



Environmental and Social Assessment Report



Summit Communications Limited Nationwide Fiber Optic Network Project

Final Report



Participatory Advanced Research and Development Foundation

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Part B

Limited Environmental Assessment of Sirajgonj Sub-project

ABBREVIATIONS

ADB	Asian Development Bank
BDT	Bangladeshi Taka
BMD	Bangladesh Meteorological Department
BMP	Best Management Practices
BNBC	Bangladesh National Building Code
BREB	Bangladesh Rural Electrification Board
BRTC	Bureau of Research Testing and Consultation
CO	Center Office
COD	Chemical Oxygen Demand
DoE	Department of Environment
ECR	Environment Conservation Rules
EHS	Environmental, Health and Safety
EMP	Environmental Management Plan
ESMS	Environmental and Social Management System
GoB	Government of Bangladesh
HDD	Horizontal Directional Drilling
ICT	Information and Communication Technology
ICX	Interconnection Exchanges
IEE	Initial Environmental Examination
IDCOL	Infrastructure Development Company Limited
IFC	International Finance Corporation
IGW	International Gateway Operators
ILDTS	International Long Distance Telecommunication Services
ISP	Internet Service Provider
ITPP	Indigenous and Tribal People's Plan
MoEF	Ministry of Environment and Forests
NGO	Non-Government Organization
NOC	No Objection Certificate
NTTN	Nation-wide Telecommunication Transmission Network
OHS	Occupational Health and Safety
OP	Operational Policy
OSHA	Occupational Safety & Health Administration
PDB	Power Development Board
PGCB	Power Grid Company of Bangladesh
PM	Particulate Matter
PM ₁₀	Particulate Matter with aerodynamic diameter $\leq 10 \mu\text{m}$
PM _{2.5}	Particulate Matter with aerodynamic diameter $\leq 2.5 \mu\text{m}$
PPR	Public Procurement Rule
RCC	Reinforced Cement Concrete
SMP	Social Management Plan
SPM	Suspended Particulate Matter
TDS	Total Dissolved Solids
ToR	Terms of Reference

E.1 BACKGROUND

Bangladesh's telecommunications infrastructure requirement is growing at a rapid pace. The demand for additional infrastructure grows exponentially every year as content and device end users have progressively moved more of their work and lifestyles to mobile-unified communications and collaboration technologies. This has moved the need for robust, reliable, scalable and future-proof infrastructure which is the heart of strategic consideration for Summit Communications Limited (SCL) and the Government of Bangladesh as part of its ongoing Digital Bangladesh 2021 Vision.

The most efficient and cost effective way for telecom operators and the government to expand their horizon is by partnering with an infrastructure solutions provider i.e. NTTN licensee that can help plan, acquire, implement, support, maintain and manage the entire lifecycle of the country's IT & telecommunication infrastructure. SCL has been designing, building and supporting telecommunications infrastructure in Bangladesh over the last decade.

SCL obtained the Nationwide Telecommunication Transmission Network (NTTN) license from Bangladesh Telecommunication Regulatory Commission (BTRC) in December 2009. The scope of the license empowers it to provide data connectivity services to the ISP providers, telecom operators, educational institutions, health & local government institutes etc.

SCL's strategy is to work as a partner in achieving the goals laid out in the International Long Distance Telecommunication Services (ILDTS) Policy with all industry stakeholders including the BTRC, other telecommunication companies, banks, commercial bodies, Internet Service Providers (ISPs), Interconnection Exchanges (ICXs), International Gateway Operators (IGWs) and ANS Operators.

It has the capacity to supply 10 Gigabit (upgradable up to 100 Gigabit) of transmission bandwidth within Dhaka and ample capacity to transmit data throughout the country. A talented and experienced staff of 1,200+ works round the clock to ensure 99.99% uptime.

To further expand their NTTN network coverage, SCL approached Infrastructure Development Company (IDCOL) for USD 12.5 Million Term Loan facility under the Third Public-Private Infrastructure Development Facility extended by Asian Development Bank (ADB).

Table E.1: Proposed Underground fiber optic cable rollout distance coverage along with its Expansion area

Underground Expansion	
Expansion Area	Distance Coverage (km)
Chittagong	58
Comilla	36
Dhaka	325
Khulna	18
Rajshahi	15
Rangpur	29
Sylhet	36
Mymensing	20
Barishal	39
Kushtia	44
Dhaka - Ashugonj - B.Barua - Comilla - CTG	280
Dhaka -Tangail - Bogra - Rajshahi - Khulna	570
Ashugonj – Sylhet	199
Gazipur – Mymensing	98
Total Distance (KM)	1767

Table E.2: Proposed Underground fiber optic cable rollout distance coverage along with its Expansion area

Overhead Expansion	
Region/ Route	Distance (KM)
Dhaka metro network	1225
Rangpur – Dinajpur	851
Kushtia – Faridpur	562
Khulna – Barishal	1512
Sylhet	456
Mymensing- Sherpur-Jamalpur	176
Chittagong Hill Tracts	360
Dhaka Metro	1101
Comilla – Chandpur	912
Noakhali-Feni-Laxmipur	756
Dhaka Rural	151
Kishorganj, Narshindi	96
Shirajganj	80
Pabna	40
Total Distance (KM)	8278

E.2 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

Bangladesh has an environmental legal framework that is conducive to both environmental protection and natural resources conservation and applies to the proposed “Nationwide Fiber Optic Network Project”. The policies, laws and regulations (some of them cross sectoral and partially related to environmental issues) regulations that are relevant and may apply to activities supported by the Nationwide Fiber Optic Network Project have been reviewed along with the institutional arrangement and national and sub-national level to implement these laws into actions. In addition to that, the Safeguard Policy Statement, 2009 of Asian Development Bank (ADB) has been reviewed and their applicability to the proposed Nationwide Fiber Optic Network Project is also discussed. As per Environmental Conservation Rules 1997, this type of the project do not specifically fall into any of the categories (i.e. Red, Orange-A, Orange-B and Green). However given the limited nature of impacts, the proposed project may be defined as an “**Orange A**” category project.

The Department of Environment has already provided clearance to the project provided that the project proponent adheres to certain conditions which involve submitting a work plan before initiating field work for any of the subprojects. According to the SPS, 2009, ADB, the proposed project in general could be classified as a “**Category B**” project. Since the actual layout of the project is not yet known, an ESMS report has been prepared to assess the environmental and social impacts and respective mitigation measures. For individual subprojects, before implementation, a limited environmental assessment (LEA) will be performed following the ESMS. Subproject-specific assessment and mitigation measures will be incorporated at the design stage. For these subprojects, it will be important to monitor the work, both during construction and operation, to ensure that mitigation measures are implemented and that no unforeseen negative impacts are occurring.

The Environmental and Social Assessment (ESA) report of the proposed project therefore composed of two components. Part A consists of the Environmental and Social Management Framework of the Nationwide Fiber Optic Cable Installation project and Part B contains a typical example of a Limited Environmental Assessment (LEA). For this purpose, the SCL fiber optic cable subproject from Sirajgonj PGCB substation to Enayetpur Robi Tower has been used.

E.3 MAJOR PROJECT ACTIVITIES

The major project activities during pre-construction and construction phase will be the following:

- A detailed survey is performed for the selection of route direction, number of handholes to be constructed, meter measurement of loop for per handhole, collection of infrastructural blueprints from RAJUK and roads & highway related authorities.
- Collection of permission from relevant authorities (i.e. City Corporation, Roads & Highway, CDA, LGED, Pourashava, Union Parishad, Local Land).
- Mobilization of construction equipments and manpower facilitating by storing Duct, Cable, HDD machine, Cable blowing machine and other necessary requirements for the

- project in the site.
- Construction of ancillary facilities (“handholes” for cable splicing) and control stations (point of connectivity (PoC)) to house the drop points from PGCB towers.
- Pulling and splicing of the communications cable through the conduit and any necessary final restoration and cleanup operations.
- Pit cutting for the purpose of HDD operation and handhole construction.
- Application of horizontal directional boring to carry out the underground fiber optic cable laying operation for installation of HDPE ducts.
- Deploy overhead fiber optic cable lines using existing power line poles owned by BREB.
- If necessary construction of intermediate poles to deploy overhead fiber optic cable lines.
- Mobilization of construction equipment and manpower.

E.4 ENVIRONMENTAL MANAGEMENT PROCEDURES

Sub-project Influence Area and Baseline Environment

In order to establish a sub-project influence area, the activities to be carried out and processes that would take place during both construction phase and operational phase of the sub-project need to be carefully evaluated, provides general guidelines for identification of influence area for different types of sub-projects to be implemented are provided in the ESMS.

For proper environmental assessment, it is very important to define the “environmental baseline” against which environmental impacts of a particular sub-project would be subsequently evaluated. For systematic recording of data, the baseline environment is usually classified into physicochemical environment, biological environment, and socio-economic environment; and important features/parameters under each category are identified and measured/ recorded during baseline survey. Guidelines for collection of primary and secondary data on physic-chemical environmental parameters for different types of sub-projects to be implemented under the proposed project are provided in the ESMS. Form 1 has been designed to delineate the essential features of subproject activities and environmental/social baseline condition.

Analysis of Alternatives

The primary objective of the “analysis of alternatives” is to identify the location/technology for a particular sub-project that would generate the least adverse impact, and maximize the positive impacts. In general, for a typical fiber optic cable installation project, the analysis of alternative should focus on: a) Alternative route (for underground or overhead fiber optic cable line); b) Alternative technology (e.g. Trenching or HDD); c) Costs of alternatives; and d) No sub-project scenario. A simple format for analysis of alternatives is presented in Annex IV (Form 2 for fiber optic cable line).

Screening of Impacts

The purpose of “environmental/social screening” is to get a preliminary idea about the degree and extent potential environmental impacts of a particular sub-project, which would subsequently be used to assess the need for further environmental/social assessment. SCL will be responsible for carrying out environmental/social screening in accordance with the format provided in “Form 3” of Annex V. The screening form (Form 3) has been designed to conduct preliminary assessment of the impacts of major sub-project activities on the ecological, physical-chemical and socio-economic environment of the surrounding areas. Annex XIII provides a detailed explanation of all impacts associated with fiber optic cable installation.

Mitigation and Enhancement Measures during Construction Phase

Table E.3 shows the mitigation measures corresponding to specific adverse impacts during construction phase, along with assignment of responsibilities for their implementation. The measures presented in Table E.3 are aimed at minimizing the effects of the possible adverse impacts and enhancing the positive impacts.

Table E.3: Environmental impact during construction phase for installation of fiber optic cables by SCL and mitigation measures

Activity/ Issues	Potential Impacts	Proposed Mitigation and Enhancement Measures	Responsible Parties
Excavation and backfilling (trenching operation), concreting work, mobilization of vehicles and equipment	Air Pollution due to fugitive construction dust, fossil fuel burning by construction equipment, increased traffic	- Ensure that all project vehicles are in good operating condition - Spray water on dry surfaces/ unpaved roads/ vulnerable areas regularly to reduce dust generation - Maintain adequate moisture content of soil during transportation, compaction and handling - Sprinkle and cover stockpiles of loose materials (e.g., fine aggregates for concreting work). - Securing and covering material in open trucks while hauling excavated material, construction materials (for concreting work) - For concreting work, not using equipment such as stone crushers at site, which produce significant amount of particulate matter - Establishment of minimally intrusive and well-designed traffic patterns for onsite construction activities - Limiting GHG emission by using	Contractor (monitoring by SCL)/ SCL

Activity/ Issues	Potential Impacts	Proposed Mitigation Enhancement Measures	and	Responsible Parties
		modern construction equipment and by prohibiting excessive idling of equipment when not in use.		
		• Apply relevant Best Management Practices for excavation and preventing air pollution from construction activities (Annex X)		
	• Damage/ reduction of native flora, displacement of wildlife, birds etc.	• Plantation/afforestation program for tree replacement (plantation of at least two trees of similar species for each cut tree). • Provide proper compensation if there is any destruction of trees outside RoW. • Not removing undergrowth fully where possible, so that they may re-grow naturally after the project activity. • Control intensive movement of heavy construction vehicles. • Temporary stockpiling of materials should be done on non-vegetative surfaces • Avoid removing mature riparian vegetation. • Re-vegetation should be done using native, non-invasive species and by preventing the introduction of noxious weeds • Keep noise level (e.g., from equipment) to a minimum level, as certain fauna may be very sensitive to loud noise. • Apply relevant Best Management Practices (Annex X) for disturbance to fauna and faunal habitat.		Contractor (monitoring by SCL)/ SCL
	• Water pollution by suspended solids as a result of soil erosion or by accidental fuel spills	• Remove from site excess subsoil, substrate, and/or larger rock materials that cannot be buried in the excavated trench • Install sediment basins to trap sediments in storm water prior to discharge to surface water. • Replant vegetation when soils have been exposed or disturbed. • No in-stream river or water body crossing will be allowed • Work would be halted when wet conditions would lead to excessive damage to soils and vegetation in work areas. • Employ typical spill prevention guidelines as outlined in the BMP (Annex X). • Hazardous materials (fuel) will not be drained into the ground or allowed to		Contractor (monitoring by SCL)/ SCL

