Initial Environmental Examination

July 2021

Bangladesh: Improving Computer and Software Engineering Tertiary Education Project – Jashore University of Science and Technology

Prepared by the University Grants Commission of the Ministry of Education for the Asian Development Bank. This is an updated version of the draft originally posted in December 2019 available on https://www.adb.org/projects/documents/ban-50140-002-iee-6

CURRENCY EQUIVALENTS

(as of 15 July 2021)

Currency unit	–	Taka (Tk)
Tk1.00	=	$0.012
$1.00	=	Tk84.80

ABBREVIATIONS

ADB	–	Asian Development Bank
CSE/IT	–	computer science and engineering and information technology
COVID-19	–	coronavirus disease
DOE	–	Department of Environment
ECA	–	Environment Conservation Act
ECC	–	environmental clearance certificate
ECP	–	environmental code of practice
ECR	–	Environment Conservation Rules
EIA	–	environmental impact assessment
EMP	–	environmental management plan
EMOP	–	environmental monitoring plan
IEE	–	initial environmental examination
JUST	–	Jashore University of Science and Technology
MOE	–	Ministry of Education
MOEFCC	–	Ministry of Environment, Forest, and Climate Change
PIU	–	project implementing unit
PMU	–	project management unit
SPS	–	Safeguard Policy Statement
UGC	–	University Grants Commission

WEIGHTS AND MEASURES

^{o}C	–	degree Celsius
dB(A)	–	A-weighted decibel
ha	–	hectare
mg/L	–	milligram per liter
m^2	–	square meter
$\mu g/m^3$	–	microgram per cubic meter
ppm	–	parts per million
NO_2	–	nitrogen dioxide
$PM_{2.5}$	–	particulate matter 2.5
PM_{10}	–	particulate matter 10

NOTE

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

CONTENTS

		Page
EXECUTIVE SUMMARY		
I.	INTRODUCTION	1
	A. Overview of the Project	1
	B. Project Implementation Arrangements	2
	C. Need for Environmental Assessment	4
	D. IEE Methodology	5
II.	POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK	6
	A. National Environmental Requirements	6
	B. Environmental Requirements of the Asian Development Bank	11
	C. Disclosure Requirements	12
III.	DESCRIPTION OF THE PROJECT	15
IV.	DESCRIPTION OF THE ENVIRONMENT (BASELINE DATA)	17
	A. The Jashore University of Science and Technology	18
	B. Physical Environment	20
	C. Biological Environment	26
	D. Socioeconomic Environment	28
V.	ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES	30
	A. Pre-construction and Design Phase	30
	B. Construction Phase	33
	C. Post-construction Phase	42
VI.	ANALYSIS OF ALTERNATIVES	44
VII.	INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION	45
	A. Introduction	45
	B. Methodology	45
	C. Results of Consultation	45
	D. Consultations and Information during Implementation	46
VIII.	GRIEVANCE REDRESS MECHANISM	48
	A. Objectives of the Grievance Redress Mechanism	48
	B. Structure	48
IX.	ENVIRONMENTAL MANAGEMENT PLAN	49
	A. Monitoring	49
	B. Implementation Arrangements	50
X.	CONCLUSION AND RECOMMENDATION	63
APPENDIXES		
1.	ENVIRONMENTAL CODES OF PRACTICE	54
2.	LIST OF PARTICIPANTS AND PHOTOGRAPHS DURING CONSULTATION	60
3.	SAMPLE COMPLAINT FORM FOR GRIEVANCE REDRESS MECHANISM	61
4.	TERMS OF REFERENCE FOR ENVIRONMENTAL SAFEGUARD CONSULTANT	62

5. PROPOSED FORMAT OF ENVIRONMENTAL MONITORING REPORT DURING CONSTRUCTION PHASE 63
6. PROPOSED FORMAT OF ENVIRONMENTAL MONITORING REPORT POST-CONSTRCUTION 66
7. SAMPLE ENVIRONMENTAL SITE INSPECTION AND MONITORING CHECKLIST 67
8. COVID-19 HEALTH AND SAFETY PLAN (DRAFT) 84

List of Figures

Figure 1.1 Project management Structure 4
Figure 2.1 Approval process of DOE for ECC 8
Figure 3.2 Perspective Front View of the New Building 17
Figure 4.1 Jashore University of Science and Technology 19
Figure 4.2 Location of the New Building 20
Figure 5.1 New Building—Diagrammatic View of Green Building Features 30
Figure 5.2 Alternate Access Route to Site, JUST 33
Figure 5.3 Temporary Waste Collection Area 35
Figure 5.4 Medical Center 37
Figure 8.1 Three-tier grievance redress mechanism 43

List of Tables

Table 1.1 Project Outputs 2
Table 2.1 Relevant Regulations 6
Table 2.2 Relevant National Environmental Standards 8
Table 2.3 Relevant Environmental Standards from IFC-WB EHS Guidelines 2007 9
Table 2.4 Relevant International Environmental Agreements 10
Table 2.5 Environmental Classification According to Safeguard Policy Statement 2009 11
Table 2.6 Implications of the Safeguard Policy Statement 2009 to the Project 12
Table 3.1 Tentative Plan for the New Building 16
Table 4.1 Summary of Environmental Setting within the Project Site 19
Table 4.2 Results of Ambient Air Quality Measurements 22
Table 4.3 Ambient Noise Level Measurements 23
Table 4.4 Groundwater Quality, JUST 23
Table 4.5 Sources of Drinking Water 24
Table 4.6 Plant Species within the JUST Campus 25
Table 5.1 Green Building Features of the New ICT Center for Excellence, JUST Campus 28
Table 5.2 Typical Noise Levels of Tools and Equipment 34

Table 5.3	Common Sources of Noise and Decibel Levels	34
Table 5.4	Key Elements of Draft Emergency Response Plan	38
Table 6.1	Comparison of “With Project” and “No Project” Options	39
Table 7.1	Summary of Consultations	41
Table 7.2	Information Disclosure Program	47
Table 9.1	Environmental Management Plan	52
Table 9.2	Environmental Monitoring Plan	59

List of Maps

Map 1.1	Location Map	3
Map 4.1	Project’s Area of Influence	18
Map 4.2	Climate Region Map of Bangladesh	21
Map 4.3	Seismic Zone and Flood-Prone Areas in Bangladesh	25

EXECUTIVE SUMMARY

Introduction

The Government of Bangladesh, through the Ministry of Education (MOE), requested the Asian Development Bank (ADB) for financing of about $100 M to cover the cost of the improving the relevance and quality of computer science and engineering and information technology (CSE/IT) programs in selected universities. These universities are (i) Bangladesh University of Science and Technology (BUET), (ii) Jashore University of Science and Technology (JUST), and the (iii) University of Dhaka (DU).

The project is expected to strengthen the preparation of graduates to take on jobs, improve the connection with industries to understand their requirements for human resource, and to create the required environment in developing the skills for entrepreneurships relevant to CSE/IT.

Project Description

The proposed project will help improve relevance and quality of CSE/IT programs in selected universities. It aims to increase job-ready graduates, increase research and development (R&D) capacity through industry collaboration and interdisciplinary research projects, and develop technology entrepreneurships. These objectives will be delivered through the following four outputs.

Output	Description
Output 1: Modern Learning, research, and start up facilities established	The Improving Computer and Software Engineering Tertiary Education Project will support the three universities in developing classrooms, laboratories, industry collaboration and start up or incubation space, and auxiliary facilities. The project will establish the supporting environment which will include adopting green building features such as energy efficiency, water saving, climate and disaster-resilient design; accessibility for persons with disabilities; female-friendly amenities such as students' study areas and staff lounges, and safety features like access control system, increased lighting at night, and video surveillance system.
Output 2: Quality and industry-relevance of CSE/IT programs enhanced	The project will assist the universities in updating and improving their CSE/IT degree programs using new technologies, blended learning, industry-demanded soft-skills, and strengthen the existing digital libraries to ensure that they are aligned with international standards. JUST will set up an industry certification center for information technology (IT) professionals in the southwest region. JUST, DU, and BUET will provide undergraduate scholarships to attract more female students to CSE/IT. There will be a support to enable the IT industry to introduce flexible working hours and telecommuting to boost women participation in the IT industry.
Output 3: R&D and technology entrepreneurship strengthened	The University Grants Commission (UGC) to provide grants on the following research initiatives: (i) industry collaboration addressing industry problems or developing new products or services; (ii) interdisciplinary work on IT solutions that associate with other areas to develop new products or

Output	Description
	services; (iii) cutting edge CSE/IT research; and (iv) IT solutions to address disability issues. Research proposals can be developed together with foreign universities. There would also be support in introducing training programs on technology entrepreneurships as well as rules and incentives to encourage more university-based start-ups and spin-off firms using the facility in Output 1.
Output 4: Project management capacity strengthened.	The project will provide the necessary resources for effective project implementation and management—including necessary information system for planning, implementation and monitoring of grant scheme, stipend programs, and training, and strengthen the capacity of the UGC and three universities in key functions of modern higher education institutions including student services and industry relations.

From Output 1, a new building for JUST will be constructed. The new building will be a 10-storey building of about 20,412 m^2 to accommodate a maximum of 900 undergraduate and graduate students; international level professional certification program; and test centers for IT professionals and English languages, incubators, and seminar and conference facilities. Given the location of JUST, vehicles will be provided to as conveyance during industry-related activities and conferences. The new building will also incorporate green building features and will be designed to be climate change resilient.

Implementation Arrangements

MOE will be the executing agency (EA) acting through UGC while the key implementing agencies (IAs) are JUST, DU, and BUET. A project management unit (PMU) will be set up at UCG and project implementation unit (PIU) at the three universities who will be responsible for the day-to-day management, monitoring, reporting, and coordination during implementation. A project steering committee (PSC) will be arranged at the MOE to provide guidance and direction, monitor and review the overall progress and outputs of project implementation. The PSC will be chaired by the Secretary, MOE with representatives consisting of UGC chairperson, assigned UGC member, vice chancellors of the three universities, and representatives from other agencies to ensure that the project achieves the targets and outcomes as well as coordination in resolving potential issues during implementation. An environmental safeguard consultant will be engaged at the PMU to provide technical support on compliance to ADB requirements.

Environmental Requirements

The Environment Conservation Act (ECA) 1995 and the Environment Conservation Rules (ECR) 1997 are the main environmental regulations in Bangladesh which provides that no project or industrial unit can be undertaken without securing an environmental clearance certificate (ECC) from the Department of Environment (DOE). However, under President's Order No. 10 of 1973, UGC has the autonomy in the university education, and among others, in examining development plans within the universities. In which case, they are not within the purview of ECA 1995 and ECR 1997. The universities have their own development planning, engineering and maintenance units with adequate staff that oversee the projects needed to ensure the sustained provision of education in Bangladesh.

The Safeguard Policy Statement (SPS) 2009 of ADB sets out the requirements for environmental safeguard that applies to all ADB-financed projects and grants. Under SPS 2009, projects or grants are screened and categorized based on their potential environmental impacts.

Output 1 will involve construction of three new buildings in JUST, DU, and BUET. These interventions will have potential environmental impacts, and thus, following SPS 2009, the project has been classified as category B on environment requiring the preparation of an initial environmental examination (IEE). Based on the requirements of SPS 2009, this IEE is prepared and will be publicly disclosed to ADB website. Aside from SPS 2009, disclosure of IEE is also required by the Access to Information Policy (AIP) 2019.

The IEE prepared for the project is presented in three volumes to cover the three implementing universities: (i) Volume 1 – JUST; (ii) Volume 2 – BUET, and (iii) Volume 3 – DU. This Volume 1 of the IEE will discuss the due diligence of the new building for JUST.

Description of the Existing Environment

JUST is a public university established in 2007 and located within an area of about 142,000 square meters (m^2), or 14.2 hectares. The new building, to be known as the **"ICT Center for Excellence"** in JUST, will be located within its premises and will occupy about 20,412 m^2 (or 14% of the total area). There are no natural water sources, protected areas, or ecologically sensitive areas adjacent to or near the university but there is a research pond under the Fisheries Department located west of the site. JUST has several academic buildings including a mosque, hostel, staff dormitory or housing, and a 25-bed capacity medical center.

The site is flat terrain with an average elevation of about 8 meters (m) above mean sea level. The annual average maximum temperature is about 31^{o}C and minimum temperature of about 16^{o}C. Annual average rainfall is about 1,402 millimeters (mm) and relative humidity varying from 67% to 84%. The area lies in the southwestern region of Bangladesh considered as a low-flood-risk zone and is within seismic zone III (low intensity seismic zone). The JUST area is within the low-lying agricultural land that is usually cultivated every two years.

The JUST Department of Environmental Science and Technology carried out environmental quality measurements in March 2019 at three sampling stations for ambient air quality and noise, and the groundwater quality of the water source. Results indicate that inhalable particles, with diameters that are generally 10 micrometers and smaller ($PM_{2.5}$) and noise limits were exceeded in the three sampling stations based on the National Ambient Air Quality Standards (NAAQS) 2005 and Noise Pollution Control Rules 2006, respectively. At the time of sampling, there were three ongoing building construction projects within JUST. Groundwater quality meets the limits set by Schedule 3b, Rule 12 of ECR 1997 for pH, fecal coliform, arsenic, lead, cadmium, and hexavalent chromium. There are around 5,000 plants from 75 different species planted to open spaces within the campus to improve its landscape and to provide shade to students during summer.

The first case of coronavirus disease (COVID-19) was identified on 8 March 2020 and the first death was reported on 18 March 2020. Following this incident, the government declared a nationwide lockdown on 26 March 2020 implementing an area-based zoning system. Prior to the nationwide lockdown, educational institutions were temporarily closed on 17 March 2020 affecting about 39 million learners from pre-primary to tertiary education. During the closure, educational institutions opted to use remote learning, but the lack of digital infrastructure affected most of the students.

COVID-19 testing started in May 2020 and with support from the World Health Organization (WHO) and other international financial institutions like the ADB, there are a total of 613 laboratories and testing centers in Bangladesh as of 11 July 2021, one of which is in the Genome Centre in JUST. A total of 1,021,189 COVID-19 cases have been recorded in Bangladesh as of 11 July 2021 with 16,419 deaths and about 10.859 million vaccines administered (i.e., 1st dose – 6,048,505 and 2nd dose – 4,810,368). According to WHO Bangladesh, Khulna division has 71,382 cases of COVID-19 with 1,854 deaths from 8 March 2020 until 11 July 2021.

Anticipated Impacts and Mitigation Measures

The new building will incorporate green building features that aim to reduce energy and water consumption, and thus, is also expected to be a climate change-resilient building. These features are included in the budget with an estimated cost of about 10% of the total project cost on civil works (or about $1.461 million). This cost will cover design, use of construction materials, energy-efficient lighting systems and electric fans, and relevant Energy Star-certified products. The use of energy-efficient lighting and cooling equipment from incorporating the green building features will contribute to an estimate of about 220.85 tCO_2 emissions reduction per year.

Prior to construction works, the PMU in UGC and the PIU in JUST will ensure that the Contractors will assume the responsibility in compensating for any temporary damage, loss, or inconvenience resulting from accident or failure to comply with regulations in implementing the project. The Contractors will be also required to prepare a health and safety plan (H&SP) based on guidance notes from WHO and other international best practices to address the risk of COVID-19 at the construction sites that may affect students and staff of JUST as well as the immediate community in Jashore District. The H&SP will be approved by the PIU and PMU prior to implementation. PMU and PIU together with the environmental safeguard consultant will conduct an orientation to the Contractors and workers on their responsibility to comply with environmental requirements, their awareness of diseases such as HIV/AIDS, tuberculosis, and COVID-19, and their adherence to best practices on occupational health and safety in construction.

Associated environmental impacts are mainly during the construction phase such as increased noise and dust levels, occupational health and community safety risks, generation of waste, movements of construction vehicles, presence of workers within the premises of JUST, and similar impacts due to civil, mechanical, and electrical works for the new building. The Contractors will be required to prepare a construction management plan describing the commitments to implement measures in managing these temporary impacts and to comply with the environmental management plan (EMP). The H&SP will be an integral part of the EMP.

An alternate access route will be used to prevent construction vehicles passing through the main entrance of JUST along the Churamonkathi–Chaugachha Road. Waste that may be generated during project implementation will be disposed of in designated disposal site approved by Jashore Municipal Government. This may be ultimately at the Integrated Landfill and Resource Recovery Center in Jashore which is under the City Regional Development Project implemented by the Local Government Engineering Department with support from the ADB.

The construction site will be temporarily enclosed with clear and proper demarcation to separate access of university students, faculty, and administrative staff. The Contractors will designate security personnel to prevent unauthorized access to the construction site. The use of personal protective equipment and safety gear such as hard hats, working gloves, earmuffs, googles, masks, and similar safety protection will be mandatory. The Contractors will provide sanitary facilities, safe drinking water, first aid kits, facial masks, hand washing stations with adequate

soap and water, hand sanitizers with at least 60% alcohol (if water and soap are not available) to prevent the potential spread of COVID-19, and fire-fighting system. Good housekeeping at the work site and temporary space during break-time will be always enforced. Toolbox meetings will be conducted daily prior to start of work to reinforce the importance of health and safety in the workplace and compliance to the rules and regulations of the construction site. Those who fail to attend the daily toolbox meetings will not be allowed to work for the day. Strict compliance to COVID-19 containment measures such as physical distancing, hand washing, staggered work schedule, etc. will be enforced.

The PIU will ensure that ambient air quality limits set by the International Finance Corporation–World Bank Environmental, Health, and Safety General Guidelines 2007, or IFC–WB EHS General Guidelines 2007, the NAAQS 2005, and the Noise Pollution (Control) Rules 2006 will not be exceeded during the construction phase. The PIU and the environmental safeguard consultant will monitor compliance of the Contractor.

Analysis of Alternatives

No alternative site was considered for the new building as this is the best option in terms of ownership, adequate area, and availability. The “no project” option will mean that the open green space within JUST will not have its best and highest usage of land. At the same time, the undergraduate and graduate students, faculty, and staff of CSE Department will not have the opportunity to benefit from the innovative IT learning environment that the new building will provide.

The “with project” option entails that the demand for IT graduates to meet the requirements of the IT industry will be met; temporary jobs for skilled and nonskilled workers during construction will be created; and there will be more options for R&D, training, and private sector linkages, which are expected to improve chances of graduates for employment.

Information Disclosure, Consultation, and Participation

A total of 16 participants (five females and 11 males) joined the consultation meeting on 1 April 2019 in JUST. Issues raised were potential noise and dust levels during construction, access to the building of persons with disability on mobility and vision, workers’ behavior and access to students’ areas, waste management, and emergency preparedness. The PIU in JUST will ensure that these concerns are taken into consideration in the building design and during construction phase.

Consultations will continue during project implementation. The PIU together with the PMU will review the COVID-19 situation in Jashore district and the restrictions imposed by the government to contain its transmission. While still under the threat of COVID-19, consultations with students, faculty, administrative staff, and other stakeholders will avoid face-to-face interactions and will use other means of communications such as social media, Viber, WhatsApp, Skype, etc. When stakeholders do not have access to the internet, traditional means of communication will be used for consultation such as dedicated phone lines, radio, TV, newspaper, or mail. Once the health situation improves, the approach to consultations like town hall meetings, focus group discussions, and interviews will be followed. The PIU will ensure that all means of communication with stakeholders will include a way to provide comments and suggestions. The PIU office will include an information desk.

PIU will create a project webpage in the JUST website and will provide a link to project information. Only essential information such as the grievance redress mechanism (GRM) and project brief (both in English and Bangla) will be made available to stakeholders as printed materials while still under the COVID-19 pandemic. A project brief (a one-page flyer or a question-and-answer [Q&A] sheet, or a frequently asked questions [FAQ]) both in English and Bangla will be made available at the PIU, construction site office, PMU, and JUST administration office. The IEE, which provides more information, will be posted on the ADB website following SPS 2009 and AIP 2019.

Grievance Redress Mechanism

The PMU at UGC will establish a grievance redress mechanism (GRM) to deal with potential complaints that may be lodged against the project. The GRM will include the creation of a grievance redress committee (GRC), which may consist of the PMU head, local government representative, representative of the Contractor, and witness of the complainant. The environmental safeguard consultant at the PMU will act as the secretary of the GRC. Complaints can be lodged either in person to the Site Engineer, in writing, or by phone. While on restrictions due to COVID-19, filing of complaints will be made online as much as possible also to prevent any physical interactions. A complainant can seek redress in three tiers: (i) through the site engineer of the Contractor or PIU level, (ii) through the GRC, and (iii) or through the DOE under the Environment Court Act 2010. The complainant is not restricted to seek redress through the legal system at any point in the GRM process.

The PIU will disclose details on the GRM through the project website of JUST as well as on billboards at the construction site. Details will include the contact person, a hotline phone number, and a simplified flowchart on how to file a complaint. If needed, the environmental safeguard consultant will help the affected person in submitting a complaint.

Environmental Management Plan

The environmental management plan (EMP) describes the measures to be implemented to ensure that the identified impacts during the construction phase and post-construction phase are mitigated. The EMP includes an environmental monitoring plan (EMOP) that identifies the parameters to be monitored, frequency of monitoring, location, implementing responsibility, and supervision. A COVID-19 H&SP will be prepared by the Contractors for approval by the PIU and PMU. The H&SP will be an integral part of the EMP. The cost of implementing the EMP and the EMOP will be part of the Contractor’s budget.

As soon as the project becomes effective, the PIU through the PMU, will prepare environmental monitoring reports that will be submitted to ADB semiannually during construction and annually during post-construction. These monitoring reports will be posted on the ADB website following the requirements of SPS 2009 and AIP 2019. The PIU will designate a staff to coordinate with the environmental safeguard consultant at the PMU in submitting environmental monitoring reports and other concerns on environmental safeguard compliance.

Conclusion and Recommendation

While the project will have associated environmental impacts during construction phase, overall, it will have significant contribution in advancing the goals of Vision 2021 through improving computer and software engineering tertiary education.

The project is environment category B based on SPS 2009 and an IEE was prepared. Stakeholders were consulted and a GRM will be set up consistent with the requirements of SPS 2009. Potential environmental impacts of the project are mainly during the construction phase, which are considered temporary, of short duration, and can be easily mitigated through the implementation of the EMP and EMOP, compliance of the Contractors with the approved building design and relevant regulations, and compliance monitoring by the PIU. Appropriate COVID-19 health and safety measures will be implemented based on the guidance from the government and WHO to ensure the wellbeing of students, staff, and the immediate local communities in Jashore district. An environmental safeguard consultant will provide the required technical support to the PIU and the PMU in ensuring compliance with the environmental requirements of ADB.

I. INTRODUCTION

1. To celebrate the 50th year of independence, Bangladesh launched Vision 2021 which embodies measures to achieve eight identified goals. These goals reflect a future Bangladesh as an economically inclusive and politically accountable society.[1] These goals are: (i) to become a participatory democracy; (ii) to have an efficient, accountable, transparent and decentralized system of governance; (iii) to become a poverty-free middle-income country; (iv) to have a nation of healthy citizens; (v) to develop a skilled and creative human resource; (vi) to become a globally integrated regional economic and commercial hub; (vii) to be environmentally sustainable; and (viii) to be a more inclusive and equitable society.

2. Part of the goal to develop a skilled and creative human resource is to ensure that Bangladesh will be known as a country of educated people with skills in information technology. In addition, one of the outcomes visualized for education, training, and skills development in Vision 2021 is to have established an informed, knowledge-based, technologically oriented, and gender equitable learning system.[2]

3. To achieve these goals, the government through the Ministry of Education (MOE), requested the Asian Development Bank (ADB) for financing of about $100 million to cover the costs of Improving Computer and Software Engineering Tertiary Education Project, which is expected to improve the relevance and quality of computer science and engineering and/or institute for information technology (CSE/IT) programs in selected universities. These universities are (i) Bangladesh University of Engineering and Technology (BUET), (ii) University of Dhaka (DU), and (iii) Jashore University of Science and Technology (JUST).

