the works proceed, alter the signing so that it is always consistent with the work that is going on.
- ▶ Fix the signs properly - In most cases it will be best to fix the signs on upright poles set in heavy, concrete block bases. This will help prevent theft and stops the signs from being blown over or dislodged by moving traffic. If the works are to last more than a few weeks fix the sign poles into proper concrete foundations. Check the signs regularly to see if they are all still in place and clean them if they get dirty.
- ▶ Ensure the signs are visible at night - Use reflective signs and cones, and preferably supplement them with flashing lights.
- ▶ Remove unnecessary signs - Never leave signs on the road once they are no longer needed. , It will help prevent any nuisance/annoyance to/among the road users.
- ▶ Keep the site tidy - Take up as little road space as possible, and store construction materials and equipment off the road if you can. When you have finished make sure that the road surface has been properly reinstated and that there are no dangerous holes or trenches. Clean away any mud or gravel.
- ▶ Always use the standard signs as recommended in Bangladesh Road Sign Manual and do not design your own
- ▶ During the rainy season water stagnates water in different section of the road and pavement badly damage and cause of traffic congestion on the road, this time special care to be taken by the contractor.
- ▶ In the festivals traffic volume increases on the road and causes congestion in different intersection and urban area. The contractor will take special measure for traffic and co-ordinate with the local authority of Roads and Highways and Local Thana Police.
- ▶ Necessary equipment, manpower (flagman), sign, etc. will be deployed by 24 x 7 hours at site.
- ▶ The related cost will be included under the pay item 1/1/1a Protection of Traffic & Traffic Management during construction phase

The signs, not limited to the following shall be used to define the work zones or construction sites, etc.

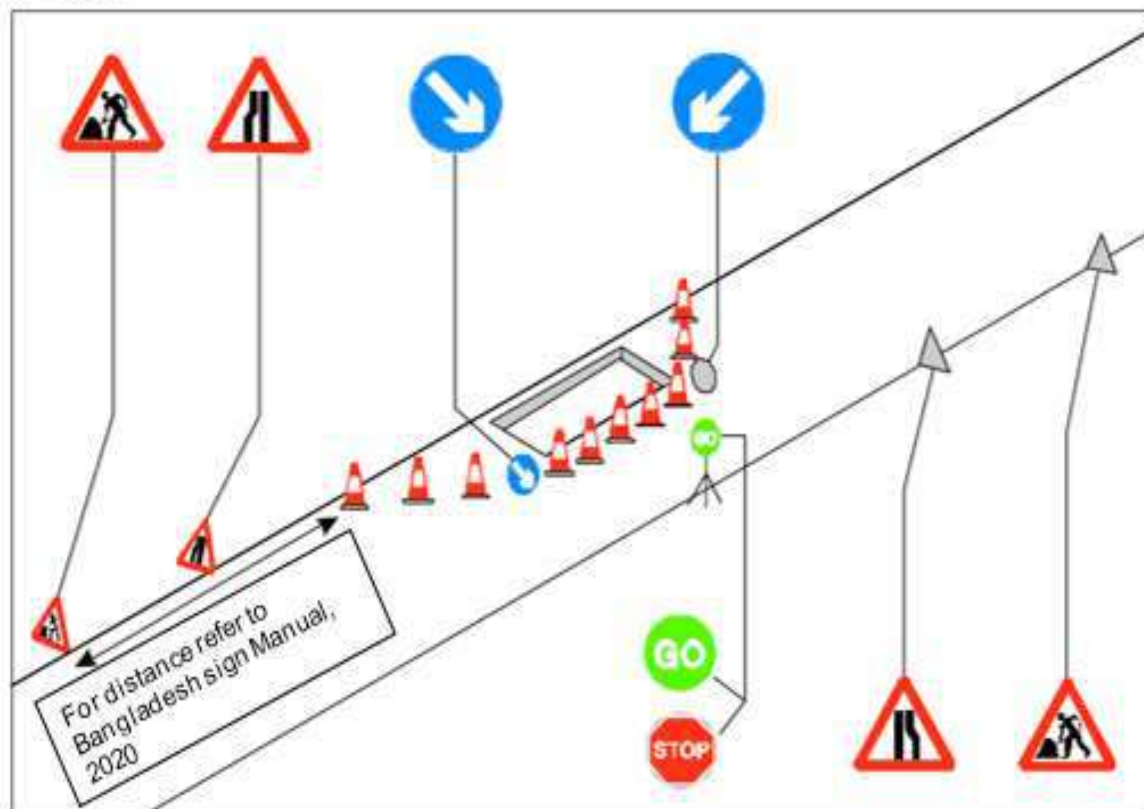
List of Minimum/basic Signs required at construction Site ³⁵	
Pictorial View of Sign	Description about the Sign

