GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH

Local Government Engineering Department (LGED)

Local Government Division

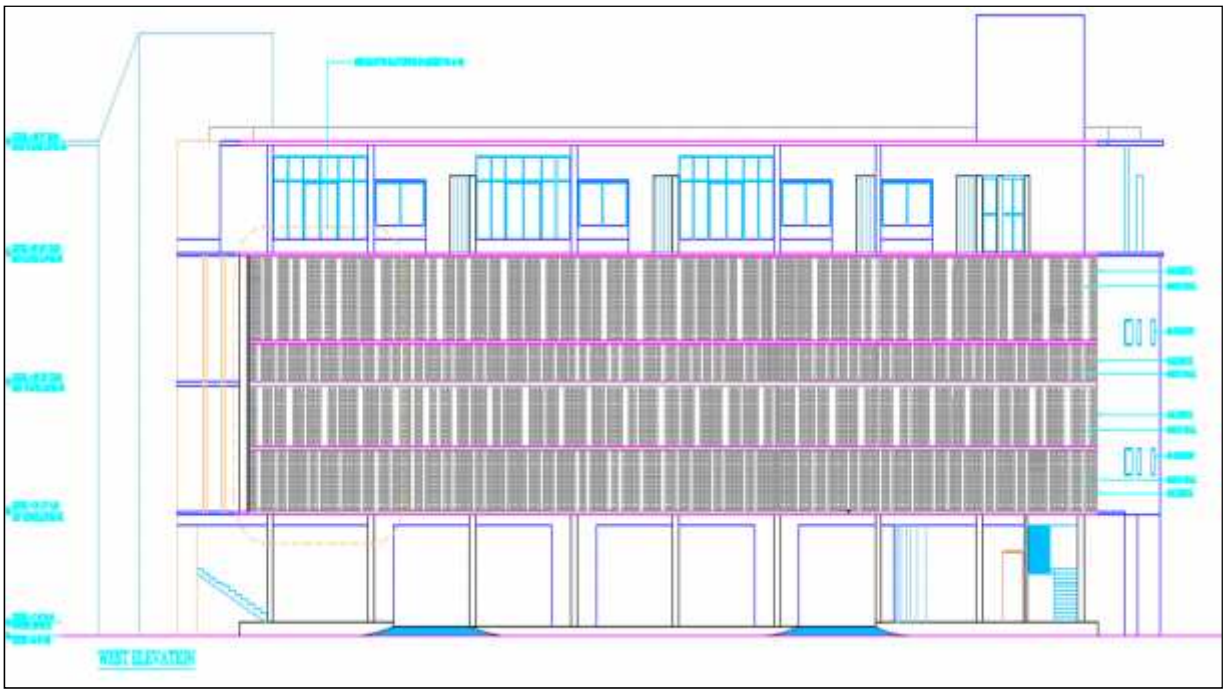
Ministry of Local Government, Rural Development, and Cooperatives

ENVIRONMENTAL MANAGEMENT PLAN

Name of the Subproject: Construction of Chandina Poura Community Centre under Chandina Pourashava

Package No: MGSP/CND/2018-19/W-05

Chandina Pourashava, Comilla



Municipal Governance and Services Project (MGSP)

Design, Supervision, and Management (DSM) Consultancy Services

Joint Venture of

Hifab International AB, Sweden

AQUA Consultant and Associates Ltd., Bangladesh

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ABBREVIATIONS

BDT	Bangladeshi Taka
BOQ	Bill of Quantity
CC	Cement Concrete
DSM	Design, Supervision, and Management
EA	Environmental Assessment
ECR	Environmental Conservation Rules
EMP	Environmental Management Plan
EPP	Emergency Preparedness Planning
ES	Environmental Screening
GoB	Government of Bangladesh
LGED	Local Government Engineering Department
MGSP	Municipal Governance and Services Project
PD	Project Director
PMU	Project Management Unit
RCC	Reinforcement Cement Concrete
WB	World Bank

1 SUBPROJECT DESCRIPTION

1.1 Subproject Background

Chandina Pourashava is located at Chandina Upazila under Comilla District. Chandina Pourashava designated as a Class B was declared as a Pourashava in the year of 1997. It has an area of 14.2 sq. km. The present population of Chandina Pourashava is about 69,700. The Pourashava has 39.50 km pucca, 12.75 km semi pucca and 66.50 km earthen road. It has 3 km earthen drain and 7 km pucca drain. Also, it has 1 cinema hall, 1 children park, 1 cinema hall (Source: at a glance Chandina Pourashava), but, there is no community centre in the Pourashava area.

The subproject area is one of the important centers of economic activities of the Pourashava which connects with Dhaka-Chittagong Highway. Like other fast growing towns, Chandina Pourashava also faces infrastructural problems due to lack of adequate and improved road, drainage networks and other facilities. Hence, planned and integrated development of road and drainage network with street lighting facilities, other infrastructures can boost-up the infrastructural improvement.

The significant features of the subproject are stated below:

Name of the Subproject:	Construction of Chandina Poura Community Centre under Chandina Pourashava
Package No.:	MGSP/CND/2018-19/W-05
District Name:	Comilla
ULB Name:	Chandina Pourashava
Jurisdiction Area:	Ward number 7
Structural Design Option:	Three storied community centre with sanitary, water supply, electrical and other associated works
Wards Population:	About 5634 as per as Population and Housing Census 2011
Tribal People:	No tribal people settlement found in the subproject area
Land Acquisition:	No private land acquisition is required
Estimated Cost:	83.824 million BDT
Subproject Duration:	12 Months
Tentative Start Date:	January 13, 2019
Tentative Completion Date:	January 12, 2020

For the preparation of the subproject appraisal, environmental screening has been performed. According to that screening, an environmental management plan is required. Hence, this environmental management plan is prepared to meet the regularity requirement. This plan simplifies the anticipated impacts and corresponding mitigation measures for easy understanding of the personnel responsible for the subproject implementation. Therefore, this study only includes key contents that are appropriate.

1.2 Subproject Setting

The subproject site is situated within the jurisdiction area of the Chandina Pourashava Ward no. 07. The location map, lay-out plan, and topographic features of the subproject are shown in ***Figure 1.2.1, Figure 1.2.2 and Figure 1.2.3.***