4. Following the requirements of ADB's Safeguard Policy Statement (SPS) 2009, the environmental assessment for the project is presented as follows:

Volume 1: Initial Environmental Examination (IEE) of JUST
Volume 2: IEE of BUET
Volume 3: IEE of DU

5. The IEE for each university is based on the environmental impact assessment (EIA) format given in the Annex to Appendix 1 of SPS 2009, pp. 41–43.

A. Overview of the Project

6. The Improving Computer and Software Engineering Tertiary Education Project is expected to strengthen the preparation of graduates to take on jobs, improve the connection with industries to understand their requirements for human resource, and to create the required environment in developing the skills for entrepreneurships relevant to CSE/IT. Table 1.1 presents the four project outputs while Map 1.1 presents the project location.

Table 1.1: Project Outputs

[1] Center for Policy Dialogue, Bangladesh. 2007. *Bangladesh Vision 2021*. Dhaka.
[2] Government of the People's Republic of Bangladesh, General Economics Division. 2010. *Outline Perspective Plan of Bangladesh 2010-2021, Making Vision 2021 A Reality*. Dhaka.

Output	Description
Output 1: Modern learning research, and start up facilities established	The improving Computer and Software Engineering Tertiary Education Project will support the three universities in developing classrooms, laboratories, industry collaboration and start up or incubation space, and auxiliary facilities. The project will establish the supporting environment, which will include adopting green building features for energy efficiency, water-saving and climate- and disaster-resilient design; accessibility of persons with disabilities; female-friendly amenities such as students' study areas and staff lounges, and safety features like access control system, increased lighting at night, and video surveillance system.
Output 2: Quality and industry relevance of CSE/IT programs enhanced	The project will assist the universities in updating and improving their CSE/IT degree programs using new technologies, blended learning, industry-demanded soft-skills, and in strengthening their existing digital libraries to ensure that they are aligned with international standards. JUST will set up an industry certification center for information and communication technology (IT) professionals in the southwest region. JUST, DU, and BUET will provide undergraduate scholarships to attract more female students to CSE/IT. There will be supported to enable the IT industry to introduce flexible working hours and telecommuting to boost women participation in the IT industry.
Output 3: R&D and technology entrepreneurship Strengthened	The University Grants Commission (UGC) will provide grants on the following research initiatives: (i) industry collaboration addressing industry problems or in developing new products or services; (ii) interdisciplinary work on IT solutions that associate with other areas to develop new products or services; (iii) cutting edge CSE/IT research; and (iv) IT solutions to address disability issues. Research proposals can be developed together with foreign universities. There would also be support also in introducing training programs on technology entrepreneurships as well as rules and incentives to encourage more university-based startup and spin-off firms using the facility in output 1.
Output 4: Project management capacity strengthened	This project will provide the necessary resources for effective project implementation and management—including necessary information system for planning, implementation and monitoring of grant scheme, stipend programs, and training, and strengthen the capacity of the UGC and three universities in key functions of modern higher education institutions including student services and industry relations.

BUET = Bangladesh University of Engineering and Technology, CSE/IT = computer science and engineering and/or information technology, DU = University of Dhaka, JUST = Jashore University of Science and Technology
Source: Development Project Proposal, MOE.

B. Project Implementation Arrangements

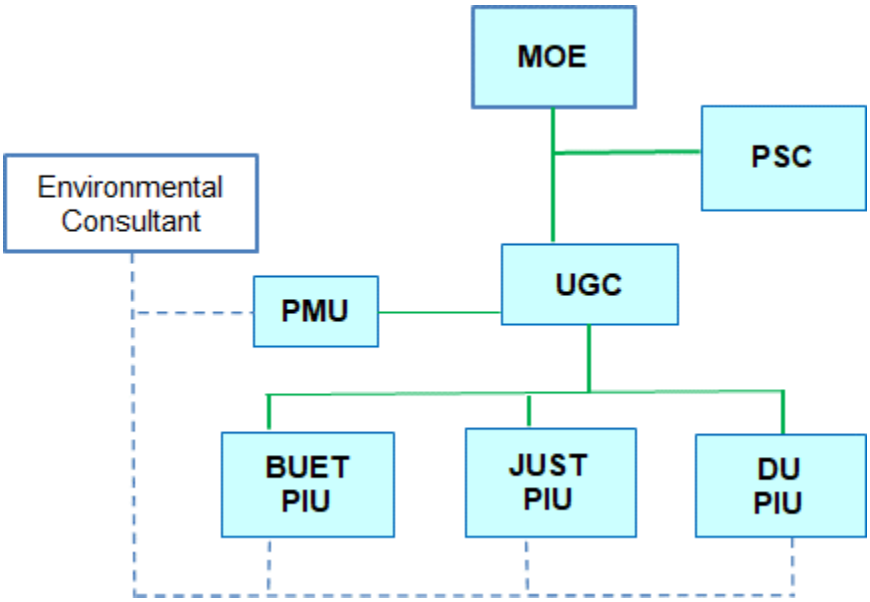
7. MOE will be the executing agency (EA) acting through UGC while the key implementing agencies (IAs) are JUST, DU, and BUET. A project management unit (PMU) will be set up at UCG and project implementation units (PIUs) at the three universities who will be responsible for the day-to-day management, monitoring, reporting, and coordination during implementation. A project steering committee (PSC) will be arranged at the MOE to provide guidance and direction, monitor

and review the overall progress and outputs of project implementation. The PSC will be chaired by the Secretary, MOE with representatives consisting of UGC chairperson, assigned UGC member, vice chancellors of the three universities, and representatives from other agencies to ensure that the project achieves the targets and outcomes as well as coordination in resolving potential issues during implementation.

8. An environmental safeguard consultant will be engaged intermittently until the completion of construction phase (about two years) to provide technical support to the PMU and PIUs on compliance to environmental requirements of ADB, and the building construction requirements of the government. The project is expected to be completed by June 2027. Figure 1.1 presents the project management structure.

Map 1.1: Location Map

Figure 1.1: Project Management Structure



BUET = Bangladesh University of Engineering and Technology, DU = University of Dhaka, JUST = Jashore University of Science and Technology, MOE = Ministry of Education, PIU = project implementing unit, PMU = project management unit, PSC = project steering committee, UGC = University Grants Commission.

C. Need for Environmental Assessment

(i) Requirements of the Government

9. The Environment Conservation Act (ECA) 1995 and the Environment Conservation Rules (ECR) 1997 are the main environmental regulations in Bangladesh which provides that no project or industrial unit can be undertaken without securing an environmental clearance certificate (ECC) from the Department of Environment (DOE). The DOE is the government agency authorized to regulate and enforce environmental management regulations to ensure that development projects are implemented sustainably, and to conserve and manage the environment in Bangladesh.

10. However, under President's Order No. 10 of 1973, UGC has the autonomy in the university education, and among others, in examining development plans within the universities. In this case, UGC is not within the purview of ECA 1995 and ECR 1997. The universities have their own development planning, engineering and maintenance units with adequate staff that oversee the projects needed to ensure the sustained provision of education in Bangladesh.

(ii) Requirements of ADB

11. The Safeguard Policy Statement (SPS) 2009 of ADB sets out the requirements for environmental safeguard which applies to all the projects and grants ADB finance.[3]

[3] ADB. 2009. *Safeguard Policy Statement 2009*. Manila.

12. SPS 2009 requires that projects to be funded by ADB will be subject to screening and categorization based on their potential environmental impacts. The categorization determines the required environmental assessment.

13. A Rapid Environmental Assessment checklist was used to determine the potential environmental impacts of the project. Given the associated civil works that will be involved in the construction of the new buildings, the project is classified as category B on environment requiring an initial environmental examination (IEE). A category B project is considered likely to have adverse environmental impacts that are less adverse, site-specific, few if any of them irreversible, and in most cases mitigation measures can be more readily designed.

D. IEE Methodology

(i) Objectives

14. Preparation of an IEE aims to (i) describe the existing environment; (ii) assess the potential environmental impacts of the proposed project; (iii) identify the mitigation and/or enhancement measures corresponding to the potential environmental impacts identified; (iv) describe the environmental management and monitoring plan to be implemented and complied; and, (v) ensure that all the statutory regulatory requirements relevant to the project have been identified and considered, to understand what requires compliance.

(ii) Scope

15. This IEE was prepared following the requirements of SPS 2009. The scope covers the general existing environmental profile of the project site, assessment of potential environmental impacts during design and/or pre-construction, construction, and operation (or post-construction) stages; and a description of the environmental management plan (EMP) and environmental monitoring plan (EMOP). A COVID-19 health and safety plan (H&SP) will be part of the EMP. The following steps were considered:

(a) undertake site visits to collect relevant secondary data to establish the baseline environmental condition;
(b) assess the potential impacts due to location, design, construction and post-construction of the CSE/IIT building;
(c) examine opportunities for environmental enhancement and identify measures;
(d) prepare an EMP outlining the measures to mitigate potential environmental impacts including the institutional arrangements;
(e) identify key environmental parameters required to be monitored during project implementation and prepare an EMOP;
(f) carry out consultation with affected stakeholders, local administrative bodies to identify perceptions of the project and introduce project components and anticipated impacts; and,
(g) disclose the draft IEE on the ADB website and prepare in Bangla a project brief and/or frequently asked questions (FAQ) that can be publicly available at the offices of UGC, JUST, BUET, and DU, and the construction sites.

16. Specifically for JUST, site visits were conducted in January and March–April 2019 to collect secondary data, conduct consultations, and coordinate with relevant agencies of the government. Environmental sampling was done intermittently from 21–30 March 2019.

II. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

A. National Environmental Requirements

17. The following presents the relevant regulatory agency, process, regulations, and international environmental agreements.

(i) Environmental Agency

18. The Ministry of Environment, Forest and Climate Change (MOEFCC) is the agency that plans, promotes, coordinates and oversees the implementation of programs and plans on environment and forestry. MOEFCC manages all national environmental matters and is responsible for activities such as prevention and control of pollution, forestation and regeneration of degraded areas and protection of the environment, and in the framework of legislations. MOEF also conducts surveys, impact assessment, control of pollution, research, and collection and dissemination of environmental information and creation of environmental awareness among all sectors in Bangladesh.

19. Created in 1989, the Department of Environment (DOE) performs the regulatory functions of the MOEFCC. DOE is the main agency entrusted with regulating and enforcing environmental management regulations in order to ensure sustainable development and to conserve and manage the environment. DOE ensures the consistent application of environmental rules and regulations, and provides guidance, training and conduct promotional campaign on improving the awareness of environmental issues.

(ii) Environmental Regulations

20. The main environmental regulations in Bangladesh are the Environment Conservation Act (ECA) 1995 (amended 2000, 2002, 2007 and 2010) and the Environment Conservation Rules (ECR) 1997.

21. ECA 1995 provides the requirements on environmental protection, improvement of environmental standards, and control and abatement of environmental pollution. Through the ECA 1995, the DOE is mandated to undertake any activity needed to conserve and enhance the quality of environment and to control, prevent and mitigate pollution.

22. ECR 1997 provides for the declaration of ecologically critical areas, categorization of industries and projects and identification of the types of environmental assessments needed for respective categories of industries or projects. Among other things, these rules set (i) the National Environmental Quality Standards for ambient air, various types of water, industrial effluent, emission, noise, vehicular exhaust etc.; (ii) the requirements for and procedures to obtain environmental clearance certificate (ECC); and (iii) the requirement for the IEE based on categories of industrial and other development interventions.

23. The ECA 1995 and ECR 1997 outline the regulatory mechanism to protect the environment in Bangladesh. Aside from ECA 1995 and ECR 1997, Table 2.1 presents a summary of relevant environmental regulations.

Table 2.1: Relevant Regulations

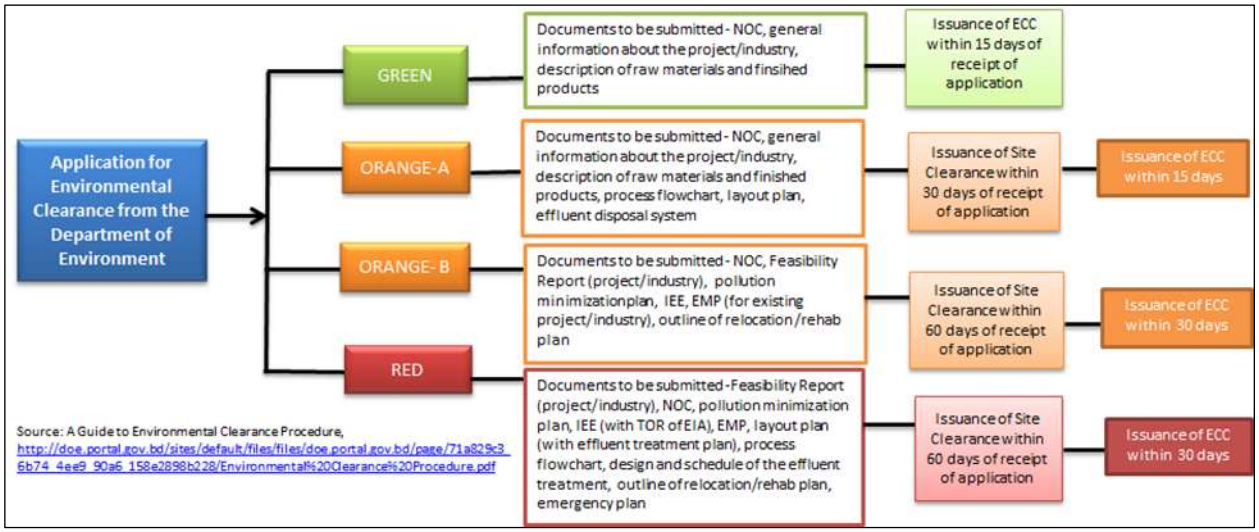
Regulation	Brief Description
Bangladesh National Building Code 2006 (or latest version)	Sets minimum standards for design, construction, quality of materials, use and occupancy, location and maintenance of all buildings to safeguard, within achievable limits, life, limb, health, property and public welfare.
Bangladesh Building Construction Rules 2008	These rules superseded the previous Building Construction rules of 1984. These rules seek to control development plot-by-plot and case-by-case. It controls development by imposing conditions on setbacks, site coverage, construction of garages, access to plot, provision of lift, land use of that plot and height of building. Restricting the height of a building in Building Construction Rules 1996 helps to control the density of an area and manage the growth of the city in some way.
Disaster Management Act 2012	Coordinates activities on disaster management, making them object-oriented and strengthens and formulate rules to build up infrastructure of effective disaster management to fight all types of disaster.
Environment Court Act 2000 (amended in 2002 and 2010)	This Act is under the Judiciary and Ministry of Environment and Forests to ensure the resolution of disputes on environmental and social damages resulting from any development activities. This Act also allows for the effective completion of environment-related legal proceedings.
Vehicle Act 1927, the Motor Vehicles Ordinance 1983, and Bengal Motor Vehicle Rules 1940	These are under the Bangladesh Road Transport Authority which regulates vehicular emissions and noise including road safety.
Bangladesh Factories Act 1995	Requires every workplace including small- or large-scale construction where women are employed, to have an arrangement of childcare services. Based on this Act and Labor Laws, medical facilities, first aid and accident and emergency arrangements are to be provided by the authority to the workers at workplaces.
Bangladesh Labour Act 2006 (amended 2013), Bangladesh Labor Rules 2015	These regulations are under the Ministry of Labour, which provides for the occupational rights and safety of factory workers and the provision of comfortable work environment and reasonable working conditions including the prohibition of child labor and adolescent labor.
The Antiquities Act 1968 (amended 1976)	Regulation on the preservation and protection of antiquities.
The Embankment and Drainage Act, 1952	Consolidates the laws relating to Embankments and drainage providing provision for the construction, maintenance, management, removal and control of embankments and water courses for the better drainage of lands and for their protection from floods, erosion or other damage by water.

(iii) Environmental Approval Process

24. Section 12 of ECA 1995 provides that no industrial unit or project can be established or undertaken without securing an environmental clearance certificate (ECC) from the DOE. Following the requirements of ECR 1997, the DOE has classified various development interventions according to the potential adverse environmental impacts for the purpose of issuing the ECC. This classification includes: (i) green; (ii) orange-A; (iii) orange-B; and (iv) red. The Green classification refers to industries or projects considered to be relatively pollution-free, thus, no environmental study will be required. The Orange-A, Orange-B, and Red category are those projects and industrial units that may have potential adverse environmental impacts and therefore requires an environmental impact assessment (EIA). Securing the ECC for these categories involves two steps: (i) issuance of site clearance certificate (SCC), and then (ii) the ECC.

25. The site clearance certificate will be issued by the DOE upon approval of the IEE and the receipt of the "No Objection Certificate (NOC)." These documents serve as "proof of authorization" to initiate a project. The IEE includes the terms-of-reference (TOR) of the EIA which requires the approval of the DOE. Once the EIA has been reviewed and approved by the DOE, the ECC will be issued. The project proponent cannot open line of credit in favor of importable machineries and cannot start any physical activities for the project without the DoE-approved EIA. Figure 2.1 presents the overview of the approval process.

Figure 2.1: Approval Process of Department of Environment for Environmental Compliance Certificate



EIA = environmental impact assessment, ECC = environmental compliance certificate, EMP = environmental management plan, IEE = initial environmental examination, NOC = No Objection Certificate.

(iv) Applicable Environmental Standards

26. Table 2.2 lists the applicable standards to meet national regulations. SPS 2009 provides that during construction, the government will apply pollution prevention and practices that are in line with international good practice as set by international standards such as the International Finance Corporation-World Bank Environmental, Health, and Safety General Guidelines 2007 or IFC-WB EHS General Guidelines 2007. In addition, should the regulations of the government differ from the levels and measures set by the IFC-WB EHS General Guidelines 2007, the

government will achieve whichever is more stringent. The relevant standards from IFC-WB EHS General Guidelines 2007 are given in Table 2.3.

Table 2.2: Relevant National Environmental Standards

AIR[a]		
Pollutant	Standards	Averaging Period
NO_x	100 µg/m^3 (0.053 ppm)	Annual
PM_{10}	50 µg/m^3	Annual
	150 µg/m^3	24-hour
$PM_{2.5}$	15 µg/m^3	1-hour
	65 µg/m^3	24-hour
NOISE[b]		
Zone Class	Limits in L_{eq} dB(A)	
	Daytime	Nighttime
	(6 a.m. – 9 p.m.)	(9 p.m.- 6 a.m.)
i) A sensitive area where quietness is of primary importance such as schools, hospitals, mosques etc.	50	40
ii) Residential zone	55	45
iii) Mixed areas, which are, used as residential areas as well as commercial and industrial purposes	60	50
iv) Commercial areas	70	60
v) Industrial areas	75	70

dB(A) = A-weighted decibels, NO_2 = nitrogen dioxide, ppm = parts per million, µg/m^3 = microgram per cubic meter, $PM_{2.5}$ = particulate matter 2.5, PM_{10} = particulate matter 10.
Note: Daytime shall mean from 6 a.m. to 9 p.m. Nighttime shall mean from 10 p.m. to 6 a.m. Leq means equivalent continuous sound level. or the average sound pressure level over a specified time interval
[a] National Ambient Air Quality Standards 2005.
[b] Noise Pollution (Control) Rules 2006.

Table 2.3: Relevant Environmental Standards from IFC-WB EHS Guidelines 2007

Table 1.1.1: WHO Ambient Air Quality Guidelines[7,8]

	Averaging Period	Guideline value in µg/m^3
Sulfur dioxide (SO_2)	24-hour	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)
	10 minute	500 (guideline)
Nitrogen dioxide (NO_2)	1-year	40 (guideline)
	1-hour	200 (guideline)
Particulate Matter PM_{10}	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter $PM_{2.5}$	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

Table 1.7.1- Noise Level Guidelines[54]

Receptor	One Hour L_{Aeq} (dBA)	
	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational[55]	55	45
Industrial; commercial	70	70

Source: World Bank Group-International Finance Corporation EHS General Guidelines 2007

(v) Relevant International Environmental Agreements

27. Aside from the national environmental regulations, international environmental agreements where Bangladesh is a party will be referred to in the design and implementation of the project. Table 2.4 lists the applicable international environmental agreements that can provide guidance during project implementation.

Table 2.4: Relevant International Environmental Agreements

International Environmental Agreement	Date Ratified	Description
Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris 1972)	3 November 1983	Entered into force on 23 November 1972, this convention defines and provides for the conservation of the world`s heritage by listing the natural and cultural sites whose value should be preserved.
Vienna Convention for the Protection of the Ozone Layer 22 March 1985	2 August 1990	A framework for efforts to protect the globe's ozone layer by means of systematic observations, research and information exchange on the effects of human activities on the ozone layer and to adopt legislative or administrative measures against activities likely to have adverse effects on the ozone layer.
Montreal Protocol on Substances that Deplete the Ozone Layer (a protocol to the Vienna Convention for the Protection of the Ozone Layer)	2 August 1990	This international treaty was entered into force on 1 January 1989 and is designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion. This treaty also requires controlling emissions of substances that deplete ozone.
Kyoto Protocol (1997)	22 October 2001	An international agreement adopted on 11 December 1997 and entered into force on 16 February 2005, which commits its Parties to set internationally- binding emission reduction targets. This agreement is linked to the United Nations Framework Convention on Climate Change (UNFCCC).
UNFCCC (1992)	15 April 1994	This framework came into force on 21 March 1994 and aims to achieve stabilization of greenhouse gas (GHG) concentrations in the atmosphere at a level low enough to prevent dangerous anthropogenic interference with the climate system.
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989)	1 April 1993	This convention came into force on 5 May 1992 which aims to reduce the amount of waste produced by signatories and regulates the international traffic in hazardous wastes.
UNESCO World Heritage Convention 1972	3 August 1983 (Accession) Accession – the state accepts the offer or the opportunity to	This convention describes the concepts of nature conservation and the preservation of cultural properties. Parties agree to identify and nominate properties on their national territory to be considered for inscription on the World Heritage List, gives details of how

International Environmental Agreement	Date Ratified	Description
	become a party to a treaty already negotiated and signed by other states	a property is protected, and provides a management plan for its upkeep.

B. Environmental Requirements of the Asian Development Bank

28. The SPS 2009 sets the environmental requirements and review procedures that apply to all projects and grants that ADB finance. SPS 2009 comprises three key safeguard areas: environment, involuntary resettlement, and indigenous peoples. It aims to avoid adverse project impacts to both the environment and the affected people; minimize, mitigate and/or compensate for adverse project impacts; and help Borrowers to strengthen their safeguard systems and to develop their capacity in managing the environmental and social risks.

29. SPS 2009 uses a categorization system to indicate the significance of potential environmental impacts, which is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts within the project's area of influence. The project categorization system is described in Table 2.5.

Table 2.5: Environmental Classification According to Safeguard Policy Statement 2009

Category	Definition	Assessment Requirement
A	Likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented, and may affect an area larger than the sites or facilities subject to physical works.	Environmental impact assessment
B	Likely to have adverse environmental impacts that are less adverse than those of Category A. Impacts are site-specific, few if any of them irreversible, and in most cases mitigation measures can be designed more readily than Category A.	Initial Environmental Examination
C	Likely to have minimal or no adverse environmental impacts.	No environmental assessment is required but the environmental implications of the project will be reviewed.
FI	Project involves investment of ADB funds to or through a financial intermediary (FI).	FIs will be required to establish an environmental and social management commensurate with the nature and risks of the FI's likely future portfolio to be maintained as part of the FI's overall management system.

Source: ADB. 2009. *Safeguard Policy Statement*. http://www.adb.org/sites/default/files/institutional document/32056/safeguard-policy-statement-june2009.pdf.