³⁵ Bangladesh Road Sign Manual, Bangladesh Road Transport Authority Ministry of Communication, March 2020

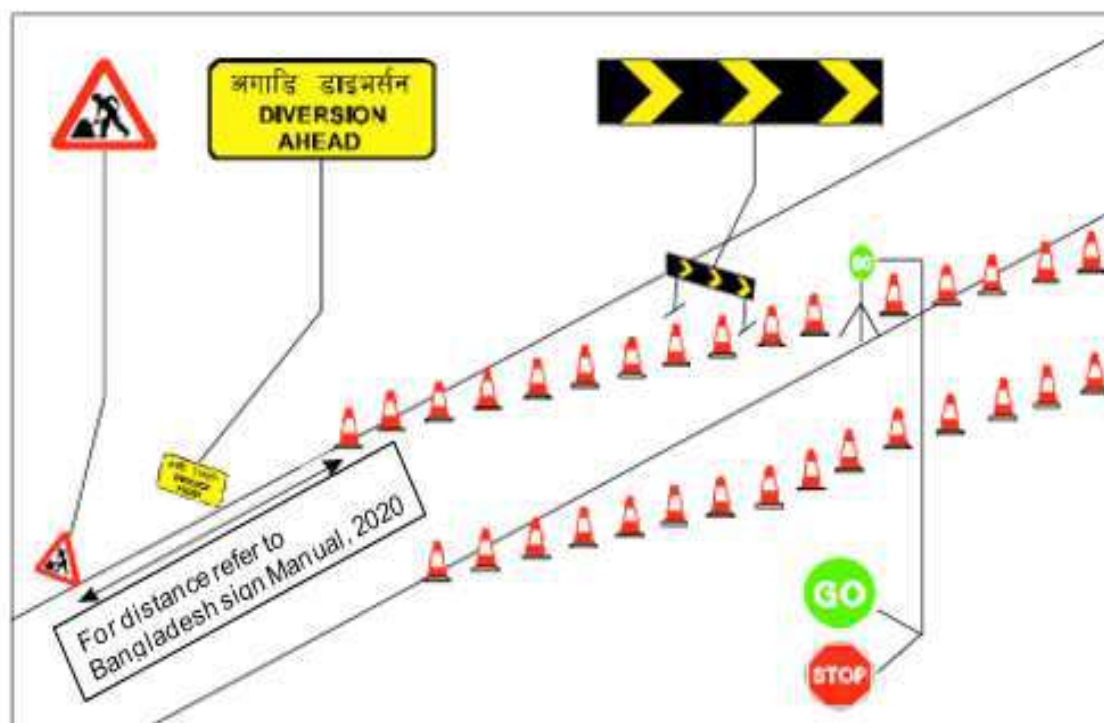
List of Minimum/basic Signs required at construction Site ³⁵	
Pictorial View of Sign	Description about the Sign
	The Road Works Ahead sign is the first sign to be seen by the driver, so place it well before the work site - about 45 meters in town and 90 meters on rural roads - but on a high-speed National Highway it should be at least 150 meters away. Put the sign where it can be seen from a distance. For example, if the works are just after a bend in the road, put the sign before the bend. This sign has a black symbol on a white background, all within a red triangle.
	The Road Narrows Ahead sign warns drivers which side of the road is obstructed. Place it midway between the Road Works Ahead sign and the works site. Make sure you use the appropriate sign on each approach to the obstruction. This sign has a black symbol on a white background within a red triangle.
	Place Keep Left or, if appropriate, Keep Right, signs at the beginning and end of the works - at the point where the works extend furthest into the road. This sign has a white arrow on a light blue background.
	Place a line of Traffic Cones to guide pedestrian and vehicle traffic past the works. Leave some working space between the line of cones and the actual excavation or works area. Traffic cones should be red, and, if used at night, should preferably have white reflective sleeves. Where theft is likely to be a problem oil drums painted red and white may be used instead.
	Where there is a lot of traffic or the works site is very long, you will need to control traffic manually using these STOP /GO boards. If the obstruction is less than 30 meters long and is on a straight section of road you will only need a single board operating at one end or in the middle. Do not use flags, as these can be confusing, and make sure that the boards are operated by a responsible adult. Provide training if necessary.
Notes: ▶ Sign plates should normally be 750mm in diameter (750mm high triangle). On low-speed (40km/h or less) single carriageway roads 600mm high signs will normally be adequate. ▶ Safety jackets and helmets should be provided to all the workers/ Engineers working on the road. ▶ Fixed mobile solid barricades must be placed between the workmen and traffic or pedestrian and traffic.	