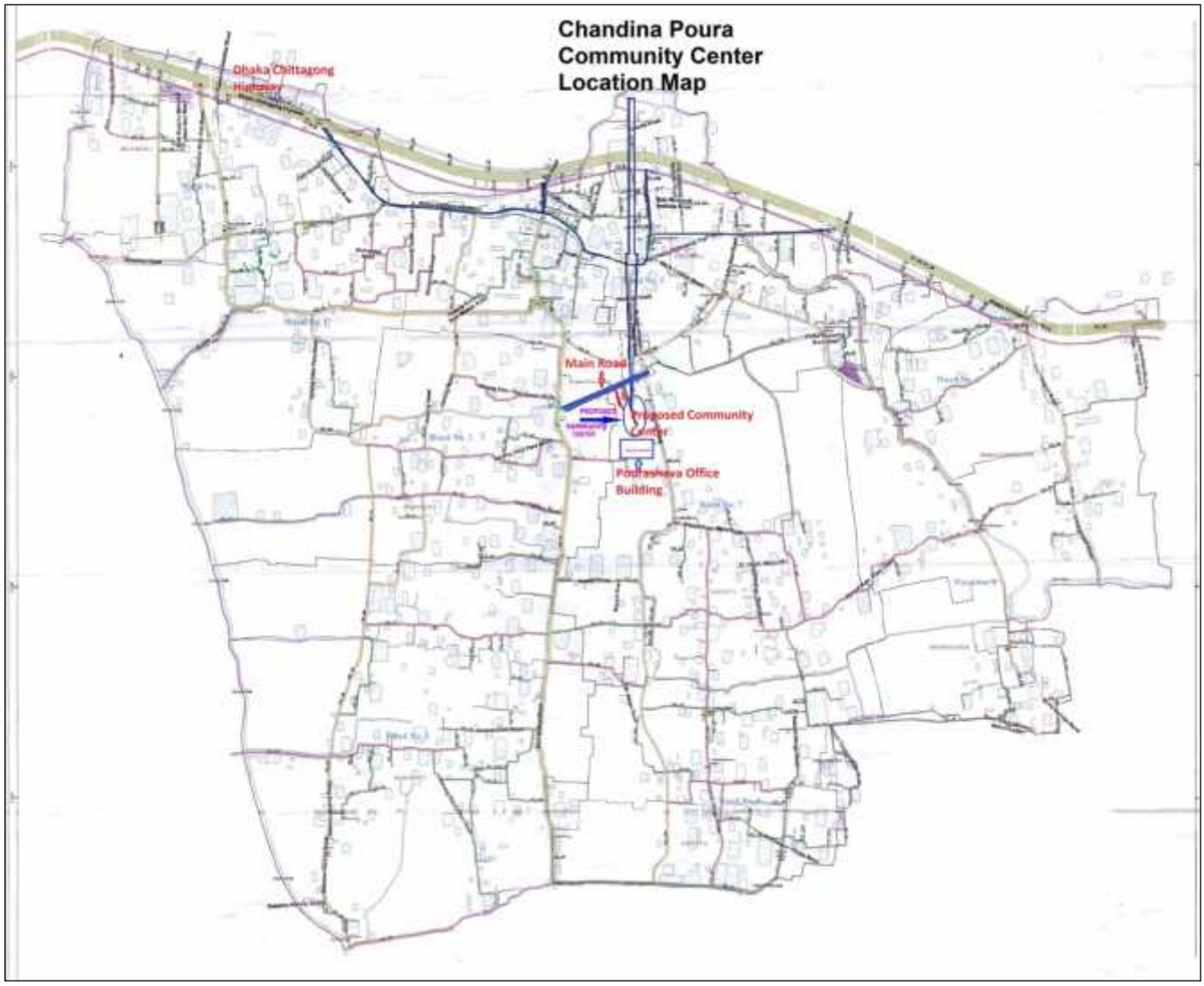

Figure 1.2.1: Location Map of the Subproject Site

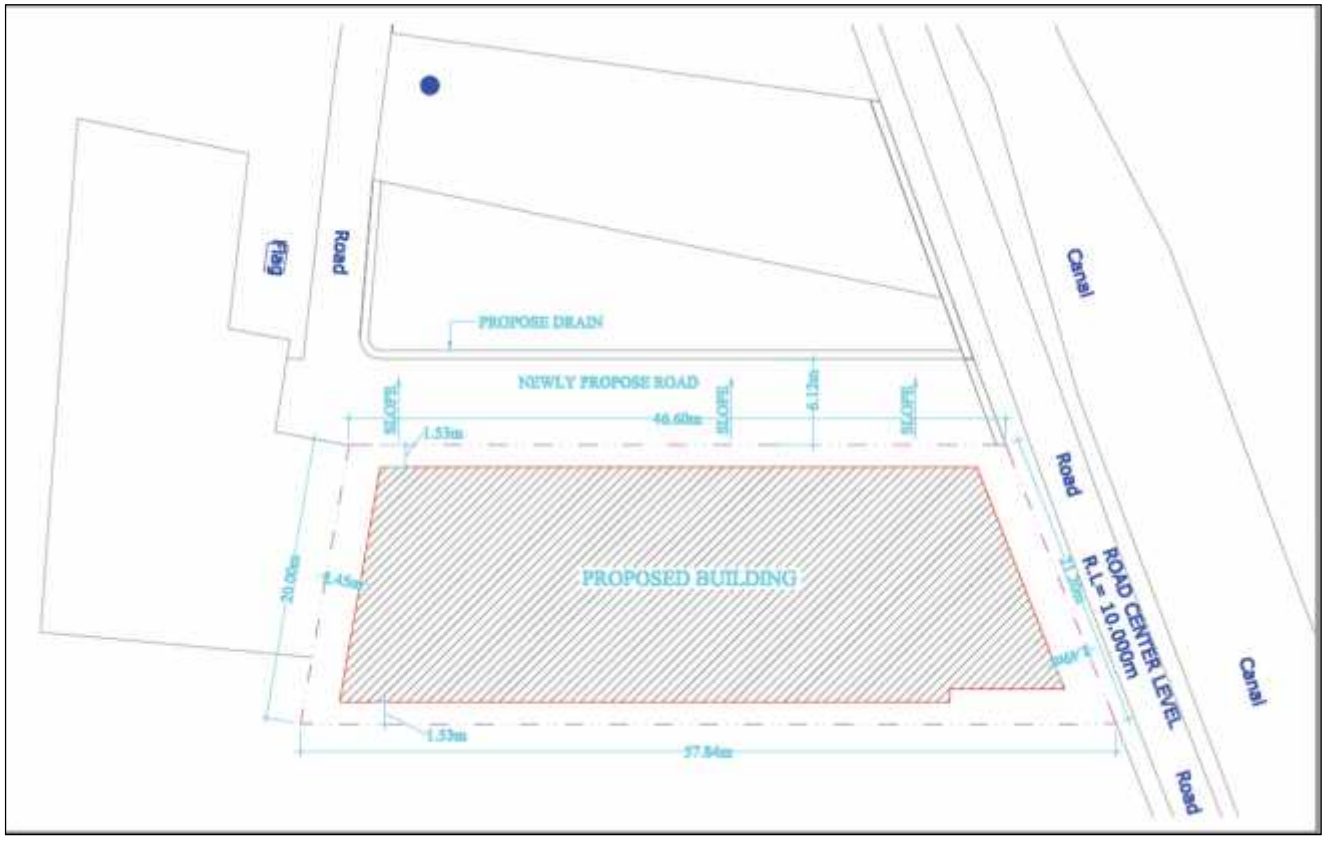

Figure 1.2.2: Lay-out Plan of the Subproject Site

Figure 1.2.3: Topographical Features of the Proposed Community Centre and Adjacent Areas

The subproject site is situated beside the Poura Bhaban. During the site visit, the detailed environmental and infrastructural features listed around the subproject site. The major findings of the site visit are given below:

Side/ Direction	Major Environmental and Infrastructural Features
North	Boundary wall, main road, canal, Non-functional Pucca Library Building
South	Pourashava office, trees
East	Boundary wall, trees
West	Pourashava Entrance Road, Chandina Municipality Auditorium Building (not functional), open space, trees

1.3 Current Situation, Proposed Intervention and Need for the Subproject

The subproject site is situated within the jurisdiction of the ward no. 07, which is under developed area. The built-up infrastructure of the subproject area includes: Pourashava office, Non-functional library, Chandina Municipality Auditorium Building (not functional), boundary wall. Trees, bushes, open space and canal are also important features of the subproject area. Boundary wall, main road, canal, Non-functional Pucca Library Building are situated at North side of the subproject site. Pourashava office and trees at the South side, boundary wall and trees at the East side, Pourashava Entrance Road, Chandina Municipality Auditorium Building (not functional), open space, trees at the West side.

The total land area of the proposed building is 15.26 katha (10,989 sft.). The built-up area of the proposed building varies from floor to floor. The proposed area of the ground floor is 7126.25 sft, first floor is 8842.14 sft, second floor is 8683.14 sft, third floor is 8118.69 sft and roof is 8927.58 sft.

The ground floor will be used as parking area and kitchen zone. It is planned to provide hall room, stage, store room, lobby and service area in the first floor and second floor, 11 numbers of rest room with one V.I.P room and attached bath rooms, three sitting room, dining room, kitchen and lobby in the third floor and open space, rain water outlet in the roof. One stair case in each floor has been included in the design. The design also includes periphery drain, adequate water supply and sanitation facilities and access road. Separate toilet facilities of male and female at all floors have been included in the design. The design also includes adequate water supply and sanitation facilities. Moreover, shop owners will carry out interior decorations as per their requirement. The existing condition and inspection of the proposed site is further elaborated in the following ***Photographs 1.3.1 and 1.3.2***.

Photographs 1.3.1: Current Situation of the Subproject Site

Photographs 1.3.2: DSM Consultant Team with Pourashava Representatives inspected the Proposed Community Centre

1.4 Envisaged Subproject Activities and Implementation Process

The general activities for the subproject includes: construction of the semi-pucca site office and construction of the labor shed. The major specific activities include:

- Site clearing work;
- Providing lay-out;
- Cast-in-situ pile foundation;
- Earthwork in excavation of foundation trenches;
- Earth filling work as per requirement;
- Compaction of earth;
- Fabrication, binding, bending of the ribbed or deformed bar;
- Mass reinforcement cements concrete work in grade beam, beam, and column and slab construction;
- Single layer brick flat soling in ground floor;
- Brick work in facing super structure;

- Fancy and ornamental screen work;
- Preparation of the door and window frames with seasoned wood;
- Fitting and fixing of the window and door with accessories;
- Fitting and fixing of the glazed tiles;
- Fitting and fixing of the unglazed tiles;
- Plastering work;
- Distempering with ready mixed synthetic polyvinyl distemper;
- Painting work;
- Fixing of the railing;
- Construction of the toilets;
- Construction of the septic tank and soak well;
- Construction of the water tank:
- Beautification work;
- Fitting and fixing of the plumbing and electrical accessories etc;
- Installation of the waste bins;
- Tree plantation work as environmental enhancement work.

The materials and resources to be used for the key activities: soil in earth work, sand, stone chips, brick chips, glass, cement, bricks, concrete, tiles, reinforcement, sanitary and electrical accessories.

The major equipment to be used for the implementation of the subproject: sand driven pile, wooden drag, roof hoist, ladder, hammer, steel/ concrete hammer, excavator, concrete mixer machine, mechanical vibrator machine, MS sheet, steel cutter, steel shutter and dump truck.