C. Disclosure Requirements

30. Aside from the SPS 2009 requirements, the AIP 2019 provides for the requirements of disclosure for project information of projects and grants funded by ADB (footnote 3). Consistent with SPS 2009, this requires the disclosure of documents submitted by the borrower and/or client:

(i) a draft EIA report for category A project, at least 120 days before Board consideration;
(ii) a draft environmental assessment review framework, where applicable, before appraisal;[4]
(iii) the final EIA or IEE, upon receipt by ADB;
(iv) a new or updated EIA or IEE, and a corrective action plan, if any, prepared during project implementation, upon receipt by ADB; and,
(v) the environmental monitoring reports, upon receipt by ADB.

31. Table 2.6 presents a summary of the implications of SPS 2009 to the project.

Table 2.6: Implications of the Safeguard Policy Statement 2009 to the Project

No.	SPS 2009 Principles	Description
1	Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks.	The components with environmental implications have been identified under Output 1 of the Project: (a) construction of three new multi-storey buildings within the university premises of JUST, BUET, and DU. A Rapid Environmental Assessment (REA) checklist was completed for these components, and the environment category based on SPS 2009, is B requiring an IEE.
2	Conduct an environmental assessment for each proposed project to identify potential direct, indirect, cumulative, and induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential transboundary and global impacts, including climate change. Use strategic environmental assessment where appropriate.	An IEE following the requirements of SPS 2009 was conducted for the components with environmental implications.
3	Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and document the rationale for selecting the alternative proposed. Also consider the no project alternative.	Alternative sites, where appropriate, were considered and included in the IEE.

[4] Management review meeting or the first staff review meeting for sovereign projects, or before the final investment committee meeting for nonsovereign projects, as applicable (ADB procedures).

No.	SPS 2009 Principles	Description
4	Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive impacts by means of environmental planning and management. Prepare an environmental management plan (EMP) that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations for EMP preparation include mitigation of potential adverse impacts to the level of no significant harm to third parties, and the polluter pays principle.	An EMP is included in the IEE for each of the components with environmental implications under the three universities of the MOE. The EMPs will provide guidance to the construction contractor and their subcontractor (if any) who will be engaged during project implementation to ensure compliance to the relevant provisions in SPS 2009.
5	Carry out meaningful consultation with affected people and facilitate their informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected people and concerned nongovernment organizations, early in the project preparation process and ensure that their views and concerns are made known to and understood by decision makers and considered. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment. Establish a grievance redress mechanism to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance.	Three consultations events were undertaken during the preparation of the IEE (i.e., one per university). Consultations will continue through the PIUs in each university (as appropriate) during project implementation. A three-tiered grievance redress mechanism (GRM) is included in the IEE including the proposed composition of the grievance redress committee (GRC). The implementation of the GRM will be monitored by the PMU established under the UGC.
6	Disclose a draft environmental assessment (including the EMP) in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders.	The IEE will be endorsed by the MOE for public disclosure through the ADB website.
7	Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.	At the construction phase, the contractors will be responsible for implementing the EMP and will be monitored by the PIU and PMU for compliance. Environmental monitoring reports and corrective actions (if needed) will be prepared by the PIUs and will be disclosed to ADB website.

No.	SPS 2009 Principles	Description
8	Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the overall benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources.	All the proposed interventions with environmental implications are not located in critical habitats as defined by SPS 2009.
9	Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phaseouts. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.	Construction activities will generate waste and may increase ambient dust and noise levels. Vegetation and land clearing will be done. No hazardous chemicals will be used in vegetation clearing. The new buildings will use Energy Star certified products and will incorporate green building features.  https://www.energystar.gov/about/energy-star-brand/energy-star-brand-book
10	Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.	Construction works may cause accidents or injuries to workers. Contractors will be required to comply with the EMP and implement, to the extent possible, the Environmental Codes of Practice (ECPs). Compliance will be monitored by the PIUs and the PMU. Contractors will be required to prepare a health and safety plan in response to COVID-19 pandemic and will be an integral part of the EMP.

No.	SPS 2009 Principles	Description
11	Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.	The sites are within the existing premises of the universities and are not known to have physical cultural resources as defined by SPS 2009.

IEE = initial environmental examination, MOE = Ministry of Education, PIU = project implementation unit, PMU = project management unit, SPS = Safeguard Policy Statement.

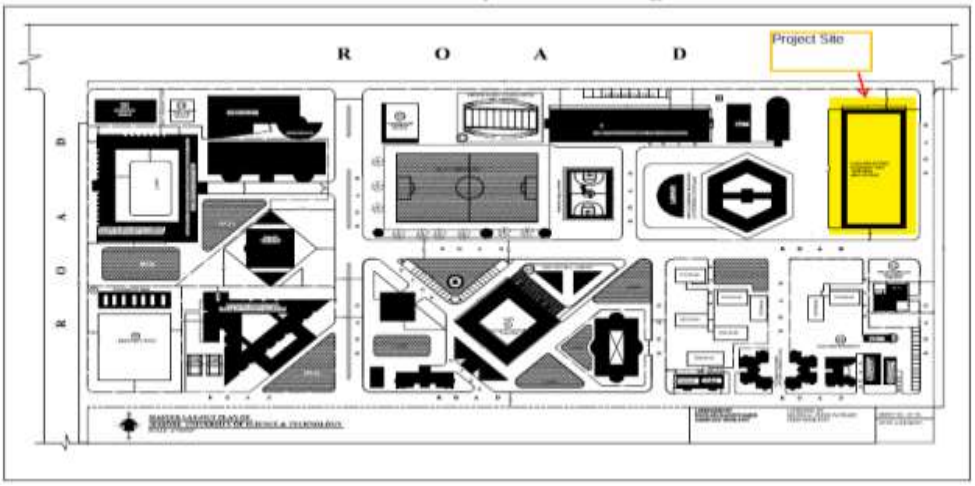
III. DESCRIPTION OF THE PROJECT

32. The Improving Computer and Software Engineering Tertiary Education Project will have four outputs as summarized in Table 1.1. The component that will have environmental implications from Output 1 (see below) will be the construction of new IT buildings for BUET, DU, and JUST.

Output 1: An established modern learning, research, and startup supporting environment	The project will support the three universities in developing classrooms, laboratories, industry collaboration, start-up or incubation space, and auxiliary facilities. The project will establish the supporting environment, which will include adopting green building features such as energy efficiency and water-saving and climate- and disaster-resilient design; accessibility for persons with disabilities; female-friendly amenities such as students' study areas and staff lounges; and safety features like access control system, increased lighting at night, and video surveillance system.

33. For JUST, the project will involve a new, fully furnished, and complete 10-storey building of about 20,412 square meters (m^2). This new building will be known as the **"ICT Center for Excellence"** and will accommodate a maximum of 900 undergraduate and graduate students; international-level professional certification program; and test centers for IT professionals and English languages, incubators, and seminar or conference facilities. Given the location of JUST, vehicles will be provided for conveyance during industry-related activities and conferences. The total estimated cost of civil works is $14.61 million. Figure 3.1 shows the project site within the premises of JUST.

Figure 3.1: Project Site—Location of the New Building within Jashore University of Science and Technology



34. The summary of the building structure is given in Table 3.1 while Figure 3.2 shows the perspective front view of the proposed building.

Table 3.1: Tentative Plan for the New Building

Arrangement	Purpose
Guest lounge for trainees and international trainers	Accommodation facility for about 100 people There will be some quadruple occupancy rooms for trainees and some single occupancy rooms for international trainers
Seminar rooms and conference halls	Rooms will be designed and equipped to be a showcase for organizing international conferences and seminars
Commercial zone for IT industries, incubation center	Commercial space for around 10–15 IT industries for IT business with proper facilities including broadband internet connection, electrical facilities, etc. There will enough space for a software incubation center
Professional and language training, online test centers	Space for training centers of Professional and English Language Certification courses and online test centers will be accommodated
Departmental laboratory and data center	Space for CSE departmental laboratories and data center given by the government will be provided
Departmental laboratory	Space for CSE departmental laboratories to accommodate Diploma students
Teacher lounge	Office rooms, meeting rooms for the faculties of CSE Department, space for part-time teachers, visiting professors, and advisors
Classrooms, seminar library, and information booth	Classrooms for undergraduate and graduate students of the CSE Department, seminar library, and information helpdesk
Parking and information area	Information booth, car parking for internal members and guests

CSE = computer science and engineering; IT = information and communication technology.

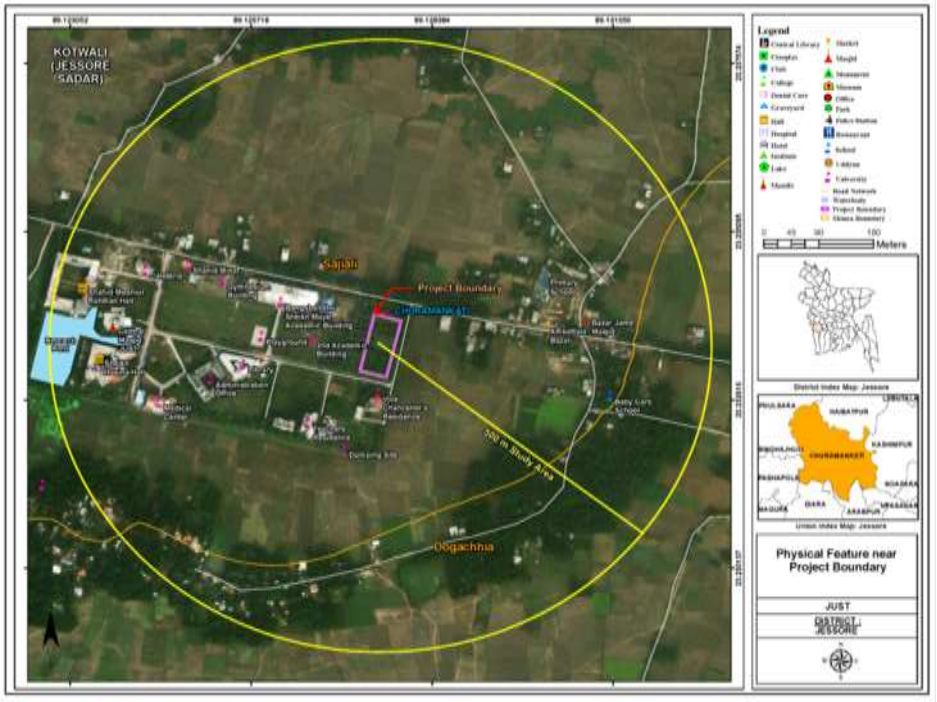
Figure 3.2: Perspective Front View of the New Building

ICT Center for Excellence. (*Bottom left*) View of front atrium from southwest; (*upper left*) View of entry lobby looking toward VC Bungalow in the south; (*upper right*) Southwest corner view (to be seen from the campus).

IV. DESCRIPTION OF THE ENVIRONMENT (BASELINE DATA)

35. This chapter describes the existing environment within the study area and is based on baseline measurements but relying heavily on secondary data from government sources, international organizations, and other research entities. Baseline measurements on ambient air quality, noise, and water supply in JUST were conducted on 21 March, 25 March, and 31 March, 2019 by the Department of Environmental Science and Technology, JUST. Measurements were done within a 500-meter radius from the project site (Map 4.1).

Map 4.1: Project's Area of Influence



A. The Jashore University of Science and Technology

36. JUST is a public university established in 2007 and is located within an area of about 142,000 m^2 (14.2 hectares). The new building will occupy about 20,412 m^2 (or 14% of the total area). The university is bounded on the north by the Churamonkathi-Chaugacha Road (a regional road), the Islampur village under Dogachhia union on the south, a "Baby Care School" and agricultural land on the east, and the Research Pond under the Fisheries Department on the west. There are no natural water sources, protected areas, or ecologically sensitive areas adjacent to or near the university. JUST has several academic buildings as well as a mosque; dormitories for students, faculty members, and administrative staff; and a 25-bed capacity medical center. Table 4.1 presents a summary of the environment setting within the study area. Figure 4.1 shows the location of JUST while Figure 4.2 shows the site for the new building within the premises of JUST.

Figure 4.1: Jashore University of Science and Technology

Table 4.1: Summary of Environmental Setting within the Project Site

Item	Details
Location	Jashore District under Sajiali Mouza, Churamankati Union, Kotwali (Jashore Sadar) Thana
Latitude	23.233415
Longitude	89.127631
General elevation	Average ground elevation 8.0 meters above mean sea level
Topography	Flat terrain and land are relatively plain
Major physiographic unit	Ganges River floodplain
Soil type	Sandy silt
Climatic conditions	Subtropical monsoon climate where rainy season is hot and humid having about 85% of the annual rainfall Winter is predominately cool and dry while summer is hot and dry interrupted by occasional heavy rainfall and thunderstorms The annual average maximum temperature is about 31^{o}C and minimum temperature is about 16^{o}C Annual average rainfall is about 1,402 millimeters and relative humidity varies from 67% to 84%
Flooding	Area lies in the southwestern region of Bangladesh considered as low-flood-risk zone
Seismicity	Area is within Zone III (i.e., low intensity seismic zone)
Present site land status	University area is within the low-lying agricultural land that is cultivated every two years
Nearest water bodies	University Research pond is about 400 meters from the project site
Ecologically critical area(s)	No ecologically critical area
Reserve and/or protected forests	No reserves or protected forests
Archeologically important place	There is no known archeologically important site.
Major settlements	Islampur, Doragachhia, Sajiali villages

Figure 4.2: Location of the New Building

B. Physical Environment

(i) Geology and Soil

37. Jashore is in the southwestern part of the Bengal Basin, a long-established area of subsidence and deposition containing an almost complete sequence from the cretaceous to recent alluvium. The surface geology consists mainly of quaternary sediments, although there are some tertiary deposits in the eastern flood belt. Clay soils are prevalent in the low-lying areas, and medium-textured soils at the higher grounds.

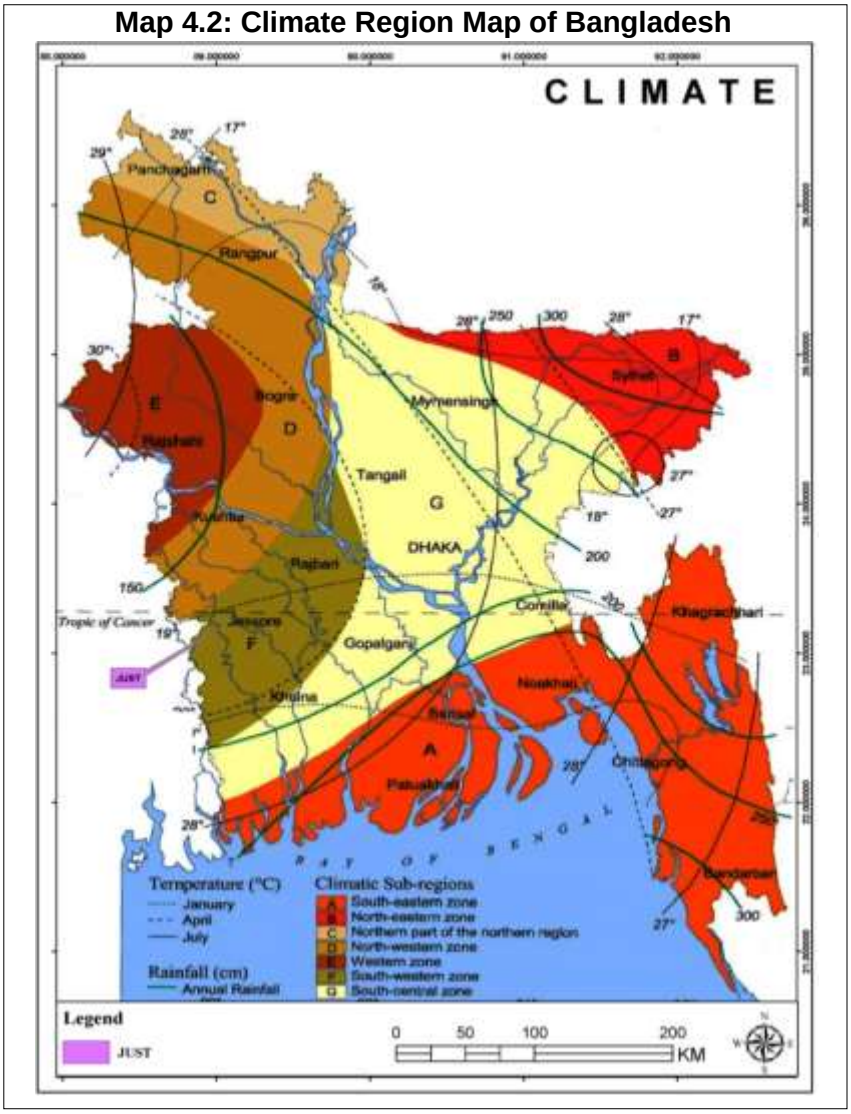
38. Jashore is included in hydrogeological unit II of the Holocene Deltaic and Piedmont Plains. Deltaic and piedmont deposits mainly consist of unconsolidated sand, silt, and clay of varying thickness. The aquifer system in the area consists of several aquifers occurring at various depths at various positions of the hydrogeological unit. The aquifers are separated by clayey aquitards. The number of aquifers in the area is less in the northern part whereas there are up to four aquifers in the southern part. The shallow aquifer varies widely in thickness with the region and accordingly, depth of the deep aquifer also varies. The shallow aquifer is thicker toward the north.

(ii) Climate

39. The project area experiences a tropical monsoon climate characterized by four main seasons, namely, winter (December–February), summer (March–May), monsoon (June–September), and the post-monsoon or autumn season (October–November). The climate region map of Bangladesh is given in Map 4.2.

40. The rainy season is hot and humid, and characterized by heavy rainfall, tropical depressions, and cyclones. The winter is predominately cool and dry. The summer is hot and dry interrupted by occasional heavy rainfall and thunderstorms. Gentle north and northwesterly winds with occasional violent thunderstorms, called northwester during summer and southerly wind with occasional cyclonic storm during monsoon, are prominent wind characteristics of the region.

Map 4.2: Climate Region Map of Bangladesh



41. Data recorded from 2011 to 2015 at the Jashore Station of the Bangladesh Meteorological Department were used to describe the meteorological condition within the study area.

42. May is the hottest month with monthly average maximum temperature reaching 33.22^{o}C. In June, there is sharp fall in temperature due to the outbreak of the monsoon season. During the monsoon, the monthly average temperature is about 29°C. The cool dry winter season begins in November, and January is the coldest month with an average minimum of about 17°C·

43. The average annual rainfall is about 1,402 mm. Normally, the rainy season starts toward the end of May and ends in October. Heavy rainfall occurs in July, August, and September compared to other months. In March and April, some rainfall also occurs due to northwesters. Winter is a dry period with little or nearly no rainfall. The maximum average relative humidity is 84% occurring in August, while the minimum is 67% in March.

(iii) Air Quality and Noise

44. There is no record of ambient air quality monitoring within the study area from the DOE. Existing sources of air pollution are vehicular emissions, unpaved roads, and daily activities of farming near the campus and from settlements. There is no industry or brick field near the JUST campus. The study area is rural with JUST as the central public institution.

45. Baseline ambient air quality measurements were conducted on 21 March, 25 March, and 31 March 2019 by the Department of Environmental Science and Technology of JUST on a 24-hour averaging time. Parameters measured were fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller ($PM_{2.5}$); inhalable particles, with diameters that are generally 10 micrometers and smaller (PM_{10}); and nitrogen dioxide (NO_2) using portable air quality monitoring instruments at three sites around the project site.[5] At the time of sampling, there were three ongoing major building constructions within the premises of JUST. Table 4.2 presents the results of measurements while Figure 4.3 shows the sampling location. Map 4.3 shows the location of the ambient air quality and noise sampling stations in a Google map.

Table 4.2: Results of Ambient Air Quality Measurements

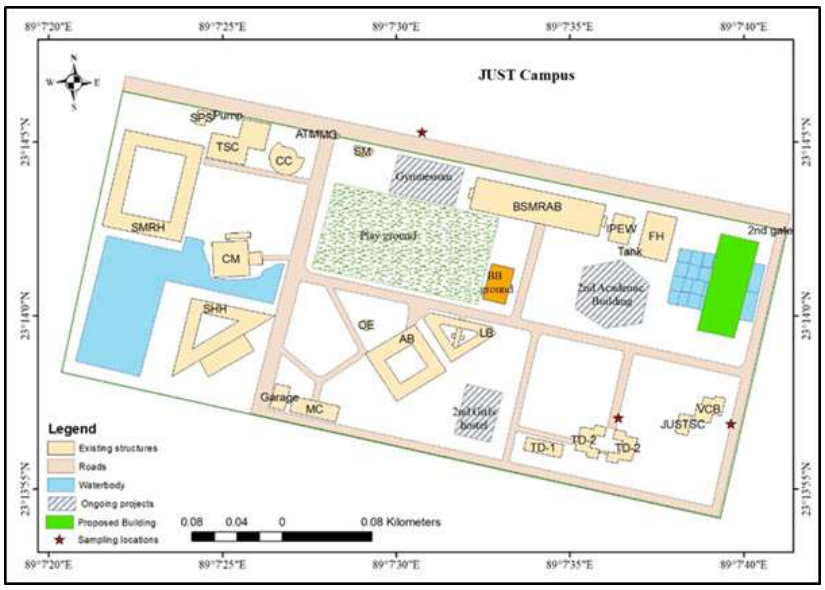
Location	Concentration (µg/m³)		
	$PM_{2.5}$	**PM_{10}**	**NO_2**
In front of Vice Chancellor's residence within JUST premises	115	121	73
In front of 10-story dormitory and staff housing	114	115	75
Settlements near Shadhinota Shorok Road	115	134	74
NAAQS 2005	65 µg/m³ (24 hours)	150 µg/m³ (24 hours)	100 µg/m³ (annual)
IFC-WB EHS General Guidelines 2007 (Table 1.1.1)	25 µg/m³ (24-hour averaging time)	50 µg/m³ (24-hour averaging time)	200 µg/m³ (1-hour averaging time)

µg/m³ = microgram per cubic meter, NO_2 = nitrogen dioxide, $PM_{2.5}$ = particulate matter 2.5, PM_{10} = particulate matter 10.