Activity/ Issues	Potential Impacts	Proposed Mitigation Enhancement Measures	and	Responsible Parties
		drain into the nearest drainage canals. A spill prevention, containment, and countermeasure plan would be prepared. This plan would detail the measures required of all construction, operation, and maintenance personnel for transport, storage, use, spill response/ containment, and disposal of hazardous materials, waste, and debris.		
	• Noise pollution	- Use of noise suppressors and mufflers in heavy construction equipment. - Avoid using of construction equipment producing excessive noise during school hours and also at night - Avoid prolonged exposure to noise (produced by equipment) by workers/ give protective gears - Regulate use of horns and avoiding use of hydraulic horns in project vehicles.		Contractor (monitoring by SCL)/ SCL
	• Disruption of local drainage	- Provide adequate diversion channel, if required - Provide facilities for pumping of congested water, if needed - Ensure adequate monitoring of drainage effects, especially if construction works are carried out during the wet season.		Contractor (monitoring by SCL)/ SCL
	• Traffic congestion during roadside work	- Schedule deliveries of material/ equipment during non-school hours and after regular working hours - Employ a minimally intrusive and well-designed traffic patterns for onsite activities - Depute flagman for traffic control - Arrange for signal light at night		Contractor (monitoring by SCL)/ SCL
	• Direct or indirect impact to natural, manmade or buried physical cultural resources	- Excavation activities through places of archaeological and historical importance should be avoided at all costs. - Place fences at the boundaries of these places so that construction activities or equipment movement do not harmfully affect them. - Limiting noise-generating activities near such sites, which can interfere with the use and enjoyment of PCR such as tourist destinations, historic buildings, religious establishments and cemeteries. - During excavation activities, if any buried PCR items are found, the		Contractor (monitoring by SCL)/ SCL

Activity/ Issues	Potential Impacts	Proposed Mitigation Enhancement Measures	and Responsible Parties
		Chance Find Procedures outlined in Annex IX should be followed.	
	Health and safety of workers, risk to pedestrian movement	- Clean bill of health a condition for employment - Provide the workers with personal protective equipment for protection against dust and noise - Contractors and workers should wear high visibility safety apparel while working in public right of way. - Signposts and directional signs should be provided at appropriate locations for pedestrians and traffic at construction site. - Contractor/SCL should develop an occupational health and safety plan	Contractor (monitoring by SCL)/ SCL
	Obstruction or interference with other utility infrastructures	During design and permitting process of the project, efforts should be made to coordinate and minimize disruptions	SCL
Installation of fiber optic cables	Various injuries related to fiber optic cable handling (exposure to laser, microscopic fiber optic shards), fire hazard	Follow the fiber optic cable safety protocols as stated in IFC guidelines for environmental, health and safety for telecommunications (Annex XI)	Contractor (monitoring by SCL)/ SCL
Horizontal Directional Drilling Work	Noise and air pollution, worker health and safety, disruption of local drainage	As applicable, adopt similar noise and air pollution mitigation measures, measures to prevent drainage congestion and ensuring worker health and safety stated above for trenching operation, concreting work, mobilization of vehicles and equipment.	Contractor (monitoring by SCL)/ SCL
	Water pollution due to sediment suspension (increase in suspended solids) or washing away of slurry to the water bodies	- The directional drilling equipment should be placed away from stream shore (at least 20 feet away from stream shore according to BMP in Annex X) - Ensuring that no seepage occurs through the borehole. In case of seepage, the procedures outlined in the BMP (Annex X) should be followed. - In water body crossing, it has to be ensured that the borehole remains at	Contractor (monitoring by SCL)/ SCL

Activity/ Issues	Potential Impacts	Proposed Mitigation and Enhancement Measures	Responsible Parties
		a sufficient depth below the lowest bed level of the water body. The accurate bed level of water bodies needs to be determined through morphological surveys.^a • After completion of the borehole, all slurry should be removed from the construction site and disposed in an approved site.	
Water body crossing operation of fiber optic cables by clamping to bridge	• Noise and air pollution	• As applicable, adopt similar noise and air pollution mitigation measures stated above for trenching operation, concreting work, mobilization of vehicles and equipment.	Contractor (monitoring by SCL)/ SCL
	• Disruption of bridge traffic	• Employ a minimally intrusive and well-designed traffic patterns for onsite activities • Depute flagman for traffic control • Arrange for signal light at night	Contractor (monitoring by SCL)/ SCL
	• Health and safety of workers	• Provide the workers with personal protective equipment for protection against noise. • Provide the workers with life jackets with high visibility while working on the bridge. • Signposts and directional signs should be provided at appropriate locations for diverting pedestrians and traffic on the bridge. • SCL/Contractors should comply with the relevant IFC guidelines of occupational health and safety (Annex XI)	Contractor (monitoring by SCL)/ SCL

^a Any morphological survey work performed by the Contractor or any other party has to be approved by SCL before the initiation of drilling. Detailed survey maps prepared by the Contractor or any other party will be presented to SCL who would first check the technical viability of HDD operation. Only after their approval, work can commence.

Operational Phase:

At the operational phase, SCL will be responsible for the operation and maintenance of the fiber optic cable network and ancillary facilities. Operation and maintenance will be on foot traffic only and no adverse environmental impact to environmental parameters is anticipated during this phase. However, during the maintenance and repair of fiber optic cables, the issue of worker exposure to laser and microscopic fiber optic shards would have to be considered. The relevant IFC EHS guidelines and other best practices are expected to be followed in order to minimize and eliminate any adverse effect on worker health and safety.

Monitoring Plan

Table E-4 presents guidelines for monitoring of specific environmental parameters during construction phase of all the sub-projects.

Table E-4: Guidelines for monitoring of environmental parameters during construction phase

Monitoring	Period/Location	Parameters to be monitored	Monitoring Frequency and responsibility	Resources Required
Noise Level	<u>Baseline</u> One set of measurements at property boundaries of selected critical locations (schools, residential areas, hospitals etc.) prior to commencing cable laying activities	Equivalent Noise level (L_{eq}) with GPS location, wind speed and direction	Spot checking in a monthly basis; Contractor/SC L's Responsibility	Noise level meter, GPS;
	Three set of measurements at the same locations during cable laying process (trenching)			
	Three set of measurements at the same locations during cable laying process (HDD operation)			
Air Quality (dust particles/particulate matter)	<u>Baseline</u> Only at selected critical locations downwind of site activities (prior to commencement of work) and in close proximity to human receptors			Particulate matter sampling device, GPS
	Only at selected critical locations downwind of site activities (during trenching and cable laying work) and in close proximity to human receptors	SPM, PM_{10} with GPS location, wind speed and direction	Spot checking on a Monthly basis; Contractor/SC L's Responsibility	Wind speed/direction data to be collected from local BMD station
	Only at selected critical locations downwind of site activities (during HDD activities) and in close proximity to human receptors			
Water Quality	<u>Baseline:</u> One measurement from the nearest surface water body ^a	Turbidity, Total Suspended Solids, Total Solids,	Monthly and as directed by the Project team leader; Contractor/	Laboratory facilities for water/wastewater analysis
	One measurement from the nearest surface water body			

Monitoring	Period/Location	Parameters to be monitored	Monitoring Frequency and responsibility	Resources Required
	during cable laying operation by trenching Onemeasurementfromthe nearest surfacewaterbody during cable laying operation by HDD ^a	Dissolved Oxygen	SCL's Responsibility ^a	
General site condition	<u>Baseline:</u> Visual survey (once) of proposed cable laying site before prior to cable laying operation Visual survey of cable laying site during the entire period of cable layingoperation	General site condition, traffic condition, pedestrian movement, vegetation clearance etc. by visual survey (photographs)	Weekly and as directed by the Project team leader; Contractor/SCL's Responsibility	Digital camera
House- keeping activities, Safety measures during construction	Visual survey of cable laying site during the entire period of cable layingoperation	Construction debris management, traffic management, management of flammable materials (if any), use of Personal Protective Equipment by workers etc.	Weekly and as directed by the Project team leader; Contractor/SCL's Responsibility	Digital camera
Occupational Health and safety Compliance	During the period of cable layfor workersengagedin optical fiber connection	Routine eye examination	For each worker exposed to laser light during cable installation	Eye specialist

^aNo need to perform this measurement if no water body is present in close proximity to the work site

Note: The Project Team Leader will decide actual monitoring time and location.

SCL anticipates no adverse environmental or social impacts during the operation phase of the proposed fiber optic cable installation project. However, the following issues need to be addressed during the operation phase:

- The trenches should be monitored over a three-year period for settling and possible cracks showing evidence of disturbance from proposed activities. Visual observation with photograph documentation in this case would be sufficient. This is the responsibility of SCL.

- The project-affected area should be monitored over a period of one year to ensure reseedling does not appear unnatural (i.e. presence of non-native or invasive species). Visual observation with photograph documentation in this case would be sufficient. This is the responsibility of SCL.
- For personnel engaged in fiber optic repair and maintenance, if they are exposed to laser during such operation, they should have their eyes examined regularly by a medical professional. This would be the responsibility of SCL and the actual frequency of monitoring would have to be determined by SCL as well.

Best Management Practices (BMPs)

The Best Management Practices (BMP) is prepared as a guideline for environment management of different parts of the project to be implemented by the SCL. The BMP developed will address the following issues related to the above project components: (1) Protection of flora and fauna, (2) excavation, backfilling and topsoil restoration and re-vegetation (3) reuse of excavated soil, (4) protection of sensitive locations, (5) HDD operation, (6) Cable laying by bridge-crossing, (7) pole construction, (8) installation of control station, (9) waste management, (10) public health and safety, (11) natural habitats, (12) air pollution control and (13) general maintenance and erosion control.

Third Party Monitoring

In order to ensure proper environmental management a third party consulting firm (to be hired separately by SCL) will be given the responsibility to independently monitor the overall performance of environmental management of the proposed project, including compliance with the DoE conditions (Annex II) and the provisions of the Environmental and Social Management System (ESMS) developed for the project.

E.5 SOCIAL MANAGEMENT PROCEDURES

As there is no issue with indigenous people, involuntary resettlement or even loss of physical cultural resources, no specific social management procedures have been warranted.

E.6 INSTITUTIONAL ARRANGEMENT OF ESMS

For sub-projects to be implemented by SCL, the Project Management Unit (PMU) headed by the General Manager of SCL will be formed who will oversee the project activities. An Environmental and Social Unit within the PMU will oversee the environmental and social management issues associated with the project. For effective and timely implementation of environmental safeguard activities, two senior official posted by Deputy Manager and Senior Manager of SCL will be designated as an environmental focal person who will be responsible for the activities of “Environmental and Social Unit” in undertaking environmental and social

screening and monitoring as per the provisions of ESMS and the senior officials will report directly to the General Manager of PMU of SCL.

E.7 GRIEVANCE REDRESS MECHANISM

Grievance Redress Mechanism (GRM) is a valuable tool, which will allow affected people to voice concerns regarding environmental and social impacts of the proposed project. SCL should be the first-line recipient of any grievance. SCL would duly address their grievances within one month of the receipt of the complaint. A Grievance Redress Committee (GRC) will be considered in outstanding cases that cannot be resolved directly and require mediation by a third party.

PART A

**ENVIRONMENTAL AND SOCIAL
MANAGEMENT SYSTEM (ESMS)**

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

1. To deploy the fiber optic backbone throughout the country for the development of Information and Communications Technology (ICT) infrastructure sector Summit Communications Limited (SCL) received the Nation-wide Telecommunication Transmission Network (NTTN) license on 09 December 2009, International Terrestrial Cable (ITC) 05 January, 2012, International Internet Gateway (IIG) license on 12 April, 2012, and Interconnection Exchange (ICX) License on 03 May, 2012 etc. from BTRC.
2. SCL has access to around 26,618 km of fiber optic network all over the country covering 61 districts and 319 upazillas. This includes 19,857 km owned, 1,800 km from Power Grid Company Bangladesh Ltd and 4,961 km from other operators. SCL has already established its network access to over 26,618 Kilometers fiber optic network nationwide through which it is serving all Telcos, ISPs, Gateway operators. It has successfully connected around 2500 nos Base Stations (BTS) for leading mobile and Wi-Max operators. It has already established network coverage over 64 no of districts and 319 Upazillas. SCL has obligation to cover 40% Upazilla's Headquarters within its 5th year of operation and currently it is running 6th year's operation and has connected 59% Upazillas from 489 Upazillas. It has obligation to cover upto 100% Upazillas within its 10th year of operation.
3. To further expand their NTTN network coverage, SCL approached Infrastructure Development Company (IDCOL) for USD 12.5 Million Term Loan facility under the Third Public-Private Infrastructure Development Facility extended by Asian Development Bank (ADB). The proposed project includes expansion of the network infrastructure, i.e. rollout of the fiber optic network in several locations across Bangladesh.
4. Major planned investments for SCL in different sectors pertinent to fiber optic cable infrastructure are the following:

Investment to expand nationwide coverage

5. SCL is planning to deploy around 13,980 Km of overhead fiber and 4110 Km underground fiber all around the country within the year 2016-2018 which requires an approx. investment of \$108.9 million over next three years. This investment is required to cater to continuous demand from the market for long haul transmission capacity at different places of the country by Telcos and ISPs.

Investment in Government Digitization Project

6. Current Government is implementing its plan of digitizing total Government set ups all over the country within 2021. SCL has completed and handed over 3650 connectivity within 14 Districts and 96 upazillas for 'Info-Sarker' Project Phase-II. According to 'Info-Sarker' Project Phase-II, there is scope of 55 government offices connectivity at each District and 30 government offices connectivity at each Upazilla; all together total 18000 government offices connectivity at 64 Districts and 489 Upazillas. Such connectivity will be provided by three NTTN operators. According to „Info-Sarker Project“ Phase-III, government is targeting to cover 4550 Union Parishads (smallest rural administrative and local government units in Bangladesh) where Government is initially starting facilitating the nation with 1200 Union Information Service Centre (UISC). Another Government project of connecting 96,000 Educational Institution will start in 2015 and according to business plan SCL will provide 31,500 Connectivity over next five years under this project.