The contractor must design the traffic management plan as per the construction activities that are planned to be taken up considering the requirement of traffic sign manual of Bangladesh Road Transport Authority, Ministry of Communication. Similarly typical basic layout for two road operations is presented in the figures as follows:

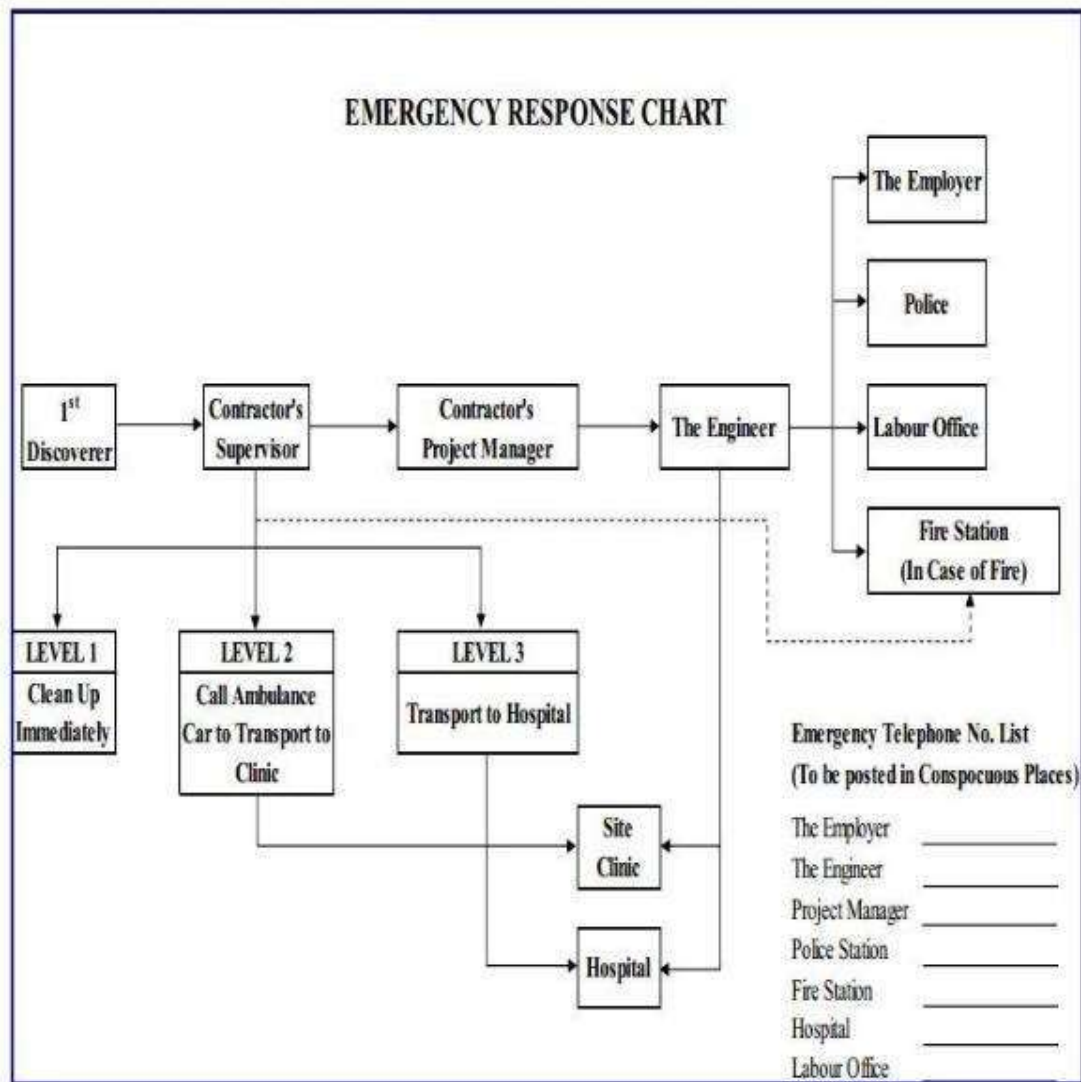
Basic layout



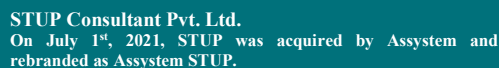
Road diversion



Annex 10-4: Flow Chart and Reporting Mechanism of Incidents for Development Emergency Response Action Plan



Joint Venture of



1										
2										
3										
4										
5										
6										
What Action is being taken to Prevent Reoccurrence?										
State: _____										

_____					Action: Yes [] No [] Date: _____					
Other Comments: _____										
Name: _____					Signature: _____		Title: _____			
Follow-up Review (To be completed by the Engineer's Safety Department)										
Do all actions taken meet the Engineer's satisfaction					Yes [] No []					
If No, please state further actions required: _____										
Close out: Yes [] No []					Date: _____					
Name: _____					Signature: _____		Title: _____			
Distribution: The Employer, The Engineer, Construction Manager, Safety Manager, ...										

Incident / Accident Report									
INCIDENT / ACCIDENT REPORT									
To:								File No.:	
