

Initial Environmental Examination

July 2021

BAN: Improving Computer and Software Engineering Tertiary Education Project – Bangladesh University of Engineering 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-3>.

CURRENCY EQUIVALENTS

(as of 15 July 2021)

Currency unit	–	taka (Tk)
Tk1.00	=	\$0.012
\$1.00	=	Tk84.81

ABBREVIATIONS

ADB	–	Asian Development Bank
CASE	–	Clean Air and Sustainable Environment
COVID-19	–	Coronavirus disease
CSE/IT	–	computer science and engineering and information technology
DOE	–	Department of Environment
ECA	–	Environment Conservation Act
ECE	–	electrical and computer engineering
ECC	–	environmental clearance certificate
ECR	–	Environment Conservation Rules
ECP	–	environmental code of practice
EHS	–	environmental, health, and safety
EIA	–	environmental impact assessment
EMP	–	environmental management plan
EMOP	–	environmental monitoring plan
GRC	–	grievance redress committee
GRM	–	grievance redress mechanism
ICT	–	Information and communications technology
IEE	–	initial environmental examination
MOE	–	Ministry of Education
MOEFCC	–	Ministry of Environment, Forest and Climate Change
NO ₂	–	nitrogen dioxide
PIU	–	project implementing unit
PMU	–	project management unit
PPE	–	personal protective equipment
SPS	–	Safeguard Policy Statement
UGC	–	University Grants Commission

WEIGHTS AND MEASURES

°C	–	degree Celsius
dB(A)	–	A-weighted decibel
ha	–	hectare
m	–	meter
mm	–	millimeter
mg/L	–	milligram per liter
m ²	–	square meter
µg/m ³	–	microgram per cubic meter
PM _{2.5}	–	particulate matter 2.5
PM ₁₀	–	particulate matter 10
ppm	–	parts per million

NOTE

In this report, "\$" refers to United States dollars.

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EXECUTIVE SUMMARY

Introduction

The Government of Bangladesh, through the Ministry of Education (MOE), requested the Asian Development Bank (ADB) for financing of about \$100 million to cover the costs of the Improving Computer and Software Engineering Tertiary Education Project, which aims to improve 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 Engineering and Technology (BUET), (ii) Jashore University of Science and Technology (JUST), and (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 resources, and create the required environment in developing the skills for entrepreneurship 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 entrepreneurship. These objectives will be delivered through the following four outputs.

Output	Description
Output 1: Modern learning, research, and start-up facilities established	<p>The Improving Computer and Software Engineering Tertiary Education Project will support the four universities in developing classrooms, laboratories, industry collaboration, start-up or incubation space, and auxiliary facilities.</p> <p>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.</p>
Output 2: Quality and industry-relevance of CSE/IT programs enhanced	<p>The project will assist the universities in updating and improving their CSE/IT degree programs using of new technologies, blended learning, and industry-demanded soft-skills; and in strengthening their existing digital libraries to ensure that they are aligned with international standards.</p> <p>JUST will set up an industry certification center for information and communication technology (ICT) professionals in the southwest region. JUST, DU, and BUET will provide undergraduate scholarships to attract more female students to CSE/IT. There will be support to enable the ICT industry to introduce flexible working hours and telecommuting to boost women participation in the ICT industry.</p>
Output 3: R&D and technology entrepreneurship strengthened	<p>The University Grants Commission will provide grants on the following research initiatives: (i) industry collaboration for addressing industry problems or developing new products or services, (ii) interdisciplinary work on ICT solutions that</p>

Output	Description
	associate with other areas to develop new products or services, (iii) cutting-edge CSE/IT research, and (iv) ICT 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 entrepreneurship 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 design and 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.

BUET = Bangladesh University of Engineering and Technology, CSE/IT = computer science and engineering and information technology, DU = University of Dhaka, ICT = information and communication technology, JUST = Jashore University of Science and Technology, R&D = research and development.

Source: University Grants Commission.

From Output 1, the new building for BUET (Electrical and Computer Engineering Annex Building) will involve a new, fully furnished, and complete 17-storey building and three-level basements of about 252,000 square feet (ft²) or about 23,412 square meters (m²) to accommodate around 1,130 graduate and postgraduate students; 119 faculty members; computing and ICT Incubator (about four floors), which will accommodate 20 entrepreneurs for R&D; and other features. The new building will also incorporate green building features and will be designed to be climate change resilient. Construction of the new building in BUET is expected to start in October 2021 and completed by December 2022.

Implementation Arrangements

The MOE will be the executing agency acting through the University Grants Commission (UGC), while the key implementing agencies are BUET, DU, and JUST. A project management unit (PMU) will be set up at UGC, and project implementation units (PIUs) in the three universities will be responsible for the day-to-day management, monitoring, reporting, and coordination during implementation.

Environmental Requirements

The main environmental regulations in Bangladesh are the Environment Conservation Act (ECA) 1995 and the Environment Conservation Rules (ECR) 1997, which provide 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 autonomy in 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.

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 BUET, DU, and JUST. These interventions will have potential environmental impacts. Based on SPS 2009 and using the rapid environmental assessment checklist, the project has been classified as category B on environment requiring the preparation of an initial environmental examination (IEE). Following the requirements of SPS 2009, this IEE is prepared and will be publicly disclosed on the ADB website. Aside from SPS 2009, the disclosure of IEE is also required by ADB's Access to Information Policy (AIP) 2019. The IEEs prepared were disclosed to the ADB website in December 2019 but due to the coronavirus disease (COVID-19) pandemic declared by the World Health Organization (WHO) on 11 March 2020, and the change in the location of the proposed new building in BUET, this IEE has been revised and updated. The revised and updated IEE will be similarly disclosed to the ADB website.

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 2 of the IEE will discuss the due diligence of the new building for BUET.

Description of the Existing Environment

The new Electrical and Computer Engineering Annex Building (ECE Annex Building) in BUET will be in its West Palashi Campus. In 2019, the proposed location is in the north-east corner of the BUET West Palashi Campus as an extension of the existing ECE Building where the Department of Computer Science and Engineering is hosted. However, in March 2021, a new location also within the West Palashi Campus was identified by the BUET Master Plan Committee. The new location is the vacant land between the diesel power generator building and the BUET-Japan Institute of Disaster Prevention and Urban Safety (JIDPUS) building. The land required for the new building will be about 1,260 m².

The Azimpur Government Girls' School and College (AGGSC) is next to the new site and is separated by a perimeter concrete fence site from the BUET West Palashi Campus. AGGSC has an existing academic building (five floors) next to the new site.

Based on the Köppen climate classification, the project area belongs to "Aw" category, which is characterized by tropical wet and dry climate (hot and humid summer and dry winter). According to the Dhaka Station of the Bangladesh Meteorological Department, the maximum monthly temperature varies from 39.6°C to 30.1°C, while the minimum temperature ranges from 22.5°C to 6.5°C. Annual average rainfall is 2,066 millimeters (mm) and the highest rainfall recorded was 3,028 mm, which occurred in 1984.

The project site is in the urban area with no identified ecologically sensitive areas close or adjacent to the site. Dhaka falls under seismic zone II (moderate seismic risk) and is subject to normal flooding during the monsoon season (June to September).

The DOE maintains three continuous air monitoring stations in Dhaka under the Clean Air and Sustainable Environment Project funded by the World Bank since May 2009. The three stations are Sangshad Bhavan, Sher-e-Bangla Nagar, Farmgate, and Darus-salam. Based on their monitoring results from January 2019 to December 2020, inhalable particles, with diameters that are generally 10 micrometers and smaller (PM₁₀), fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller (PM_{2.5}), and nitrogen dioxide (NO₂) exceed the limits set by National Ambient Air Quality Standards (NAAQS) 2005.

Ambient air sampling was done on 4 April 2019 in three stations within the 500-meter (m) radius from the BUET project site to determine the levels of PM₁₀, PM_{2.5}, and NO₂. Results of this one-time sampling suggest that the station across the project site (Palashi Bazar Market) has more air pollution sources than in the Eden Mohila College, and in front of the existing ECE Building in BUET (West Palashi Campus) as it did not meet the limits set by NAAQS 2005 for PM₁₀, PM_{2.5}, and NO₂ as well as the International Finance Corporation-World Bank Environmental, Health, and Safety (IFC-WB EHS) General Guidelines 2007. Noise level was similarly measured on 4 April 2019 in the same stations as the ambient air sampling. Results suggest that Palashi Bazar Market exceeded the daytime and nighttime levels set by the Noise Pollution Control Rules 2006 as well as the IFC-WB EHS General Guidelines 2007. Source of drinking water at the project site was tested on 30 March 2019 for heavy metals (arsenic, cadmium, hexavalent chromium, and lead), fecal coliform, and pH. Results show that it meets the standards set by Schedule 3(b), Rule 12 of ECR 1997 and WHO.

Vegetation in the previous site and in the new location is limited, with less than 10 mature trees and some patches of grass. While the new site is a vacant, there is an existing small graveyard with two persons buried - one is unidentified while the other one is identified with a stone marker associated with the Bangladesh Liberation War in 1971. With the proposed new CSE building, BUET sent a letter to the Ministry of Liberation War Affairs (MOLWA) on 31 August 2016 informing them about the project and seeking their permission to construct a new high-rise academic building beside the graveyard. However, MOLWA responded on 26 September 2016 that they are not responsible in this regard.

The vacant land with the graveyard used to be under the Public Works Department but in 1998-1999, the government turned it over to BUET for additional space. Now that there is a need for a better vacant land to accommodate the new ECE building, the BUET Master Plan Committee decided on 28 March 2021 during its 4th meeting to relocate the graveyard in a suitable place following the government procedures.

Coronavirus disease (COVID-19) pandemic The first case of COVID-19 in Bangladesh 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 adopt remote learning, but the lack of digital infrastructure affected most of the students.

COVID-19 testing started in May 2020 and with support from WHO and other international financial institutions like ADB, there are a total of 502 laboratories and testing centres in the country as of 31 May 2021. Based on WHO Bangladesh, there are a total of 826,922 cases as of 14 June 2021 with 13,118 related deaths and 766,266 recovered cases.

To ensure that students, teachers, employees, and their families are informed of the COVID-19 situation and the available support, BUET posted guidance notes on its website (<https://www.buet.ac.bd/web/#/covid19/2>). Online health support is made available 24/7 from the doctors at the BUET Medical Centre. A safety checklist was also posted on the BUET website on campus protocols before and during a visit to BUET campus.

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 estimated cost of about \$3.1853 million which will cover 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 green building features will contribute to about 232.13 tCO₂ emissions reduction per year.

Given its proximity to the new building (which is 20 floors), the existing 5-floor academic building of AGGSC may be affected during construction and operation. To minimize the potential impacts, BUET will consider during the design/pre-construction phase all features and options such as having firewall at the northern side of the new building so that windows will be in the eastern, western, and southern side, locate the data center and other student-intensive activities in the lower floors, etc.

Prior to construction works, the small graveyard will be relocated to a suitable site following the procedures of the government. The BUET Office of the Chief Engineer will oversee the graveyard relocation and will ensure compliance of applicable government regulations and requirements. No construction contract will be awarded, and no civil works will commence until the graveyard relocation is completed. Outcome of the graveyard relocation (i.e., consultations, site selection, procedures, etc.) will be included in the environmental monitoring report to be submitted by BUET to ADB and will be disclosed in the ADB website.

The PMU in UGC and the PIU in BUET will ensure that the Contractor's responsibilities will include 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) to be approved by the PIU based on guidance notes of WHO and other international best practices to address the transmission risk of COVID-19 at the construction sites that may affect the students and staff of BUET as well as the immediate community in BUET West Palashi Campus. The PMU and PIU together with the environmental safeguard consultant will conduct an orientation for the Contractor and their workers about their responsibility to comply with the environmental requirements of ADB, their awareness of diseases such as HIV/AIDS, COVID-19, and tuberculosis, and their adherence to construction best practices on occupational health and safety.

Associated environmental impacts are mainly during the construction such as increased noise and dust levels, occupational and community safety risks, generation of waste, movements of construction vehicles, presence of workers within the premises of BUET, and similar impacts due to civil, mechanical, and electrical works for the new building. The Contractor will be required to prepare a construction management plan describing the commitments to implement measures in managing these temporary impacts, and details on compliance to the environmental management plan (EMP).

Due to its proximity to the new site, AGGSC may be potentially affected during the construction phase by impacts such as increased noise and dust levels, presence of several construction workers, privacy invasion of the girls in AGGSC, and movements of construction vehicles. The Contractor will be required to ensure that construction impacts that may affect the girls' school are minimized. The construction management plan that will be required from the Contractors will include workers' code of conduct.

Waste that may be generated during project implementation will be disposed of in designated disposal site approved by the Dhaka South City Corporation (DSCC) where BUET is under its jurisdiction. There are four secondary transfer station (STS) in DSCC funded by ADB and it will likely be STS 12 for BUET which is in front of Dhaka Medical College. Final disposal for garbage generated from DSCC is the Matuail landfill site about 6.5 km from BUET.

The construction site will be temporarily enclosed with clear and proper demarcation to separate access of university students, faculty, and administrative staff. Temporary enclosures will be made high enough to protect the students and staff in BUET and AGGSC. The Contractor will designate security personnel to prevent any unauthorized access to the construction site. The use of personal protective equipment (PPE) and safety gear such as hard hats, working gloves, earmuffs, goggles, masks, and similar safety protection will be mandatory. The Contractor will provide sanitary facilities, safe drinking water, first aid kits, hand washing stations with adequate soap and water, hand sanitizers with at least 60% alcohol (if soap and water 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 in compliance to the rules and regulations of the construction site. Strict compliance to COVID-19 containment measures such as social distancing, handwashing, use of facial mask if needed, staggered work schedule, etc. will be enforced.

The PIU will also ensure that ambient air quality limits set by the 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

Given the limited available space within the government-owned area in BUET, there were no alternatives considered that may require land acquisition. Initially, the proposed location of the new building was the open space at the back of the existing ECE Building. This open space is in the north-east corner of the West Palashi Campus. However, in March 2021, a new location was considered by the BUET Master Plan Committee as much better in terms of highest and best usage of available land within the campus, and the configuration of the open space. The new location is in front of the existing ECE Building between the BUET-JIDPUS building and the diesel power generator building which has not been used since February 2016.

The “no project” option will mean that the available vacant space in BUET will not have its best and highest usage of land. As well, the undergraduate and graduate students, faculty, and staff of the CSE Department will not have the opportunity to benefit from innovative ICT learning environment that the new ECE Annex Building will provide.

“With project” option entails that the demand for ICT graduates to meet the requirements of the ICT 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 links to the private sector that are expected to improve chances of graduates for employment.

Information Disclosure, Consultation, and Participation

In the previous location, a total of 61 participants joined the consultation meeting on 3 April 2019 at the BUET West Palashi Campus. Issues raised were participation of students not from CSE

Department in the opportunities that will be provided by the project, behavior of Contractor and their workers, alternate access of Contractor and workers to ensure separation from students, potential traffic during construction, emergency preparedness for the new ECE Annex Building, and temporary accommodation for students due to traffic. Participants were not extremely concerned about increased noise and dust level given that the West Palashi Campus is secluded, bounded by a high concrete fence, and the existing academic buildings are insulated from noise. With the proposed new site, virtual consultation was held on 17 June 2021 with the Principal of AGGSC due to the COVID-19 restrictions for a face-to-face consultation. The main concern raised is the potential invasion to the privacy of the girls during construction and operation of the new building due to its proximity and elevation (20 floors). The PIU in BUET will ensure that these concerns are taken into consideration in the building design and during the construction phase.

Due to the COVID-19 situation in Dhaka, no in-person consultations were done yet for the new location. Thus far, the consultations and information disclosure conducted were creation of a project webpage in the BUET website, coordination with MOWLA on graveyard relocation, coordination with AGGSC, and the virtual consultation with the Principal, AGGSC. A stakeholder engagement and information disclosure plan were prepared and will be implemented upon ADB approval of the project. No construction contract will be awarded, and no civil works will start prior to completion of the required consultations for the graveyard relocation and a wider consultation with AGGSC (i.e., representatives from student, staff, and parents).

Consultations will continue during project implementation. The PIU together with the PMU will review the COVID-19 situation in Dhaka City and the restrictions imposed by the government to contain its transmission. While still the 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 usual approach to consultations like town hall meetings, focus groups discussions, and face-to-face 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.

Only essential information such as 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) both in English and Bangla will be made available at the PIU, construction site office, PMU, and BUET administration office. A project brief providing information on the potential environmental impacts and mitigation measures will be posted to the project webpage. This revised and updated IEE, which provides more information, will be posted to the ADB website following the requirements of SPS 2009 and AIP 2019.

Grievance Redress Mechanism

The PMU at UGC will establish a GRM to deal with potential complaints that may be raised 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 submitted either in person to the Site Engineer, 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 interaction. 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 of GRM through the project webpage in the BUET website 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 can 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 construction and post-construction 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. 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 to be submitted to ADB semi-annually during construction and annually post-construction. These monitoring reports will be posted in 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 the 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 grievance redress mechanism will be set up by the PMU consistent to the requirements of SPS 2009. Potential environmental impacts of the project are mainly during construction, which are considered temporary, of short duration, and can be easily mitigated through the implementation of the EMP and EMOP, compliance of the Contractor 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 of the government and WHO to ensure the wellbeing of students, staff, and the immediate local communities in Dhaka City. An environmental safeguard consultant will provide the required technical support to the PIU and the PMU in ensuring that the environmental requirements of ADB are complied with.

I. INTRODUCTION

1. To celebrate its 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, technology-oriented, and gender-equitable learning system.¹

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 the Improving Computer and Software Engineering Tertiary Education Project, which is expected to improve 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 Engineering and Technology (BUET), (ii) Jashore University of Science and Technology (JUST), and (iii) University of Dhaka (DU).

4. Following 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, pages 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 entrepreneurs relevant to CSE/IT. Table 1.1 presents the four project outputs while Map 1.1 presents the project location.

¹ Center for Policy Dialogue. 2007. [Bangladesh Vision 2021](#). Dhaka

¹ 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.

Table 1.1: Project Outputs

Output	Description
Output 1: Modern learning, research, and start-up facilities established	<p>The Improving Computer and Software Engineering Tertiary Education Project will support the four universities in developing classrooms, laboratories, industry collaboration, start-up or incubation space, and auxiliary facilities.</p> <p>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.</p>
Output 2: Quality and industry-relevance of CSE/IT programs enhanced	<p>The project will assist the universities in updating and improving their CSE/IT degree programs using of new technologies, blended learning, and industry-demanded soft-skills; and in strengthening their existing digital libraries to ensure that they are aligned with international standards.</p> <p>JUST will set up an industry certification center for information and communication technology (ICT) professionals in the southwest region. JUST, DU, and BUET will provide undergraduate scholarships to attract more female students to CSE/IT. There will be support to enable the ICT industry to introduce flexible working hours and telecommuting to boost women participation in the ICT industry.</p>
Output 3: R&D and technology entrepreneurship strengthened	<p>The University Grants Commission will provide grants on the following research initiatives: (i) industry collaboration for addressing industry problems or developing new products or services, (ii) interdisciplinary work on ICT solutions that associate with other areas to develop new products or services, (iii) cutting-edge CSE/IT research, and (iv) ICT solutions to address disability issues. Research proposals can be developed together with foreign universities.</p> <p>There would also be support in introducing training programs on technology entrepreneurship as well as rules and incentives to encourage more university-based start-ups and spin-off firms using the facility in output 1.</p>
Output 4: Project design and management capacity strengthened	<p>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.</p>

BUET = Bangladesh University of Engineering and Technology, CSE/IT = computer science and engineering and information technology, DU = University of Dhaka, JUST = Jashore University of Science and Technology, R&D = research and development.

Source: University Grants Commission.

