

Semi-annual Environmental Monitoring Report

Project No. 40540-017
December 2020

**Bangladesh: South Asia Subregional Economic Cooperation Dhaka-Northwest Corridor
Road Project, Phase 2 - Tranche 1**

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Government of the People's Republic of Bangladesh

Ministry of Road Transport and Bridges

Road Transport and Highways Division

Roads and Highways Department

SASEC ROAD CONNECTIVITY PROJECT-2

**IMPROVEMENT OF ELENGA-HATIKAMRUL-RANGPUR ROAD TO A 4-LANE
HIGHWAY, ROADS AND HIGHWAYS DEPARTMENT (RHD)**

ADB Loan: 3592/3593-BAN

SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT

JULY-DECEMBER 2020

PROJECT IMPLEMENTATION CONSULTANTS

Korea Consultants International Co., Ltd. (South Korea)

in joint venture with

Chodai Co., Ltd. (Japan),

H.P. Gauff Ingenieure GmbH & Co. KG-JBG (Germany),

Lea Associates South Asia Private Limited (India),

Soosung Engineering Co. Ltd. (South Korea),

And in association with

BCL Associates Limited (Bangladesh),

BETS Consulting Services Ltd. (Bangladesh),

Development Technical Consultants Pvt. Ltd. (Bangladesh),

Philkoei International, Inc. (Philippines)

EXECUTIVE SUMMARY

1. The contractors are being executed all civil works including CEMP implementation as per specification and as per terms of conditions of the Contract of SASEC Road Connectivity Project-II: Improvement of Elenga-Hatikamrul-Rangpur Road to a 4-lane Highway, ADB Loan 3592/3593-BAN.

2. The project is deemed as Category B in ADB safeguard policy 2009, while in Bangladesh Environmental Conservation Rule 1997 categorized the project as Red. Second time renewal of Environmental Clearance Certificate (ECC) from Department of Environment (DoE) has been performed and the renewed ECC has been obtained from Department of Environment (DOE). Its validity will remain for one year that is up to 21 February 2021. So, for the third time renewal application will be processed with submission of necessary renewal fee and compliance report in the first week of February 2021 accordingly.

Infrastructures and Physical Progress during July-December 2020

3. The contracted work is being undertaken via “design checking and construction” arrangement with the Contractors of the Eight Working Packages and being supervised by the Project Implementation Consultant (PIC) or Engineer, Korea Consultants International Co., Ltd. (South Korea) with joint venture and in association partners. The scope of works includes detailed design, earthworks, pavement construction, construction of new Bridges and rehabilitation of old Bridges, drainage, structures, link/roadside improvements and installation of road furniture such as signs and safety barriers. A total of 26 Bridges and 161 culverts will be rehabilitated and/or reconstructed. In addition, construction of three flyovers, 39 underpass, 68 bus bays, 11 pedestrian overpasses etc. will be constructed. During July-December 2020 the physical progress of WP-06 is 11.18%, WP-07 is 6.40%, WP-08 is 2.34%, WP-09 is 3.26%, WP-10 is 7.63%, WP-11 is 5.6% and WP-12 is 8.23%.

4. Contractors are monitoring environmental quality parameter test quarterly. The environmental mitigation measures like dust control /dust suppression measure, noise attenuation measures, measures taken in watercourse impacts mitigation in wetlands/ponds/rivers, measures taken to minimize borrow and dredging site impacts, measures taken for disposal of construction debris and other waste materials, mitigation measures taken for servicing and operating equipment impact, measures taken for controlling of petroleum products are being taken effectively and accordingly in all of the WPs.

5. The environmental specialists of the PIC are being monitored the environmental aspects through Environmental Monitoring Checklist of all project activities. Based on the field visits, analysis is being done on compliance in lieu with specific scope of on works as defined in the respective Contract Packages and prevailing field condition.

6. After the projects resumes several guidelines regarding COVID-19 from Director General of Health-Bangladesh and from World Health Organization have been adopted and followed as directed by ADB. Workers and Engineers are supplied with set of PPEs, hand sanitizer, masks, goggles etc. which are inadequate and of low qualities. Disinfectant spray arrangements provided at some work places and in the vehicles and also disinfectant tunnel has been installed at the important camp's entry. Hand washing system with no touch also have been facilitated. Arrangement of quarantine room also has been ensured before resuming the project works. Awareness guidelines have been circulated to all. COVID-19 awareness program has been arranged maintaining social distance, using mask and hand gloves.

Environmental Compliance Monitoring

7. Monitoring works focus on inspection of contractor's work areas, their waste disposal sites, their rehabilitation/re-vegetation, proper landscaping, re-establishment of local access, debris clearance from construction sites, culverts as well as the Engineers Office, etc. RHD is being conducted the air, water and noise quality monitoring program during construction period to implement proper noise and air quality attenuation measures.

Water Quality Monitoring

8. Surface water quality monitoring had been performed during reporting period. There is a possibility to pollute the surface water during the construction period from housekeeping garbage, construction debris discharged by the workers, spillage of fuel and other chemicals from construction equipment. The quality of surface water tested and analyzed and result of the parameters found within acceptable limit.

9. Groundwater contamination occurs when gasoline, oil, lubricants, petroleum products and chemicals get into the groundwater and cause it to become unsafe and unfit for human use. The quality of groundwater is being tested and analyzed in the project area quarterly basis by Contractors JV. The result of the parameters of ground water found within the standard limit.

Air Quality Monitoring

10. Ambient air samples were collected from the different working package areas of the project road between Elenga and Rangpur. The ambient status of major air pollutants viz. Particulate Matter (PM₁₀ and PM_{2.5}), Sulfur Dioxide (SO₂), Oxides of Nitrogen (NO_x), and Carbon Monoxide (CO) have been assessed by monitoring air quality. All parameters of air quality are found within the acceptable limits specified by the DoE.

Noise Level Monitoring

11. Ambient noise levels have been monitored from working packages of the SASEC-2 project. Project related key noise sources are bus traffic, generators, vehicles, construction equipment and people. Sometimes noise level found little bit more than EMP and DoE standard. Noise attenuation measure is suggested for mitigation.

Results of Environmental Monitoring and Compliance Measures

12. The monitoring results revealed that there are a number of working sites where some mitigation action is need to be taken by the contractor to meet up full compliance with the EMP. In respect to location, work type and status of compliance contractor should mention the environmental issues and mention their mitigation measures taken in upcoming reports.

Satisfactory status of monitoring results:

Air quality: In WP-07, WP-08, WP-10, WP-11 and WP-12 air quality results are satisfactory but that of in WP-09 is unsatisfactory where PM_{2.5} was more (112.57, 103.63µg/m³) than DOE (65 µg/m³) and PM₁₀ was 167.28µg/m³ which is also more than DOE value (150g/m³). Other parameters in all the six WPs are satisfactory.

Surface water quality: In WP-07, WP-08, WP-09, WP-10 and WP-11 the DO values are satisfactory but that of in WP-12 is unsatisfactory where DO value found 4.0 mg/l which is below DOE value (5 or more). In WP-08 and WP-09 the TSS value found satisfactory but in WP-07, WP-10, WP-11 and WP-12 the TSS value found more (11, 19.93, 47.62, 67, 24, 18.23 and 40.33mg/l) than DOE (10mg/l) value respectively which are unsatisfactory. Other parameters in all the six WPs are satisfactory.

Ground water quality: In WP-10 Fe value found 5.81 mg/l and in WP-12 Fe value found 1.8 mg/l both of them are higher than DOE value (0.3-1.0 mg/l) which are unsatisfactory. Other parameters in all the six WPs are satisfactory. Other parameters in all the six WPs are satisfactory.

Noise level: It is unsatisfactory that in WP-08 noise level found 67.39 dBA in mixed area and 71.45 dBA in commercial area which are higher than DOE value (mixed area 60 and commercial area 70 dBA). Noise level in all other five WPs is satisfactory.

Suggestion for Corrective Action: Contractors are suggested to take corrective action for all unsatisfactory results by January 2021.

Conclusions

13. Elanga-Hatikamrul -Rangpur Highway project generate a number of environmental impacts, such as those associated with the embankment construction, the river crossings or workers poor campsite housekeeping by the contractor. The EMP provides the specific guidelines which RHD has put in place to prevent or mitigate these effects. RHD is committed to implement these measures have fully endorsed into the EIA which is the basis for the EMP. RHD will ensure that the work is carried out in an environmentally acceptable manner and the monitoring and reporting are completed in a compliant and timely fashion, acceptable to DoE and ADB.

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
BDT	Bangladesh Taka
BOQ	Bill of Quantities
DOE	Department of Environment
DPP	Development Project Proforma /Proposal
EA	Executing Agency
ECA	Environmental Conservation Act
ECC	Environmental Clearance Certificate
ECR	Environmental Conservation Rules
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMR	Environmental Monitoring Report
GOB	Government of Bangladesh
GRC	Grievances Redress Committee
IECs	Important Environmental Components
IEE	Initial Environmental Examination
INGO	Implementation Non-Government Organization
IPC	Interim Payment Certificate
PIC	Project Implementation Consultants
PVD	Prefabricated Vertical Drain
RHD	Roads and Highways Department
RoW	Right-of-Way
ROU	Road Operation Unit
RRTC	Road Research and Training Centre
SASEC	South Asian Sub-regional Economic Cooperation
SASEC-2	Elenga- Rangpur Double Line Project

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1. INTRODUCTION

1.1. Overall project description and objectives

1.1.1. Overall project description

14. The Project Implementation Consultants (PIC) under the Korea Consultants International Co., Ltd., Korea as consortium is undertaking construction and environmental supervision and monitoring works. Environmental compliance of the Contractor's civil works is being monitored by the Environmental Specialists with field coordination with Resident Engineers and Road safety Engineers of the PIC. Improvement of 190.4 Kilometers of Elenga-Hatikamrul-Rangpur Project Road under the South Asian Sub-regional Economic Cooperation (SASEC) Road Connectivity Project-2 is being financed by the Asian Development Bank (ADB). The improvement of this project road to a 4 Lane Highway has been designed under the framework of Regional Cooperation and Integration Project (RCIP) to develop Trans- Asian Highway (TAH) connectivity with South Asian and many Asian countries.

15. Within the period of Contract, each Contractor is obligated to perform the necessary measures to mitigate environmental issues as part of his CEMP implementation activities. The contractors are being executed all civil works including EMP as per specification and as per terms of conditions of the Contract of SASEC Road Connectivity Project-II: Improvement of Elenga-Hatikamrul-Rangpur Road to a 4-lane Highway, ADB Loan 3592/3593-BAN. SASEC Road Connectivity Project-2: Improvement of 190.4 kilometers of Elenga- Hatikamrul-Rangpur project road, is approved by the ECNEC on September 6, 2016. Implementation Period is from: September 2016 - August 2021. Feasibility study and detailed design for this project was completed in 2015 with Technical Assistance of ADB under Sub-regional Road Transport Project Preparatory Facility.

16. Contractors will do environmental safeguard works in compliance with the CEMP, particularly the Environmental Monitoring Plan of the Technical Specification in the Tender Document Volume 3 of 5. The periodic measurements of water quality, noise/vibration and air quality, will be carried out for all Work Packages. The results and analysis of these tests will be submitted regularly to the Engineer in accordance with agreed schedule. The Environmental Specialists are being monitored the environmental aspects of the project roads through site visits and a number of facilities, reviewing Contractors' CEMP. Monthly Environmental Monitoring report prepared by the contractors and approved, as well as follow up the contractor's environmental management compliances will be carried out during construction, operation and

maintenance activities. The Engineers of PIC in addition, to their main tasks will monitor the environmental aspects of the project and will review the environmental mitigation performance of the Contractors.

17. Based on the field visits, analysis would be done on compliance in lieu with specific scope of works as defined in the respective Contract Packages and prevailing field condition. Contract was signed with Project Implementation Consultants (PIC), Korea Consultants International Co., Ltd. (South Korea), in joint venture with Chodai Co. Ltd. (Japan), H.P. Gauff Ingenieure GmbH & Co. KG-JBG (Germany), Lea Associates South Asia Private Limited (India), SOOSUNG ENGINEERING CO. LTD. (South Korea), in association with BCL Associates Limited (Bangladesh), BETS Consulting Services Ltd. (Bangladesh), Development Technical Consultants Pvt Ltd. (Bangladesh), Philkoei International, Inc. (Philippines) on 25 October 2018. The PIC had mobilized in January 2019. The project comprises eight road improvement packages and one interchange construction package.

18. This Environmental Progress Monitoring Report covers July-December 2020 and presenting the environmental issues encountered in the project. Construction works of SASEC-II Road Connectivity Project is under implementation, since the commencement of all Contractor's field activities under Eight Work Packages (WPs) have been started and the packages are being in progress. So, the environmental monitoring activities have been started with full swing. The compliance measures are being reported in the Monthly Progress Monitoring Report.

19. The Government of Bangladesh is emphasizing on improved connectivity between each part of the country. In line with this objective the GOB announced its National Land Transport Policy in 2004 defining long term (20 years) Road Master Plan (RMP). The RMP has identified many feasible and priority projects. One of priority roads identified is the Elenga-Hatikamrul-Rangpur (HER) Highway. This road is a vital link in the national highway network and forms a part of the Asian Highway Network complementing the government plans to increase trade with neighboring countries.

20. Under the project, a team of Consultants has mobilized on 27 January 2019 and started working as Project Implementation Consultants (PIC) to provide professional and expert support in design review of project roads, construction supervision, and design of Hatikamrul Interchange, establishment of Road Operation Unit (ROU) and Road Research and Training Centre (RRTC). This report has been prepared by the Project Implementation Consultants providing services to the Roads and Highways Department (RHD) under the Asian Development Bank, ADB Loan Project Loan; Project No.: 3592/3593-BAN). The loan is effective from 3 January 2018, L-3592/3593-BAN.

21. The outbreak of coronavirus disease-2019 (COVID-19) first emerged at the end of December 2019, and declared as an international public health emergency in a couple of weeks by the World Health Organization (WHO, 2020a). Although the intermediate source of origin and transfer to humans is not clearly known, the rapid human to human transmission capability of this virus has been established.

22. Older people along with other underlying medical conditions are at a high risk of mortality. Till date, there has not been any significant breakthrough in the development of an effective medicine or a vaccine for this disease. National and international authorities and experts suggest the use of non-pharmaceutical measures like wearing face masks and hand gloves, washing hands with soap, frequent use of antiseptic solution and maintaining social distance. All the public transport services (e.g., bus, truck, train, aero planes etc.) were suspended, with exceptions of the transportation of essential goods and emergency services. Overall, the pandemic has caused huge socio-economic disruption, which directly or indirectly affected the environment like improvement of air and water quality, reduction of noise and restoration of ecology.

23. Moreover, the increased use of personal protective equipment (PPE) (e.g., face mask, hand gloves, gowns, goggles, face shield etc.), and their haphazard disposal creates environmental burden. In these circumstances, this study intended to explore the positive and negative environmental consequences of the COVID-19 pandemic, and propose possible strategies as future guideline for environmental sustainability.

1.1.2 Project Objectives

24. The Elenga-Hatikamrul-Rangpur Highway is an important part of SASEC Corridor, Asian Highway, BIMSTEC Corridor & SAARC Highway Figure 1. The existing 2-lane highway is inadequate for carrying passengers and goods between Dhaka and 16 northern districts of Bangladesh. Increasing the capacity of this highway is crucial for sustainable development of the country. The road is two lanes with no shoulders and no provision for slow moving vehicular traffic (SMVT) or non-motorized traffic (NMT). There are capacity constraints caused by congested junctions, markets, and community areas. Presence of several unsafe sharp bends and movement of slow- moving traffic (like rickshaw, rickshaw-van, 'Koriman', 'Nosiman', etc.) on the same lanes with heavy vehicles make the existing undivided 2-lane highway prone to risk of frequent road

1.1.3 Purpose of the Report and Rationale

25. The Environmental Safeguard Compliance Monitoring Report covers the period from 2019 to 2020, in compliance with the environmental scope of the construction supervision. The upgrading of the project road will have its associated environmental impacts that require due consideration in project design for its mitigation and management, based on detailed Environmental Impact Assessment (EIA). The EIA is carried out for the Elenga- Hatikamrul Road section to determine the likely significant environmental changes due to the project's associated activities and formulated mitigation measures in the Environmental Management Plan (EMP) to avoid, minimize, or compensate the identified adverse impacts during implementation phases of the project.

26. The main purpose of this environmental monitoring is to ensure the implementation of environmental mitigation measures of the EMP during the construction and maintenance phases according to the Technical Specifications of the Bidding Documents of all Work Packages. Also, to comply the full requirement of the Environmental Clearance Certificate (ECC) approved by the Department of Environment and ADB's Safeguard Policy Statement, 2009 for timely completion of the project as environmentally sound and sustainable.



Figure 1.1 Elenga- Hatikamrul-Rangpur Project Road

1.2 Locations of the SASEC-2 Project Road

27. The EHR road passes through Tangail, Sirajganj, Bogura, Gaibandha and Rangpur Districts. The Elenga-Hatikamrul road located north of Tangail District and starts at Elenga Junction (N 24°20'22" and E 89°55'28") near the intersection of N4 and N405 and ends at 200m apart from Modern More of Rangpur city. The beginning of this road joins the N4 and then follows the N405 at end of SASEC-I. At Chainage 83+081 the Bangabandhu Bridge started and at west side of this Bridge Chainage is 90+700 of the project roads. The road passes Hatikamrul (24°25'8.97"N and 89°33'6.97"E) of Sirajganj district and then passes up to Rangpur district and Figure 2 and Figure 3 shows the project location. The road is a standard two-lane highway (two 3.65m lanes, paved shoulders each 1.5m and verges each 1.0m). The road condition is varying in different section. Pavement crack is one the main problem for this road. There are several sub- standard horizontal curves. Road passes through Bogura town and several Upzila towns, market and developed areas like: Elenga, Koddar moor, Hatikamrul, Sherpur, Mokamtola, Gobindoganj, Polashbari, Pirgonj, Mithapukur, etc. The Length of the road is 190.4km and the average width of the carriageway is 7.3m.

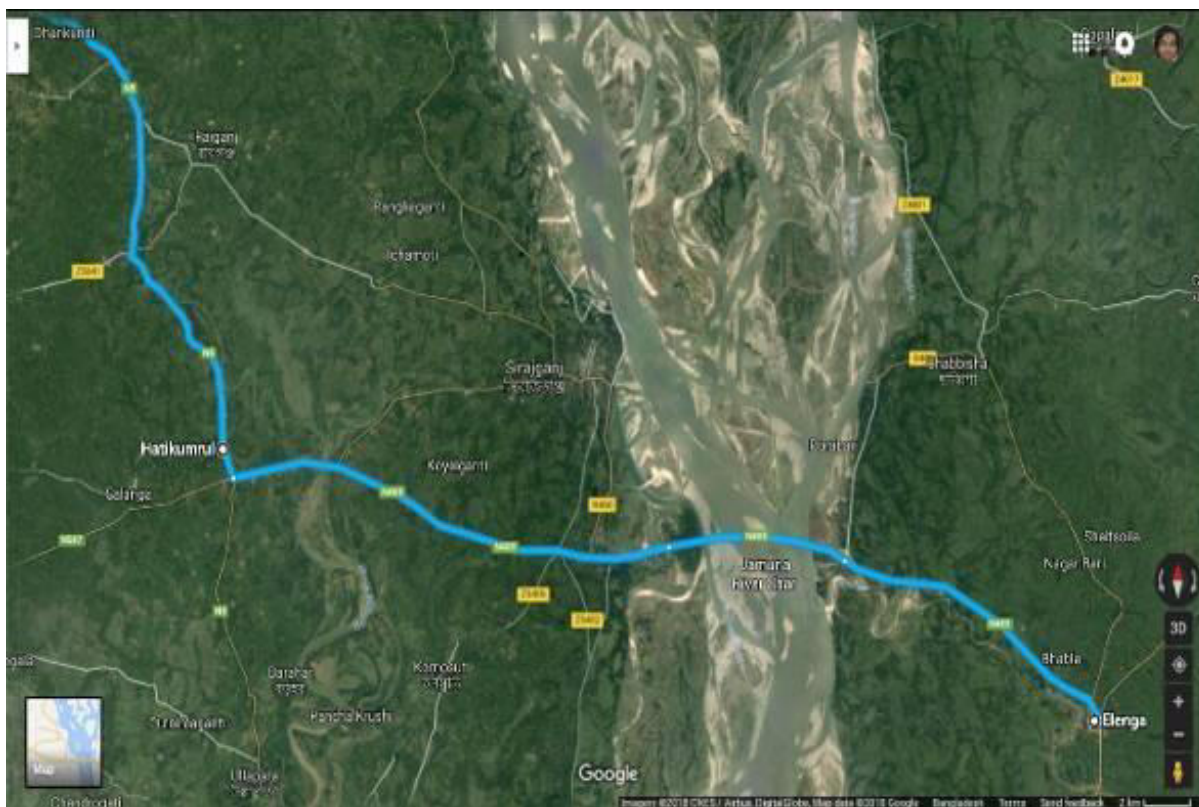


Figure 1.2 Project Road from Elenga to Hatikamrul

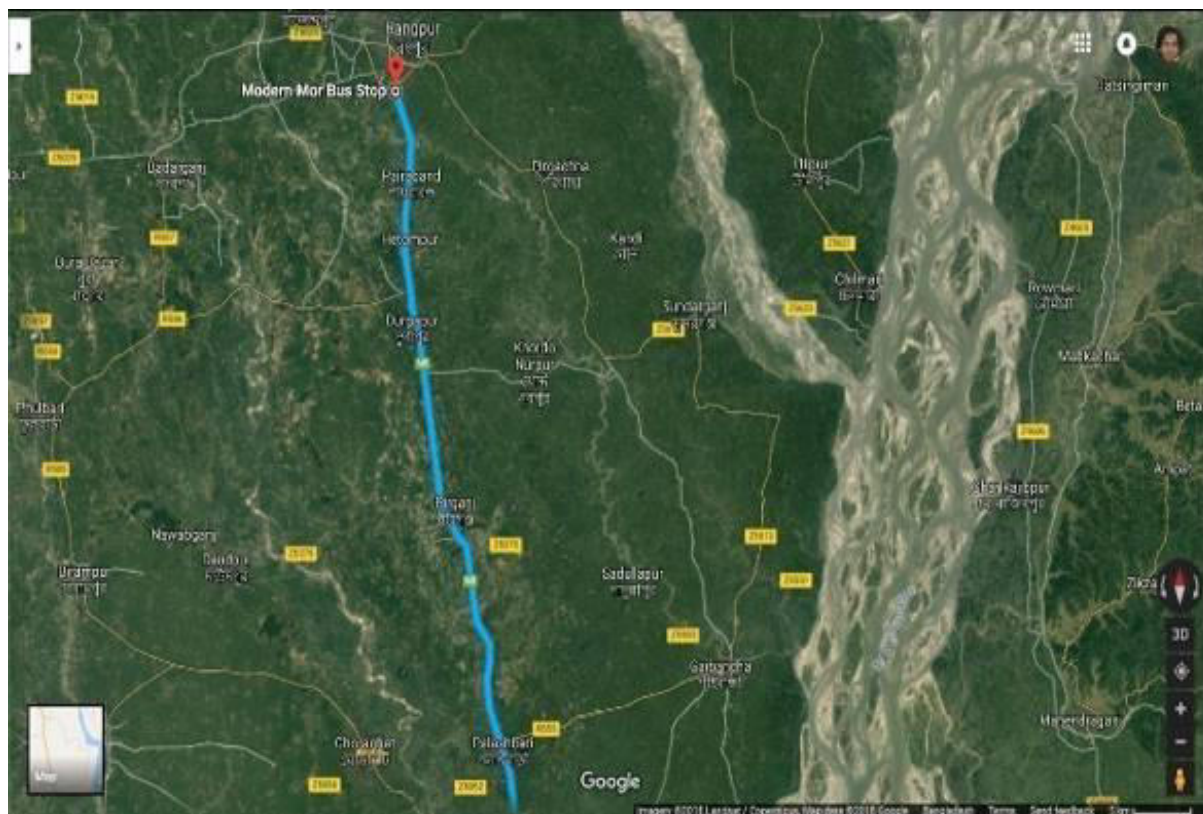


Figure 1.3 Project Road ends at Modern Bus Stop in Rangpur District

1.3 Environmental Category as per ADB Safeguard Policy Statement, 2009 and DOE

28. This project was classified as environment Category B according to the ADB Safeguard Policy Statement (SPS) 2009 as there are no environmentally sensitive sites within the project area and the project includes improvement of road from 2- lanes to 4- lanes alongside an already existing road with limited impact to the existing environment. Hence an Initial Environmental Examination (IEE) has been prepared.