Details (To be completed by immediate Supervisor / Supervisor-in-Charge within 24 hours)									
Project: _____					Country: _____				
Contractors Name: _____					Contract No.: _____				
Location of Accident: _____					Date: _____			Time: _____	
Weather Condition: FINE ☐ RAIN ☐ COLD ☐ HOT ☐									
Visibility: _____					Temperature: _____				
Name of Injured: _____					Nationality: _____				
Date of Birth: Day _____ Month _____ Year _____					ID No. _____				
Sex: Male ☐ Female ☐ Occupation: _____									
Activity at time of Accident: _____									
Severity of Injury: Fatal ☐ Referred to Hospital ☐ Sent Home ☐ Return to Work ☐									
Parts of Body Injured					Types of Injury				
Head	☐	Torso	☐	Crush	☐				
Eyes	☐	Back	☐	Fracture	☐				
Ears	☐	Abdomen	☐	Dislocation	☐				
Face	☐	Hip	☐	Sever	☐				
Neck	☐	Rump	☐	Laceration	☐				
Shoulder	☐	Thigh	☐	Puncture Wound	☐				
Arm	☐	Leg	☐	Abrasion	☐				
Elbow	☐	Knee	☐	Bruise	☐				
Wrist	☐	Foot	☐	Sprain / Strain	☐				
Hand	☐	Ankle	☐	Electric Shock	☐				
Finger	☐	Toe	☐	Burn	☐				
Chest	☐			Multiple	☐				
Others: _____					Others: _____				
Witness									
Name: _____					Company: _____ ID No.: _____				
Name: _____					Company: _____ ID No.: _____				
Name: _____					Company: _____ ID No.: _____				
How did Accident Occur									
Description: _____					Sketch (Continued on separate sheet if necessary)				

How could this incident have been avoided									
State: _____									

(Mark x one)									