Map 1.1: Project Location Map

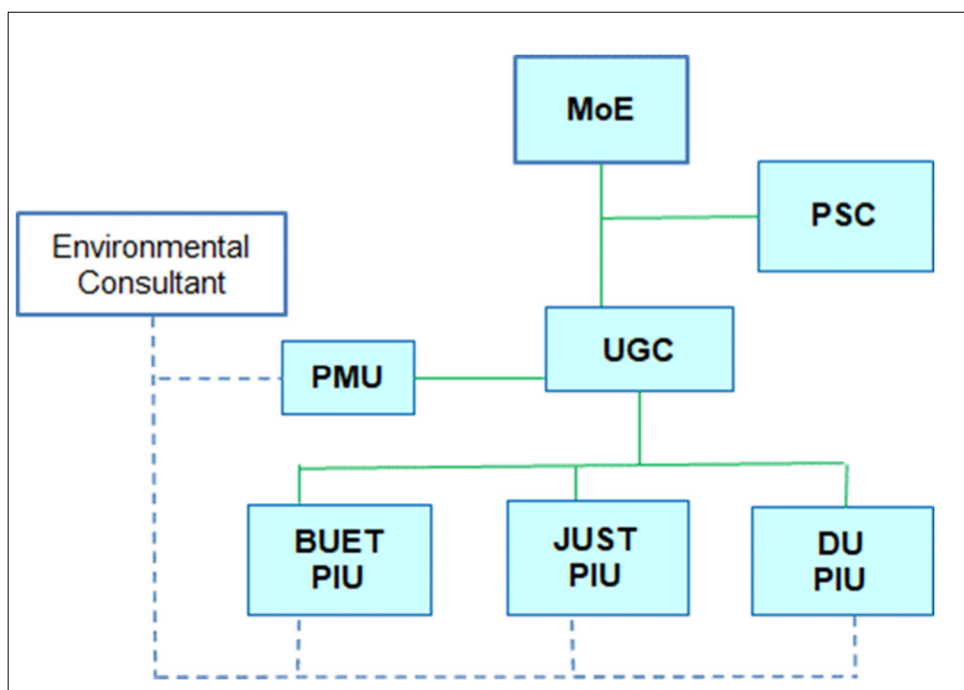


B. Project Implementation Arrangements

7. The MOE will be the executing agency acting through the University Grants Commission (UGC), while the key implementing agencies are BUET, DU, and JUST. A project management unit (PMU) will be set up at UGC, and project implementation units (PIUs) in the three universities 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. PSC will 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 2 years) to provide technical support to the PMU and PIUs in compliance to the environmental requirements of ADB, and the building construction requirements of the government. The project is expected to be completed by June 2026. Figure 1.1 presents the project management structure.

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 implementation 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 provide 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 autonomy in 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 that apply to all the projects and grants ADB finances.²

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 with; 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 of ADB. 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:

- (i) Undertake site visits to collect relevant secondary data to establish the baseline environmental condition.
- (ii) Assess the potential impacts due to location, design, construction, and post-construction of the CSE/IT building.
- (iii) Examine opportunities for environmental enhancement and identify measures.
- (iv) Prepare an EMP outlining the measures to mitigate potential environmental impacts including the institutional arrangements.
- (v) Identify key environmental parameters required to be monitored during project implementation and prepare an EMOP.
- (vi) Carry out consultation with affected stakeholders and local administrative bodies to identify perceptions of the project and introduce project components and anticipated impacts.

² ADB. 2009. [Safeguard Policy Statement 2009](#). Manila.

- (vii) Disclose the draft IEE on the ADB website and prepare a project brief and/or frequently asked questions in Bangla that can be publicly available at the offices of UGC, JUST, BUET, DU, and in the construction sites.

16. Specifically, for BUET, site visits were conducted in January, March, and April 2019 intermittently to collect secondary data, conduct consultations, and coordinate with relevant agencies of the government. Environmental sampling was done on 30 March and 4 April 2019.

17. This IEE is revised/updated to incorporate preparedness to COVID-19 and to consider the environmental implications (if any) of the new location also within BUET West Palashi campus proposed by the BUET Master Plan Committee.

II. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

A. National Environmental Requirements

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

(i) Environmental Agency

19. 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. MOEFCC also conducts surveys, impact assessment, control of pollution, research, collection and dissemination of environmental information, and creation of environmental awareness among all sectors in Bangladesh.

20. Created in 1989, the 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; provides guidance and training; and conduct promotional campaigns on improving the awareness of environmental issues.

(ii) Environmental Regulations

21. 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.

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

23. 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 an ECC; and (iii) the requirements for the IEE based on categories of industrial and other development interventions.

24. 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 Environmental Regulations

Regulation	Brief Description
Bangladesh National Building Code 2006	Sets minimum standards for the 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 supersede the previous Building Construction Rules of 1984 and 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 particular 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 objective-oriented, and strengthens and formulates rules to build infrastructure for effective disaster management to face all types of disasters.
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 activity. 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 for childcare services. Based on this Act and Labor Laws, medical facilities, first aid, and accident and emergency arrangements are to be provided by the authorities to the workers at workplaces.
Bangladesh Labor Act 2006 (amended 2013), Bangladesh Labor Rules 2015	These regulations are under the Ministry of Labor, which provides for the occupational rights and safety of factory workers and the provision of a comfortable work environment and reasonable working conditions, including the prohibition of child and adolescent labor.
The Antiquities Act 1968 (amended 1976)	Regulation on the preservation and protection of antiquities

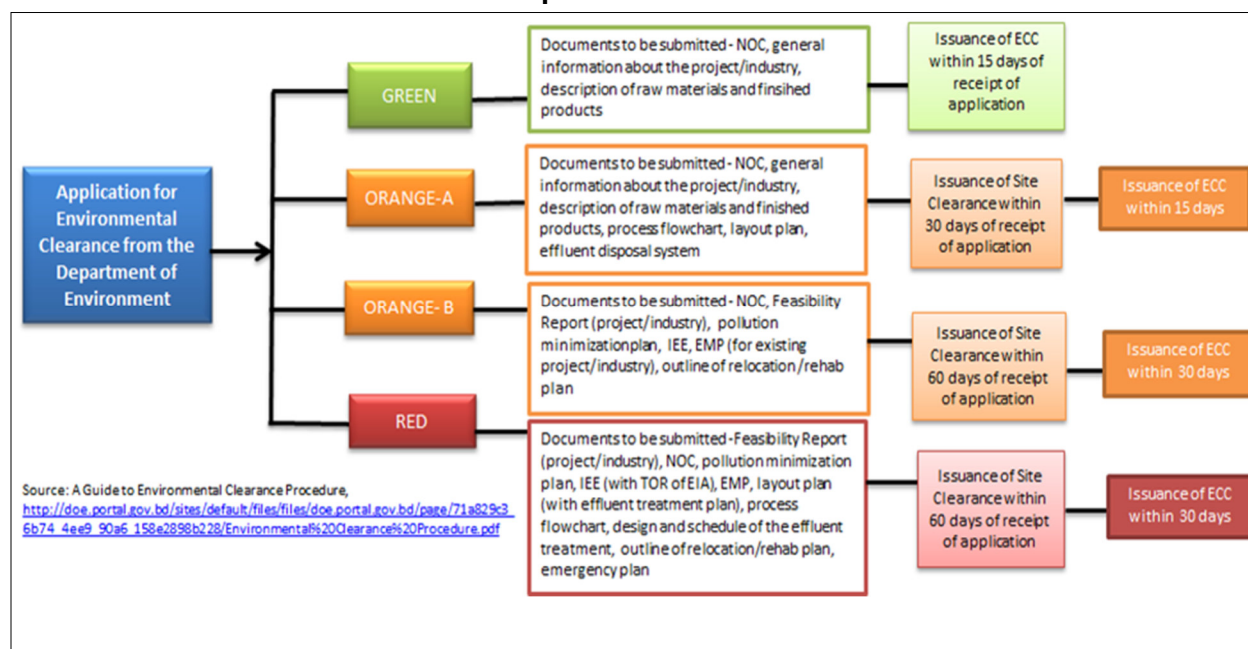
Regulation	Brief Description
The Embankment and Drainage Act 1952	Consolidates the laws relating to embankments and drainage, providing provision for the construction, maintenance, management, removal, and control of embankments and water courses for the better drainage of lands and for their protection from floods, erosion, or other damage by water.
Right to Information Act (RTI Act) 2009	<p>Came into force on 1 July 2009 primarily to increase transparency and accountability, decrease corruption and establish good governance.</p> <ul style="list-style-type: none"> • Only citizens have the right to demand and receive access to information from public bodies. • Scope - extends to the executive, legislative branch and organisations that undertake public functions; private organisations with government or foreign funding are included, which applies to NGOs, international organisations, and other private bodies.

(iii) Environmental Approval Process

25. 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 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 projects and industrial units that may have potential adverse environmental impacts and therefore require an environmental impact assessment (EIA). Securing the ECC for these categories involves two steps: (i) issuance of site clearance certificate, and then (ii) the ECC.

26. The site clearance certificate will be issued by the DOE upon approval of the initial environmental examination (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 a line of credit in favor of importable machineries and cannot start any physical activity for the project without the DOE-approved EIA. Figure 2.1 presents the overview of the approval process.

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



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

(iv) Applicable Environmental Standards

27. 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 Leq, dB(A)	
	Daytime (6 a.m. –9 p.m.)	Nighttime (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

AIR^a		
Pollutant	Standards	Averaging Period
(iii) Mixed areas, which are used as residential areas as well as for commercial and industrial purposes	60	50
(iv) Commercial areas	70	60
(v) Industrial areas	75	70

dB(A) = A-weighted decibel, NO_x = oxides of nitrogen, PM_{2.5} = particulate matter 2.5, PM₁₀ = particulate matter 10, ppm = parts per million, µg/m³ = microgram per cubic meter.

Note: 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 the International Finance Corporation–World Bank Environmental, Health, and Safety General Guidelines 2007

WHO Ambient Air Quality Guidance		
	Averaging Period	Guideline value in µg/m³
SO ₂	24-hour	125 (Interim target 1) 50 (Interim target 2) 20 (guideline)
	10 minutes	500 (guideline)
NO ₂	1-year	40 (guideline)
	1-hour	200 (guideline)
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)
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)
Noise Level Guidelines		
Receptor	One Hour Leq (dBA)	
	Daytime (7:00 a. m.-10:00 p.m.)	Nighttime (10:00 p.m.-7:00 a.m.)
Residential; Institutional; educational ^a	55	45
Industrial; commercial	70	70

dB(A) = A-weighted decibel, NO₂ = nitrogen dioxide, PM₁₀ = particulate matter 10 micrometers, PM_{2.5} = particulate matter 2.5 micrometers, SO₂ = sulfur dioxide.

^a Guidelines values are for noise levels measured out of doors (Source: Guidelines for Community Noise, WHO, 1999).

Note: Leq means equivalent continuous sound level or the average sound pressure level over a specified time interval.

Source: World Bank Group-International Finance Corporation Environment, Health and Safety (EHS) General Guidelines 2007.

(v) Relevant International Environmental Agreements

28. 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 entered into force on 1 January 1989. It 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.
United Nations Framework Convention on Climate Change (1992)	15 April 1994	This framework came into force on 21 March 1994 and aims to achieve stabilization of greenhouse gas 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. It 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	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

International Environmental Agreement	Date Ratified	Description
	offer or the opportunity to become a party to a treaty already negotiated and signed by other states	inscription on the World Heritage List, gives details of how a property is protected, and provides a management plan for its upkeep.

B. Environmental Requirements of the Asian Development Bank

29. The SPS 2009 sets the environmental requirements and review procedures that apply to all projects and grants that ADB finances. 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.

30. 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/institutionaldocument/32056/safeguard-policy-statement-june2009.pdf>

31. **Disclosure Requirements.** Aside from the SPS 2009 requirements, the Access to Information Policy (AIP) 2019 provides for the requirements of disclosure for project information

of projects and grants funded by ADB.³ Consistent to SPS 2009, this requires the disclosure of documents submitted by the borrower and/or client as follows:

- (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.

32. 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 BUET, DU, and JUST. A rapid environmental assessment checklist was completed for these components, and the environment category based on SPS 2009, is category 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 particular alternative proposed. Also consider the "no project" alternative.	Alternative sites, where appropriate, were considered and included in the IEE.
4	Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive	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

³ The Access to Information Policy replaces Public Communication Policy 2011.

⁴ If no further mission for appraisal is required, the document will be posted before the 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
	impacts by means of environmental planning and management. Prepare an 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.	guidance to the construction contractor and their subcontractor (if any) who will be engaged during project implementation to ensure compliance with 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 taken into account. 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.	<p>Three consultation events were undertaken during the preparation of the IEE (one per university). Consultations will continue through the PIUs in each university (as appropriate) during project implementation.</p> <p>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.</p>
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.	<p>During construction phase, the contractor will be responsible for implementing the EMP and will be monitored by the PIU and PMU.</p> <p>Environmental monitoring reports and corrective actions (if needed) will be prepared by the PIUs and will be disclosed on the ADB website.</p>
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	All the proposed interventions with environmental implications are not located in critical habitats as defined by SPS 2009.

No.	SPS 2009 Principles	Description
	<p>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.</p>	
9	<p>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.</p>	<p>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 available Energy Star certified products and will incorporate green building features. (Refer to  https://www.energystar.gov/about/energy-star-brand/energy-star-brand-book)</p>
10	<p>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.</p>	<p>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. Compliance will be monitored by the PIUs and PMU.</p> <p>Contractors will be required to prepare a health and safety plan in response to the coronavirus disease (COVID-19) pandemic and will be an integral part of the EMP.</p>
11	<p>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</p>	<p>The sites are within the existing premises of the universities and are not known to have physical cultural resources as defined by SPS 2009.</p>

No.	SPS 2009 Principles	Description
	the use of “chance find” procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.	

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

33. The 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 buildings for BUET, DU, and JUST.

Output 1: An established modern learning, research, and startup supporting environment	<p>The project will support the three universities in developing classrooms, laboratories, industry collaboration, start-up or incubation space, and auxiliary facilities.</p> <p>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.</p>
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34. To realize the objectives and goals of the other outputs in the project, a high-rise building will be required for BUET given the limited space available within the premises of the university. BUET is the premiere technological and engineering university of Bangladesh, and the Computer Science and Engineering (CSE) Department is the first department in Bangladesh providing information and communications technology (ICT) education.

35. Initially in 2019, the proposed high-rise building will be constructed at the north-east corner of the West Palashi Campus of BUET as an extension of the existing Electrical and Computer Engineering (ECE) Building (ECE Annex) where the CSE department is hosted. However, in March 2021, the BUET Master Plan Committee decided on a new location at the south side of its West Palashi Campus, opposite the middle part of the existing ECE Building. The new location is the empty space between the existing building of the diesel power generator (800 kilowatt) and the BUET-Japan Institute of Disaster Prevention and Urban Safety (JIDPUS) (Figure 3.1). The existing diesel power generator was installed in November 2013 to provide emergency power for the BUET West Palashi campus during events of power shortfall in Greater Dhaka area. However, with the improvement in the power supply from the national grid, the diesel power generator has not been used since February 2016.

36. The land required for the new building will be about 1,260 m². The new building will have a total floor area of 252,600 ft² or about 23,412 m² consisting of three-level underground parking lot, ground floor, and additional 16 floors (Table 3.1). It will incorporate green building features expected to reduce the use of energy and water resources. The estimated cost for green building features is \$3.185 million and will cover the design, choice and use of construction materials, energy-efficient lighting and cooling systems, and relevant Energy Star-certified products available in Bangladesh such as data centre equipment, office equipment, and electronics. The

total estimated cost for the civil works of the new building is \$12.14 million and will have the following specifications:

- (i) Fully furnished 17-storey building and three-level basements for parking (total area – about 23,412 m²).
- (ii) Will accommodate 1,130 graduate and post-graduate students, and 119 faculty members.
- (iii) Will have computing and ICT Incubator (about four floors) which will accommodate 20 entrepreneurs for R&D and other features.
- (iv) Big data R&D Center (24/7 infrastructure in standard data center, use of Spark and Hadoop⁵ as big data analytics) and will incorporate big data analytics in curriculum.
- (v) Will include CSE BUET Open Course Ware (establish open access repository with online materials such as digital slides, audio-visual lectures, online ICT-based assignments, online discussion sessions, etc.).
- (vi) Separate stream of distance and online learning certification and/or diploma program.
- (vii) Will incorporate green building features and be designed to be climate change resilient.

Table 3.1: Tentative Plan for the New ECE Annex Building

Particulars	Spaces in each floor, ft ²	Floor Area, ft ²
Three-storied underground parking lot	12,600	37,800
Ground Floor + 16 storied building	12,600	214,200
Foundation for Ground Floor + 16 storied building + three-storied underground parking lot	12,600	12,600

ft² = square foot

Source: Table 5.1 in BUET. 2019. *Revised Final Proposal*. Dhaka. p. 24.

37. **Graveyard in the new location.** While a vacant area, the new location has a small graveyard with two persons buried - one is unidentified while the other is identified with a stone marker. The identified stone marker is associated with the Bangladesh Liberation War in 1971. The vacant land with the graveyard used to be maintained by the Public Works Department but in 1998–1999, the government turned it over to BUET for additional space. Since then, BUET has maintained the graveyard. Now that there is a need for a better vacant land to accommodate the new CSE building, the BUET Master Plan Committee decided on 28 March 2021 during its 4th meeting to relocate the graveyard in a suitable place following government procedures.

38. **COVID-19 Preparedness in BUET.** To ensure that students, teachers, employees and their families are informed of the COVID-19 pandemic and the available support, BUET posted guidance notes on its website (<https://www.buet.ac.bd/web/#/covid19/2>).

39. Consistent to the COVID-19 guidelines issued by the government, BUET suspended all physical academic activities on 16 March 2020 and by 22 August 2020 decided to resume all academic activities online. BUET has also taken all the necessary health and safety measures to protect the wellbeing of its students, faculty, and staff. Online health support is made available

⁵ Apache Spark is lightning-fast unified analytics engine for big data and machine learning while Apache Hadoop is a framework that allows for the distributed processing of large data sets across clusters of computers using simple programming models. See <https://databricks.com/spark/about> and <https://hadoop.apache.org/>.

24/7 from the doctors at the BUET Medical Centre. A safety checklist was also posted on the BUET website on campus protocols before and during a visit to BUET campus.

40. **Access during construction** BUET will ensure that disruptions to students, staff, and visitors will be minimized by managing access during construction phase through the following measures:

- (i) All large vehicles carrying construction material will be allowed only after 10 p. m. when academic activities are already closed for the day. At this time also, it is expected that there will be no more people walking within the immediate vicinity of the BUET West Palashi campus.
- (ii) The students and employees will be restricted from using the road on the north side of the proposed location of the building while the public will not be allowed to access the south side of ring road.
- (iii) All pedestrians and cars will make a right turn through the north side of ring road to get access to the JIDPUS building.
- (iv) Bypass route and alternate access will be implemented (Figure 3.2).

41. Construction of the new building is expected to commence in October 2021 and completed by December 2022 (about 14 months). The project is expected to be implemented until June 2027.

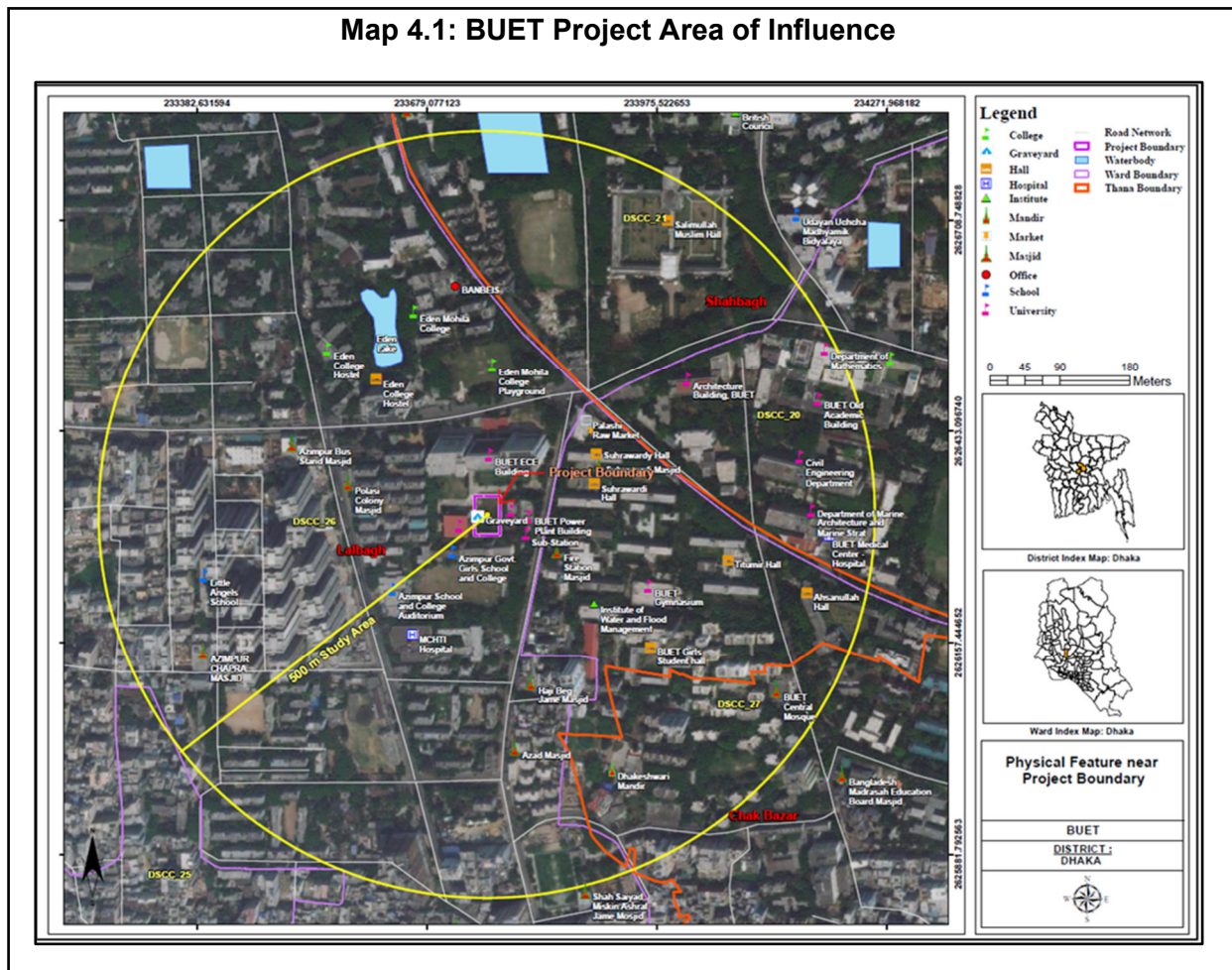
Figure 3.2: Bypass Route and Alternative Access During Implementation



IV. DESCRIPTION OF THE ENVIRONMENT (BASELINE DATA)

42. 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 drinking water source in BUET West Palashi campus were taken by EQMS Consulting Limited on 3 March 2019, and 4–8 April 2019. Measurements were done within a 500-meter radius from the project site (Map 4.1).