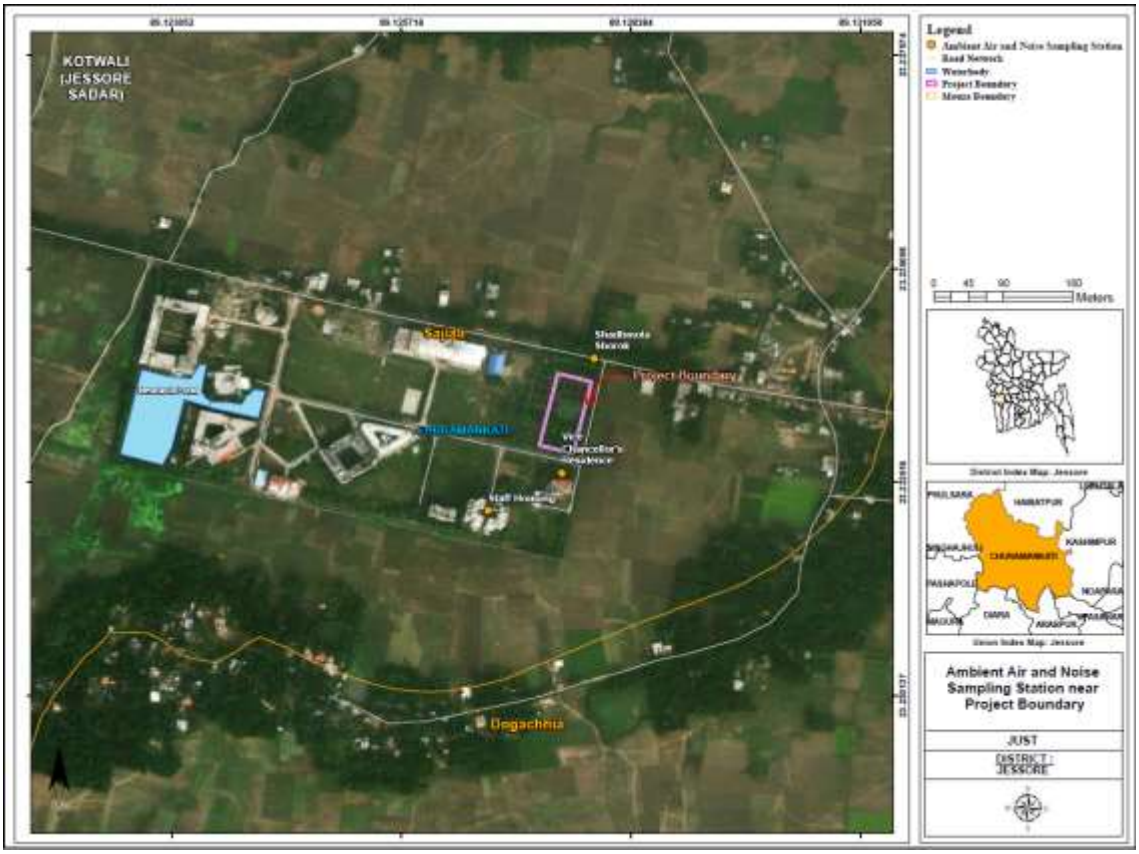
46. Results suggest that $PM_{2.5}$ levels in all the three sampling stations exceeded the limits set by the NAAQS 2005 but within the limits for PM_{10} and NO_2. Referring to the WB-IFC EHS General Guidelines 2007, $PM_{2.5}$ and PM_{10} exceeded the limits but NO_2 is within the limit of 200 200 µg/m³.

[5] Ambient air quality measuring instruments were acquired through the *Higher Education Quality Enhancement Project* (2018) funded by the World Bank.

Figure 4.3: Ambient Air Quality Sampling Station, Jashore University of Science and Technology



Map 4.3: Location of Ambient Air Quality and Noise Sampling Stations, JUST



47. Ambient noise levels were also measured the same time as the ambient air quality sampling in the same stations. Results of the 24-hour noise level measurements show that it did not meet the limits set by the Noise Pollution Control Rules 2006 and the WB-IFC EHS General Guidelines 2007. Results of noise level measurements are given in Table 4.3.

Table 4.3: Ambient Noise Level Measurements, L_{eq} dB(A)

Location		Daytime (6 a.m. to 9 p.m.)	Nighttime (9 p.m. to 6 a.m.)
In front of Vice Chancellor's residence within JUST premises		67*	47*
In front of 10-story dormitory and staff housing		81*	47*
Settlements near Shadhinota Shorok Road		82*	50*
Noise Pollution Control Rules 2006	Sensitive zone or area	50	40
	Residential area	55	45
WB-IFC EHS General Guidelines 2007	Residential, institutional, educational	55 (7 a.m. to 11 p.m.)	45 (11 p.m. to 7 a.m.)

Source: Department of Environmental Science and Technology, JUST

(iv) Water Resources and Quality

48. There is no natural surface water source within the study area. The University Research pond is about 400 m from the site of the proposed new building. Bhairab River runs parallel to the study area but is about 2.4 km from the site.

49. The Jashore *Pourashava* belongs to the hydrogeological unit II of Holocene Deltaic and flood Plains. Groundwater is available and the water table does not go beyond the suction limit throughout the year. The water in the shallow layer contains iron but the water in the deep layer does not contain excessive iron. Arsenic is not reported to be a problem in both deep and shallow aquifers.

50. For water supply, JUST uses three deep tube wells drilled within the campus premises (footnote 5). Of the three deep tube wells, two tube wells are used as drinking water supply and one tube well for irrigation and general purposes. The capacity of each pump is 600 liters per minute (l/min) to 800 l/min. There is no central water purifying system in JUST. Water filtration systems are installed within the academic buildings and residents in the dormitory or staff housing. Each building has its own reinforced cement concrete overhead water tank. Results show that groundwater quality of the water sample from the tubewell installed in the central cafeteria of JUST meet the limits set by Schedule 3b, Rule 12 of ECR 1997 for fecal coliform, pH, arsenic, lead, cadmium, and chromium (see Table 4.4). Table 4.5 lists the distribution of water supply within the campus premises.

Table 4.4: Results of Groundwater Quality Sampling, JUST

Water Quality Parameter	Unit of Measure	Drinking Water Standards (Schedule 3b, Rule 12 of ECR 1997)	Groundwater Sample
Fecal coliform	n/100 ml	0	0
pH	-	6.5–8.5	8.5
Arsenic	mg/l	0.05	0.012
Lead	mg/l	0.05	Less than 0.03
Cadmium	mg/l	0.005	Less than 0.02
Chromium	mg/l	0.05	Less than 0.01

ml = milliliter, mg/l = milligram per liter

Table 4.5: Sources of Drinking Water

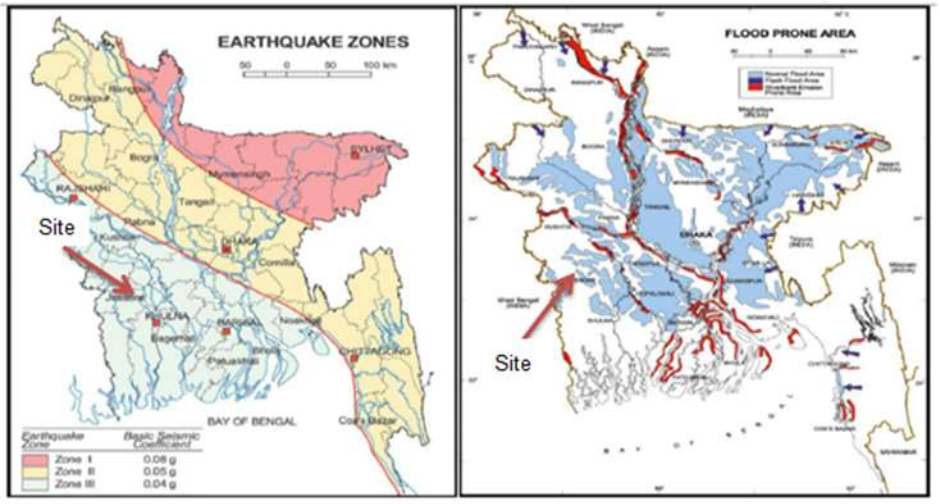
Description	Source
Vice Chancellor's residence	Deep tube well (installed at the premise); consumed after filtration (commercial filter)
10-storied teacher dormitory	Deep tube well water (installed in front); consumed with or without after filtration (commercial filter)
5-storied officer dormitory	Deep tube well water (installed in front); consumed with or without after filtration (commercial filter)
Academic building	• Centrally supplied water; consumed after filtration (commercial filter) • Tube well water (installed at the back side); consumed directly
Library cum academic building	• Centrally supplied water; consumed after filtration (commercial filter) • Tube well water (installed at the west side of administrative building); consumed directly
Administrative building	• Centrally supplied water; consumed after filtration (commercial filter) • Tube well water (installed at the west side of administrative building); consumed directly
Medical center cum academic building	• Centrally supplied water; consumed after filtration (commercial filter) • Tube well water (installed at the west side of administrative building); consumed directly
Sheikh Hasina Girls Hostel	Deep tube well (installed inside the hall); water supplied separately in every floor; consumed directly
SMR Boys Hostel	Deep tube well (installed inside the hall); water supplied separately in every floor; consumed directly
Central Mosque	Tube well (installed in front); consumed directly
Central Cafeteria	Tube well (installed in front); consumed directly

(v) Natural Hazards

(a) ***Flooding.*** The project area is considered low risk to natural disasters like cyclone, flood, and earthquake. However, during intense rainfall in the monsoon season, there is drainage congestion. Flooding that occurred in the Jashore area, based on the flood-prone area map, is considered low-river flooding.

(b) ***Seismicity.*** Bangladesh has three seismic zones with moderate and low seismic activity. The area in JUST and around it fall under Zone III category, which is considered as low intensity seismic zone. No major earthquake has been reported in the university area in recent years or in the recent past. Seismic zoning and flood prone areas are shown in Map 4.4.

Map 4.4: Seismic Zone and Flood-Prone Areas in Bangladesh



C. Biological Environment

51. The JUST campus is rich in plant biodiversity. Around 5,000 plants from 75 different species have been planted within the campus to improve its landscape and to provide shade to students during summer. Table 4.6 gives the list of the plant species while Figure 4.4 shows the location of plants within the JUST campus.

Table 4.6: Plant Species within the Jashore University of Science and Technology Campus

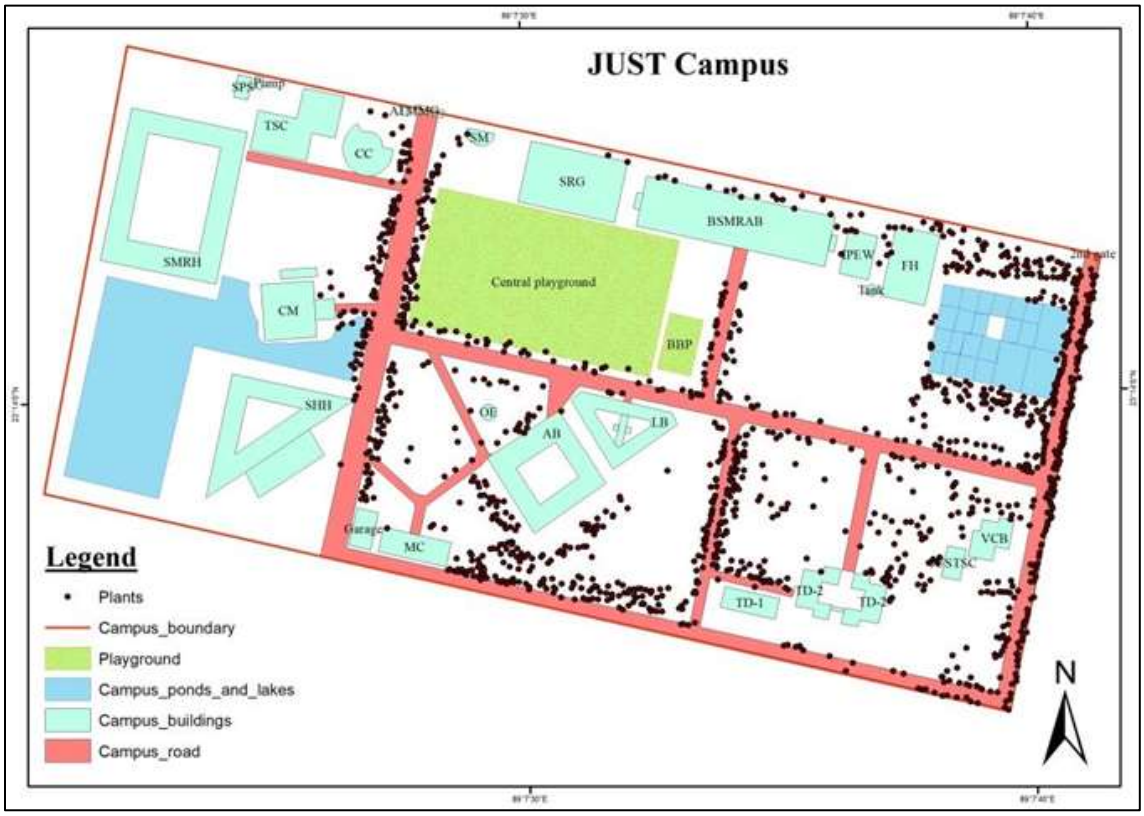
Common Name	Scientific Name
Mango	*Mangifera_indica*
Jambul (Berry)	*Syzygium cumini*
Jackfruit	*Artocarpus heterophyllus*
Litchi	*Litchi chinensis*
Sapodilla	*Manilkara zapota*
Chinese date	*Ziziphus zizyphus*
Coconut	*Cocos nucifera*
Guavas	*Psidiun guajava*
Stone apple	*Aegle marmelos*
Wood apple	*Feronia Limonia Swingle*
Olive	*Olea europaea*
Elephant apple	*Dillenia indica*
Java apple	*Syzygium samarangense*
Custard-apple	*Annona reticulata*
Orange	*Citrus reticulata*
Apple	*Malus domestica*
Grape	*Vitis vinifera*
Aamla (Gooseberry)	*Phyllanthus emblica*
Cherries	*Prunus avium*
Phalsa	*Grewia asiatica*
Tamarind	*Tamarindus indica*
Persimmon	*Diospyros kaki*
Dragon	*Hylocereus undatus*
Pomegranate	*Punica granatum*
Pomelo	*Citrus maxima*

Common Name	Scientific Name
Lemon	*Citrus limon*
Hog Plum	*Spondias mombin*
Nut	*Arachis hypogea*
Hartaki	*Terminalia chebula*
Bahera, Bellirica	*Terminalia bellirica*
Carambola	*Averrhoa carambola L.*
Neem	*Azadirachta indica*
Nishinda	*Vitex negundo L.*
Arjun	*Terminalia arjuna*
Silk cotton	*Bombax*
Rose apple	*Syzygium jambos*
Monkey jack	*Artocarpus lakoocha*
Rambai	*Baccaurea motleyana*
Aloe wood	*Aquilaria malaccensis*
Hing	*Ferula assafoetida*
Malabar leaf (tejapatta)	*Cinnamomum tamala*
Cinnamon	*Cinnamomus zeylanicum*
Mandarin orange	*Citrus X sinensis*
Date palm	*Phoenix dactylifera*
Lucky bamboo	*Dracaena braunii*
Royal poinciana	*Delonix regia*
Dwarf poinciana	*Caesalpinia pulcherrima*
Pride of India	*Lagerstroemia speciosa*
Snowy orchid-tree	*Bauhinia acuminata*
Night-flowering jasmine	*Nyctanthes arbor-tristis*
Cherry	*Prunus avium*
Flame of the woods	*Ixora coccinea*
Pinwheel flower	*Tabernaemontana*
Ashanti blood	*Mussaenda*
Rose	*Rosa*
Oleander	*Nerium indicum L.*
Velvet	*Miconia calvescens*
Cape jasmine	*Gardenia jasminoides*
Arabian jasmine	*Jasminum sambac*
Shoeblack plant	*Hibiscus rosa-sinensis*
Silver queen	*Aglaonema*
Cannonball tree	*Couroupita guianensis*
Jacaranda	*Jacaranda mimosifolia*
Beli-phul	*Jasminum sambac*
Orange jessamine	*Murraya paniculata*
Night-blooming jasmine	*Cestrum nocturnum*
Allamanda	*Allamanda L.*
Mahogany	*Swietenia mahagoni*
Albizia tree	*Albizia lebbeck*
Shidhu	*Dalbergia Sissoo Roxb*
Panika, Mexican heather	*Cuphea hyssopifolia*
Green coconut	*Cocos nucifera*
Debdaru	*Polyalthia longifolia*
Golden shower tree	*Cassia fistula*

52. **Homestead and roadside vegetation.** Vegetation around the households in the study area consists mostly of commonly cultivated tree species and wild shrubs and herbs. Common

planted tree species are raintree (*Albizia saman*), mango (*Mangifera indica*), coconut (*Cocos nucifera*), mahogany (*Swietenia mahagoni*), banana (*Musa sp*), Gogon Siris (*Albizia richardiana*), and Betel palm (*Areca catechu*). Among the weeds are sessile joy weed (*Alternanthera sessilis*), thorny Amaranth (*Amaranthus spinosus*), Bermuda grass (*Cynodon dactylon*), Smartweed (*Polygonum sp*), and creeping oxalis (*Oxalis corniculata*).

Figure 4.4 Spread of Plants within the JUST Campus



D. Socioeconomic Environment

53. The proposed site is in Jashore district under Sajiali Mouza, Churamankati Union, Kotwali (Jashore Sadar) Upazilla.

(i) ***Population.*** Based on the Census 2011 by the Bangladesh Bureau of Statistics (BBS), Jashore Sadar *upazilla* has 656,413 households, with a total population of 2,764,547 and a household size of 4.17. Population density of the *upazilla* is 1,060 persons per square kilometers. The population of Jashore sadar *upazilla* is growing at a much higher rate compared to the overall growth rate for Jashore district.

(ii) ***Education.*** The literacy rate in Jashore Sadar *upazilla* is 56.52% (7 years old and above). Literacy among the male population (59.38%) is higher than that among females (53.65%). For ages 5 to 29 years old, 47.45% of the population in the *upazilla* attend school.

(iii) ***Poverty.*** Jashore sadar *upazilla* has 35.3% incidence of poverty and 16.4% incidence of extreme poverty (BBS 2010).

(iv) ***Land use.*** The campus is built on 14. 2 hectares or 142,000 m^2 of land acquired by the government starting from 2006. The campus area is a low-lying agricultural land that used to be cultivated biannually.

(v) ***Agriculture.*** The agricultural land occupies about 20%. According to local people, their produce includes rice paddy, jute, potato, onion, pulse, and vegetables. Available fruits include mango, jackfruit, etc.

(vi) ***Housing.*** About 26% of the households live in pucca house, 35% in semi pucca, 34% in kutcha house, and the remaining 5% live in *jhupri* (made of straw).

(vii) ***Sources of drinking water.*** About 97% of the household population get their drinking water from tube wells, 1.2% from tap, and the remaining 1.8% households get water from other sources.

(viii) ***Sanitation***. About 60.35% of the household population use sanitary latrine, 35.2% non-sanitary latrine, while the remaining 4.45% have no toilet facilities.

(ix) ***Access to electricity.*** All the unions of *upazilla* (15 in all) have been brought under the Rural Electrification Program. A total of about 75% of the general households reported to have electricity connection in the entire upazilla in 2011 as against about 55% in 2001.

(x) ***Physical cultural resources.*** There are no known sites of historical and archaeological value. Within the study area, there are three mosques, two schools, and one medical center located within the premises of JUST.

54. **COVID-19 Pandemic**. On 30 January 2020, the World Health Organization (WHO) declared the coronavirus disease (COVID-19) as a Public Health Emergency of International Concern under the International Health Regulations 2005.[6] The COVID-19 is a new disease with similar symptoms as influenza but different in terms of severity and community transmission.[7] On 11 March 2020, the WHO recognized COVID-19 as a pandemic, "an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people".[8]

55. In Bangladesh, the first COVID-19 case was identified on 8 March 2020 and the first death reported on 18 March 2020. Following this incident, the government declared a nationwide lockdown on 26 March 2020 implementing an area-based zoning system. Prior to the nationwide lockdown, educational institutions were temporarily closed on 17 March 2020 affecting about 39 million learners from pre-primary to tertiary education.[9,10] During the closure, educational institutions opted to use remote learning, but the lack of digital infrastructure affected most of the students.

56. Some of the initiatives taken by the government in response to the challenges facing the education sector due to COVID-19 pandemic include the following:

- Preparation of the COVID-19 Response and Recovery Plan May 2020
- Preparation of the School Re-opening Framework for primary sub-sector
- Arrangement of distance learning through television and radio
- Introducing a television channel named Education TV, dedicated to education and educational issues during COVID-19 and even after COVID-19

---

[6] WHO. 2005. *International Health Regulations*. Geneva.
[7] WHO. 2021. *Health Topics. Coronavirus*. Geneva.
[8] WHO. 2020. *Bulletin of the World Health Organization*. Geneva.
[9] UNESCO. 2021. *COVID-19 Impact on Education*. Paris.
[10] Ministry of Education, Bangladesh. 2020. *COVID-19 Response and Recovery Plan Education Sector*. Dhaka.

- Institution level arrangement for online class through Zoom and other social media
- Evaluation of students based on school performance.

COVID-19 testing started in May 2020 and with support from WHO and other international financial institutions like ADB, there are 613 laboratories and testing laboratories in Bangladesh by 11 July 2021, one of which is in the Genome Centre in JUST. From 8 March 2020 until 11 July 2021, there are a total of 1,021,189 COVID-19 cases recorded in Bangladesh with 16,419 deaths and about 10.859 million vaccines administered (i.e., 1st dose – 6,048,505 and 2nd dose – 4,810,368).[11]

V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

57. The associated potential environmental impacts will be mainly during the construction phase of the new building, which are temporary, of short duration, localized, and can be easily mitigated through the implementation of the environmental management plan (EMP). Aside from the EMP, these impacts can be avoided and/or mitigated through compliance with relevant provisions of the Bangladesh National Building Code (BNBC) 2006 (or the latest amendment) and adherence to the best practices in construction engineering. The environmental monitoring plan (EMOP) will provide the key elements to be monitored to ensure compliance by the Contractors to the approved building design, and relevant regulations on building construction, and environmental and occupational health, and safety.

A. Pre-construction and Design Phase

58. At this stage, activities include the preparation of project proposal, detailed design of the new building, desktop and ground surveys of the proposed site, preliminary consultations, and drafting of the development project proforma. These activities are not expected to have significant environmental impacts as they will have minimal physical disturbances to the environment.

59. Green building features were incorporated into the design of the new building, which aims to be a climate change-resilient building with reduced energy and water consumption. These features are included in the budget and estimated to be about 10% of the total project cost for civil works. The use of energy-efficient lighting and cooling systems will result to CO_2 emissions reduction estimated to be about 220.85 tCO_2 per year. Table 5.1 presents a summary of the green building features that will be incorporated in the design of the new building, while Figure 5.1 shows the diagrammatic view of all the features to be applied

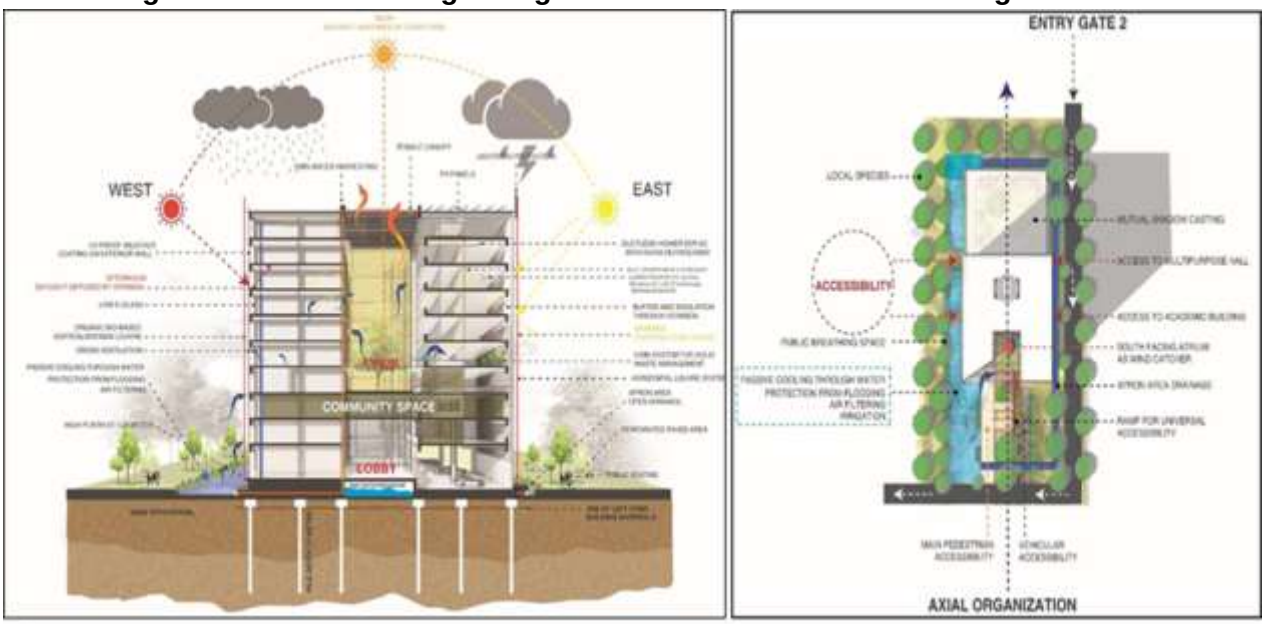
[11] WHO. 2021. *Morbidity and Mortality Weekly Update (MMWU) No. 72*. Geneva.