1.5 Category of the Subproject

- According to ECR 199 : Green □ Orange □ A √ Orange B □ Red □ Not Listed □
- According to WB classification : Category B □ Category C □√

In the Project EMF, it is noted that mixed used building can classify as Orange A and or Orange B as per ECR-97 depending on assessment of impact. Considering the environmental impacts which is low and site specific, primarily this subproject can consider as Orange-A category as per ECR-97. According to the WB classification, it can classify as Category C.

1.6 Subproject Schedule

The tentative schedule of construction of the subproject is:

(a) Subproject Duration (months) **:**12 Months

(b) Tentative Start Date **:** January 13, 2019

(c) Tentative Completion Date **:** January 12, 2020

The daily construction hours will normally include regular working time. However, daily working hours may vary based on the on-site condition. The detailed work program will be prepared by the contractor with the assistance of the PIU-Pourashava. Then it will be shared with the PMU, LGED and DSM consultants. In addition, the detailed work program will also be shared with the Bank as per requirement.

2 ENVIRONMENTAL SCREENING

Environmental Screening (ES) for the subproject has been conducted with the purpose of fulfilling the requirements of Government (GOB) and World Bank (WB) for the preparation of subproject appraisal. Environmental Screening Checklist, as adopted in Appendix C of the Environmental Management Framework (EMF) of the MGSP, was administered for identifying the impacts and their extents.

The screening data for **the community centre** have been formulated and are shown in below:

2) Potential Environmental Impact during Construction Phase:

(a) Ecological Impacts:

➢ Felling of the trees	Significant □	Moderate □	Minor □√	Number of trees 8
➢ Clearing of the vegetation	Significant □	Moderate □	Minor □√	
➢ Potential impact on species of aquatic (i.e., water) environment	Significant □	Moderate □	Minor □√	

The proposed community centre will be constructed at the open space beside Poura Bhaban. Only 8 trees will be felled down and no vegetation will be cleared for the proposed community centre. Furthermore, there will be no impact on aquatic species at construction phase because there is a water body adjacent to the subproject site. Hence, the subproject activities have insignificant adverse impact on the ecology.

(b) Physicochemical Impacts:

➢ Noise pollution	Significant □	Moderate □	Insignificant □ √
➢ Air pollution	Significant □	Moderate □	Insignificant □ √
➢ Drainage congestion	Very likely □	Likely □ √	Unlikely □
➢ Water pollution	Significant □	Moderate □	Insignificant □√
➢ Pollution from solid/ construction wastes	Significant □	Moderate □√	Insignificant □
➢ Water logging	Significant □	Moderate □	Insignificant □√

The subproject will have impacts on noise and air quality during construction phase due to mobilization of the equipment, vehicles movement for the transportation of the materials, using of hydraulic excavator if required, mechanical compaction machine, welding and drilling machine, concrete mixer machine, vibrator machine etc. Since the activities do not require heavy equipment and no massive activities needed for the completion of the work, it is anticipated that noise & air pollution will be minor and will be limited within the subproject boundary. Construction activities also will generate solid wastes due to removing of the existing pucca structure that have temporary and localized impacts on the surrounding environment if not properly re-used or disposed-off. Furthermore, adjacent roadside periphery drain will retain the storm water. Hence, anticipated impact on the drainage congestion & water logging due to the subproject activities will be insignificant. Primarily, the subproject will have no adverse impact on the other physicochemical components.

(c) Socio-economic Impacts:

➢ Traffic congestion	Very likely □	Likely □	Unlikely □ √
➢ Health and safety	Significant □	Moderate □√	Insignificant □
➢ Impact on archaeological and historical	Significant □	Moderate □	Insignificant □√
➢ Employment generation	Significant □√	Moderate □	Insignificant □

Though, it is limited; however, during construction period, vehicles movements for carrying construction materials and mobilization of the equipment have not likely impacts on the local traffic system because it is not busy road. The subproject will have negative impact in health and safety during construction phase due to likely accidents from the construction activities. Careless activities during removing of the existing structure and using of the welding machine, drill machine, concrete mixer, vibrator machine etc. may create accidents. There is no archaeological and historical site will be affected due to the subproject activities. The subproject has significant positive impact by generating employment opportunity for the local people.

3) Potential Environmental Impact during Operational Phase:

(d) Ecological Impacts:

- Potential impact on species of the aquatic (i.e., water) environment — Significant □ Moderate □ Minor □√

The subproject activities do not have any likely impacts on the surrounding ecological environment during operation phase because septic tank with soak well will be used for generated waste water and sewage management.

(e) Physicochemical Impacts:

- Potential air quality — Significant □ Moderate □ Insignificant □√
- Noise level — Significant □ Moderate □√ Insignificant □
- Drainage congestion — Improvement □ Minor Improvement □ No Impact □ √
- Waste water disposal — Significant □ Moderate □ Minor □ √
- Pollution from solid wastes — Significant □ Moderate □ Insignificant□√

During operation phase, public gathering and possible use of loud speaker may create severe noise nuisance to the users and shoppers. In addition, night time operation of the community centre will have adverse impact on the adjacent residential area. Installation of the trash bins will minimize the environmental degradation due to improper disposal of solid wastes. However, if the trash bins will not be used properly and wastes are thrown here and there may pollute the surrounding environment. In addition, septic tank with soak well will be used for generated waste water and sewage management which will minimize environmental degradation.

(f) Socio-economic Impacts:

- Traffic — Significant □ Moderate □ Minor □√
- Safety Issue (fire hazard, short-circuit etc) — Significant □ Moderate □√ Minor □
- Employment generation — Significant □√ Moderate □ Minor □

It has significant positive impact by providing job & business activities and community interaction. During operation phase, it will not create significant traffic congestion due to improper parking of the vehicles and ignoring of the traffic rules as the adjacent road is not busy. Possible accidents and social risks of fire hazard due to short-circuit and other vulnerability may also have negative socio-economic impacts.

(4) Summary of the Possible Environmental Impacts of the Subproject:

From the above study, it seems that the ecological impact is minor. The construction activities may degrade the air quality and noise level. In addition, solid wastes generation from the construction activities may temporary degrade the quality of the surrounding environment. Improper storage of the construction materials, un-used soils, debris and other forms of the waste materials due to construction activities may create localized hazard for the local people

and the workers. However, the anticipated impact on physicochemical components is mainly site specific and limited within the subproject boundary. During construction phase, possible failure of the equipment such as roof waist may create severe accidents to the workers. It is noted that the subproject activity does not require any heavy equipment, complex procedure and massive activities. Hence, the impacts are low and significantly limited within the subproject boundary. The possible occupational health and safety risk should be considered properly.

During operation phase, due to public gathering and possible using of loud speaker may create severe noise nuisance to the users. Wastes disposal and waste water and sewage management should be considered properly. This subproject has positive impacts in terms of the generation of the employment opportunities due to construction activities, supplying of the materials at construction phase and by providing business activities at operation phase. Furthermore, to resist earth quake impact, the design and construction work will follow BNBC Code-1993.

3 SPECIFIC IMPACT, MITIGATION AND ENHANCEMENT MEASURES

The likely impacts of the subproject are mainly caused by the activities required for the implementation of the subproject, materials, resources and equipment to be used to perform the activities. This section describes some specific impacts due to the subproject activities and their mitigation measures.

3.1 Demolition of the Existing Structure and Demolition Wastes Disposal

Under this subproject, the abandoned structure will be demolished. The hazards and environmental impacts associated with demolition works are mainly function of location of the structure, type of structure, method of demolition, the area of building being demolished, amount of solid wastes, dust and traffic being generated and duration of the demolition work.

There is a buffer zone between the abandoned building. Hence, demolition work needs simple procedure and commonly used manual equipment-hammer with mechanical drill machine and steel cutter. Therefore, this is not massive demolition work and anticipated impacts are not severe. The generated solid wastes and dust will be less. In addition, demolition materials such as reinforcement, door and window, debris are reusable. Importantly, the demolition work will require less time (even lesser than 15 days).

The anticipated impact due to demolition of the existing building is not severe. However, potential environmental impacts in connection with demolition works are taken seriously and corresponding mitigation measures are formulated adequately. The potential environmental impacts in connection with demolition works are: noise & vibration, dust, generation of demolition wastes including metal frames, concrete, debris & reinforcement and visual & aesthetic impacts.

Mitigation Measures

- Electric power and all utility services if exist should be shut off within the structure before demolition works to be started;
- Wooden and metal window & door and other furniture should be relocated for re-use;
- Site should be fenced and screened to protect site from strong winds and to contain dust;
- Proper location of equipment and machinery on site;
- Ensure use of the personal protective equipment where applicable;
- Ensure careful operation of the machineries and equipment;
- Demolition work should be started from roof and then side brick wall;
- Demolition work should avoid at night time and should follow normal working hour;
- The demolition works shall be taken not any nuisance by the way of noise, dust and vibration to the surrounding environment;

- Ensure re-use of the materials and disposal of the wastes materials at the dumping site at Katerpull beside Dhaka-Chittagong Highway;
- No wastes materials and debris shall be burned on the site;
- No encroachment of demolition wastes on adjacent road side area and any private property;
- Cover the exposed loose wastes with fabric.