Map 4.1: BUET Project Area of Influence

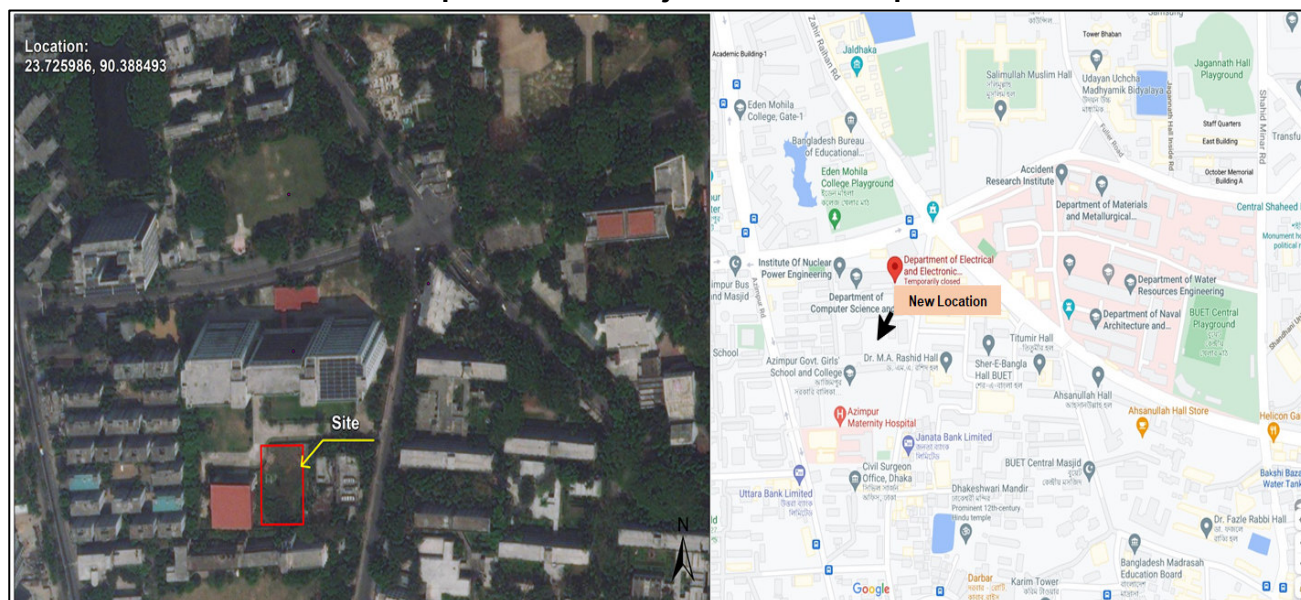


A. The Bangladesh University of Engineering and Technology

43. Located in Dhaka City, the Bangladesh University of Engineering and Technology (BUET) is one of the most prestigious institutions for tertiary studies in Bangladesh. At present, BUET has 18 teaching departments under five faculties and six institutes. The yearly intake of undergraduate students is 1,060; and about 1,000 for graduate students (master's and doctor of philosophy). The total number of faculty members is about 640 while the total number of students is about 10,899.

44. BUET became an engineering college and gained independent university status in 1962 and is now occupying a total area of about 34 hectares (or 83.9 acres). Aside from academic buildings, BUET has a medical center, eight residential halls, 285 teacher's quarters, 70 office quarters, and 596 staff quarters. The Department of Computer Science and Engineering (CSE) was established in 1984 and is under the Faculty of Electrical and Electronic Engineering.

45. The proposed site for the new building is located within the West Palashi Campus of BUET. Map 4.2 shows the location map while Table 4.1 presents the summary of the environmental setting within the study area.

Map 4.2: BUET Project Location Map**Table 4.1: Summary of Environmental Setting in the Study Area**

Item	Details
Location	Within the West Palashi Campus of BUET in Dhaka district under the Dhaka South City Corporation Ward, Lalbagh Thana
Latitude	23.727074
Longitude	90.388938
General elevation	Average ground elevation 6.8 meters above mean sea level
Topography	Terrain in the site is generally flat
Major physiographic unit	The area is in the physiographic unit of Madhupur Tract. It comprises the central part of Dhaka along the course of Brahmaputra–Jamuna Flood Plain.
Major soil type	Soil belongs to a Pleistocene terrace consisting mainly of red and mottled clays. Soil in the valleys is dark gray heavy clay. It is strongly acidic in reaction with low-level of organic matter, low moisture holding capacity, and low fertility level.
Climatic condition	Humid and subtropical, with a typical three season pattern. During the winter season (November–February), cool winds blow from the northeast. The average temperature is 26.1°C. The project area receives on average 2,066 millimeters (mm) of precipitation annually. The prevailing winds vary month to month in the project area, though predominantly in the northwest, south and northeast directions.
Flooding	Area is generally flooded by the ingress of floodwater from the north, west, and south side by the Bangsi, Dhaleswari, Tongi khal, Turag, and Buriganga rivers
Seismicity	Area falls within seismic zone II (medium intensity seismic zone)
Nearest water body	Eden Lake is on the northwest side and about 196 m from the project area; Ramna Lake is on the northeast side and about 1.57 kilometers (km) from the project area. Buriganga River is on the west side and about 3.15 km from the project area.
Ecologically critical area	No identified ecologically critical areas

Item	Details
Reserves and/or protected forests	Site is within the urban area.
Archeologically important place	Curzon Hall is a British Raj-era building and home of the Faculty of Sciences at the University of Dhaka, about 1.25 km from the proposed site
Major settlements	Lalbagh Thana

B. Physical Environment

(i) Geology and Soil

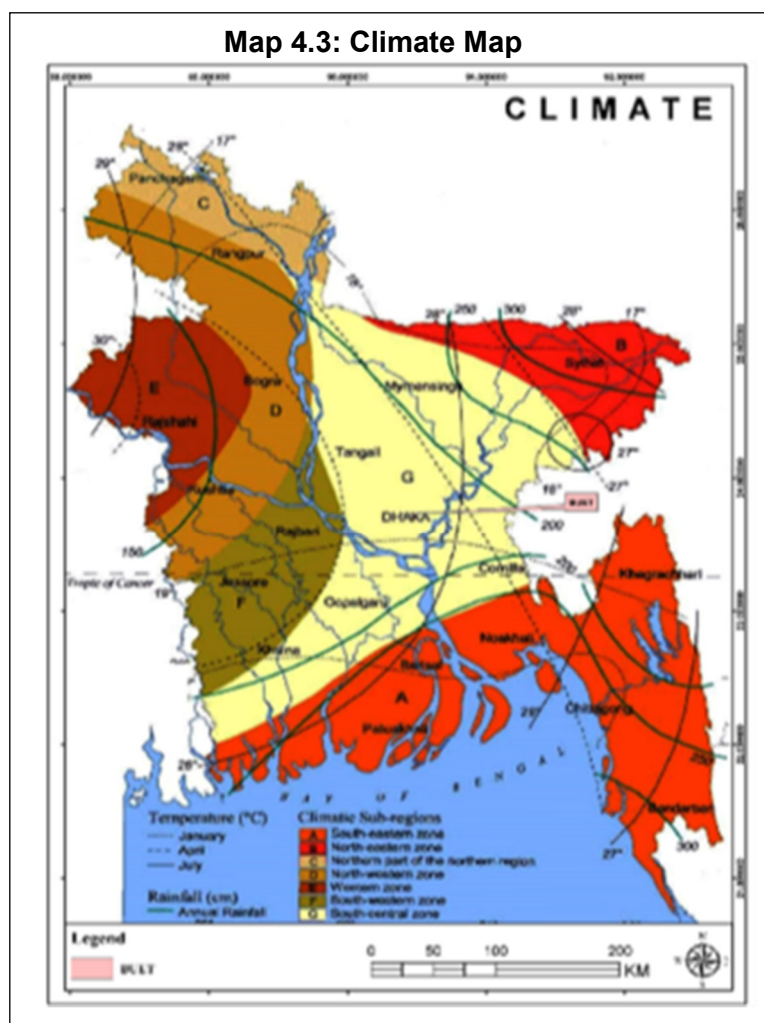
46. Dhaka is within the central-eastern part of Bangladesh. The city is in the extreme south of the Madhupur Tract. The main area is covered by Pleistocene Madhupur clay, a yellowish brown to oxidized reddish brown silty clay. Madhupur Clay makes up most of the surface across the elevated Madhupur Tract. This unit is about 45 m in thickness (compared to the average 10 m thickness in Dhaka) and has a fine sandy layer at its base. The southern part of Dhaka is made of Holocene sediments. The drainage channels and shallow depressions on the Madhupur Tract are partially comprised of gray and yellow organic-rich sands and clays of the Holocene Bashabo Formation.

47. The major geomorphic units of the city are the high land or the Dhaka terrace, the lowlands or floodplains, depressions, and abandoned channels. Low-lying swamps and marshes located in and around the city are other major topographic features. Madhupur Clay of the Pleistocene age characterized by reddish plastic clay with silt and very fine sand particles. The soil is non-calcareous dark gray in color in and around the project area. Moreover, dark grey floodplain soil can be found adjacent to the area of Turag and Buriganga.

(ii) Climate

48. According to the Köppen climate classification, Dhaka falls under Aw category, which is characterized by tropical wet and dry climate. This type of climate experiences hot and humid summer and dry winter. According to climatic characteristics, Bangladesh is divided into seven different climatic subregions. The study area of the project falls under the south-central climatic zone of the country (Map 4.3).

49. Meteorological data recorded at Dhaka station of the Bangladesh Meteorological Department (BMD) from January 1980 to December 2013 were used to describe the climate within the study area. The average maximum temperature ranges between 39.6°C to 30.1°C. The monthly variation of the average minimum temperature is 22.5°C to 6.5°C. The maximum recorded temperature in Dhaka station was 39.6°C, which occurred in March 1999 and April 2009. In January 1995, the minimum temperature was recorded as 6.5°C. The warmest month is April while the coldest month is January.



50. The average monthly rainfall is 332 mm while the maximum rainfall is 836 mm. The minimum monthly rainfall is 59 mm. Annual average rainfall is 2,066 mm and the highest recorded annual rainfall was 3,028 mm which occurred in 1984. The driest period of the year is winter when the average monthly rainfall varies from 21 mm to 7.21 mm. Relative humidity varies from 83.77% to 62.47%.

(iii) Natural Hazards

Flooding

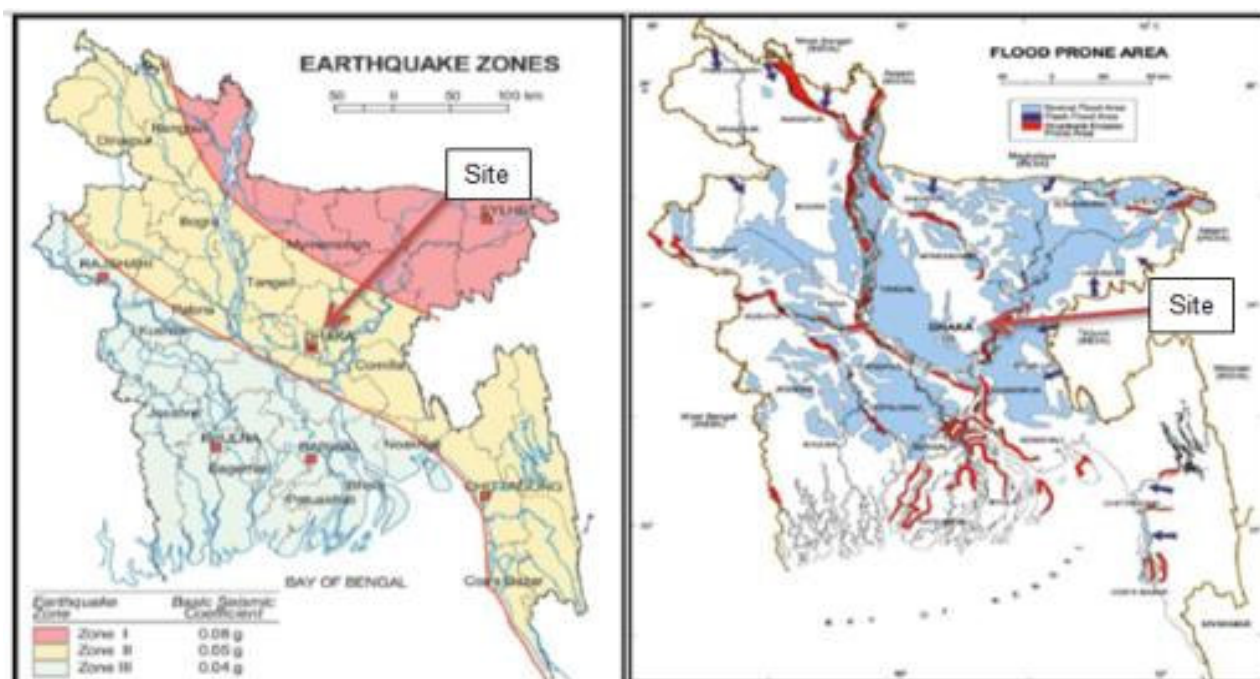
51. Dhaka city was particularly hit by severe floods in 1988 and 1998. During the 1998 flood, about 56% of the city was inundated, including most of the eastern part of the city, and 23% of the western part. Over 60% of the area of Dhaka can be demarcated as flood-risk zone considering its flood history. Floods in Dhaka are caused by high rainfall or by overflowing from the surrounding rivers and canals. The western and most densely settled part of Dhaka is protected from river flooding by raised roads and an encircling embankment built after the 1988 flood. The eastern part of the city where most of the expansion takes place consists of low-lying floodplains that are submerged during the monsoon season. Some issues on Dhaka's flood scenario are provided below.

- (i) All sides of Dhaka city are bounded by rivers and canals.
- (ii) Above 50% of Dhaka is low-lying and inundated during monsoons.
- (iii) Filling of water retention areas and drains increases the risk of seasonal flooding.
- (iv) Encroachment of rivers and canals can increase flood hazard susceptibility.
- (v) Internal drainage congestion can make the flood situation more complex.
- (vi) Poor and/or no enforcement of laws in protecting the low-lying areas in and around Dhaka.

Seismic Effects

52. According to the National Seismic Zoning Map produced by the Geological Survey of Bangladesh, Dhaka lies at the end of the Dauki fault in an area of medium seismic risk. This means that shocks of moderate intensity are possible, with a probable maximum magnitude of 6.5–7 on the Richter scale. Seismic events in Bangladesh are relatively infrequent but historically have been severe, such as the earthquakes of 1930 and 1950, which caused widespread damage throughout the country; and the earthquake in 2004 that damaged large parts of Dhaka City. Map 4.4 shows the seismic zoning and flood-prone areas in Bangladesh.

Map 4.4: Seismic Zoning and Flood-Prone Areas, Bangladesh



(iv) Ambient Air Quality and Noise

Ambient Air Quality

53. The DOE maintains three continuous air quality monitoring stations within the Dhaka district. This monitoring is under the Clean Air and Sustainable Environment (CASE) project

funded by the World Bank.⁶ Table 4.2 shows the summary of monitoring results from January 2019 to December 2020 collected through the CASE project, and Map 4.5 shows the location of the monitoring stations.

Table 4.2: Summary of Monitoring Results under Clean Air and Sustainable Environment Project, January 2019-December 2020

Parameter	National Ambient Air Quality Standards (2005)	Unit of Measure	Station		
			CAMS -1 Sangshad Bhavan, Sher-e-Bangla Nagar	CAMS -2 BARC Farmgate	CAMS -3 Darus-Salam
Average monthly air quality data (January 2019)					
SO ₂ – 24 hr	140	ppb	6.32	2.64	16.8
NO ₂	53 (Annual)	ppb	63.3	141	93.2
PM _{2.5} – 24 hr	65	µg/m ³	131	149	205
PM ₁₀ – 24 hr	150	µg/m ³	DNA	212	302
Average monthly air quality data (February 2019)					
SO ₂ – 24 hr	140	ppb	7.79	2.77	12.4
NO ₂	53 (annual)	ppb	66.1	111	71.0
PM _{2.5} – 24 hr	65	µg/m ³	124	134	144
PM ₁₀ – 24 hr	150	µg/m ³	DNA	235	244
Average monthly air quality data (March 2019)					
SO ₂ – 24 hr	140	ppb	DNA	2.41	5.99
NO ₂	53 (annual)	ppb	84.0	DNA	45.1
PM _{2.5} – 24 hr	65	µg/m ³	86.3	114	123
PM ₁₀ – 24 hr	150	µg/m ³	164	206	225
Average monthly air quality data (April 2019)					
SO ₂ – 24 hr	140	ppb	3.16	2.60	DNA
NO ₂	53 (annual)	ppb	54.3	DNA	21.8
PM _{2.5} – 24 hr	65	µg/m ³	57.2	67.3	71.5
PM ₁₀ – 24 hr	150	µg/m ³	115	149	132
Average monthly air quality data (May 2019)					
SO ₂ – 24 hr	140	ppb	DNA	15.8	DNA
NO ₂	53 (annual)	ppb	DNA	DNA	20.1
PM _{2.5} – 24 hr	65	µg/m ³	38.2	69.6	49.7
PM ₁₀ – 24 hr	150	µg/m ³	98.7	129	99.8
Average monthly air quality data (June 2019)					
SO ₂ – 24 hr	140	ppb	5.75	DNA	DNA
NO ₂	53 (annual)	ppb	DNA	DNA	15.9
PM _{2.5} – 24 hr	65	µg/m ³	18.9	58	33.2
PM ₁₀ – 24 hr	150	µg/m ³	43	105	58.4
Average monthly air quality data (July 2020)					
SO ₂ – 24 hr	140	ppb	DNA	1.415	DNA
NO ₂	53 (annual)	ppb	DNA	5.931	DNA
PM _{2.5} – 24 hr	65	µg/m ³	DNA	15.913	DNA
PM ₁₀ – 24 hr	150	µg/m ³	DNA	25.92	DNA
Average monthly air quality data (August 2020)					
SO ₂ – 24 hr	140	ppb	DNA	1.86	DNA

⁶ Department of Environment. Clean Air and Sustainable Development.
http://case.doe.gov.bd/index.php?option=com_contact&view=contact&id=1.