29. In accordance with the requirements of the Department of Environment (DoE), Ministry of Environment and Forests, Government of Bangladesh the project is classified as Red category and requires a full EIA. The 69 types of projects listed a Red category in the Environmental Conservation Rules 1997 includes engineering works where the capital investment is more than 1 million BDT and construction of Bridges longer than 100 m. The project investment is more than 1 million taka and includes Bridges longer than 100 m, and hence is Red category project. So, the EIA study has been conducted.

30. As part of the requirements as per the GOB guidelines, the EIA document was produced for the project, which served as the guidelines for the environmental management and monitoring during construction period. Technically, the EIA provides guidance to the environmental measures needed to prevent and/or mitigate negative environmental effects associated with the project implementation, as well as provides a detailed description of the direct and indirect environmental effects during conducting of the construction.

31. Due to existing road with settlement, the area near the project road has limited flora and much of the trees and vegetation on slopes and ROW has been depleted as the trees were cut down and used as fuel. The fauna along the project road is rather low, aside from the commonly existing species in the country and no important, rare, endangered or protected bird species or habitats are found within the Project Corridor and according to EIA.

1.4 The Overall Project Particulars with Location and Length

The SASEC road connectivity project-2 has divided into 9 working packages which are expressed in the following table 2.2.

Table 1.1 List of Work Packages of Project

Work Packages	Road Sections (Location)	Length (km)
WP-05	Elenga to East Side of Bangabandhu Bridge	13.6
WP-06:	West Side of Bangabandhu Bridge to Hatikamrul	19.8
WP-07:	Hatikamrul to Mirzapur	28.3
WP-08:	Mirzapur to Banani (Bogura)	22.5
WP-09:	Banani (Bogura) to Mokamtala	25.3
WP-10:	Mokamtala to Polashbari	29.9
WP-11:	Polashbari to Borodargah Bus Stand	27.2
WP-12:	Borodargah Bus Stand to Rangpur	23.8
WP-13:	Hatikamrul Interchange (1500 m) including ROU	1.50

1.5 Overall Project Components and Design

32. Project comprises eight road improvement packages and one interchange construction package. The scope of works includes detailed design, earthworks, pavement construction, construction of new Bridges and rehabilitation of old Bridges, drainage, structures, link/roadside improvements and installation of road furniture such as signs and safety barriers. A total of 26 Bridges and 161 culverts will be rehabilitated and/or reconstructed. In addition, construction of three flyovers, 39 underpass, 68 bus bays, pedestrian overpass etc. will be constructed under eight Working package and Hatikamrul Intersection. The components of the project and design of the project are presented in **Table 1.2**.

Table 1.2 Project Components and Description of Design Plan of Project Road

Project	Description of Design
Main Carriageway	190.4 kilometres of existing 2-lane undivided road will be upgraded to
SMVT	Separate lanes will be provided on both sides for Slow Moving
Interchange	One (1500 meters) at Hatikamrul
Flyovers	Three (3) flyovers, total 2635 meters <ul style="list-style-type: none"> • Elenga: 1538.61 meters • Kodda Moor: 395.64 meters • Gobindoganj: 700.75 meters
Railway Overpass:	1 No, 411 meters
Bridge:	26 nos. total 1461.39 meters
Culvert:	161 nos. total 1102 meters
Underpass:	39 nos.
Foot Over Bridge:	11 nos. total 397 meters
Land Acquisition	198.94 hectares
ROU	Road Operation Unit (ROU) for axle load control, road incident response and other road operational activities on the corridor.
RRTC	A Road Research and Training Center (RRTC) for Roads and Highways Department.

Table 1.3 Description of subprojects (package-wise) and status of implementation

Package Number	Components / List of Works	Status of Implementation (Preliminary Design/Detailed Design/On-going Construction/Completed/O&M)	Contract Status (specify if under bidding or contract awarded)	Status of Environmental Approval (provide specific response from list below)	SEMP prepared and Approved by PD (Y/N)	If On-going Construction	
						% Physical Progress (July-Dec.) 2020	Expected Completion Date
WP-5	Bridge-8 Culvert-10 SMVT-2 Fly Over-1	a	Under bidding	a, d & e (on 16 January, 2021)	No	Not started	-
WP-6	Bridge-7 Culvert-17 Under pass-1 SMVT-2 Fly Over-2	Detailed Design and Constructions are on-going simultaneously	Awarded	a, d & e (on 16 January, 2021)	Yes	11.18	2023
WP-7	Bridge-7 Culvert-32 Under pass-1 SMVT-7	Detailed Design and Constructions are on-going simultaneously	Awarded	a, d & e (on 16 January, 2021)	Yes	6.40	2023
WP-8	Bridge-1 Culvert-8 Under pass-2 SMVT-5	Detailed Design and Constructions are on-going simultaneously	Awarded	a, d & e (on 16 January, 2021)	Yes	2.34	2023
WP-9	Bridge-2 Culvert-20 Under pass-3 SMVT-6 Fly Over-2	Detailed Design and Constructions are on-going simultaneously	Awarded	a, d & e (on 16 January, 2021)	Yes	3.26	2023

Package Number	Components / List of Works	Status of Implementation (Preliminary Design/Detailed Design/On-going Construction/Completed/O&M)	Contract Status (specify if under bidding or contract awarded)	Status of Environmental Approval (provide specific response from list below)	SEMP prepared and Approved by PD (Y/N)	If On-going Construction	
						% Physical Progress (July-Dec.) 2020	Expected Completion Date
WP-10	Bridge-5 Culvert-27 Under pass-1 SMVT-7 Fly Over-1	Detailed Design and Constructions are on-going simultaneously	Awarded	a, b, c, d, e	Yes	7.63	2023
WP-11	Culvert-30 Under pass-2 SMVT-5 Fly Over-1	Detailed Design and Constructions are on-going simultaneously	Awarded	a, d & e (on 16 January, 2021)	Yes	5.6	2023
WP-12	Bridge-2 Culvert-17 Under pass-1 SMVT-5	Detailed Design and Constructions are on-going simultaneously	Awarded	a, d & e (on 16 January, 2021)	Yes	8.23	2023
WP-13	Interchange	a	Under bidding	a, d & e (on 16 January, 2021)	No	Not started	-

a. Not yet due (detailed design not yet completed)

b. IEE/EIA report prepared and shared with ADB for comments

c. IEE submitted to DOE for clearance

d. Environmental clearance renewal had been obtained on 12 October 2020 and Valid 13 February 2021

e. Submitted to ADB (Provide Date of Submission) (Submitted with the SEMR Oct-Dec. 2020)

- Identify the role/s of Safeguards Team including schedule of on-site verification of reports submitted by consultants and contractors.
- For each package, provide name/s and contact details of contractor/s' nodal person/s for environmental safeguards.
- Include as appendix all supporting documents including signed monthly environmental site inspection reports prepared by consultants and/or contractors.
- Substantiate compliance and non-compliance statements with relevant photographs.
- With reference to approved EMP/site-specific EMP/construction EMP, complete the table below

Table 1.4 Project Safeguards Team Composition Under Roads and Highways Department

Name	Designation/Office	Email Address	Contact Number
PMU			
Dr. Md. Waliur Rahman	Project Director	waliur.rahman.rhd@gmail.com	01891973956
Joy Prakash Chowdhury	Deputy Project Director	dpl.sasec2.rhd@gmail.com	01799985248
Md. Mahbubur Rahman	Project Manager-3	mmr_buet@yahoo.com	01716279922
PIC			
SEOL Jeong Ho	Team Leader	jhseol92@gmail.com	01882528311
Md. Gias Uddin	Deputy Team Leader	dtl.sasec2.pic@gmail.com	01715032707
Dr. Md. Kabil Hossain	Environment Specialist	drmkh.du@gmail.com	01715974701
Md. Sirajul Karim Talukder	Road Safety Engineer-1	sirajulktalukdewr@gmail.com	01715331418
Md. Mustafizur Rahman	Road Safety Engineer-2	mustafizbakul@yahoo.com	01717478580
Contractor			
Akhlas Uddin	Project Manager/ WP6	mahl.saseccwp06@gmail.com	01917063532

Name	Designation/Office	Email Address	Contact Number
Md. Khalid Hossain	Environment Officer	mkhs46@gmail.com	01716248100
Mozaffar Rahman	Safety Officer	mozaffarrahan1983@gmail.com	01708642272
Engr. SM Nazmul	Project Manager/ WP7	smnazmul99@yahoo.com	01711325619
Md. Abdur Rahman	Environment Officer	abdur.rahman@eqms.com.bd	01764692447
Gias Uddin Khandakar	Safety Officer	N/A	N/A
Engr. Shamsuzzoha	Project Manager/ WP8	engr.szoha@gmail.com	01712021752
Ashis Dhar	Environment Officer		01726965036
Shafiul Shajahan	Safety Officer	shafiulsaju1988@gmail.com	01721882084
Dewan Emran Ahmed	Project Manager/ WP9	deahmed@yahoo.com	01787697586
Shihabuddin Ahmed	Environment Officer	shihabuddin.ahmed@eqms.com.bd	01717014387
Hannan Khan	Safety Officer	hannan.123khan123@gmail.com	01715895643
Mr. Zhang Zhong Wei	Project Manager/ WP10	wp10pm.sasec2.cscec7@gmail.com	01838360071
Md. Faisal Bin Mahmud	Environment Officer	aecl.lab1@gmail.com	01733376603
Md. Shahidul Islam	Safety Officer	N/A	01319915516
Zhang Youjinjin	Project Manager/ WP11	cscecwp11@gmail.com	01306767168
Atiar Rahman (HSE)	Environment Officer	atiar500@gmail.com	01744518098
Atiar Rahman (HSE)	Safety Officer	atiar500@gmail.com	01744518098
Mr. Dong Yanliang	Project Manager/ WP12	sesec2wp12@163.com	01824727778
Mr. Peng Zelin	Environment Officer	N/A	N/A
Shakhawat Hossain	Safety Officer	shakhawathossain527@gmail.com	01736485020

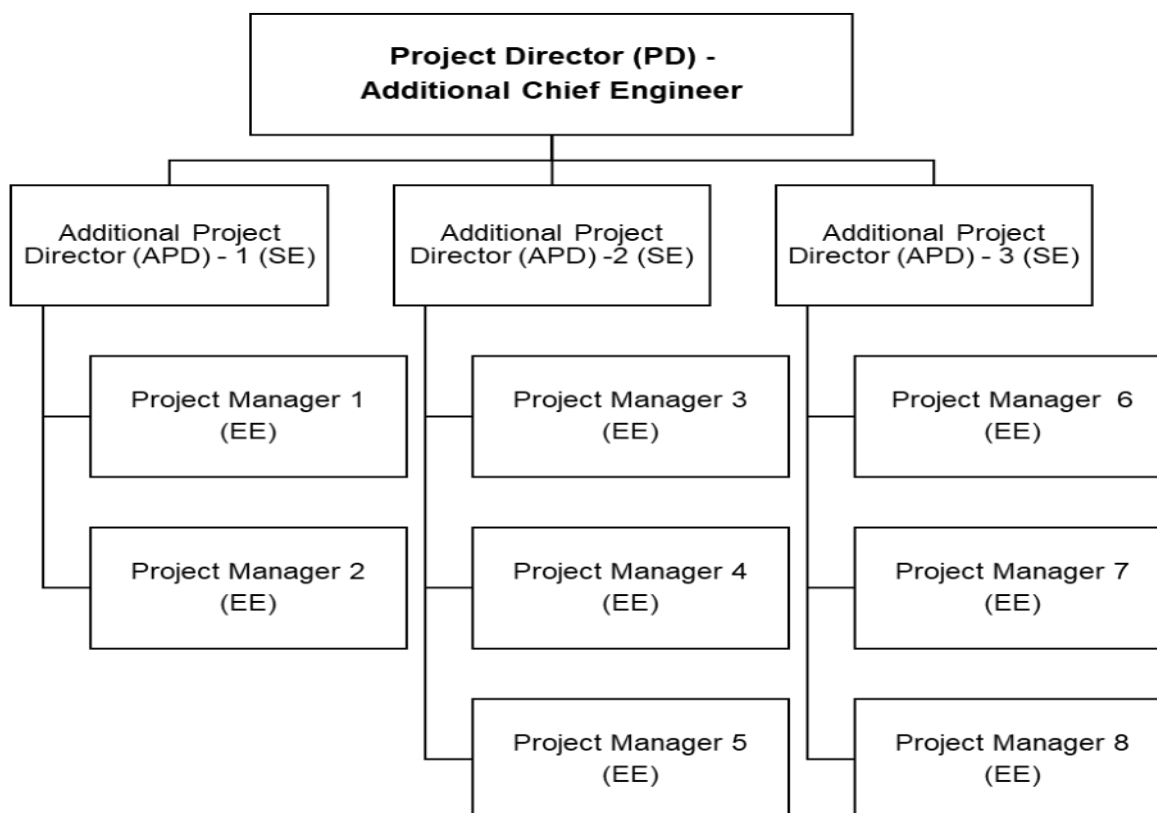


Figure 1.4 Organizational Chart of Project Implementation Unit of SASEC-2

2. PRESENT STATUS OF THE PHYSICAL PROGRESS OF THE WORK PACKAGES

33. The Project (Elenga to Rangpur) is divided into eight work packages (WP5 to WP12), one Hatikamrul Intersection package (WP13), One Road Research Training Center (RRTC), Package WP14 and one Road Operation Unit (ROU), Package (WP15). The overall progress achieved during October-December 2020 is presented in the tabular form (**Table 2.1**) below:

Table 2.1 Summary of Physical Activities for each Package up to Reporting Period

WPs	WP-06	WP-07	WP-08	WP-09	WP-10	WP-11	WP-12
Targeted (%)	16.06	19.92	17.34	19.61	14.08	13.22	14.24
Achieved (%)	11.18	6.4	2.34	3.26	7.63	5.6	8.23
Ach.-Tar. (%)	-4.26	-13.52	-15.00	-16.35	-6.45	-7.62	-6.01



Figure 2.1 Progress Meeting in wp-08 with PD, DPD and PIC consultants of the project

Table 2.2 Compliance Status with National/ Statutory Environmental Requirements

Package No.	Statutory Environmental Requirements	Status of Compliance	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Establish
All Packages	Yearly Renewal of ECC	Compliant, obtained and submitted	13 February 2021	Action required in first week of February for the next renewal	Forest Clearance/ Tree-cutting permit taken provided that 3 trees should be planted for every tree cut.

Table 2.3 Compliance Status with Environmental Loan Covenants

No. (List schedule and paragraph number of Loan Agreement)	Loan Covenant Items	Status of Compliance	Action Required
ADB Loan Project Loan; Project No.: 3592/3593-BAN). The loan is effective from 3 January 2018, L-3592/3593-BAN.	1. Project screening and categorization 2. Environmental assessment 3. Alternative examination 4. Environmental management plan 5. Consultation and grievance redress mechanism 6. Information disclosure 7. Monitoring and reporting 8. Biodiversity protection and natural resources management 9. Pollution prevention and abatement 10. Occupational and community health and safety 11. Physical cultural resources	1. Compliant 2. Compliant 3. Compliant 4. Partially compliant 5. Compliant 6. Compliant 7. Compliant 8. Compliant 9. Compliant 10. Compliant 11. Compliant	4. CEMP is under final construction (To be submitted by 20 February 2021)

3. COMPLIANCE STATUS WITH THE ENVIRONMENTAL MANAGEMENT PLAN

3.1 List of Works Completed During the Reporting Period July-December 2020

Project activity conducted during reporting period	Potential Impacts	Proposed mitigation measures as per EMP	Actual Implementation	Recommendations	Compliance status
1. Bridge work 2. Culvert work 3. Earth work 4. Pavement work 5. Sand filling in embankment area	a. Dust pollution b. Waste pollution c. Water pollution	a. Dust suppression b. Waste disposal in designated places c. Prevention of water pollution	Actual implementation is on-going with pollution prevention measures taking	Construction period impact mitigation measures should be continued followed by post construction maintenance period.	Being Complied

Non-compliance issues identified during the reporting period have been presented below with implementation timeline:

Table 3.1 Corrective Action Plan (CAP) to be carried out by the contractors of all WPs

Description of non-compliance	Corrective Actions recommended	Responsible Person	Timeline for Action
Surface soil pollution by bituminous	The bituminous drum should be removed from the open space and prevent leaking the drum	WP-06 contractor	By the month of February 2021
Light pollution	During construction works at night light should be prevented from visual pollution of drivers to protect road accident	All contractors' EMOs supported by PM	During the night time works when required

3.2 Complaints Received During the Reporting Period July-December 2020

Provide information on number, nature, and resolution of complaints received during reporting period. Attach records as per GRM in the approved IEE. Identify safeguards team member/s involved in the GRM process. Attach minutes of meetings (ensure English translation is provided).

Table 3.2 Complaints log for the project to be used in all working packages

Log Ref	Date / Location	Complainant/ Date of Contact	Details of Complaint	Investigation/ Mitigation Action	Resolution Status
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

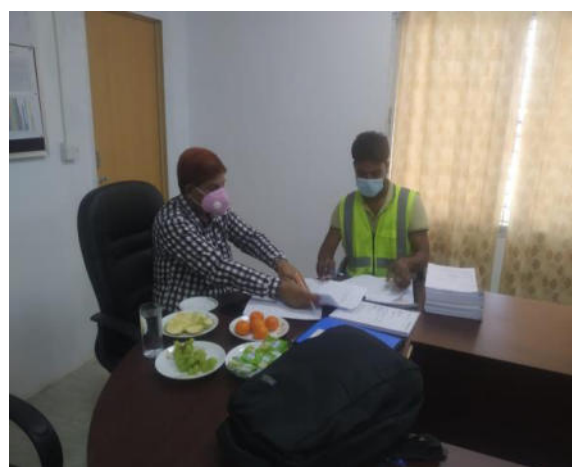
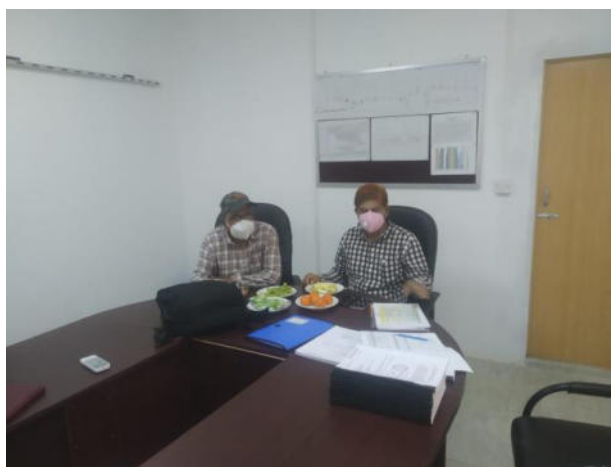


Figure 3.1 Meeting with Resident Engineer and HSE Officer of WP-11

4. ENVIRONMENTAL SAFEGUARD ACTIVITIES CONDUCTED IN REPORTING PERIOD

4.1 ECC Renewal Status from DOE for this year 2020

34. RHD has applied for renewal of Environmental Clearance Certificate (ECC) to DOE for the year 2019-2020 with necessary document, renewal fee and compliance monitoring report accordingly and this is now under the progress by DOE.

35. During the monitoring period, the team observed some construction activities are in progress such as embankment, road and culvert construction etc. Pilling activities of bridges and culverts have been initiated. The embankment alignment of road is also on pursuits that involve soil and sand filling (second layer) along the designated road length.

4.2 Visual Monitoring and Observation in Working Package-07

4.2.1 Air Pollution and Dust Control

36. Air pollution is usually observed near batching point or mixing plants. However, air quality report suggests that the air pollution is within DOE standards. During the dry season dust around the project site is being produced due to on-going construction work. To control the dust nuisance during dry weather, the Contractors are spraying water three to four times in a day as per necessity. Dust Suppression is carried out by truck mounted water spray system. Workers involved in dust control have to put on proper PPE during water spray.



A. Water Spraying after Earth Filling



B. Covered Sand Transportation

Figure 4.1 Air pollution and dust control at under construction road in wp-07

4.2.2 Noise Attenuation Measures

37. Prior to the selection and design of control measures, noise sources were identified and the noise produced was carefully evaluated. The Contractors have employed machineries and heavy earth moving equipments which is mostly latest. New equipment tends to be quieter than the old ones. Earplugs as an integral part of PPE along with other accessories have been provided to the labors and workers accordingly. The use of earplugs is made mandatory during heavy construction activities and its proper use is a part of orientation training also.



Figure 4.2 Generator with Silencer controlling noise in wp-07

4.2.3 Protection of Topsoil and Soil Erosion

38. Topsoil consists of loam, sandy loam; silt loam, silty clay loam or clay loam is incomparable when it comes to road construction. It is essential to consider how the topsoil is being stored, so it can effectively serve its purpose.

39. During dry season, flow of rivers along the project alignment is relatively low. As a result, running water is not a major cause of any soil erosion along the river banks. However, in the Bridge construction site visible soil erosion is observed due to heavy equipment use and construction works which is not that significant. Sandbags have been deployed near bridge and culvert construction area as a preventive measure.