3.2 Earth Excavation, Trenching and Foundation work

The key activities associated to the footing foundation-earth excavation, trenching, cutting and welding of the reinforcement, placing of the reinforcement ring into the trenching and RCC work for the foundation etc. have environmental impacts on the physicochemical components. The anticipated impacts due to footing foundation works are:

- Noise pollution due to use of concrete mixer machine, vibrator machine, steel cutter and welding machine;
- Muddy water and clay may generate due to earth excavation and trenching work;
- Potential occupational health and safety risks and accidents from mixer machine, steel cutter, vibrator and welding machine;
- Air pollution due to black smoke emission from diesel based concrete mixer machine and vibrator machine.

Mitigation Measures

- RCC work should avoid at schooling time and at night time and should follow normal working hour;
- In case of muddy water and mud, establishment of pucca tank (two chambers) to collect muddy water and mud;
- Re-use of the mud and clay for filling work if applicable and disposal of the mud in the at Katerpull beside Dhaka-Chittagong Highway;
- Avoid using of steel cutter, wielding machine, concrete mixer machine, vibrator machine at night;
- Avoid prolonged exposure to noise (produced by equipment) by workers;
- Ensure use of the personal protective equipment's (helmet, goggles, gloves, ear plug, safety boot);
- Availability and access to first-aid equipment and medical supplies in case of any accidents;
- Carefully operation of the steel cutter, wielding machine, concrete mixer machine, vibrator machine;

- Regular maintenance of the concrete mixer and vibrator machine to avoid any black smoke emission.

3.3 Pollution from the Construction Materials

Dumping of the construction spoils, including accidental leakage of the oil, grease, and fuel in equipment yards is a significant hazard. Surface water and soil quality might be polluted from these contaminants. Even the people to be engaged for the construction activities might endanger the physical and human habitats of the area.

Mitigation Measures

- Safe transport, storage, and disposal of the construction materials, and the equipment have to be carried out in order to avoid the accidental spillage and loss;
- Fuels, lubricants, and other hazardous materials should store over raised platforms and not directly on the ground;
- Maintain adequate moisture content of soil and sand during transportation, compaction and handling;
- Carry the materials especially loose soil and sand with adequate cover;
- Disposal of soil and construction wastes at Katerpull beside Dhaka-Chittagong Highway.

3.4 Air Quality and Dust

During construction phase, air pollutants will be emitted from the equipment, subproject activities and construction vehicles are expected to remain low. Local residents in the vicinity of the work sites will be temporarily disturbed by the limited dust pollution. The overall impacts, however, are expected to remain low.

Mitigation Measures

- Water should be sprayed at the work site and camp site area for dust control. Ensure sprinkle and cover stockpiles of the loose materials (e.g., fine aggregates);
- Maintain adequate moisture content of soil and sand for transportation, compaction and handling;
- Avoid use of dust generating equipment (which produce significant amount of particulate matter) far from the local residents;
- Ensure that all subproject vehicles are in good operating condition.

3.5 Noise and Vibration

Noise and vibration caused by the equipment, subproject activities and movement of the construction vehicles may temporarily disturb nearby environment though the impacts are anticipated to be limited within the subproject boundary.

Mitigation Measures

- Transportation of the construction materials have to be carried during the scheduled times, and mainly during the day in off-peak time;
- If needed and applicable, all powered mechanical equipment and machineries will be fitted with noise abating gear such as mufflers for effective sound reduction.

3.6 Occupational Health and Safety

The most important risks associated with the construction activities are listed below:

- Risks of using of the machineries in motion such as steel cutter, glass cutter, tiles cutter etc;
- Risk of falling from the height during chipping, plastering work, painting work etc;
- Risk from drop down of the materials from the height during chipping, plastering work, painting work etc;
- Risk from mechanical failure of the equipment;
- Risk from the traffic collision or accidents during operation of the equipment such as hydraulic excavator, steel cutter, welding machine, vibrator machine and vehicles movement for the transportation activities of the subproject;
- Risks from head loads for carrying soil, construction materials and construction equipment;
- Risk associated to the sudden bad weather working conditions such as storm, thunder storm and earth quake etc.
- Exposure to the sunlight- workers are being exposed to the sun for long hours;
- Exposure to the high temperature, and humidity for a long time resulting in dehydration;
- Contact with the hazardous substances and wastes pose risks of the infections and diseases.

Requirements for the Workers' Health and Safety

The key salient features of the general requirements for the workers' health and safety stated are presented in ***Table 3.6.1.***

Table 3.6.1: General Requirements for the Workers Health and Safety

Issues	Requirements
Site fencing, ladder, scaffolding and pulley	• Site should be fenced and screened to protect site from strong winds and to contain dust; • Ladder should be placed if needed and scaffolding should be provided for the site protection work and for chipping, plastering, painting etc; • Provide jute netting for avoiding any drop down of the materials to the ground; • Use mechanical equipment such as pulley for the lifting of the materials to the roof and other floors.
Health and Hygiene	• Cleanliness at the site premises and workers living places and at the Labor Shed; • Arrangement of the proper ventilation and temperature at the Labor Shed; • Protection against dust and furnace by using of the nose masks and covering of the head and body; • Proper disposal of the wastes and effluents; • Provision of the adequate latrines and separate toilet for the women; • Sufficient dustbins for the solid waste management system.
Safety and First Aid Box	• Using of the personal protective equipment (helmet, gloves, ear plug, goggles, nose mask, safety boots); • Precautions during work on or near machineries in motion; • Head loads are prohibited; • Ensure first aid box; • First aid facilities should be provided and maintained; • The first aid kit should include adhesive bandages, regular strength pain medication, gauze, and low grade disinfectant.
Compensation for Accidents at Work	• Contractors will bear medical treatment costs. If any severe accidents such as loss of hands, legs or loss of working ability or any case of death needs compensation-(the amount of the compensation should be fixed considering the type of accidents).
Dust and Fumes	• For any dust, fumes, or other impurities likely to be injurious to the workers, effective measures shall be taken to prevent their accumulation and its inhalation by the workers.
Overcrowding	• No labor room should be overcrowded.
Latrines and Urinals	• Sufficient latrines shall be provided; • Latrines shall be maintained in clean and sanitary condition; • Latrines shall be adequately lighted and ventilated.
Disposal of Wastes and Effluents	• Proper disposal system for the solid waste and effluent is required.

3.7 Impacts on Social Environment and Common Property Resources

Through comprehensive study, it is revealed that impacts are expected not to be severe and to be largely manageable. The following ***Table 3.7.1*** presents impacts on socio-economic environment and common property resources.

Table 3.7.1: Impacts on Social Environment and Common Property Resources

Social Components	Impacts on IECs	Impact Significance
Community Perception	The local community people welcome this subproject and there is no visible objection from them.	Significant (+ve)
Employment and Business Opportunity	Community feels happy because generally the local contractor will be engaged for the construction works which will create work opportunity for the skilled and non-skilled labor. The subproject will create business opportunity for the equipment and materials suppliers.	Significant (+ve)
Community Order and Security	This subproject activity does not create any severe security problems to the local community and community people.	Minor (-ve)
Possible damage to infrastructure and facilities	Possible damage of the existing road infrastructure by the construction equipment and vehicles used in this subproject.	Minor (-ve)
New infrastructure and facilities	Construction of community center will provide new infrastructure facilities.	Moderate (+ve)
Landscape and Aesthetics	This subproject activity temporarily will degrade landscape and aesthetics values of the subproject area to a limited extent.	Minor (-ve)
Labor Habitat	It is anticipated that the outsider workers will stay at the Labor shed which will have impacts on the environment relates to the generation of the solid wastes, effluent, and water consumption.	Moderate (-ve)
Health Care	Workers may suffer from the dehydration problems, respiratory problem, and other health hazards.	Minor (-ve)
Accident	In case of road accidents by the vehicles to be used for the transportation and possible accidents from subproject activities may have serious negative impact.	Significant (-ve)

Mitigation Measures

- Conduct dissemination with the local community about the subproject details;
- Continue liaison with the community leaders in order to maintain the community support;
- Engage local contractor and local people as much as possible for positive perception of the local community;
- Follow traffic rules to avoid any accidents;
- Transportation and mobilization of the equipment and construction materials avoiding peak hours and scheduled time;
- Ensure first aid facilities and effective use of personal protective equipment where applicable.

3.8 Labor Influx and Anticipated Impacts

The labor force and associated goods and services required for the construction of infrastructure civil works under this subproject cannot be fully supplied locally. The migration to and temporary settlement of laborers in the subproject, referred to as labor influx, carries an

array of potentially positive and negative impacts in terms of demands on public infrastructure, utilities, housing and sustainable resource management and the strain on social dynamics.

Labor influx effects on host communities include positive impacts such as:

- The subproject activities will generate work opportunities for the local people and supplying of the construction materials, equipment, food and other necessary stuffs to the campsite;
- Improved infrastructure and public service access and availability whereby subproject investment catalyzes larger allocation of resources to a region, stimulating the development or expansion of infrastructure and public services.