Parameter	National Ambient Air Quality Standards (2005)	Unit of Measure	Station		
			CAMS -1 Sangshad Bhavan, Sher-e-Bangla Nagar	CAMS -2 BARC Farmgate	CAMS -3 Darus-Salam
NO ₂	53 (annual)	ppb	DNA	7.66	DNA
PM _{2.5} – 24 hr	65	µg/m ³	DNA	21.27	DNA
PM ₁₀ – 24 hr	150	µg/m ³	DNA	33.89	DNA
Average monthly air quality data (September 2020)					
SO ₂ – 24 hr	140	ppb	DNA	2.34	1.23
NO ₂	53 (annual)	ppb	DNA	9.59	23.97
PM _{2.5} – 24 hr	65	µg/m ³	DNA	24.82	33.82
PM ₁₀ – 24 hr	150	µg/m ³	DNA	50.03	54.12
Average monthly air quality data (October 2020)					
SO ₂ – 24 hr	140	ppb	DNA	DNA	1.76
NO ₂	53 (annual)	ppb	DNA	9.17	39.88
PM _{2.5} – 24 hr	65	µg/m ³	DNA	54	59.67
PM ₁₀ – 24 hr	150	µg/m ³	DNA	88.67	93.45
Average monthly air quality data (November 2020)					
SO ₂ – 24 hr	140	ppb	DNA	8.05	1.62
NO ₂	53 (annual)	ppb	DNA	DNA	59.89
PM _{2.5} – 24 hr	65	µg/m ³	DNA	119.36	114.52
PM ₁₀ – 24 hr	150	µg/m ³	DNA		
Average monthly air quality data (December 2020)					
SO ₂ – 24 hr	140	ppb	DNA	6.24	2.38
NO ₂	53 (annual)	ppb	DNA	9.4	55.95
PM _{2.5} – 24 hr	65	µg/m ³	DNA	168.2	182
PM ₁₀ – 24 hr	150	µg/m ³	DNA	228.89	236.36

BARC = Bangladesh Agricultural Research Council, CAMS = Continuous Air Quality Monitoring Station, DNA = Data not available, µg/m³ = microgram per cubic meter of air, NO₂ = nitrogen dioxide, PM_{2.5} = particulate matter 2.5, PM₁₀ = particulate matter 10, ppb = parts per billion, SO₂ = sulfur dioxide.

Source: DOE. Clean Air & Sustainable Environment.

http://case.doe.gov.bd/index.php?option=com_content&view=article&id=11&Itemid=8.

54. Based on the ambient air quality monitoring data from January 2019 until December 2020 recorded by the CASE project, results suggest that only SO₂ meets the National Ambient Air Quality Standards (NAAQS) 2005 in the three monitoring stations. CAMS-1 and CAMS-2 meet the limit for PM₁₀ (150 µg/m³) while CAMS-3 meets the annual limit for NO₂ (53 ppb). Results from July-December 2020 show that SO₂, NO₂, and PM₁₀ meet the limits set by NAAQS (2005) but not the limit for PM_{2.5}. The results for SO₂, NO₂, and PM₁₀ complying with the limits set by NAAQS (2005) may have been influenced by the significantly reduced or lack of domestic activities at the height of the COVID-19 pandemic. Existing sources of air pollution are mainly vehicular emissions, ongoing construction of large infrastructure projects, and dust-generating activities of densely populated settlements.

Map 4.5: Continuous Ambient Air Quality Monitoring Stations, CASE Project

55. Ambient air quality measurements were conducted on 4 April 2019 at and around the project site by the EQMS Consulting Limited. Three sampling stations were identified (Map 4.6) and results are given in Table 4.3.

Table 4.3: Results of Ambient Air Quality Measurements, 4 April 2019

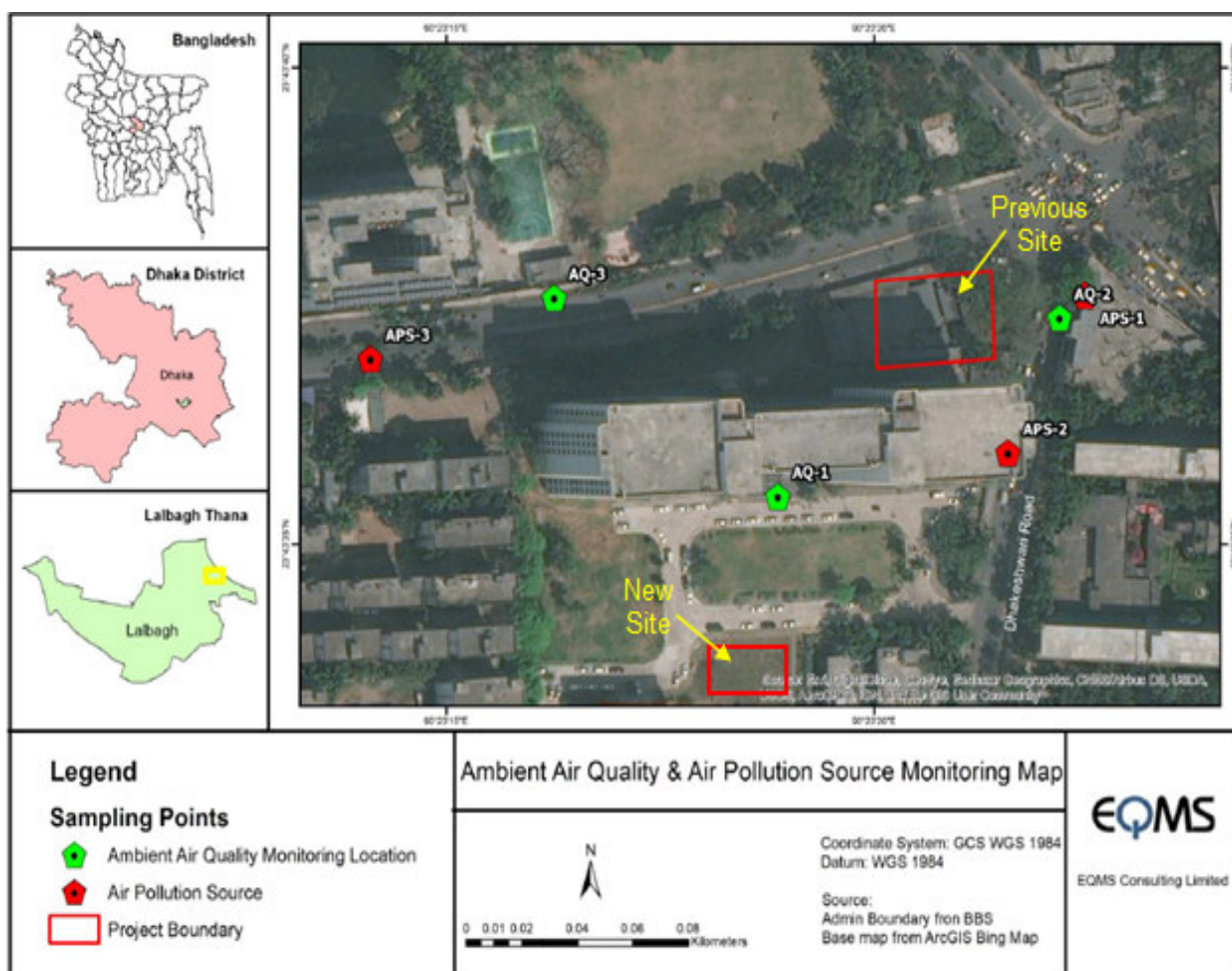
Location	Concentration ($\mu\text{g}/\text{m}^3$)		
	PM ₁₀	PM _{2.5}	NO ₂
AQ1 – In front of Electrical and Computer Engineering Building at West Palashi Campus, BUET	53.41	36.93	34.15
AQ2 – In front of Palashi Bazar Market	198.67	154.03	144.7
AQ3 – In front of Eden Mohila	35.88	26.33	55.01

Location	Concentration ($\mu\text{g}/\text{m}^3$)		
	PM ₁₀	PM _{2.5}	NO ₂
College			
Duration (hour)	24	24	1
Standards Environment Conservation Rules 1997 and amendment in 2006 Standard (Schedule 2)	150 (24 hours)	65 (24 hours)	100 (annual)
World Bank–International Finance Corporation standard	50 (guideline)	25 (guideline)	200 (1 hour)

AQ = air quality, NO₂ = nitrogen dioxide, PM_{2.5} = particulate matter 2.5, PM₁₀ = particulate matter 10

56. Results from the three stations suggest that there are more sources of air pollution in front of Palashi Bazar Market (AQ2) than in front of West Palashi Campus BUET (AQ1) or at Eden Mohila College (AQ3).

Map 4.6: Ambient Air Quality Sampling Stations, Project Site



Noise

57. Main sources of increased noise level at and around the project site are vehicles and the use of construction equipment at the existing road construction. Three noise sampling stations were identified to establish the baseline data. Results suggest that there are more noise-generating sources in front of Palashi Bazar Market as well as in Eden Mohila College. Measurements were done on 4 April 2019 and results are given in Table 4.4 while sampling stations are shown in Map 4.7.

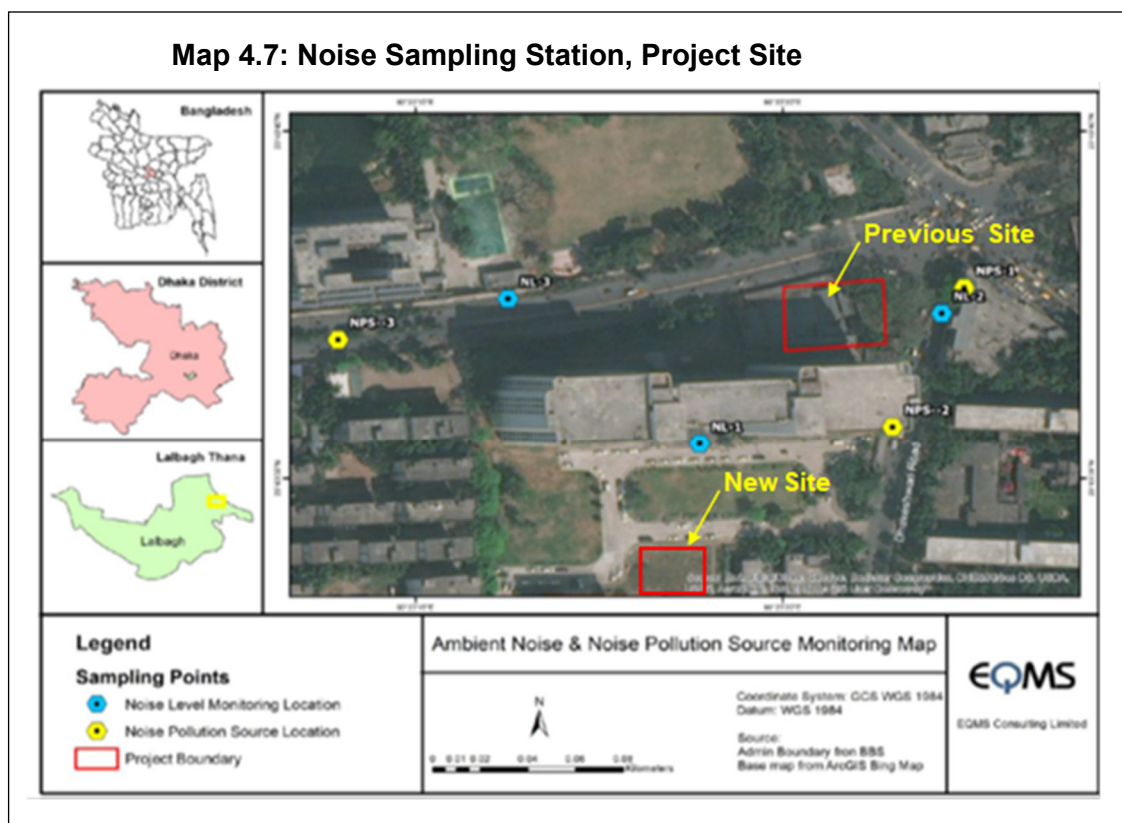
Table 4.4: Results of Ambient Noise Sampling, 4 April 2019

Location	Coordinates	Leq day (dBA)	Leq night (dBA)
NL1 – Infront of ECE building	23°43'35.50" N 90°23'18.88" E	55.28	43.88
NL2 – In front of Palashi Bazar near Palashi West Campus, BUET	23°43'37.37" N 90°23'22.17" E	68.00	64.58
NL3 – In front of Eden Mohila College near Palashi West Campus, BUET	23°43'37.58" N 90°23'16.27" E	55.21	48.1
Noise Pollution Control Rules 2006	Mixed use	60	50
International Finance Corporation–World Bank Environmental, Health, and Safety General Guidelines 2007	Residential, institutional, educational	55	45

BUET = Bangladesh University of Engineering and Technology, dBA = decibel, NL = noise level.

Note: Leq equivalent continuous sound pressure level or the average sound pressure level over a specified time interval.

Map 4.7: Noise Sampling Station, Project Site



(v) Groundwater Quality

58. On 30 March 2019, drinking water sample was collected from the faucet within the project site (Figure 4.1) at the West Palashi Campus for laboratory analysis of fecal coliform, pH, arsenic, lead, cadmium, and chromium (hexavalent). Results show that the drinking water sample meets the limits for fecal coliform, pH, arsenic, lead, cadmium, and hexavalent chromium set by the Environment Conservation Rules (Schedule 3B Rule 12) and WHO. Table 4.5 shows the results of sampling.

Figure 4.1: Water Sampling at the Project Site



Table 4.5: Result of Drinking Water Analysis

Water Quality Parameter	Unit of Measure	Allowable Limit		Sampling Station: Project Site, West Palashi Campus
		Bangladesh Environmental Quality Standards	World Health Organization	Result of Analysis
Fecal Coliform	n/100 ml	0	Must not be detectable in any 100 ml sample	0
pH	–	6.5–8.5	–	6.78
Arsenic	mg/l	0.05	0.01	<0.010
Lead	mg/l	0.05	0.01	0.002
Cadmium	mg/l	0.005	0.003	Below detectable limit
Chromium	mg/l	0.05	0.05	0.001

– = not applicable, BDL = below detectable limit, mg/l = milligram per liter, ml = milliliter, n = number, WHO = World Health Organization.

Date of sampling: 30 March 2019.

C. Biological Environment

59. The previous project site has minimal vegetation (see Figure 4.1) with about less than 10 mature trees. No natural terrestrial flora of significance for protection remains at the project site. The composition of the plant community is low growing and herbaceous vegetation as well as other flora typical for urban sites. Some of the major types of trees found in the project area include mahogany, rain tree, *kul*, and *sishu*. Given the urban nature where the BUET West

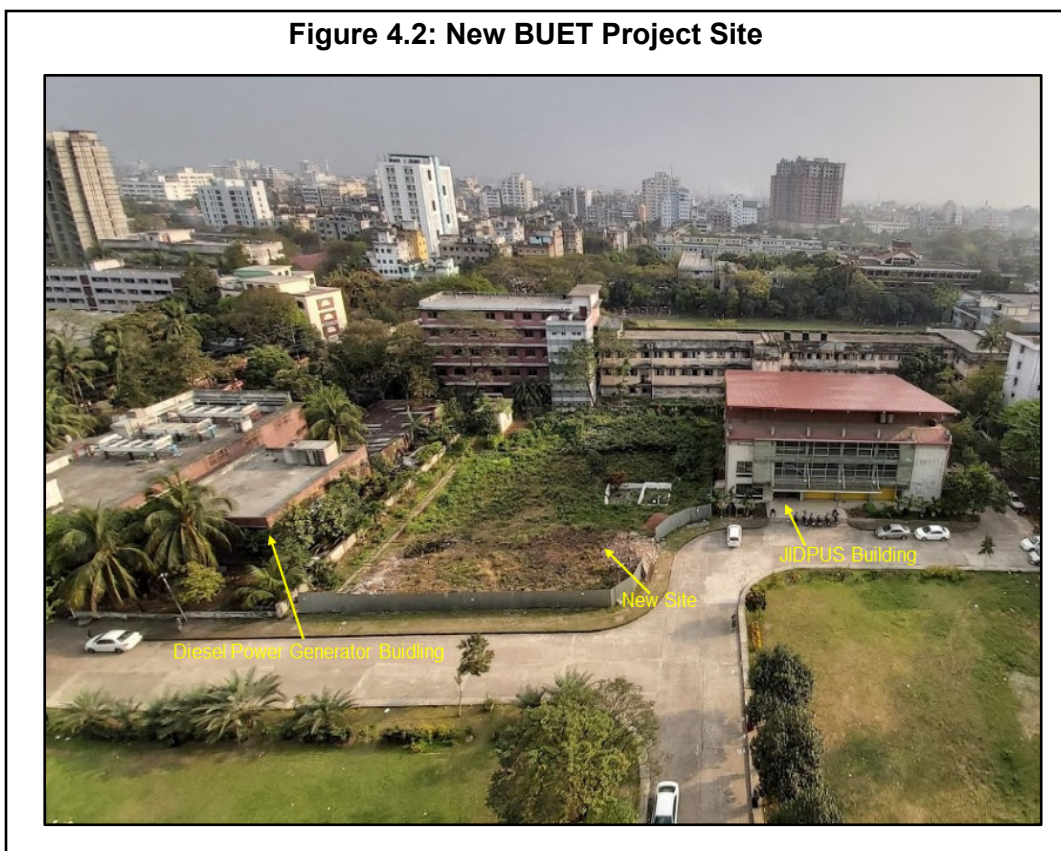
Palashi campus is located, there are no wildlife, and aquatic flora and fauna. There is no habitat within the campus that can sustain these species.

Figure 4.1: Previous BUET Project Site



60. Compared to the previous site, the new site is in between the existing building of the diesel power generator and BUET-JIDPUS has even few shrubs and patches of grass (Figure 4.2).

Figure 4.2: New BUET Project Site



D. Socioeconomic Environment

61. Dhaka is the most populated city in Bangladesh, and it is also one of the most populated cities in the world. According to the Population and Housing Census, 2011 the city itself has an estimated population of about 8 million.

62. BUET is in Lalbagh Thana with a total land area of about 4.1 km². According to Dhaka District Statistics (2013), the population was 7,650 consisting of 1,652 households. The average household size of 4.63 and the population density is 1,866 person/km².

63. Based on the 2011 census, religion in the project area is dominated by Muslim community (94.66%) followed by Hindu (3.79%).

64. Lalbagh is mainly part of Old Dhaka city with narrow road networks and old houses of two- to four-storey building areas. The Old Dhaka City has developed freely with mixed land use showing less or no regard to any urban planning. It has typical land use pattern, a strip of land along the main roads generally used for commercial purpose, and inner areas used for manufacturing and residential purposes. Most of areas of the Old Dhaka City are densely built with low- to medium-rise structure of different forms and designs.

65. Within the 500-m radius from the project site, there are eight mosques, four schools, two colleges, one graveyard, and one temple. Table 4.6 presents a list of important historical sites close to BUET.

Table 4.6: Important Historical Sites

Site Name	Importance	Distance (kilometers)
Tin Netar Majar	Monument to three renowned political leaders of the subcontinent	0.95
Doyel Chattar	Monument of national symbolic importance, expressed by Doyel bird	0.98
Curzon Hall	British-era building; example of aesthetic architecture of that time	1.14
Old High Court Building	Historical building important for the history, culture, and heritage of country	1.0
Bangladesh National Museum	National museum representing the national history, culture, and heritage	0.26
Bangla Academy	Building of historical and cultural importance	0.65
Shourawardy Uddayan	Historical place with historical links with national independence	0.22

66. **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 2005.⁷ The COVID-19 is a new disease with similar symptoms as influenza but different in terms of severity and community transmission.⁸ On 11 March 2020, the WHO recognized COVID-19 as a pandemic, “an

⁷ World Health Organization (WHO). 2005. *International Health Regulations (2005). 3rd Ed.* Geneva.

⁸ WHO. 2021. *Health Topics. Coronavirus.* Geneva.

epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people”.⁹

67. 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.¹⁰ During the closure, educational institutions opted to adopt remote learning, but the lack of digital infrastructure affected most of the students.

68. The following are some of the initiatives taken by the government in response to the challenges facing the education sector due to COVID-19 pandemic:¹¹

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

69. COVID-19 testing started in May 2020 and with support from WHO and other international financial institutions like ADB, there are 109 testing laboratories in Bangladesh by October 2020.¹² As of 24 December 2020, there have been additional 30 COVID-19 dedicated hospitals, 10,510 COVID-19 dedicated general beds, and 582 intensive care unit beds.