4.2.4 Drainage Congestion

40. Highway drainage removes or control surface water and subsurface water away from the road surface and the subgrade supporting it. The continuous presence of water on the road surface weakens the pavement causing pot holes and ruts; similarly, the presence of water in the subgrade reduces its bearing power and load dispersion capacity. As the project is still in its initial phase, drainage system has not been constructed yet. As in addition, in the base camp area temporary drainage system has been made to ensure the wellbeing of the labors and the environment.

4.2.5 Borrow and Dredging Site Impacts

41. Borrow pits are selected on a basis that it shall be adjacent to the functional area i.e. selection under embankment process. Borrow pits used in construction are approved but outside of ROW. After the subsequent embankment is completed, respected pits are leveled using road rollers.

4.2.6 Protection of Wetlands/Ponds/Rivers/Canals

42. The project adjacent to river and the pond nearby are under environmental study on a quarterly basis. Water sample is collected and analyzed in the laboratory for the given parameters which are- PH , DO, EC, BOD, PO_4 and TSS. No anomalies and threat have been found so far. Mitigation measures shall be deployed

if such event comes up.

4.2.7 Liquid Waste

43. Oily water and chemical discharge have been collected and treated separately to an approved quality before discharge. All drains and other liquids discharged from the project site should meet the quality standards specified in GOB Environment Conservation Rule (1997).

4.2.8 Control of Petroleum Products

44. Petroleum products used in the site are stored in the respected tanker in the base camp. While fueling a vehicle or transferring to different medium, polybags are used to prevent spillage of oily substance on the ground. However, if somehow spillage occurs, shovels are used to separate that soil amount and transfer to the designated waste disposal area in the base camp for further disposal in the dumping yard. Air pollution has not been reported yet according to air quality tests so far.



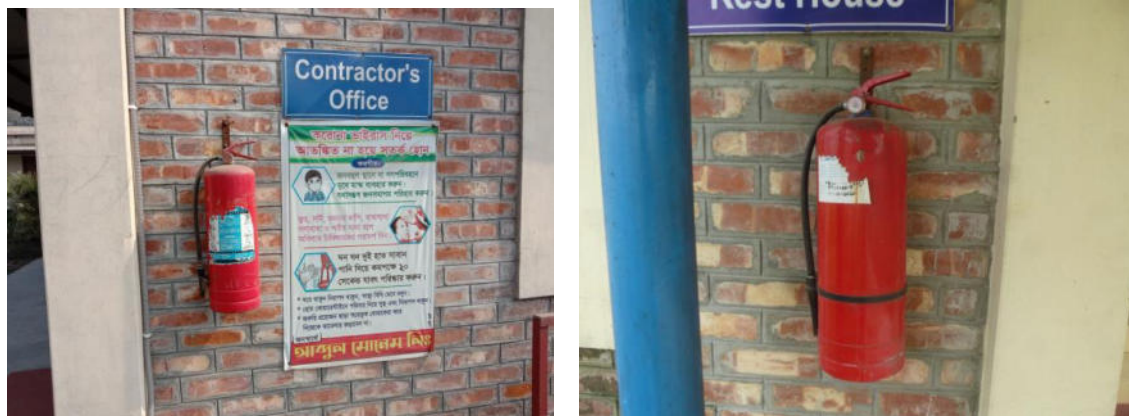
Figure 4.3 Pavement surface at refueling station controlling oil pollution in wp-07

4.2.9 Disposal of Construction Debris & Other Waste Materials

45. Construction wastes are generated from construction works and workers activities (kitchen waste, paper waste) at the project site. Contractor is erecting all kinds of relevant signs regarding waste minimization in respective places of the project. Generated solid and domestic waste are being disposed in specific locations. At construction camps, adequate solid waste bins and baskets are placed at proper places. All the wastes are then collected and carried to designated disposal site by waste delivery trucks. All the domestic wastes are further disposed in the waste disposal yard.

4.2.10 Site Security and Fire Safety

46. The Contractors have already constructed site boundary fencing to isolate the base camp. Proper sign boards and pictorial sign have been used mentioning caution for the area of petroleum, spirit & highly flammable materials & general awareness prohibiting smoking inside the base camp. At camp site there are adequate fire extinguisher systems. It is suggested to ensure pavement surface of refueling station in base camps and secondary containments of lubricant chemicals. Fire safety signage, precautionary symbols and labeling are used at refueling station and base camp.



I. Fire Extinguisher Infront of Site Laboratory II. Fire Extinguisher Infront of Engineer's Office

Figure 4.4 Site security through fire safety extinguisher system

4.2.11 Incident Record and Reporting

47. Contractors with RHD authority have to develop recording and reporting system with proper format to monitor any incident, accident, near misses etc. If any incidental issue arises, immediately it has to be reported & recorded properly in the prescribed format. Remedial measures are being determined by contractor for any kind of incident and accident at project site.

4.2.12 Personal Protective Equipment

48. The working personnel involved in the construction activities have put on PPE properly. The workers were found with proper PPE, such as Safety Jacket, Safety Shoes, Helmet and Hand Gloves, Eye face protection etc. Due to COVID-19 outbreak all the workers, labors and other personnel involved in this project has been provided with respiratory masks to protect themselves while working. Social distance has been seen to be maintained by everyone as much as possible. General knowledge regarding self-protection against novel Corona Virus has been infused with orientation program and training properly.

Table 4.1 List of personal protective equipment used in project site

SI No.	Type of work	Personal Protective Equipment used in site
1	Excavation	Safety Jacket, Safety Shoes, Helmet, Respiratory protection and Hand Gloves.
2	Construction	Safety Jacket, Safety Shoes, Helmet, Respiratory protection and Hand Gloves.

3	Welding	Helmet, Safety shoes, Eye face protection, protective clothing, Hand Gloves, Ear defense, Respiratory protection etc.
4	Scaffolding	Safety vests, Headwear, Safety footwear, Eye face protection, Slush Boots, Safety belt, Rain Suits, Hand protection.

4.2.13 Worker's Health

49. The Contractor has provided all kinds of treatment facilities and pay compensation according to Bangladesh Labor Law 2006. It is suggested that worker's health have to be checked properly twice in a year. The Contractor has established health monitoring system by appointing nurse for the workers. In addition, necessary steps are being taken for arrangement of ambulance service in the project area to support any emergency medical aid and shifting to the hospital/medical Centre. It is suggested to keep records of all accidents, medical support and emergency issues arise. Any case involving Corona disease has been given a top priority and shall be handled immediately.

4.2.14 Sanitation & Drinking Water Facility to Workers

50. Safe drinking water is being supplied through the arrangement of piping network in the base camp and water is available for the workers for the washing and toilet facilities. Adequate toilets for male and female workers have been constructed. It is recommended that washrooms & toilets have to be cleaned twice a day otherwise it will be unhygienic.

4.2.15 Safety Orientation & Training of Workers

51. Training is essential to maintain the employee's health and safety. Both theoretical and practical training is conducted for the employees on the hazards, precautions, and procedures involving the safe storage, handling, and use of all potentially harmful materials. Safety orientation & training are being provided to all working personnel during the fresh enrollment / employment. Routine safety training on regular basis is maintained. It is suggested that the Contractors will arrange routine safety training at definite time interval for the workers throughout the construction phase of the project. Toolbox meeting, Fire safety & COVID19 awareness training are arranged and training is conducted for fresh enrolment employee.

4.3 Visual Monitoring and Observation in Working Package-08

4.3.1 Air Pollution and Dust Control

52. Air pollution is usually observed near batching point or mixing plants. However, air quality report suggests that the air pollution is within DOE standards. During the dry season dust around the project site is being produced due to on-going construction work. To control the dust nuisance during dry weather, the Contractors are spraying water three to four times in a day as per necessity. Dust Suppression is carried out by truck mounted water spray system. Workers involved in dust control have to put on proper PPE during water spray.

4.3.2 Noise Attenuation Measures

53. Prior to the selection and design of control measures, noise sources were identified and the noise produced was carefully evaluated. The Contractors have employed machineries and heavy earth moving equipment which is mostly latest. New equipment tends to be quieter than the old ones. Earplugs as an

integral part of PPE along with other accessories have been provided to the labors and workers accordingly. The use of earplugs is made mandatory during heavy construction activities and its proper use is a part of orientation training also.

4.3.3 Protection of Topsoil and Soil Erosion

54. Topsoil consists of loam, sandy loam; silt loam, silty clay loam or clay loam is incomparable when it comes to road construction. It is essential to consider how the topsoil is being stored, so it can effectively serve its purpose.

55. During dry season, flow of rivers along the project alignment is relatively low. As a result, running water is not a major cause of any soil erosion along the river banks. However, in the Bridge construction site visible soil erosion is observed due to heavy equipment use and construction works which is not that significant. Sandbags have been deployed near bridge and culvert construction area as a preventive measure.

4.3.4 Drainage Congestion

56. Highway drainage removes or control surface water and subsurface water away from the road surface and the subgrade supporting it. The continuous presence of water on the road surface weakens the pavement causing pot holes and ruts; similarly, the presence of water in the subgrade reduces its bearing power and load dispersion capacity. As the project is still in its initial phase, drainage system has not been constructed yet. As in additional, in the base camp area temporary drainage system has been made to ensure the wellbeing of the labors and the environment.

4.3.5 Borrow and Dredging Site Impacts

57. Borrow pits are selected on a basis that it shall be adjacent to the functional area i.e. selection under embankment process. Borrow pits used in construction are approved but outside of ROW. After the subsequent embankment is completed, respected pits are leveled using road rollers.

4.3.6 Protection of Wetlands/Ponds/Rivers/Canals

58. The project adjacent to river and the pond nearby are under environmental study on a quarterly basis. Water sample is collected and analyzed in the laboratory for the given parameters which are- P^H , DO, EC, BOD, PO_4 and TSS. No anomalies and threat have been found so far. Mitigation measures shall be deployed if such event comes up.

4.3.7 Liquid Waste

59. Oily water and chemical discharge have been collected and treated separately to an approved quality before discharge. All drains and other liquids discharged from the project site should meet the quality standards specified in GOB Environment Conservation Rule (1997).

4.3.8 Control of Petroleum Products

60. Petroleum products used in the site are stored in the respected tanker in the base camp. While fueling a vehicle or transferring to different medium, polybags are used to prevent spillage of oily substance on the ground. However, if somehow spillage occurs, shovels are used to separate that soil amount and transfer to the designated waste disposal area in the base camp for further disposal in the dumping yard. Air pollution has not been reported yet according to air quality tests so far.

4.3.9 Disposal of Construction Debris & Other Waste Materials

61. Construction wastes are generated from construction works and workers activities (kitchen waste, paper waste) at the project site. Contractor is erecting all kinds of relevant signs regarding waste minimization in respective places of the project. Generated solid and domestic waste are being disposed in specific locations. At construction camps, adequate solid waste bins and baskets are placed at proper places. All the wastes are then collected and carried to designated disposal site by waste delivery trucks. All the domestic wastes are further disposed in the waste disposal yard.

4.3.10 Site Security and Fire Safety

62. The Contractors have already constructed site boundary fencing to isolate the base camp. Proper sign boards and pictorial sign have been used mentioning caution for the area of petroleum, spirit & highly flammable materials & general awareness prohibiting smoking inside the base camp. At camp site there are adequate fire extinguisher systems. It is suggested to ensure pavement surface of refueling station in base camps and secondary containments of lubricant chemicals. Fire safety signage, precautionary symbols and labeling are used at refueling station and base camp.



a. Under construction Road side safety



b. Bore Hole No. 02, B-Block Cantonment

Figure 4.5 Site security with safety caution tape at under construction sites in wp-08

4.3.11 Incident Record and Reporting

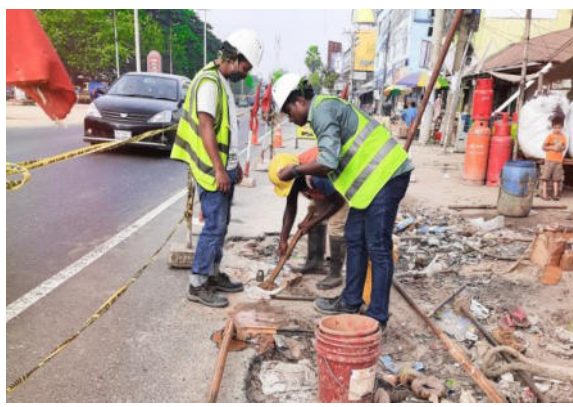
63. Contractors with RHD authority have to develop recording and reporting system with proper format to monitor any incident, accident, near misses etc. If any incidental issue arises, immediately it has to be reported & recorded properly in the prescribed format. Remedial measures are being determined by contractor for any kind of incident and accident at project site.

4.3.12 Personal Protective Equipment

64. The working personnel involved in the construction activities have put on PPE properly. The workers were found with proper PPE, such as Safety Jacket, Safety Shoes, Helmet and Hand Gloves, Eye face protection etc. Due to COVID-19 outbreak all the workers, labors and other personnel involved in this project has been provided with respiratory masks to protect themselves while working. Social distance has been seen to be maintained by everyone as much as possible. General knowledge regarding self-protection against novel Corona Virus has been infused with orientation program and training properly.



A. PC Girder Concrete Casting, (Fotki Bridge)



B. Sub soil investigation work for underpass

Figure 4.6 Workers are using PPE during construction work at wp-08

Table 4.2 List of personal protective equipment used in project site

SI No.	Type of work	Personal Protective Equipment used in site
1	Excavation	Safety Jacket, Safety Shoes, Helmet, Respiratory protection and Hand Gloves.
2	Construction	Safety Jacket, Safety Shoes, Helmet, Respiratory protection and Hand Gloves.
3	Welding	Helmet, Safety shoes, Eye face protection, protective clothing, Hand Gloves, Ear defense, Respiratory protection etc.
4	Scaffolding	Safety vests, Headwear, Safety footwear, Eye face protection, Slush Boots, Safety belt, Rain Suits, Hand protection.

4.3.13 Worker's Health

65. The Contractor has provided all kinds of treatment facilities and pay compensation according to Bangladesh Labor Law 2006. It is suggested that worker's health have to be checked properly twice in a year. The Contractor has established health monitoring system by appointing nurse for the workers. In addition, necessary steps are being taken for arrangement of ambulance service in the project area to support any emergency medical aid and shifting to the hospital/medical Centre. It is suggested to keep records of all accidents, medical support and emergency issues arise. Any case involving Corona disease has been given a top priority and shall be handled immediately.

4.3.14 Sanitation & Drinking Water Facility to Workers

66. Safe drinking water is being supplied through the arrangement of piping network in the base camp and water is available for the workers for the washing and toilet facilities. Adequate toilets for male and female workers have been constructed. It is recommended that washrooms & toilets have to be cleaned twice a day otherwise it will be unhygienic.

4.3.15 Safety Orientation & Training of Workers

67. Training is essential to maintain the employee's health and safety. Both theoretical and practical training is conducted for the employees on the hazards, precautions, and procedures involving the safe storage, handling, and use of all potentially harmful materials. Safety orientation & training are being provided to all

working personnel during the fresh enrollment / employment. Routine safety training on regular basis is maintained. It is suggested that the Contractors will arrange routine safety training at definite time interval for the workers throughout the construction phase of the project. Toolbox meeting, Fire safety & COVID19 awareness training are arranged and training is conducted for fresh enrolment employee.

4.4 Visual Monitoring and Observation in Working Package-09

4.4.1 Air Pollution and Dust Control

68. Air pollution is usually observed near batching point or mixing plants. However, air quality report suggests that the air pollution is within DOE standards. During the dry season dust around the project site is being produced due to on-going construction work. To control the dust nuisance during dry weather, the Contractors are spraying water three to four times in a day as per necessity. Dust Suppression is carried out by truck mounted water spray system. Workers involved in dust control have to put on proper PPE during water spray.

4.4.2 Noise Attenuation Measures

69. Prior to the selection and design of control measures, noise sources were identified and the noise produced was carefully evaluated. The Contractors have employed machineries and heavy earth moving equipment which is mostly latest. New equipment tends to be quieter than the old ones. Earplugs as an integral part of PPE along with other accessories have been provided to the labors and workers accordingly. The use of earplugs is made mandatory during heavy construction activities and its proper use is a part of orientation training also.

4.4.3 Protection of Topsoil and Soil Erosion

70. Topsoil consists of loam, sandy loam; silt loam, silty clay loam or clay loam is incomparable when it comes to road construction. It is essential to consider how the topsoil is being stored, so it can effectively serve its purpose.

71. During dry season, flow of rivers along the project alignment is relatively low. As a result, running water is not a major cause of any soil erosion along the river banks. However, in the Bridge construction site visible soil erosion is observed due to heavy equipment use and construction works which is not that significant. Sandbags have been deployed near bridge and culvert construction area as a preventive measure.

4.4.4 Drainage Congestion

72. Highway drainage removes or control surface water and subsurface water away from the road surface and the subgrade supporting it. The continuous presence of water on the road surface weakens the pavement causing pot holes and ruts; similarly, the presence of water in the subgrade reduces its bearing power and load dispersion capacity. As the project is still in its initial phase, drainage system has not been constructed yet. As in additional, in the base camp area temporary drainage system has been made to ensure the wellbeing of the labors and the environment.

4.4.5 Borrow and Dredging Site Impacts

73. Borrow pits are selected on a basis that it shall be adjacent to the functional area i.e. selection under embankment process. Borrow pits used in construction are approved but outside of ROW. After the

subsequent embankment is completed, respected pits are leveled using road rollers.

4.4.6 Protection of Wetlands/Ponds/Rivers/Canals

74. The project adjacent to river and the pond nearby are under environmental study on a quarterly basis. Water sample is collected and analyzed in the laboratory for the given parameters which are- PH , DO, EC, BOD, PO_4 and TSS. No anomalies and threat have been found so far. Mitigation measures shall be deployed if such event comes up.

4.4.7 Liquid Waste

75. Oily water and chemical discharge have been collected and treated separately to an approved quality before discharge. All drains and other liquids discharged from the project site should meet the quality standards specified in GOB Environment Conservation Rule (1997).

4.4.8 Control of Petroleum Products

76. Petroleum products used in the site are stored in the respected tanker in the base camp. While fueling a vehicle or transferring to different medium, polybags are used to prevent spillage of oily substance on the ground. However, if somehow spillage occurs, shovels are used to separate that soil amount and transfer to the designated waste disposal area in the base camp for further disposal in the dumping yard. Air pollution has not been reported yet according to air quality tests so far.



a. Refueling Station at Camp Site



b. Fuel Kept on concrete Place

Figure 4.7 Controlling of petroleum products through using concrete surface in wp-09

4.4.9 Disposal of Construction Debris & Other Waste Materials

77. Construction wastes are generated from construction works and workers activities (kitchen waste, paper waste) at the project site. Contractor is erecting all kinds of relevant signs regarding waste minimization in respective places of the project. Generated solid and domestic waste are being disposed in specific locations. At construction camps, adequate solid waste bins and baskets are placed at proper places. All the wastes are then collected and carried to designated disposal site by waste delivery trucks. All the domestic wastes are further disposed in the waste disposal yard.

4.4.10 Site Security and Fire Safety

78. The Contractors have already constructed site boundary fencing to isolate the base camp. Proper sign boards and pictorial sign have been used mentioning caution for the area of petroleum, spirit & highly flammable materials & general awareness prohibiting smoking inside the base camp. At camp site there are adequate fire extinguisher systems. It is suggested to ensure pavement surface of refueling station in base camps and secondary containments of lubricant chemicals. Fire safety signage, precautionary symbols and labeling are used at refueling station and base camp.

4.4.11 Incident Record and Reporting

79. Contractors with RHD authority have to develop recording and reporting system with proper format to monitor any incident, accident, near misses etc. If any incidental issue arises, immediately it has to be reported & recorded properly in the prescribed format. Remedial measures are being determined by contractor for any kind of incident and accident at project site.

4.4.12 Personal Protective Equipment

80. The working personnel involved in the construction activities have put on PPE properly. The workers were found with proper PPE, such as Safety Jacket, Safety Shoes, Helmet and Hand Gloves, Eye face protection etc. Due to COVID-19 outbreak all the workers, labors and other personnel involved in this project has been provided with respiratory masks to protect themselves while working. Social distance has been seen to be maintained by everyone as much as possible. General knowledge regarding self-protection against novel Corona Virus has been infused with orientation program and training properly.

Table 4.3 List of personal protective equipment used in project site

SI No.	Type of work	Personal Protective Equipment used in site
1	Excavation	Safety Jacket, Safety Shoes, Helmet, Respiratory protection and Hand Gloves.
2	Construction	Safety Jacket, Safety Shoes, Helmet, Respiratory protection and Hand Gloves.
3	Welding	Helmet, Safety shoes, Eye face protection, protective clothing, Hand Gloves, Ear defense, Respiratory protection etc.
4	Scaffolding	Safety vests, Headwear, Safety footwear, Eye face protection, Slush Boots, Safety belt, Rain Suits, Hand protection.

4.4.13 Worker's Health

81. The Contractor has provided all kinds of treatment facilities and pay compensation according to Bangladesh Labor Law 2006. It is suggested that worker's health have to be checked properly twice in a year. The Contractor has established health monitoring system by appointing nurse for the workers. In addition, necessary steps are being taken for arrangement of ambulance service in the project area to support any emergency medical aid and shifting to the hospital/medical Centre. It is suggested to keep records of all accidents, medical support and emergency issues arise. Any case involving Corona disease has been given a top priority and shall be handled immediately.



A. First Aid Kits and medical services (closed) B. First Aid Kits and medical services (opened)

Figure 4.8 Workers primary health treatment by first aid kits in wp-09

4.4.14 Sanitation & Drinking Water Facility to Workers

82. Safe drinking water is being supplied through the arrangement of piping network in the base camp and water is available for the workers for the washing and toilet facilities. Adequate toilets for male and female workers have been constructed. It is recommended that washrooms & toilets have to be cleaned twice a day otherwise it will be unhygienic.

4.4.15 Safety Orientation & Training of Workers

83. Training is essential to maintain the employee's health and safety. Both theoretical and practical training is conducted for the employees on the hazards, precautions, and procedures involving the safe storage, handling, and use of all potentially harmful materials. Safety orientation & training are being provided to all working personnel during the fresh enrollment / employment. Routine safety training on regular basis is maintained. It is suggested that the Contractors will arrange routine safety training at definite time interval for the workers throughout the construction phase of the project. Toolbox meeting, Fire safety & COVID19 awareness training are arranged and training is conducted for fresh enrolment employee.

4.5 Visual Monitoring and Observation in Working Package-10

4.5.1 Air Pollution and Dust Control

84. Air pollution is usually observed near batching point or mixing plants. However, air quality report suggests that the air pollution is within DOE standards. During the dry season dust around the project site is being produced due to on-going construction work. To control the dust nuisance during dry weather, the Contractors are spraying water three to four times in a day as per necessity. Dust Suppression is carried out by truck mounted water spray system. Workers involved in dust control have to put on proper PPE during water spray.