Critical negative social risks include:

- Increase in criminal activity and alcohol and drug abuse, domestic violence, political attachment and violence, smuggling and robbery etc;
- Increase in gender-based violence, including eve teasing, sexual harassment etc;
- Increases in communicable diseases, including respiratory problems, diarrheal diseases, vector-borne diseases (e.g., malaria), and sexually transmitted infections (e.g., HIV/AIDS, syphilis, gonorrhea, hepatitis B);
- Conflicts arising from increased demand on existing infrastructure, services, and utilities, including transportation, health, education, water and sanitation, waste management, public utilities and community, religious, and recreational facilities and loss of land for access routes.

The general environmental impacts of labor influx include pressure on the natural resources such as using of the water, electricity, other fuel for cooking, loss of land for the labor establishment, depletion of the water supply, sewage and waste water generation, degradation of the air quality, waste generation, increased demands on the local energy and resources and noise pollution effects. The number of local and migrated people involved in the subproject activities can be only identified in the construction phase. Hence, these specific impacts will be quantified during construction work and environmental management plan will be modified accordingly. However, the following safeguard measures are recommended to avoid any risk of labor influx:

- Inform local people about the subproject activities;
- Liaison with the community leaders in order to get community support;
- Engage local people as much as possible to minimize workers from outsiders;
- Monitor workers attitude and behavioral matter;
- Monitor the workers movement for avoiding any unexpected social activities (robbery, crime, political attachment and conflicts, drugs abuse);

- Inform and use local administration to get support if needed;
- Inform local utilities service providers (such as for new electricity connection REB or any other department);
- Ensure effective use of natural resources such as water, electricity, fuel, wood etc.

3.9 Impacts on Traffic Movement

Due to transportation of the materials and equipment, the subproject will have temporary negative impact in traffic congestion during movement of the vehicles and equipment. However, it is anticipated that the subproject activities do not have any severe impact on the local traffic system because movement of the vehicles and equipment will be only for a short time and as per requirement. The on-site subproject activities do not have any impact on the local traffic system during construction phase. Furthermore, the subproject is situated beside the Poura Bhabon and Pourashava Road, therefore, traffic congestion is not a major issue as the influence area is not busy. However, during operation phase, improper and roadside parking may create localized traffic congestion.

The following safeguard measures are recommended to minimize the impacts associated to the traffic movement:

- Inform local people about the subproject activities;
- Inspire local people to use connecting and diversion roads;
- Ensure schedule deliveries of material/ equipment during off-peak hours;
- Place traffic sign/cautionary sign to avoid undue traffic congestion and associated traffic control measures to limit possible disruption;
- The stack yards and at the place of construction works should be fenced off with fences and should be isolated from general public access and marked with signs to ensure safe movement;
- Avoid any material storage and any work on the road side area.

3.10 Drainage Congestion

Construction of the proposed three storied building could create adverse impact on the existing drainage system through impedance to natural flow conditions. Temporary drainage congestion could occur especially during monsoon period due to excavation of earth from the foundation trench. In addition, drainage congestion resulting in to stagnant water or local flooding also may be occurred in the places such as construction yard and labor's camp. In fact, the drainage system on the surrounding of the proposed building area can be affected by construction activities.

Mitigation Measures

- Temporary storm water drainage congestion in the proposed building area due to rainwater should be removed by pumping from the foundation trench;
- Drainage congestion at the labor camp and construction yard should be removed by temporary earth or brick drain;
- Alternative temporary surface drain close and inside the boundary should be provided to connect with the existing drain;

In the detailed design, peripheral surface drainage system should be included.

4 RECOMMENDED MITIGATION AND ENHANCEMENT MEASURES

The activities wise anticipated environmental impacts and corresponding mitigation measures have been outlined in ***Table 4.1 and Table 4.2***.

Table 4.1: Anticipated environmental impacts during construction phase and corresponding mitigation and enhancement measures

Activity / Issues	Potentials Impacts	Proposed Mitigation and Enhancement Measures	Responsible Parties
Construction and operation of labor shed for the workers (Workforce and labor shed management)	• Generation of sewage and solid waste may degrade quality of the surrounding environment	• Construction of sanitary latrine considering 15 persons for one toilet at the labor shed and separate toilet for male and female; • Erection of "no litter" sign, provision of waste bins (introduce separate waste bins for organic and inorganic wastes); • Ensure wastes (solid wastes and other forms of the wastes) disposal at dumping site at Katerpull beside Dhaka-Chittagong Highway; • Ensure emptying and cleaning of the waste bins regularly; • Drum trucks are available in the Pourashava. Hence, drum truck should be used for transportation of the wastes; • At present, the Pourashava has improved their waste management capacity. Hence, use the existing facilities for the subproject activities for the effective waste management.	Contractor Monitoring-Primarily by Chandina Pourashava Secondarily by PMU, LGED and DSM
	• Health of workers	• Conduct formal and unofficial discussion to increase awareness about hygiene practices among the workers; • Ensure availability and access to first-aid equipment and medical supplies for the workers.	
	• Possible development of labor camp into permanent settlement	• Contractor to remove labor camp at the completion of contract.	
	• Outside labor force causing negative impact on health and social well-being of local people	• Ensure that contractor employ local work force to provide work opportunity to the local people and conduct formal and unofficial awareness program for the health and social well-being of the local people.	
General construction works	• Air pollution	• Check regularly and ensure that all the subproject vehicles and equipment are in good operating condition; • Ensure contractor spray water on dry surfaces of the compound and adjacent area regularly to reduce dust generation; • Maintain adequate moisture content of sand for transportation, handling and storage; • Ensure contractor sprinkle and cover stockpiles of loose materials (e.g., fine aggregates).	
	• Drainage congestion and flooding	• Adequate provision of storm water drainage and provision of the pumping-out the storm water and drain-out water from the trenches of the foundation work if needed.	
	• Traffic congestion, effect on traffic and pedestrian safety	• Ensure schedule deliveries of materials/ equipment during off-peak hours; • Place traffic sign to avoid undue traffic congestion and associated traffic control	

Activity / Issues	Potentials Impacts	Proposed Mitigation and Enhancement Measures	Responsible Parties
		measures to limit possible disruption; • Inform the local people about the subproject activities.	Contractor Monitoring-Primarily by Chandina Pourashava Secondarily by PMU, LGED and DSM
	• Noise pollution	• Check and maintenance the equipment properly; • Avoid using of construction equipment producing excessive noise at night; • Avoid prolonged exposure to noise (produced by equipment) by the workers; • Regulate use of horns and avoid un-due use of hydraulic horns by subproject vehicles. • Avoid schooling time to perform activities that may generate noise nuisance.	
	• Water and soil pollution	• Prevent discharge of fuel, lubricants, chemicals, and wastes into adjacent water bodies, low lands and soil.	
	• Accidents	• Conduct formal and informal discussion for creating awareness about the accident; • Provide personal protective equipment (PPEs) and ensure using of the PPEs by the workers; • Regular checking of the mechanical equipment such as roof hoist, winch, hydraulic excavator, vibrator machine, concrete mixer machine, steel cutter, drill machine, hammer etc. • Provision of jute netting to avoid any undue fall down of the construction materials to the ground; • Ensure using of the safety belts during chipping, plastering, painting, glass fitting etc.	
	• Spills and leaks of oil, toxic chemicals and soil pollution	• Prevent discharge of fuel, lubricants, chemicals, and wastes into soil; • Use jute netting to prevent possible drop down of the cemented materials to the ground; • Proper collection and disposal of the spills.	
All construction works	• Beneficial impact on employment generation	• Employ local people in the subproject activities as much as possible; • Give priority to poor people living within subproject area in subproject works (e.g., excavation and other works) which do not require skilled manpower.	
	• General degradation of the environment	• Ensure environmental enhancement measures-15 trees will be planted to enhance ecological condition and for beautification work; • Ensure environmental enhancement measures, such as traffic and cautionary signs.	
Environmental impact due to the demolition of existing structure and corresponding mitigation measures			
Demolition of the existing pucca structure	• Potential health and safety risk and accidents due to removing of pucca structure	• Electric power and all services should be shut off within the structure before demolition work to be started; • Site should be fenced and screened to protect site from strong winds and to contain dust; • Proper location of equipment and machinery on site; • Ensure use of the personal protective equipment where applicable; • Ensure careful operation of the machineries and equipment;	Contractor