A - Requirements / Guidelines not prepared						Does Incident relate to the one			
B - Requirements / Guidelines not appropriate						of the followings:			
C - Requirements / Guidelines not complied						If yes, mark appropriately			
A	B	C	Descriptions			Emergency Isolation			
			Leadership and Accountability			Ground Disturbance			
			Risk Assessment and Management			Confined Space Entry			
			People, Training and Behaviors			Working at Height			
			Working with Contractors and Others			Lifting Operations			
			Facilities Design and Construction			Vehicle Safety			
			Operation and Maintenance			Management of Change			
			Management of Change						
			Information and Documentation						
			Customers and Products						
			Community and Stakeholder Awareness			Does Incident relate to Dropped Objects?			
			Crisis and Emergency Management			Yes			
			Incident Analysis and Prevention			No			
			Assessment, Assurance and Improvement						
Actions to prevent Reoccurrence									
No.	Action			Responsible Person			Priority	Due Time	
1									
2									
3									
4									
5									
6									
What Action is being taken to Prevent Reoccurrence?									
State: _____									

_____ Action: Yes [] No [] Date: _____									
Other Comments: _____									
Name: _____ Signature: _____ Title: _____									
Follow-up Review (To be completed by the Engineer's Safety Department)									
Do all actions taken meet the Engineer's satisfaction						Yes [] No []			
If no, please state further actions required: _____									
Close out: Yes [] No []						Date: _____			
Name: _____ Signature: _____ Title: _____									
The Engineer's Review and Comments									

Report to the Employer: Yes [] No []				Lost Work Days: _____		Light Duty Days: _____			
Name: _____ Signature: _____ Title: _____									
Distribution: The Employer, The Engineer, Construction Manager, Safety Manager, ...									

Joint Venture of



STUP Consultant Pvt. Ltd.

On July 1st, 2021, STUP was acquired by Assystem and rebranded as Assystem STUP.



BCL Associates Limited, Bangladesh

Monthly Safety Report (1/4)											
Project											
Country											
Contractors Name:											
Contract No.:											
Reporting Period	From				To						
Job Situation	Start				End						
Document No.											
Type of Accident	Nature of Injury									First Aid	Total
	Eye Disease	Burn	Cut	Bruise	Contusion	Sprain	Fracture	Other	Fatal		
Fall to Different Level											
Fall on Same Level											
Struck against Object											
Struck by Flying or Falling Object											
Collapse											
Struck by Moving Object											
Caught in or between Object											
Cut / Rub											
Stepping on Nails, etc.											
Drowning											
Contact with extreme Temperature											
Contact with Poisonous Substances											
Contact with Electrical Current											
Explosion											
Rupture											
Fire											
Traffic Accident (Public Road)											
Traffic Accident (other)											
Reaction or Overexertion											
Others											
Total											

Approved By	:	Name		Title		Signature	
Prepared By	:	Name		Title		Signature	

Monthly Safety Report (2/4)

Near - Miss Record

No.	Date	Time	Location	Description of Near-Miss (Brief)	Caused by			Damage		Cause (tick)	
										Unsafe Act / Human Error	
										Unsafe Condition / No Procedure	
										Wrong Direction / Time Pressure	
										Lack of Communication	
										Lack of Education	
										Others	
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											

Approved By	:	Name		Title		Signature	
Prepared By	:	Name		Title		Signature	

Recordable Work Injuries

[illegible]

Approved By	:	Name		Title		Signature	
Prepared By	:	Name		Title		Signature	

[illegible]

Note:

(i) Transfer the figures calculated in column (8) in sheet 3 of 4. Total Lost Workdays * 1,000,000; No. of Total Recordable Injuries * 1,000,000

(ii) Frequency Rate of Recordable Injuries = -----

(iii) Transfer the figure calculated in column (5) in sheet 3 of 4. No. of Total Lost Time Injuries * 1,000,000