4.5.2 Noise Attenuation Measures

85. Prior to the selection and design of control measures, noise sources were identified and the noise

produced was carefully evaluated. The Contractors have employed machineries and heavy earth moving equipment which is mostly latest. New equipment tends to be quieter than the old ones. Earplugs as an integral part of PPE along with other accessories have been provided to the labors and workers accordingly. The use of earplugs is made mandatory during heavy construction activities and its proper use is a part of orientation training also.

4.5.3 Protection of Topsoil and Soil Erosion

86. Topsoil consists of loam, sandy loam; silt loam, silty clay loam or clay loam is incomparable when it comes to road construction. It is essential to consider how the topsoil is being stored, so it can effectively serve its purpose.

87. During dry season, flow of rivers along the project alignment is relatively low. As a result, running water is not a major cause of any soil erosion along the river banks. However, in the Bridge construction site visible soil erosion is observed due to heavy equipment use and construction works which is not that significant. Sandbags have been deployed near bridge and culvert construction area as a preventive measure.

4.5.4 Drainage Congestion

88. Highway drainage removes or control surface water and subsurface water away from the road surface and the subgrade supporting it. The continuous presence of water on the road surface weakens the pavement causing pot holes and ruts; similarly, the presence of water in the subgrade reduces its bearing power and load dispersion capacity. As the project is still in its initial phase, drainage system has not been constructed yet. As in addition, in the base camp area temporary drainage system has been made to ensure the wellbeing of the labors and the environment.

4.5.5 Borrow and Dredging Site Impacts

89. Borrow pits are selected on a basis that it shall be adjacent to the functional area i.e. selection under embankment process. Borrow pits used in construction are approved but outside of ROW. After the subsequent embankment is completed, respected pits are leveled using road rollers.

4.5.6 Protection of Wetlands/Ponds/Rivers/Canals

90. The project adjacent to river and the pond nearby are under environmental study on a quarterly basis. Water sample is collected and analyzed in the laboratory for the given parameters which are- PH , DO, EC, BOD, PO_4 and TSS. No anomalies and threat have been found so far. Mitigation measures shall be deployed if such event comes up.

4.5.7 Liquid Waste

91. Oily water and chemical discharge have been collected and treated separately to an approved quality before discharge. All drains and other liquids discharged from the project site should meet the quality standards specified in GOB Environment Conservation Rule (1997).

4.5.8 Control of Petroleum Products

92. Petroleum products used in the site are stored in the respected tanker in the base camp. While fueling a vehicle or transferring to different medium, polybags are used to prevent spillage of oily substance on the ground. However, if somehow spillage occurs, shovels are used to separate that soil amount and transfer to

the designated waste disposal area in the base camp for further disposal in the dumping yard. Air pollution has not been reported yet according to air quality tests so far.

4.5.9 Disposal of Construction Debris & Other Waste Materials

93. Construction wastes are generated from construction works and workers activities (kitchen waste, paper waste) at the project site. Contractor is erecting all kinds of relevant signs regarding waste minimization in respective places of the project. Generated solid and domestic waste are being disposed in specific locations. At construction camps, adequate solid waste bins and baskets are placed at proper places. All the wastes are then collected and carried to designated disposal site by waste delivery trucks. All the domestic wastes are further disposed in the waste disposal yard.

4.5.10 Site Security and Fire Safety

94. The Contractors have already constructed site boundary fencing to isolate the base camp. Proper sign boards and pictorial sign have been used mentioning caution for the area of petroleum, spirit & highly flammable materials & general awareness prohibiting smoking inside the base camp. At camp site there are adequate fire extinguisher systems. It is suggested to ensure pavement surface of refueling station in base camps and secondary containments of lubricant chemicals. Fire safety signage, precautionary symbols and labeling are used at refueling station and base camp.

4.5.11 Incident Record and Reporting

95. Contractors with RHD authority have to develop recording and reporting system with proper format to monitor any incident, accident, near misses etc. If any incidental issue arises, immediately it has to be reported & recorded properly in the prescribed format. Remedial measures are being determined by contractor for any kind of incident and accident at project site.

4.5.12 Personal Protective Equipment

96. The working personnel involved in the construction activities have put on PPE properly. The workers were found with proper PPE, such as Safety Jacket, Safety Shoes, Helmet and Hand Gloves, Eye face protection etc. Due to COVID-19 outbreak all the workers, labors and other personnel involved in this project has been provided with respiratory masks to protect themselves while working. Social distance has been seen to be maintained by everyone as much as possible. General knowledge regarding self-protection against novel Corona Virus has been infused with orientation program and training properly.

Table 4.4 List of personal protective equipment used in project site

SI No.	Type of work	Personal Protective Equipment used in site
1	Excavation	Safety Jacket, Safety Shoes, Helmet, Respiratory protection and Hand Gloves.
2	Construction	Safety Jacket, Safety Shoes, Helmet, Respiratory protection and Hand Gloves.
3	Welding	Helmet, Safety shoes, Eye face protection, protective clothing, Hand Gloves, Ear defense, Respiratory protection etc.
4	Scaffolding	Safety vests, Headwear, Safety footwear, Eye face protection, Slush Boots, Safety belt, Rain Suits, Hand protection.

4.5.13 Worker's Health

97. The Contractor has provided all kinds of treatment facilities and pay compensation according to Bangladesh Labor Law 2006. It is suggested that worker's health have to be checked properly twice in a year. The Contractor has established health monitoring system by appointing nurse for the workers. In addition, necessary steps are being taken for arrangement of ambulance service in the project area to support any emergency medical aid and shifting to the hospital/medical Centre. It is suggested to keep records of all accidents, medical support and emergency issues arise. Any case involving Corona disease has been given a top priority and shall be handled immediately.

4.5.14 Sanitation & Drinking Water Facility to Workers

98. Safe drinking water is being supplied through the arrangement of piping network in the base camp and water is available for the workers for the washing and toilet facilities. Adequate toilets for male and female workers have been constructed. It is recommended that washrooms & toilets have to be cleaned twice a day otherwise it will be unhygienic.

4.5.15 Safety Orientation & Training of Workers

99. Training is essential to maintain the employee's health and safety. Both theoretical and practical training is conducted for the employees on the hazards, precautions, and procedures involving the safe storage, handling, and use of all potentially harmful materials. Safety orientation & training are being provided to all working personnel during the fresh enrollment / employment. Routine safety training on regular basis is maintained. It is suggested that the Contractors will arrange routine safety training at definite time interval for the workers throughout the construction phase of the project. Toolbox meeting, Fire safety & COVID19 awareness training are arranged and training is conducted for fresh enrolment employee.

4.6 Visual Monitoring and Observation in Working Package-11

4.6.1 Air Pollution and Dust Control

100. Air pollution is usually observed near batching point or mixing plants. However, air quality report suggests that the air pollution is within DOE standards. During the dry season dust around the project site is being produced due to on-going construction work. To control the dust nuisance during dry weather, the Contractors are spraying water three to four times in a day as per necessity. Dust Suppression is carried out by truck mounted water spray system. Workers involved in dust control have to put on proper PPE during water spray.

4.6.2 Noise Attenuation Measures

101. Prior to the selection and design of control measures, noise sources were identified and the noise produced was carefully evaluated. The Contractors have employed machineries and heavy earth moving equipment which is mostly latest. New equipment tends to be quieter than the old ones. Earplugs as an integral part of PPE along with other accessories have been provided to the labors and workers accordingly. The use of earplugs is made mandatory during heavy construction activities and its proper use is a part of orientation training also.

4.6.3 Protection of Topsoil and Soil Erosion

102. Topsoil consists of loam, sandy loam; silt loam, silty clay loam or clay loam is incomparable when it comes to road construction. It is essential to consider how the topsoil is being stored, so it can effectively serve its purpose.

103. During dry season, flow of rivers along the project alignment is relatively low. As a result, running water is not a major cause of any soil erosion along the river banks. However, in the Bridge construction site visible soil erosion is observed due to heavy equipment use and construction works which is not that significant. Sandbags have been deployed near bridge and culvert construction area as a preventive measure.

4.6.4 Drainage Congestion

104. Highway drainage removes or control surface water and subsurface water away from the road surface and the subgrade supporting it. The continuous presence of water on the road surface weakens the pavement causing pot holes and ruts; similarly, the presence of water in the subgrade reduces its bearing power and load dispersion capacity. As the project is still in its initial phase, drainage system has not been constructed yet. As in addition, in the base camp area temporary drainage system has been made to ensure the wellbeing of the labors and the environment.

4.6.5 Borrow and Dredging Site Impacts

105. Borrow pits are selected on a basis that it shall be adjacent to the functional area i.e. selection under embankment process. Borrow pits used in construction are approved but outside of ROW. After the subsequent embankment is completed, respected pits are leveled using road rollers.

4.6.6 Protection of Wetlands/Ponds/Rivers/Canals

106. The project adjacent to river and the pond nearby are under environmental study on a quarterly basis. Water sample is collected and analyzed in the laboratory for the given parameters which are- P^H, DO, EC, BOD, PO₄ and TSS. No anomalies and threat have been found so far. Mitigation measures shall be deployed if such event comes up.

4.6.7 Liquid Waste

107. Oily water and chemical discharge have been collected and treated separately to an approved quality before discharge. All drains and other liquids discharged from the project site should meet the quality standards specified in GOB Environment Conservation Rule (1997).

4.6.8 Control of Petroleum Products

108. Petroleum products used in the site are stored in the respected tanker in the base camp. While fueling a vehicle or transferring to different medium, polybags are used to prevent spillage of oily substance on the ground. However, if somehow spillage occurs, shovels are used to separate that soil amount and transfer to the designated waste disposal area in the base camp for further disposal in the dumping yard. Air pollution has not been reported yet according to air quality tests so far.

4.6.9 Disposal of Construction Debris & Other Waste Materials

109. Construction wastes are generated from construction works and workers activities (kitchen waste, paper waste) at the project site. Contractor is erecting all kinds of relevant signs regarding waste minimization in respective places of the project. Generated solid and domestic waste are being disposed in specific locations. At construction camps, adequate solid waste bins and baskets are placed at proper places. All the wastes are then collected and carried to designated disposal site by waste delivery trucks. All the domestic wastes are further disposed in the waste disposal yard.

4.6.10 Site Security and Fire Safety

110. The Contractors have already constructed site boundary fencing to isolate the base camp. Proper sign boards and pictorial sign have been used mentioning caution for the area of petroleum, spirit & highly flammable materials & general awareness prohibiting smoking inside the base camp. At camp site there are adequate fire extinguisher systems. It is suggested to ensure pavement surface of refueling station in base camps and secondary containments of lubricant chemicals. Fire safety signage, precautionary symbols and labeling are used at refueling station and base camp.



Figure 4.9 Road safety by caution tape and plastic road cones in wp-11

4.6.11 Incident Record and Reporting

111. Contractors with RHD authority have to develop recording and reporting system with proper format to monitor any incident, accident, near misses etc. If any incidental issue arises, immediately it has to be reported & recorded properly in the prescribed format. Remedial measures are being determined by contractor for any kind of incident and accident at project site.

4.6.12 Personal Protective Equipment

112. The working personnel involved in the construction activities have put on PPE properly. The workers were found with proper PPE, such as Safety Jacket, Safety Shoes, Helmet and Hand Gloves, Eye face protection etc. Due to COVID-19 outbreak all the workers, labors and other personnel involved in this project has been provided with respiratory masks to protect themselves while working. Social distance has been seen to be maintained by everyone as much as possible. General knowledge regarding self-protection against novel Corona Virus has been infused with orientation program and training properly.

Table 4.5 List of personal protective equipment used in project site

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4.6.13 Worker's Health

113. The Contractor has provided all kinds of treatment facilities and pay compensation according to Bangladesh Labor Law 2006. It is suggested that worker's health have to be checked properly twice in a year. The Contractor has established health monitoring system by appointing nurse for the workers. In addition, necessary steps are being taken for arrangement of ambulance service in the project area to support any emergency medical aid and shifting to the hospital/medical Centre. It is suggested to keep records of all accidents, medical support and emergency issues arise. Any case involving Corona disease has been given a top priority and shall be handled immediately.

4.6.14 Sanitation & Drinking Water Facility to Workers

114. Safe drinking water is being supplied through the arrangement of piping network in the base camp and water is available for the workers for the washing and toilet facilities. Adequate toilets for male and female workers have been constructed. It is recommended that washrooms & toilets have to be cleaned twice a day otherwise it will be unhygienic.

4.6.15 Safety Orientation & Training of Workers

115. Training is essential to maintain the employee's health and safety. Both theoretical and practical training is conducted for the employees on the hazards, precautions, and procedures involving the safe storage, handling, and use of all potentially harmful materials. Safety orientation & training are being provided to all working personnel during the fresh enrollment / employment. Routine safety training on regular basis is maintained. It is suggested that the Contractors will arrange routine safety training at definite time interval for the workers throughout the construction phase of the project. Toolbox meeting, Fire safety & COVID19 awareness training are arranged and training is conducted for fresh enrolment employee.

4.7 Visual Monitoring and Observation in Working Package-12

4.7.1 Air Pollution and Dust Control

116. Air pollution is usually observed near batching point or mixing plants. However, air quality report suggests that the air pollution is within DOE standards. During the dry season dust around the project site is being produced due to on-going construction work. To control the dust nuisance during dry weather, the Contractors are spraying water three to four times in a day as per necessity. Dust Suppression is carried out by truck mounted water spray system. Workers involved in dust control have to put on proper PPE during water spray.

4.7.2 Noise Attenuation Measures

117. Prior to the selection and design of control measures, noise sources were identified and the noise produced was carefully evaluated. The Contractors have employed machineries and heavy earth moving equipment which is mostly latest. New equipment tends to be quieter than the old ones. Earplugs as an integral part of PPE along with other accessories have been provided to the labors and workers accordingly. The use of earplugs is made mandatory during heavy construction activities and its proper use is a part of orientation training also.

4.7.3 Protection of Topsoil and Soil Erosion

118. Topsoil consists of loam, sandy loam; silt loam, silty clay loam or clay loam is incomparable when it comes to road construction. It is essential to consider how the topsoil is being stored, so it can effectively serve its purpose.

119. During dry season, flow of rivers along the project alignment is relatively low. As a result, running water is not a major cause of any soil erosion along the river banks. However, in the Bridge construction site visible soil erosion is observed due to heavy equipment use and construction works which is not that significant. Sandbags have been deployed near bridge and culvert construction area as a preventive measure.



Figure 4.10 Sandbags are deployed at bridge construction site for preventing soil erosion

4.7.4 Drainage Congestion

120. Highway drainage removes or control surface water and subsurface water away from the road surface

and the subgrade supporting it. The continuous presence of water on the road surface weakens the pavement causing pot holes and ruts; similarly, the presence of water in the subgrade reduces its bearing power and load dispersion capacity. As the project is still in its initial phase, drainage system has not been constructed yet. As in addition, in the base camp area temporary drainage system has been made to ensure the wellbeing of the labors and the environment.

4.7.5 Borrow and Dredging Site Impacts

121. Borrow pits are selected on a basis that it shall be adjacent to the functional area i.e. selection under embankment process. Borrow pits used in construction are approved but outside of ROW. After the subsequent embankment is completed, respected pits are leveled using road rollers.

4.7.6 Protection of Wetlands/Ponds/Rivers/Canals

122. The project adjacent to river and the pond nearby are under environmental study on a quarterly basis. Water sample is collected and analyzed in the laboratory for the given parameters which are- PH , DO, EC, BOD, PO_4 and TSS. No anomalies and threat have been found so far. Mitigation measures shall be deployed if such event comes up.

4.7.7 Liquid Waste

123. Oily water and chemical discharge have been collected and treated separately to an approved quality before discharge. All drains and other liquids discharged from the project site should meet the quality standards specified in GOB Environment Conservation Rule (1997).

4.7.8 Control of Petroleum Products

124. Petroleum products used in the site are stored in the respected tanker in the base camp. While fueling a vehicle or transferring to different medium, polybags are used to prevent spillage of oily substance on the ground. However, if somehow spillage occurs, shovels are used to separate that soil amount and transfer to the designated waste disposal area in the base camp for further disposal in the dumping yard. Air pollution has not been reported yet according to air quality tests so far.

4.7.9 Disposal of Construction Debris & Other Waste Materials

125. Construction wastes are generated from construction works and workers activities (kitchen waste, paper waste) at the project site. Contractor is erecting all kinds of relevant signs regarding waste minimization in respective places of the project. Generated solid and domestic waste are being disposed in specific locations. At construction camps, adequate solid waste bins and baskets are placed at proper places. All the wastes are then collected and carried to designated disposal site by waste delivery trucks. All the domestic wastes are further disposed in the waste disposal yard.

4.7.10 Site Security and Fire Safety

126. The Contractors have already constructed site boundary fencing to isolate the base camp. Proper sign boards and pictorial sign have been used mentioning caution for the area of petroleum, spirit & highly flammable materials & general awareness prohibiting smoking inside the base camp. At camp site there are adequate fire extinguisher systems. It is suggested to ensure pavement surface of refueling station in base camps and secondary containments of lubricant chemicals. Fire safety signage, precautionary symbols and labeling are used at refueling station and base camp.



A. Rally for safe road at under construction road B. Safety sign board at under construction road site

Figure 4.11 Road safety activities at under construction road in wp-12

4.7.11 Incident Record and Reporting

127. Contractors with RHD authority have to develop recording and reporting system with proper format to monitor any incident, accident, near misses etc. If any incidental issue arises, immediately it has to be reported & recorded properly in the prescribed format. Remedial measures are being determined by contractor for any kind of incident and accident at project site.

4.7.12 Personal Protective Equipment

128. The working personnel involved in the construction activities have put on PPE properly. The workers were found with proper PPE, such as Safety Jacket, Safety Shoes, Helmet and Hand Gloves, Eye face protection etc. Due to COVID-19 outbreak all the workers, labors and other personnel involved in this project has been provided with respiratory masks to protect themselves while working. Social distance has been seen to be maintained by everyone as much as possible. General knowledge regarding self-protection against novel Corona Virus has been infused with orientation program and training properly.

Table 4.6 List of personal protective equipment used in project site

SI No.	Type of work	Personal Protective Equipment used in site
1	Excavation	Safety Jacket, Safety Shoes, Helmet, Respiratory protection and Hand Gloves.
2	Construction	Safety Jacket, Safety Shoes, Helmet, Respiratory protection and Hand Gloves.
3	Welding	Helmet, Safety shoes, Eye face protection, protective clothing, Hand Gloves, Ear defense, Respiratory protection etc.
4	Scaffolding	Safety vests, Headwear, Safety footwear, Eye face protection, Slush Boots, Safety belt, Rain Suits, Hand protection.

4.7.13 Worker's Health

129. The Contractor has provided all kinds of treatment facilities and pay compensation according to

Bangladesh Labor Law 2006. It is suggested that worker's health have to be checked properly twice in a year. The Contractor has established health monitoring system by appointing nurse for the workers. In addition, necessary steps are being taken for arrangement of ambulance service in the project area to support any emergency medical aid and shifting to the hospital/medical Centre. It is suggested to keep records of all accidents, medical support and emergency issues arise. Any case involving Corona disease has been given a top priority and shall be handled immediately.

4.7.14 Sanitation & Drinking Water Facility to Workers

130. Safe drinking water is being supplied through the arrangement of piping network in the base camp and water is available for the workers for the washing and toilet facilities. Adequate toilets for male and female workers have been constructed. It is recommended that washrooms & toilets have to be cleaned twice a day otherwise it will be unhygienic.



A. Source of drinking water for labours B. Wash basins available in the base camp

Figure 4.12 Drinking water facilities in the base camp in wp-12

4.7.15 Safety Orientation & Training of Workers

131. Training is essential to maintain the employee's health and safety. Both theoretical and practical training is conducted for the employees on the hazards, precautions, and procedures involving the safe storage, handling, and use of all potentially harmful materials. Safety orientation & training are being provided to all working personnel during the fresh enrollment / employment. Routine safety training on regular basis is maintained. It is suggested that the Contractors will arrange routine safety training at definite time interval for the workers throughout the construction phase of the project. Toolbox meeting, Fire safety & COVID19 awareness training are arranged and training is conducted for fresh enrolment employee.



I. Toolbox meetings are arranged



II. Fire drill is arranged on a monthly basis

Figure 4.13 Safety orientation and training of workers in wp-12

5. APPROACH AND METHODOLOGY FOR ENVIRONMENTAL MONITORING OF THE PROJECT

Brief description on the means for environmental monitoring of each sub-project

5.1 Monitoring environmental components (soil, air, water, etc) with parameters

The environmental components with parameters are analyzed in the lab but some parameters were detected at site through digital instrument such as pH, Temperature, TDS, and DO etc.

5.2 Frequency of Monitoring

The environmental components with parameters are being monitored quarterly. Environmental management implementation is being performed monthly.

5.3 Location of monitoring

Locations of monitoring are construction base camp, Asphalt mixing plant, pavement construction sites, labour camp, bridge and culvert construction sites.



Figure 5.1 Site meeting with ADB Consultant, PM, RE and Environment Specialist in WP- 09

5.1 Air Quality Monitoring

132. Air pollution is the change in the natural composition of the air we breathe, beyond some defined limits. This change is induced by releasing harmful substances into the atmosphere and it causes damage to our health and environment. Natural sources of air pollution include sea spray, volcanic activity, forest fire, and dust storms. Anthropogenic sources include motor vehicles, industrial production processes, and power generation. The main pollutants that can affect human health are often known as “criteria” pollutants and these include:

Particulate matter:

133. Particulate matter is the general term used to describe a mixture of solid and liquid particles in air including dust, soot, smoke, and dirt. PM_{10} is particulate matter less than 10 microns in aerodynamic diameter and is often called the coarse fraction. $PM_{2.5}$ is particulate matter less than 2.5 microns (about 0.0001 inch) in aerodynamic diameter and is often called the fine fraction. PM_{10} and $PM_{2.5}$ particles are small enough to penetrate into and accumulate in the respiratory system. Exposure can cause respiratory morbidity, impaired lung function and irritation. It is also carcinogenic. This pollution is sometimes referred to as “black carbon pollution”. Suspended particulate matter (SPM) are finely divided solids or liquids that may be dispersed through the air from combustion processes, industrial activities or natural sources.

Sulfur dioxide:

134. Sulfur dioxide (SO_x) is a gas that is often produced in the burning of fossil fuels containing Sulfur. It can cause respiratory problems and damage vegetation. Sulfur dioxide dissolves easily in water and therefore can contribute to acid rain, once it released into the atmosphere.

Oxides of Nitrogen:

135. Nitrogen dioxide (NO_x) is a noxious gas, highly reactive and it is formed when fuel is burned at high temperature. The main sources are motor vehicles, power plants and industrial boilers. Nitrogen dioxide can cause respiratory problems. It can also take part in the chemical reactions in the atmosphere to form corrosive nitric acid and can also react with sunlight to form ground level ozone. Long term exposure can decrease lung function, increase the risk of respiratory conditions and increases the response to allergens.

NO_x also contributes to the formation of fine particles (PM) and ground level ozone, both of which are associated with adverse health effects.