Activity / Issues	Potentials Impacts	Proposed Mitigation and Enhancement Measures	Responsible Parties
	• Generation of solid and construction wastes and noise nuisance due to demolishing brick wall	• Wooden and metal window & door and other furniture should be relocated for re-use; • Ensure use of the personal protective equipment where applicable; • Ensure careful operation of the machineries and equipment; • Demolition work should be started from roof and then side brick wall; • Demolition work should avoid at schooling time and at night time and should follow normal working hour; • The demolition works shall be taken not any nuisance by way of noise, dust and vibration to the surrounding environment; • Ensure re-use of the materials and disposal of the wastes materials at dumping site at Katerpull beside Dhaka-Chittagong Highway; • No wastes materials and debris shall be burned on the site; • No encroachment of demolition wastes on adjacent area and any private property; • Cover the exposed loose wastes with much fabric.	Monitoring- Primarily by Chandina Pourashava Secondarily by PMU, LGED and DSM
Environmental impact due to the key construction activities for super-structure and corresponding mitigation measures			
Earth excavation and site clearing work etc.	• Generation of solid and construction wastes; • Generation of loose soil.	• Cover exposed loose soil, construction debris etc. before disposal; • Disposal of un-used soils and construction wastes at dumping site at Katerpull beside Dhaka-Chittagong Highway;	
	• Health and safety issue and possible accidents	• Operate the hammer carefully for the dismantle work; • Ensure effective use of the personal protective equipment; • Monitor the demolition work etc closely to avoid any possible accidents.	
Sand filling/ Back filling work	• Air and dust pollution affecting nearby settlements	• Maintain adequate moisture content of soil and sand during transportation, compaction and handling; • Carry the materials especially loose soil and sand with adequate cover.	
Cutting, welding of the reinforcement and shuttering work	• Noise Pollution	• Avoid using of rod cutter and wielding machine at night.	Contractor Monitoring- Primarily by Chandina Pourashava Secondarily by PMU, LGED and DSM
	• Health and Safety	• Ensure use of the PPEs; • Availability and access to first-aid equipment and medical supplies.	
RCC (reinforcement concrete) work	• Air pollution due to black smoke emission from concrete mixer machine and vibrator machine	• Regular maintenance of the concrete mixer and vibrator machine.	
	• Noise pollution	• Avoid operation of the concrete mixer and vibrator machine at night; • RCC work should be carried-out at regular working hour.	
Chipping, plastering, painting and glass fitting etc	• Possible health and safety issues such as fall down from the height	• Use ladder/scaffolding, safety belts, helmet and other safety equipment; • Use jute netting to avoid fall down of the materials during chipping, plastering, painting and glass fitting work.	

Activity / Issues	Potentials Impacts	Proposed Mitigation and Enhancement Measures	Responsible Parties
Fitting and fixing of the sanitary and electrical accessories; Setting up electrical connection	• Potential health and safety risks due to drill machine, tiles cutter and hammer.	• Ensure use of the PPEs as per requirement.	
Environmental impact on health safety and prone to accidents due to construction activities and corresponding mitigation measures			
Subproject activities such as demolition work, RCC work, plastering, painting, chipping, electrical connection, etc. and other work	• Potential health and safety risks and site security during demolition work, and other major works	• Risks of using of the machineries in motion such as steel cutter, glass cutter etc; • Risk from falling from the height during chipping, plastering work, painting work etc; • Risk from drop down of the materials from the height during chipping, plastering work, painting work etc; • Risk from mechanical failure of the equipment such as winch machine; • Risk from the traffic collision or accidents during operation of the equipment such as hydraulic excavator, steel cutter, winch machine, welding machine, and vehicles movement for the transportation activities of the subproject; • Risks from head loads for carrying soil, construction materials and construction equipment; • Risk associated to the sudden bad weather working conditions such as storm, thunder storm and earth quake etc. • Exposure to the sunlight- workers are being exposed to the sun for long hours; • Exposure to the high temperature, and humidity for a long time resulting in dehydration; • Contact with the hazardous substances and wastes pose risks of the infections and diseases.	Contractor Monitoring-Primarily by Chandina Pourashava Secondarily by PMU, LGED and DSM
		• Ensure site fencing and use of ladder, scaffolding and pulley; • Site should be fenced and screened to protect site from strong winds and to contain dust; • Ladder should be placed and scaffolding should be provided for the site protection work and for chipping, plastering, painting etc; • Provide jute netting for avoiding any drop down of the materials to the ground; • Use mechanical equipment such as pulley for the lifting of the materials to the roof and other floors.	

Table 4.2: Anticipated Environmental Impacts during Operational Phase and Corresponding Mitigation and Enhancement Measures

Activity/Issues	Potential Impacts	Proposed Mitigation and Enhancement Measures	Responsible Parties
Air quality degradation	• Black smoke emission and dust from the vehicles may degrade the air quality	• Ensure effective traffic management; • Sprinkle of water at adjacent area of the building.	Monitoring primarily by Chandina Pourashava
Noise Nuisance	• Use of hydraulic horns by the vehicles may create noise nuisance; • Use of loud speaker and overcrowded during events may create noise nuisance to the nearby residents at night	• Ensure effective traffic management and create awareness to avoid undue use of horns; • Regulate use of the loud speaker at night; • Avoid use of loud speaker during prayer time.	
Wastes generation	• Possible degradation of the environment due to improper disposal of the wastes	• Introduce waste bins; • After collection from the waste bins food wastes, other forms of wastes should be dumped at dumping site at Katerpull beside Dhaka-Chittagong Highway;	
Traffic congestion	• Increase and improper parking of the vehicles may create traffic congestion	• Ensure effective traffic management; • Use car parking zone for the proper parking of the guest vehicles.	
Possible accidents and social safety risk due to fire hazard, short-circuit and eve teasing.	• Fire hazard, short-circuit and earth quake etc. may create accidents and safety risks; • Possible social risks due to eve teasing, robbery, pick pocketing etc	• Use fire extinguisher and ensure emergency exit; • Conduct programs for awareness rising of the community people to minimize social vandalism.	
Waste water/sewage disposal	• Improper disposal and leakage of sewage may degrade the surrounding environment.	• Separate sewer lines for bath room and toilet facilities; • Provision of septic tank system and soak pit.	

5 ENVIRONMENTAL MONITORING PLAN

Environmental Monitoring Plan for this subproject will help to evaluate the extent and severity of environmental impacts against the predicted impact and the performance of environmental protection measures. The following ***Table 5.1*** has been prepared for the key environmental indicators.

Table 5.1: Matrix Table of Monitoring Plan (Visual observation during construction phase)

Monitored Parameter/ Issues	Monitoring Method/ Key Aspects	Location of Monitoring	Period & Monitoring Frequency
Safety orientation and training of workers	Frequency of training & orientation of workers for safety	Subproject site	• Once in a month • Reporting: Once in a month
Personal Protective Equipment	Ensure every single person involved in the activities wear and use safety equipment	Subproject site	• Daily • Reporting: Once in a month
Worker's health	Monitoring process of worker's health	Subproject site	• Daily • Reporting: Once in a month
Sanitation & drinking water facility to the workers	Availability of safe drinking water and sanitation to the workers	Subproject site	• Daily • Reporting: Once in a month
Incident record and reporting	Documented record of all incident, accident, its remedial process	Subproject site	• Daily • Reporting: Once in a month
Site security/ Fencing at the site	Isolation of site from general access by fencing, restriction of the un-authorized entry in the site.	Subproject site	• Daily • Reporting: Once in a month
Bulletin/ announcement boards/ prohibition signs	Visible in good condition or not	Subproject site	• Daily • Reporting: Once in a month
Equipment /vehicles	Switched-off diesel engines when not in use; Search any possible leakage; Fueling.	Subproject site	• Daily • Reporting: Once in a month
Dust	Dust is visible or not	Subproject site	• Daily • Reporting: Once in a month
Oily waste generation and disposal	Quantity of oily waste, storage and disposal	Subproject site	• Daily • Reporting: Once in a week
Solid waste generation	Quantity of solid wastes and disposal	Subproject site	• Daily • Reporting: Once in a month
Gender equity	No discrimination regarding payment	Subproject site	• Daily • Reporting: Once in a month
Child labor	No child will be engaged in the activities	Subproject site	• Daily • Reporting: Once in a month
Handling of hazardous materials	Fueling, storage, operation	Subproject site	• Daily • Reporting: Once in a month

In addition, a comprehensive Environmental Compliance Monitoring checklist has been enclosed in ***Appendix-I***.

6 ENVIRONMENTAL MANAGEMENT BUDGET

Considering the environmental impacts and their mitigation measures for the subproject, several items are included in the BOQ for the environmental management. ***Table 6.1*** presents the estimated cost for the environmental management.