Table 5.1: Green Building Features of the New ICT Center for Excellence, Jashore University of Science and Technology Campus

Green Building Features	Description
Energy efficiency	• Use of renewable energy through rooftop solar panels • About 20% reduction of power consumption is expected through natural lighting and passive cooling, achieved through innovative massing that uses a south-facing internal courtyard covered with a lightweight operable tensile canopy; narrow structural bays; and use of buffer and insulated spaces (shading devices, verandas, terraces, screen walls, surface and roof plantations) between indoor spaces and external environment • Use of energy star-certified products • Use of building materials with “low thermal conductivity”, which may include bright reflective ultraviolet ray-proof weather coatings for exterior walls on the south and western part of the building
Temperature	• A building envelope will be created on the west side using bio-based treated wooden screens, while reflective bright exterior paints will be used for exterior walls; photovoltaic cells on rooftop will act as insulation from heat • Tensile canopy will provide shade from the sun but will allow airflow and light, keeping the atrium temperature low
Rainfall	• During heavy rainfall, rainwater harvesting from the roof will be directed to the rainwater storage beneath the ground floor; water retention pond and bio-swales beside the building will help collect excess water • Design will include maximizing plants and green surfaces in surrounding areas
Humidity	• Orientation of the atrium to the south will ensure ample wind flow to the different spaces of the building, as the atrium would serve as a “wind catcher” driving away excess humidity. The narrower structural bays will also help cross ventilation through strategically located windows or openings in each space. • Energy star-certified air conditioning will be provided based on requirements of building users
Flooding	• The building will be designed to have a surrounding apron area and an open drainage network that will end up in a body of water or bio-swale pond on the southwest corner of the site • In terms of fluvial flooding and possible inundation (predicted flood level for 2050), the building’s plinth level will be built 1.25 meters above the present ground level, which according to indigenous sources, has never experienced flooding in the recent past
Drainage	• Capacity of artificial drainage will be calculated based on intensity, duration and frequency (IDF) parameters of rainfall. • Drainage will be provided all around the building along the building’s apron area, while the discharge area is designated to be the body of water adjacent to the building on its southwest corner
Cyclone	• Jashore is designated as a noncoastal zone according to the Bangladesh National Building Code 2015 (final draft) with no real cyclone vulnerability but for additional precaution, structural design will consider a maximum wind load of 230 kilometers per hour • To withstand cyclonic wind loads, anchoring and proper bolting of all cladded building materials including rooftop photovoltaic panels and exterior wall screens will be undertaken.

Green Building Features	Description
Earthquake	• Seismic zoning and seismic requirements based on the Bangladesh National Building Code 2015 will be considered • From subsoil investigation, a deep foundation system with precast pile down to 21-meter depth has been considered in the design

Figure 5.1: New Building—Diagrammatic View of Green Building Features



Sectional (left) and planar (right) representations of JUST IT building with indications about green building standards, considerations and features

Note: The left photo shows sectional and planar representations of the JUST ICT Center for Excellence to be built, with indications on green building standards, considerations, and features. The right photo shows the axial organization.

60. Aside from incorporating green building features, the relevant provisions set forth in BNBC 2006 and the draft BNBC 2015 (or the latest approved version) will be adhered to during design and construction.

61. Should there be any changes in the design from where this IEE was based, the PIU will revise the IEE while the PMU will review and submit to ADB for disclosure on ADB website and government or EA/IA website.

62. In response to the potential outbreak of COVID-19 in the construction site that may cause occupational and community health risks, the Contractors will be required to prepare a health and safety plan (H&SP) which will be an integral component of the EMP. The H&SP will be approved by the PIU and PMU. While there is already a COVID-19 vaccination rollout, and administration of vaccine to the population continues, there is still a need to be prepared in the unfortunate event of an incidence in the workplace that may affect the workers, students and staff of JUST. Appendix 8 presents a draft H&SP.

B. Construction Phase

63. This phase will involve the recruitment of workers and staff; securing relevant permits from the government; mobilization of contractors, equipment, and machineries; site preparation; delivery and storage of construction materials; civil, mechanical, and electrical works; landscaping and clean-up of construction debris; and occupancy of the new building.

64. Prior to construction works, the PMU in UGC and the PIU in JUST will ensure that Contractors will include the responsibility in compensating for any temporary damage, loss, or inconvenience resulting from accident or failure to comply with regulations in implementing the

project. The Contractor will be required to conduct baseline environmental quality measurements for air, noise, and source of drinking water to be provided to construction workers before the start of construction. Results of measurements will be included in the environmental monitoring report that will be submitted by the PIU semi-annually to ADB through the MOE. Sampling protocol and results will be reviewed by the Environmental Consultant of PIU. The Department of Environmental Science and Technology of JUST will provide technical support, if needed.

65. Environmental Codes of Practice (ECPs) relevant during construction phase are given in Appendix 1. ECPs are general non-site-specific guidance from best construction practices that can be implemented for this project to ensure that potential associated construction environmental impacts will be minimized. Contractors will be required to refer to these ECPs as well as comply to the EMP.

(i) Prepare Construction Management Plan

66. Before any construction works, the Contractors will be required to prepare a construction management plan to guide the implementation of earth-moving works, construction of the building, civil, mechanical, and electrical works including restoration of the site and the existing access roads. The plan will cover work scheduling, occupational and community health and safety, temporary pedestrian, and traffic management; spoils disposal and construction waste; noise and dust control; drainage and stormwater management; materials storage and management; protocol in dealing with students, faculty and occupants of staff housing and administrative staff of JUST, and emergency/disaster preparedness. Critical information to know during emergency will be included in an emergency kit such as evacuation or assembly point, as well as do's and don'ts. Emergency contact details will be posted on easily visible billboards at the construction site.

(ii) Hiring of Staff and Workers

67. There will be potential job opportunities for both skilled and unskilled workers during the construction phase. These opportunities, however, may cause conflict over lack of transparency in recruitment. Hiring of local labor will be given priority. The Contractors will be required to comply with the relevant provisions in the Bangladesh Labour Act 2006 (amended 2013) and Bangladesh Labour Rules 2015 on recruitment and working conditions.

68. Due to construction works, there will be workers present within the premises of JUST particularly in the construction site. The Contractors will be required to ensure that their workers will strictly observe the rules and regulations of JUST including occupational health and safety rules that will be imposed on them by the Contractors.

69. Before arrival of workers and staff, Contractors and PIU will ensure that they have been tested negative to COVID-19 and will not pose occupational and community health risks. Contractors and PIU will keep a record of their contact details such as mobile telephone number, alternate telephone, email (if any), and the address of where they are staying. Aside from the workers, the Contractors will similarly provide the PIU of negative results to COVID-19 test.

(iii) Orientation of Workers and Staff

70. Before any construction works begin, the PIU in JUST and PMU together with the environmental safeguard consultant will conduct an orientation for the workers and staff of Contractor on occupational health and safety, applicable rules, and regulations of JUST as well

as the environmental requirements of the government and ADB. The orientation aims to create awareness on their responsibility for implementing and compliance to the EMP, effective record keeping, and environmental reporting. The orientation will also include awareness on communicable disease like tuberculosis, HIV/AIDS, and COVID-19 to prevent potential incidence in the workplace. Workers will be given training and/or orientation on disaster and emergency procedures, occupational health, and safety (OHS); on COVID-19, its symptoms, mode of transmission, mandatory use of PPEs, and general precautionary measures that will be implemented based on the approved H&SP such as hand washing, physical distancing (2 m apart), enhanced cleaning and disinfection of surfaces and objects frequently touched in the workplace, posting of signs to create awareness of COVID-19.

71. The Contractor will be required to designate an Emergency and Disaster Coordinator who will also function as OHS Officer to guide the workers in case of an emergency, disaster, or COVID-19 incidence, and oversee compliance to H&SP on prevention of COVID-19 transmission in the workplace. Workers will be informed that mock drills will be conducted regularly, and participation will be mandatory. The Contractor will be required also to invite resource persons from relevant government agency or private sector to conduct training on proper emergency response at least once a year throughout construction phase.

72. All workers are expected to be fit to work. The Contractor will ensure that daily temperature checks are done to the workers before entry to the work sites. Any person that shows signs of cough and colds will not be allowed entry to the work sites and will be advised to stay at home and isolate.

(iv) Site Preparation and Construction Works

73. The Contractor will coordinate with respective government agencies before any site preparation to determine the connections of utilities such as natural gas pipeline, water pipes, sewers, telecommunications, and other services that may be affected.

74. If the Contractor decides to operate a quarry to meet the requirements of the construction works, the necessary permits and clearances from relevant agencies of the government will be obtained prior start of operation. The Contractor will ensure that the quarry providing materials to the construction of the new building is maintained in stable condition; is appropriately and adequately landscaped; and when taken from the river, it should not disrupt river flow or damage the riverbanks causing erosion. Bhairab River is located about 3 km east from the site. The stockyard and construction site will be temporarily and properly enclosed, with designated security personnel to prevent entry of unauthorized persons.

75. The area within the premises of JUST is not known to have sites of archeological and historical value. Nonetheless, ECP 1.0 provide measures in case of encounter with physical cultural resources.[12]

(v) Impacts on Air Quality

[12] Physical cultural resources as defined in SPS 2009 are movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings and may be above or below ground or under water. Their cultural interest may be at the local, provincial, national, or international level.

76. Site preparation will involve land and minimal vegetation clearing. Potential increase in dust level may be expected as a result of these activities. This impact may cause inconvenience to the occupants of the Vice Chancellor's residence and may be experienced up to the staff housing/dormitory depending on the wind direction and windspeed. To contain the potential increase in generation of dust, the Contractor will be required to do the following:

(a) Provide temporary fencing and enclosures of the construction site (at least 2 m-high);
(b) Spray water to any opened area and work sites, as and when needed particularly during the summer season;
(c) All excavated soil and stockyard will be covered with tarpaulin or other appropriate cover material during non-working time, and excess soil will be removed from the worksite to the designated disposal site;
(d) Provide a space on-site to accommodate the required materials so that transport and delivery of construction materials will be minimized including vehicular emissions;
(e) Alternate access route to the site will be used (see Figure 5.2) to minimize safety risks to the university students, faculty members, and other people using the main roads of the university;
(f) Provide workers assigned to dusty areas with safety masks or goggles or other appropriate personal protective equipment (PPE);
(g) Vehicles that will deliver construction materials to the site that generate dust will be covered with suitable material to contain dust;
(h) Regularly maintain construction vehicles, generators (if required), and heavy equipment to avoid smoke belching;
(i) Prohibit burning of garbage, liquid waste and other combustible materials within the construction site; and,
(j) Follow or refer to ECP 2.0 for other measures on managing air quality.

Figure 5.2: Alternate Access Route to Site, Jashore University of Science and Technology

Site of the New Building. The area within the vicinity of the project is not known to have sites of archeological and historical value.

77. The PIU will ensure that ambient air quality limits set by the IFC-WB EHS General Guidelines 2007 and the government will not be exceeded during the construction phase. The limits from the National Ambient Air Quality Standards (NAAQS) 2005 are less stringent compared to the IFC-WB EHS General Guidelines 2007. SPS 2009 requires that should host country

regulations differ from the levels and measures set by the IFC-WB EHS General Guidelines 2007, the host country will achieve whichever is more stringent. In this case, the IFC-WB EHS General Guidelines 2007 will be the relevant limits that the Contractors needs to comply.

(vi) Impacts on Noise

78. The major sources of noise generation are movement of construction vehicles, associated land clearing, and from the construction of the new building. These activities, together with daily university activities, in some occasions, may exceed the limits provided for in the Noise (Pollution) Control Rules 2006. This intermittent increase in noise levels will be temporary, of short duration and can be mitigated.

79. Exposure of workers to increased noise levels is an occupational as well as a public health hazard. Table 5.2 presents the typical noise levels of tools and equipment. As a comparison, Table 5.3 presents the common sources of noise and decibel levels that people are generally exposed to daily. To mitigate the temporary negative impacts on noise, the Contractor will be required to:

(a) orient, prior to construction works, and inform workers about noise level requirements;
(b) provide workers assigned to high-level noise-generating activities with PPEs such as earmuffs and earplugs, and will be rotated every two hours to minimize exposure;
(c) provide temporary enclosure of the work site particularly those area generating noise;
(d) undertake activities that generate noise during daytime only (but will be adjusted contingent to weather and season);
(e) require drivers of construction vehicles to observe low speed and blowing of horns or whistle will not be allowed unless absolutely necessary;
(f) assign staff to maintain the flow of traffic to avoid inconvenience to students, faculty members, and administrative staff;
(g) require regular tune-up of construction vehicles and proper maintenance of machinery; and,
(h) refer to ECP 3.0 on measures to manage noise and vibration.

Table 5.2: Typical Noise Levels of Tools and Equipment

Equipment	Noise Level, dB(A)
Cranes	78 - 103
Backhoes	85 - 104
Loaders	77 - 106
Dozers	86 – 106
Scrapers	97 - 112
Trenchers	95 - 99
Pile drivers	119 - 125
Compactors	90 – 112
Grinders	106 -110
Chainsaws	100 - 115
Concrete saw	97 – 103
Sandblasting nozzle	111 - 117
Jackhammers	100 - 115
Compressors	85 – 104

Equipment	Noise Level, dB(A)
Note: These noise levels are measured at the operator's position.	

dB(A) = A-weighted decibel.
Note: These noise levels are measured at the operator's position.
Source: Infrastructure Health & Safety Association, Chapter 14, Hearing Protection, Table 14-4. http://www.ihsa.ca/About.aspx

Table 5.3: Common Sources of Noise and Decibel Levels

Everyday Sounds and Noises	Average Sound Level (dBA)	Typical Response (after routine or repeated exposure)
Softest sound that can be heard	0	Sounds at these dB levels typically don't cause any hearing damage.
Normal breathing	10	
Ticking watch	20	
Soft whisper, quiet library	30	
Refrigerator hum	40	
Moderate rainfall	50	
Normal conversation, air conditioner	60	
Washing machine, dishwasher	70	You may feel annoyed by the noise
City traffic (inside the car)	80–85	You may feel very annoyed
Gas-powered lawnmowers and leaf blowers	80-85	Damage to hearing possible after 2 hours of exposure
Subway, passing motorcycle, gas mower	91	Dangerous to hearing; wear earplugs or earmuffs
Hair dryer, kitchen blender, food processor	94	Dangerous to hearing; wear earplugs or earmuffs
Motorcycle	95	Damage to hearing possible after about 50 minutes of exposure
Approaching subway train, car horn at 16 feet (5 meters), and sporting events (such as hockey playoffs and football games)	100	Hearing loss possible after 15 minutes
The maximum volume level for personal listening devices; a very loud radio, stereo, or television; and loud entertainment venues (such as nightclubs, bars, and rock concerts)	105–110	Hearing loss possible in less than 5 minutes
Shouting or barking in the ear	110	Hearing loss possible in less than 2 minutes
Standing beside or near sirens	120	Pain and ear injury
Jet plane takeoff, siren, pneumatic drill	120	Not safe for any period of time
Jackhammer	130	Not safe for any period of time
Firecrackers	140–150	Pain and ear injury

dB(A) = A-weighted decibel.
Source: US Department of Health & Human Services. Centers for Disease Control and Prevention. Centers What Noises Cause Hearing Loss? https://www.cdc.gov/nceh/hearing_loss/what_noises_cause_hearing_loss.html.
American Speech-Language-Hearing Association. Loud Noise Dangers.https://www.asha.org/public/hearing/Loud-Noise-Dangers/#signs.

(vii) Generation of Waste

80. There is no available data on the volume of solid waste generated in JUST. Based on an undergraduate thesis in 2017, solid waste management in JUST is done using three methods: (i) recyclable wastes like papers, reports, PET bottles, metals, glass, e-waste, household items, etc. are being sold or donated to hawkers, who take or haul the waste out of the campus; (ii) printed materials with confidential information and those not recyclables (e.g., office files and letters,

reports, exam scripts, etc.) are burned on- campus; and (iii) nonrecyclable household waste (e.g., kitchen waste from the dormitories and hostels, etc.), building scrap, and waste from sweeping and yard trimmings are deposited either into the temporary waste collection bins next to the 10-story teacher dormitory (see Figure 5.3) or earth filling site next to the girl's hostel. Once the temporary waste bins are full, municipal waste carrier vehicles are hired to transfer the wastes to the Jashore Municipal waste dumping site or in the Integrated Landfill and Resource Recovery Center.

Figure 5.3: Temporary Waste Collection Area

Solid waste management. Nonrecyclable household waste and building scrap collected next to the 10-story teacher dormitory await removal to the Jashore Municipal waste dumping site or Integrated Landfill and Resource Recovery Center.

81. Construction works are expected to generate waste such as spoils, construction materials, wood, cleared vegetation, waste food, cement container, used PPEs such as facial masks, gloves, and other similar debris. If not managed properly, this waste will be unsightly and may pose health and safety risks to workers and the community within JUST. To mitigate this impact, the Contractor will be expected to implement the following measures:

(a) Implement the waste management plan that is part of the overall Construction Management Plan submitted to PIU before the start of construction;
(b) Provide adequate garbage bins and require workers to separate waste for easier collection and management (i.e., residual oil and lubricants, paints, thinners will not be mixed with other waste);
(c) Always observe good housekeeping at the construction site and monitor compliance;
(d) Prohibit burning of solid waste at the construction site;
(e) Provide separate bins for collection of used facial masks and gloves as part of COVID-19 prevention measure, and;
(f) Refer to ECP 4.0 for further measures on waste management.

(viii) Impacts on People

82. Associated works during site preparation and construction of the new building may pose health and safety risks to workers and the community, such as working at heights or constrained spaces, and risk of exposure to and transmission of COVID-19. Noncompliance to the approved H&SP, relevant regulations on codes and standards on civil, mechanical, and electrical works may also trigger accidents and occupational health risks to workers. Given the site, construction

camps will not be located within JUST premises. To minimize the occupational and community health and safety risks, the Contractors will be required to implement the following measures:

(a) ***Occupational health and safety risks.*** To prevent accidents, provide workers and staff with appropriate PPE and safety clothes such as hard hats, steel-toed boots, earmuffs, or plugs, etc., and will train and/or orient workers on safe building construction practices and other issues on safety. Wearing of safety gear will be mandatory, and the statutory age requirements for employment as provided for in Bangladesh Labour Act 2013 will be strictly enforced. Consider providing group insurance to construction workers for accidents resulting to disabilities or death. The provisions on occupational health and safety in the IFC-WB EHS General Guidelines 2007 will be followed as internationally recognized standards and best practice.

Sanitary facilities and safe drinking water will be provided to the workers and appropriate scaffoldings will be installed. Clear and visible warning signs and lighting will be installed. In case of medical emergency, first aid kits will be provided at the construction site. The JUST medical center can provide medical support, if required. The medical center is within the 1st and 2nd floor of the academic building; has a 25-bed capacity; and is equipped with an ambulance, three medical officers (one night shift and three daytime shift), and a pharmacy model (see Figure 5.4). The Medical Centre will coordinate with the Directorate General of Health Services (DGHS) on the appropriate protocol for handling of persons in the construction site that show symptoms of COVID-19. Fire-fighting equipment will be provided on-site.

At the start of each day, toolbox meetings that last for a few minutes will be held to remind workers on the importance of compliance to the health and safety rules and procedures, and the consequence of non-compliance.

With the risk of exposure to COVID-19, the Contractor will comply with the approved H&SP and workers, at the minimum, will always observe enhanced cleaning procedures in the construction site and temporary rest areas, physical distancing of at least 2 meters apart from each other, use appropriate PPEs such as masks, gloves, and eye cover if physical distancing is not possible, and will practice frequent handwashing. Contractors will provide wash stations with adequate soap and water within the work sites. Use of hand sanitizers (with at least 60% alcohol) will be provided if water and soap are not available. Separate bins for disposal of PPEs to prevent COVID-19 will be provided by the Contractor.

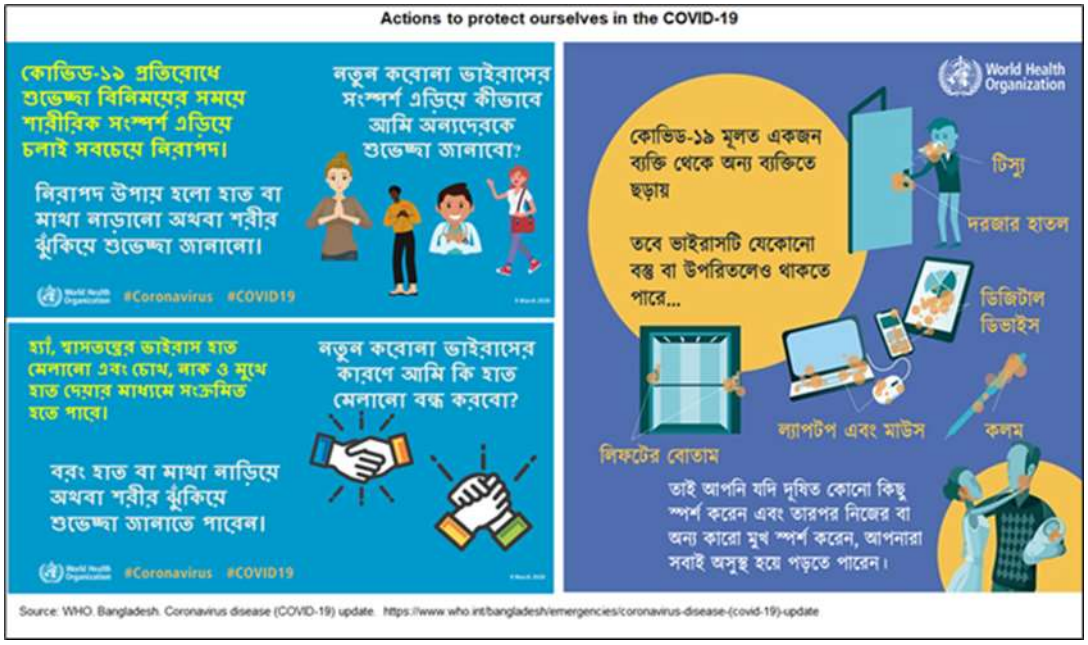
(b) ***Community safety risks.*** Prior to start of construction works, conduct awareness orientation and/or briefing about health and safety to key stakeholders in JUST (i.e., faculty staying in housing or dormitory, students, etc.). Inform PIU and key stakeholders (if required) on the schedule of construction activities that may pose risks to public safety. Proper fencing and enclosure (at least 2 m high) will be installed at the site to prevent unauthorized access. Security personnel will be posted to discourage pilferage and vandalism. Clear and visible warning and danger signs at and around the site will be installed. Posters promoting awareness of COVID-19, its transmission, proper use of PPEs, etc. will be placed in strategic locations within the project site to create an increased awareness. Figure. 5.5 shows a sample of the posters developed by WHO Bangladesh.

Set boundary line between construction site and areas accessible to JUST community. Provide proper identification of workers and staff at the construction site. The Contractor will monitor the COVID-19 situation in Jashore district to ensure that workers report to the sites healthy and fit. ECP 5.0 gives additional measures on occupational health and community safety. Section 3 of the IFC-WB EHS General Guidelines 2007 provides guidance on community health and safety which is considered as international best practice.

Figure 5.4: Medical Center

The JUST medical center. The 1st and 2nd floor of this academic building houses the medical center that is available to construction workers in case of accidents.