Carbon monoxide:

136. Carbon monoxide (CO) is a gas that is slightly lighter than air and is formed when carbon in fuel is not burned completely. In urban areas, almost all CO is produced by motor vehicles. Exposure to CO can disrupt the supply of oxygen to the body tissue, cause neurobehavioral effects and cardiovascular problems.

5.2 Monitoring of Noise Level

137. Noise is an important environmental pollutant. A survey by the U.S. Federal Council of Science and Technology has revealed that noise is a technology generated problem and that the overall loudness of environmental noise doubles every ten years in pace with our social and industrial progress. This geometric progression wise growth of noise could be mind-boggling in view of the ever-increasing pace of technological growth. The noise quality of the pre mentioned locations has been measured during working phase. Wind direction was from south to north. According to the Department of Environment (ECR'1997), the standard for ambient noise level in the industrial zone is 75 and 70 decibels at day & night time respectively. The results were found within allowable limits.

5.3 Monitoring of Surface Water

138. The surface water quality has been analyzed and found that the project is not posing any detrimental effect to surrounding environment by surface water pollution. From the above analysis result it is found that, all the parameters are within allowable limit.

5.4 Ground Water

139. The Ground Water samples collected from different points as described has been analyzed. Iron content in some location doesn't conform to the given standards. Seasonal variations that affect hydrological/hydrogeological conditions are a critical factor which may affect Fe concentrations. However subsequent studies shall be continued yearlong to clearly understand the reasons behind it.

6. ENVIRONMENTAL EFFECTS OF PANDEMIC COVID-19

140. The disruption caused by the COVID-19 has brought about several effects on the environment and climate. Due to movement restriction and a significant slowdown of social and economic activities, air quality has improved in many towns and city with a reduction in water pollution in different parts of the country. Besides, increased use of PPE (e.g., face mask, hand gloves etc.), their haphazard disposal, and generation of a huge amount of hospital waste has negative impacts on the environment. Both positive and negative environmental impacts of COVID-19 are described below:

6.1 Positive Environmental Effects

6.1.1. Reduction of air pollution and GHGs emission

141. As industries, transportation and companies have closed down, it has brought a sudden drop of greenhouse gases (GHGs) emissions. Compared with this time of last year, levels of air pollution in major cities have reduced because of measures taken to control the virus. It was estimated that the reduction of N₂O and CO occurred due to the shutdown of heavy industries. Also, emission of NO₂ is one of the key indicators of economic activities, which indicates a sign of reduction in our country due to the recent shut down, NO₂ is emitted from the burning of fossil fuels, 80% of which comes from motor vehicle exhaust. Due

to the COVID-19 lockdown, NO₂ emission dropped in many towns. The levels of NO₂, PM_{2.5} and PM₁₀ had been decreased during the nationwide lockdown.

142. It is assumed that, vehicles are key contributors of emissions and contribute much in the transport sector's GHGs emission. The measures taken for the containment of the virus are also having a dramatic impact on the transport sector.

143. Overall, much less consumption of fossil fuels lessens the GHGs emission, which helps to combat against climate change. Oil demand has dropped in the year of 2020, compared to the same period of last year. Besides, coal consumption is also reduced because of less energy demand during the lockdown period.

6.1.2. Reduction of water pollution

144. Water pollution is a common phenomenon of a developing country like Bangladesh, where domestic and industrial wastes are dumped into rivers without treatment. During the lockdown period, the major industrial sources of pollution have shrunk or completely stopped, which helped to reduce the pollution load. This improvement of water quality like physicochemical parameters i.e., pH, dissolved oxygen (DO), biochemical oxygen demand (BOD) and total coliform of the waterbodies was found within the surface water quality standard of Bangladesh. Except total coliform in some monitoring stations, all others parameters even meet the national drinking water quality standard, which can be used without conventional treatment but after disinfection. It is also found that, the concentration of pH, electric conductivity (EC), DO, BOD and chemical oxygen demand (COD) has reduced in different monitoring stations during the lockdown in comparison to the pre-lockdown period. Moreover, due to imposed a ban of public gathering, number of tourists and water activities were reduced in many places. It is reported that, due to the lockdown of COVID-19, the reappearances of many aquatic species have been occurred. Water pollution are also reduced in the beach areas of Bangladesh. Due to the COVID-19 lockdown, the amount of food waste is reduced in Bangladesh which ultimately reduces soil and water pollution. However, the amount of industrial water consumption is also reduced, especially from the textile sector. Usually, huge number of solid trashes is generated from construction and manufacturing process responsible for water and soil pollution, also reduced.

6.1.3. Reduction of noise pollution

145. Noise pollution is the elevated levels of sound, generated from different human activities (e.g., machines, vehicles, construction work), which may lead to adverse effects in human and other living organisms. Usually, noise negatively effects on physiological health, along with cardiovascular disorders, hypertension, and sleep shortness of human. Moreover, anthropogenic noise pollution has adverse impacts on wildlife through the changing balance in predator and prey detection and avoidance. Unwanted noise also negatively effects on the invertebrates, that help to control environmental processes which are vital for the balance of the ecosystem. However, the quarantine and lockdown measures mandate that people stay at home and reduced economic activities and communication, which ultimately reduced noise level in most cities. For instance, noise level is reduced drastically in the recent lockdown period. Due to reduction of vehicle movement during the lockdown period, the noise levels have been reduced. As a result, city dwellers are now enjoying the chirping of birds. Moreover, due to travel restrictions, the number of flights and vehicular movements have drastically reduced, which have ultimately reduced the level of noise pollution. For example, passenger air travel has been slashed, car traffic has dropped and trains are running few numbers than the usual rates. Overall, COVID-19 lockdown, and lessens of economic activities reduced the noise pollution.

6.1.4. Ecological restoration and assimilation of Mohasthan Gor tourist spot

166. Over the past few years, tourism sector has witnessed a remarkable growth because of technological advancements and transport networks; which contribute significantly to gross domestic product (GDP). It is estimated that the tourism industry is responsible for GHGs emission. However, the places of natural beauty (e.g., national park, mountains, mangroves, etc.) are usually attracting the tourists, and make a huge harsh. To facilitate and accommodate them, lots of hotels, motel, restaurant, bar and market are built, which consume lots of energy and other natural resources. Moreover, visitors dump various wastes which impair natural beauty and create ecological imbalance. Due to the outbreak of COVID-19 and local restrictions, the number of tourists has reduced in the Mohasthan Gor tourist spot. Local administration imposed a ban on public gathering. Nature gets a time to assimilate human annoyance, and due to pollution reduction recently returning back natural scenery of canals and waterways after a long decade.

6.2 Negative Environmental Effects of Covid-19

6.2.1 Increase of biomedical waste generation

147. Since the outbreak of COVID-19, medical waste generation is increased, which is a major threat to public health and environment. For sample collection of the suspected COVID-19 patients, diagnosis, treatment of huge number of patients, and disinfection purpose lots of infectious and biomedical wastes are generated from hospitals. Such a sudden rise of hazardous waste, and their proper management has become a significant challenge to the local waste management authorities. So, waste generated from the hospitals (e.g., needles, syringes, bandage, mask, gloves, used tissue, and discarded medicines etc.) should be managed properly, to reduce further infection and environmental pollution, which is now a matter of concern.

6.2.2 Safety equipment use and haphazard disposal

148. To protect from the viral infection, presently peoples are using face mask, hand gloves and other safety equipment, which increase the amount of healthcare waste. It is reported that, trash amount has been increasing due to increased PPE use at the domestic level. Since the outbreak of COVID-19, the production and use of plastic based PPE is increased. However, due to lack of knowledge about infectious waste management, most people dump these (e.g., face mask, hand gloves etc.) in open places and in some cases with household wastes. Such haphazard dumping of these trashes creates clogging in water ways and worsens environmental pollution. It is reported that, face mask and other plastic based protective equipment are the potential source of microplastic fibers in the environment. Usually, Polypropylene is used to make N-95 masks, and Tyvek for protective suits, gloves, and medical face shields, which can persist for a long time and release dioxin and toxic elements to the environment. Though, experts and responsible authorities suggest for the proper disposal and segregation of household organic waste and plastic based protective equipment (hazardous medical waste), but mixing up these wastes increases the risk of disease transmission, and exposure to the virus of waste workers.

6.2.3 Municipal solid waste generation, and reduction of recycling

149. Increase of municipal waste (both organic and inorganic) generation has direct and indirect effects on environment like air, water and soil pollution. Due to the pandemic, quarantine policies established in many parts of the country have led to an increase in the demand of online shopping for home delivery, which ultimately increase the amount of household wastes from shipped package materials. However, waste recycling is an effective way to prevent pollution, save energy, and conserve natural resources. But, due to the pandemic situation country postponed the waste recycling activities to reduce the transmission of viral

infection. Overall, due to disruption of routine municipal waste management, waste recovery and recycling activities, increasing the landfilling and environmental pollutants in project districts.

6.2.4 Other effects on the environment

150. Recently, huge number of disinfectants is applied into roads, commercial, and residential areas to exterminate Corona virus. Such extensive use of disinfectants may kill non-targeted beneficial species, which may create ecological imbalance. So, additional measures in wastewater treatment are essential, which is challenging for developing countries like Bangladesh, where municipal wastewater is drained into nearby aquatic bodies and rivers without treatment. Bangladesh has already strengthened the disinfection process (increased use of chlorine) to prevent the virus spreading through the wastewater. But, the excessive use of chlorine in water could generate harmful by-product.

151. Directly or indirectly, the pandemic is affecting human life and the economy, which is ultimately affecting the environment and climate. It reminds us how we have neglected the environmental components and enforced human induced climate change. Moreover, the response of COVID-19 also teaches us to work together to combat against the threat to mankind. Though the impacts of COVID-19 on the environment are short-term, united and proposed time-oriented effort can strengthen environmental sustainability and save the earth from the effects of climate change.



Figure 6.1 Disinfectant Safety Tunnel Facilities at the Camp Area

6.2.5 Further Considerations

In addition to these matters, consideration needs to be given to:

- The applicable or background law – which may confer rights and impose obligations on top of the relevant contractual provisions.
- Contractual notification provisions for the making of claims, and for keeping records of the impact of events;
- Measures that have been or will be taken to try to overcome or mitigate the effects of the impacting events. Demonstrating these matters may be a critical aspect of any claim made due to the COVID-19 situation. Under many laws, parties must continue to exhaust all reasonably available means to continue performing their obligations, notwithstanding the existence of a force majeure event;
- The possibility that a party may have to terminate the contract, if the force majeure event continues materially to prevent the performance of its obligations for a certain period of time; and
- How the impact of COVID-19 should inform parties' behavior when entering into construction and engineering contracts in the future. Matters requiring attention in this regard will include ensuring that there is symmetry of liability along the supply chains used for the project.

6.2.6 COVID-19 Assessment in sites and ADB's guideline on COVID-19

152. ADB provided health & safety guideline on COVID-19 had been sent to the sites of all WPs with Annex-A, Annex-B and Annex-E form for field assessment on COVID-19. All of the field workers are instructed to follow the guideline for awareness building to protect from pandemic COVID-19 affect.



Figure 6.2 How to reduce risk of the Corona Virus infection



Figure 6.3 HSE Officer of wp-11 is explaining about Corona Virus awareness program

7. IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT PLAN

7.1 Dust Control

- Regular sprinkling of water is being done on open surface and dust grounds during construction phase;
- During school hour, sprinkling of water should be done around the school premises mentioned in Baseline survey.
- Transport of materials in tarpaulin- covered trucks
- The sand and other such dispersible material should be stored at site for minimum working period.
- Plantation of trees nears the road side after completion of construction phase.
- Project management and contractor should enforce strict use of personal protective clothing;
- Complaints of dust related ailments among employees and neighbors to be given attention by contractor.



a) Dust pollution pre-scenario condition



b) Dust control post scenario condition in wp-11

Figure 7.1 Dust control pre- and post-scenarios in wp-11

7.2 Noise Control

- ✓ Noise barrier or padding on heavy construction machinery shall be deployed in order to keep noise level inside the allowable limit near the residential areas.
- ✓ Working time schedule shall be optimized according to requirement.

7.3 Soil Erosion Prevention

- To protect soil erosion and soil embankment, Protective measure (Sand bags, Geotextile) will be used during construction phase and planting native grass and creepers on erosion prone sections during operation phase.
- Limit the extent of excavation to reduce soil erosion potential.
- Upon completion of works, the Contractor will ensure that all excavated areas are properly stabilized. This includes the rehabilitation of all disturbed areas by the most appropriate and effective method.

7.4 Drainage Congestion

- Surface drainage have to be controlled to divert surface runoff away from the construction area;
- Laying barrier net;
- Undertaking construction work during dry seasons;
- Completed areas should be restored/re-vegetated as soon as practicable;
- Temporary silt-trap or digging of pond towardsiltation prevention
- Stockpiling of spoil soil at a safe distance from the drainage system



Figure 7.2 Culvert construction site visit by PIC Environment Specialist at wp-11

7.5 Borrow Pit

- Borrow pits shall not be kept as it is after work for long as the rainy season is nearby. Pits shall be

leveled as soon as possible.

- During rainy season sandbags shall be used due to prolonged exposure to heavy rain.

7.6 Protection of Wetlands

Water quality analysis shall be continued along the project time length. If any anomaly occurs, the reason behind it shall be diagnosed and proper mitigation measure shall be deployed to reduce the impact.

7.7 Liquid Waste

- ❖ Wastewater effluent from contractor's workshop and equipment washing yards would be passed through gravel/ sand beds to remove oil/ grease contaminants before discharging it into natural streams;
- ❖ The hazardous waste will be transported carefully;
- ❖ The EHS guidelines on Hazardous Materials and Solid waste Management should be followed for all solid and hazardous waste management.
- ❖ Sanitary wastes generating from staff and labor camps must be disposed of in environment friendly manner, i.e., provision of septic tank etc. for toilet wastes

7.8 Control of Petroleum Products

Refining petroleum and burning gasoline causes air pollution. So, petroleum products shall be handled with great caution. Spillage of oils in the ground shall be prevented.

7.9 Wild Life and Biodiversity

- ✚ Proper disposal and management of construction waste
- ✚ No waste should be dumped in water bodies during construction
- ✚ Wastewater from labor camp and construction site should not be disposed- off in the waterbodies
- ✚ Septic tank/soak pits should be provided to dispose-off the wastewater from construction camp
- ✚ Site should be kept clean so as no pollutant from site should enter the water bodies along with run-off
- ✚ Excavation activities should not be undertaken during monsoon season
- ✚ Piling of raw material at construction site should be avoided
- ✚ Raw material, debris and fuel should be stored on paved surfaces by covering them.

7.10 Fisheries

- ✓ Adequate cross drainage structure shall be provided in all waterlogged area or pond extending both sides of the road areas.
- ✓ No construction shall be undertaken during the high flood when water depth is more than 6m.
- ✓ Construction along the riverbanks must be avoided during the fish breeding season (July to September).

7.11 Construction Debris & Waste Materials Handling

- Waste will be disposed at designated sites and no waste will be disposed in the productive agricultural field.
- The EHS guidelines on Solid waste Management should be followed for all solid and hazardous waste management.
- Solid waste generated during construction will be safely disposed in approved and demarcated waste disposal sites and the contractor will not dispose waste into productive agricultural lands and will also provide a proper waste management plan

- Aggregate waste material of existing road will be reused in up-gradation of road.
- Other than destruction, construction debris could be recycled and/or reused. If the responsible party is unable to perform any of the above, they can sell their wastes to such function providing party.

7.12 Health and Sanitation

- ❖ The workers should use PPE (Personal Protective Equipment), safety goggles, and other necessary means of protection.
- ❖ Must ensure sufficient lighting in the area where a person performs construction work or may be required to pass through, including access ways and emergency exit or passage without risk to health and safety.
- ❖ Adequate perimeter fencing should be installed on the site before construction work commences and that should be maintained during the construction work and signs should be placed which is clearly visible from outside the site including emergency telephone numbers.
- ❖ Construction site should be kept clean and tidy. Access ways should be kept clear of materials and debris and maintained in a non-slippery condition.
- ❖ Arrangements of first aid facility should be made available at base camp.
- ❖ It is suggested that worker's health have to be checked properly once in a year.
- ❖ An understanding has to be built with a local hospital for the emergency incident for the worker's health of the project and EPC contractor and establish such health monitoring system of the workers.
- ❖ Necessary steps to be taken for arrangement emergency ambulance service in the project area to support any emergency medical aid and shifting to the hospital/ medical Centre.
- ❖ Proper sanitation system should be provided and regular, proper and safe disposal of human waste should be ensured during the construction period.
- ❖ Contractors and workers should follow appropriate means of waste removal and sanitation measures.
- ❖ Adequate number of toilets and bathrooms for male and female workers have already been constructed
- ❖ Proper disposal system of sewage waste should be implemented for sanitation purpose and the workers should be made aware to practice those facilities.

8. ENVIRONMENTAL MONITORING ACTIVITIES OF THE SASEC-2 PROJECT

8.1 Objectives of The Monitoring

- ✚ To characterize and monitor the environmental and health safety quality at project site
- ✚ To obtain an environmental database which can be used to identify any short- and long-term environmental impacts of the project
- ✚ To monitor the performance and effectiveness of proposed environmental management plan and practiced mitigation measures
- ✚ To identify environmental compliance of the project with regulatory requirements, Government and international standards and policies
- ✚ To provide suggestion and additional measures to achieve proposed Construction Environmental Management Plan (CEMP).

Table 8.1 Summary of Environmental Monitoring Activities (for the Reporting Period)

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Construction Phase						
<u>1. Change in Hydrologic Regime</u> (The use of dredged material may have its impact in terms of localized sedimentation level increase and dispersion of pollutants present in the dredged material in the river water.)	<ul style="list-style-type: none"> • Small bridges will be constructed on canals and drains; • Box culverts to control flood damages and provision of safety of embankments; • Sufficient sizes of drains to take design flows; • Wastes should not be disposed near any water body. 	Dredged materials and other waste materials	Visual inspection and through environmental parameter test in field and in the laboratory	Bridges and culverts over the rivers and waterbodies	In the month of November 2020	PIC Environment Specialist Contractors' Environment Officer
<u>2. Drainage Congestion & Flood</u> (Run off from storage of construction material near water bodies cause temporary drainage congestion near small bridges, culverts, service areas, and construction sites. Stockpiling of fill materials dredged from the riverbeds for construction of the embankment may result erosion and subsequent deposition in the adjacent crop fields.)	<ul style="list-style-type: none"> ▪ Careful planning for construction to minimize drainage congestion. ▪ Wastes should not be disposed near any water body. ▪ All waste should be disposed in a controlled manner. ▪ Adequate cross drainage structure shall be provided to easily drain off water to canals and other lowland areas. ▪ The road elevation level in the project area should be designed considering the flood threat levels. ▪ Provision of 1m free board is proposed. 	Waste materials & water logging	Visual inspection and through environmental parameter test in field and in the laboratory	Bridges and culverts over the rivers and waterbodies	In the month of November 2020	PIC Environment Specialist Contractors' Environment Officer
<u>3. Soil Erosion and Siltation</u> (Some trees, shrubs, and grasses will be cleared)	<ul style="list-style-type: none"> ➤ The road embankments and road cuttings shall be vegetated with a fast-growing crop and a native seed mix immediately after fill 	Embankment erosion of river and water bodies	Visual inspection and through environmental parameter	Bridges and culverts over the rivers and waterbodies	In the month of November 2020	PIC Environment Specialist Contractors' Environment Officer

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
and existing road pavement will be removed which cause localized soil erosion problems during the rains. The potential risk of river or water bodies' erosion will increase after implementation of the project road if the bridge crossings are provided with waterway width less than the regime width of the water bodies.)	<p>placement to prevent scour and to encourage stabilization.</p> <ul style="list-style-type: none"> ➤ Use of stone pitching or riprap shall be made at appropriate places especially around overpasses, bridges, culverts. ➤ Provide adequate bank protection and structures. ➤ Adequate drain and slope protection measures shall be applied at such locations. ➤ Use of geo-grids on a layer-by-layer basis for better bonding in the pavement structure must be carried out to resist erosion. ➤ The portion of the highway that is in contact with river, channel and canal will be provided with slope protection measures. 		test in field and in the laboratory			
<u>4. Soil compaction and contamination</u> (The Soil contamination may take place around borrow pits, road cuttings, embankments, construction camps, workshop areas, equipment washing yards, asphalt plants, batching plants, fuel and chemical storage areas, etc. Soil contamination may affect the road stability in worst cases may reduce the	<ul style="list-style-type: none"> ▪ The impacts of soil contamination would be temporary and moderate negative. ▪ The movement of construction vehicles, machinery and equipment will be restricted to the corridor or identified route. ▪ The unusable, non-saleable, non-hazardous construction waste shall be disposed of in the properly delineated places. ▪ The compacted land will be restored for agricultural use. ▪ The construction vehicle 	Soil pollution in construction sites	Visual inspection and through environmental parameter test in field and in the laboratory	Bridges and culverts over the rivers and waterbodies and earth work sites	In the month of November 2020	PIC Environment Specialist Contractors' Environment Officer

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
economic productivity of land and biodiversity in the project area. During transportation of machine and materials, the cultivable lands beyond the proposed ROW may get compacted due to movement of vehicle and construction equipment. Soil in the project area may also get contaminated particularly from the bituminous wastes, spillage of oil and grease, mixing with construction materials.)	<p>shall be fueled or repaired/serviced at the designated place with proper arrangement of waste collection and disposal.</p> <ul style="list-style-type: none"> ▪ The arrangement shall include, cemented floor with dyke around for fuel storage and filling as well as repairing of construction equipment. ▪ Soil contamination by bitumen, fuel and chemical storages shall be minimized by siting them on an impervious base within an embanked area and secured by fencing. ▪ The base and walls of the embankment shall be impermeable and of sufficient capacity to contain of the total volume of stored fuels and chemicals. ▪ The disposal of waste asphalt shall be made in approved locations such as borrow pits or natural depressions and shall not be within the RoW. 					
<p>5. Top Soil</p> <p>(Removal of top soil for construction from outside the RoW. Compaction of top soil. Loss of top soil by wind and water erosion. Covering of top soil by project works.)</p>	<ul style="list-style-type: none"> 🚧 The stockpiles will be done in slopes of 2:1 to reduce surface runoff and enhance percolation through the mass of stored soil. 🚧 Locate topsoil stockpiles in areas outside drainage lines and protect from erosion. 🚧 Construct diversion channels and silt fences 	Loss of top soil by wind and water erosion outside construction areas.	Visual inspection and through environmental parameter test in field and in the laboratory	Bridges and culverts over the rivers and waterbodies and earth work sites	In the month of November 2020	<p>PIC Environment Specialist</p> <p>Contractors' Environment Officer</p>