70. According to WHO Bangladesh, as of 13 June 2021, a total of 826,922 COVID-19 cases have been recorded by the government with 13,118 related deaths and 766,266 cases recovered. Surveillance and testing are done in the country’s 502 laboratory and test centres. Of the COVID-19 cases reported in Bangladesh, 68.61% represents Dhaka division (58.9% or about 334,170 cases in Dhaka City). Figure 4.2 shows the cumulative COVID-19 incident cases in Bangladesh as of 13 June May 2021. About 5.822 million vaccines have been administered for the 1st dose and about 4.25 million vaccines for the 2nd dose.¹³

⁹ WHO. [Bulletin of the World Health Organization](#). Geneva.

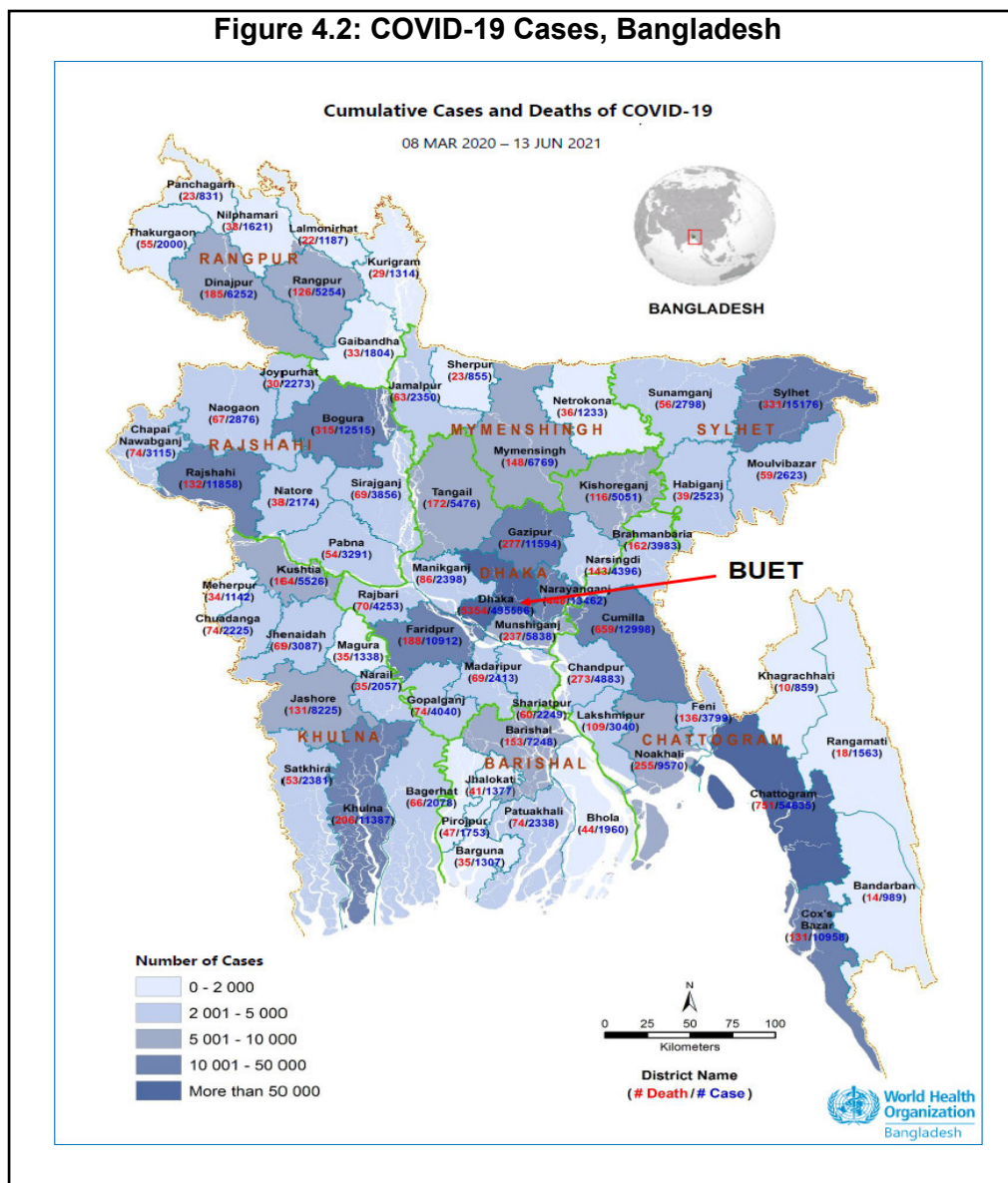
¹⁰ UNESCO. [COVID-19 Impact on Education](#). Paris.

¹¹ Bangladesh. Ministry of Education. 2020. [COVID-19 Response and Recovery Plan Education Sector](#). Dhaka.

¹² WHO. [Increased testing capacity, essential step in fighting COVID-19](#). Geneva.

¹³ WHO. 2021. [Morbidity and Mortality Weekly Update \(MMWU\) No. 68](#). Geneva.

Figure 4.2: COVID-19 Cases, Bangladesh



V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

71. 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 and adherence to best practices in construction engineering. The environmental monitoring plan (EMOP) will provide the key elements to be monitored to ensure compliance by the Contractor with the approved building design and relevant regulations on building construction, occupational and environmental health, and safety. In response to the COVID-19 pandemic, the Contractor(s) will be required to prepare a health and safety plan (H&SP) and will be an integral component of the EMP (Appendix 8).

A. Pre-construction and Design Phase

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

73. Green building features were incorporated in 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 with an estimated cost of about \$3.1853 million, which will cover cost of construction materials, use of energy-efficient lighting system and electric fans, and relevant Energy Star-certified products available in Bangladesh. The use of energy-efficient lighting and cooling equipment from incorporating green building features will contribute to an estimated 232.13 tCO₂ emissions reduction per year.

74. Aside from incorporating green building features, relevant provisions set forth in BNBC 2006 and BNBC 2015 (draft) will be adhered to in the design and construction of the new building. Should there be any changes in the design from where this IEE was based, the PIU will revise the IEE, PMU to review and submit to ADB for disclosure to their website.

Azimpur Government Girls' School and College close to the site of the new CSE building

75. The new site for the proposed CSE building is next to the Azimpur Government Girls' School and College (Figure 5.1). Established by the MOE in 1957, the Azimpur Government Girls' School and College (AGGSC) covers an area of 5.3 acres (or 2.14 hectares) with one five-storey building and two three-story buildings.¹⁴ A perimeter fence separates the BUET West Palashi campus from the AGGSC. Given the proximity of the girls' school, the design of the new CSE building will consider features and options that will avoid any harm or inconvenience to both BUET and the girls' school, or any potential invasion of privacy to AGGSC. Design features and options may include locating data center and such other facilities in the first and second floor, consider the northern side of the building to be firewall so that windows can be on the eastern, western, and southern sides of the new building, etc.

76. Consultations with the administration of AGGSC will be conducted prior to any construction works to inform them of the protocols that will be followed by the Contractors to ensure that any potential inconvenience will be avoided. Outcome of the consultations will be included in the environmental monitoring report submitted by BUET through the UGC-MOE to ADB semi-annually during the construction phase. The environmental monitoring reports will be publicly disclosed to the website of ADB as required by the applicable policies of ADB – the SPS 2009 and AIP 2019.

Relocation of the Graveyard

77. There is an existing graveyard with two buried persons – one unidentified and one with a stone marker associated with the Bangladesh Liberation War 1971 at the new project site (Figure 5.1). The Master Plan Committee of BUET during its 4th meeting on 28 March 2021 decided that the graveyard will be relocated in a suitable place following the relevant government requirements.

¹⁴ Azimpur Government Girls' School and College. About Us. <http://www.aggsc.edu.bd/index.php>.

78. With the proposed new CSE building, BUET sent a letter to the Ministry of Liberation War Affairs (MOLWA) on _____ informing them and seeking their permission to construct a new high-rise academic building beside the graveyard. However, MOLWA responded on _____ that they are not responsible in this regard.

79. Thus far, there is no potential site yet for the relocation. To start the process, the Office of the Chief Engineer, is designated to handle the graveyard relocation and for ensuring that all applicable government requirements are complied. With approval from the Master Plan Committee of BUET is looking for the applicable government regulation and/or protocols on graveyard relocation as well as a suitable site. At present, the Office of the Chief Engineer is coordinating with MOLWA on the relocation. BUET will ensure that there will be a designated staff to oversee the relocation process, identify selection criteria for the relocation site such as accessibility, applicable government graveyard, and possibility of within BUET campus, secure clearance, and coordination with religious leaders. They will also reach out to the potential relatives of the identified buried person to inform them of the relocation such as posting information in the project webpage of the BUET website. BUET will bear the cost of relocation. No construction contract will be awarded, and no civil works will commence until the relocation has been completed based on applicable government protocols. BUET will include the outcome of the graveyard relocation in the environmental monitoring reports that will be submitted to ADB semi-annually during the construction phase. The environmental monitoring reports are disclosed to the ADB website.

Preparedness to COVID-19

80. Contractors will be required to prepare an H&SP in response to a potential COVID-19 outbreak in the construction sites that may cause occupational and community health risks. While there is already 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 outbreak in the workplace that may affect the students and staff in BUET as well as the immediate communities. Appendix 8 presents a sample H&SP. The H&SP will be finalized by the Contractors and will be reviewed and approved by the PIU and PMU.

B. Construction Phase

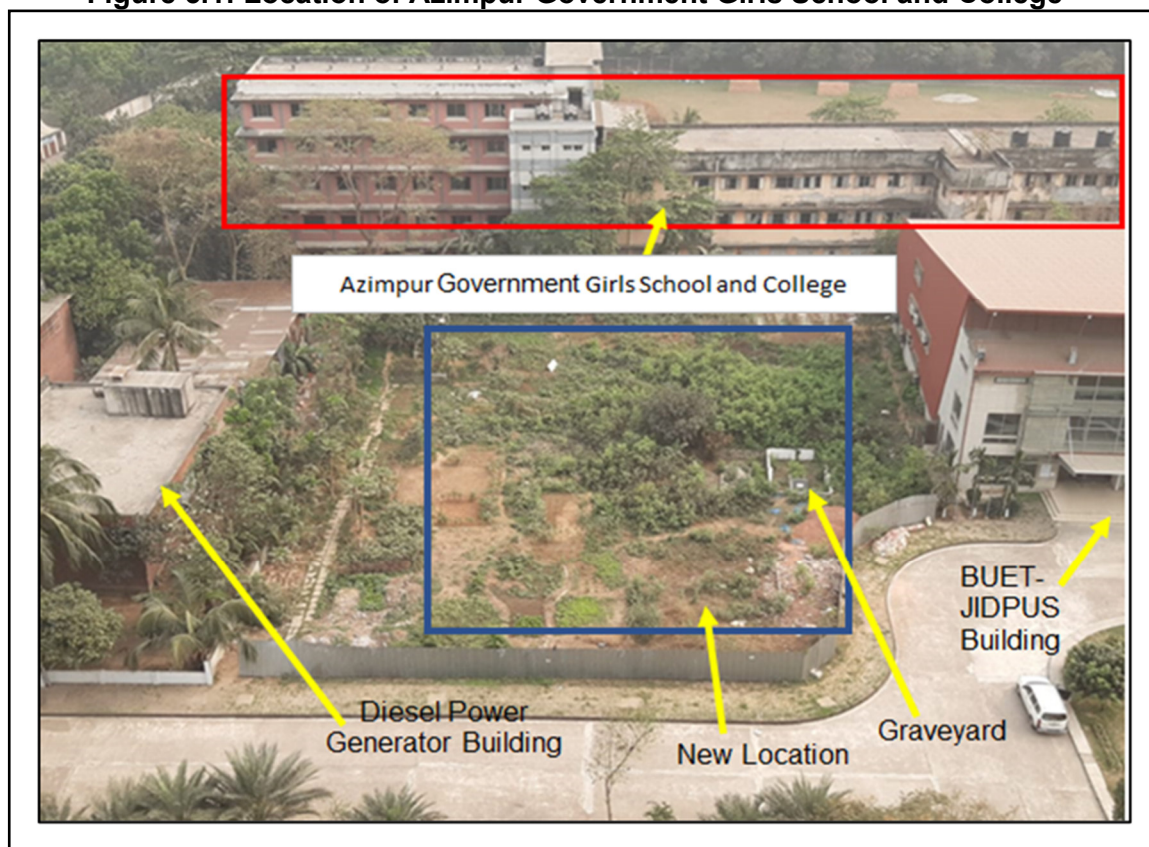
81. This phase will involve the recruitment of workers and staff; mobilization of contractors, equipment, and machinery; site preparation; delivery and storage of construction materials; civil, mechanical, and electrical works; landscaping and clean-up of construction debris; and occupancy of the new building.

82. Prior to construction works, the PMU in UGC and the PIU in BUET will ensure that the Contractor will include the responsibility of compensating for any temporary damage, loss, or inconvenience due to 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 start of construction. Results of baseline environmental quality measurements will be included in the environmental monitoring report that will be submitted by the PIU semi-annually during construction phase to ADB through the MOE.

83. Environmental Codes of Practice (ECP) relevant during the construction phase are given in Appendix 1. ECPs are general non-site-specific guidance from best construction practices that

will 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 with the EMP.

Figure 5.1: Location of Azimpur Government Girls School and College



(i) Prepare Construction Management Plan

84. Before any construction works, the Contractor will be required to prepare a construction management plan to guide the implementation of earth-moving works; and 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 staff of BUET particularly those in the West Palashi Campus; and emergency or disaster preparedness. Critical information to know during emergencies 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.

85. AGGSC is adjacent to the new site of the proposed CSE building (Figure 5.1). With the proximity of the girls' school to the new site, construction works such as generation of noise and dust, mobilization of construction vehicles, and presence of workers may potentially affect the daily school activities of the students and faculty. The Contractor will be required to incorporate in the Construction Management Plan measures such as temporary enclosures high enough to

shield the students in AGGSC from the potential impacts of noise generation and increased level of dust and adjust work schedule (if needed) of noise and dust-generating activities.

(i) Hiring of Staff and Workers

86. 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 Contractor will be required to comply with the relevant provisions in the Bangladesh Labour Act 2006 (amended 2013) and Bangladesh Labor Rules 2015 on recruitment and working conditions.

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

88. 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.

(ii) Orientation of Workers and Staff

89. Before any construction works begin, the PIU in BUET 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 BUET, as well as 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 and about HIV/AIDS 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 personal protective equipment (PPE), and general precautionary measures that will be implemented based on the approved H&SP such as daily temperature checks, hand washing, physical distancing (2 m apart), enhanced cleaning and disinfection of surfaces and objects frequently touched in the workplace, and posting of signs to create awareness of COVID-19.

90. The Contractor will be required to designate an Emergency and Disaster Coordinator who will also function as the OHS Officer to guide the workers in case of an emergency, disaster or COVID-19 incidence, and will oversee the 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. 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.

(iii) Site Preparation and Construction Works

91. 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.

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

93. The area within the premises of BUET (West Palashi Campus) is not known to have sites of archeological and historical value. Nonetheless, ECP 1.0 provides measures in case of an encounter with any physical cultural resource.¹⁵

94. **Alternative Access Routes** All large vehicles carrying construction material will be allowed only after 10 p. m. when academic activities are already closed for the day and it is expected that there will be no more people walking within the immediate vicinity of the BUET West Palashi campus.

95. Students and employees will be restricted from using the road on the north side of the new site and the public will not be allowed to access the south side of ring road. All pedestrians and cars will make a right turn through the north side of ring road to get access to the JIDPUS building (Figure 3.2).

(iv) Impacts on Air Quality

96. Site preparation will involve land and minimal vegetation clearing. Potential increase in dust level may be expected resulting from these activities. This impact may cause inconvenience to the users of the engineering building in front of the project site. The engineering building in front of the project site has a designated place for prayer used by faculty, staff, and students. To contain the potential increase in the generation of dust, the Contractor will be required to do the following:

- (i) Provide temporary fencing and enclosures of the construction site (at least 2 m-high).
- (ii) Spray water to any opened area and work sites, as and when needed particularly during the summer season.
- (iii) All excavated soil and stockyard will be covered with tarpaulin or other appropriate cover material during nonworking hours, and excess soil will be removed from the worksite to the designated disposal site.
- (iv) Provide a space on-site to accommodate the required materials so that transport and delivery of construction materials and vehicular emissions will be minimized.

¹⁵ Physical Cultural Resources (PCR) 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 in urban or rural settings, may be above or below ground, or located under water. Their cultural interest may be at the local, provincial, national, or international level.

Figure 5.2: Alternative Access to the Site, BUET West Palashi Campus



- (v) Alternate access routes to the site will be used (Figure 3.1 and Figure 5.2) to minimize safety risks to the university students, faculty members, and other people using the main roads of the university.
- (vi) Provide workers assigned to dusty areas with safety masks or goggles.
- (vii) Vehicles that will deliver construction materials to the site that generate dust will be covered with suitable material to contain the dust.
- (viii) Regularly maintain construction vehicles, generators (if required), and heavy equipment to avoid smoke belching.
- (ix) Prohibit burning of garbage, liquid waste, and other combustible materials within the construction site.
- (x) Follow the measures identified in ECP 2.0 on managing quality.

97. 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 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 Contractor needs to comply with.

(v) Impacts on Noise

98. The major sources of noise generation are movement of construction vehicles, associated land clearing, and construction of the new building. These activities, together with daily university activities, on 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.

99. Exposure of workers to increased noise levels is an occupational as well as public health hazard. Table 5.1 presents the typical noise levels of tools and equipment. As a comparison, Table 5.2 presents the common sources of noise and decibel levels that people are generally exposed to. To mitigate the temporary negative impact on noise, the Contractor will be required to:

- (i) orient and inform workers, prior to construction works, about noise level requirements;
- (ii) provide workers assigned to high-level noise-generating activities with PPEs such as earmuffs and earplugs, and will be rotated every 2 hours;
- (iii) undertake activities that generate noise during the daytime only (but will be adjusted depending on the weather and season);
- (iv) require drivers of construction vehicles to observe low speeds, and blowing of horns or whistles will not be allowed unless absolutely necessary;
- (v) assign staff to maintain the flow of traffic to avoid inconvenience to students, faculty members, and administrative staff;
- (vi) require regular tune-up of construction vehicles and proper maintenance of machinery; and,
- (vii) observe the measures listed in ECP 3.0 on managing noise and vibration.

Table 5.1: 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

dB(A) = decibel.

Note: These noise levels are measured at the operator's position.

Source: Chapter 14, Table 14-4 in Infrastructure Health & Safety Association. <http://www.ihsa.ca/About.aspx>.

Table 5.2: 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 do not 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

Everyday Sounds and Noises	Average Sound Level (dBA)	Typical Response (after routine or repeated exposure)
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

Sources: 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>.

(vi) Generation of Waste

100. Construction works are expected to generate waste such as spoils, construction materials, wood, cleared vegetation, waste food, cement container, 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 BUET. To mitigate this impact, the Contractor will be expected to implement the following measures:

- (i) implement the waste management plan, which is part of the overall Construction Management Plan submitted to PIU before the start of construction;
- (ii) 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);
- (iii) always observe good housekeeping at the construction site and monitor compliance;
- (iv) provide separate bins for the used facial mask and gloves worn as part of COVID-19 prevention measure;
- (v) burning of solid waste at the construction site will not be allowed at any time; and,
- (vi) refer to ECP 4.0 for further measures on waste management;
- (vii) a new gate along the Pilkhana Road will allow an alternative access to BUET students, faculty, staff, and visitors, which is good and convenient;
- (viii) the existing gate can be fixed to temporarily allow segregate access by construction workers and students/faculty/staff.

101. Waste that may be generated during project implementation will be disposed in designated disposal site approved by the Dhaka South City Corporation (DSCC). After the separation of

Dhaka City Corporation into north and south, BUET is under the jurisdiction of DSCC. There are four secondary transfer station (STS) in DSCC funded by ADB and it will likely be STS 12 for BUET which is in front of the Dhaka Medical College.¹⁶ Final disposal for garbage generated from DSCC will be the Matuail landfill site about 6.5 km from BUET.

(vii) Impacts on People

102. Associated works during site preparation and construction of the new building may pose health and safety risks to workers and community. This could be from working on heights and 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 to workers and occupational health risks. Given the location (i.e., within the BUET campus), construction camps will not be located within BUET premises (West Palashi Campus). To minimize the occupational and community health and safety risks, the Contractor will be required to implement the following measures:

- (i) **Occupational health and safety risks.** To prevent accidents, provide workers and staff with appropriate PPEs and safety clothes such as hard hats, steel-toed boots, earmuffs, or earplugs, etc.; and 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 sites. Fire-fighting equipment will be made available on-site.