Table 6.1: Environmental Management Budget

Item No.	Description of the Works	Unit	Qty	Unit Rate (BDT)	Amount (BDT)
eme-1	Dust suppression measures by water spraying throughout the construction period in and around the subproject site, uncovered aggregates and loose materials such as stockpiles of the sand, excavated earth, construction wastes etc. and overall construction works as per requirement	LS	–	–	20,000.00
eme-5	Prevention of the spillage and leakage of the polluting materials (Detailed procedure will be given in the EMP)	LS	–	–	5,000.00
eme-6	Campsite wastes disposal facility during the construction period (collection, transportation, and dumping of the wastes at designated dumping site beside Chandina-Shariatpur Highway: 2 nos (1 no. for the organic wastes and 1 no. for the inorganic wastes disposal facility)	Nos.	2.00	20,000.00	40,000.00
eme-7	Campsite water supply facilities: Preferably 1 no. of tube well at the labor campsite (Depending on the site condition, DSM consultant will assist the contractor for selecting the option)	Nos.	1.00	20,000.00	20,000.00
eme-8	Campsite sanitation facilities: 2 nos. of the toilets preferably sanitary toilets at the labor campsite (1 no. for women and 1 no. for men)	Nos.	2.00	20,000.00	40,000.00
eme-9	Providing safety gear packages like hand gloves, spectacles for eye protection, ear plug, helmets, masks, visible jacket, safety shoes for at least 30 persons (20 workers and 10 visitors)	Set	30.00	3,000.00	90,000.00
	One first aid box with necessary accessories (contractor is responsible for providing necessary medicines, saline as per requirement during construction period)	Set	1.00	2,500.00	2,500.00
eme-11	Tree plantation for beautification work- preferably local fruits, flowers, medicinal and ornamental trees- (including protection and conservation during project defect liability period)- tree plantation detailed will be given in the EMP- 15 nos. of the trees	Nos.	15.00	750.00	11,250.00
eme-14	Cautionary signs-4 nos. (Detailed specifications will be given in the EMP)	Nos.	4.00	2,500.00	10,000.00
eme-15	Installation of the waste bins at the ground (at the front side) (detailed design will be given in the EMP)-6 nos.	Nos.	6.00	8,000.00	48,000.00
	Total				**286,750.00**

After approval to revise the cost estimate has lengthy complex procedure. Hence, as per project EMF, PMU suggestion and experience from other LGED projects, adequate budget has been allocated for the environmental management for the mitigation and enhancement measures. The budget for labor shed and site office construction is included in the civil works items. Therefore, it is not included in the environmental budget. It should be noted that the contractor will be paid as per actual work done.

7 ENVIRONMENTAL CODES OF PRACTICE

This section identifies and specifies environmental management guidelines and practices to be followed by the contractor for sustainable management of all environmental issues. The Contractor shall carry out the subproject related activities as specified in contract agreement. Chandina Pourashava shall ensure that contractor take due responsibility to mitigate those negative impacts. Environmental awareness creation, particularly about the direct construction impacts and for the health, pollution and safety issues will be Contractor's responsibility. Clauses that may be incorporated in the tender documents are:

- ECoP-1 (Overall Environmental Protection): Contractor shall take all steps to protect environment and avoid causing all types of public nuisances during implementation;
- ECoP-2 (Labour shed Management): Contractor shall maintain the work camp and construction sites in clean and tidy conditions and shall ensure standard facilities;
- ECop-3(Workforce Environment): Contractor shall engage local people as much as possible where applicable and ensure prohibition of the child labour (less than 18 years) and aged labor (more than 65 years) in heavy works;
- ECoP-4 (Waste Management): Contractor shall be responsible for the safe transportation and disposal of the wastes generated due to the subproject activities;
- ECoP- 5 (Workers Health and Safety): Contractor shall be responsible for providing personal protective equipment and first aid facilities as per requirements;
- ECoP-6 (Compensation for Accidents): Contractor shall bear medical treatment costs for any accidents. If any severe accidents such as loss of hands, legs or loss of working ability or any case of death needs compensation- (the amount of the compensation should be fixed considering the type of accidents);
- ECoP-7 (Implementation of the Mitigation Measures): Contractor shall responsible for the implementation of the mitigation measures mentioned in the EMP;
- ECoP-8 (Spill Prevention, Fuels and Hazardous Substances Management): Contractor shall take preventive measures for spill prevention and fuels and hazardous substances management;
- ECoP-9 (Restoration of the Facilities): The contractor on completion of the contract shall remove the equipment, surplus materials, and rubbish and temporary structures of all types and shall leave sites in clean condition to the satisfaction of Pourashava and local people.

8 CONCLUSIONS AND RECOMMENDATIONS

The 3-storied market with community center subproject involves medium size construction activities and some disturbance during construction and operation may take place. Though, due to implementation of the subproject the anticipated ecological impact is very less. Hence, the anticipated impact is mainly on the physicochemical components during construction and operation phase. With good construction management and appropriate design and management during operation these impacts will be kept to a minimum.

A few key recommendations are outlined below:

- The Pourashava should inform the local people about the subproject intervention regularly;
- The construction work should be followed structured work program;
- The Pourashava will ensure availability of the EMP at subproject site during construction phase;
- All mitigation and enhancement measures proposed in this report need to be followed;
- Visual and analytical monitoring should be carried-out as per EMP and with the facilitation of the DSM consultant;
- Contractor will ensure availability of the PPEs and first-aid, water supply and sanitation facilities to the workers;
- Contractor will monitor the workers behavioral matter to avoid any undue issues associated to the labor influx.

9 REFERENCE

1. Chandina Pourashava at a glance
2. Population and Housing Census 2011
3. Environmental Assessment Volume 1: Overall Environmental Assessment [Draft Final Report], September 2013. Municipal Governance and Services Project (MGSP), Local Government Engineering Department (LGED) and Bangladesh Municipal Development Fund (BMDF), Ministry of Local Government, Rural Development and Cooperatives, Government of the People's Republic of Bangladesh.
4. Environmental Assessment Volume 2: Environmental Management Framework (EMF) [Draft Final Report], September 2013. Municipal Governance and Services Project (MGSP), Local Government Engineering Department (LGED) and Bangladesh Municipal Development Fund (BMDF), Ministry of Local Government, Rural Development and Cooperatives, Government of the People's Republic of Bangladesh.
5. Drawing, Design and Estimation part of the community centre building.
6. Bangladesh National Building Code (BNBC).

Appendix

Appendix 1: Environmental Monitoring Checklist

Local Government Engineering Department
Municipal Governance Services Project (MGSP)
Environmental Compliance Monitoring Form

Part A: General Subproject Information

Subproject Name	Construction of Chandina Poura Community Centre under Chandina Pourashava
Package No.	MGSP/CND/2018-19/W-05
ULB Name	Chandina Pourashava
Approved Estimated Cost in BDT	
Contract Amount in BDT	
Contractor Name	
Date of Commencement	
Target Date of Completion	
Physical Progress (%)	
Financial Progress (%)	
Person Responsible (PIU) (Name, Designation &Phone) for the Overall Subproject Management	
Person Responsible (DSM) (Name, Designation &Phone) for the Overall Subproject Management	
Form Completed by (Name, Designation &Phone)	
Overall Environmental Description of the Subproject	

Part B: Design, Preparation, and Legal Requirements

Environmental Concerns (PMU, PIU & DSM) (Name, Designation & Phone)	PMU-	
	PIU-	
	DSM-	
Subproject Category	DoE-BD-	WB-
Environmental Clearance Received?	Yes	No
EA Required?	Yes	No
EA Prepared and Delivered?	Yes	No
EMP Prepared & Delivered Separately?	Yes	No
Items and Cost of EMP Implementation Included in the Contract?	Yes	No
EMP Included in the Procurement Documents?	Yes	No
Inspection Schedule/Last Inspection/Monitoring by PMU Environmental Concerns	Date-	
	Key findings-	
Inspection Schedule/Last Inspection/Monitoring by PIU Environmental Concerns	Date-	
	Key findings-	
Inspection Schedule/Last Inspection/Monitoring by DSM Environmental Safeguard Specialist/Jr. Environmental Specialist	Date-	
	Key findings-	

Part C: Key Environmental Impacts

The Subproject Results in any of the following Impacts?	Yes	No	NA	If yes, is the impact (give observation)		
				Significant	Moderate	Minor
Felling of the trees						
Clearing of the vegetation that increase the risk of increased soil degradation or erosion						
Disturbance of the terrestrial and or aquatic specifies						
Noise pollution						
Air pollution						
Adverse effects on the quantity or quality of the surface water or groundwater						
Production or increase the production of the solid waste						
Drainage congestion						
Water logging that increases the risk of the water related diseases						
Traffic congestion						
Public safety						

Part D: Work Place Environment and Gender Equity

The Subproject Results in any of the following Impacts?	Yes	No	NA	Observations
Does the contractor pay to the workers regularly?				
Is there any discrepancy between the male and female workers regarding the wages or salary for the same works?				
Is the contractor complying with the GOB labor law concerning the hiring of the workers?				
Does the contractor engage women labors and does the project have suitable works for them?				
Does the contractor engage child labor (less than 18 years) and aged people (more than 65 years old)?				
Does the contractor force to the workers for the completion of the works?				
Do the workers involve with the political activities, crime, drugs addiction and other forms of unwanted activities?				
Are construction camps adequately equipped with water supply, sanitary toilets, washing facilities and facilities for waste collection and storage?				
Has separate sanitation facilities been provided for women at work camps and the construction site?				