Investment in Mobile Backhauling

7. With the launch of 3G services in 2013 increase in data usage is forthcoming, while the backplane capacity is being built by all the operators. All the telecom operators are required to upgrade their access capacity at the base stations through fiber optic. As an NTTN licensee, SCL has this opportunity to provide the backhauling service to the mobile operators. Currently SCL are working with the country's leading operators Grameenphone, Robi and Teletalk. Till date SCL has connected over 2356 base stations. SCL is expecting work orders of over 3,550 no. of base stations in between of 2016-2018 which will require an investment amounting to \$25.6 million.

Investment in capacity enhancement: Gateways (ITC, IIG and ICX)

8. The International Terrestrial Cable provides a flexible global connectivity to the information traffic of Bangladesh as previously Bangladesh was solely dependent on the single international connectivity through SEA-ME-WE-4. Currently SCL has Terrestrial Cable Landing Station at Benapole and have connected up with TATA Communications and Bharti Airtel Limited. SCL plans to invest for backhaul till no man's land in Akaura, Darshana, Tamabil and Teknaf to connect seven sisters of India and Myanmar. The main investment is already made here; there will be requirement of nominal investments in ITC, IIG and ICX network which will create a cost of \$1.2 million.

1.2 SCOPE OF THE PROJECT

9. SCL is planning to deploy around 13,980 Km of overhead fiber and 4110 Km underground fiber all around the country. Among which, SCL will deploy around 1,767 Km underground and 8,278 km overhead fiber. Expansion of new fiber optic cable network will include underground fiber optic cable to establish the main backbone of the network all over the country and establishment of overhead fiber optic cable to connect local stations in particular regions of the countries. The proposed underground and overhead fiber optic cable rollout distance coverage along with its location is summarized in Table 1.1 and 1.2 respectively.

Table 1.1: Proposed Underground fiber optic cable rollout distance coverage along with its Expansion area

Underground Expansion	
Expansion Area	Distance Coverage (km)
Chittagong	58
Comilla	36
Dhaka	325
Khulna	18
Rajshahi	15
Rangpur	29
Sylhet	36
Mymensing	20
Barishal	39
Kushtia	44
Dhaka - Ashugonj - B.Barua - Comilla - CTG	280
Dhaka -Tangail - Bogra - Rajshahi - Khulna	570
Ashugonj – Sylhet	199
Gazipur – Mymensing	98
Total Distance (KM)	1,767

Table 1.2: Proposed Underground fiber optic cable rollout distance coverage along with its Expansion area

OH Expansion	
Region/ Route	Distance (KM)
Dhaka metro network	1225
Rangpur – Dinajpur	851
Kushtia – Faridpur	562
Khulna – Barishal	1512
Sylhet	456
Mymensing- Sherpur-Jamalpur	176
Chittagong Hill Tracts	360
Dhaka Metro	1101
Comilla – Chandpur	912
Noakhali-Feni-Laxmipur	756
Dhaka Rural	151
Kishorganj, Narshindi	96
Shirajganj	80
Pabna	40
Total Distance (KM)	8278

10. At the implementation level of the project, company has to undergo two basic types of jobs: passive network development i.e. layout of optical fiber cable and active network development i.e. equipment installation for lighting up and connectivity. Summit Communications Ltd. has its own operation and maintenance team to implement the project in the ground. In some occasions, the company uses sub-contractors and local partners in developing its network. Both passive and active network expansion work will require not less than 24 months for Summit Communications Ltd. The company has scheduled the project to be commenced on 1st January 2016 and got an end on 31st December 2018 for all sort of tasks under major job head including Resource Mobilization, Equipment pricing negotiation, Civil work (duct laying), Civil work (fiber blowing), Active Equipment import, Active Equipment installation and Connectivity Progression.

1.3 SPECIFIC OBJECTIVES OF THE ESMS

11. The Environmental and Social Management System (ESMS) is intended to provide general policies, guidelines, and procedures to be integrated in the formulation, design, implementation, and operation and monitoring of all components of the proposed nationwide fiber optic network project. Its overall objective is to assist SCL to ensure that:

- Project components (i.e., overhead and underground fiber optic lines, location of drop points) are formulated considering potential environmental and social issues, especially of those people who would be directly benefited or impacted by the proposed project;
- Project components are designed considering unique socio-cultural and environmental situation prevailing at the areas where the specific project component would be implemented;
- Possible environmental and social impacts of major project activities during both construction and operational phases are identified during project formulation and design, appropriate mitigation/ enhancement measures are devised and monitoring plan prepared, as a part of the overall environmental and social management plans;
- Environmental Management Plan (EMP) and Social Management Plan (SMP) are properly followed; and
- Project activities comply with the relevant policies, rules and regulations of the GoB (e.g., Environmental Conservation Rules 1997) and safeguard policies of ADB.

12. The ESMS will be a guiding document for project-element specific:

- Environmental screening;
- Assessment of impacts (both positive and negative);
- Environmental and Social Assessment;
- Public consultation and disclosure;
- Environmental and Social Management Plans (EMP, SMP);
- Implementation of EMP and SMP; and
- Monitoring and reporting.

13. The different subcomponents will go through initial environmental and social screening, a component-specific assessment and mitigation measures will be prepared under the provisions of the ESMS. The ESMS will outline the procedures of screening and assessment. The overall environmental and social assessment including the overall project baseline, evaluation of potential environmental and social impacts of different project components, and assessment of environmental practices in different ongoing and completed projects

1.4 STRUCTURE OF THE ESMS

14. The ESMS will initially review current relevant policies, legislations, EIA procedures/practices and land acquisition procedures for transmission fiber optic line of the Government of Bangladesh (GoB) related to the sustainable urban sector development and explain its implication to the proposed project. It will also review the requirement of SPS, 2009, ADB and explain its implication to the proposed project.

15. Under the framework of the ESMS, the baseline information of the areas will be established where fiber optic cable layout operations will be carried out. The ESMS will outline the procedures of collecting baseline social and environmental information during the detail survey of the project subcomponents and how the baseline information would be presented. SCL will be responsible for the identification of their respective project elements (e.g., underground and overhead fiber optic cable routes), and preparation of element specific project documents. SCL will be responsible for preparation of an adequate description of each project component (or sub-project) (in accordance to the format provided in the ESMS), including sub-project layout and other relevant information. A sample baseline survey report has been presented based on field visit at a selected location which will serve as a guidance example.

16. In accordance baseline data, the stages or elements of the various activities of the subprojects those are sensitive on the environmental and social parameters will be identified, overall environmental and social impacts of the project will be assessed. SCL will also be responsible for carrying out “environmental/social screening” and “analysis of alternatives” of each project component in accordance to the formats provided in the ESMS. Based on the “screening” and “analysis of alternatives”, SCL may re-design the project component (e.g., selecting alternative route of fiber optic lines, alternate methods of cable laying). A sample environmental and social impact assessment checklist will has been provided based on the baseline survey report at a selected location which will serve as a guidance example.

17. Based on the results of the environmental/ social screening and analysis of alternatives, and after finalizing the routes, SCL will be responsible for preparing IEE/ EMP/ SMP and carrying out ESIA, as required. The ESMS presented in this report provides detail guideline for carrying out environmental and social assessment (including preparation of EMP/ SMP). The SCL will also be responsible for getting necessary environmental clearance from the Department of Environment (DoE), if required.

CHAPTER 2

POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

18. The proposed Nationwide Fiber Optic Network Project will be implemented in compliance with applicable environmental and telecommunication laws and regulations. Bangladesh has a wide range of laws and regulations related to environmental protection, natural resources conservation as well as social issues, which are mostly cross-sectorial and would be applicable to the proposed project. ADB also has certain social and environmental safeguard policies, which needs to be adhered to for the purpose of the implementation of this project. This section presents an overview of the major national environmental, social and telecommunication laws, policies and regulations that are relevant and may apply to activities supported by the project, institutional arrangement and national and sub- national level, and ADB SPS, 2009.

2.1 NATIONAL ENVIRONMENTAL POLICIES, LAWS AND REGULATIONS

National Environmental Policy 1992

19. The concept of environmental protection through national efforts was first recognized and declared in Bangladesh with the adoption of the Environment Policy, 1992 and the Environment Action Plan, 1992. The major objectives of Environmental policy are to i) maintain ecological balance and overall development through protection and improvement of the environment; ii) protect country against natural disaster; iii) identify and regulate activities, which pollute and degrade the environment; iv) ensure environmentally sound development in all sectors; v) ensure sustainable, long term and environmentally sound base of natural resources; and vi) actively remain associate with all international environmental initiatives to the maximum possible extent.

Bangladesh Environmental Conservation Act (ECA), 1995 amended 2002

20. This umbrella Act includes laws for conservation of the environment, improvement of environmental standards, and control and mitigation of environmental pollution. It is currently the main legislative framework document relating to environmental protection in Bangladesh, which repealed the earlier Environment Pollution Control ordinance of 1977.

21. The main provisions of the Act can be summarized as:

- Declaration of ecologically critical areas, and restrictions on the operations and processes, which can be carried or cannot be initiated in the ecologically critical area;

- Regulation in respect of vehicles emitting smoke harmful for the environment.
- Environmental Clearance;
- Regulation of industries and other development activities with regards to discharge permits;
- Promulgation of standards for quality of air, water, noises and soils for different areas for different purposes;
- Promulgation of standard limits for discharging and emitting waste; and
- Formulation and declaration of environmental guidelines;

22. The first sets of rules to implement the provisions of the Act were promulgated in 1997 (see below: “Environmental Conservation Rules 1997”). The Department of Environment (DoE) implements the Act. A Director General (DG) heads DoE. The DG has complete control over the DoE and the main power of DG, as given in the Act, may be outlined as follows:

- Identification of different types and causes of environmental degradation and pollution;
- Instigating investigation and research regarding environmental conservation, development and pollution.
- Power to close down the activities considered harmful to human life or the environment.
- Power to declare an area affected by pollution as an Ecologically Critical Area. Under the Act, operators of industries/projects must inform the Director General of any pollution incident. In the event of an accidental pollution, the Director General may take control of an operation and the respective operator is bound to help. The operator is responsible for the costs incurred and possible payments for compensation.

23. The Act was amended in 2006 (SRO No. 175-Act/2006 dated August 29, 2006) on collection and recycling of used/non-functional batteries for conservation of environment, improving environmental standard and control and prevention of environmental pollution. According to this amendment, no recycling of battery will be permitted without environmental clearance of DOE. This also restricted the improper disposal of used batteries or any parts of used battery in open place, water bodies, waste bins etc. All used batteries must be sent to the DOE approved battery recycling industry at earliest convenience. No financial transaction was allowed for used/non-functional batteries. However, the act was amended on same issue again in 2008 (SRO No. 29-Act/2008 dated February 11, 2008) to allow financial transaction on mutually agreed fixed cost.

Environment Conservation Rules (ECR) 1997 amended 2003

24. These are the first set of rules, promulgated under the Environment Conservation Act 1995. 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) requirement for and procedures to obtain Environmental Clearance, and (iii) requirements for IEE/EIA according to categories of industrial and other development interventions.

25. However, the rules provide the Director General a discretionary authority to grant '*Environmental Clearance*' to an applicant, exempting the requirement of site/location clearance, provided the DG considers it to be appropriate.

26. Presently, "EIA Guidelines for Industries" published by the Department of Environment and the "Environment Conservation Rules 1997" are the formal documents providing guidance for conducting Environmental Assessment. Any proponent planning to set up or operate an industrial project is required to obtain an "*Environmental Clearance Certificate*" from the Department of Environment (DoE), under the Environment Conservation Act 1995 amended in 2002.

27. The first step of obtaining *Environmental Clearance* for the project the proponent is to apply for it in prescribed form, together with a covering letter, to the Director/Deputy Director of respective DoE divisional offices. The application should include a project feasibility study report, the EIA report, *No Objection Certificate* (NOC) of the local authority; Mitigation Plan for minimizing potential environmental impacts; and appropriate amount of fees in "treasury chalan" (in the present case the amount is BDT 50,000). The DOE authority reserves the right to request additional information, supporting documents, or other additional materials for the proposed project. Under the conditions specified in the Environment Conservation Rules-1997, the DoE divisional authority must issue environmental site clearance certificates within 60 working days from the date of submitting the application, or the refusal letter with appropriate reasons for such refusal. The clearance issued remains valid for a one-year period and is required to be renewed 30 days prior to its expiry date.

28. Environment Conservation Rules-1997 ensures the right of any aggrieved party to appeal against the notice order or decision to the appellate authority. The appeal should be made to the appellate authority with clear justification and the attested copy of the specific notice, order, or decision of the respective DoE office against, which the appeal is to be made. Prescribed fee is to be paid through treasury chalan of BDT 50,000 and the relevant papers for the appeal must be placed.