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
	<p>around the topsoil stockpiles to prevent erosion and loss of topsoil.</p> <ul style="list-style-type: none"> Spread the topsoil to maintain the physico-chemical and biological activity of the soil. The stored top soil will be utilized for covering all disturbed area and along the proposed plantation sites. Limit equipment and vehicular movements to within the approved construction zone. Remove unwanted materials from top soil like grass, roots of trees and similar others 					
<p>6. Air Quality</p> <p>(Certain amount of dust and gaseous emissions will be generated during the construction phase from road construction machineries. emissions are also anticipated from hot mix plants and batching plants.).</p>	<ul style="list-style-type: none"> The stockpiles of construction material shall be sprinkled with water. Water should be sprayed at asphalt mixing site and temporary service and access roads. After compacting, water should be sprayed on the earthwork regularly to prevent dust. Construction equipment will be maintained to a good standard and idling of engines will be discouraged. Machinery causing excessive pollution (e.g., visible clouds of smoke) will be banned from construction sites; 	Air quality parameters	Visual inspection and through environmental parameter test in field and in the laboratory	Earth work sites	In the month of November 2020	<p>PIC Environment Specialist</p> <p>Contractors' Environment Officer</p>

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
	<ul style="list-style-type: none"> The Contractor(s) will submit a dust suppression program to RHD prior to construction. The plan will detail action to be taken to minimize dust generation (e.g., spraying of roads with water), and will identify equipment to be used. Road pavement design should be such that tyre friction due to vehicle movement will be reduced. Vehicles delivering loose and fine materials like sand and fine aggregates shall be covered to reduce dust pollution on existing road. Regular maintenance of machinery and equipment shall be carried out. Dust mask will be provided to the workers. Air pollution monitoring shall be carried out as per monitoring plan and corrective action shall be taken in case of deviation. 					
<u>7. Noise & Vibration</u> (Noise is likely to be generated from site clearing, excavation, concrete mixing, crushers, and piling during bridge construction. Vibrations caused by movements of	<ul style="list-style-type: none"> ➤ Selection of latest equipment and plant with reduced noise level ➤ All powered mechanical equipment and machinery shall be fitted with noise abating gear such as mufflers ➤ Vehicles and equipment should be fitted with silencer 	Noise level and vibration monitoring	Noise and vibration measurement	Construction working sites	In the month of November 2020	PIC Environment Specialist Contractors' Environment Officer

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
heavy construction equipment, pile driving operations, operation of crushing, ballasting and aggregating plants will disturb the local residents unless operation times are fixed by discussing with local representatives.)	<p>and maintained well.</p> <ul style="list-style-type: none"> ➤ Mufflers should be used during pile driving hydraulic mechanism to ensure noise level is below 85 dBA. ➤ The noisiest operations should be performed during daytime. ➤ temporary noise barrier shall be made near sensitive locations like schools, religious places and hospitals. ➤ The workers should be provided with personal protection devices as earplugs and earmuffs. ➤ where there are structures likely to be affected by vibrations because of the construction activities, precaution will be taken to minimize the vibration ➤ Noise and vibration monitoring shall be carried out as per the suggested monitoring plan. 					
<p>8. Surface Water</p> <p>(Dredging and piling activities increase in total suspended particulates (TSS) level in surface water. Get contaminated due to the disposal of construction waste. Uncontrolled dumping of wastes, sewage, dredge</p>	<ul style="list-style-type: none"> ▪ Proper care will be taken above or near the water channels so that no damage could be made during construction activities. ▪ To maintain the surface water flow/drainage, proper mitigation measures will be taken along the road, like drainage structures in urban areas. ▪ Proper training of operators 	Surface water quality parameters	Visual inspection and through environmental parameter test in field and in the laboratory	Bridge and culvert work sites	In the month of November 2020	<p>PIC Environment Specialist</p> <p>Contractors' Environment Officer</p>

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
materials, and accidental spillage of fuels and chemicals will pollute water bodies. Disposal of sewage and wastes from the construction camps to surface water bodies without treatment will deteriorate the water quality. The seasonal canals and ponds are unlikely to be affected from construction activities.)	<p>and other workers should be ensured to avoid pollution of water bodies by the operation of construction machinery and equipment.</p> <ul style="list-style-type: none"> Temporary construction facilities including structures and material stockpiles shall be located at least 50 m away from water bodies. Avoid disposal of wash water, solid waste as discarded packing etc., waste from concrete agitator cleaning operations and excavated material on water bodies adjacent to or within the vicinity of the project. Construction of bridges and culverts should be done during dry season as much as possible. Cast-in-place concrete pile should be used in bridge and culvert construction. During the boring in the river cofferdams will be installed to prevent silt from mixing with river water. When large amounts of boring slag are produced, this slag will be hauled to spoiled disposal areas. 					
<p>9. Groundwater</p> <p>(Consumption of arsenic contaminated groundwater may have adverse health effect on</p>	<ul style="list-style-type: none"> ❖ Arrangement for safe drinking water is made prior to start of work. ❖ Water shall be supplied for consumption only after adequate analysis and 	Ground water quality parameters	Visual inspection and through environmental parameter test in field and in the	Construction and equipment maintenance sites	In the month of November 2020	<p>PIC Environment Specialist</p> <p>Contractors' Environment Officer</p>

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
workers. Uncontrolled extraction of water may also affect availability of water to locals. In addition to that, construction waste, if left unattended will result in forming leachate which will percolate through the soil strata and will reach underground water table and hence, will end up contaminating it.	<p>requisite treatment.</p> <ul style="list-style-type: none"> ❖ The workers may also be trained on the need for judicious use of freshwater resources. ❖ The contractors must be advised to use water judiciously. ❖ The water reserves will be adequately protected from any source of contamination such as the construction and oily waste that will degrade its potable quality. 		laboratory			
10. Construction Waste Oil, grease etc. from construction machinery; Solid waste from waste construction material and food; Wastewater from washing and sprinkling; and Sanitary waste from staff toilets.	<ul style="list-style-type: none"> Wastewater would be passed through gravel/ sand beds to remove oil/ grease contaminants before discharging it into natural streams; Waste will be disposed at designated sites and no waste will be disposed in the productive agricultural field; The hazardous waste will be transported to nearby incineration facility; Solid waste generated during construction will be safely disposed in approved and demarcated waste disposal sites and the contractor will not dispose waste into productive agricultural lands and will also provide a proper waste management plan; Sanitary wastes generating 	Water bodies and soil sample	Visual inspection and through environmental parameter test in field and in the laboratory	Construction sites	In the month of November 2020	PIC Environment Specialist Contractors' Environment Officer

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
	<p>from staff and labour camps must be disposed of in environment friendly manner, i.e., provision of septic tank etc. for toilet wastes; and</p> <p>Aggregate waste material of existing road will be reused in road improvement.</p>					
Operational Phase						

8.1 Monitoring of Environmental Impacts on Project Surroundings

153. Environmental parameters: Ambient Air, Water Quality and Noise Levels

8.1.1 Brief discussion on the basis for monitoring

Basis of monitoring are construction site impact by construction works. The impact would be identified by ambient air, water and noise level monitoring through analytical method.

8.1.2 Indicate type and location of environmental parameters to be monitored

Construction base camp, construction sites, bridge and culvert construction sites and earth work sites.

8.1.3 Methods of monitoring of air, water, noise level and equipment used

The method of monitoring of air, water, noise level and equipment used is given below:

8.1.3.1 Air Quality Monitoring Methodology in Different Working Packages

WP-07 to WP-09: Methodology for monitoring of ambient air quality and equipment used

Parameters	Methods	Equipment used
PM _{2.5}	Particulates Sensor Light Scattering Nephelometer	Haz-Scanner TM (HIM 6000)
PM ₁₀	Particulates Sensor Light Scattering Nephelometer	Haz-Scanner TM (HIM 6000)
SO ₂	High Sensitivity Electrochemical	Haz-Scanner TM (HIM 6000)
NO ₂	High Sensitivity Electrochemical	Haz-Scanner TM (HIM 6000)
CO	High Sensitivity Electrochemical	Haz-Scanner TM (HIM 6000)

WP-10 to WP-12: Methodology for monitoring of ambient air quality and equipment used

Parameters	Methods	Equipment used
PM _{2.5}	Gravimetric Method	AAS 127 Sampler
PM ₁₀	Gravimetric Method	APM 460 sampler
SO ₂	West Gaeke Method	APM 460 BL
NO ₂	Jacobs-Hochheiser Method	APM 460 BL
CO	Jacobs-Hochheiser Method	APM 460 BL

8.1.3.2 Surface Water Quality Monitoring Methodology in Different Working Packages

WP-07 to WP-09: Methodology for monitoring of surface water quality and equipment used

Parameter tested	Methods	Equipment used
pH	APHA Method	Hanna Combo Meter
Electrical Conductivity (EC)	APHA Method	Hanna Combo Meter
DO	APHA Method	Hanna Combo Meter
BOD ₅	5 days Incubation	Incubator
TSS	APHA Method	Gravimetric Method
TN	N/A	N/A
TP	APHA Method	Amino acid

WP-10 to WP-12: Methodology for monitoring of surface water quality and equipment used

Parameter tested	Methods	Equipment used
p ^H	APHA Standard methods	Digital pH Meter
Electrical Conductivity (EC)	Open Reflux	EC Meter
DO	APHA Standard methods	Digital DO meter
BOD ₅	5-day BOD test	N/A
TSS	APHA 2540D	AAS
TN	N/A	N/A
TP	APHA Method	AAS

8.1.3.3 Ground Water Quality Monitoring Methodology in Different Working Packages**WP-07 to WP-09: Methodology for monitoring of ground water quality and equipment used**

Parameter tested	Methods	Equipment used
As	Modified Gutzeit Method	Test Kit
Fe	Phenanthroline Method	Test Kit
Mn	Periodate Oxidation	Test Kit
Cl-	Titrimetric Method	Test Kit
Total Hardness	Colorimetric Method	Test Kit
Total Coliforms	Membrane Filtration Method	N/A

WP-10 to WP-12: Methodology for monitoring of ground water quality and equipment used

Parameter tested	Methods	Equipment used
As	Atomic Absorption Spectrophotometer	Test Kit
Fe	Spectrophotometry Technique	Spectrophotometer
Mn	Atomic absorption spectrometry (AAS) technique	Atomic Absorption Spectrophotometer
Cl-	Photometric	Test Kit
Total Hardness	Titrimetric	Test Kit
Total Coliforms	Membrane Filter Technique	N/A

8.1.3.4 Noise Level Monitoring Methodology in Different Working Packages

WP-07 to WP-09: Methodology for monitoring of noise level and equipment used

Parameter	Methods	Equipment
Noise Level	Noise data logger	Sound Level Meter

WP-10 to WP-12: Methodology for monitoring of noise level and equipment used

Parameter	Methods	Equipment
Noise Level	Leq Value in dB (A)	Sound Level Meter

8.2 Monitoring results and analysis of results in relation to baseline data and statutory requirements

The results are presented as per the tables below.

Table 8.2 Air Quality Results

Work Package Number	Site No.	Date of Testing	Site Location	Parameters (As IEE instructed)				
				PM _{2.5} µg/m ³	PM ₁₀ µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³	CO ppm
WP-06	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
WP-07	AQ-S1	20.12.2020	Batching plant of construction camp, Chonka, Sherpur, Bogra	57.4	112.3	87.6	68.1	0.19
	AQ-S2	21.12.2020	Infront of Kurban's House, Talpara, Hatikamrul, Sirajganj	61.8	102.4	79.9	59.1	0.27
WP-08	AQ-S1	21.12.2020	Base camp	51.61	67.73	13.52	36.24	0.17
	AQ-S2	-	-	-	-	-	-	-
WP-09	AQ-S1	Dec. 2020	Chandihara, Bogra	112.57	167.28	12.73	67.82	<1
	AQ-S2	Dec. 2020	Baghopara Sahid Danesh Uddin School and College	103.63	119.49	16.32	59.46	<1
WP-10	AQ-S1	01.12.2020	Rahobol Govt. Primary School	43.91	78.36	13.21	26.98	0
	AQ-S2	01.12.2020	Gobindaganj Govt. High School	52.38	110.76	16.70	38.32	1
WP-11	AQ-S1	02.12.2020	Palashbari S.M. Pilot Govt. High School	52.23	107.71	16.62	48.17	3
	AQ-S2	02.12.2020	Jamtola Modinatul Ulum Madrasa	43.72	91.24	20.77	58.20	6
WP-12	AQ-S1	03.12.2020	Shathibari High School	39.91	88.12	16.08	19.17	6
	AQ-S2	03.12.2020	Base camp	49.61	76.18	27.16	38.74	3
Government Standards (ECR, 1997: Schedule-2)				65	150	365	100	9

Analysis of air quality: In wp-09 $PM_{2.5}$ was more ($112.57, 103.63 \mu g/m^3$) than DOE ($65 \mu g/m^3$) and PM_{10} was $167.28 \mu g/m^3$ which is also more than DOE value ($150 \mu g/m^3$).

Corrective Action Required: Contractor will control air pollution through dust suppression measure by January 2021.



a. WP-7 Kurban's House, Hatikamrul



b. WP-12 Base Camp

Figure 8.1 Air quality Sampling during the reporting period in WP 7 and WP 12

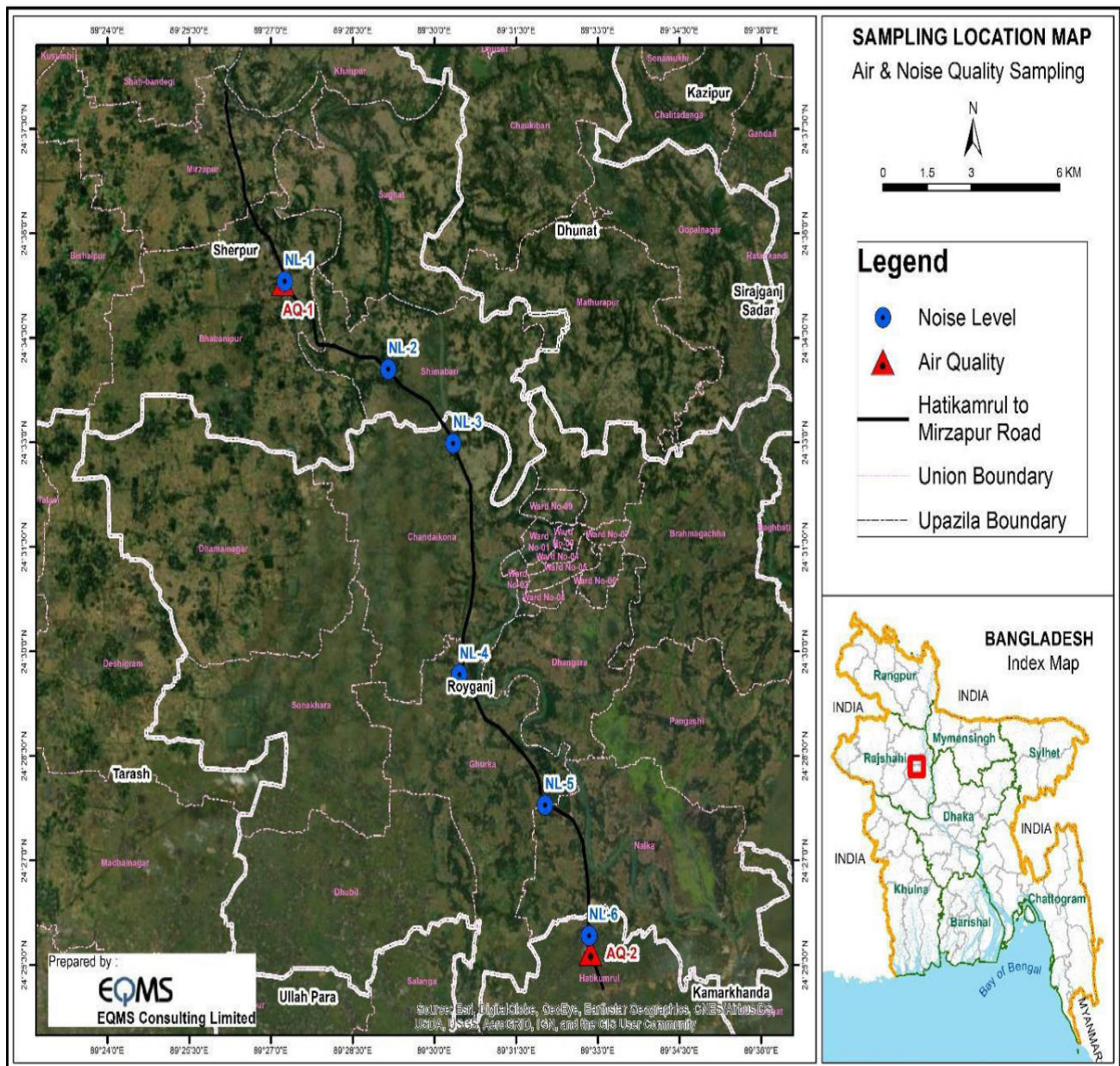


Figure 8.2 Location Map of Air and Noise Level Sampling Points in wp-07

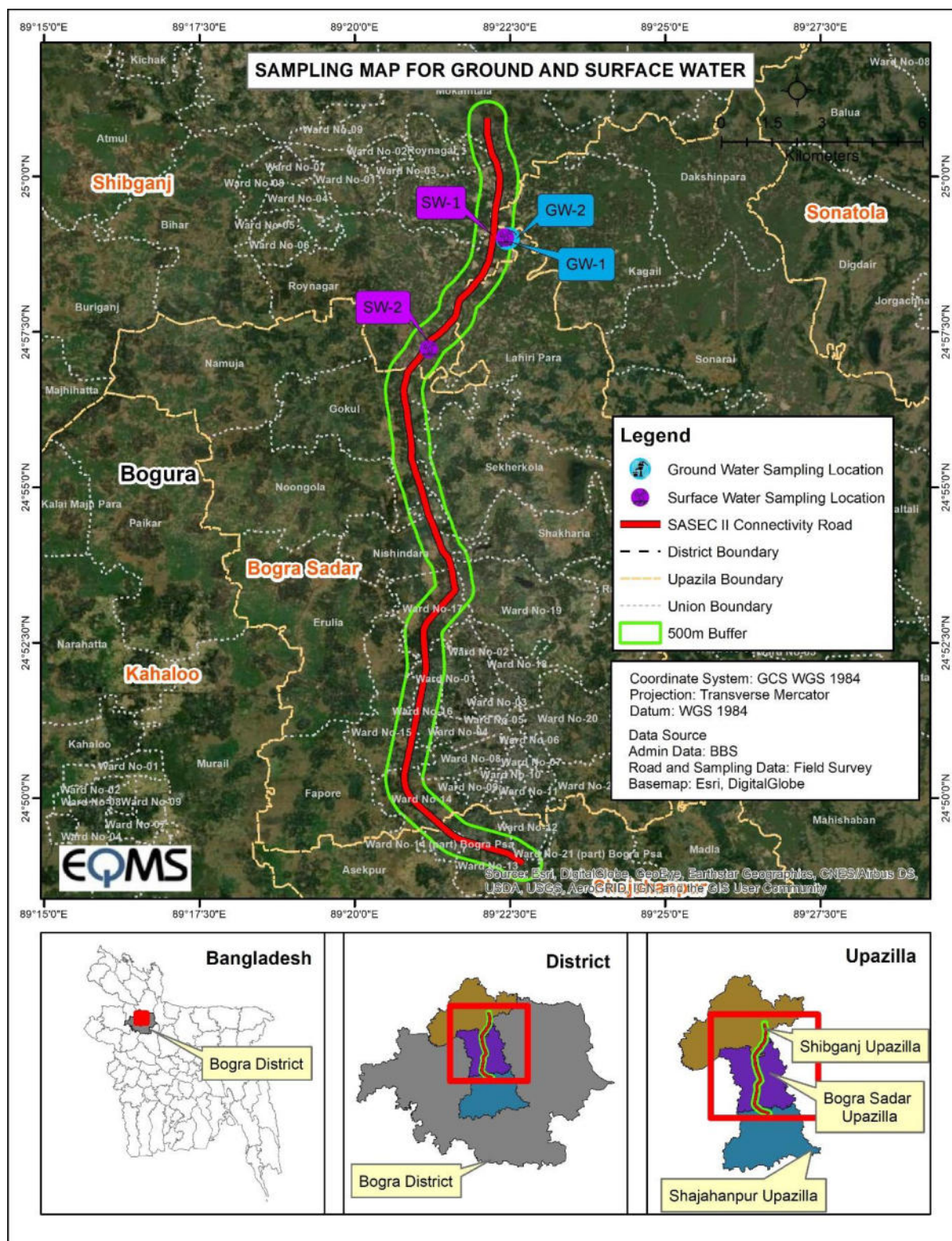


Figure 8.3 Location Map of Surface and Ground Water Sampling in wp-08

Table 8.3 Surface Water Quality Results

Work Package Number	Site No.	Date of Sampling	Site Location	Parameters						
				pH	Conductivity $\mu\text{S/cm}$	DO mg/L	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L
WP-06	SW-S1	-	-	-	-	-	-	-	-	-
	SW-S2	-	-	-	-	-	-	-	-	-
WP-07	SW-S1	20.12.2020	Ghogra River near Garoy Bazar	8.1	164	7.2	1.7	9	-	0.8
	SW-S2	20.12.2020	Bangali River near Bhuiyati Bazar	7.6	188	9.5	2.1	11	-	0.11
WP-08	SW-S1	21.12.2020	Canal of Korotoa River near Fotki Bridge	6.35	115	3.6	2.2	6	-	0.7
	SW-S2	-	-	-	-	-	-	-	-	-
WP-09	SW-S1	Dec. 2020	Camp side pond, Bogra.	7.14	174	5.2	3.6	7	-	0.4
	SW-S2	Dec. 2020	Canal of Korotoa River, Mahastha, Bogra	6.62	162	5.9	4.1	5	-	0.1
WP-10	SW-S1	01.12.2020	Gobindhoganj (Lake)	6.84	290	4.9	0.6	19.93	-	<0.05
	SW-S2	01.12.2020	Bengali River	6.98	210	5.5	0.5	47.62	-	0.05
WP-11	SW-S1	03.12.2020	Pond	6.78	170	6.0	2.6	67	-	<0.05
	SW-S2	03.12.2020	Angrar Bridge	7.11	125	5.7	0.6	24	-	<0.05
WP-12	SW-S1	03.12.2020	Ghaghot river (Upstream)	7.10	180	6.8	0.5	18.23	-	0.05
	SW-S2	03.12.2020	Ghaghot river (Downstream)	6.81	210	4.0	0.2	40.33	-	<0.05
Government Standards (ECR, 1997: Schedule-3A)				6.5-8.5	2250	5 or more	6 or less	10	1.2	6

Analysis of surface water quality: In wp-12 DO value found 4.0 mg/l which is below DOE value. In wp-07, wp-10, wp-11 and wp-12 TSS value found more (11, 19.93, 47.62, 67, 24, 18.23 and 40.33mg/l) than DOE (10mg/l) value.