(iv) Frequency Rate of Lost Time Injuries = -----

(v) Rate of Lost Workdays = -----

(vi) Severity Rate = -----

Approved By	:	Name		Title		Signature	
Prepared By	:	Name		Title		Signature	



Crane Detail Inspection Checklist			
Name of Contractor			
Name of Responsible Person			
Type of Crane			
Brand / Model / Serial No.			
Location of Used			
Last Inspection Date			
Parts to be Checked	Descriptions	Condition	
		Yes	No
Guarding	All exposed moving parts such as gears, chains, reciprocating or rotating parts are guarded or isolated.		
Swing Clearance Protection	Materials for guarding rear swing area or Warning Lights & Audible Alarms installed to signal movement of crane.		
High-Voltage Warning Sign	High-voltage warning signs displaying restrictions and requirements installed at the operator's station & at strategic locations on the crane.		
Boom Stops	Shock absorbing or hydraulic type boom stops installed in a manner to resist boom overturning.		
Jib Boom Stops	Jib stops restraints installed to resist overturning.		
Boom Angle Indicator	Boom angle indicator readable from Operator station installed accurately to indicate boom angle.		
Boom Hoist Disconnect, Automatic Boom Hoist Shutoff	Boom hoist installed with disconnect safety shutoff or hydraulic relief to automatically stops the boom hoist when the boom reaches a predetermined high angle.		
Two-Blocking Device	Cranes with telescoping booms equipped with two-blocking damage prevention feature that has been tested on-site in accordance with manufacturers requirements.		
	Cranes hydraulic and fixed boom type used to hoist personnel equipped with two-blocking devices on all hoist lines.		
	Anti-two blocking device installed has automatic capabilities for controlling functions that will cause a two-blocking condition.		
Power Controlled Lowering	Cranes use to hoist personnel equip with power controlled lowering operation on all hoist lines.		
	Check clutch, chains, and sprockets for wear.		
Leveling Indicating Device	Leveling device provided on crane.		
	Crane leveled during set up.		
Sheaves	Sheave grooves smooth and free from surface defects, cracks, or worn places that will cause rope damage.		
	Flanges not be broken, cracked, or chipped.		
	Bottom of sheave groove form a close-fitting saddle for the rope used.		
	Lower load blocks equipped with close fitting guards.		
Main Hoist and Auxiliary Drums System	Minimum number of wraps to remain on the drum.		
	Condition of drum grooves		
	Condition of flanges at the end of drum.		
	Rope end attachment		
	Spooling characteristics of rope.		
	Rope condition.		
Main Boom, Jib Boom, Boom Extension	Boom jibs, or extensions, not cracked or corroded.		
	Bolts and rivets tightly installed.		
	Certification that repaired boom members meets manufacturer's original design standard documented and submitted.		
	Any non-certified repaired to boom members.		
Load Hooks and Hook Blocks	Hooks and blocks permanently labeled with rated capacity.		
	Hooks and blocks are counterweighted to the weight of the overhaul line from highest hook position.		
	Hooks will not have cracks or throat openings more than 15% of normal or twisted off center more than 10% from the longitudinal axis.		
	All hooks used to hoist personnel equipped with effective positive safety catches especially on hydraulic cranes.		

Hydraulic Hoses Fittings and Tubing	Flexible hoses show no signs of leaking at the surface or its junction with the metal and couplings.		
	Hoses show no blistering or abnormal deformation to the outer covering and no leaks at threaded or clamped joints that cannot be eliminated by normal tightening or recommended procedures.		
	No evidence of excessive abrasion or scrubbing on the outer surfaces of hoses, rigid tubing, or hydraulic fittings.		
Outriggers	Outrigger number, locations, types and type of control are in accordance with manufacturer's specifications.		
	Outriggers visible to the operator or a signal person during extension or setting.		
Load Rating Chart	A durable rating chart(s) with legible letters and figures will be attached to the crane in a location accessible to the operator while at the controls. The rating charts will contain the following:		
	A full and complete range of manufacturer's crane loading ratings at all stated operating radius.		
	Optional equipment on the crane such as outriggers and extra counterweight which effect ratings.		
	A work area chart for which capacities are listed in the load rating chart, i.e., over side, over rear, over front.		
	Weights of auxiliary equipment, i.e., load block, jibs, boom extensions.		
	A clearly distinguishable list of ratings based on structural, hydraulic or other factors rather than stability.		
	A list of no-load work areas.		
	A description of hoist line reeving requirements on the chart or in operator's manual.		
Wire Rope	Main hoist and auxiliary wire rope inspection will include examining for Broken wires.		
	Excess wear.		
	External damage from crushing, kinking, cutting or corrosion.		
Cab	Contains all crane function controls in additional to mechanical boom angle indicators, electric wipers, dash lights, warning lights and buzzers, fire extinguishers, seat belts, horn, and clear unbroken glass.		
Braking Systems	Truck cranes and self-propelled cranes mounted on rubber-tired chassis or frames will be equipped with a service brake system, secondary stopping emergency brake system and a parking brake system.		
	The braking systems will have been inspected and tested and found to be in conformance with applicable requirements.		
	Crawler cranes are provided with brakes or other locking devices that effectively hold the machine stationary on level grade during the working cycle.		
	The braking system will be capable of stopping and holding the machine on the maximum grade recommended for travel. The brakes or locks are arranged to engage or remain engaged in the event of loss of operating pressure or power.		
Turntable/Crane Body	Make sure that the rotation point of a crane gears and rollers are free of damage, wear and properly adjusted and the components are securely locked and free of cracks or damage.		
	The swing locking mechanism will be functional (pawl, pin) and operated in the cab.		
Counterweight	The counterweight approved and installed according to manufacturer's specifications with attachment points secured.		
Name of Inspector			
Position / Title			
Date of Inspection			
Signature			