BUET has a Medical Centre at Fuller Road campus and is about 600 m from the West Palashi Campus (where the new building will be located). Students, teachers including their family members and all employees of BUET receive treatment, investigation, and medical services at this Medical Centre. The Contractor can coordinate with BUET to ensure that there will be immediate medical assistance in the event of an emergency at the construction site. As well, the Medical Centre will coordinate with the Directorate General of Health Services on the appropriate protocol for handling of persons that show symptoms of COVID-19. The Contractor will be responsible for getting the up-to-date information.

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 health and safety rules and procedures, and the consequence of non-compliance.

With the risk of exposure to COVID-19 in the workplace, the Contractor will comply with the approved H&SP and the workers, at the minimum, will always observe enhanced cleaning procedures in the workplace and temporary rest area, social

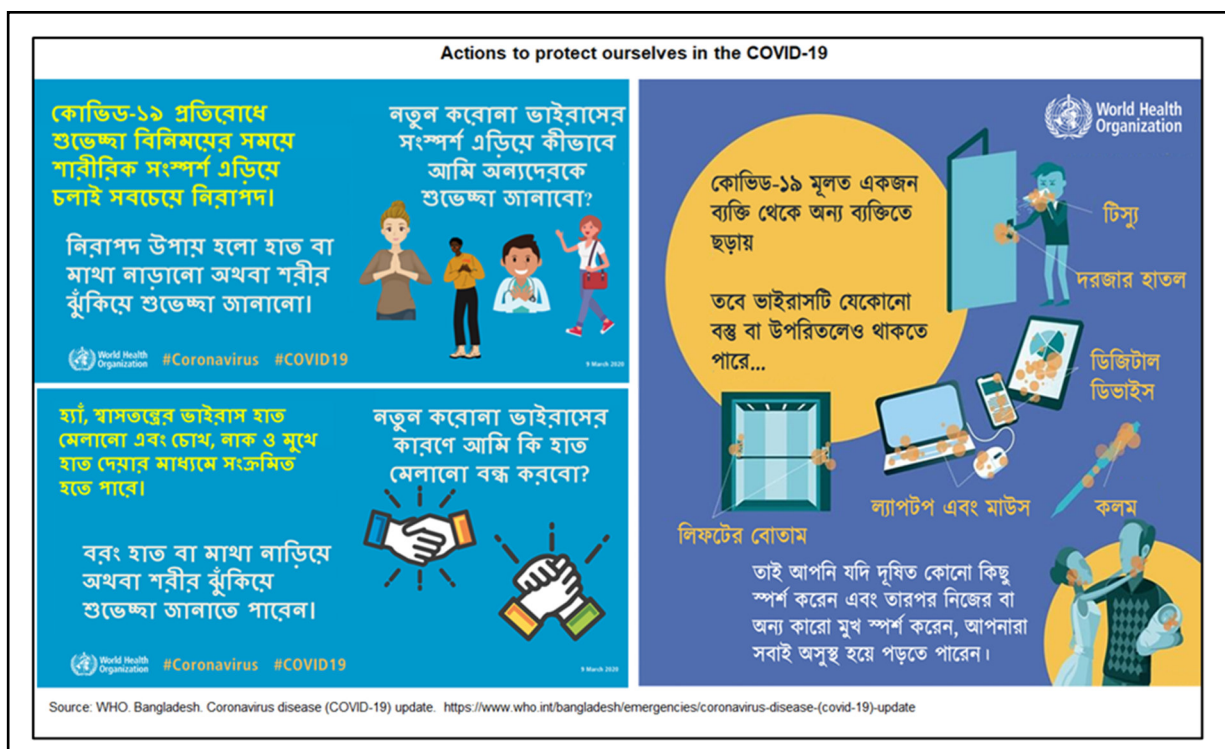
¹⁶ Loan 2554/Loan 2555-Bangladesh: Urban Public and Environmental Health Sector Development Program approved on 28 September 2009.

distancing of at least 2 meters apart from each other, use appropriate PPEs such as masks, gloves, and eye cover if social distancing is not possible, and will practice frequent handwashing. Contractors will provide wash stations with adequate soap and water within the work sites. If adequate soap and water are not available, hand sanitizers (with at least 60% alcohol) will be used. Separate bins will be provided by the Contractor for disposal of PPEs used to prevent COVID-19.

- (ii) **Community safety risks.** Prior to start of construction works, conduct awareness orientation and/or briefing about health and safety to key stakeholders in BUET (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 5.3 shows a sample of the posters developed by WHO Bangladesh.

Set boundary line between construction site and areas accessible to BUET community. Provide proper identification of workers and staff at the construction site. The Contractor will monitor the COVID-19 situation in Dhaka City 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 will be observed as international best practice.

Figure 5.3: Sample of WHO Posters on COVID-19



C. Completion of Construction Works

103. Improper clean-up and disposal of construction debris may cause safety and health risks, and reduced aesthetic value. To ensure clean-up and restoration of construction sites, the Contractor will be required to restore and/or reinstate all 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.

D. Post-construction Phase

104. 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 ECE Annex building. At this stage, they will enjoy the comfort of a new building.

(i) Occupancy of the New Building

105. 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. 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. The current waste management in the ECE building simply consists of cleaning workers collecting waste from waste bins then bring the aggregated waste into the designated collection point that will be eventually picked up by the municipal waste management service.

106. To mitigate these potential impacts, BUET administration 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 Office of the Chief Engineer will designate a waste management coordinator who can also act as the OHS officer. The CSE Department can consult with other relevant institutes and/or departments in developing a building waste management program that will incorporate the 3R principles of reduce, reuse, and recycle as well as segregation at source.

107. The CSE Department will conduct yearly orientation and briefing to staff, students, and other building occupants on proper management, care, and sustainable use of the new ECE Annex building.

(ii) Emergency Response Plan

108. 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 emergency response plan (ERP) will be finalized by the CSE department in consultation with BUET students, faculty, and administrative staff. The ERP will include precautions to COVID-19. Table 5.3 presents the key elements of the draft emergency response plan.

Table 5.3: Key Elements of Draft Emergency Response Plan

Elements	Description
Approach	The aim of this emergency response plan is to guide personnel during 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	<ul style="list-style-type: none"> • Earthquakes • Cyclones • Energy or utility outages • Fire hazards • Hazardous materials releases • Terrorism • COVID-19 outbreak
Planning	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Identify assembly points and/or evacuation points • Prepare well-defined escape routes • Install fire-fighting systems in strategic locations • Ensure that proper security arrangements functions at all times • Ensure efficient transport and communications system • Prohibit smoking within areas with flammable substances (if any) • Ensure water availability for firefighting • Ensure availability of sufficient number of trained staff to deal with any emergency • Supply clear and audible emergency alarms or whistles and public address system • Conduct drills to familiarize students, faculty, and administrative staff on evacuation routes and use of the fire-fighting system • Provide emergency contact number of the medical center (and nearest hospital), ambulance, and fire service and police stations • Switch off main electrical equipment when not in use • With COVID-19, social 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, social distancing will be observed
Incident command system	<pre> graph TD IC[INCIDENT COMMANDER] --- S[SAFETY] IC --- I[INFORMATION] IC --- L[LIAISON] IC --- O[OPERATIONS] IC --- P[PLANNING] IC --- LOG[LOGISTICS] IC --- FA[FINANCE/ADMINISTRATION] </pre>

(iii) Effects of climate change

109. 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 1.8°C 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.

110. 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). The western part of Dhaka will have a higher exposure to riverine and monsoonal floods. In Dhaka Metropolitan Area, where BUET is located, it is bounded by rivers namely, Turag River, Buriganga River, Dhaleshwari River, Balu River, and Sitalakhya River but they are far from BUET. The closest of which is Buriganga River, about 6 km from BUET, thus riverine flooding risk is considered very low.

111. Dhaka is situated in a Zone 2 earthquake-prone area (moderate risk). Design of the new building will comply with the Bangladesh National Building Code (2006), Chapter 2 (Loads on Buildings and Structures). 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

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

113. The initial consideration for the location of the new building was the open space at the back of the existing ECE Building. This open space is in the north-east corner of the West Palashi Campus of BUET. In this location, the new building could have been an extension of the existing ECE Building (i.e., ECE Annex) where the CSE Department is hosted.

114. However, in March 2021, a new location was considered by the Master Plan Committee of BUET as much better in terms of highest and best usage of available land within the campus, and the configuration of the open space. The new location is in front of the existing ECE Building between the BUET-JIDPUS building and the diesel power generator building which has not been used since February 2016 (Figure 3.1).

115. The “no project” option will mean that the available open space within the West Palashi Campus of BUET 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 the innovative ICT 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 ICT industry	There will be demand for ICT graduates to meet the requirements of the ICT industry	Limited or no possibility of producing better graduates due to poor ICT facilities
Inconvenience and disruption to daily activities during construction	There will be temporary disruption to the university community	Potential traffic congestion may also occur due to increased population and vehicle owners
Ecological impacts	Vegetation at the site is mainly grass and a few shrubs commonly grown in Dhaka	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 ICT training	There will be more options for R&D and training; links to the private sector are expected to improve chances of employability	No opportunities
Contribution to Vision 2021	Will contribute to the goals and objectives	No contribution

ICT = information and communications technology.

VII. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

A. Introduction

116. 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 BUET about the proposed construction of the new multi-storied ECE Annex building, and for BUET to present to the stakeholders the 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 BUET 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. Consultations during the preparation of the IEE

117. **Previous location** The consultation was held on 3 April 2019 at the Information Access Centre of the CSE Department, BUET. A total of 61 participants joined, consisting of faculty staff from the Eden Mohila College,¹⁷ representative from the Bangladesh Bureau of Educational Information and Statistics, students, and faculty from the Department of Electrical and Electronics, students, and Faculty from CSE Department, Secretary of Palashi Bazar Market Association (located on the east side of the proposed building), and the residents from the settlements along Dhakeshwari Road.

118. Faculty members of BUET CSE Department made a presentation about the CSE program in BUET and about the proposed project (i.e., outputs 1–4), which includes the new building. The consultants briefly discussed the requirements for environmental due diligence and measures to be implemented to ensure that the temporary adverse impacts during the construction phase will be mitigated including the grievance redress mechanism for handling complaints that may be raised against the project.

117. **New location** Key stakeholders identified in the new location are the Azimpur Government Girls' School and College located which is adjacent to the new location (northern side), government and non-government organizations relevant to graveyard operations, and the potential relatives of the identified person in the graveyard that will be relocated. Due to COVID-19 pandemic and the situation in Bangladesh, face-to-face consultations cannot be conducted at this time. BUET will ensure that no civil works contract will be awarded, and no construction works will start until consultations to get the concerns and/or suggestions of the key stakeholders are completed. The results of consultations for the new location will be included in the environmental monitoring reports that will be submitted semi-annually to ADB by BUET through the UGC-MOE during the construction phase and will be publicly disclosed to the ADB website.

118. So far, efforts made by BUET to carry out consultation and information disclosure, amidst restrictions due to the COVID-19 pandemic includes the following:

- (i) A project webpage in the CSE department was created on the website of BUET that provides general information about the project, potential environmental impacts associated with the construction of the new building and mitigation measures, and the grievance redress mechanism to deal with potential complaints to the project (https://cse.buet.ac.bd/adb_development_project);
- (ii) Letter sent to the Azimpur Government Girls' School and College on 6 June 2021 providing project information and inviting them to a virtual meeting on 17 June 2021 (Appendix 2); and,
- (iii) Coordination and letter to MOLWA on the process of graveyard relocation.

119. On 17 June 2021, BUET conducted a virtual consultation with Professor Hasibur Rahman, Principal of Azimpur Government Girls' School and College to present the project and to know if they have any concerns. The meeting was organized and led by Dr. Md. Ashikur Rahman, Professor and Head of CSE Department together with Professor Md. Mostofa Akbar who did the project presentation. Two environmental consultants also joined the virtual consultation and mentioned that the summary of consultations on the issues raised will be included in the

¹⁷ Eden Mohila College is a women's college in Azimpur, Lalbag first established in 1873 in the Farashganj area of Dhaka. It has about 35,000 students in an area of about 17 acres. See <http://www.emc.edu.bd/>.

environmental report for the project which will be disclosed in the ADB website. The virtual consultation was done mainly in Bengali.

D. Results of Consultation

120. Appendix 2 gives the list of participants consulted on 3 April 2019 for the previous location and some photographs, and the letter of BUET on 6 June 2021 to Azimpur Government Girls' School and College for the new location. Table 7.1 presents the summary of the issues raised on 3 April 2019 while Table 7.2 gives the summary of consultation on 17 June 2021. Consultations will continue during project implementation.

Table 7.1: Summary of Consultations on 3 April 2019

Issues Raised	Response from Project Team
Research and development opportunities may be limited to students from CSE Department only	Any student opportunity that the project will provide will be open to other students of BUET if applicable to their circumstances regardless of race or gender.
Impact on academic activities during construction may be minimal. The campus is secluded from the outside community and existing academic buildings are well insulated from noise levels.	To make sure that there will be minimal impacts on air quality and noise levels, mitigation measures will be required of the Contractor.
Access of Contractor and workers during construction works	Contractor will have two access options: (i) existing temporary gate behind the main ECE Building used during the ongoing construction of Cafeteria, and (ii) another temporary gate can be used along the Dhakeshwari Road. Contractor will finalize the alternate access in consultation with PIU in BUET.
Emergency evacuation points and better alarm system in the new building to warn students of an emergency	The new building will be designed to withstand natural hazards to the extent possible and will be equipped with better emergency alarm and public address systems. An emergency response plan or program will be finalized that will include regular mock drills for students, faculty members, and staff.
Regular emergency training and awareness program to be provided by the Chief Engineer Office of the university.	Training and awareness program will be included in the Emergency Response Plan not only for the new building but for BUET.
Positive impact is anticipated through use of solar panel and LED as well as incorporation of automation or high technology in design	New building will incorporate green building features and will be designed to be climate change-resilient
Proper road signage and speed control measures with traffic lights for pedestrian road crossing at the Palashi-Dhakeshwari Road	Clear and visible warning signs will be required from the Contractor to minimize safety risks to students and to community. If needed, the Contractor will be required to designate staff to manage traffic on the stretch of Palashi-Dhakeshwari Road close to the project site during construction.
Opportunity to create more graduates from CSE Department	It is the goal of the project to create opportunities for more quality graduates from CSE Department to meet the emerging requirements of the ICT industry not only in Bangladesh but also globally.
Accommodation facilities for graduate students due to traffic jam	Providing hostel or temporary student accommodations during traffic jams is not part of

Issues Raised	Response from Project Team
	the building design but BUET can explore the possibility particularly for training participants.
Contractor's behavior and access to construction materials	<p>Contractor and their workers will be required to comply with applicable rules and regulations of BUET including the government, and ADB.</p> <p>Project site will be enclosed temporarily and the Contractor will be required to assign security personnel to prohibit unauthorized access and to ensure separation of student access to workers.</p>

BUET = Bangladesh University of Engineering and Technology, CSE = computer science and engineering, ICT = information and communication technology, LED = light-emitting diode, PIU = project implementation unit.

Table 7.2 Summary of Consultation on 17 June 2021

Issues Raised	Response from Project Team
Construction of the proposed building will be adjacent to Azimpur Girls' School and College, it is important to know the scale of the new building	The vacant area will accommodate a twin tower type building of about 300,000 square foot (ft ²) where CSE will have a share of about 100,000 ft ² and the rest will be occupied by other departments of BUET. The new building will be 20 floors.
<ul style="list-style-type: none"> Given the height of the new building to be occupied by mainly young boys at the university level compared to the 5 floor-existing building of the Azimpur Girls' School and College being used by junior and teenage girls, there is a chance of interfering in the privacy of the girls. The Azimpur Girls' School and College is also planning to build a 10-story building very soon and the approval process is at the final stage. Thus, both buildings will be high and the privacy of the girls need to be addressed. 	<p>The privacy of the girls will be taken cared of with high priority and all options will be explored in the design to avoid any such interference.</p> <p>BUET will ensure finding the best design option to avoid any privacy issues concerning the students in Azimpur Girls' School.</p> <p>Project team also emphasized that there will be minimal impacts on air quality and noise levels, traffic signals and risk-related issues will be addressed by the contractors and all mitigation measures will be adopted. Performance of the contractors will be monitored by BUET.</p> <p>The safeguard requirements of ADB ensure that the temporary adverse impacts during the construction phase will be mitigated including the privacy concerns. The project will have a grievance redress mechanism to deal with complaints that may be raised by stakeholders. Compliance to the safeguard requirements will be monitored by ADB.</p>

E. Consultations and Information Disclosure during Implementation

121. Consultations The PIU together with the PMU will review the COVID-19 situation in Metro Dhaka and the restrictions imposed by the government to contain its transmission. At present, people are required to exercise social or 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 more than a year into the COVID-19 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 the Directorate General of Health Services (DGHS).

122. 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 groups 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. Table 7.3 presents the stakeholder engagement plan during implementation. Outcome of consultations will be included in the environmental monitoring reports to be submitted by BUET semi-annually to ADB for review and disclosure the ADB website.

Table 7.3 Stakeholders' Consultation Plan

Project Stage	Topic for Consultation	Method	Target Stakeholder	Responsible Unit
Design and Pre-construction	<ul style="list-style-type: none"> • Need for the project • Background about the graveyard (e.g., transfer from PWD to BUET) • Details of the graveyard relocation plan – proposed site, procedures, responsibility for relocation, schedule, etc. 	<ul style="list-style-type: none"> • Phone, email, letters • Advertisement or notice in the local paper 	<ul style="list-style-type: none"> • MOLWA • Potential relatives of identified person in the graveyard 	<ul style="list-style-type: none"> • CSE, BUET focal person • PIU • Environmental consultant
	<ul style="list-style-type: none"> • Need for the project • Project component and activities that may have potential environmental and social (E&S) risks and impacts • Mitigation measures for the potential E&S impacts • Responsibilities of contractor to comply with mitigation measures 	<ul style="list-style-type: none"> • Phone, letter, or email • Virtual meetings due to COVID—19 pandemic • Small group meetings – if allowed by the government 	<ul style="list-style-type: none"> Azimpur Government Girl's School and College - • School administrator • Student and/or student organization • Parents association • Employee/staff association 	<ul style="list-style-type: none"> • CSE, BUET focal person • PIU • Environmental consultant

Project Stage	Topic for Consultation	Method	Target Stakeholder	Responsible Unit
	<ul style="list-style-type: none"> Monitoring of compliance Details of grievance redress mechanism (GRM) 			
Construction	<ul style="list-style-type: none"> General health and safety concerns GRM Construction management plan – traffic, construction workers' area, community safety, etc. COVID-19 and other illness like HIV/AIDs and measures to be implemented to prevent incidence 	<ul style="list-style-type: none"> Information desk at the construction site/office Small group meetings – if allowed 	<ul style="list-style-type: none"> Azimpur Government Girl's School and College BUET students and staff Local residents close to the BUET campus 	<ul style="list-style-type: none"> CSE, BUET focal person PIU Environmental consultant Contractor representative
Post-construction	<ul style="list-style-type: none"> Emergency response plan Building management plan COVID-19 measures 	<ul style="list-style-type: none"> Small group meetings – if allowed Email Notice in BUET website 	<ul style="list-style-type: none"> Azimpur Government Girls' School and College BUET Students and/or student organizations Relevant staff/employees 	<ul style="list-style-type: none"> Office of Chief Engineer CSE, BUET focal person PIU Environmental consultant

123. Information Disclosure To meet the disclosure requirements of ADB, the CSE department created a project webpage in the BUET website and will provide a link to project information (e.g., project brief, GRM flowchart or flyer, etc.). However, only essential information such as GRM flyer and project brief will be made available to stakeholders as printed materials (both in English and in Bangla) while still under the threat of the COVID-19 pandemic. The one-page project brief will be made available to interested individuals from the project site office, in BUET, and in UGC. The one-page flyer on questions & answers (Q&A) or frequently asked questions (FAQ) will include details on the grievance redress mechanism and contact details of designated focal person. Also, the IEE disclosed on the ADB website will provide more information on the project (revisions/update in the IEE to be reposted if there are changes in the project design or location). Table 7.4 presents the information disclosure program.