29. Rule 7 of Environment Conservation Rules (ECR) has classified the projects into following four categories based on their site conditions and the impacts on the environment; (a) Green, (b) Orange A, (c) Orange B and (d) Red. Various industries and projects falling under each category have been listed in schedule 1 of ECR 1997. According to the Rules, Environmental Clearance

Certificate is issued to all existing and proposed industrial units and projects, falling in the Green Category without undergoing EIA. However, for category Orange A and B and for Red projects, require location clearance certificate and followed by issuing of Environmental Clearance upon the satisfactory submission of the required documents. Green listed industries are considered relatively pollution-free, and therefore do not require site clearance from the DoE. On the other hand, Red listed industries are those that can cause 'significant adverse' environmental impacts and are, therefore, required to submit an EIA report. These industrial projects may obtain an initial Site Clearance on the basis of an IEE based on the DoE's prescribed format, and subsequently submit an EIA report for obtaining Environmental Clearance.

30. The ECR 1997 was amended in 2005 to incorporate new standards for ambient air quality and a variety of emissions.

National Land-use Policy, 2001

31. The Government of Bangladesh has adopted national Land use Policy, 2001. The salient features of the policy objectives relevant to the proposed are as follows:

- To prevent the current tendency of gradual and consistent decrease of cultivable land for the production of food to meet the demand of expanding population;
- To ensure that land use is in harmony with natural environment;
- To use land resources in the best possible way and to play supplementary role in controlling the consistent increase in the number of land less people towards the elimination of poverty and the increase of employment;
- To protect natural forest areas, prevent river erosion and destruction of hills;
- To prevent land pollution; and
- To ensure the minimal use of land for construction of both government and nongovernment buildings.

Environment Court Act, 2000

32. The aim and objective of the Act is to materialize the Environmental Conservation Act, 1995 through judicial activities. This Act established Environmental Courts (one or more in every division), set the jurisdiction of the courts, and outlined the procedure of activities and power of the courts, right of entry for judicial inspection and for appeal as well as the constitution of Appeal Court.

Bangladesh Labor Act, 2006

33. This Act pertains to the occupational rights and safety of factory workers and the provision

of a comfortable work environment and reasonable working conditions. In the Chapter VI of this law safety precaution regarding explosive or inflammable dust/ gas, protection of eyes, protection against fire, works with cranes and other lifting machinery, lifting of excessive weights are described. And in Chapter VIII, provision of safety measures like appliances of first aid, maintenance of safety record book, rooms for children, housing facilities, medical care, group insurance etc. are illustrated.

Bangladesh National Building Code

34. The basic purpose of this code is to establish minimum standards for design, construction, and quality of materials, use and occupancy, location and maintenance of all buildings within Bangladesh in order to safeguard, within achievable limits, life, limb, health, property and public welfare. The installation and use of certain equipment, services and appurtenances related, connected or attached to such buildings are also regulated herein to achieve the same purpose.

35. Part-7, Chapter-3 of the Code has clarified the issue of safety of workmen during construction and with relation to this, set out the details about the different safety tools of specified standard. In relation with the health hazards of the workers during construction, this chapter describes the nature of the different health hazards that normally occur in the site during construction and at the same time specifies the specific measures to be taken to prevent such health hazards. According to this chapter, exhaust ventilation, use of protective devices, medical checkups etc. are the measures to be taken by the particular employer to ensure a healthy workplace for the workers.

36. Section 1.4.1 of chapter-1, part-7 of the BNBC, states the general duties of the employer to the public as well as workers. According to this section, “All equipment and safeguards required for the construction work such as temporary stair, ladder, ramp, scaffold, hoist, run way, barricade, chute, lift etc. shall be substantially constructed and erected so as not to create any unsafe situation for the workmen using them or the workmen and general public passing under, on or near them”.

37. Part-7, Chapter -1 of the Bangladesh National Building Code (BNBC) clearly sets out the constructional responsibilities according to which the relevant authority of a particular construction site shall adopt some precautionary measures to ensure the safety of the workmen. According to section 1.2.1 of chapter 1 of part 7, “in a construction or demolition work, the terms of contract between the owner and the contractor and between a consultant and the owner shall be clearly defined and put in writing. These however will not absolve the owner from any of his responsibilities under the various provisions of this Code and other applicable regulations and by-laws. The terms of contract between the owner and the contractor will determine the responsibilities and liabilities of either party in the concerned matters, within the provisions of the relevant Acts and Codes (e.g.) the Employers' Liability Act, 1938, the Factories Act 1965, the Fatal Accident Act, 1955 and Workmen's Compensation Act 1923”. (After the introduction of the Bangladesh Labor Act, 2006, these Acts have been repealed).

38. To prevent workers falling from heights, the Code in section 3.7.1 to 3.7.6 of chapter 3 of part 7 sets out the detailed requirements on the formation and use of scaffolding.

Constitution of Bangladesh

39. Article 24 of the constitution of Bangladesh says that the state shall adopt measures for the protection against disfigurement, damage or removal of all monuments, objects or places of special artistic or historic importance or interest.

Antiquities Act, 1968

40. This Act provides the modes of protection and preservation of things, which are part of our national history and heritage. Article 24 states that if the Government is of the opinion that for the purpose of protecting or preserving any immovable antiquity it is necessary so to do, it may, by notification in the official Gazette, prohibit or restrict, within such area as may be specified therein, mining, quarrying, excavating, blasting and other operations of a like nature, or the movement of heavy vehicles, except under and in accordance with the terms of a license granted and rules, if any, made in this behalf.

Water Act, 2013

41. The Water Act 2013 has been promulgated with an aim to preserve and protect water resources as well as to exert control on water use in Bangladesh. Through different provisions under this Act, restrictions have been imposed in attempting to alter the natural flow in water by landfilling and other activities. The other issues that are addressed in this Act involve protection of potable water sources and management, provision for declaration of water stress areas, provision for declaration of flood control zone and its management, restrictions on storing natural water in artificial or natural reservoirs, restriction on abstraction of total water from any water source, water pollution control etc. Any violation of compliance or protection order will result in an offence, which would be punishable in various degrees including fines, compensation and imprisonment.

The Bangladesh Telecommunication (Revised) Act, 2010

42. Previously known as The Bangladesh Telecommunication (Revised) Act, 2006 and The Bangladesh Telecommunication Act 2001, this act provides provisions for the establishment of an independent Commission (Bangladesh Telecommunication Regulatory Commission) for the purpose of development and efficient regulation of telecommunication system and telecommunication services in Bangladesh and for the transfer of the powers and functions of the Ministry of Post and telecommunication to the Commission and matters ancillary. The broad objectives of the Commission include encouraging the orderly development of a telecommunication system to enhance and strengthen the social and economic welfare of Bangladesh.

43. The Commission have exclusive authority to issue license for activities like establishing or operating a telecommunication system in Bangladesh or undertaking any construction work of such system, providing telecommunication service in Bangladesh or to any place outside of Bangladesh, undertaking any construction work for providing internet service or install or operate any apparatus for such service. The Commission may specify in the license any condition consistent with this Act and regulations and, to suit the requirements of a particular situation, it may also specify additional conditions. Under this act a licensee may be given the obligations with regard to conservation of environment in accordance with prevalent laws or may be obligated to compensate any person or organization for the damage caused by cables or installations laid as a part of the license agreement.

44. According to this act an operator (a person licensed for establishing or operating a telecommunication system or providing telecommunication service or operating a system which is the combination of more than one of those facilities) shall have right to install any apparatus, thing or facility on, above or over any land for the purpose of establishing a telecommunication system or for providing telecommunication service. Within this purview of this right, an employee or representative of the operator authorized in writing in this behalf may: (a) by giving reasonable notice, enter any land at any time, and put up any post or pillar for the purpose of holding or supporting any telecommunication apparatus; (b) fasten or attach a bracket or other device to a tree standing on the land; (c) cut down any tree or branch of a tree which is causing or is likely to cause injury to, or which impedes or is likely to impede the workability of, such apparatus, thing, facility or device; and (d) take any other necessary step or action under this Act for the purpose of installing, constructing, examining, repairing, changing, removing or increasing the workability of such apparatus, thing, facility or device. An operator shall ordinarily exercise his right of way on the land owned or possessed by the Government or a local authority or statutory body, but may, if necessary, exercise this right on any other land also; the Government agency or the local authority or the statutory body shall not ordinarily obstruct the exercise of the right of way. In exercising this right, the operator shall not enter or do anything in a graveyard or crematorium or a sacred place, unless such entry is necessary for the purpose of saving life or property or security of that area. Such entry can only be allowed through consent of the person in charge of the area or through obtaining written permission of the Commission. The operator shall not enter a public or private land without the consent of the authority or owner or occupier of the land and shall not acquire any other right only because of his right of way. In exercising the right of way, the operator shall keep the damage caused to the land and environment at the minimum level and shall be bound to pay compensation to the affected person, authority or body for the damage caused as a result of such exercise.

Guidelines for Infrastructure Sharing (Amended), 2011

45. The guideline provides an approach to ensure optimum utilization of telecommunication resources and infrastructure, to minimize the operational cost, to achieve higher economies of scale, to promote healthy competition by reducing the entry cost for new entrant and to reduce the wastage

of land route to develop telecommunication network and infrastructure. The Commission has the right and authority to change, amend, vary or revoke any part of these guidelines and also to incorporate new terms and conditions necessary for the interest of national security, or public interest, or any other reason whatsoever.

46. The objectives of the guidelines are as follows:

- a) To maximize the use of network facilities including but not limited to base station sites, towers, in-house wiring, local-loops etc. to enhance sharing and reduce duplication of investment for network facilities. The term “Infrastructure Sharing” for the purposes of these guidelines refers to the passive infrastructure (which means non-electronic infrastructure & facility which includes sharing of physical sites, buildings, shelters, towers/masts, electric power supply and battery backup, grounding/ earthing, air conditioning, security arrangement, poles, ducts, trenches, right of way, in-house wiring, sub-loop (wire/cable) and local- loop (wire/cable)).
- b) To promote the availability of wider range of cost effective and competitive telecommunication networks throughout Bangladesh by ensuring optimum utilization of telecommunication resources.
- c) To minimize the environmental effect, to ensure minimum occupation of land space and maximizing the utilization of existing infrastructure and installations.
- d) To ensure optimum utilization of the operators’ capital expenditure on supporting infrastructure, therefore facilitating the whole sector.

47. These guidelines are applicable for sharing of passive infrastructure amongst all telecommunication operators having license from the Commission within their respective licensing zone/area. The operators shall share its passive infrastructure with other operators on a non-discriminatory “first come, first serve” basis and they shall enter into bilateral agreement for such sharing through mutual agreement based on the directives issued or to be issued by the Commission. Operators (except the Nationwide Telecommunication Transmission Network’s Licensee) will not be permitted to build optical/wired backbone transmission network, if such networks of NTTN operators are already available there. Telecom operators may jointly develop, built, maintain and operate optical/wired backbone transmission network with the approval of the Commission if NTTN operators fail to provide them with transmission network facility fulfilling the requirement of the telecom operators. The telecom operators may sell/lease the excess capacity/core/fiber of the transmission network to NTTN operators. All operators shall publish and monthly update detailed information of passive infrastructure available for sharing with other operators in their websites.

National Broadband Policy, 2009

48. The National Broadband Policy is intended to be a statement of the philosophy, objectives, strategies and the methodology to ensure the proliferation of affordable Internet access through superior networks and efficient services for the Bangladeshi consumers. The policy stipulates key deliverables addressing broad vision of the Government and outlining pertinent modalities to materialize the vision quickly and cost-effectively. The term ‘Broadband’ may be defined as an ‘always on’ data/internet connection that ensures a minimum bandwidth of 128 kbps subject to its revision as and when necessary. The policy promotes use of existing facilities as an implementation means to facilitate the broadband services, appropriate measures will be taken to ensure maximum utilization of existing networks and to encourage the introduction of new technologies e.g. FTTx, WiMax, WiFi. In case of sharing of resources, there may be provisions for existing resources of Power Development Board (PDB), Power Grid Company of Bangladesh (PGCB), Bangladesh Railway (BR) or Bangladesh Rural Electrification Board (BREB) or any other organization for broadband connectivity in the country.

National Information and Communication Technology (ICT) Policy, 2002

49. Information Communication Technology (ICT) encompasses the broad fields of data/information processing, transmission and communications by means of computer and telecommunication techniques and these modern tools are being increasingly used for organizational/personal information processing in all sectors of economy and society. The ICT policy presents the policy guidelines for the development of the ICT sector in Bangladesh. The policy statement includes a specific section related to the importance of ICT in mitigating environmental issues and disseminating information on environmental problems and their causes in order to create awareness about environment among the common people.

50. The Policy encourages information system for making a complete inventory of existing flora & fauna of Bangladesh, their habitats and other natural communities whose existence has been endangered. Use of GIS and other ICT-based systems are promoted for planning at the national level, for agricultural crops estimation, conservation of nature while accommodating compatible land use to maintain the ecological balance. The Policy also promotes use of Information and Communication Technology to help solve the most pressing problems of environment in the urban areas like toxic emissions from vehicles, industries and other sources.

Regulatory and Licensing Guidelines for Nationwide Telecommunication Transmission Network (NTTN), 2008 (Draft)

51. The Bangladesh Telecommunication Regulatory Commission is empowered to issue licenses for the operation and provision of telecommunication services, and to determine the eligibility criteria and other general terms and conditions of Licenses. Having given due

consideration to the principles of transparency, fairness, nondiscrimination and all other relevant principles, the Commission decided to issue Guidelines on Licensing Procedure of Nationwide Telecommunication Transmission Network License envisaged in the Licensing (Procedure) Regulations, 2004.