Figure 5.4: Sample WHO Posters on COVID-19



(ix) Completion of Construction Works

83. Improper clean-up and disposal of construction debris may cause safety and health risks, and reduced aesthetics value. To ensure clean-up and restoration of construction sites, the Contractors will be required to restore or reinstate all the areas potentially damaged during construction works. Workers who may be assigned to clean-up and restoration works will be provided with proper safety gear and equipment.

C. Post-construction Phase

84. Upon completion of construction phase, the potential impacts will be mainly beneficial since the students, faculty members, and academic staff of the CSE Department will now have a new and fully furnished ICT building. At this stage, they will enjoy the comfort of a new building and new computing equipment.

(i) Occupancy of the New Building

85. Occupancy of the new building may give rise to improper use and inadequate maintenance. Absence of a proper building management plan may lead to premature wear and tear. The use of the new building may result to generation of waste from occupants. As well, the use of the new building may result to generation of waste from occupants that if improperly managed will cause deterioration of its aesthetic value and may pose health and safety risks.

82. To mitigate these potential impacts, the management of JUST, through the CSE Department, will prepare a building maintenance and management plan that will include management of waste, emergency and disaster preparedness, and response to COVID-19. The Chief Engineering Section will designate a waste management coordinator who can also act as the OHS officer. The CSE Department can consult the Department of Environmental Science and Technology in developing a building waste management program that will incorporate the 3R principles of reduce, reuse, and recycle as well as segregation at source.

83. The CSE Department will conduct yearly orientation and briefing to staff, students, and other building users on the proper management, cares, and sustainable use of the new ICT building.

(ii) Emergency Response Plan

84. Fire-fighting systems will be strategically located in the new building. There will be a security team to ensure safety and security of all building users. As part of emergency preparedness, a draft building emergency response plan will be finalized in consultation with students, faculty, and administrative staff. The emergency response plan will include precautions to COVID-19. Table 5.4 presents the key elements of the draft emergency response plan.

Table 5.4: Key Elements of Draft Emergency Response Plan

Elements	Description
Approach	The aim of this emergency response plan is to guide personnel in an accident or emergency to prevent or minimize injury, damage, and material loss and to prevent or mitigate environmental impact from the accident or emergency.
Types of emergency	• Earthquakes • Cyclones • Energy/utility outages

Elements	Description
	• Fire hazards • Hazardous materials releases • Terrorism • COVID-19 outbreak
Planning	• Identify hazards and assess risk • Assess capabilities and resources • Develop an emergency plan and procedures • Conduct training • Public relations • Conduct drills and exercises • Develop audit procedures
Emergency preparedness requirements	• Identified assembly points and/or evacuation points • A well-defined escape routes • Fire-fighting system will be supplied in strategic locations • Proper security arrangements functioning at all times • Efficient transport and communications system • Smoking will be prohibited within areas with flammable substances (if any) • Water will be kept available for fire-fighting • Availability of sufficient number of trained staff to deal with any emergency • Clear and audible emergency alarm/whistles and public address system • Conduct drills to familiarize students, faculty, and administrative on the evacuation routes and use of the fire-fighting system • Emergency contact number of the medical centre (and nearest hospital), ambulance and fire service and police station) • Main electrical equipment is switched off when not in use • With COVID-19, physical distancing is important but in the event of an emergency evacuation, the priority is to execute a safe and expeditious evacuation. Once safely evacuated from the building, physical distancing will be observed.
Incident command system	

(iii) Effects of climate change

85. Building design features accommodating future effects of climate change are summarized in Table 5.1. Based on the climate change assessment conducted for the project, with business as usual scenario, temperature will continue to rise and is expected to be around 1.8oC from baseline (1986–2005) by 2050. To address this likely temperature change in the future, the

building envelope and windows will be designed to consider natural light, ventilation, and wind speed.

86. Extreme rainfall events may increase in the future that may lead to flooding. Bangladesh is a flood-prone country with about 80% of its surface forming a giant floodplain. Flooding types are flash flood (due to heavy or excessive rainfall), river/sea flooding (or monsoon flooding) and waterlogging (due to poor drainage). Jashore in Khulna has a higher exposure to riverine and monsoonal floods. While Jashore is considered flood-prone due to monsoon season, JUST is located about 24 km from the Bhairab River, and thus, riverine flooding will be considered very low. No other river or stream is close to JUST.

87. Jashore is in earthquake zone 3 (low risk). Design of the new CSE/IT building will comply with the Bangladesh National Building Code (2006), Chapter 2 (Loads on Buildings and Structures). The engineering and architectural design of the new building are considered sufficient to address disaster risks and the future effects of climate change. The national building codes incorporate relevant international standards from ASME, ASTM, ASHRAE, ASCE, IEC and the like.

VI. ANALYSIS OF ALTERNATIVES

88. Given the limited space within the government-owned area in JUST, there were no alternatives considered that may require land acquisition. However, a “no project” option was considered and compared to the “with project” option.

89. The “no project” option will mean that the open green space within JUST will not have its best and highest usage of land. In addition, the undergraduate and graduate students, faculty, and staff of CSE Department will not have the opportunity to benefit from an innovative IT learning environment that the new building will provide. Table 6.1 presents a comparison of the “no project” and “with project” options.

Table 6.1: Comparison of “With Project” and “No Project” Options

Description	“With Project” Option	“No Project” Option
Producing students equipped with state-of-the-art training and education fit to the requirements of the IT industry	There will be demand for IT graduates to meet the requirements of the IT industry	Limited or no possibility of producing better graduates due to poor IT facilities
Inconvenience and disruption to daily activities during construction	There will be temporary disruption to university community	Potential traffic congestion may also occur due to increased population and vehicle owners
Ecological impacts	Site has some small trees as part of university landscaping that will be cleared. These can be replaced or replanted.	Existing environmental condition will be the same
Creation of temporary employment	There will be temporary jobs for skilled and nonskilled workers during construction	No temporary jobs will be created
Opportunities for students to have more options for IT training	There will be more options for R&D and training, and link to the private sector expected to improve chances of employability	No opportunities

Description	"With Project" Option	"No Project" Option
Contribution to Vision 2021	Will contribute to the goals and objectives	No contribution

IT = information technology.

VII. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

A. Introduction

90. Consultations aim to engage key stakeholders throughout the project implementation and to know their concerns and perceptions, if any about the project. These events give the opportunities for the public to share their views to JUST about the proposed construction of the new multi-storied ICT building and for JUST to present to the stakeholder's relevant information on the project. Consultation will not be limited during the preparation of IEE but will be carried out during project implementation.

B. Methodology

(i) ***Identification of stakeholders***. Stakeholders are primary if they will be directly affected during construction and post-construction, namely, students, faculty members, administrative staff, and support services staff. Secondary stakeholders are persons, organizations, or businesses that may not be directly affected but may have interests on the project, such as relevant government agencies, nongovernment organizations, transport cooperatives, and the general public. Stakeholders were invited by the JUST project team focal person through phone calls, letter, and personal visits.

(ii) ***Approach.*** Participants were informed of the proposed project and the potential environmental impacts due to the project. After the presentations, participants were given the time for questions and answers to raise their concerns. Discussions were done in Bangla and English.

(iii) ***Record of the meeting*.** General information of the participants such as name, gender, occupation, and signature were collected and shown in the attendance list.

C. Results of Consultation

91. A total of 16 participants (5 females and 11 males) joined the consultation meeting on 1 April 2019 at the Conference Room of the Vice Chancellor in the Administrative Building. Participants included some residents from the staff housing within the JUST premises, a representative from the central mosque, a representative from the student council, the Chief Engineer and the Executive Engineer of the Engineering Section, chair of CSE, faculty members from different departments, and students from the CSE Department.

92. The focal person from the CSE Department made a presentation about the project (Outputs 1–4) and details on the proposed new ICT building. The consultants briefly discussed the requirements for environmental due diligence and measures to be implemented to ensure that the temporary adverse impacts of construction will be mitigated including the grievance redress mechanism. Appendix 2 presents the list of participants and photographs. Table 7.1 presents the summary of consultations.

Table 7.1: Summary of Consultations

Issues Raised	Response from Project Team
Potential noise and air pollution during construction of the new building	Measures to minimize generation of dust and noise will be required from the Contractor and will be included in the environmental management plan
Access to the building of persons with disability on mobility and vision (e.g., wheelchair, ramp, or elevator)	Design of the building will include access for persons with disability and will explore incorporating features to help persons with impaired vision
Contractor's behavior and access for construction materials	Contractor will use alternate access route to site, to avoid disruption to students; use the gate presently used by the Vice Chancellor, which passes through Churamonkathi–Chaugacha road
Waste management at the university premises	For solid waste management during the operation phase, Contractor will provide bins in different colors to separate biodegradable and nonbiodegradable wastes in every floor of the building JUST officials plan in the future to establish a memorandum of understanding with Jashore Pourashava to use their landfill as a waste disposal area
Emergency response preparedness	Identification of an emergency evacuation point in the building and installation of an emergency alarm system in the building to warn the student population of emergencies Regular emergency training and awareness program will be provided by the Chief Engineer's Office

D. Consultations and Information during Implementation

93. **Consultations.** The PIU together with the PMU will review the COVID-19 situation in Jashore district and the restrictions imposed by the government to contain its transmission. At present, people are required to exercise physical distancing (at least 2 m-apart), wearing of facial masks in public, government offices, businesses, and public transport; avoiding public gatherings or events, prohibition of non-essential public gatherings, closure of schools, and tracking the public dissemination of false or erroneous information on COVID-19. After a year into the pandemic, the general public has become increasingly aware of the transmission risks, and the consequence of not behaving responsibly and in following the advise from DGHS.

94. While still under the threat of COVID-19, consultations with students, faculty, administrative staff and other stakeholders will continue but will avoid face-to-face interactions and will use other means of communications such as social media, Viber, WhatsApp, Skype, etc. The PIU will create a dedicated online platforms or chatgroups appropriate to the type of stakeholders. When stakeholders do not have access to the internet, traditional means of communication will be used for consultation such as dedicated phone lines, radio, TV, newspaper or mail. Once the health situation improves, the usual consultations of face-to-face meetings or town hall meetings, focus group discussions, and interviews will be followed. The PIU will ensure that all the means of communication with stakeholders will include a way to provide comments and suggestions. The PIU office will include an information desk.

95. Topics during consultations may cover GRM, construction practices, building management, emergency preparedness, information awareness on COVID-19 and the measures to be enforced in preventing an outbreak in the workplace and the community, resources to be

provided in case of COVID-19 incidence, and the general health and safety measures that will be and are being implemented to ensure the wellbeing of workers, students, faculty, staff, and the immediate community. The medical clinic in JUST will provide technical support to the Contractors and the PIU during the information campaign on COVID-19 and other transmitted diseases.

96. **Information Disclosure** To meet disclosure requirements of ADB, the PIU will create a project webpage in the website of JUST and will provide a link to project information (e.g., project brief both in Bangla and English, GRM flowchart or flyer, etc.). Only the essential information such as GRM flyer and project brief will be made available as printed materials (both English and Bangla) to stakeholders while still under the COVID-19 pandemic. The one-page project brief will be made available from the project site, in the Department of CSE, and in UGC. The one-page flyer on questions & answers (Q&A) or a frequently ask questions (FAQ) will include information on the GRM and the contact details of the designated person. Any changes in project design will require an update or revision to the IEE which will be re-posted to ADB website. The IEE provides more information on the project. Table 7.2 presents the information disclosure program.

Table 7.2 Information Disclosure Program

Project Phase	Information to be Disclosed	Method of Disclosure	Type of Stakeholders	Responsible Unit
Design and Pre-Construction	• Project brief and status of implementation • Q&A or FAQ flyer • IEE	• Project webpage, CSE Department • Project office • JUST and UGC	• Local population that may be affected • Other interested individuals (e.g., NGOs)	PIU, Project Environmental consultant
Construction	• COVID-19 health and safety measures • GRM, designated staff and contact details • Traffic management • Emergency procedures	• Posters or signboards, flyer • Project webpage, CSE Department • Local traffic authority • Meeting	• Workers and staff • Local population that may be affected • JUST students, faculty and staff	PIU, Project Environmental consultant, contractors (and subcontractors)
Post-construction	• Emergency preparedness and procedures • COVID-19 health and safety measures	• CSE Department website • Posters or signboards • Social media • Meeting	• Building occupants (i.e., students, faculty, and staff) • Immediate local population	PIU, Project Environmental consultant,

Project Phase	Information to be Disclosed	Method of Disclosure	Type of Stakeholders	Responsible Unit
	• Building management			

VIII. GRIEVANCE REDRESS MECHANISM

97. To ensure that complaint(s) will be addressed properly during project implementation the PMU, through the PIU, will establish a grievance redress mechanism (GRM) as soon as the ADB loan becomes effective. The GRM is a process of handling complaints from affected people on the environmental performance of the project, in reviewing, and in facilitating the resolution.

A. Objectives of the Grievance Redress Mechanism

98. This ensures a process of receiving and resolving complaint(s) promptly from persons that may be affected by the new ICT building. Following the requirements of SPS 2009, the GRM will involve a process that is understandable, transparent, gender-responsive, culturally appropriate, and easily accessible to affected persons without cost and retribution.

B. Structure

99. A grievance redress committee (GRC) will be created and may consist of: (i) PMU Head, (ii) representative from the local government, (iii) representative of Contractor, and (iv) witness of the complainant. The environmental safeguard consultant at the PMU will act as the secretary of the GRC. Ideally, the GRC will continue to function from construction until post-construction. However, given the nature of the project, where environmental issues may be of concern during construction phase, the GRC may be inactive post-construction. MOE and UGC will ensure the representation of women in GRC.

100. The GRC will be responsible for resolving complaint(s) and will convene once a month to review the complaint(s) received, if any. GRC will resolve complaint(s) within 15 days from the date of receipt and will keep a record indicating the name of complainant and nature of complaint, status of resolving the complaint, decisions or actions undertaken, and the date the decision was effected.

101. The PMU will review the implementation of the GRM regularly to assess the effectiveness of the process and to examine their ability to address grievances. Cost of implementing the GRM will be part of the administration cost borne by the PMU.

(i) *Information disclosure*. PIU will disclose details on GRM through the project website of JUST as well as in the billboards at the construction site. Details will include the contact person, a hotline phone number, and a simplified flowchart on how to file a complaint.

(ii) *Record-keeping.* A record of all complaints received including contact details of the complainant, date the complaint was received, nature of grievance, decisions and date, and date the complainant was informed of the decision. Grievances filed and resolved will be summarized and included in the semi-annual monitoring reports submitted to ADB during construction stage and annually during post-construction/operation stage.

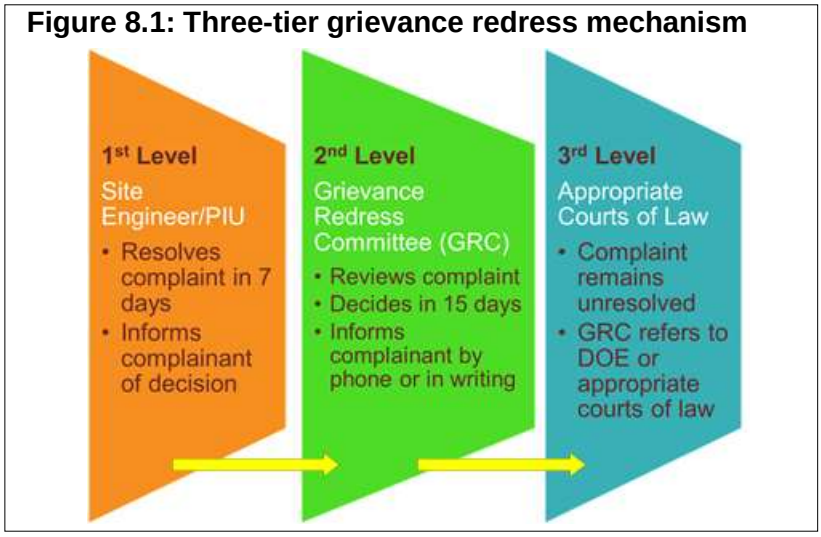
(iii) *Procedure.* Complaint can be lodged either by approaching the Site Engineer of the Contractor, in writing or by phone. With restrictions due to COVID-19, filing of complaints will be made online as much as possible to prevent any physical interactions. A complaint form is given in Appendix 3. Transparency will be maintained on the grievances received and their resolution. The environmental safeguard consultant will provide support to the complainant in filing the complaint. Affected persons can seek redress to their complaints in three levels (Figure 8.1): (i) through the PIU or through the Site Engineer of the Contractor, (ii) through the GRC, and (iii) the DOE under provisions set forth by the Environment Court Act 2000 (amended in 2002 and 2010) or the appropriate courts of law. The complainant is not restricted to seek redress through the legal system at any point in the GRM process. The three-tier entry points include:

(a) First level – Contractor Site Engineer/PIU Head. Complaint to be resolved at the PIU level within seven days and advise the Complainant accordingly.

(b) Second level – *GRC.* If complaint is not resolved at the first level, the Complainant can submit the complaint to the GRC chaired by the PMU Head. The GRC will review the submission and decide within 15 days. The Complainant will be informed of the decision in person, by mail or by phone.

(c) Third level – Appropriate Courts of Law. If the complaint remains unresolved, this will be referred by the GRC to the DOE or the appropriate courts of law.

Figure 8.1: Three-tier grievance redress mechanism



IX. ENVIRONMENTAL MANAGEMENT PLAN

102. The summary of impacts and measures that will be conducted to mitigate the adverse impacts are presented in the environmental management plan (EMP). The EMP covers the H&SP, environmental monitoring plan (EMOP), and the institutional arrangements required. Table 9.1 presents the EMP.

A. Monitoring

103. The environmental monitoring is a time-bound process to ensure that non-compliance of the Contractor will be avoided or will be immediately addressed. Environmental monitoring reports

will be submitted to ADB twice a year during construction and annually post-construction. The environmental monitoring reports submitted to ADB will be publicly disclosed in their website as required by SPS 2009 and AIP 2019. Table 9.2 presents the EMOP.

B. Implementation Arrangements

(i) **Project management unit (PMU).** PMU will be set-up at UGC who will be responsible for the overall management of the project. Supported by an environmental safeguard consultant, the PMU will be also responsible in ensuring that the EMP and EMOP are properly implemented and complied with by the Contractor, submitting the environmental monitoring report to ADB, and in handling complaints following the GRM. The terms-of reference of the environmental safeguard consultant for the PMU is given in Appendix 4.

(ii) **Project implementation unit (PIU).** JUST will set-up a PIU who will be responsible for day-to-day managing of the project. The PIU will ensure that the EMP and EMOP are properly implemented, timely reporting to PMU of the environmental monitoring report required by ADB (see Appendix 5 and Appendix 6 for proposed format), public consultations, information disclosure (as appropriate), and in handling of complaints according to the GRM. Key responsibilities of PIU are as follows:

(a) designate a staff to oversee the implementation of EMP, H&SP and EMOP;
(b) ensure compliance of contractor to EMP, H&SP and EMOP;
(c) engage stakeholders, as appropriate;
(d) conduct on-site spot-checks to monitor compliance of contractor (see Environmental Inspection and Monitoring Checklist in Appendix 7);
(e) in the event of non-compliance by the Contractor or any unanticipated environmental impacts, coordinate with the PMU environmental safeguard consultant in preparing a corrective action plan (CAP) to address the issue with time-bound actions; CAP will be submitted to ADB for review and will be disclosed to the ADB website;
(f) ensure that any grievance/complaint received are addressed in a timely manner;
(g) maintain a record of grievance/complaint received, resolution or action taken, and include the details in the environmental monitoring report;
(h) keep a list of relevant permits issued by the government for the project, if any; and,
(i) prepare the respective environmental monitoring report and submit to the PMU for consolidation and finalization by the environmental safeguard consultant.

104. In the event there will be a change in the design of the new ICT Center for Excellence building, this IEE will be updated/revised and submitted ADB prior to any construction works. The updated/revised IEE will be also disclosed to ADB website.

(iii) **Contractor of civil works.** The EMP which includes the H&SP and the EMOP will be an integral part of the Bid and Contract documents. This will be verified by the PIU and the PMU. The Contractor will designate their environmental staff who will be responsible in overseeing the implementation and compliance to EMP, H&SP, and the EMOP during the construction phase. Maintain a record of

complaint/grievance submitted at the project level through the Contractor including the action taken to address the issue.

105. The designated environmental staff will submit a monthly compliance and monitoring report to the PIU-designated environmental staff. The compliance and monitoring report will cover the EMP, H&SP, EMOP, and the specific environmental clause(s) in their contract.