Sample of Risk Assessment and Management				
Risk Assessment and Management				
Project:				
Contractors Name:				
Country:				
Contract No.:				
Task:		Excavation and Backfill		
Identify Hazard (Potential to do harm)	Hazard Effect (If the Hazard is released)	Risk Ranking	Control Measures (PPE, Procedures, etc.)	Recovery Measures
Heavy Rain Flooding	Collapse of Walls of Trench or Excavation, Injuries to Personnel	Low	After rain and before the work commences excavation - Trench shall be checked by the Supervisor	First Aid, Clinic, Hospital
Underground Electrical Cables Services	Electrocution of persons or Damage to Services	High	Excavation Permit before start excavation. Use of Cable Detectors, As built Drawings and Cable Protection Boards	Emergency Procedures (No.)
Insufficient, Incorrect Barriers Insufficient Signage	Persons or Machinery Falling into Excavation	Med	Pre - work Site Inspection, Tool Box Talks, Training Barricading Procedure (No.)	Emergency Contact:
Side Wall, Banking Collapse	Crush Injuries, Asphyxiation of Personnel	Med	Correct Angle of Repose, Battening as Necessary Excavation Procedure	
Excavation Beside Existing Facilities	Collapse of Structure, Crush Injuries, Death	High	Excavation Permit before start excavation. Shoring & Scaffolding	
Open Trench, Ditch	People, Machinery and Animals falling in.	Med	Barriers, Signage, Flash Lamp Toolbox Talks	
Equipment Operators Lack of Competence	Collision, Trench Collapse Damage to Machinery	Med	Use only Experienced Operators (5Years min) Training, Assessments Competent Person Designation	
Uneven Soft Floor Surface	Slips, Trips, Falls	Low	Toolbox Talks, PPE, Grading	

Approved By	:	Name		Title		Signature	
Prepared By	:	Name		Title		Signature	

Risk Assessment and Management				
Project:				
Contractors Name:				
Country:				
Contract No.:				
Task:		Working at Height		
Identify Hazard (Potential to do harm)	Hazard Effect (If the Hazard is released)	Risk Ranking	Control Measures (PPE, Procedures, etc.)	Recovery Measures
Scaffolding	Defective scaffolding resulting in collapse leading to injury/fatality	High	Only proprietary materials to be used. Erection to be done by trained persons. Full supervision Procedure- No.	First Aid, Clinic, Hospital
Access to scaffolding	Insecure or substandard ladder leading to falls and injury	Med	Scaffolding access to comply with Procedure- No. Provision of Scaff tag	Emergency Procedures (No. _____)
Unguarded platforms	Fall from height leading to injury/fatality	High	Persons working on unguarded areas shall wear harness and lifelines. Tag System Fall Protection Procedure - No.	Emergency Contact:
Unauthorized personnel	Personnel climbing scaffolding falling leading to injury/fatality	High	Barriers and signboards to be erected to prevent access of third parties	
Unsafe Scaffolds	Collapse, Injury, Fatality	High	Daily Inspection, RED Scaff Tag Procedure- No.	