52. These Guidelines are intended to provide an overview of the licensing and regulatory framework for Applicant(s) seeking to obtain License under these guidelines to develop, build, maintain and operate Nationwide Telecommunication Transmission Network (NTTN) in Bangladesh. No person or business entity shall be allowed to develop, build, operate and maintain NTTN without a valid License issued by the Commission. The overall objectives of the NTTN reflect the Government's intent to create Nationwide Telecommunication Transmission Networks with a view to separating Transmission Network Services and Access Network Services in future.

53. The Licensee(s) is authorized to develop, build, operate and maintain NTTN to provide nationwide telecommunication transmission network services to the ANS Operators, Licensed Telecommunication Operators and to other authorized users. NTTN licensees are permitted to use cable, optical fiber and any other wire based technologies to provide NTTN service. Shall there be any necessity to deploy wireless/laser and other new technology based network to provide NTTN service, the licensee(s) must take prior permission from the Commission before deployment of such network in the country. NTTN Licensee shall have the obligation to develop, build, operate and maintain the NTTN minimum up to Upazilla Headquarters throughout the country as per the rollout obligation. Network must have Nodal Points for connection up to Upazilla Headquarters.

54. Prior to any installation or maintenance work on the systems, the licensee(s) shall obtain all necessary permissions from the relevant authorities or Governmental departments for works on land owned or controlled by any Government or local authority or statutory body and from the relevant owner or occupier for works on any private land. The Licensee(s) shall undertake and complete all installation and maintenance work diligently observing the need for public safety in compliance with local laws and regulations. If third party owned property is affected as a result of the installation and/or maintenance work, the Licensee(s) shall seek the applicable third party's consent prior to displacing or hindering with telecommunication lines, gas or water pipes, drains or sewers, or tubes, casings, ducts, wires or cables or other third party property or equipment. The Licensee(s) shall be solely liable for any losses, damages, claims, costs or expenses caused, arising from or in connection with any installation and/or maintenance work in public and private areas.

55. Roll out obligation is applicable to the NTTN Licensee(s) who shall obtain license under these guidelines and such obligation period shall be counted from 180 days after the issuance of license. The licensee(s) shall have to provide NTTN connectivity covering up to 5%, 10%, 20%, 30%, 40%, and 100% Upazilla Headquarters within 1st, 2nd, 3rd, 4th, 5th, and 10th year of issuance of license, respectively, provided other conditions of the guidelines remains the same.

2.2 NATIONAL SOCIAL POLICIES, LAWS AND REGULATIONS

56. There is no national policy in Bangladesh governing social effects of infrastructure development projects on the project area communities. However, the Constitution of Bangladesh provides some rights to the affected persons, communities and groups those are not upheld in the Ordinance II of 1982. The active instruments under the legislative and regulatory framework in Bangladesh are discussed below:

Constitution of Bangladesh

57. The fundamental rights under the Constitution indicate the general guidelines for a policy on resettlement/rehabilitation of citizens adversely affected (whatever be the mechanism) due to any activity of the State. Article 40 of the constitution states categorically that every citizen has the right to practice any lawful occupation which implies that anything impeding such right (a) should not be done or (b) there should be supplementary measures to make good the losses incurred by the citizen. Resettlement and rehabilitation of adversely affected people due to infrastructure projects very clearly falls within this requirement for supplementary measures. However, as per Article 42, sub-clause 2, no law with provision of compensation for acquisition of land can be challenged in a court on the ground that such compensation has been inadequate.

Constitutional Right of the Tribal People

58. The Constitution of Bangladesh does not mention the existence of the cultural and ethnic minorities in Bangladesh. The only protective provision for the ethnic minorities that the policy makers often refer to is Article 28(4) which states that: Nothing shall prevent the state from making special provision in favor of women and children or for the advancement of any backward section of the citizens. The above provision is an ambiguous one and it does not define who or what constitutes "backward". However, the Government recognizes existence of "tribal peoples" and the need for special attention and in general tribal people are essentially viewed as backward, poor and socio-economically & culturally inferior. Towards this end a special program was initiated in 1996- 97 by the Prime Minister's Secretariat aimed at improving the socio-economic situation of the indigenous people of Bangladesh, resident outside the Chittagong Hill Tracts.

The Chittagong Hill Tracts Regulation 1900

59. The Chittagong Hill Tracts Regulation, 1900 (Regulation I of 1900) is the regulatory framework for State sovereignty over the traditional rights of the tribal peoples living in the Chittagong Hill Tracts (CHTs) region. They are governed through Revenue Circle Chiefs who are local revenue collectors vide an amalnama (authorization by the Government). The Deputy Commissioner and the Commissioner from the Central Government reserve the authority to settle land to the hill-men or non-hill residents or lease out land (non-transferable) for rubber plantation or establishing industries in the CHTs. The regulation provides the right to possessing cultivable land up to 5 acres by hill men or non-hill residents. The headman is responsible for the conservation of the resources of his mouza through exercising his authority to (i) prohibit the removal of forest produces by residents of respective mouzas other than for their domestic purposes or by non-residents for any purpose, (ii) exclude any area or areas in his mouzas from the jhuming (shifting cultivation), (iii) prevent new comers from cutting jhums in his mouza, and (iv) prevent a person from grazing cattle in his mouza.

The CHT Regional Council Act, 1998

60. The National Parliament of Bangladesh in 24 May 1998 passed the Peace Accord 1997 as the “Chittagong Hill Tracts Regional Council Act, 1998 (Act 12 of 1998). In addition to re-establishing peace, the Accord recognized the ethnic people’s right to land, culture, language, and religion. The Accord set out detailed provisions for strengthening the system of self-governance in the CHT, and redressing the most urgent land-related problems including resolution of land disputes by a commission on land, the transfer of authority for land administration to the hill district councils (HDCs), the cancellation of lease granted to non-residents during the conflict period, the distribution of land to ethnic or “tribal” villages, and the strengthening of customary land rights. Under this Act, no lands, hills and forests within the control and jurisdiction of the HDCs shall be acquired or transferred by the government without consultation and consent of the Regional Council. No law will be executed in the region which is not developed and enacted in consultation and agreement with the tribal peoples in CHT. A ministry on CHT Affairs was established by appointing a Minister from among the tribal communities of hill districts. An Advisory Council from the CHT region assists this ministry.

2.3 SAFEGUARD POLICY STATEMENT 2009, ASIAN DEVELOPMENT BANK

61. In July 2009, ADB's Board of Directors approved the new Safeguard Policy Statement (SPS) governing the environmental and social safeguards of ADB's operations. The SPS builds upon ADB's previous safeguard policies on the Environment, Involuntary Resettlement, and Indigenous Peoples, and brings them into one consolidated policy framework with enhanced consistency and coherence, and more comprehensively addresses environmental and social impacts and risks. The SPS also provides a platform for participation by affected people and other stakeholders in the project design and implementation.

62. The SPS applies to all ADB-financed and/or ADB-administered projects and their components, regardless of the source of financing, including investment projects funded by a loan; and/or a grant; and/or other means, such as equity and/or guarantees. ADB works with borrowers and clients to put into practice the requirements of SPS. The SPS supersedes ADB's Involuntary Resettlement Policy (1995), Policy on Indigenous Peoples (1998), and Environment Policy (2002). In accordance with the SPS, these previous policies apply to all projects and tranches of multi-tranche financing facility projects that were reviewed by ADB's management before 20 January 2010. The objectives of ADB's safeguards are to:

- Avoid adverse impacts of projects on the environment and affected people, where possible;
- Minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is not possible; and assist borrowers and clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

63. ADB's SPS sets out the policy objectives, scope and triggers, and principles for three key safeguard areas:

- Environmental safeguards;
- Involuntary Resettlement safeguards; and
- Indigenous Peoples safeguards.

64. To help borrowers and clients and their projects achieve the desired outcomes, ADB adopts a set of specific safeguard requirements that borrowers and clients are required to meet in addressing environmental and social impacts and risks. These safeguard requirements are as follows:

- Safeguard Requirements 1: Environment (Appendix 1 of SPS);
- Safeguard Requirements 2: Involuntary Resettlement (Appendix 2 of SPS);
- Safeguard Requirements 3: Indigenous Peoples (Appendix 3 of SPS); and
- Safeguard Requirements 4: Special Requirements for Different Finance Modalities (Appendix 4 of SPS).

65. In addition, ADB does not finance activities on the prohibited investment activities list (Appendix 5 of SPS). Furthermore, ADB does not finance projects that do not comply with its safeguard policy statement, nor does it finance projects that do not comply with the host country's social and environmental laws and regulations, including those laws implementing host country obligations under international law.

Consultation and Disclosure requirements of ADB

66. ADB's Safeguard Policy and Public Communications Policy (2011) sets out disclosure requirements for various ADB activities, including safeguard requirement. Safeguard Requirements 2: Involuntary Resettlement (Appendix 2 of SPS); and Safeguard Requirements 3: Indigenous Peoples (Appendix 3 of SPS) sets out the need for meaningful consultation and information disclosure during project preparation and operation to the affected population and other ely stakeholders. Key requirements include:

- Information Disclosure: The borrower/client will submit the following documents to ADB for disclosure on ADB's website as per the applicability with respect to the Project:
- Draft EIA including draft EMP;
- Final EIA/IEE;
- Updated EIA/IEE and corrective active plan;
- Environmental Monitoring Reports.
- Resettlement Plan (RP)
- Indigenous Peoples Plan (IPP)
- Information disclosure to affected people or stakeholders: The borrower/client will provide relevant environmental information in a timely manner, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. For illiterate people, other suitable communication methods will be used.
- Consultation and Participation: The borrower/client will carry out meaningful consultation with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation.
- Timing and Frequency for consultation and participation: Meaningful consultation begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle.

ADB Project Categorization

67. The SPS, 2009 further outlines a classification system for the categorization of projects. The classification tentatively occurs at the project identification stage, during the initial screening of anticipated impacts. However, classification is an ongoing process, and the classification can be changed at any time with the concurrence of the Chief Compliance Officer (CCO), as more detailed information becomes available and a project proceeds.

Environment

68. A project's environment category is determined by the category of its most environmentally sensitive component, including direct, indirect, induced, and cumulative impacts. Each proposed project is scrutinized as to its type, location, scale, sensitivity and the magnitude of its potential environmental impacts. The level of detail and comprehensiveness of the EIA or IEE are commensurate with the significance of the potential impacts and risks.

69. A proposed project is assigned to one of the following categories depending on the significance of the potential environmental impacts and risks:

- Category A: Projects that could have significant environmental impacts. An Environmental Impact Assessment (ESIA) is required.
- Category B: Projects that could have some adverse environmental impacts, but of less significance than those for category A. An Initial Environmental Examination (IEE) is required to determine whether significant impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
- Category C: Projects those are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.
- Category FI: Projects that involve a credit line through a financial intermediary (FI) or an equity investment in a FI. The FI must apply an environmental management system, unless all subprojects will result in insignificant impacts.

Involuntary Resettlement

70. A project's involuntary resettlement category is determined by the category of its most sensitive component in terms of involuntary resettlement impacts. The involuntary resettlement impacts of an ADB-supported project are considered significant if 200 or more persons will experience major impacts, which are defined as (i) being physically displaced from housing, or (ii) losing 10% or more of their productive assets (income generating). The level of detail and comprehensiveness of the resettlement plan are commensurate with the significance of the potential impacts and risks. A proposed project is assigned to one of the following categories depending on the significance of the probable involuntary resettlement impacts:

- Category A: A proposed project is classified as category A if it is likely to have significant involuntary resettlement impacts. A resettlement plan, including assessment of social impacts, is required;
- Category B: A proposed project is classified as category B if it includes involuntary resettlement impacts that are not deemed significant. A resettlement plan, including assessment of social impacts, is required;
- Category C: A proposed project is classified as category C if it has no involuntary resettlement impacts. No further action is required; and
- Category FI: A proposed project is classified as category FI if it involves the investment of ADB funds to, or through, a financial intermediary (paragraphs 53–58).

71. Projects are also classified on the basis of impacts to indigenous people, however is not applicable for this Project.

Categorization of Proposed Project

72. Categorization for the proposed Project was undertaken by using ADB's Rapid Environmental Assessment (REA), Involuntary Resettlement (IR) and Indigenous People (IP) Assessment checklists during the scoping exercise. From the environmental point of view, this project falls under **Category B** project according to ADB SPS-2009. In addition, Indigenous People and Involuntary Resettlement perspective, it is a **C category** Project.

IFC Environmental, Health and Safety Guidelines

73. The Environmental, Health and Safety (EHS) Guidelines of International Finance Corporation (IFC), 2008 is the safeguard guidelines for environment, health and safety for the development of the industrial and other projects. They contain performance levels and measures that are considered to be achievable in new facilities at reasonable costs using existing technologies. When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent. If less stringent levels or measures than those provided in these EHS Guidelines are appropriate, in view of specific project circumstances, a full and detailed justification for any proposed alternatives is needed as part of the site-specific environmental assessment. This justification should demonstrate that the choice for any alternate performance levels is protective of human health and the environment.

74. The section 4 of EHS Guidelines for "Construction and Decommissioning" provides additional, specific guidance on prevention and control of community health and safety impacts that may occur during new project development, at the end of the project life-cycle, or due to expansion or modification of existing project facilities.