Table 7.4 Information Disclosure Program During Implementation

Project Phase	Information to be Disclosed	Method of Disclosure	Type of Stakeholders	Responsible Unit
Design and Pre-Construction	<ul style="list-style-type: none"> Project brief Q&A or FAQ flyer IEE 	<ul style="list-style-type: none"> Project webpage Project site office BUET and UGC 	<ul style="list-style-type: none"> Local population that may be affected – Azimpur Government 	<ul style="list-style-type: none"> CSE, BUET focal person PIU Environmental consultant

Project Phase	Information to be Disclosed	Method of Disclosure	Type of Stakeholders	Responsible Unit
			Girls' School and College, MOLWA, potential relatives of the identified buried person in the graveyard, student or faculty organizations, etc. • Other interested individuals (e.g., NGOs)	
Construction	<ul style="list-style-type: none"> • COVID-19 health & safety measures • GRM, designated staff and contact details • Traffic management • Emergency procedures 	<ul style="list-style-type: none"> • Posters or signboards, flyer • Project webpage • Local traffic authority • Small group meetings – if allowed or virtual 	<ul style="list-style-type: none"> • Project workers and staff • Local population that may be affected – Azimpur Government Girls' School and College • BUET students, faculty and staff 	<ul style="list-style-type: none"> • CSE, BUET focal person • PIU • Environmental consultant • Contractor (and subcontractor)
Post-construction	<ul style="list-style-type: none"> • Emergency preparedness and procedures • COVID-19 health & safety measures • Building management 	<ul style="list-style-type: none"> • BUET College Department website • Posters or signboards • Social media • Meeting 	<ul style="list-style-type: none"> • Building occupants (i.e., students, faculty, and staff) • Immediate local population 	<ul style="list-style-type: none"> • Office of Chief Engineer, BUET • CSE, BUET focal person • PIU • Environmental consultant

VIII. GRIEVANCE REDRESS MECHANISM

124. 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

125. The GRM 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

126. 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 the construction phase, the GRC may be inactive post-construction. MOE and UGC will ensure the representation of women in the GRC.

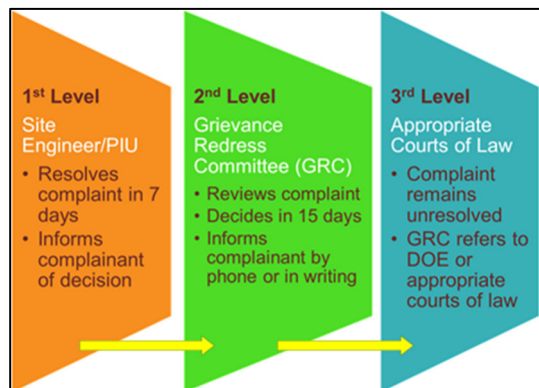
127. The GRC will be responsible for resolving complaint(s) and will convene once a month to review the complaint(s) received, if any. GRC will resolve complaint(s) within 15 days from the date of receipt and will keep a record indicating the name of complainant and nature of complaint, status of resolving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

128. 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. The cost of implementing the GRM will be borne by the PMU as part of administration costs.

- (i) **Information disclosure.** PIU will disclose details on the GRM through the project website of BUET as well as post on 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.** The record will consist 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 semiannual monitoring reports submitted to ADB during the construction stage, and annually during post-construction and/or operation stage.
- (iii) **Procedure.** Complaints 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 interaction. 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: (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 (see Figure 8.1). 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 or PIU Head: Complaint to be resolved at the PIU level within 7 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

129. 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 monitoring plan and the institutional arrangements required. Table 9.1 presents the EMP.

A. Monitoring

130. The environmental monitoring is a time-bound process to ensure that noncompliance 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 on the ADB website as required by SPS 2009 and Access to Information Policy 2019. Table 9.2 presents the environmental monitoring plan (EMOP).

B. Implementation Arrangements

1. *Project management unit.*

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

2. *Project implementation unit.*

132. The BUET will set up a PIU that will be responsible for managing the day-to-day activities of the project. The PIU will ensure proper implementation of the EMP and EMOP, timely reporting to PMU of the environmental monitoring report required by ADB (see Appendix 5 and Appendix

6 for proposed format), scheduling of public consultations and information disclosure (as appropriate), and handling of complaints according to the GRM. Key responsibilities of the PIU are as follows:

- (a) Designate a staff to oversee the implementation of EMP and EMOP.
- (b) Ensure compliance of Contractor to EMP 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 noncompliance by Contractor or any unanticipated environmental impacts, coordinate with the PMU environmental safeguard consultant in preparing a corrective action plan to address the issue with time-bound actions; this corrective action plan will be submitted to ADB for review and will be disclosed on the ADB website.
- (f) Ensure that any grievance or complaint received is addressed in a timely manner.
- (g) Maintain a record of grievances or complaints received, resolutions or actions taken, including details in the environmental monitoring report.
- (h) Keep a list of relevant permits issued by the government for the project, if any.
- (i) Prepare the respective environmental monitoring report and submit to the PMU for consolidation and finalization by the environmental safeguard consultant.

133. In the event there will be a change in the design of the new ECE Annex building, this IEE will be updated or revised and submitted to ADB prior to any construction works. The updated or revised IEE will be also disclosed to the ADB website.

3. Contractor of civil works.

134. The EMP, which includes the EMOP and the HS&P, 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 its own environmental staff who will be responsible in overseeing the implementation and compliance to the EMP, H&SP, and EMOP during the construction phase. The Contractor will maintain a record of complaints and grievances submitted at the project level through the Contractor, including the action taken to address the issue.

135. 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, EMOP, H&SP, 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	<ul style="list-style-type: none"> Failure of the building to withstand climate change and natural hazards Potential safety and health risks to 	<ul style="list-style-type: none"> Green building features were incorporated Design will comply with the requirements of BNBC 2006 and 	Included in project cost	PIU, Design Consultant	PMU and Environmental Safeguard Consultant

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
	students and building users due to poor building design	relevant provisions in the BNBC 2015 (draft)			
	<ul style="list-style-type: none"> Invasion of privacy of students and staff of AGGSC 	<ul style="list-style-type: none"> Consider in the building design the location of data centers (or student-heavy activities) in the lower floors Have the firewall in the northern side of the building to cover AGGSC and locate the windows in the west, east and south sections 	Included in project cost	PIU, Design Consultant	PMU and Environmental Safeguard Consultant
	<ul style="list-style-type: none"> Relocation of graveyard from the new building site 	<ul style="list-style-type: none"> Publicly disclose information on the process of graveyard relocation in the CSE Project webpage, local newspaper, or local radio station Contact potential relatives of identified person buried in the graveyard Conduct consultations with MOLWA and potential relatives on possible relocation site No construction works will commence until graveyard is relocated complying with applicable government regulations Include the process of graveyard relocation in the environmental monitoring reports to be disclosed in ADB website 	To be included in the BUET Operations Budget	CSE, BUET	PIU
	<ul style="list-style-type: none"> Lack of technical capacity on safeguards at BUET (CSE Department) 	<ul style="list-style-type: none"> 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

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
Construction Stage					
Complete construction management work plan	<ul style="list-style-type: none"> Avoid impacts of Contractor unplanned activities Smooth work implementation 	<ul style="list-style-type: none"> 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 Emergency or disaster preparedness plan Measures on COVID-19 preparedness Provide list of contact details during emergency to workers or post on billboards at the construction site 	Included in the project cost	Contractor, PIU	PMU, Environmental Safeguard Consultant
Orientation of workers and staff	<ul style="list-style-type: none"> 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 education and disease prevention awareness talks to the workers and staff 	<ul style="list-style-type: none"> 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 Health and Safety Plan (see Appendix 8) focusing on COVID-19 as a priority 	Included in the Contractor cost	PIU, Environmental Safeguard Consultant	PMU
Prepare for emergency and potential incidence of COVID-19 infection	<ul style="list-style-type: none"> Create awareness of workers on emergency and COVID-19 risk of exposure and/or transmission 	<ul style="list-style-type: none"> Designate Disaster Coordinator 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 COVID-19 incidence 	n/a	Contractor, PIU	PMU, Environmental Safeguard Consultant

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
Hiring of project staff and workers	<ul style="list-style-type: none"> Dispute over transparency in hiring 	<ul style="list-style-type: none"> Contractor will be required to give priority to local labor Contractors will be required to provide negative results to COVID-19 and will ensure recruited staff and workers have been tested negative to COVID-19 as well Contractors to keep a record of their contact details such as mobile telephone number, alternate telephone, email (if any), and address of where they are staying 	n/a	Contractor, PIU	PMU, Environmental Safeguard Consultant
Site preparation and construction works	<ul style="list-style-type: none"> Disturbance and inconvenience to AGGSC, BUET students and staff and some residents due to traffic from construction vehicles, increased noise and dust levels, and disposal of waste Emissions from heavy equipment machinery and construction vehicles 	<ul style="list-style-type: none"> CMP will be strictly implemented Use of proper safety clothes/personal protective equipment Provide temporary enclosures (at least 2 meters high or high enough to protect students and staff of AGGSC) to contain dust and minimize noise 	Included in the costs of Contractor	Contractor, PIU	PMU, Environmental Safeguard Consultant
	<ul style="list-style-type: none"> Potential chance find during site excavation 	<ul style="list-style-type: none"> Chance find procedures in ECP 1.0 will be followed 			Environmental Safeguard Consultant
	<ul style="list-style-type: none"> Potential safety risks to community 	<ul style="list-style-type: none"> 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 			PMU, Environmental Safeguard Consultant

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
	<ul style="list-style-type: none"> Potential occupational health and safety risks to workers 	<ul style="list-style-type: none"> 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 workers are aware and understand the consequences of non-compliance Workers to observe social/physical distancing at all times Require workers and staff the mandatory use of non-medical masks and gloves if social distancing is not possible Daily temperature checks before workers enter 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 			PMU, Environmental Safeguard Consultant
	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Construction vehicles will be maintained to minimize vehicular emissions Movement of construction vehicles will be done starting at 10 p.m. when school activities are over and public activities are minimal Provision of temporary enclosures Provide space on-site for construction 			PMU, Environmental Safeguard Consultant

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
	heavy equipment and construction vehicles	materials to reduce trips of material delivery <ul style="list-style-type: none"> 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 Transport of dust-generating materials will be covered 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 the CSE-ICT building	<ul style="list-style-type: none"> Noncompliance of Contractors with relevant regulations Potential accidents due to working on heights Occupational and community safety risks Generation of waste 	<ul style="list-style-type: none"> Monitor compliance with regulations Provide PPE 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	<ul style="list-style-type: none"> Improper disposal of construction debris 	<ul style="list-style-type: none"> Restore or reinstate all the areas potentially damaged during construction works Workers will be provided with proper safety gear and equipment Dispose remaining waste and debris at designated sites 	Included in Contractor costs	Contractor, PIU	PMU, Environmental Safeguard Consultant
Post-construction stage					

Project Activity	Potential Environmental Impacts	Mitigation/Enhancement Measures	Estimated Cost	Implementing Unit	Supervising and Monitoring Unit
Occupation and/or use of the new building	Improper use and lack of care to the new building	<ul style="list-style-type: none"> • BUET to conduct orientation and awareness to staff and students on proper care of the facility 	Include in operation costs	PIU, CSE Department	PMU
	Generation of waste	<ul style="list-style-type: none"> • Designate waste management coordinator • Prepare waste management plan with time-bound targets • Conduct yearly training or orientation for trainees on waste management, proper collection, and disposal • Explore measures to implement the 3R principles of reduce, reuse, and recycle effectively including segregation at source. 	Include in operation costs	PIU, CSE Department	PMU
	Potential incidence of emergency or natural disaster	<ul style="list-style-type: none"> • Prepare emergency and disaster preparedness plan and procedures • Designate a Disaster Coordinator who will also act as the OHS officer • Conduct trainings, orientations, and drills on safety and emergency awareness, and on “to do” in case of exposure or incidence of COVID-19 • Provide clear and visible emergency warning signs and posters that promote awareness of COVID-19 (e.g., refer to WHO Bangladesh-prepared materials, OSHA, etc.) 	n/a		PMU

ADB = Asian Development Bank, BUET = Bangladesh University of Engineering and Technology, CMP = construction management plan, CSE = computer science and engineering, EMP = environmental management plan, EMOP = environmental monitoring plan, n/a = not applicable, PIU= project implementation unit, PMU = project management unit, PPE = personal protective equipment.

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	<ul style="list-style-type: none"> Frequency of water spraying Ocular inspection 	Daily	Contractor	PIU, Environmental Safeguard Consultant
	Increase in noise level	Construction site	<ul style="list-style-type: none"> Check enclosure of noise-generating activities or machinery Check blowing of horns 	Daily		
	Ambient air quality	Sampling stations in Table 4.3	<ul style="list-style-type: none"> PM₁₀ and PM_{2.5} 	Quarterly		
	Ambient noise level	Sampling stations in Table 4.4	Sound level meter (dBA)	Quarterly		
	Availability of project information	PIU and construction site	<ul style="list-style-type: none"> 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 labor	PIU office	Number of local workers and staff recruited	Monthly	Contractor, PIU	PMU
	Orientation of workers on health and safety particularly on 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 with EMP and ADB requirements, etc.	Construction site	Number of participants	<ul style="list-style-type: none"> Once before construction Quarterly as refresher to make sure knowledge is up to date 	Environmental safeguard consultant, PIU	PMU
	Solid waste management	Construction site	<ul style="list-style-type: none"> Number of appropriate bins Temporary collection area Volume of waste disposed Ocular inspection or spot checks 	Twice a week	Contractor	PIU, Environmental Safeguard Consultant
	Clear and visible warning signs for safety of workers and BUET community	Construction site and access roads	Ocular inspection or spot checks	Once a month	Contractor	PIU, Environmental Safeguard Consultant

Project Stage	Parameter	Location	Method of Measurement	Frequency	Responsibility	
					Implementation	Supervision
	COVID-19 awareness - Clear and visible posters promoting handwashing, social distancing, use of masks, and respiratory etiquette	Construction sites, workers temporary shelter	Ocular inspection/spot checks	Weekly	Contractor	PIU, Environmental safeguard consultant
	Announcement to the public of works schedule	BUET community	Work schedule log sheet	As needed	Contractor	PIU, Environmental Safeguard Consultant
	Smoke belching construction vehicles	Construction site and access roads	Ocular inspection or spot checks	Weekly	Contractor	PIU, Environmental Safeguard Consultant
	Proper storage and management of construction materials and wastes	Construction site	Number of vehicles Ocular inspection or spot checks	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	<ul style="list-style-type: none"> 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 facial masks for workers and staff 	Daily	Contractor	PIU, Environmental safeguard consultant
	Use of PPE and safety gear	Construction site	Ocular inspection or spot checks	Daily	Contractor	PIU, Environmental Safeguard Consultant
	Condition of sanitary facilities and safe drinking water	Construction site	Ocular inspection or spot checks	Daily	Contractor	PIU
	Good housekeeping	Construction site and temporary workers' shelter or rest areas	Ocular inspection or spot checks	Daily	Contractor	PIU
Post-construction	Orientation of students, faculty, and administrative staff on care and maintenance of the building	BUET	Number of trainees	Annually (at start of each term)	<ul style="list-style-type: none"> Office of Chief Engineer Office of Director of Planning, Development and Works 	PIU
	Good housekeeping (also garbage collection and disposal)	BUET	Ocular inspection or spot checks	Monthly	Office of Chief Engineer	PIU

Project Stage	Parameter	Location	Method of Measurement	Frequency	Responsibility	
					Implementation	Supervision
	Condition and maintenance of fire extinguishers, fire-fighting units, and fire alarms	BUET	Ocular inspection or spot checks	Annual	Office of Chief Engineer	PIU
	<ul style="list-style-type: none"> • Orientation on health and safety, emergency, disaster manual, and procedures • Orientation/awareness drive on COVID-19 	BUET	<ul style="list-style-type: none"> • Check manuals • Check logsheets 	Quarterly (with COVID-19, consider monthly)	Office of Chief Engineer	PIU
	Emergency mock drills	BUET	Number of trainees	Semiannual (or every start of school term)	Office of Chief Engineer	PIU
	Greening program, grounds maintenance	BUET	Types of plants, area planted	Annual	Office of Chief Engineer	PIU
	Condition of safety gears and emergency equipment	BUET	Ocular inspection or spot checks	Annual	Office of Chief Engineer	PIU
	Building condition <ul style="list-style-type: none"> • Roof • Electrical panel and wiring • Door handles, windows, hinges, and closures • Walls and ceilings • Fume hoods • Stairways and fire exit or escape • Storm water drains • Elevators 	BUET	Ocular inspection or spot checks for cracks, signs of water leaks, damage, fire hazards, etc.	Semiannual	Office of Chief Engineer	PIU

BUET = Bangladesh University of Engineering and Technology, PIU = project implementation units, PM_{2.5} = particulate matter 2.5, PM₁₀ = Particulate matter 10, PPE = personal protective equipment, Q&A = question-and-answer.

X. CONCLUSION AND RECOMMENDATION

136. Assessment of the potential environmental impacts associated with the construction of the new building for the CSE Department show that they are mainly during the construction phase, 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 identified in the EMOP. Appropriate measures for COVID-19 preparedness through the health and safety plan 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.

137. Stakeholders were consulted and a GRM to deal with potential complaints on the project was described. Public consultations were conducted during the preparation of the IEE and will continue in varying degrees throughout the project implementation. A stakeholders' engagement and information disclosure plan were prepared to guide the consultation activities during implementation with due consideration to the threat of COVID-19.

138. An environmental safeguard consultant will be engaged in the PMU throughout the 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 semiannually during construction and annually post-construction. These monitoring reports will be similarly disclosed to ADB website. Given these measures, UGC and BUET are committed to comply with the requirements of ADB.

ENVIRONMENTAL CODES OF PRACTICE

1. 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	<p>The Contractor will ensure that</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Use of construction vehicles and machinery 	<p>Contractor will perform the following:</p> <ul style="list-style-type: none"> • 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 to not more than 2 minutes • Cover trucks and other vehicles transporting materials that generate dust • Implement speed limits on vehicular movement within the construction sites • Sprinkle water on crusher and orient workers to follow good practices while handling material in concrete-mix plant

Area of Concern		Project Activity	Management Measures
		<ul style="list-style-type: none"> • Construction activities 	<p>The Contractor will perform the following:</p> <ul style="list-style-type: none"> • 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 personal protective equipment (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 nonworking hours • Revegetate 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 will be located upwind of the construction site
ECP 3.0	Managing noise and vibration	<ul style="list-style-type: none"> • Vehicular traffic 	<p>The Contractor will ensure the following:</p> <ul style="list-style-type: none"> • 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 minimize unnecessary noise at the construction site

Area of Concern		Project Activity	Management Measures
		<ul style="list-style-type: none"> • Use of construction machinery and equipment 	<p>The Contractor will ensure the following:</p> <ul style="list-style-type: none"> • 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 necessary like during emergencies
		<ul style="list-style-type: none"> • Construction works 	<p>Contractor will ensure the following:</p> <ul style="list-style-type: none"> • Nearby residents are notified of noise-generating activities, time, and duration • Operators of heavy equipment and machineries will be educated or 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 BUET (West Palashi Campus)
ECP 4.0	Waste Management	<ul style="list-style-type: none"> • Generation of waste at construction sites 	<p>Contractor will perform the following:</p> <ul style="list-style-type: none"> • 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, location of disposal site, and specific requirements for management of these sites • Wastes that cannot be reused will be disposed of safely at designated sites • Minimize generation of waste by implementing 3Rs (reduce, reuse,

Area of Concern		Project Activity	Management Measures
			<p>recycle), and segregate waste at source</p> <ul style="list-style-type: none"> • Waste will be transported in fully covered trucks to prevent spillage along the way • Provide appropriate bins or containers for waste at the construction site • Conduct orientation of the workforce on waste management practices • Require workers to always observe good housekeeping
		<ul style="list-style-type: none"> • Handling of hazardous waste 	<p>Contractor will ensure the following:</p> <ul style="list-style-type: none"> • 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 of all chemicals on-site during construction are maintained and properly recorded • Chemical and other hazardous materials are stored in banded place, or in an area lined with impervious material and away from drainage system to prevent soil contamination • Store sufficient stock of absorbent materials for used chemicals or spent lubricants, lube oil, etc.
ECP 5.0	<p>Occupational health and community safety</p> <p>The Contractor will be responsible for including 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</p>	<ul style="list-style-type: none"> • Construction works at the new ECE Annex building 	<p>The PIU and the Contractor shall inform the BUET (West Palashi Campus) community and adjacent settlements (Palashi Bazar Market Association) along the access roads of the following:</p> <ul style="list-style-type: none"> • Schedule of construction works, routing of traffic (if needed), possible health concerns (exposure to dust, noise, and vibration) <p>Contractor will perform the following:</p> <ul style="list-style-type: none"> • Set up a health and safety committee and designate a Safety Officer • Provide workers with PPE such as footwear, gloves, eye protection devices, helmets, etc. • Prepare an emergency action plan