Corrective Action Required: Contractor will pollution surface water pollution through preventing run off loose soil by January 2021.



a. Chainage 125+880 in wp-11



b. Ghaghot River in wp-12

Figure 8.4 Surface water sampling during the reporting period in WP-11 and WP-12

Table 8.4 Ground Water Quality Results of all WPs

Work Package Number	Site No.	Date of Sampling	Site Location	Parameters					
				As mg/L	Fe mg/L	Mn mg/L	Cl-mg/L	Total Hardness mg/L	Total coliform n/100ml
WP-06	GW-S1	-	-	-	-	-	-	-	-
	GW-S2	-	-	-	-	-	-	-	-
WP-07	GW-S1	20.12.2020	Site office of construction camp	<0.01	0.01	0.02	0.8	43	0
	GW-S2	20.12.2020	Staff residence of construction camp	<0.01	0.02	0.01	2.7	82	0
WP-08	GW-S1	21.12.2020	Labor shed of base camp	<0.01	0.13	0.03	0.3	96	0
	GW-S2	-	-	-	-	-	-	-	-
WP-09	GW-S1	Dec. 2020	Staff Residence of Construction Camp	0.0	0.26	0.0	1.9	41	0
	GW-S2	Dec. 2020	Labor shed of Construction Camp	0.0	0.18	0.0	2.1	59	0
WP-10	GW-S1	01.12.2020	Rahobol Govt. Primary School	<0.01	5.81	<0.1	<60	112	0
	GW-S2	01.12.2020	Gobindaganj Govt. High School	<0.01	<0.1	<0.1	<60	103	0
WP-11	GW-S1	03.12.2020	Palashbari S.M. Pilot Govt. High	<0.01	0.09	<0.1	<60	108	0

	GW-S2	03.12.2020	School Jamtola Modinatul Ulum Madrassa	<0.01	0.20	<0.1	<60	50	0
WP-12	GW-S1	03.12.2020	Shathibari High School	<0.03	1.8	<0.1	<60	212	0
	GW-S2	03.12.2020	Pairabond Dimukhi Dakhil Madrassa	<0.03	0.2	<0.1	<60	67	0
Government Standards (ECR, 1997: Schedule-3B)				0.05	0.3-1.0	0.1	150-600	200-500	0

Analysis of ground water quality: In wp-10 Fe value found 5.81 mg/l and in wp-12 Fe value found 1.8 mg/l both of which are higher than DOE value (0.3-1.0 mg/l).

Corrective Action Required: Contractor will advise the school authority to avoid using the water by January 2021.



a. Ground water sampling at Construction Camp, wp-7

b. Ground water sampling at wp-8

Figure 8.5 Ground water sampling during the reporting period in WP-11 and WP-12

Table 8.5 Noise Quality Results of all PWs

Work Package Number	Site No.	Date of Testing	Site Location	LAeq (dBA) (Monitoring Results)	
				Day Time	Night Time
WP-06	-	-	-	-	-
	-	-	-	-	-
WP-07	NL-S1	20.12.2020	Mosque of construction camp, Chonka, Sherpur	57.4	41.7
	NL-S2	20.12.2020	In front of Shohor Ali's House, Betgari, Dhonkund, Sirajganj	67.1	41.6
WP-08	NL-S1	21.12.2020	Mixed area	67.39	-
	NL-S2	21.12.2020	Commercial area	71.45	-
WP-09	NL-S1	Dec. 2020	Chandihara Bazar Jame Mosjid	56.3	48.6
	NL-S2	Dec. 2020	Construction Camp area, Chandihara	63.8	57.4

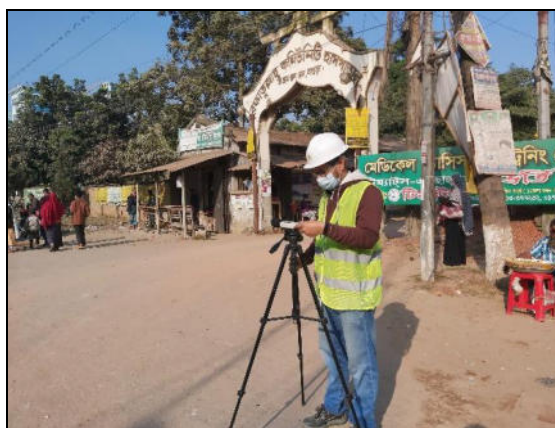
WP-10	NL-S1	01.12.2020	Base Camp	57.1	-
	NL-S2	01.12.2020	Gobindaganj Govt. High school	50.2	-
WP-11	NL-S1	03.12.2020	Base camp 01	57.2	-
	NL-S2	03.12.2020	Polashbari SM Pilot High School	51.2	-
WP-12	NL-S1	03.12.2020	Mixed area	58.1	-
	NL-S2	03.12.2020	Commercial area	59.3	-
Government Standards [(ECR, 1997: Schedule-4) (Mixed area: Day-60, Night-50; Commercial area: Day-70, Night-60)]					

Analysis of noise level: In wp-08 noise level found 67.39 dBA in mixed area and 71.45 dBA in commercial area which are higher than DOE value (mixed area 60 and commercial area 70 dBA).

Corrective Action Required: Contractor will take corrective action for mitigation or minimize the noise pollution by January 2021.



a) Noise level monitoring in WP-8



b) Noise level monitoring in WP-9

Figure 8.6 Noise Level monitoring during the reporting period in WP-8 and WP-9

9. ENVIRONMENTAL SAFEGUARD TRAINING PERFORMED DURING REPORTING PERIOD

154. PIC had performed a day long training on environmental safeguard training among the Contractors' Environmental Management Officers, Safety officers and PIC's Road Safety Engineers on 6 December 2020 at conference room of PIC's Head Office, Niketan, Dhaka. Project Director Dr. Md. Waliur Rahman gave

valuable speech in the inauguration session. The closing session was performed by Team Leader Mr. Seol Jeong Ho. The main training items and list of participants are stated below.

9.1 Main Topics for Environmental Safeguard Training:

A. Construction Activities and Effects of SASEC-2 Project

1. Construction Activities and Environmental Aspects
2. Potential Site Establishment Impacts
3. Potential Construction Impacts
4. Potential Operational Impacts

B. CEMP Implementation and Operation

1. CEMP Management Structure and Responsibility
2. Contractor's Organization and Accountability
3. Environmental Training and Induction
4. Environmental Maps
5. Operating Procedures
6. Emergency and Incident Response
7. Communication
8. Environmental Risk Register
9. Environmental Risk Assessment Procedures
10. Complaints Management
11. Transition Phase

C. Construction Environmental Management Plan (CEMP)

1. Construction Noise and Vibration Management Plan
2. Construction Air Quality Management Plan
3. Erosion and Sediment Control Plan
4. Groundwater (Level) Management Plan
5. Settlement Monitoring Management Plan
6. Contaminated Soils and Groundwater Management Plan
7. Hazardous Substances Management Plan
8. Health and Safety Management Plan
9. Ecological Management Plan
10. Resource Efficiency and Waste Management Plan
11. Construction Traffic Management Plan
12. Stakeholder and Communication Management Plan
13. Landscape Management Plan
14. Construction Lighting Management Plan
15. Environmental Monitoring Requirements
16. Example Environmental Incident Form
17. Example Environmental Complaint Form
18. Climatic and Ecological Compensational Tree Plantation Plan

D. Monitor and Review

1. Compliance Monitoring
2. Environmental Auditing
3. Corrective Action Plan

4. Environmental Reporting
5. CEMP Management Review

E. Roles and Responsibilities of Contractors

F. Toolbox Talks

Table 9.1 List of Participants of Environmental Safeguard Training in December 2020

SL. No.	Name	Designation	Organization	Contact No. and email ID
1	Dr. Md. Waliur Rahman	PD	RHD	01799985240 pd.sasecii.rhd@gmail.com
2	Md. Mahbubur Rahman	PM3	RHD	01716279922 mmr_buet@yahoo.com
3	M. Afid Hussain	PM7	RHD	01713018279 hawkeyef13@gmail.com
4	Md. Sirajul Karim Talukter	Road Safety Engineer-1	PIC	01715331418 sirajulktalukder@gmail.com
5	Shakhawat Hossain	HSE Officer	WP-12	01736485020 shakhawathossain@527@gmail.com
6	Md. Atiar Rahman	HSE Officer	WP-11	01744518098 Atiar500@gmail.com
7	Md. Faisal Bin Mahmud	Environment Consultants	WP-10	01733376603 aecl.lab1@gmail.com
8	Md. Khalid Hossain	Environment Engineer	WP-06	01716248100 mkhs46@gmail.com
9	Shafioul Shajahan	Safety Officer	WP-08	01721882084 Shafiulsagu1988@gmail.com
10	Hannan Khan	HSE Inspector	WP-09	01715895643 hannan123khan123@gmail.com
11	Shihabuddin Ahmed	Environmental Monitoring Officer	WP-09	01717014387 Shihabuddin.ahmed@eqms.com.bd
12	Md. Mustafizur Rahman	Road Safety Engineer	RO	01717478580 Mustfzbakul@yahoo.com
13	Md. Gias Uddin	DTL	PIC	01715032707 dtl.sasec-2.pic@gmail.com
14	Seol Jeong Ho	Team Leader	PIC	01882528311 jhseol92@gmail.com
15	Dr. Md. Kabil Hossain	Environment Specialist	PIC	017159747401 Drmkh.du@gmail.com
16	Md. Abdur Rahman	Environment Management Officer	WP-07	017164692447 Abdur.rahman@eqms.com.bd
17	Md. Mozaffor Rahman	HSE Officer	WP-06	01708642272 Mozafforrahman1983@gmail.com
18	Md. Fajlur Rahman	Office Engineer	KCI	01911179718 Antar.kci@gmail.com



Figure 9.1 Environmental Safeguard training with EMOs, HSEs and PIC's Road Safety Engineers

9.2 Summary of Key Issues and Remedial Actions

- Summary of follow up time-bound actions to be taken within a set timeframe.

10. OVERALL CONCLUSIONS OF SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT

10.1 Overall Progress with Implementation of Environmental Safeguard Measures

155. The Project is now at the primary to middle stage and various development activities are in progress. The land development activity of the project area is ongoing. There are some environmental compliance measures in environmental management plan that should be at place during this construction stage. From the first quarter environmental monitoring of assessment, some recommendations have been made and it is important to consider these measures to properly implement the approved Environmental Management Plan (EMP). Contractors are implementing the Environmental Management Plan (EMP) accordingly but sometimes fluctuates and deviates which PIC observes and give instruction to comply the issues.

156. According to the monitoring and supervision by the Engineer of the environmental activities on the SASEC-2 it is found that the contractors are now credibly undertaking most of the environmental mitigative measures specified in the EMP although there are areas where further action and improvement need to be made.

157. The Contractor's compliance with contract clauses and EMP tasks have increased since the mobilization of contractors' Environmental Management Officer (EMO), which is a very positive sign.

158. The potential adverse impact of the ongoing works on the major watercourses and overall drainage of the area is being minimized by ensuring the design and construction of the new embankment and structures generally match the embankment and structures of the existing track alignment. The potential adverse impact of dust from the transport of large quantities of embankment materials is being minimized by spraying water to the worksites.

159. The monitoring of water quality, air quality, and noise levels has generally been fully compliant during reporting period July-December 2020. The implementation of the occupational health and safety issues has been greatly improving with the Contractor and Engineer holding regular briefing related to the various campsites and work sites.

10.2 Overall Environmental Safeguards Compliance

1) Contractor

160. The environmental awareness creation, particularly regarding the direct construction impacts and especially for health, pollution and safety issues are important. They have developed self-regulation which contractors are giving emphasized, with the consultant's supervisory role that are in conformity the relevant Environmental Clauses incorporated in the construction contracts and national legislation.

2) Roads and Highway

161. RHD had recognized the need and have improved its safeguards technical capacity and so to that end in planning established an Environmental and Social Safeguards Unit within the agency.

3) Project Implementation Consultants (Engineer)

162. The engineer has addressed all safeguard issues and recognizing the technical capacity of the contractor through preparing and delivering workshop on EMP implementation, field monitoring and reporting, including templates of all required tables and reports.

4) Asian Development Bank (ADB)

163. For loan implementation work the ADB's active participation is very important and periodic discussion with RHD about the need for the Contractor to comply (based on the Engineer's input) is essential if the EMP actions need to be effective. This action reinforces the seriousness of safeguard implementation with both the Contractor and RHD, while underscoring the value of the Engineer's oversight. With the absence of suitable staff engaged from the commencement of the Project by the Contractor this did not happen at the start of the works, but the situation has been resolved during the reporting period.

5) Engineer's Environmental Specialist on the Job while the Contractor was mobilizing.

164. Having the Engineer's (PIC) designated environmental specialist on the job when the Contractor mobilized was essential to set the tone and significance of environmental safeguards. Most EMPs have, as an important pre-construction activity, information on EMP implementation and reporting to the Contractor, and assisting with the preparation of the contractor's Environmental Mitigation or Management Work Schedule (EMWS).

6) Presentation on safeguard by contractor for all of the ADB missions and involvement of PIC

165. Contractor is making presentations on the work being undertaken without the knowledge or oversight of the Engineer is essentially the same as taking away all responsibility and authority of the Engineer to direct the Contractor and to decide on performance. This occurred twice during the constructions stage and resulted in a very significant loss of authority for the Engineer. The Contractor took this to mean that the Engineer and environmental safeguards were items no to be ignored, with few if any consequences.

166. ADB needs to insist that the Engineer be involved in all matters that require regular the Engineer oversight. This is especially true for safeguard matters, which tend to slip “under the radar”. It is important to have both GoB and ADB HQ involved on large and long duration projects and to make sure that the Engineer is kept in the information loop as much as possible.

167. All contractors are executing all civil works including EMP as per specification and terms and conditions of the Contract.

168. The number of grievances recorded, resolved and the outcomes are being displayed/ disclosed in the PIU offices, as applicable and to be reported in the next semi-annual environmental monitoring report of the SASEC Road Connectivity Project-2.

169. The Environmental specialists of the PIC are being monitored the environmental aspects through Environmental Monitoring Checklist of all project activities. Based on the field visits, analysis is being done on compliance in lieu with specific scope of on works as defined in the respective Contract Packages and prevailing field condition.

11. APPENDICES

APPENDIX-I: Environmental Quality Parameters Test Sample Results from One WP

SL No: 6870

Ref: EQMS/Air Quality/2019072501101387

EQMS ENVIRONMENTAL LABORATORY

Test Results of Ambient Air Quality

Project Name : South Asian Sub-regional Economic Cooperation (SASEC) II, WP-09

Description of Sample : Ambient Air Quality

Sample Collector : Collected by EQMS Personnel (Shihabuddin Ahmed)

Sampling Date : 20-21.12.2020

Date of Analysis : 27.12.2020

Description of Analysis:

Location	Ambient Air Pollutants Concentration in $\mu\text{g}/\text{m}^3$						TVOC mg/m^3	CO ppm
	PM ₁₀	PM _{2.5}	SO ₂	NO ₂	NO	O ₃		
AQ-1	167.28	112.57	12.73	67.82	37.19	3.17	0.26	<1
AQ-2	119.49	103.63	16.32	59.46	28.62	2.83	0.13	<1
Standard Duration (hour)	8	8	8	8	8	8	8	-
ECR, 1997 and amendment in 2005 Standard (Schedule-2)	150	65	365	-	-	157	-	9
WB Standard**	50	25	20	-	-	100	-	9
Method of Analysis Instrument Use: Haz-Scanner™ HIM 6000	Light Scattering Nephelometer	Light Scattering Nephelometer	High Sensitivity Electrochemical	High Sensitivity Electrochemical	High Sensitivity Electrochemical	Mixed Metal Oxide	High Sensitivity Electrochemical	High Sensitivity Electrochemical

Note: "Regular Checkup and calibration of the equipment are done by the manufacturers and EQMS personnel to avoid any error". *ECR, 1997 = Environmental Conservation Rules, 1997. **WB=World Bank, IFC=International Finance Cooperation

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, SO₂ -Sulphur Dioxide; NO₂ -Nitrogen Dioxide; NO -Nitric Oxide; O₃ -Ozone, TVOC -Total Volatile Organic Compounds; CO -Carbon Monoxide



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SL No: 6871

EQMS

Weather Condition:

Code	Coordinate	Temperature (°C)	Wind Speed (km/h)	Wind Direction	Relative Humidity (%)	Remarks/ Comments
AQ-1	24°58'51.15"N 89°22'11.63"E	18	6	NNW	53	Fog and Sunny Day
AQ-2	24°54'50.34"N 89°21'6.62"E	17	4	NNW	48	Fog and Sunny Day

Collected By:



Shihabuddin Ahmed
Assistant Consultant
EQMS Consulting Limited

Analyzed By:



Ferdows Alam Quaraishi
Consultant
EQMS Consulting Limited

Checked By:



SK. Salahuddin Ahammad
Lab In-Charge
EQMS Consulting Limited



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SL No: 023405

Ref: EQMS/Noise Level/2019072501101217

EQMS

EQMS ENVIRONMENTAL LABORATORY**Test Results of Noise Level Measurement**

Project Name : South Asian Sub-regional Economic Cooperation (SASEC) II, WP-09

Description of Sample : Noise Level Measurement

Sample Collector : Collected by EQMS Personnel

Sampling Date : 18-20.10.2020

Date of Analysis : 22.10.2020

Description of Analysis:

Code	Location	Leq day	Leq Night	Standard dBA Day	Standard dBA Night
NL 1	Chandihara Bazar Jame Masjid, Chandihara, Bogra	57.9	54.2	50	40
NL 2	Construction Camp area, Chandihara, Bogra	55.7	48.3	75	70
NL 3	Residential area, TMSS, Bogra	58.3	54.6	55	45
NL 4	Baghopara Sahid Danesh Uddin School and College, Gokul, Bogra	59.3	56.2	60	50
NL 5	Mokamtola Bus Stand, Mokamtola, Bogra	64.7	58.5	70	60
NL 6	Rofatullah Community Hospital, TMSS, Bogra	59.3	55.6	60	50
Standard (ECR'1997) & Noise Pollution (Control) Rules 2006					
Silent area				50	40
Residential area				55	45
Mixed area				60	50
Commercial Area				70	60
Industrial area				75	70
World Bank/IFC Standard					
Residential; Institutional; Educational				55	
Industrial				70	

Note: Regular Checkup and calibration of equipment are done by the manufacturers and EQMS personnel to avoid any error.

Collected By:


Shihabuddin Ahmed
Assistant Consultant
EQMS Consulting Limited

Analyzed By:


Md Jahidul Islam
Consultant
EQMS Consulting Limited

Checked By:


SK. Salahuddin Ahammad
Lab In-Charge
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SL No: 6869

Ref: EQMS/Noise Level/2019072501101386

EQMS ENVIRONMENTAL LABORATORY**Test Results of Noise Level Measurement**

Project Name : South Asian Sub-regional Economic Cooperation (SASEC) II, WP-09

Description of Sample : Noise Level Measurement

Sample Collector : Collected by EQMS Personnel

Sampling Date : 09-10.11.2020

Date of Analysis : 11.11.2020

Description of Analysis:

Code	Location	Leq day	Leq Night	Standard dBA Day	Standard dBA Night
NL 1	Chandihara Bazar Jame Masjid, Chandihara, Bogra	58.6	51.5	50	40
NL 2	Construction Camp area, Chandihara, Bogra	52.1	44.7	75	70
NL 3	Residential area, TMSS, Bogra	62.4	58.3	55	45
NL 4	Baghopara Sahid Danesh Uddin School and College, Gokul, Bogra	57.2	55.8	60	50
NL 5	Mokamtola Bus Stand, Mokamtola, Bogra	67.3	58.1	70	60
NL 6	Rofatullah Community Hospital, TMSS, Bogra	61.4	57.9	60	50
Standard (ECR'1997) & Noise Pollution (Control) Rules 2006					
Silent area				50	40
Residential area				55	45
Mixed area				60	50
Commercial Area				70	60
Industrial area				75	70
World Bank/IFC Standard					
Residential; Institutional; Educational				55	
Industrial				70	

Note: Regular Checkup and calibration of equipment are done by the manufacturers and EQMS personnel to avoid any error.

Collected By:



Shihabuddin Ahmed
Assistant Consultant
EQMS Consulting Limited

Analyzed By:



Ferdows Alam Quaraishi
Consultant
EQMS Consulting Limited

Checked By:



SK. Salahuddin Ahammad
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SL No: 6872

Ref: EQMS/Noise Level/2019072501101388

EQMS ENVIRONMENTAL LABORATORY**Test Results of Noise Level Measurement**

Project Name : South Asian Sub-regional Economic Cooperation (SASEC) II, WP-09

Description of Sample : Noise Level Measurement

Sample Collector : Collected by EQMS Personnel

Sampling Date : 20-21.12.2020

Date of Analysis : 22.12.2020

Description of Analysis:

Code	Location	Leq day	Leq Night	Standard dBA Day	Standard dBA Night
NL 1	Chandihara Bazar Jame Masjid, Chandihara, Bogra	61.8	54.1	50	40
NL 2	Construction Camp area, Chandihara, Bogra	56.3	48.6	75	70
NL 3	Residential area, TMSS, Bogra	58.9	47.3	55	45
NL 4	Baghopara Sahid Danesh Uddin School and College, Gokul, Bogra	58.4	53.6	60	50
NL 5	Mokamtola Bus Stand, Mokamtola, Bogra	63.8	57.4	70	60
NL 6	Rofatullah Community Hospital, TMSS, Bogra	59.4	55.7	60	50
Standard (ECR'1997) & Noise Pollution (Control) Rules 2006					
Silent area				50	40
Residential area				55	45
Mixed area				60	50
Commercial Area				70	60
Industrial area				75	70
World Bank/IFC Standard					
Residential; Institutional; Educational				55	
Industrial				70	

Note: Regular Checkup and calibration of equipment are done by the manufacturers and EQMS personnel to avoid any error.