Table 9.1: Environmental Management Plan

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
Design and Pre-Construction Stage					
Site survey and design of the new building	• Failure of the building to withstand climate change and natural hazards • Potential safety and health risks to students and building users due to poor building design	• Green building features were incorporated • Design will comply with the requirements of BNBC 2006 and relevant provisions in the BNBC 2015 (draft)	Included in project cost	PIU, Design consultant	PMU and Environmental Safeguard consultant
	• Lack of technical capacity on safeguards at JUST	• PIU will designate staff to coordinate with the environmental safeguard consultant in PMU • PIU team will undergo orientation training on the safeguards requirements and compliance under SPS 2009 • PIU may consider engaging intermittent consultant on safeguards	PIU Budget	PIU, Environmental Safeguard consultant	PMU and ADB
	• Incidence of or risk of exposure to COVID-19 due to inadequate or lack of preparation	• Include prevention measures such as physical distancing, use of facial mask, frequent handwashing, enhanced cleaning of frequently touched surfaces like tables, doorknobs, etc. • Stagger work schedule to limit number of people in the workplace • Install posters or signs on COVID-19 to increase awareness • Install barriers in the workplace/office such as plexiglass to maintain distance between staff and workers • Reconfigure work stations to maintain	Included in design contractor cost	PIU, Environmental Safeguard consultant	PMU and ADB

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
		distance and limited persons indoor			
Construction Stage					
Complete construction management work plan	• Avoid impacts of Contractor unplanned activities • Smooth work implementation	• Temporary pedestrian and traffic management plan to minimize disturbance from vehicular traffic and workers • Spoils disposal and construction waste management plan • Noise and dust control plan • Drainage and stormwater management plan • Materials management plan • Measures on COVID-19 preparedness identified in the health and safety plan (H&SP) • Emergency/disaster preparedness plan • Provide list of contact details during emergency to workers or post in billboards at construction site	Included in the project cost	Contractor, PIU	PMU, Environmental Safeguard consultant
Orientation of workers and staff	• Awareness to environmental requirements and their responsibility • Understanding the responsibility of Contractor in implementing the EMP, compliance to ADB requirements and the government • Provide HIV-AIDS, COVID-19 education and disease prevention	• Conduct briefing on EMP, records management, compliance and reporting • Identify areas to be monitored and the required mitigation measures • Create awareness of sexually transmitted diseases such as HIV/AIDs • Explain the H&SP (Appendix 8) focusing on COVID-19 as a priority	Included in the Contractor cost	PIU, Environmental Safeguard consultant	PMU

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
	awareness talks to the workers and staff				
Prepare for emergency and potential incidence of COVID-19 infection	• Create awareness of workers on emergency and COVID-19 risk of exposure and/or transmission	• Designate Disaster Coordinator who can act as the occupational health and safety (OHS) officer to guide during an emergency • Conduct mock drills regularly • Provide information like emergency hotline, evacuation routes, etc. • Provide training or orientation on proper response during emergency and incidence of COVID-19	---	Contractor, PIU	PMU, Environmental Safeguard Consultant
Hiring of project staff and workers	• Dispute over transparency in hiring • Potential risks of COVID-19 infection	• Contractor will be required to give priority to local labor • Contractor will ensure that recruited staff and workers have been tested negative to COVID-19 • Contractor will provide the PIU with negative result to COVID-19 • Contractors will keep a record of contact details of staff and workers such as mobile telephone number, alternate telephone, email (if any), and address of where they are staying	---	Contractor, PIU	PMU, Environmental Safeguard consultant
• Site preparation and construction works	• Disturbance and inconvenience to people due to traffic, increased noise and dust levels, and disposal of waste	• CMP will be strictly implemented • Use of proper safety clothes/equipment • Provide temporary enclosures (at least 2 m-high) to contain dust and minimize noise	Included in the costs of Contractor	Contractor, PIU	PMU, Environmental Safeguard consultant

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
	• Emissions from heavy equipment machinery and construction vehicles				
	• Potential chance find during site excavation	• Chance find will be included in the orientation training of workers prior to construction works • Chance find procedures in ECP 1.0 will be followed			Environmental Safeguard consultant
	• Potential safety risks to community	• Provide fence or barricade, sufficient lights, clear warning signs and danger signals, and take all precautions identified in the community and safety plan of CMP • Assign security staff prevent accidents, trespassing, and pilferage • Contractor to direct drivers to strictly follow road regulations • Post visible and clear signs on COVID-19 to increase awareness on physical distancing, hand washing, and wearing of facial masks • Provide information on health and safety COVID-19 measures to be implemented during consultations			PMU, Environmental Safeguard consultant
	• Potential occupational health and safety risks to workers	• Provide workers with hard hat, safety shoes and belts • Set up first aid at construction site • Comply with relevant safety measures required by law and best engineering practices • Provide signs on COVID-19 safety measures to ensure			PMU, Environmental Safeguard consultant

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
		workers are aware and understand the consequences of non-compliance • Workers to always observe physical distancing • Provide PPEs such as non-medical masks and gloves if physical distancing is not possible • Daily temperature checks before workers enter/exit the work sites • Any worker that shows cough and cold symptoms will not be allowed entry to work sites, and will be advised to stay home and quarantine • Install handwashing and sanitation stations at designated places • Implement H&SP and monitor compliance			
	• Heavy equipment and construction vehicles may increase vehicular emissions • Transport of materials to construction site may increase dust level • Earthmoving works and opened land areas increase dust levels • Increase in noise level and vibration from excavation and heavy equipment and	• Construction vehicles will be maintained to minimize vehicular emissions • Provision of temporary enclosures • Provide space on-site for construction materials to reduce trips of material delivery • Contractor will be required to maintain construction vehicles, equipment and machineries regularly to reduce emissions, avoid smoke belching, and reduce noise • Spray water in opened land areas or in sources of dust generation • Transport of dust-generating materials will be covered			PMU, Environmental Safeguard consultant

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
	construction vehicles	• Observance of low speed by vehicles to reduce noise • Noise-generating works will be done between 6 a.m. and 11 p. m. only. • No blowing of horns will be allowed • Comply with traffic management plan			
Construction of ICT building	• Non-compliance to relevant regulations • Potential accidents due to working at heights • Occupational and community safety risks • Generation of waste	• Monitor compliance to regulations • Provide PPEs to workers • Provide first aid kits and fire-fighting system • Conduct daily toolbox meeting prior to start of work • Conduct work only from 6 a.m.to 11 p.m.Provide enclosures to noise-generating works and equipment, and areas generating dust • Implement and comply with the approved H&SP	Included in Contractor costs	Contractor, PIU	PMU, Environmental safeguard consultant
Clean up of construction sites after completion of construction works	• Improper disposal of construction debris	• Restore/reinstate all the areas potentially damaged during construction works • Workers will be provided with proper safety gear and equipment • Implement COVID-19 health and safety measures • Dispose remaining waste and debris at designated sites	Included in Contractor costs	Contractor, PIU	PMU, Environmental safeguard consultant
Post-construction stage					
Occupy new building	• Improper use and lack of care to the new building	• JUST to conduct orientation and awareness to staff and students on proper care of the facility	Include in the operation cost	PIU, CSE Department	PMU

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
	• Generation of waste	• Designate waste management coordinator • Prepare waste management plan with time-bound targets • Conduct yearly training/orientation to trainees on waste management, proper collected, and disposal • Explore measures to implement the principles of reduce, reuse and recycle effectively including segregation at source.	Include in the operation cost of the	PIU, CSE Department	PMU
	• Potential incidence of emergency, natural disaster, or COVID-19 case	• Prepare emergency/disaster preparedness plan and procedures • Designate a Disaster Coordinator who will also act as the OHS officer • Conduct training/orientation/drills on safety, exposure or incidence of COVID-19, and emergency awareness • Provide clear and visible emergency warning signs, and posters that promote awareness of COVID-19 (e.g., refer to WHO Bangladesh prepared materials)	---		PMU

ADB = Asian Development Bank, BNBC = Bangladesh National Building Code, EMP = environmental management plan, N/A = not applicable, PIU = project implementation unit, PMU = project management unit.

Table 9.2: Environmental Monitoring Plan

Project Stage	Parameter	Location	Method of Measurement	Frequency	Responsibility	
					Implementation	Supervision
Construction	Generation of waste and other construction debris	Construction site	Volume of waste or number of trips	Twice a week	Contractor	PIU
	Increase in dust level	Construction site	• Frequency of water spraying • Ocular inspection	Daily	Contractor	PIU, Environmental safeguard consultant
	Increase in noise level	Construction site	• Enclosure of noise-generating activities or machinery • Check blowing of horns	Daily		
	Ambient air quality	Sampling stations in Table 4.2	• PM_{10} and $PM_{2.5}$	Quarterly		
	Ambient noise level	Sampling stations in Table 4.3	Sound level meter (dBA)	Quarterly		
	Availability of project information	PIU and construction site	• One-page flyer, project brief or Project Q&A • Poster and flyer on COVID-19	Quarterly	Contractor, PIU	Environmental safeguard consultant, PMU
	Recruitment from local labour	PIU office	Number of local workers and staff recruited	Monthly	Contractor, PIU	PMU
	Orientation of workers on health and safety particularly COVID-19	Construction site	Number of participants	Monthly	Environmental safeguard consultant, Contractor, PIU	PMU
	Orientation of Contractor and workers on issues like HIV/AIDS, COVID-19, compliance to EMP and ADB requirements, etc.	Construction site	Number of participants	• Once before construction • Quarterly as refresher to make sure knowledge is up to date	Environmental safeguard consultant, PIU	PMU

	Solid waste management	Construction site	Volume of waste disposed Ocular inspection/spot checks	Every week	Contractor	PIU, Environmental safeguard consultant
	Clear and visible warning signs for safety of workers and JUST community	Construction site and access roads	Ocular inspection/spot checks	Once a month	Contractor	PIU, Environmental safeguard consultant
	COVID-19 awareness - Clear and visible posters promoting handwashing, physical distancing, use of masks, and respiratory etiquette	Construction sites, workers temporary shelter or rest area	Ocular inspection/spot checks	Weekly	Contractor	PIU, Environmental safeguard consultant
	Announcement to the public of works schedule	JUST community	Work schedule log sheet	As needed	Contractor	PIU, Environmental safeguard consultant
	Smoke belching construction vehicles	Construction site and access roads	Ocular inspection/spot checking	Weekly	Contractor	PIU, Environmental safeguard consultant
	Proper storage and management of construction materials and wastes	Construction site	• Number of vehicles • Ocular inspection/spot checking	Weekly	Contractor	PIU, Environmental safeguard consultant
	Handwashing stations with adequate soap and water, or hand sanitizers with at least 60% alcohol	Construction site and temporary workers' shelter	• Ocular inspection/spot checks • Number of available working handwashing stations • Number of working hand sanitizing stations (if water and soap are not available) • Available stock of gloves and	Daily	Contractor	PIU, Environmental safeguard consultant

			facial masks to workers and staff			
	Use of personal protective equipment (PPE) and safety gear	Construction site	Ocular inspection/spot checks	Daily	Contractor	PIU, Environmental safeguard consultant
	Condition of sanitary facilities and safe drinking water	Construction site	Ocular inspection/spot checks	Daily	Contractor	PIU
	Good housekeeping	Construction site and temporary workers' shelter or rest areas	Ocular inspection/spot checks	Daily	Contractor	PIU
Post-construction	Orientation of students, faculty, and administrative staff on care and maintenance of the building	JUST	Number of trainees	Annually (at start of each term)	• Office of Chief Engineer • Office of Director of Planning, Development and Works	PIU[a]
	Good housekeeping (also garbage collection and disposal)	JUST	Ocular inspection/spot checks	Monthly	Office of Chief Engineer	PIU
	Condition/maintenance of fire extinguishers/fire- fighting units/fire alarms	JUST	Ocular inspection/spot checks	Annually	Office of Chief Engineer	PIU
	• Orientation on the safety/emergency/disaster manual and procedures • Orientation/awareness drive on COVID-19	JUST	• Check manuals • Check logsheet	Quarterly (to consider monthly with COVID-19)	Office of Chief Engineer	PIU
	Emergency mock drills	JUST	Number of trainees	Semi-annual (or every start of school term)	Office of Chief Engineer	PIU
	Greening program/grounds maintenance	JUST	Types of plants, area planted	Annually	Office of Chief Engineer	PIU

	Condition of safety gears and emergency equipment	JUST	Ocular inspection/spot checks	Annually	Office of Chief Engineer	PIU
	Building condition • Roof • Electrical panel and wiring • Door handles, windows, hinges and closures • Walls and ceilings • Stairways and fire exit/escape • Storm water drains • Elevators	JUST	Ocular inspection/spot checks for cracks, signs of water leaks, damage, fire hazards, etc.	Semi-annual	Office of Chief Engineer	PIU

[a] Only until the loan is implemented.

ADB = Asian Development Bank, BNBC = Bangladesh National Building Code, EMP = environmental management plan, N/A = not applicable, PIU = project implementation unit, PMU = project management unit, JUST = Jashore University of Science and Technology, PIU = project implementation unit, $PM_{2.5}$ = particulate matter 2.5, PM_{10} = particulate matter 10,

X. CONCLUSION AND RECOMMENDATION

106. The potential environmental impacts associated with the construction of the new building in JUST to be known as the **"ICT Center for Excellence"** are assessed as appearing mainly during the construction phase, are of short duration, temporary, reversible, and can be easily mitigated by good and best practices in engineering construction. The potential impacts can be mitigated also by adhering to the design provisions set forth in the BNBC 2006. The mitigation measures are outlined in the EMP and the parameters to be monitored are listed in the EMOP. Appropriate COVID-19 preparedness measures have been incorporated both during the construction and post-construction phase to ensure the safety and wellbeing of workers, students, faculty, staff, and the community. The Contractor will be required to prepare a COVID-19 health and safety plan, which will be part of the EMP, and will be approved by the PIU and PMU.

107. Stakeholders were consulted and a GRM to deal with potential complaints on the project is included. Public consultations will continue in varying degrees throughout project implementation. Due to COVID-19 pandemic, reliable information provided by the government and agencies like WHO will be incorporated during consultations. Appropriate consultation methods based on WHO guidance notes will be used while under the threat of COVID-19.

108. An environmental safeguard consultant will be engaged in the PMU throughout construction phase to ensure capacity and technical support in complying with the requirements of ADB. Environmental monitoring reports will be submitted by the PMU to ADB semi-annually during construction and annually post-construction. These monitoring reports will be similarly disclosed on the ADB website. Given these measures, UGC and JUST are committed to comply with the requirements of ADB.

Environmental Codes of Practice

The environmental codes of practice (ECP) provide guidance in managing potential environmental impacts during the construction phase.

ECP 1.0 – "Chance find" of physical cultural resources
ECP 2.0 – Managing air quality
ECP 3.0 – Managing noise and vibration
ECP 4.0 – Waste management
ECP 5.0 – Occupational health and community safety

Area of Concern		Project Activity	Management Measures
ECP 1.0	"Chance find" of physical cultural resources	Excavation for building foundation and other earthmoving works	The Contractor will ensure that: • Excavation works within the area of "chance find" will be stopped • Identify and mark the area with a global positioning system (GPS) unit to determine the exact location and take photographs • Secure the area discovered to avoid potential damage, loss or removal of any movable or transportable object • Inform the PIU of the "chance find" and designate a security personnel until a representative from the Ministry of Cultural Affairs arrives
ECP 2.0	Managing air quality	• Use of construction vehicles and machinery	Contractor will do the following: • Prepare air quality management plan as part of the overall construction management plan and consult PIU for concurrence • Keep construction vehicles in good working condition and limit idling time of not more than two minutes • Cover trucks and other vehicles transporting materials that generate dust • Implement speed limits on vehicular movement within the construction site • Sprinkle water to crusher and orient workers to follow good practices while handling material in concrete-mix plant

Area of Concern		Project Activity	Management Measures
		• Construction activities	The Contractor will do the following: • Spray water regularly (or as needed) to unpaved and opened land areas, material stockpiles, and access roads to contain dust • Dust-generating construction activities will be enclosed to contain dust dispersion • Workers assigned to activities generating high dust level will be provided with PPE such as masks, goggles, etc. • Must ensure that there will be minimum generation of dust and waste while unloading the materials from delivery trucks or construction vehicles • Materials generating dust such as sand and gravel will be covered particularly during non-working hours. • Re-vegetate opened areas (if possible) to limit area of exposed land • Stock cement and other dust-generating materials in covered space • Provide area for mixing and loading of construction materials. • Burning of solid waste within the construction site will not be allowed. • Batching plant (if needed) will be located upwind of the construction site.
ECP 3.0	Managing noise and vibration	• Vehicular traffic	The Contractor will ensure: • Regular upkeep and maintenance of construction vehicles to minimize generation of unwanted noise • Drivers of construction vehicles to comply with speed limits • Use of horns will be allowed only when necessary • Divert routes to minimize traffic, observe loading and unloading procedures, and to minimize unnecessary noise at the construction site

Area of Concern		Project Activity	Management Measures
		• Use of construction machinery and equipment	The Contractor will ensure: • Enclosure and/or isolation of noise-generating machinery and equipment to contain noise levels • Identify and organize all noise-generating activities to minimize increase in ambient noise levels • Proper and regular maintenance of equipment and machinery to avoid unwanted generation of noise • Avoid the use of alerts, horns, or sirens unless absolutely necessary like emergency
		• Construction works	Contractor will ensure that: • Nearby local residents are notified of noise generating activities, time and duration • Operators of heavy equipment and machineries will be educated/oriented on construction techniques to reduce generation of noise • Temporary noise barriers or enclosures are installed, where needed • On-site deliveries will be planned to minimize noise from delivery trucks • Noise-generating activities will be conducted only during daytime (6 a.m. to 11 p.m.) • Schedule of noise-generating activities and deliveries of materials will be coordinated with the PIU to ensure minimal disruption to students and activities in JUST
ECP 4.0	Waste Management	• Generation of waste at construction sites	Contractor will do the following: • Identify the activities that will generate waste and identify location for disposal • Develop waste management plan for different waste streams prior to start of construction works • Orient workforce on disposal of waste, the location of disposal site and specific requirements for management of these sites • Wastes that cannot be re-used will be disposed of safely at designated sites • Minimize generation of waste by implementing 3Rs (Reduce, Re-

Area of Concern		Project Activity	Management Measures
			use, Recycle), and segregate waste at source • Waste will be transported in fully covered trucks to prevent spillage along the way • Provide appropriate bins/containers for waste at construction site • Conduct orientation to workforce on waste management practices • Require workers to always observe good housekeeping
		• Handling of hazardous waste	Contractor will ensure that: • Chemical wastes are stored in sealed container and properly labeled • All chemical containers such as paints are labeled properly for easy identification • Material Safety Data Sheets (MSDS) of all chemicals on-site during construction are maintained and properly recorded • Chemical and other hazardous materials are stored in bunded place or in an area lined with impervious material to prevent soil contamination and away from drainage system • Store sufficient stock of absorbent materials for used chemicals or spent lubricants, lube oil, etc.
ECP 5.0	Occupational health and community safety The Contractor will be responsible to include the protection of every person and nearby property from construction accidents. The Contractor will be responsible for complying with all safety requirements of the government and any other measures necessary to avoid accidents, including the following:	• Construction works at the new ICT Centre for Excellence building	The PIU and the Contractor shall inform the JUST community and adjacent settlements along the access roads of the following: • Schedule of construction works, routing of traffic (if needed), possible health concerns (exposure to dust, noise, and vibration) Contractor will do the following: • Set-up a health and safety committee and designate a Safety Officer • Provide workers with personal safety equipment (PPE) such as footwear, gloves and eye protection devices, helmets, etc. • Prepare an emergency action plan • Maintain PPE properly by cleaning dirty ones and replace damaged sets.

Area of Concern		Project Activity	Management Measures
	(i) Notice or signboards shall be properly installed at the construction site (ii) Conduct safety training or orientation to workers prior to start of work; (iii) Provide required PPE to workers and its use will be mandatory; (iv) In case of an emergency, suspend all work. To maintain good community relations, the Contractor will: (i) Inform local authorities and community about construction and work schedules, interruption of services, and rerouting of traffic. (ii) Restrict construction activities at night. If needed, ensure that night work is carefully scheduled, and the community is properly informed so they can take necessary measures.		• Provide adequate lighting, drainage systems to prevent water stagnation, and adequate space to administer first aid • Implement appropriate standards of safety to all workers and site visitors to comply with the national requirements and the World Bank-IFC Environmental, Health and Safety Guidelines 2007 • Conduct toolbox meetings prior to start of construction works. Record names of workers present during the meetings. Worker not joining toolbox meeting will not be allowed to work. • Enforce safety procedures and provide training on PPE to workers • Designate someone to deal with community and occupational health and safety • Clear and visible danger and warning signs shall be placed as soon as construction begins and will remain until works are completed. • Keep a record of workers and place assigned
		• Child labor	Contractor will not hire workers below 15 years old
		• Training and record keeping	The Contractor will: • Conduct orientation on COVID-19 and the safety measures that will be implemented to prevent incidence in the workplace • Keep a record of occupational accidents, diseases, and injuries • Prevent work-related accidents or injury by minimizing workplace hazards consistent with international best practice • Ensure health care facilities and first aid kits are readily available • Train construction workers about general health and safety practices, and on specific hazards related to their work

Area of Concern		Project Activity	Management Measures
		• Security of construction site	Contractor will ensure that: • Security personnel will be deployed to prevent unauthorized entry at construction site • All the tools, equipment and construction materials at the site are accounted for, identified, clearly labeled/marked, and recorded • Maintain a record of tools' serial numbers and check inventory on a regular basis • Implement an inventory system where tools and equipment are checked in and out, securely stored when not in use to prevent theft • Provide proper fencing of construction site perimeter with secured chain and lock • Construction site will have controlled access points to allow for close monitoring of entry and exit from the site • Workers will have proper identification while within the site • Staff or workers required to have access to the site after working hours will be notified with the PIU • Job site will be adequately lighted • Pre-employment investigations are conducted to verify previous employment, references (if needed), education and criminal background

List of Participants and Photographs during Consultation

BAN: Innovations in Tertiary Education for Competitiveness in Information Technology Project

Public Consultation Meeting
held on April 1, 2019 (Monday)
Venue: Conference Room, Vice Chancellor, 4th Floor, Administrative Building
Jashore University of Science and Technology (JUST)

List of Participants

Sl No.	Name	Occupation	Male	Female	Cell No.	Signature
1.	Dr. Syed Md. Galib	Associate Prof. CSE	✓		01781408274	
2.	Dr. Md Asif Nashiry	Assistant Prof CSE	✓		01303378254	
3.	Abu Nahid Muhiuddin	Env. Consultant (ADB-National)	✓		01715464590	
4.	Ruby Socorro M. Arico	ADB Consultant		✓		
5	MD. Akramul Islam	Deputy Imam	✓		01773215671	
6	Md. Helal uddin Pramanik	Chief Engr. JUST	✓		01709818149	
7.	Dr. Md. Nazmul Hasan	Secretary, Teachers Association	✓		01703685145	
8.	Dr. M. Mahfuzur Rahman	Associate Professor	✓		01797757421	
9.	Dr. Md Alo Hossain	Assistant Prof CSE	✓		01749032911	
10.	Md. Touhid Imam	Executive Engineer	✓		01788502727	
11	Farhana Yeasmin	Lecturer, English		✓	01716803380	
12	Chaity Rany Das	Lecturer, English			01933734397	
13.	Fatema Tuj-Zohra	Asst. Prof.		✓	01706363417	
14.	Mohammad Nowsin Amin	Assist. Prof	✓		01714-492550	
15.	Jannatul Ferdush	Lecturer		✓	01731791101	
16.	Engr. Md. Asif Ibn	Asst. Prof	✓		01717283909	

Some photographs during consultation

Stakeholder consultation. Consultation with project-affected people and local administrative bodies will facilitate their informed participation and ensure that their views and concerns are taken into account by decision makers. Consultations are to continue throughout project implementation to address issues related to environmental assessment, e.g., to identify perceptions on the project, introduce project components and anticipated impacts, and determine if there is any concern during construction.

Sample Complaint Form for Grievance Redress Mechanism

Complaint/Suggestion/Comment Form			
Loan No.: _____BAN: Improving Computer and Software Engineering Tertiary Education Project			
Please provide the following information:			
	Date of Filing:		
Name of Person/Organization:			
Contact Details:			
Address			
Telephone/Mobile Phone			
Email (if available)			
Signature of Person Filing Complaint			
Representative in filing this complaint?	Yes		
Please provide details	Name		
	Address		
	Telephone		
	No		
	Not applicable		
Complaint/Suggestion/Comment (*Please provide details as appropriate: what happened, how and why it happened, when and where, how many times it occurred*)			
Please describe any inconvenience/harm caused or may have been caused			
Please provide suggestion to resolution of your complaint (if any)			
Please let us know how you prefer to be contacted	Mail or email		
	Phone		
	Meeting		
Contractor/PIU/PMU Use only			
Recorded by (Name of designation of Contractor/PIU staff)			
Reviewed by (Name and designation of Contractor/PIU staff)			
Action(s) taken to resolve the complaint/comment/suggestion			
	No action needed		
Action/decision disclosed to Complainant	Yes	No	Not required
	Date		
Manner of disclosure	Mail		
	Phone		
	Meeting		
	Not required		

PMU Environmental Safeguard Form 1 - GRM

Terms of Reference for Environmental Safeguard Consultant

The Environmental Safeguard Consultant for the Project Management Unit (PMU) will be sourced through national selection and render 4 person-months of inputs within 24 months on an intermittent basis.

He or she should preferably have a post-graduate degree in environmental engineering, environmental sciences, or equivalent discipline with a minimum of 7 years in environmental management and monitoring and in oversight of project implementation and compliance. A strong knowledge of the applicable environmental regulations and other construction requirements in Bangladesh as well as the environmental requirements of Asian Development Bank (ADB) following the Safeguard Policy Statement (SPS) 2009 will be mandatory. The candidate should have good communication skills (oral and written), a good team player with strong organizational and problem-solving skills.

Duties and tasks of the Environmental Safeguard Consultant include but not are not limited to the following:

(i) provide technical support to the PMU to ensure that all environmental requirements of ADB including occupational health and safety requirements of the government are complied with by the project;
(ii) ensure that the environmental management plan (EMP), the COVID-19 health and safety plan, and the environmental monitoring plan (EMOP) are included in the bid documents and civil works contracts;
(iii) implement a system for monitoring the environmental safeguards;
(iv) in coordination with staff designated by the project implementation unit (PIU), conduct regular site visits at the construction sites to verify or check compliance with the EMP and EMOP including adherence to occupational health and safety provisions and core labor standards;
(v) together with the PIU-designated staff and the representative of the contractor, conduct stakeholder consultations, as appropriate, to determine if there is any concern during construction;
(vi) conduct orientation and/or training to workers and staff on compliance to government requirements and ADB, health and safety awareness, information on COVID-19 preparedness, and other diseases such as AIDS, and sexually transmitted diseases;
(vii) assist in obtaining associated government permits (if any) prior to start of construction works;
(viii) take immediate action in the event of unexpected adverse impact or ineffective mitigation measures identified during implementation and in preparing the corrective action plan;
(ix) provide technical support to the PIU-designated staff in drafting the environmental monitoring reports required by ADB, and in monitoring compliance of contractor to the environmental, health and safety requirements;
(x) address any grievances through the Grievance Redress Mechanism (GRM) in a timely manner, prepare record of such grievances for inclusion in the environmental monitoring report;
(xi) prepare the semi-annual environmental monitoring reports to be submitted to ADB, and upon ADB review, address any comments raised (if any); and,
(xii) assist in any relevant works that may be assigned by PMU or PIU.