2.4 IMPLICATIONS OF NATIONAL POLICIES AND REGULATIONS ON THE PROPOSED PROJECT

75. The Environmental Conservation Rules (ECR) 1997 (DoE, 1997) classifies projects into four categories according to potential environmental impacts: (1) Green; (2) Orange A; (3) Orange B; and (4) Red. Green category projects are those with mostly positive environmental impacts or negligible negative impacts; Orange A category projects are those with minor and mostly temporary environmental impacts for which there are standard mitigation measures; Orange B category project are those with moderately significant environmental impacts; while Red category projects are those with significant adverse environmental impacts. As per Environmental Conservation Rules 1997, deployment of fiber optic cables do not specifically fall into any of the categories (i.e. Red, Orange-A, Orange-B and Green). Based on experience of SCL from implementation of similar projects, it appears that deployment of underground lines is not likely to generate significant environmental/social impacts. Such projects would not require acquisition of private/public land, and would involve construction works along existing corridors of power lines or road networks. Given the limited nature of impacts, the proposed project may be defined as an “Orange A” category project DoE has provided a No Objection Certificate to SCL provided that certain criteria should be followed during project implementation. (See Annex II). The DoE instructed SCL to submit a workplan before execution of the project or subprojects and this would be the only commitment of SCL to the DoE. This indicates that the proposed project need not go through the customary environmental clearance application procedure as per DoE and there would be no requirement to submit an IEE or EIA to the DoE.

76. The Bangladesh Labor Act 2006 outlines guidelines for ensuring worker’s health and safety during construction works, which would have direct implications in the proposed project. It would be the responsibilities of the contractors to make sure that these guidelines are followed in the workplace environment.

CHAPTER3

PROJECT DESCRIPTION

3.1 MAJOR SUB-PROJECT ACTIVITIES

77. The major project activities during pre-construction and construction phase will be the following:

- A detailed survey is to be performed for the selection of route direction, number of handholes to be constructed, meter measurement of loop for per handhole, collection of infrastructural blueprints from relevant local government as well as government entities authorities.
- Collection of permission from relevant authorities (i.e. City Corporation, Roads & Highway, CDA, LGED, Pourashava, Union Parishad, Local Land).
- Mobilization of construction equipment and manpower facilitating by storing Duct, Cable, HDD machine, Cable blowing machine and other necessary requirements for the project in the site.
- Construction of ancillary facilities (“handholes” for cable splicing) and control stations (point of connectivity (PoC)) to house the drop points from PGCB towers.
- Pulling and splicing of the communications cable through the conduit and any necessary final restoration and cleanup operations.
- Pit cutting for the purpose of HDD operation and handhole construction.
- Application of horizontal directional boring to carry out the underground fiber optic cable laying operation for installation of HDPE ducts.
- Deploy overhead fiber optic cable lines using existing power line poles owned by BREB.
- If necessary construction of intermediate poles to deploy overhead fiber optic cable lines.
- Mobilization of construction equipment and manpower.

78. The following sections describes the basic construction and installation techniques:

3.2 DEPLOYMENT OF UNDERGROUND FIBER OPTIC CABLE

79. Underground fiber optic cable deployment is done mainly by Horizontal Directional Drilling (HDD). Other construction activities involve bridge crossing operation, handhole construction, cable handling, blowing and splicing. The methods along with other supplementary construction actions are described briefly in the following sections.

3.2.1 Trenching

80. Before trench cutting, survey is done to ascertain soil type/ underground utilities/ trees & their roots/ road crossings/ bridges, culverts etc. A realistic work program is prepared before commencing trenching. A detailed BOQ is made so that continuous supply and availability of all the materials & accessories like duct, de-coiler, warning tape, sand, and bricks etc. are available on site.

81. Trenching physically removes the soil from the trench slot and requires restoration of the soil, since it needs to be backfilled using sand and native soil, packed in lifts. In the component A of the project trenching operations will be conducted along the roadway only, hence there will not be any impact on the vegetation due to trenching operation.

82. Trench cutting is done by labor using spade, gaiter, and hammer. After Cutting the trench duct is laid as per drawing. Trenching is followed mainly to cross roads of city and rural area. Deployment speed depends on the manpower employed. However, SCL can deploy 1 to 1.5km cable a day through trenching. For this deployment, it employs one engineer from its part and 100 labors from contractor's part. In city areas trench depth is usually 1.0 m, whereas for the rural areas trench depth is usually 1.2 m and backfilling is done using 100% sand. All other specifications of the trench excavation of the city areas and the rural areas are shown in Figure 3.1.

83. After installing the duct in place, the trench is refilled and compacted with sand and soil. After that required handholes are installed and the actual fiber optic cable is blown into the duct.

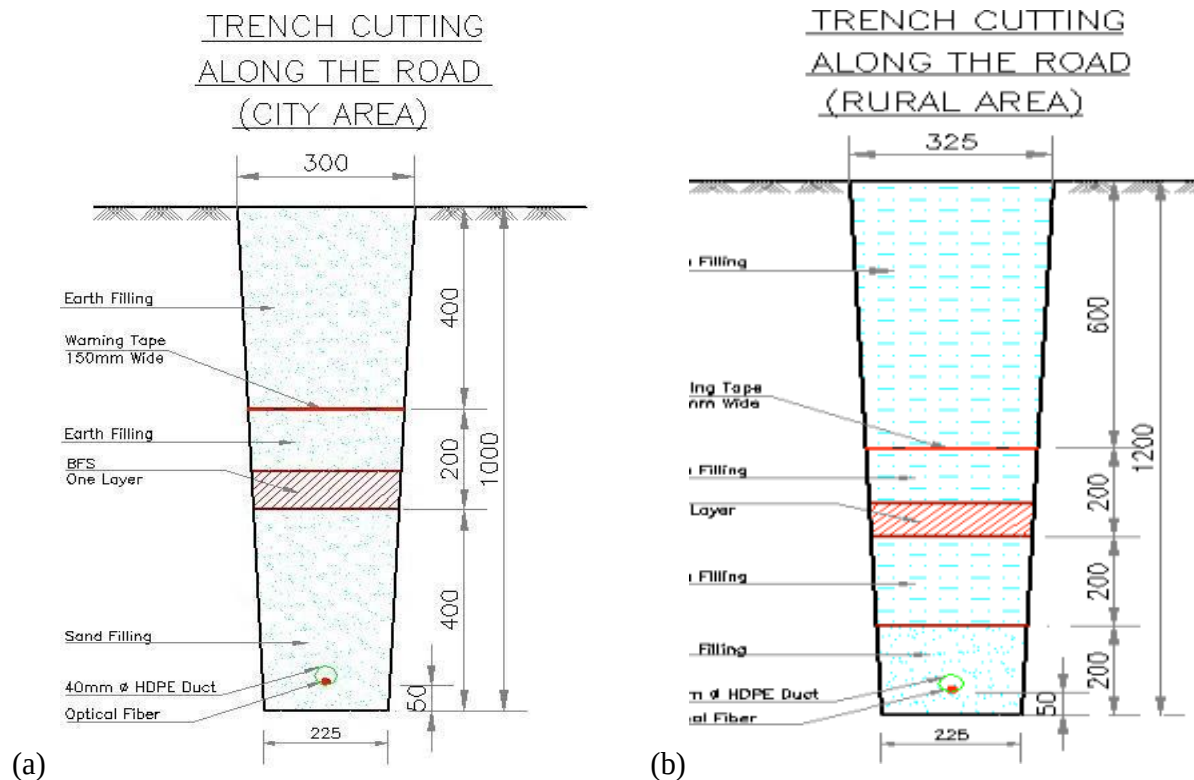


Figure 3.1: Trench cutting details along the road for (a) city areas and (b) rural areas. All drawing dimension units are in mm.

3.2.2 Horizontal Directional Drilling (HDD)

84. Horizontal Directional Drilling (HDD) is used for underground fiber optic cable deployment. If contractors are involved, two persons (i.e. one Civil engineer and another one is Assistant/Deputy Manager from the operation department of implementation team) are assigned by SCL for monitoring the work.

85. HDD operation is initiated by cutting a pit to ensure if there is any existing facility being disturbed. HDD is deployed in the soft soil only by making a tunnel through HDD machine for installing HDPE ducts. After making the tunnel, HDPE ducts are laid with HDD machine and couplers are used for the connectivity of the ducts. Figure 3.2 shows HDD operation.

86. Figure 3.3 shows the specifications of a railway/roadway crossing by HDD method. As can be seen from the figure, a 75mm diameter galvanized iron (GI) pipe is placed below the railway or roadway using the HDD method and the silicon high density polyethylene (HDPE) duct along with the optical fiber cable is placed inside this GI pipe.



Figure 3.2: Horizontal Directional Drilling (HDD) Machine

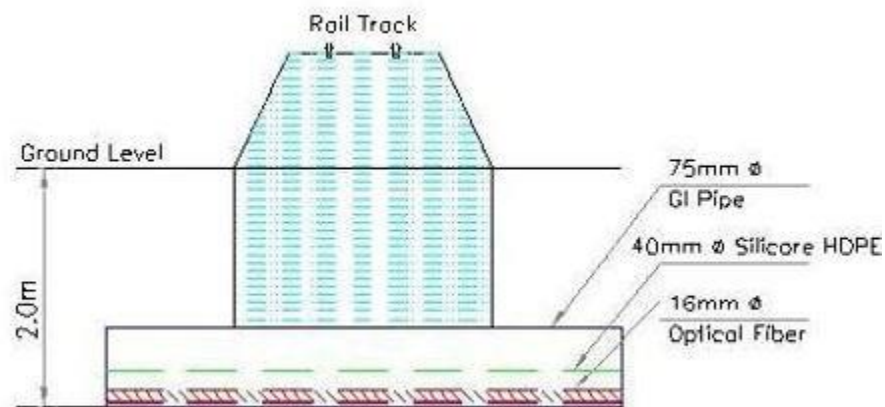


Figure 3.3: Details of a railway/roadway crossing using horizontal directional drilling (HDD) method.

3.2.3 Bridge crossing operation

87. Bridge crossing operation involves the following activities:

- First and foremost, the use of existing ducts or service culverts within bridges must be fully explored.
- SCL needs to inform the bridge owner 48-hours prior to the commencement of the work.
- Ducts attached to the underside of bridges must not affect its load bearing capacity, reduce the clearance or cause other issues. Not all bridge structures will have the exact same installation configuration and procedures may vary to accommodate specific requirements.
- Bracket mounting positions can now marked out on the side or underside of the bridge as directed by the design drawings and instructions. Next activity involves drilling the holes, fitting the concrete anchors and mounting brackets and firmly securing them.
- The steel or ultra-high-density polyvinyl chloride (UPVC) base carrier duct is then positioned and firmly secured.
- The micro ducts can be hauled through the newly mounted base carrier. Usually SCL use a continuous length of duct (no joints permitted).
- Where required and as stipulated in the design instructions, both the approach and departure ends may have to be encased in concrete where they traverse the bridge abutments and enter the ground. It is desirable of course, for the end-product to be both safe and visually appealing.

88. The details of the cable lying by HDD method are given in Figure 3.4.

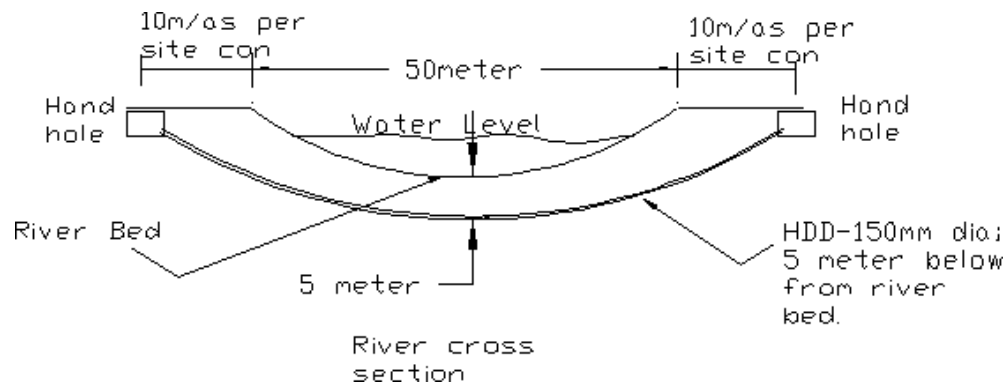


Figure 3.4: Bridge crossing of fiber optic cable using HDD method.

89. Double walled corrugated (DWC) pipe is used with clamping or by encasing in RCC for bridge crossing of the fiber optic cable when all other options become unsuccessful. A continuous path is created while hanging DWC pipe with clamps along the bridge girder as per bellow process.

- The layout of the bridge-crossing pipe is set as per design drawings.

- A 100 mm diameter DWC pipe is used and fixed as shown in the inset of Figure 3.5 (a).
- Clamping with bridge girder is done at every 1.5 meter (Figure 3.5(a)).
- When the pipe is aligned on top of the bridge, it is encased by RCC (1:1.5:3) using local cement, Sylhet sand & stone chips as per attached drawing and 7 days curing must be done (Figure 3.5(b)). (Reinforcement details: 8mm Iron bar 4 nos. and 8mm @150mm c/c tie bar)
- After fixing the DWC pipes with the bridge, 50/43mm HDPE (Tornado) duct and one copper cable (10 pair) is pushed/pulled in the DWC pipeline.