Collected By:


Shihabuddin Ahmed
Assistant Consultant
EQMS Consulting Limited

Analyzed By:


Ferdows Alam Quaraishi
Consultant
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Checked By:


SK. Salahuddin Ahammad
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SL No: 6873

Ref: EQMS/ Water Quality/2019072501101389

EQMS WET LABORATORY
Results of Ground Water Quality

Project Name : South Asian Sub-regional Economic Cooperation (SASEC) II, WP-09

Description of Sample : Ground Water Quality

Sample Collector : EQMS Personnel (Shihabuddin Ahmed)

Sampling Location : Construction Camp of KMC- MONICO JV (WP09)

Sampling Date : 21.12.2020

Date of Analysis : 22-24.12.2020

Description of Analysis

Parameter	Unit	Analysis Method	GW-1	GW-2	Bangladesh Standards*
pH	mg/L	Hanna Combo Meter	6.88	7.12	6.5-8.5
Manganese (Mn)	mg/L	Periodate Oxidation/ASS	0.0	0.00	0.1
Arsenic (As)	mg/L	Modified Gutzeit method	0.00	0.00	0.05
Iron (Fe)	mg/L	Phenanthroline Method	0.26	0.18	0.3 – 1.0
Chlorine (Cl-)	mg/L	Titrimetric Method	1.9	2.1	150-600
Total Hardness	mg/L	Colorimetric Method	41	59	200-500
Total Coliform (TC)	n/100 ml	Membrane Filtration Method	0	0	0
Fecal Coliform (FC)	n/100 ml	Membrane Filtration Method	0	0	0

*The Environment Conservation Rules, 1997 [Schedule 3 (B)]

Collected By:**Analyzed By:****Checked By:**


Shihabuddin Ahmed
Assistant Consultant
EQMS Consulting Limited



Priyanka Dey
Chemist
EQMS Consulting Limited



SK. Salahuddin Ahammad
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SL No: 6874

EQMS

Ref: EQMS/Water Quality/2019072501101390

EQMS WET LABORATORY**Test Results of Surface Water Quality**

Project Name : South Asian Sub-regional Economic Cooperation (SASEC) II, WP-09

Description of Sample : Surface Water Quality

Sample Collector : EQMS Personnel (Shihabuddin Ahmed)

Sampling Location : Camp side and Canal of Korotoa River

Sampling Date : 21.12.2020

Date of Analysis : 22-24.12.2020

Description of Analysis

Parameter	Unit	Analysis Method	SW-1	SW-2	Bangladesh Standards*
Electrical Conductivity (EC)	μS/cm	Hanna Combo Meter	174	162	--
pH	--	Hanna Combo Meter	7.14	6.62	6.5-8.5
Total Suspended Solid (TSS)	mg/L	Gravimetric Method	7	5	--
Total Dissolved Solid (TDS)	mg/L	Hanna Combo Meter	73	54	--
Biological Oxygen Demand (BOD ₅)	mg/L	5 days Incubation	3.6	4.1	6 or less
Dissolved Oxygen (DO)	mg/L	DO Meter	5.2	5.9	5 or more
Total Organic Carbon (TOC)	ppm	APHA Method 5520B	3.83	7.11	--
Total Phosphate (PO ₄ ³⁻)	mg/L	Amino acid	0.4	0.1	--
Oil and Grease	mg/L	APHA Method 5520B	<1.0	<1.0	--

* The Environment Conservation Rules, 1997 [Schedule 3 (A)]

Collected By:

Analyzed By:

Checked By:



Shihabuddin Ahmed
Assistant Consultant
EQMS Consulting Limited



Priyanka Dey
Chemist
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APPENDIX-II: Monthly Environmental Monitoring Sample Checklist from One WP

Clean Environment for Sustainable Development

Waste is asset of Contractor

SASEC Road Connectivity Project-2 under RHD

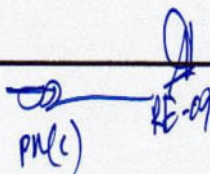
Checklist for Environmental Supervision and Monitoring During Construction Phase

WP: 09 Chainage: ch 50+800 to ch 76+100 Location: Banani to Mokamtola

Contractor's Name: KMC- Monico JV Month of Inspection: October Year: 2020

QUESTION	YES	NO	N/A	Your comment if any
1. Is contractor following the Environmental Code of Practice (ECP) during the construction?	✓			
2. Is the contractor implementing the Environmental Management Plan (EMP) to mitigate the adverse effects of the activities?	✓			
3. Are there sufficient measures incorporated in the WP to prevent water pollution of nearby water bodies?	✓			
4. Are the water quality parameters within acceptable limits?	✓			
5. Are there adequate erosion control measures to prevent erosion and sedimentation during the construction?	✓			
6. Is the contractor taking adequate measures to control dust pollution?	✓			Water spray conducted by the water vehicles
7. Is the contractor taking adequate measures to control noise pollution?	✓			
8. Are the local people informed when there will be high levels of noise?	✓			
9. Are the noisy construction works conducting during day time?	✓			
10. Is the contractor providing adequate alternative communication (diversion roads) during the construction?	✓			
11. Is the contractor procuring sand and bricks after proper evaluation of the source area and its impact on the environment during the transportation?	✓			
12. Has the contractor resolved issues related to land acquisition and compensation?	✓			

1

Prepared by Dr. Md. Kabir Hossain
Environment Specialist


PKC

Clean Environment for Sustainable Development

Waste is asset of Contractor

QUESTION	YES	NO	N/A	Your comment if any
13. Is the contractor ensuring adequate water supply and toilet facilities for labors?	✓			
14. Are the Labor Camps and Project Site Office addressing other environmental problems associated with the construction of camp sites?	✓			
15. Is the contractor maintaining construction equipment in good shape to avoid oil, smoke and noise pollution?	✓			
16. Is the garbage from the campsites being disposed in an environmentally acceptable manner?	✓			
17. Is there sufficient safety at the work place including health care facilities?	✓			
18. Is the contractor adequately prepared to handle emergency situation like serious accident or illness?	✓			
19. Are the marked trees on the construction site damaged or removed?	✓			
20. Will the cleared trees be replaced according to the Department of Forestry?		✓		
21. Is the contractor planting trees and carrying out turfing as per the EMP?		✓		
22. Is the Contractor taking adequate measures to preserve topsoil?	✓			
23. Are there adequate measures to avoid reducing the habitat of fish and other aquatic fauna and flora?			✓	
24. Is the construction work disturbing wildlife of the area?			✓	
25. Are the construction workers hunting wildlife in surrounding areas?		✓		
26. Is the contractor minimizing use of agricultural lands for borrowing pits?	✓			
27. Does the contractor cause large-scale vegetation clearance?	✓			

2

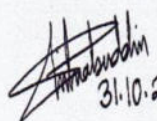
Prepared by Dr. Md. Kabil Hossain
Environment Specialist

Clean Environment for Sustainable Development

Waste is asset of Contractor

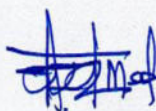
QUESTION	YES	NO	N/A	Your comment if any
28. Is the contractor putting sufficient lights and signals to avoid any accident?	✓			
29. Are the constructing workers wearing safety gears during working?	✓			
30. Are the trucks carrying raw materials over laden?		✓		
31. Are the trucks carrying raw materials covered?	✓			
32. Are the trucks carrying raw materials and heavy equipment parked at the designated area on the proposed site?	✓			
33. Are the trucks carrying solid waste materials over laden?		✓		
34. Are the trucks carrying solid waste materials covered?	✓			
35. Is the solid waste being stored adequately?	✓			
36. Is the solid waste being disposed adequately?	✓			
37. Are there records of amount of solid waste generated and the location of its ultimate disposal?	✓			
38. Are flagmen in place and adequate signs posted along the roadway?	✓			
39. Is the contractor minimizing disruption of river traffic during peak traffic period?			✓	
40. Is there any environmental concern that is not being addressed properly?		✓		

41. Major observations, Conclusions and Recommendation if any (you can add additional page if required):



31.10.2020

Contractor's EMO
Mobile No: 01717014387



Contractor's PM
Mobile No: 01787-697586



Resident Engineer
Mobile No. 01711169417

Environment Specialist
Mobile No. 01715-974701

3

Prepared by Dr. Md. Kabil Hossain
Environment Specialist

APPENDIX-III: Environmental Safeguard Training Schedule

Duration	Topics	Speakers	Total time
10.0AM -10.30AM	Inauguration Speech	Dr. Md. Waliur Rahman Project Director	20 minutes
10.30AM -11.20AM	<u>A. Construction Activities and Effects</u> 1. Construction Activities and Environmental Aspects 2. Potential Site Establishment Impacts 3. Potential Construction Impacts 4. Potential Operational Impacts	Dr. Md. Kabil Hossain PIC Environment Specialist	50 minutes
11.20AM -11.40AM	Snacks and Tea Break		20 minutes
11.40AM -12.30PM	<u>B. CEMP Implementation and Operation</u> 1. CEMP Management Structure and Responsibility 2. Contractor's Organization and Accountability 3. Environmental Training and Induction 4. Environmental Maps 5. Operating Procedures 6. Emergency and Incident Response 7. Communication	Dr. Md. Kabil Hossain PIC Environment Specialist	50 minutes
12.30PM - 2.0PM	Prayer and Lunch Break		90 minutes
2.0PM - 2.50PM	8. Environmental Risk Register 9. Environmental Risk Assessment Procedures 10. Complaints Management 11. Transition Phase <u>C. Construction Environmental Management Plan (CEMP)</u> 1. Construction Noise and Vibration Management Plan 2. Construction Air Quality Management Plan 3. Erosion and Sediment Control Plan 4. Groundwater (Level) Management Plan 5. Settlement Monitoring Management Plan 6. Contaminated Soils and Groundwater Management Plan 7. Hazardous Substances Management Plan 8. Health and Safety Management Plan 9. Ecological Management Plan	Dr. Md. Kabil Hossain PIC Environment Specialist	50 minutes

Duration	Topics	Speakers	Total time
2.50PM - 3.40PM	10. Resource Efficiency and Waste Management Plan 11. Construction Traffic Management Plan 12. Stakeholder and Communication Management Plan 13. Landscape Management Plan 14. Construction Lighting Management Plan 15. Environmental Monitoring Requirements 16. Environmental Incident Form 17. Environmental Complaint Form 18. Climatic and Ecological Compensational Tree Plantation Plan	Dr. Md. Kabil Hossain PIC Environment Specialist	50 minutes
2.50PM - 3.40PM	<u>D. Monitor and Review</u> 1. Compliance Monitoring 2. Environmental Auditing 3. Corrective Action Plan 4. Environmental Reporting 5. CEMP Management Review	Dr. Md. Kabil Hossain PIC Environment Specialist	50 minutes
3.40PM – 4.0PM	Tea Break		20 minutes
4.0PM – 4.50PM	E. Roles and Responsibilities of Contractors F. Toolbox Talks G. Records	Dr. Md. Kabil Hossain PIC Environment Specialist	50 minutes
4.50PM – 5.0PM	Thank giving and Closing	Seol Jeong Ho PIC Team Leader	10 minutes

APPENDIX-IV: Environmental Safeguard Training Participants Attendance Sheet



KCI-Gauff-Chodai-Soosung-LASA JV

SASEC II Project Implementation Consultants

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Dhaka Office: House No.27, Road No.14, Block G, Niketan, Gulshan 1, Dhaka, Bangladesh

Tel. 9856598, 9856599. E-mail: tl@sasec2.com

ATTENDANCE SHEET

SASEC Road Connectivity Project-II

Improvement of Elenga-Hatikamrul-Rangpur Road to a 4-Lane Highway

Address: H-27, R-14, Block-G, Niketan, Gulshan-1, Dhaka.

Meeting Subject : Environmental Safeguard Training

Date : 06.12.2020

Time : 9.00 am

Sl. No.	Name	Designation	Organization	Contact No. and Email	Signature with date
1	Dr. Md. Habibur Rahman	PD	RHD	01799985240 pd.sasec2.rhd@gmail.com	
2	Md. Mahbubur Rahman	PM3 SASEC-2	RHD	01716279922 mmr-buet@yachoo.com	
3	M. AFID HUSSAIN	PM7, SASEC-2 WP-11	RHD	01713018279 hawkeyaf13@gmail.com	
4	Md. Sirajul Karim Talukder	RSE-1	KCI	01715-331418 Sirajul.KT.talukder@gmail.com	
5	Sakhamat Hossain	HSE Officer	WP-12	Shakhamathossain0522@gmail.com 01236485020	 06.12.2020
6	MD: Atiqul Rahman	HSE Officer	WP-11	01744518098 atiqul500@gmail.com	 06.12.2020



KCI-Gauff-Chodai-Soosung-LASA JV

SASEC II Project Implementation Consultants

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 Dhaka Office: House No.27, Road No.14, Block G, Niketan, Gulshan 1, Dhaka, Bangladesh
 Tel. 9856598, 9856599. E-mail: ti@sasec2.com

ATTENDANCE SHEET

SASEC Road Connectivity Project-II

Improvement of Elenga-Hatikamrul-Rangpur Road to a 4-Lane Highway

Address: H-27, R-14, Block-G, Niketan, Gulshan-1, Dhaka.

Meeting Subject : Environmental Safeguard Training

Date : 06.12.2020

Time : 9.00 am

Sl. No.	Name	Designation	Organization	Contact No. and Email	Signature with date
7	Md. Faisal Bin Mahmud	Environment consultant	WP-10	+8801733376603 aedi.labi@gmail.com	 06/12/2020
8	Engr. Mohammad Khalid Hossain	Environment Engineer	WP-06	+8801716248100 mkhs46@gmail.com	 06/12/2020
9	Shafiuol Shajahan	Safety officer	WP-08	01721882084 Shafiuolshajahan1988@gmail.com	 06/12/2020
10	Hannan Khan	H.S.E Inspector	WP-09	01715895643 hannan123khan123@gmail.com	 06-12-20
11	Shihabuddin Ahmed	Environmental Monitoring officer	WP-09	01717014387 shihabuddin.ahmed@egms.com.bd	 06-12-20
12	MD. MUSTAFIZUR RAHMAN	Road Safety Engineer	RO	01717478580 mustafizurkhal@Yahoo.com	 06.12.2020



KCI-Gauff-Chodai-Soosung-LASA JV

SASEC II Project Implementation Consultants

Head Office: 7F, Daerung Technotown 15, 401, Simin-daero, Dongan-gu, Anyang-si, Gyeonggi-do, Korea

Dhaka Office: House No.27, Road No.14, Block G, Niketan, Gulshan 1, Dhaka, Bangladesh

Tel. 9856598, 9856599. E-mail: ti@sasec2.com

ATTENDANCE SHEET

SASEC Road Connectivity Project-II

Improvement of Elenga-Hatikamrul-Rangpur Road to a 4-Lane Highway

Address: H-27, R-14, Block-G, Niketan, Gulshan-1, Dhaka.

Meeting Subject : Environmental Safeguard Training

Date : 06.12.2020

Time : 9.00 am

Sl. No.	Name	Designation	Organization	Contact No. and Email	Signature with date
13	MD. GIAS UDDIN	DTL	PIC	01715032707	
				dtl@sasec2-pic@gmail.com	
14	Geol Jeong Ho	TL/pic	pic	018 8252 8211	
				jeongho92@gmail.com	
15	Dr. Rabin Hossain	Env. specialist	PIC	01715074701	
				dr.rabinhossain@gmail.com	
16	Md. Abdul Rahman	Env. Management officer.	AML WP-07.	01764692447	
				abdur.rahman@equs.com.bd	
17	Md. Mozaffar Rahman	USE officer	min Akhter Hossain. WP-06	01708 642272	
				mozaffar.rahman1983@gmail.com	
18	Md. Fajlur Rahman	office Engineer	KCI	antar.kci@gmail.com	
				01911179718	

APPENDIX-V: Renewed Environmental Clearance Certificate (ECC) 2020 From DOE

Government of the People's Republic of Bangladesh
Department of Environment
 Head Office, Paribesh Bhaban
 E-16 Agargaon, Dhaka-1207
www.doe.gov.bd

Memo No: DoE/Clearance/5195/2013- 263

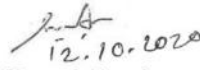
Date: 12/10/2020

Subject: Renewal of Environmental Clearance Certificate for SASEC Road Connectivity Project-II: Improvement of Elenga-Hatikamrul-Rangpur Road to a 4-Lane Highway, Roads and Highways Department, Sarak Bhaban, Tejgaon, Dhaka.

Ref: Your Application dated 17/02/2020 and 23/09/2020.

With reference to the above, the Department of Environment has decided to renew the Environmental Clearance Certificate in favor of SASEC Road Connectivity Project-II: Improvement of Elenga-Hatikamrul-Rangpur Road to a 4-Lane Highway subject to following terms and conditions.

- i. The terms and conditions as stated in Environmental Clearance Certificate issued on 14.02.2018 vide DoE/Clearance/5195/2013/82 shall remain valid for the renewed period.
- ii. This renewal is valid up to 13.02.2021. Application for further renewal along with the renewal fee and Vat on renewal fee in separate Treasury Chalan shall have to be submitted to the Director General, Department of Environment, Head Office, Dhaka with a copy to the concerned Regional/Divisional Office of DoE at least 30 days ahead of expiry.


 (Syed Nazmul Ahsan)
 Director (Environmental Clearance)
 Phone: 8181673

Project Director
 SASEC Road Connectivity Project-II
 Roads and Highways Department
 House-127, Road-02, Block-A
 Niketan, Gulshan-I, Dhaka.

Copy Forwarded to :

- 1) PS to the Hon'ble Secretary, Ministry of Environment, Forest and Climate Change, Bangladesh Secretariat, Dhaka.
- 2) Director, Department of Environment, Dhaka Regional/Rajshahi/Rangpur Divisional Office, Dhaka/ Rajshahi/Rangpur.
- 3) Deputy Director, Department of Environment, Tangail/Rangpur District Office, Gazipur/Tangail.
- 4) Assistant Director, Office of the Director General, Department of Environment, Head Office, Dhaka

APPENDIX-VI: ADB Provided Covid-19 Field Assessment Checklist Annex-A, B & E

Site Assessment for Resumption of Construction (Guidance for Site Specific Plan)

	Site Assessment Checklist (preconditions for opening the worksite)**	Yes/No	Remarks
1	Is there any hospital or health care center in close proximity that is equipped to test COVID-19 infection? a. If yes, please prepare a list of the hospitals with contact number b. If no, please make an arrangement to provide support with COVID-19 test to workers/employees, if needed.	YES	
2	Did you locate the hospital or health care center equipped to treat COVID-19 patient? Please prepare contact details.	YES	
3	Did you prepare a list of the workers/employee to be engaged at the sites? If yes, please prepare work schedule by staggering work hours (physical distance must be >1 m. to avoid crowding) If there is an issue, please contact with your EA.	YES	
4	Did you prepare any health checkup or screening checklist for maintaining daily health record of workers/visitors? If not, please use the sample checklist provided in Annex B.	YES	
5	Did you conduct worksite risk exposure using guidelines provided in Annex C? a. Construction sites with <u>low to medium risk exposures</u> , must follow the EHS guidelines for preventing infection. b. For a site with <u>high risk exposure</u> , avoid engaging people with pre-existing medical conditions, pregnant, or older than 60 years of age. Update EA on the health status everyday. (See Annex C for the details and prepare the site-specific health and safety plan for the worksite)	YES	
6	Did you recruit any health and safety professional for managing occupational health and safety at the site? a. If yes, please engage immediately and share the EHS Manual for day to day implementation and reporting b. If no, dedicate an existing worker and employee for ensuring implementation of ESH Manual	YES	
7	Is there adequate PPE, disinfectant, sanitizer, soap, covered trash bin at all worksites.	YES	
8	Did you setup washbasin, sanitizer dispenser, covered waste bin adequately at each site? If not, please setup immediately and update your EA.	YES	
9	Did you prepare post COVID-19 posters/signboards in Bangla? If yes, please place them at the entrance, worksite and camp using the samples provided in Annex D? If not, please prepare immediately.	YES	
10	Did you prepare a plan for raising awareness of your workers/employees on various measures to avoid COVID-19 infection? Please prepare weekly plan and disseminate at the worksite.	YES	
11	Did you prepare the site-specific health and safety plan for your worksites? Please prepare the plan providing details of the issues discussed from Sections A to E and Annex (B – E) of this manual and submit to EA for approval.	YES	
12	Is the worksite falls under government declared <u>YELLOW or RED zone</u> ? If yes, please consult with EA for reopening the site.		No
13	Did you review the monitoring and reporting template provided in Annex E? If necessary, please update the template as per site condition and get it approved by EA.	YES	

**Please finalize the plan and submit to employer/ executing agency for approval.

COVID-2019 WORKERS/ VISITORS SCREENING QUESTIONNAIRE (SELF DECLARATION)

Executing Agencies (employer) of ADB funded project request your kind cooperation in answering candidly the following questionnaire and inform the staff on duty of any positive answer. You may be requested to undergo further screening procedures before given access to the worksites.

Date: <u>27 / 08 / 2020</u>	
Name of the worker/employee/visitor: <u>Mr. Mostafizur Rohoman</u>	
Gender: <u>Male</u> / Female	Age: <u>34</u>
Address: (if stays outside the camp and commute daily): <u>Base Camp</u>	

Body Temperature:

	For all staff/workers	Yes	No
1.	Do you have fever?		✓
2.	Are you coughing or having difficulty to breathe?		✓
3.	Are any individuals, you have close contact with, having fever cough, or difficulty to breathe?		✓
4.	Do you stay outside camp?		✓
5.	If yes, How do you commute: a. Walk, b. Bus, c. Rickshaw, d. CNG, e.Others.....		
6.	Has there been an arrangement of physical distancing in the bus?	✓	
7.	Did you travel Internationally within the last 30 days		✓
8.	Did any individuals you have close contact with travelled abroad in the last 30 days?		✓
9.	Others		✓

Thank you for your cooperation.

Monitoring and Reporting Template

Health and Safety Issues with COVID-19 Infection

Note: This is an indicative template. The site-specific template to be prepared by the contractor.
Advise weekly reporting to EA for high risk sites.

A. Environmental Health and Safety Checklist

Checklist	Number/ Quantity	Comments
1 Number of workers & employees available at site	338	
2 Health checkup/screening completed for all workers/employee/visitors	338	
3 COVID-19 posters/signboards prepared and posted at the worksite and camp	10	
3 Washbasin, sanitizer dispenser	10/20	
4 Stock of soap, sanitizer, disinfectant, PPEs available at site	50/20/18/30	
5 Number of cleaning staff employed	04	
6 Number of covered bins with COVID sign at the site	12	

B. Daily Monitoring: COVID -19 protocols on top of usual EHS checklist (worksite and campsite)

Sl no.	EHS Practices Checklist*	Observations		Corrective Action Plan (CAP)	Time frame to comply
		Yes	No		
1	Medical professional is available at site	✓			
2	EHS officer is available at site	✓			
3	Entrance protocol: 6 ft distance maintained as stipulated in the COVID -19 response guidance?	✓			
4	Disinfectant spray used at site entry to disinfect underneath the boots of entering persons	✓			
5	Workers & employees are using mask, gloves and shoes	✓			
6	Workers & employees are washing their hands	✓			
7	Used PPEs are disposed in covered bin	✓			
8	Social distancing: workers & employees maintaining social distancing all the time	✓			
9	Vehicle protocol: vehicle disinfection protocol followed	✓			
10	Tools/machineries: wiped to disinfect before and after sharing/working	✓			
11	Disinfecting work area: worksite/ common surfaces, toilets etc. are disinfected before worksite opened in the morning, before lunch and yesterday after closing for the day	✓			
12	Trash bins are covered and used for disposal of PPEs	✓			

*Attach photos, enter additional criteria as required for site specific measures

Reported by (ESH Professional)	Checked by (TL)	Approved by (EA/IA)
Name: Ashis Dhara Designation: EMO Signature Date	Name Designation Signature Date	Name Designation Signature Date
Received and agreed to comply by the representative of the contractor	Name Designation Signature Date	