Part E: Potential Impacts, Mitigation Measures, and Monitoring Indicator Mentioned in the EMP

Activity / Issues	Potentials Impacts	Proposed Mitigation and Enhancement Measures	Responsible Parties
Construction and operation of labor shed for the workers (Workforce and labor shed management)	• Generation of sewage and solid waste may degrade quality of the surrounding environment	• Construction of sanitary latrine considering 15 persons for one toilet at the labor shed and separate toilet for male and female; • Erection of "no litter" sign, provision of waste bins (introduce separate waste bins for organic and inorganic wastes); • Ensure wastes (solid wastes and other forms of the wastes) disposal at dumping site at Katerpull beside Dhaka-Chittagong Highway; • Ensure emptying and cleaning of the waste bins regularly; • Drum trucks are available in the Pourashava. Hence, drum truck should be used for transportation of the wastes; • At present, the Pourashava has improved their waste management capacity. Hence, use the existing facilities for the subproject activities for the effective waste management.	Contractor Monitoring-Primarily by Chandina Pourashava Secondarily by PMU, LGED and DSM
	• Health of workers	• Conduct formal and unofficial discussion to increase awareness about hygiene practices among the workers; • Ensure availability and access to first-aid equipment and medical supplies for the workers.	
	• Possible development of labor camp into permanent settlement	• Contractor to remove labor camp at the completion of contract.	
	• Outside labor force causing negative impact on health and social well-being of local people	• Ensure that contractor employ local work force to provide work opportunity to the local people and conduct formal and unofficial awareness program for the health and social well-being of the local people.	
General construction works	• Air pollution	• Check regularly and ensure that all the subproject vehicles and equipment are in good operating condition; • Ensure contractor spray water on dry surfaces of the compound and adjacent area regularly to reduce dust generation; • Maintain adequate moisture content of sand for transportation, handling and storage; • Ensure contractor sprinkle and cover stockpiles of loose materials (e.g., fine aggregates).	
	• Drainage congestion and flooding	• Adequate provision of storm water drainage and provision of the pumping-out the storm water and drain-out water from the trenches of the foundation work if needed.	
	• Traffic congestion, effect on traffic and pedestrian safety	• Ensure schedule deliveries of materials/ equipment during off-peak hours; • Place traffic sign to avoid undue traffic congestion and associated traffic control measures to limit possible disruption; • Inform the local people about the subproject activities.	

Activity / Issues	Potentials Impacts	Proposed Mitigation and Enhancement Measures	Responsible Parties
	• Noise pollution	• Check and maintenance the equipment properly; • Avoid using of construction equipment producing excessive noise at night; • Avoid prolonged exposure to noise (produced by equipment) by the workers; • Regulate use of horns and avoid un-due use of hydraulic horns by subproject vehicles. • Avoid schooling time to perform activities that may generate noise nuisance.	Contractor Monitoring-Primarily by Chandina Pourashava Secondarily by PMU, LGED and DSM
	• Water and soil pollution	• Prevent discharge of fuel, lubricants, chemicals, and wastes into adjacent water bodies, low lands and soil.	
	• Accidents	• Conduct formal and informal discussion for creating awareness about the accident; • Provide personal protective equipment (PPEs) and ensure using of the PPEs by the workers; • Regular checking of the mechanical equipment such as roof hoist, winch, hydraulic excavator, vibrator machine, concrete mixer machine, steel cutter, drill machine, hammer etc. • Provision of jute netting to avoid any undue fall down of the construction materials to the ground; • Ensure using of the safety belts during chipping, plastering, painting, glass fitting etc.	
	• Spills and leaks of oil, toxic chemicals and soil pollution	• Prevent discharge of fuel, lubricants, chemicals, and wastes into soil; • Use jute netting to prevent possible drop down of the cemented materials to the ground; • Proper collection and disposal of the spills.	
All construction works	• Beneficial impact on employment generation	• Employ local people in the subproject activities as much as possible; • Give priority to poor people living within subproject area in subproject works (e.g., excavation and other works) which do not require skilled manpower.	
	• General degradation of the environment	• Ensure environmental enhancement measures-15 trees will be planted to enhance ecological condition and for beautification work; • Ensure environmental enhancement measures, such as traffic and cautionary signs.	
Environmental impact due to the demolition of existing structure and corresponding mitigation measures			
Demolition of the existing pucca structure	• Potential health and safety risk and accidents due to removing of pucca structure	• Electric power and all services should be shut off within the structure before demolition work to be started; • Site should be fenced and screened to protect site from strong winds and to contain dust; • Proper location of equipment and machinery on site; • Ensure use of the personal protective equipment where applicable; • Ensure careful operation of the machineries and equipment;	Contractor

Activity / Issues	Potentials Impacts	Proposed Mitigation and Enhancement Measures	Responsible Parties
	• Generation of solid and construction wastes and noise nuisance due to demolishing brick wall	• Wooden and metal window & door and other furniture should be relocated for re-use; • Ensure use of the personal protective equipment where applicable; • Ensure careful operation of the machineries and equipment; • Demolition work should be started from roof and then side brick wall; • Demolition work should avoid at schooling time and at night time and should follow normal working hour; • The demolition works shall be taken not any nuisance by way of noise, dust and vibration to the surrounding environment; • Ensure re-use of the materials and disposal of the wastes materials at dumping site at Katerpull beside Dhaka-Chittagong Highway; • No wastes materials and debris shall be burned on the site; • No encroachment of demolition wastes on adjacent area and any private property; • Cover the exposed loose wastes with much fabric.	Monitoring- Primarily by Chandina Pourashava Secondarily by PMU, LGED and DSM
Environmental impact due to the key construction activities for super-structure and corresponding mitigation measures			
Earth excavation and site clearing work etc.	• Generation of solid and construction wastes; • Generation of loose soil.	• Cover exposed loose soil, construction debris etc. before disposal; • Disposal of un-used soils and construction wastes at dumping site at Katerpull beside Dhaka-Chittagong Highway;	
	• Health and safety issue and possible accidents	• Operate the hammer carefully for the dismantle work; • Ensure effective use of the personal protective equipment; • Monitor the demolition work etc closely to avoid any possible accidents.	
Sand filling/ Back filling work	• Air and dust pollution affecting nearby settlements	• Maintain adequate moisture content of soil and sand during transportation, compaction and handling; • Carry the materials especially loose soil and sand with adequate cover.	
Cutting, welding of the reinforcement and shuttering work	• Noise Pollution	• Avoid using of rod cutter and wielding machine at night.	Contractor Monitoring- Primarily by Chandina Pourashava Secondarily by PMU, LGED and DSM
	• Health and Safety	• Ensure use of the PPEs; • Availability and access to first-aid equipment and medical supplies.	
RCC (reinforcement concrete) work	• Air pollution due to black smoke emission from concrete mixer machine and vibrator machine	• Regular maintenance of the concrete mixer and vibrator machine.	
	• Noise pollution	• Avoid operation of the concrete mixer and vibrator machine at night; • RCC work should be carried-out at regular working hour.	
Chipping, plastering, painting and glass fitting etc	• Possible health and safety issues such as fall down from the height	• Use ladder/scaffolding, safety belts, helmet and other safety equipment; • Use jute netting to avoid fall down of the materials during chipping, plastering, painting and glass fitting work.	

Activity / Issues	Potentials Impacts	Proposed Mitigation and Enhancement Measures	Responsible Parties
Fitting and fixing of the sanitary and electrical accessories; Setting up electrical connection	• Potential health and safety risks due to drill machine, tiles cutter and hammer.	• Ensure use of the PPEs as per requirement.	
Environmental impact on health safety and prone to accidents due to construction activities and corresponding mitigation measures			
Subproject activities such as demolition work, RCC work, plastering, painting, chipping, electrical connection, etc. and other work	• Potential health and safety risks and site security during demolition work, and other major works	• Risks of using of the machineries in motion such as steel cutter, glass cutter etc; • Risk from falling from the height during chipping, plastering work, painting work etc; • Risk from drop down of the materials from the height during chipping, plastering work, painting work etc; • Risk from mechanical failure of the equipment such as winch machine; • Risk from the traffic collision or accidents during operation of the equipment such as hydraulic excavator, steel cutter, winch machine, welding machine, and vehicles movement for the transportation activities of the subproject; • Risks from head loads for carrying soil, construction materials and construction equipment; • Risk associated to the sudden bad weather working conditions such as storm, thunder storm and earth quake etc. • Exposure to the sunlight- workers are being exposed to the sun for long hours; • Exposure to the high temperature, and humidity for a long time resulting in dehydration; • Contact with the hazardous substances and wastes pose risks of the infections and diseases. • Ensure site fencing and use of ladder, scaffolding and pulley; • Site should be fenced and screened to protect site from strong winds and to contain dust; • Ladder should be placed and scaffolding should be provided for the site protection work and for chipping, plastering, painting etc; • Provide jute netting for avoiding any drop down of the materials to the ground; • Use mechanical equipment such as pulley for the lifting of the materials to the roof and other floors.	Contractor Monitoring-Primarily by Chandina Pourashava Secondarily by PMU, LGED and DSM

Prepared by- **Signature-** **Date-**

Copies to 1. PIU
2. SME
3. AME
4. Jr. ES