90. Figure 3.6 shows an ongoing bridge-crossing work of the fiber optic cable using DWC pipe with clamps.

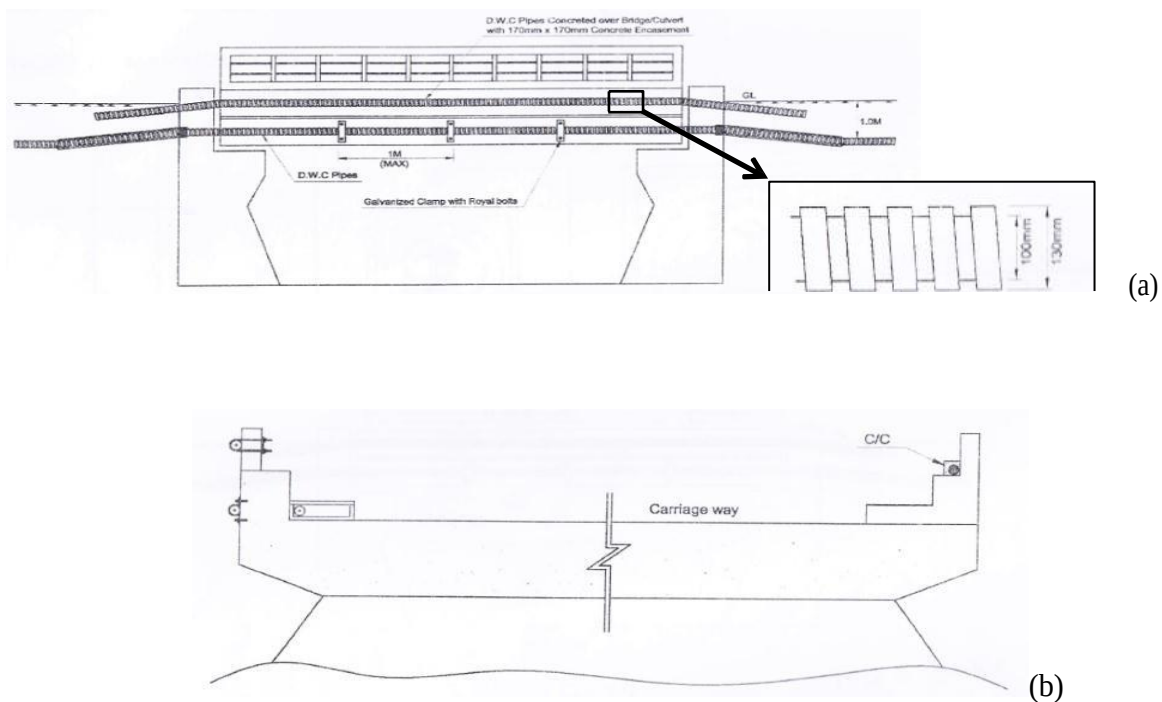


Figure 3.5: Details of bridge crossing of fiber optic cable using (a) DWC pipe with clamping, (b) DWC Pipe with RCC encasing.



Figure 3.6: Bridge crossing of fiber optic cable using DWCC Pipe with Clamping.

3.2.4 Handhole Construction

91. Handholes are constructed to accommodate underground connection between fiber optic cables, PoC establishment, and maintenance. Figure 3.7 shows a handhole constructed in the ground with fiber optic cables arriving from two separate directions. Generally, laborers use gaiter, spread shaver, hammer, chisel etc. (all are construction related tools) to construct a handhole. The worker fabricates the reinforcement before excavating the handhole. At site, they make the rod binding. They make an appropriately sized excavation on the ground based on the requirement and size of the prefabricated reinforcement casing. Laborers mix the cement, sand and stone chips as per 1:1.5:3 concreting ratio. After mixing they put it to the handhole base and sidewalls gradually. Formworks are made for casting the concrete in the sidewalls. Vibrator is used to reduce honeycomb in the freshly poured concrete. A light-duty traffic-bearing lid (a concrete slab made separately with a ratio of 1: 1.5: 3) is placed over the handhole for covering the underground fiber optic cable connection. The handhole unit would be completely buried to restrict access, but the handhole locations would be marked for maintenance, repairs, and expansion needs. Maintenance and repairs at these handholes will be limited to foot-traffic only. The following considerations are given during construction of handholes:

- All duct entries and exits at the HHs must be a watertight seal.
- All ducts in HHs shall be coupled thoroughly.
- Ducts must be sealed with a watertight coupling that is cast or inserted into the wall of the HH.
- HH cover should be 150mm above natural ground level with the fill shaped back to natural ground level in a 2m radius around the HH cover.

- On paved sidewalks or verges, next to roads or streets, a cast in-situ concrete or asphalt backfilling shall be sloped to not impede pedestrian traffic. In these instances the HH installation shall be such that it is not more than 50mm higher than the surrounding paved sidewalk.
- The inside surface of the HH shall be sealed using an approved bituminous product.



Figure 3.7: Handhole layout.

3.2.5 Cable Splicing and Integrity Checking

92. After trenching or HDD, cable splicing and DIT (duct integrity test) test is performed through the HDPE duct. The process include:

- Stripping back about 3 meters of fiber cable jacket to expose the fiber loose tubes or tight buffered fibers. Cable rip cord is used to cut through the fiber jacket and peeling back the jacket to expose the insides. Next Cutting off the excess jacket.
- Cleaning off all cable gel with Alcopad.
- For a loose tube fiber cable, about 2 meters of fiber tube is stripped away using a buffer tube stripper and the individual fibers are exposed; then tube gel is carefully cleaned off.
- Securing the end of the loose tube to the splice tray and laying out cleaned and separated fibers on the table. Stripping and cleaning of the other cable tube's fiber that is to be spliced, and is secured to the splice tray.

- Holding the first splicing fiber, 250um fiber coating is removed to expose 5cm of 125um bare fiber cladding with fiber coating stripper tool.
- Putting a fusion splice protection sleeve onto the fiber being spliced.
- With a high precision fiber cleaver, the fiber is cleaved to a specified length according to fusion splicer's manual but a fusion splice protection sleeve onto the fiber being spliced
- Strip, clean and cleave the other fiber to be spliced.
- Placement of both fibers in the fusion splicer and carrying out the fusion splice according to its manual.
- Slide the fusion splice protection sleeve on the joint and put it into the heat shrink oven, and press the heat button.

93. For integrity test of fiber optic cable laying SCL generally performs two types of tests:

- **ODTR Test:** The Optical Time Domain Reflectometer (OTDR) is useful for testing the integrity of fiber optic cables. It can verify splice loss, measure length and find faults. The OTDR is also commonly used to create a "picture" of fiber optic cable when it is newly installed.
- **Laser Test:** Laser testing is also used for measuring the integrity of the fiber optic cables. This test throws a laser light to verify splice loss or any breakage in the fiber. The fiber connectivity seems good when after throwing a laser light it does not come back.

3.3 DEPLOYMENT OF OVERHEAD FIBER OPTIC CABLE:

94. It is expected that overhead fiber optic cable lines will be installed on existing utility poles (owned by BREB) similar to that illustrated in Figure 3.8. This will eliminate the need of new poles. Pole replacement, if required, will be accomplished and new poles will be inserted and secured in existing utility pole holes or, if required, the new pole will be placed within 1 foot of the existing pole by auguring and inserting the pole. The area around the pole will be filled with dirt from auguring and the ground surface restored to original conditions. Pole replacements attributed to height or class issues will most often be reused elsewhere by the local utility at their discretion. Poles that are deemed unsafe or unusable will be recycled.



Figure 3.8: Installation of overhead fiber optic cableline.

95. Steel poles will be used in case construction of new poles becomes necessary. From the experience gathered from previous fiber optic cable deployment works by SCL, steel poles are required in few locations where BREB poles are not available, or the distance between BREB poles are large to limit sagging of optical fiber cables. The steel poles are stacked along the route at designated storage areas beside the road. The steel poles will be installed manually by digging appropriate holes on roadsides. Following erection of poles, assortments are installed for extending the fiber optic cable lines. A copper wire is passed through the poles into the ground to secure earthing. Lightning arrestor is installed at the top. From previous similar project experience the number of new poles to be installed by SCL is insignificant for a given stretch of overhead fiber optic cable line.

96. Omega rods are installed in the polls so that cables can be taken straightly through these.

97. Based on requirement SCL install TJ box in the pole. Usually a drum contains of 4kms of fiber optic cable. So after every 4kms SCL will be needing one TJ box for splicing the cables.

98. Drop points (ODF box) consists of optical parts which is the end of overhead optical fiber transmission point. This is basically a distribution point through which SCL provides connectivity to the client.

3.4 SCL SERVICE MAINTENANCE

99. Currently all the telecom operators, ISPs, gateway operators, CATV operators, a good number of government offices are using SCL's telecommunication transmission and internet services nationwide. So far SCL have covered 64 districts and 320 Upazillas with optical fiber distribution network. For maintaining the service quality Summit Communications Limited is using all the latest technology and ITU standard network monitoring tools and processes. SCL is providing 24x7 after sales services and maintaining 99% uptime for the entire network.

100. SCL services were designed and implemented including the capability to allow proactive monitoring, fault management, out-of-band access, metrics reporting, and configuration management. This provides the means to quickly identify and isolate problems that include failures or degradation of service. Faults are reported to centralized management systems, i.e. NOC Client Care Centre (later to servers and geographically diverse backup management servers). Indication of faults including nature of alarm and severity are displayed on management systems monitored 24x7 by service management staff that review and respond appropriately to alarm conditions.

3.4.1 The “Network Operation Centre” (NOC)

101. The NOC is the main hub of the operational level 24 X 7 monitoring and maintenance. The primary responsibility for day-to-day operation related systems/services. The NOC is also responsible for first level Client Care Centre support and includes general user interface and Trouble Ticket (TT) administration. The NOC is responsible for overall network management, including service monitoring, sustaining operations, trouble resolution, network maintenance activities, major outage notification, and network event and alarm monitoring. The NOC can be reached by phones or emails or online reporting systems. If for any reason the NOC cannot be reached, Cell phone of the duty personnel can be contacted.

102. To ensure a rapid response to user inquiries, SCL Client Care Centre is operating now with Roster duty and appropriate training is also provided on need basis. SCL encourages users to contact the Client Care Centre with primary responsibility for their particular service. Primary systems/services for each centre are shown in Table 3.1, Primary Responsibilities by SCL Operations centre. If there is any question of where to report a problem or whom to contact for general SCL information, contact the NOC Operation centre.

Table 3.1: Primary Responsibilities by SCL Operations Centre

Sl.	SCL System/ Service	NOC Primary	NOC Clint Care Centre
1	Data equipment consisting routers and switches	X	
2	Data equipment consisting of MPLS systems	X	
3	Element Management Systems for Data Service	X	
4	Network Management Systems for Data Services	X	
5	SDH equipment	X	
6	Element Management System for SDH equipment	X	
7	Network Management system for SDH Equipment (if any)		
8	Recording faults reported over Telephone		X
9	Recording faults reported over email/fax/letter or web based system		X
10	Monitoring and Escalating fault reports	X	X
11	Resolution of Faults to immediate Supervisors	X	X
12	Resolution of TT faults to Clients		X
13	Resolution of Dark core faults		X

SCL’s network operation centre is equipped with modern technology and equipment.

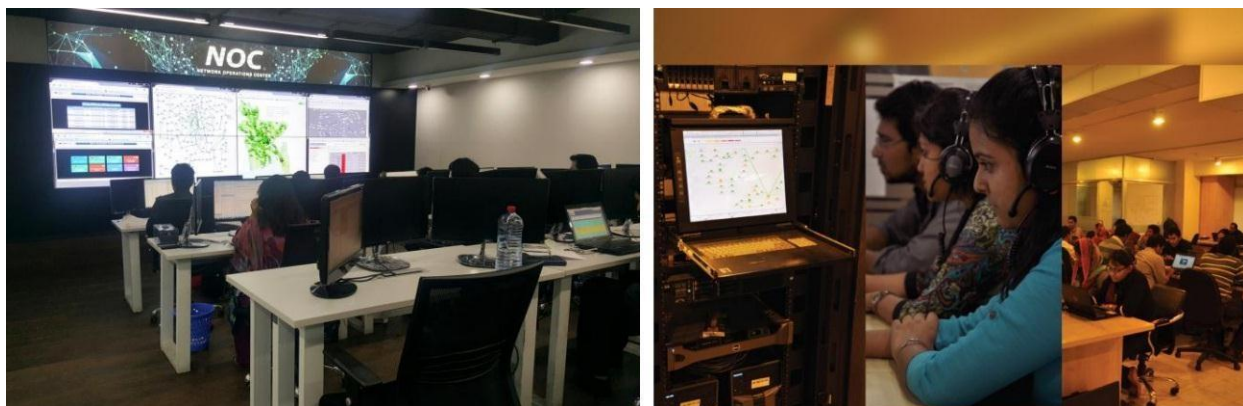


Figure 3.9:The Network Operation Centre (NOC) of SCL

3.4.2 SCL Field Operations

103. SCL has to maintain staffed facilities at each of SCL's operation region. Staffed sites include but not limited to NOC, Dhaka Zonal Offices, Chittagong, Khulna, Sylhet, Bogra, Savar, Tangail, Rangpur, Kustia, Rajshahi, Barishal, Faridpur, Comilla, Narayangong. Other areas are supported by on-site Vendor provided technicians, unless dispatch of a SCL technician from another site is warranted on an as needed basis. The field engineers are ensuring the fiber cut incidents and passive infrastructure related issues. The Network Operation Centre, generally manage and direct NOC actions regarding the SCL equipment and circuitry. SCL's field operation facilities are operated by highly trained SCL technicians with 24 x 7 call-out support and 2-hour response time. Diagnostic and corrective actions performed by on-site SCL engineers/technicians include: fault isolation; reporting of visual indicators or display information on equipment or consoles; verifying physical connections; circuit testing and acceptance; power cycling equipment; shipping and receiving equipment; and physical installation and/or replacement of equipment components for trouble resolution and new service implementation.