Area of Concern	Project Activity	Management Measures
<p>accidents, including the following:</p> <ul style="list-style-type: none"> • Notice or signboards shall be properly installed at the construction site • Conduct safety training or orientation to workers prior to start of work • Provide required PPE to workers whose use will be mandatory • In case of an emergency, suspend all work <p>To maintain good community relations, the Contractor will:</p> <ul style="list-style-type: none"> • Inform local authorities and community about construction and work schedules, interruption of services, and rerouting of traffic. • 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. 		<ul style="list-style-type: none"> • Maintain PPE properly by cleaning dirty ones and replace damaged sets • 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
	<ul style="list-style-type: none"> • Child labor 	Contractor will not hire workers below 15 years old
	<ul style="list-style-type: none"> • Training and record keeping 	<p>The Contractor will perform the following:</p> <ul style="list-style-type: none"> • 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 on general health and safety practices, and on specific hazards related to their work

Area of Concern		Project Activity	Management Measures
		<ul style="list-style-type: none"> • Security of construction site 	<p>Contractor will ensure the following:</p> <ul style="list-style-type: none"> • Security personnel will be deployed to prevent unauthorized entry at the construction site • All the tools, equipment, and construction materials at the site are accounted for, identified, clearly labeled or /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, and 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 requiring access to the site after working hours will have to 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 3, (Wednesday), Time: 3:00 pm
Venue: Information Access Centre, CSE Department, BUET

List of Participants-1

Sl No	Name	Occupation	Male	Female	Cell No.	Signature
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List of Participants-2

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List of Participants-3

Sl No	Name	Occupation	Male	Female	Cell No.	Signature
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29	Dr. M. Hossainuzzaman	Teaching	✓		01712267935	Hossain 3/4/2019
30	Richard Banai	Services	✓		01672104036	Banai 03/04/19
31	Md. Lookman Hossain	Services	✓		01715785369	Lookman 03.04.19
32	Md. Roza Shafiqul Hossain	Service	✓		01819966699	Roza 3.4.19
33	Kamuk Das	Student	✓		01845254455	Das 3.4.19
34	Sakib Ahmed Siddique	Student	✓		01718511201	Sakib 3.4.19
35	M. Sahel Rahman	Professor	✓		01552589480	Sahel 3.4.19
36	Md. Abdul Mannan	Service	✓		01926771549	Mannan 3.4.19
37	Dr. Mahbuba Nazrin	Professor, CSE, BUET		✓	01724959999	Nazrin 3.4.19
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held on April 3, (Wednesday), Time: 3:00 pm
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List of Participants-4

Sl No	Name	Occupation	Male	Female	Cell No.	Signature
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42	Md. Amrullah Haq	Service	✓		01915374345	Haq 3/4/2019
43	Md. Tanvir Islam	Service	✓		01567458143	Tanvir 03.04.19
44	Mohammed Wahiduzzaman	S.T.O	✓		01759429449	Wahid 3/4/19
45	Aziz Ahmed	Job	✓		01552015712	Aziz 3/4/19
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47	Dr. Md. Saifur Rahman	BUET	✓		01552347884	Saifur 3/4/19
48	Md. Javed Mia	BUET Job	✓		01855886826	Javed 3/4/19
49	Md. Abu Nazim	Job	✓		01812308333	Nazim 3/4/19
50	Semad Hossain	IAC Analyst CSE, BUET	M		0155205396	Semad 3/4/19
51	Dr. Md. Raki Hossain	CSE, BUET Lecturer	M		01557855464	Raki 3/4/19
52	Dr. Md. Moinul Hossain	CSE, BUET Professor	M		0173166929	Moinul 3/4/19

List of Participants-5

Sl No	Name	Occupation	Male	Female	Cell No.	Signature
53	Osman Gony	Officer, H. BUET	✓		01822178836	Gony 3/4/19
54	Md. Rezaul Karim	Service	✓		0174088992	Karim 3/4/19
55	Md. Rafiqul Islam	Service	✓		0161020100	Rafiqul 3/4/19
56	Dr. Aminul Lyal	Associate Prof.	✓		01857416847	Lyal 3/4/19
57	Md. Habibul E-Kowser	Assistant	✓		01920048154	Kowser 3/4/19
58	Md. Shahin Pramanik	Service	✓		01558373124	Shahin 3/4/19
59	Dr. Md. Shohrab Hossain	Associate Prof.	✓		0181925296	Shohrab 3/4/19
60	Professor Basak	Assistant Professor		✓	01710-288910	Basak 3/4/19
61	Md. Hossainul Islam Sikib	Assistant Professor	✓		01711-379911	Sikib 3/4/19
62	Md. Rezaul	Service	✓		0161098839	Rezaul 3/4/19

Letter of BUET to Azimpur Government Girls' School and College



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

কম্পিউটার সায়েন্স এন্ড ইঞ্জিনিয়ারিং বিভাগ

Bangladesh University of Engineering and Technology, Dhaka-1000, Bangladesh

Phone: +880-2-9665612 PABX: +880-2-9665650/7104/7109 Fax: +880-2-9665612, +880-2-8613046 E-mail: headcse@cse.buet.ac.bd Web: www.buet.ac.bd/cse

Date: June 06th, 2021

Prof. Hasibur Rahman
Azimpur Government Girls School and College
Azimpur, Dhaka-1205, Bangladesh

Dear Prof. Hasibur Rahman ,

The Bangladesh University of Engineering and Technology (BUET) will be constructing a new building for the Department of Computer Science and Engineering. The location of the proposed new building will be the empty space between the power plant and Jidpas building in the south side of the West Palashi Campus of BUET. Attachment 1 shows the location of the proposed new building and the brief information.

The proposed new building is part of a **Government project**, Improving Computer and Software Engineering Tertiary Education Project (ICSETEP), through the Ministry of Education. The Government has requested the Asian Development Bank (ADB) to finance the ICSETEP that is expected to be completed by June 2026. The new building construction is expected to commence in October, 2021 and complete in December, 2022.

Part of the requirements of ADB to the Government is to do stakeholders' consultations and we recognize the Azimpur Government Girls School and College as a key stakeholder as the proposed new building will be located to the school. In this regard, we would like to invite you for a virtual meeting using Zoom on June 17, 2021 at 3:00 PM. If Zoom is not your preferred tool for a virtual meeting, please let us know what is the most convenient to you. We will be grateful if you could provide us the information of the staff and representatives from the school organizations, parents-teachers association, or the employees association who could join us during the virtual meeting.

It will be an opportunity for BUET the present about the proposed new building and to know if you have any comments or concerns. We consider the Azimpur Government Girls School and College a valued partner in providing quality education in our country.

We look forward to hearing from you.

With best regards,

Dr. A.K.M. Ashikur Rahman
Professor & Head

Dr. A.K.M. Ashikur Rahman
Dept. of CSE, BUET
Professor & Head, Department of CSE, BUET
Dhaka-1205, Bangladesh
Mobile: 8801556329138
Email: ashikur@cse.buet.ac.bd



Attachment 1

Proposed New Building – Project Brief

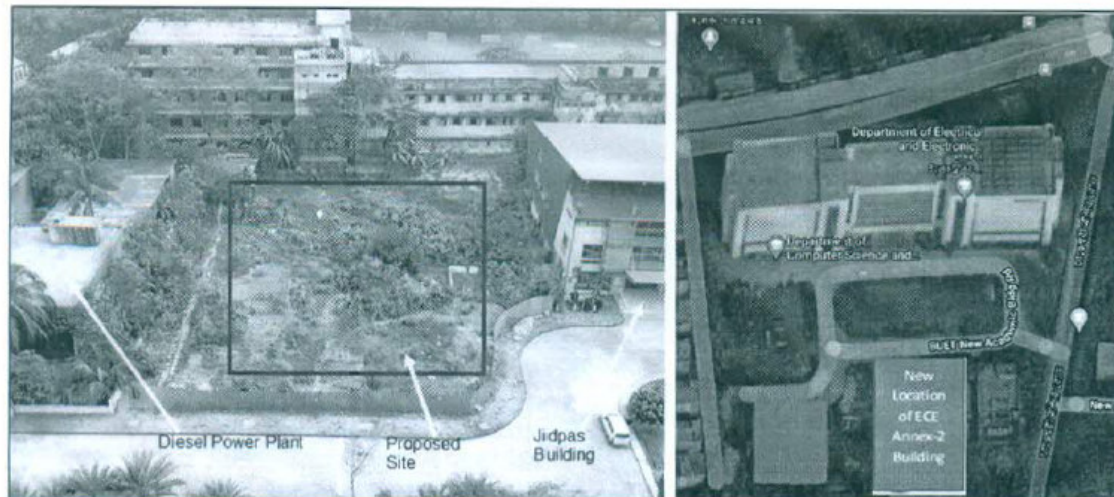
1. About the proposed new building

The new building will have a total floor area of 262,600 square foot (ft²) or 24,582 square meters (m²) consisting of three-level underground parking lot, ground floor, and additional 16 floors (see table below). It will incorporate green building features expected to reduce the use of energy and water resources. The green building features will cover the design, choice and use of construction materials, energy-efficient lighting and cooling systems, and relevant Energy Star-certified products such as data centre equipment, office equipment, and electronics available in Bangladesh.

Total Spaces in Different Floors

Particulars	Spaces in each floor in square foot (ft ²)	Floor Area in ft ²
3 storied underground parking lot	12,600	37,800
Ground Floor + 16 storied building	12,600	214,200
Foundation for Ground Floor + 16 storied building + 3 storied underground parking lot	12,600	252,000

2. Location map



3. Access during construction

The following measures will be considered to manage access during construction:

- All large vehicles carrying construction materials will be allowed after 10 p. m. when all the daily academic activities are closed. There will be no public walking during that time.

- Students and employees will be restricted from using the road on the north side of the proposed location of the building. That is, the public will not be allowed to access the south side of ring road.
- All pedestrians and vehicles will make right turn through the north side of ring road to get access to the Jidpas building.

4. Potential environmental impacts and mitigation measures

An environmental management plan that includes the COVID-19 health & safety plan, environmental monitoring plan, and implementation arrangements will be prepared by BUET. Potential environmental impacts are mainly during construction expected to be for about 24 months. Some mitigation measures are described below:

Potential environmental impacts	Mitigation measures
Increased dust and noise levels	<ul style="list-style-type: none"> • Temporary enclosures (at least 2 meters high) to contain dust and minimize noise. • Regular watering of opened land areas or in sources of dust • Transport and storage of dust-generating materials will be covered with tarpaulin or any suitable cover
Occupational and community health and safety risks	<ul style="list-style-type: none"> • Covid-19 health & safety plan based on the guidance notes of WHO will be implemented. • Prepare an emergency response and disaster preparedness. • Provide list of contact details during emergency to workers or post on billboards at the construction site. • Workers will be provided with personal protective equipment (PPE) and its use will be mandatory. • Sanitary facilities and safe drinking water will be provided to workers. • Good housekeeping will be always enforced
Generation of waste	<ul style="list-style-type: none"> • Marked/color-coded garbage bins will be provided to allow separation of waste at source. • Regular collection of collected waste to avoid accumulation
Movement of vehicles.	<ul style="list-style-type: none"> • Traffic management plan will be implemented. • Staff will be assigned to oversee smooth flow of traffic. • Clear and visible danger signs will be installed
Presence of workers in BUET campus	<ul style="list-style-type: none"> • Construction site will be temporarily enclosed with clear and proper demarcation to separate access of university students, faculty, and administrative staff. • Security personnel will be assigned to prevent unauthorized access to the construction site

5. Grievance redress mechanism

A grievance redress mechanism (GRM) will be set up during project implementation to handle complaints from affected people and in facilitating its resolution. BUET will ensure that receiving and resolving complaints will be a process that is prompt, understandable, transparent, gender-responsive, culturally appropriate, and easily accessible to affected persons without cost and retribution. BUET will assign a focal person to oversee the efficient implementation of the GRM.

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 <i>(Please provide details as appropriate: what happened, how and why it happened, when and where, how many times it occurred)</i>			
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
		Date	Not required
Manner of disclosure		Mail	
		Phone	
		Meeting	
		Not required	

TERMS OF REFERENCE FOR ENVIRONMENTAL SAFEGUARD CONSULTANT

1. 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.
2. 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 the Asian Development Bank (ADB) following the Safeguard Policy Statement (SPS) 2009 will be mandatory. The candidate should have good communication skills (oral and written) and be a good team player with strong organizational and problem solving skills.
3. Duties and tasks of the Environmental Safeguard Consultant include but 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 of Bangladesh are complied with by the project.
 - (ii) Ensure that the environmental management plan (EMP) and environmental monitoring plan (EMOP) are included in the bid documents and civil works contracts.
 - (iii) Implement a system for monitoring 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) Assist in obtaining associated government permits (if any) prior to start of construction works.
 - (vii) Take immediate action in the event of unexpected adverse impact or ineffective mitigation measures identified during implementation and in preparing the corrective action plan.
 - (viii) Provide technical support to the PIU-designated staff in drafting the environmental monitoring reports required by ADB, and in monitoring compliance of the Contractor with environmental, health, and safety requirements;
 - (ix) 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.
 - (x) Prepare the semiannual environmental monitoring reports to be submitted to ADB, and upon ADB review, address any comments raised (if any).
 - (xi) 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**

- (1) In this report, "\$" refers to United States dollars.

This environmental monitoring report is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature. Your attention is directed to the "terms of use" section of this website.

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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**

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

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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}

This environmental safeguard monitoring report is a document of the borrower and made publicly available in accordance with ADB's Access to Information Policy 2019 and the Safeguard Policy Statement 2009. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff

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 noncompliance 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 or 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 revegetated after completion of work				
Emergency Preparedness and Response				
Fire extinguishers and/or fire-fighting equipment properly maintained and not expired				
Fire escapes properly marked, clear, and not obstructed				
Emergency contacts available in case of any incident				

Items for Inspection	Y	N	NA	Remarks (i.e., problem observed, possible cause of noncompliance and/or proposed corrective action)
Accidents and incidents reported, reviewed, and corrective or preventive actions recorded				
Occupational Health and Safety				
Provision of labor and equipment shed				
Provision of sanitation facilities and safe drinking water				
Use of personal protective equipment (PPEs)				
Installation materials and equipment storage				
Separate storage of fuel and lubricant				
Training on occupational health and safety, use of PPE, etc. done before construction works				
Clear danger and warning signs on-site for students, faculty, and community				
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				
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 or 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				
Evidence of excessive noise				

Items for Inspection	Y	N	NA	Remarks (i.e., problem observed, possible cause of noncompliance and/or proposed corrective action)
Any noise mitigation measure adopted (e.g., use noise barrier or 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, sawdust 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 _____
 Designation in PIU _____

Date _____

COVID-19 Health and Safety Plan

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 the incidence of COVID-19 in the workplace for the construction of the new 17-storey Computer Science and Engineering building in Bangladesh University of Engineering and Technology (BUET) by providing information on its symptoms, modes of transmission, exposure risk assessment, and precautionary measures following the hierarchy of controls. The new building will have a total floor area of 252,600 ft² (or about 23,412 m²) consisting of three-level underground parking lot, ground floor, and additional 16 floors.

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.¹⁸

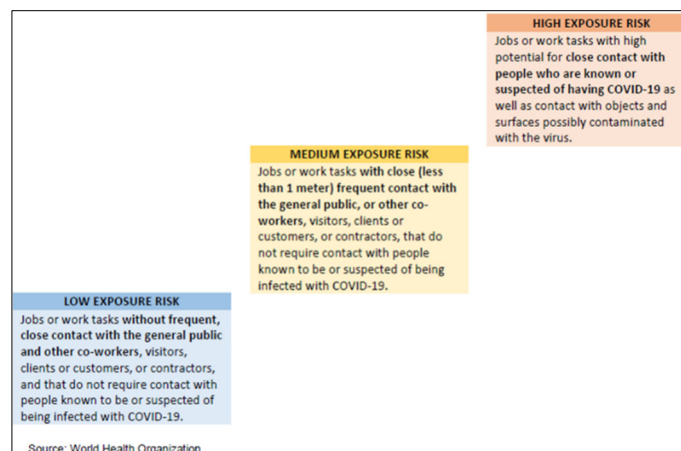


Figure 1 Levels of Risk Exposure to COVID-19

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 Dhaka 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. 66) of WHO Bangladesh, the total number of COVID-19 cases in Bangladesh as of 30 May 2021 is 798,830 with 12,583 related deaths and 738,805 recovered cases. About 5.8 million people of the eligible population (i.e., over 40 years old) have been vaccinated with the 1st dose and 2.2 million for the 2nd dose.¹⁹

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

¹⁸ 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>

¹⁹ WHO Bangladesh. COVID-19. Morbidity and Mortality Weekly Update N°66. 31 May 2021. https://cdn.who.int/media/docs/default-source/searo/bangladesh/covid-19-who-bangladesh-situation-reports/who_covid-19-update_66_20210531.pdf?sfvrsn=1a6defec_9.

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.

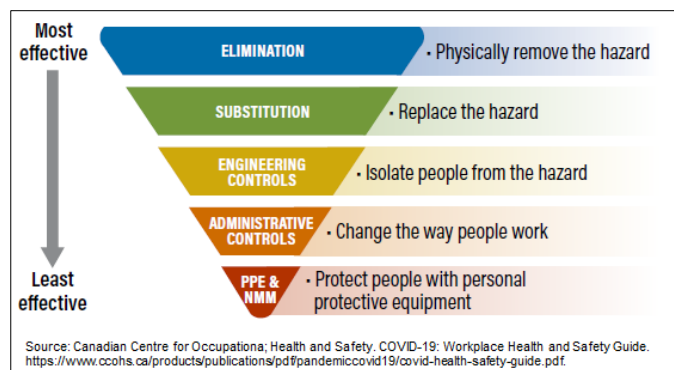


Figure 2 Hierarchy of Controls to Reduce Risk

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

Controls	Preventive Measures	Implementing Unit	Supervising and Monitoring Unit
Workforce profile			
Characteristics	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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)	<ul style="list-style-type: none"> • Include safety trainings that cover issues such as safety procedures, appropriate use of PPEs, occupational health and safety, workers' code of conduct, flexible work hours, etc. to ensure compliance to COVID-19 safety requirements. • 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

Controls	Preventive Measures	Implementing Unit	Supervising and Monitoring Unit
	<ul style="list-style-type: none"> • Training to include topics such as: (i) signs and symptoms of COVID-19, (ii) how it is transmitted, (iii) how to protect oneself (safety protocols), (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, and (vi) site access control system and monitoring. 		
Communication	<p><i>Workers and Staff</i></p> <ul style="list-style-type: none"> • 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 will be given opportunities to ask questions, raise their concerns, and make suggestions as they see fit. • Arrange for regular meetings with medical experts in Dhaka University (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 (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. <p><i>Community</i></p> <ul style="list-style-type: none"> • 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. 	Contractor	PIU, Environmental consultant
Site Management			

Controls	Preventive Measures	Implementing Unit	Supervising and Monitoring Unit
Access Control	<ul style="list-style-type: none"> • 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°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	<p><i>Hand hygiene</i></p> <ul style="list-style-type: none"> • 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 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. 	Contractor	PIU, Environmental consultant

Controls	Preventive Measures	Implementing Unit	Supervising and Monitoring Unit
	<p><i>Respiratory hygiene</i></p> <ul style="list-style-type: none"> • 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. <p><i>Cleaning, disinfection, and waste disposal</i></p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 m²), physical spacing at least 1 meter apart for workstations and common spaces like entry/exits, stairs, and other common areas. • 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. 	Contractor	PIU, Environmental consultant

Controls	Preventive Measures	Implementing Unit	Supervising and Monitoring Unit
	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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. 	Contractor	PIU, PMU
Worker who may have COVID-19 symptoms	<ul style="list-style-type: none"> 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. A contingency plan/protocol will be developed, in consultation with Dhaka University Medical Centre 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. 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>.
2. WHO. Bangladesh. Coronavirus disease (COVID-19) Update. [https://www.who.int/bangladesh/emergencies/coronavirus-disease-\(covid-19\)-update](https://www.who.int/bangladesh/emergencies/coronavirus-disease-(covid-19)-update).
3. 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>.
4. 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>.
5. US Centers for Disease Control and Prevention. COVID-19. Workplaces and Business. <https://www.cdc.gov/coronavirus/2019-ncov/community/workplaces-businesses/index.html>