Approved By	:	Name		Title		Signature	
Prepared By	:	Name		Title		Signature	

Risk Assessment and Management				
Project:				
Contractors Name:				
Country:				
Contract No.:				
Task:		Heavy Lifting Operations (1/2)		
Identify Hazard (Potential to do harm)	Hazard Effect (If the Hazard is released)	Risk Ranking	Control Measures (PPE, Procedures, etc.)	Recovery Measures
Mechanical Failure/Defective	Dropping of Load leading to Fatality	High	Machinery Inspection and Maintenance Procedures No.	First Aid, Clinic, Hospital
Incorrect Rigging/Unstable Load	Dropping of Load leading to Fatality	High	Checking by Qualified Supervisor. Competent Person Designation. Procedure- No.	Emergency Procedures (No. _____)
Unstable Ground Conditions Undeployed Out Riggers	Crane Overturning leading to Fatality	High	Check on Ground Conditions by Supervisor before Start of Work. Cranes & Lifting Operation Procedure- No.	Emergency Contact:

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Overloading of Crane	Crane Overturning/Dropping of Load leading to Fatality	High	Crane to be fitted with Overload Computer and Alarm. Cranes & Lifting Operation Procedure- No.	
Use of Damaged Lift Equipment	Dropping of Load leading to Fatality or Damage to Equipment	High	Checking by Competent Person before lift begins. Competent Person Designation. Procedure- No.	
No Load Plan/ Incorrect Choice of Equipment	Dropping of or Collision of Load leading to Fatality	High	Correct Rigging Practices. Cranes & Lifting Operation Procedure- No.	
Incompetent, Inexperienced Operators, Flagmen, Rigger and Slingers	Dropping of or Collision of Load leading to Damage, Fatality or Personnel Injury	High	Training. Qualified Rigger and Flagman. Qualified Trained, Experienced Operators. Competent Person Designation. Procedure- No.	

Risk Assessment and Management

Project:	
Contractors Name:	
Country:	
Contract No.:	
Task:	Heavy Lifting Operations (2/2)

Identify Hazard (Potential to do harm)	Hazard Effect (If the Hazard is released)	Risk Ranking	Control Measures (PPE, Procedures, etc.)	Recovery Measures
Bad Attitude, Complacency, Bad Behavior, 3 rd Party Interference	Loss of Load, Control. Leading to Major Injury, Trapped Limbs, Fatality	High	Training, Competent Personnel Selection. Tool Box Talks and Briefings by Supervisor, Foreman before Start of work. Competent Person Designation. Procedure- No.	
Adverse Weather, Poor Visibility, Poor Communication	Crane Overturning, Dropping of Load, Leading to Fatality	High	Avoid Operation in bad weather conditions. Training, Lifting Plan (No. _____), Experienced Operators, Flagmen.	
Lack of or Incorrect PPE	Personnel Injury	Med	Issue PPE as per Health and Safety Plan. PPE Procedure- No. _____	

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Prepared By	:	Name		Title		Signature	

Risk Assessment and Management

Project:	

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BCL Associates Limited, Bangladesh

Contractors Name:				
Country:				
Contract No.:				
Task:		Electricity		
Identify Hazard (Potential to do harm)	Hazard Effect (If the Hazard is released)	Risk Ranking	Control Measures (PPE, Procedures, etc.)	Recovery Measures
Working near Overhead lines	Vehicle load or equipment near or touching line leading to electrocution	High	Erection of goalposts at approach to Overhead Lines at sites and access roads. Install of Sign boards.	First Aid, Clinic, Hospital
Underground cables	Excavation equipment hitting underground line leading to major injury and severe Damage to the Public.	High	Excavation Permit system, Training, Hand Excavation. Cable Detectors/As-built drawings. Full Supervision.	Emergency Procedures (No. _____)
Power Tools	Defective tools / insulation leading to electrocution.	Med	Weekly inspection by supervisor and daily inspection by operator of tools.	Emergency Contact:
Electricity in Switchgear	Incorrect identification during tie in leading to electrocution.	High	Work to be conducted by Competent Personnel. Barriers and flags to be used. Lock Out Tag Out Procedure.	
Failure to Barricade Worksite	Electrocution, Burns, Fatalities	Med	Work to be conducted by Competent Personnel. Barriers and flags to be used.	

Approved By	:	Name		Title		Signature	
Prepared By	:	Name		Title		Signature	