Proposed Format of Environmental Monitoring Report during Construction Phase

Environmental Monitoring Report

Reporting Period {From Month, Year to Month, Year}

Date {Month, Year}

BAN: Improving Computer and Software Engineering Tertiary Education Project

Prepared by the University Grants Commission of the Ministry of Education for the Asian Development Bank

CURRENCY EQUIVALENTS

(as of)

Currency unit	–	Taka (Tk)
Tk1.00	=	$
$1.00	=	Tk

ABBREVIATIONS

WEIGHTS AND MEASURES

NOTE

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

TABLE OF CONTENTS

Page

Executive Summary

- Brief status of environmental compliance during the coverage period

1.0 Introduction

1.1 Brief Project Description
1.2 Project Progress Status and Implementation Schedule

2.0 Compliance to National Regulations

{These are just sample environmental regulations}

2.1 Environmental Conservation Rules 1997
2.2 Bangladesh Labour 2013

3.0 Compliance to Relevant Environmental Requirements from the ADB Loan Agreement

{prepare a matrix to show how compliance was achieved, see template below}

List schedule and paragraph number from the Loan Agreement	Covenant	Status of Compliance	Action Required
Schedule 4, para.8			

4.0 Compliance to Environmental Management Plan

{Refer to the EMP of the Project}

Refer to Table 9.1 and COVID H&SP

5.0 Safeguards Monitoring Results and Unanticipated Impacts

{Refer to the Environmental Monitoring Plan and document any exceedence to environmental standards (if any), or any unanticipated impact not included in the EMP and any correction action/measures taken}

Refer to Table 9.2

6.0 Implementation of Grievance Redress Mechanism and Complaints Received from Stakeholders

{Summary of any complaint/grievance and the status of action taken}

- Provide information on the setting-up of the GRM and the capacity of the grievance redress committee to deal and resolve project-related complaints
- Identify training needs (if required)
- Provide information on the number of complaints received during the reporting period, the nature of complaints (e.g., air quality at the construction site), record of events in handling the complaints (i.e., timetable), and resolution/action taken

7.0 Conclusion and Recommendations

{Any follow-up action required to be monitored for the next submission}

Proposed Format of Environmental Monitoring Report Post-construction

Environmental Monitoring Report

Reporting Period {From Month, Year to Month, Year}

Date {Month, Year}

BAN: Improving Computer and Software Engineering Tertiary Education Project

Prepared by the University Grants Commission of the Ministry of Education for the Asian Development Bank

CURRENCY EQUIVALENTS

(as of)

Currency unit	–	Taka (Tk)
Tk1.00	=	$
$1.00	=	Tk

ABBREVIATIONS

WEIGHTS AND MEASURES

NOTE

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

TABLE OF CONTENTS

Page

Executive Summary

- Brief status of environmental compliance during the coverage period

1.0 Introduction

1.1 Brief Project Description

1.2 Status/condition of the new buildings

{i.e., a checklist can be provided to indicate condition of the interior and exterior of the building}

2.0 Compliance to National Regulations

{These are just sample regulations}

2.1 Disaster Management Act 2012 (relevant requirements for safety of school/university buildings)

2.2 Bangladesh Labour Act 2006 (amended 2013)

2.3 Bangladesh Labor Rules 2015

3.0 Compliance to Relevant Environmental Requirements from the ADB Loan Agreement

{prepare a matrix to show how compliance was achieved, see template below}

List schedule and paragraph number from the Loan Agreement	Covenant	Status of Compliance	Action Required
Schedule 4, para.8			

4.0 Compliance to Environmental Management Plan

{Refer to the EMP during post construction}

5.0 Results of Environmental Monitoring Plan

{Refer to the EMoP during post construction}

6.0 Implementation of Grievance Redress Mechanism and Complaints Received from Stakeholders

{Summary of any complaint/grievance and the status of action taken}

7.0 Conclusion and Recommendations

{Any follow-up action required to be monitored for the next submission}

Sample Environmental Site Inspection and Monitoring Checklist

Loan No.:

Name of University	Location
Inspection Date	Inspection Time
Inspector	Weather at time of inspection:

Items for Inspection	Y	N	NA	Remarks (i.e. problem observed, possible cause of non-compliance and/or proposed corrective action)
Site Office				
Site office established				
Contractor appointed an EHS supervisor				
EHS supervisor or designated person on-site				
Copies of EMP, contract document, and environmental clauses on-site				
Details of construction (i.e., name of contractor, duration of construction, emergency hotline, safety, etc.) disclosed on-site				
Details of grievance redress mechanism (i.e., contact person, complaints hotline, etc.) disclosed on-site				
Complete first aid kits on-site				
Photographs of before and after completion of work on board				
Incident register book on-site				
Complaint/visitor's comment book available				
Record of regular consultation of Contractor to University management and/or nearby residents to check if there are environmental concerns				
Any complaint filed with the contractor by staff and settlements				
Disturbed areas properly re-vegetated after completion of work				
Emergency Preparedness and Response				
Fire extinguishers/fire-fighting equipment properly maintained and not expired				
Fire escapes properly marked, clear, and not obstructed				
Emergency contacts available in case of any incident				
Accidents/incidents reported, reviewed, and corrective/preventive actions recorded				

Items for Inspection	Y	N	NA	Remarks (i.e. problem observed, possible cause of non-compliance and/or proposed corrective action)
Occupational Health and Safety				
Provision of labor and equipment shed				
Provision of sanitation facilities and safe drinking water				
Provision of hand washing stations or hand sanitizing stations				
Use of personal protective equipment (PPEs)				
Installation materials and equipment storage				
Separate storage of fuel and lubricant				
Training on OHS, use of PPE, etc. done before construction works				
Clear danger and warning signs on-site for students, faculty, and community				
Posters on COVID-19 health and safety measures (e.g., physical distancing, wearing of facial masks, etc.)				
Fencing of construction site and designation of security personnel				
Good housekeeping - site kept clean and tidy				
Containers properly labelled for easy recycling or waste segregation				
Special facilities for female workers				
Bin for collecting garbage and food waste (separate bins for facial masks and gloves to contain spread of COVID-19)				
Air Quality				
Opened land and construction sites sprayed with water to minimize generation of dust				
Any evidence of excessive dust generation				
Stockpiles of dusty materials and dust-generation activities like handling of cement done in enclosed areas or sprayed with water				
Vehicles carrying dusty loads/materials covered or watered over before leaving the site				
Construction equipment well maintained (any black smoke or smoke belching observed)				
Demolition work areas watered				
Speed control measures applied (e.g. speed limit sign)				
Noise				

Items for Inspection	Y	N	NA	Remarks (i.e. problem observed, possible cause of non-compliance and/or proposed corrective action)
Evidence of excessive noise				
Any noise mitigation measure adopted (e.g. use noise barrier/enclosure)?				
Prohibition of using megaphone or whistle on-site				
Use of well-maintained equipment and vehicles				
Water Quality				
Sanitary facilities for workers equipped with on-site treatment system				
Wastewater discharged to soil				
Evidence of oil spill				
Chemicals properly stored and labelled				
Spill kits/sand /saw dust used for absorbing chemical spillage readily accessible				
Special facilities for female labor				
Construction waste/recyclable materials and general refuse removed off-site regularly				
Water pipe leakage and wastage prevented				

Reviewed by:

Name and signature _____ Date _____
Designation in PIU _____

COVID-19 Health and Safety Plan (Draft)[1]

1.0 Objective

This health and safety plan (H&SP) was prepared based on guidance notes from the WHO, the US Centers for Disease Control and Prevention (CDC), Canadian Centre for Occupational Health and Safety, and the requirements of the government and ADB. The H&SP aims to prevent incidence of COVID-19 in the workplace for the construction of the new 10-storey building, "ICT Center for Excellence" in Jashore University of Science and Technology by providing information on its symptoms, modes of transmission, exposure risk assessment, and precautionary measures following the hierarchy of controls.

2.0 About COVID-19

COVID-19 is a disease not previously identified in humans caused by the new coronavirus called SARS-CoV-2 and can infect a person causing illness that can be mild to severe or even fatal. An infected person may commonly experience mild to moderate respiratory illness such as fever, cough, and shortness of breath while some people reportedly experienced other non-respiratory symptoms, and others have no symptoms at all referred to as asymptomatic cases. According to the CDC, symptoms can appear in as few as 2 days or as long as 14 days after exposure.

3.0 Symptoms

WHO identifies the most common symptoms as fever, dry cough, and fatigue while other symptoms that are less common and may affect some patients include loss of taste or smell, nasal congestion, conjunctivitis (also known as red eyes), sore throat, headache, muscle or joint pain, different types of skin rash, nausea or vomiting, diarrhea, chills, or dizziness. Severe case of COVID-19 has symptoms like shortness of breath, loss of appetite, confusion, persistent pain or pressure in the chest, high temperature (above 38 °C).

4.0 Modes of transmission

The WHO states that COVID-19 mainly spreads from an infected person to others in close contact (less than 1 metre) through respiratory droplets (e.g., coughing, sneezing, laughing, talking, singing). By touching something with the COVID-19 virus on it and then touching the face (e.g., mouth, nose, eyes) before washing hands. People infected with COVID-19 can show no symptoms but still spread the disease. According to CDC, although COVID-19 can survive for hours or days on different surfaces, infection from contact with contaminated surfaces appears to be less common.

5.0 Workplace Risk Assessment

Having known the mode of transmission of COVID-19, the risk of work-related exposure depends on the probability of coming into close (i.e., less than 1 metre) or frequent contact with people who may be infected with COVID-19, and through contact with contaminated surfaces and objects. WHO describes the risk levels (Figure 1) that may be useful in carrying out a workplace risk assessment for exposure risk to COVID-19 and in planning for preventive measures to non-health care workplaces.[2]

---

[1] Contractor will finalize the plan to be approved by the PIU

[2] WHO. 2020. Considerations in adjusting public health and social measures in the context of COVID-19: interim guidance. 15 April. https://www.who.int/publications/i/item/considerations-in-adjusting-public-health-and-social-measures-in-the-context-of-covid-19-interim-guidance

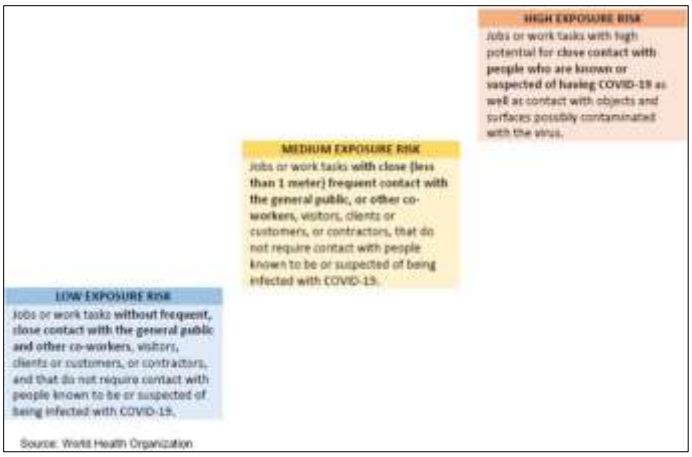


Figure 1 Levels of Risk Exposure to COVID-19

Based on this exposure risk, the design, pre-construction, and construction phases of the project can be considered as medium risk. Level of risk in the workplace is affected by several factors such as person's underlying health conditions, presence of transient workers where original community has or had an outbreak, poor condition of sanitary facilities, poor housekeeping practices, workers in and out of the local communities, and lack of reliable health care facilities to respond to any COVID-19 incidence.

The Contractors, PIU, and the PMU will coordinate with the local government unit in Jashore District in monitoring and identifying potential positive case, and level of response will depend on the developments to contain COVID-19 such as the ongoing vaccination rollout plan by the government. Based on the Morbidity and Mortality Weekly Update (No. 58) of WHO Bangladesh, the total number of people vaccinated as of 5 April 2021 is 5,498,172 with 35.9% coverage in Dhaka Metro and 11.1% national coverage.[3]

6.0 Hierarchy of Controls to Reduce Risk

The WHO and the Canadian Centre for Occupational Health and Safety (CCOHS) provide guidance on COVID-19 preventive measures that can be implemented in the workplace. According to CCOHS, a zero risk for COVID-19 transmission is not possible in any setting, and as such, the best approach is to always keep the risk exposure as low as possible. Figure 2 shows the hierarchy of controls to reduce risk while Table 1 presents the preventive measures that can be applied.

Figure 2 Hierarchy of Controls to Reduce Risk

Table 1 Preventive Measures to Reduce Risk to COVID-19 Exposure

[3] WHO Bangladesh. COVID-19. Morbidity and Mortality Weekly Update N^{0}58. 05 April 2021. https://cdn.who.int/media/docs/default-source/searo/bangladesh/covid-19-who-bangladesh-situation-reports/who_covid-19-update_58_20210405.pdf?sfvrsn=b631fa67_13.

Controls	Preventive Measures	Implementing Unit	Supervising and Monitoring Unit
Workforce profile			
Characteristics	• Prepare detailed profile of the workforce, activities and work schedule, breakdown of workers (i.e., living at home, those who stay within the local community, and onsite accommodation); identify measures to minimize movement in and out of construction site	Contractor	PIU
Information, communication, and education			
Information/awareness	• Prepare/print materials on COVID-19 [refer to WHO Bangladesh website, https://www.who.int/bangladesh/emergencies/coronavirus-disease-(covid-19)-update]. • Place COVID-19 posters and signs in the construction site and office with images and text in Bengali and English (refer to website of WHO Bangladesh and DGHS) • Provide updates to workers and staff on COVID-19 risks in the workplace from sources such as WHO, CDC, and DGHS	Contractor	PIU, Environmental consultant
Education (training and orientation)	• Include trainings with topics such as: (i) signs and symptoms of COVID-19, (ii) how it is transmitted, (iii) how to protect oneself (safety protocols and use of PPEs), (iv) what to do if one has the symptoms or others have the symptoms, (v) discrimination or prejudice in case a worker becomes positive to COVID-19, (vi) site access control system and monitoring, and (vii) workers' code of conduct and occupational health and safety. • Appoint an occupational health and safety (OHS) officer onsite who will be the authority to issue directives to maintain health and safety of all workers and staff.	Contractor	PIU, Environmental consultant
Communication	*Workers and Staff* • Information/updates on COVID-19 risks will only come from the OHS officer (or back-up in case the OHS Officer gets sick) to avoid confusion. • Workers can report to the OHS officer or Site Engineer on work situations that are not safe or healthy. • Workers can ask questions, raise their concerns, and make suggestions as they see fit. • Arrange for regular meetings with medical experts in JUST Medical Centre (or local health office of DGHS) for medical advice in designing appropriate health and safety measures. • General hygiene requirements will be communicated and monitored by the OHS officer. This includes: (i) ensure handwashing stations are equipped with soap, disposable paper towels, and waste bins with cover in key areas at the construction site (e.g., entry/exit to work areas, toilet, canteen/food distribution, drinking water station, workers' temporary rest area, waste disposal area, etc.). If hand washing stations with soap and water are not available, alcohol-based sanitizer (with at least 60% alcohol) will be used. • Communicate clearly based on information from WHO or DGHS in a manner that can be easily understood by workers such as putting of posters on handwashing, social distancing or on how to protect themselves.	Contractor	PIU, Environmental consultant

Controls	Preventive Measures	Implementing Unit	Supervising and Monitoring Unit
	Community • Communicate clearly and regularly to community members based on information from sources like DGHS and WHO. • Consultations will use other means of communications such as posters, flyers, radio, and social media and virtual meetings (to those with access to internet) • Ensure that the community is aware of the COVID-19 health and safety measures that will be or being implemented on-site to prevent incidence, and to limit or prohibit contact between workers and the community. • Procedures for entry/exit to the construction site, training of the workers and steps to follow if a worker gets sick will be communicated to the community. • Workers who interact with local community will be required to observe social distancing, wear facial mask, and follow other COVID-19 restrictions issued by DGHS or WHO.		
Site Management			
Access Control	• Post notices outside of construction site asking people not to enter the building if they have symptoms or may have been exposed. • Entry/exit to the construction site will be controlled and documented for easy contact tracing. Sign-in devices will be sanitized and contact during sign-in will be minimized. • Adequate and clear floor markings to keep a distance of at least 1 meter between persons will be provided and direct physical contact (e.g., shaking hands) will be avoided. • Temperature check using thermal scanner will be mandatory before entry and at the end of work shift (low-grade fever of 37.3^{o}C or more will not be allowed entry to the workplace). Anyone who leaves and re-enters within the work shift will be re-checked. • Mandatory use of color-coded entry pass given to workers indicating fitness to work will be worn visibly. Use of separate visitors' card will be required. • An area will be designated for staff to wear personal protective equipment (PPE) such as facial mask or gloves and will be disinfected twice a day. • Toolbox meetings or other site meetings will be outdoors with social distancing. If conducted indoors, number of persons will be limited to maintain social distancing or additional sessions will be done. • Any person on medication for a specific medical condition that will affect work performance will not be allowed.	Contractor	PIU
Sanitation	*Hand hygiene* • Put signs or posters to encourage frequent hand washing with soap and water for at least 20 seconds. • Provide hand washing stations (even just a spouted water container, catch bucket for water, soap, and paper towels) in prominent places within the construction site and accessible to staff and workers. If water and soap are not available, alcohol-based hand sanitizers (with at least 60% alcohol) will be used. • Regular and thorough handwashing: (i) before starting work, (ii) before eating or drinking, (iii) frequently during the work shift, especially after contact with co-workers or touching shared items/tools/equipment, (iv) after going to the washroom, (v) after handling garbage, (vi) after contact with	Contractor	PIU, Environmental consultant

Controls	Preventive Measures	Implementing Unit	Supervising and Monitoring Unit
	potentially contaminated objects (gloves, clothing, masks, used tissues, waste), and (vii) immediately after removing gloves and other PPEs but before touching eyes, nose, or mouth. • Sharing phones, tools, or equipment will be discouraged unless they can be disinfected between users. • Discourage sharing of items such as phones, tablets, tools, or equipment unless they can be cleaned and disinfected between users. • If possible, assign each worker a unique set of tools for their use only. • Have workers bring their own pre-filled water bottles and food. Food and water bottles should not be shared. *Respiratory hygiene* • Post signage promoting respiratory etiquette in the workplace. • Wear mask or face cover based on the requirements of the government and will ensure its safe and proper disposal. • Medical facial mask and paper tissues will be made available for those who may sneeze (or into the bend of the arm) or develop a runny nose at work, along with no-touch plastic lined garbage bins with lids for hygienic disposal of used tissues and mask. • A worker who is sick will not be allowed to work and if a worker feels unwell at work, a medical mask will be provided and will be allowed to get home safely. *Cleaning, disinfection, and waste disposal* • Clean offices, washrooms, lunch/break rooms and other workspaces every day focussing on commonly touched surfaces such as doorknobs, handrails, tables, chairs, tools, radios, etc., using soap or neutral detergent. Disinfect after cleaning to kill pathogens with disinfectants approved by local authorities such as DGHS. • Regularly clean shared tools, phones, and other devices with alcohol or disinfectant wipes. • Train cleaning staff on appropriate cleaning procedures and frequency of high-use areas • Monitor and restock washrooms and workspaces for soap paper towels and hand sanitizer. • No touch garbage bins will be provided for waste collection in all common access areas, manage waste as a type of medical waste, and dispose accordingly. Construction waste removed from site will be in covered bins and covered vehicles.		
Worker Management			
Physical distancing	• Maintain a distance of at least 1 meter between people and avoid direct physical contact, strict control over external access, queue management (provide markings on the floor, barriers). • Control site movement to reduce gathering at scaffolds, hoists, washrooms, and other high traffic areas and reduce density of people (no more than one person per 10 m^2), physical spacing at least 1 meter apart for workstations and common spaces like entry/exits, stairs, and other common areas.	Contractor	PIU, Environmental consultant

Controls	Preventive Measures	Implementing Unit	Supervising and Monitoring Unit
	• Arrange for one-way routes and use signs and other markings to direct movement through shared spaces such as hallways, common areas, and washrooms. • Post signs outside of sanitary facilities indicating number of users at a given time to ensure distancing is followed. • Limit the number of people allowed in indoor spaces and common areas at the same time to maintain distance. • Minimize movement of workers in and out of the construction site (i.e., returning home to affected areas or returning to site from affected areas) • Mandatory use of mask if social distancing cannot be followed. Reusable mask will be cleaned and disinfected after use and will not be shared. Single use mask will be disposed of in designated covered bins.		
Work schedule and work practices	• Identify work that can be done offsite and allow staff to work from home or remotely where and when possible. • Use technology such as Zoom, Microsoft Team, and other platforms to help workers while working from home. • Stagger work hours or workdays to reduce the number of workers at one time on-site or in common spaces like entry/exits (e.g., in safety toolbox meetings, breaks, orientation, training, etc.) • Create small groups whose members will be same people that may not always keep 2 meters apart (e.g., take breaks together, easier for contact tracing when members are known) • Arrange that work breaks are taken in outdoor areas on-site. • Workers returning from an area where there is COVID-19 transmission should monitor themselves for symptoms for 14 days and take their temperature twice a day; if they are feeling unwell, they should stay at home, self-isolate, and contact a medical professional. • Consider flexible hours for workers who may use public transit in coming to work so they can avoid peak travel periods. • Provide incentive for workers who use bicycle in coming to work	Contractor	PIU, PMU
Accommodation	• Review workers' accommodation in relation to COVID-19 and refer to the IFC/EBRD Guidance Note on Workers' Accommodation: processes and standards (August 2009). • Consider setting aside part of worker accommodation for precautionary self-quarantine as well as more formal isolation of staff who may be infected.	Contractor	PIU, PMU
Worker who may have COVID-19 symptoms	• Any person showing signs of cough or colds will not be allowed access to the work site and will be advised to stay home and isolate. • Consider how workers will return home without using public transit if they develop symptoms at work. • Develop a contingency plan/emergency response protocol, in consultation with JUST Medical Center and DGHS, to set out procedures if someone becomes ill at the worksite. • Report if there is stoppage of construction work due to incidence of sick workers and staff, or any health and safety concerns at the construction site.	Contractor	PIU, PMU

Sources:

1. ADB. Interim Advisory Note. Protecting the Safety and Well-Being of Workers and Communities from COVID-19. June 2020. https://www.adb.org/publications/safety-well-being-workers-communities-covid-19.

2. Canadian Centre for Occupational Health and Safety. Coronavirus (COVID-19) Tips. Construction. 7 April 2020. https://www.ccohs.ca/images/products/pandemiccovid19/pdf/construction.pdf, and COVID-19: Workplace Health and Safety Guide. 27 August 2020. https://www.ccohs.ca/products/publications/pdf/pandemiccovid19/covid-health-safety-guide.pdf.
3. US Centers for Disease Control and Prevention. COVID-19. Workplaces and Business. https://www.cdc.gov/coronavirus/2019-ncov/community/workplaces-businesses/index.html
4. WHO. Considerations for public health and social measures in the workplace in the context of COVID-19. 10 May 2020. https://www.who.int/publications/i/item/considerations-for-public-health-and-social-measures-in-the-workplace-in-the-context-of-covid-19.
5. WHO. Bangladesh. Coronavirus disease (COVID-19) Update. https://www.who.int/bangladesh/emergencies/coronavirus-disease-(covid-19)-update.

Hand Hygiene Technique