CHAPTER 4

ENVIRONMENTAL MANAGEMENT PROCEDURES

4.1 INTRODUCTION

104. As mentioned earlier, SCL is planning to deploy around 13,980 Km of overhead fiber and 4110 Km underground fiber all around the country within the year 2016-2018. The major activities of the project include resource mobilization, civil work (duct laying), civil work (fiber blowing), active equipment installation and connectivity progression which has been discussed in detail in Chapter 3. The Department of Environment of Bangladesh has issued a No Objection Certificate to SCL permitting them to carry out their project activities provided that certain environmental protection measures are adopted and a workplan is submitted before commencement of activities (see Annex II). However, as a part of the environmental and social due diligence for ADB funded projects, an environmental and social assessment under the proposed fiber optic network project needs to be carried out by following the provisions of SPS, 2009. The project activities do not appear to pose risk of significant adverse environmental impacts and accordingly, the overall project could be classified as a “Category B” project. The ESMS presents guidelines for probable environmental impacts and environmental management procedures. The ESMS also presents a simple format for “analysis of alternatives” (see Section 4.4.2) and “environmental/social screening” of sub-projects (see Section 4.4.3) to be carried out by SCL. Based on these and other relevant documents, SCL will prepare an EMP and carry out monitoring of mitigation measures. This chapter provides guidelines for (i) establishment of “baseline environment” against which impacts of the proposed sub-project would be evaluated; (ii) analysis of alternatives; (iii) assessment, prediction and evaluation of impacts of major project activities on the baseline environment; and (iv) identification of mitigation measures and preparation of environmental management plans (EMP) including monitoring requirements.

4.2 SUB-PROJECT DESCRIPTION

105. For proper environmental assessment, it is important that each sub- project is clearly described by the project proponent (SCL). The key information required for describing a particular project component would vary depending on the type of sub-project (i.e., underground or overhead fiber optic cable line). A Sub-project Description “Form 1” (for fiber optic cable line) has been developed (Annex III) for documenting description of sub-projects to be implemented under the proposed project. Once SCL, using Form 1, prepares a sub-project description, it will be easier to carry out environmental/social screening of the sub-project. The location map of a proposed sub-project should cover the entire physical extent of the sub-project and its surrounding areas.

4.3 ENVIRONMENTAL AND SOCIAL CONSIDERATIONS IN DIFFERENT MODALITIES OF FIBER OPTIC CABLE INSTALLATION

106. By considering certain issues during project formulation, it is often possible to reduce or eliminate some of the possible adverse environmental impacts during both construction and operational phases of a project. For example, efforts to avoid, where possible, critical homestead areas or crossing of rivers/hills/bamboo groves along the route of fiber optic cable lines could greatly reduce adverse impacts during construction and operational phases. Such considerations at the project formulation stage could greatly reduce adverse impacts and facilitate proper environmental management of a project. Table 4.1 identifies a number of such issues to be considered for underground and overhead fiber optic cable line deployment sub-projects. These issues should be adequately addressed during the project formulation stage, as a part of overall environmental management.

Table 4.1: Environmental and social considerations to be included in design to reduce/ eliminate the impacts for some major sub-projects

Sub-project	Issues to be Considered at Project Formulation Stage
Underground Fiber Optic Cable Line and associated	• Keeping the route layout of fiber optic cable line to follow existing roadway network or other public land • Keeping layout of fiber optic cable line such that the future maintenance work would least interfere with movement of

Sub-project	Issues to be Considered at Project Formulation Stage
control centers	traffic/pedestrian • Use suitable techniques like traditional trenching or horizontal directional drilling to minimize the socio- economic and environmental impacts. • Constructing hand-holes in readily accessible locations, which do not disturb the traffic flow or pedestrian movement.
Overhead Fiber Optic Cable Line (Standalone fiber optic cable on poles or fiber optic cable installed on existing BREB distribution lines) and associated control centers	• Avoiding crossing of rivers/hills/bamboo groves/cash-in trees, as much as possible, while selecting routes of standalone fiber optic lines • Maintenance of adequate clearance for right of way (RoW). • Keeping layout of fiber optic cable line pole such that they do not interfere with movement of traffic/pedestrian • Checking structural adequacy of existing power line towers/poles (to accommodate new fiber optic cable lines) for sub-projects.

4.4 ENVIRONMENTAL ASSESSMENT STEPS

107. The major activities involved in carrying out environmental assessment include the following:

- Identification of sub-project influence area;
- Establishment of “baseline environment” within the sub-project influence area, against which impacts of the proposed sub-project would be evaluated;
- Identification of major sub-project activities/processes during construction phase and operational phase;
- Assessment and evaluation of impacts of major project activities on the baseline environment during construction phase and operational phase (environmental screening);
- Carrying out public consultations;
- Identification of mitigation measures for reducing/eliminating adverse impacts and enhancing positive impacts;

- Analysis of Alternatives
- Development of environmental management plan (EMP), including monitoring requirements, and estimation of cost of EMP.

108. The environmental assessment will be carried out by SCL through filling up forms 1 to 4 (see Annexes III – VI). The following Section presents detail guidelines and processes for carrying out each of the abovementioned major activities and thereby filling up forms 1 to 4. It needs to be mentioned that minor social impacts (traffic congestion, worker health and safety, temporary inconvenience of construction activities etc.) will also be screened in this process and the mitigation measures for those will be a part of the environmental management plan. Therefore a separate social management plan is not prepared under the framework. Chapter 5 outlines procedures for preparing resettlement plans and tribal people's plans under the social management framework.

4.4.1 Sub-project Influence Area and Baseline Environment

109. In order to establish a sub-project influence area, the activities to be carried out and processes that would take place during both construction phase and operational phase of the sub-project need to be carefully evaluated. It is apparent that the sub-project influence area would depend not only on the type of sub-project (i.e., underground/overhead fiber optic cable line), but also on the nature of site/ area where it will be implemented. For construction of control center, influence area primarily include: (a) the areas surrounding the control center site (which may be built within the PGCB substation area); (b) the area along the access road to the control center; and (c) routes of transportation of construction materials (or construction wastes) to (or away from) the sub-project site. For construction of underground/overhead fiber optic cable lines, areas within the right of way (RoW) along the length of the route of the fiber optic cable line will experience impacts (e.g., traffic congestion, noise and air pollution, damage to crops), and therefore should be considered as the sub-project influence area. The overhead fiber optic cable lines will be deployed using existing power line poles owned by BREB. In case the distance between successive BREB poles is large enough to prevent deployment of overhead fiber optic cable lines, construction of new intermediate poles will be necessary. These intermediate poles will be constructed along existing public roads and therefore no land acquisition would be required. Wherever BREB distribution poles are not available, SCL will erect such poles along public roads (also, no requirement for land acquisition) after taking permission from the local authority. Construction of these poles may affect the surrounding environment (e.g., ecology, traffic and pedestrian movement). Therefore, the areas surrounding the poles should be considered as sub-project influence area during the construction phase. Table 4.2 provides general guidelines for identification of influence area for different types of sub-projects to be implemented under the proposed project.

Table 4.2: Guidelines for identifying influence area for different types of sub- projects

Sub-project	Influence Area
Underground Fiber Optic Cable Line and associated control centers	Areas and communities within the Right of Way (~27m) of the underground fiber optic cable line route;
Overhead Fiber Optic Cable Line (Standalone fiber optic cable on poles or fiber optic cable installed on existing BREB distribution lines) and associated control centers	Areas and communities within the Right of Way (~27m) of the overhead fiber optic cable lineroute; Areas on either side (within ~15 m) of the access road from the main road to the fiber optic cable line poles, which could be affected during construction by movement of construction related vehicular movement.

Note: The routes of transportation of material/ equipment to the sub-project site should also be included under influence area

110. For systematic recording of data, baseline environment is usually classified into physicochemical environment, biological environment, and socio- economic environment; and important features/parameters under each category are identified and measured/ recorded during baseline survey.

111. The important Physicochemical parameters for defining baseline include:

- Important Environmental Features (IEFs),
- Climate,
- Topography and drainage,
- Geology and soil,
- Hydrology and water resources,
- Air quality,
- Noiselevel,
- Water quality, and
- Traffic.

IEFs and Maps:

112. Typical Important Environmental Features (IEFs) include human settlements, educational institutions (school, college, madrassa, university), health care facilities (hospitals, clinics), commercial/ recreational establishments (markets, restaurants, parks, offices), religious establishments (mosques, temples, churches), major utility infrastructure (water/ wastewater treatment plants, water mains, sewers, power plants, sub-station, gas/ electricity transmission/ distribution lines), landfills, major ponds/ khals and rivers, and historical archaeological establishments, ecologically critical area (ECA), wildlife sanctuary, game reserve, protected area, and national park.

113. Under most circumstances, it is sufficient to identify IEFs based on a survey covering the sub-project influence area (see Table 4.1). Thus, a rapid physical survey of each sub-project will be required to identify the IEFs within the sub-project influence area. It should be noted that many of the IEFs (e.g., historical/ archaeological sites, wildlife sanctuary, and national park) should already be identified and recorded in available maps of the relevant areas. These maps could be utilized during identification of IEFs.

Climate:

114. It is important to have a general idea about the climate of the area where the sub-project would be implemented. Important climatic parameters include precipitation, temperature, relative humidity, wind speed and direction. These data should be collected from secondary sources (e.g., from the nearest station of Bangladesh Meteorological Department, BMD); the climatic data of the BMD station closest to the sub-project site should be used. These climatic data could be readily used for environmental assessment of any sub-project, as required.

Topography and drainage:

115. Information on the topography is essential in fixing the alignment of the fiber optic cable lines and also for river/khal crossing. Similarly, construction of control stations is dependent on the topography of the site and the surrounding area. For example, it is important to know whether the area where the control station would be constructed suffers from water logging or inundation problems, which could endanger the equipment and operation of the control station. Topographic maps are usually generated during surveying of the area under consideration.

Geology and soil:

116. Characteristics of soil could be important if a particular sub-project involves significant excavation/ earthworks, because wind-blown dust from these activities could contribute to air pollution. In such cases, characteristics of soils (particularly heavy metal content) are often determined as a part of baseline survey. However, considering the nature and scale of the structures to be constructed in the sub-projects to be implemented under SCL, geology and soil characteristics do not appear to be critical for environmental assessment.

Hydrology and water resources:

117. For the design of the sub-project information such as water level/ highest flood level are important. For environmental assessment, information on hydrology (e.g., river network, flow, highest water level) and water resources (e.g., discharge, surface and groundwater levels) may be collected from secondary sources.

Air quality:

118. Data on ambient air quality is not likely to be available in the areas where the sub-projects will be implemented. Particulate matter (particularly PM10 and PM2.5) is the most important air quality parameter from health perspective. However, measurement of air quality is relatively expensive and facilities for air quality measurement are not widely available. Therefore, baseline air quality data (PM) from secondary sources may be collected for carrying out environmental assessment (EA). The Clean Air and Sustainable Environment (CASE) Project, under the Ministry of Environment and Forest, Government of the People's Republic of Bangladesh, monitors different ambient air quality parameters from 11 fixed continuous air monitoring stations (CAMS) located in different parts of the country. The air quality data obtained from these CAMS can be used for carrying out detailed environmental assessment.

Noise level:

119. Noise is typically generated from operation of machines and equipment (e.g., horizontal directional drillers, concrete mixing machine), and movement of vehicles. Noise is of particular importance if the sub-project components (e.g., control stations, fiber optic cable laying equipment) are located close to sensitive installations such as educational institutions, health care facilities, religious establishments, and human settlements. Activities to be carried out during construction phase of the sub-projects would generate noise. For these sub-projects, baseline noise level should be measured and recorded, so that these could be compared with those generated during construction/ operation phase of the sub-projects. The location and frequency of baseline noise level measurements would depend on physical extent of project, and presence of sensitive installations within sub-project influence area. Both day-time and night-time noise levels should be measured, using a calibrated noise level meter.

Water quality:

120. A number of activities during the implementation of sub-projects could have impacts on water quality. These include construction of control stations and fiber optic cable poles, crossing of water bodies etc. Accidental spillage of gasoline from construction equipment/trucks may contaminate surface and/or ground water-bodies. Stagnation resulting from obstruction of cross drainage pattern in rural areas may result in deterioration of water quality in the areas surrounding these sites. For these sub-project activities, baseline water quality of the relevant water body should be measured, as a part of baseline survey.

Traffic:

121. Storage of construction materials, fiber optic cables, poles of fiber optic cable lines, etc. on the adjacent roads are likely to cause traffic congestion. Similarly, movements of additional vehicles carrying construction and fiber optic cable deployment equipment along public roads are likely to increase traffic congestion. For all the sub-projects, it would be necessary to collect traffic data from primary survey; both number and composition of traffic are important.

122. Table 4.3 presents guidelines for collection of primary and secondary data on physico-chemical environmental parameters for different types of sub- projects to be implemented under the proposed project.

Table 4.3: Guidelines for collection of sub-project specific physicochemical data/ information

Sub-project	Data/ information from secondary source	Data from primary survey/ measurement
Construction of underground fiber optic cable line by SCL	IEFs; Climate; Geology and soil; Hydrology and water resources ² ; site topography; air quality; and drainage	Noise level, Surface water quality ¹ ; air quality ³
Construction of overhead fiber optic cable line by SCL	IEFs; Climate; Hydrology and water resources ² ; site topography; air quality; and drainage	Noise level, Surface water quality ¹ ; air quality ³

¹If water body is located close to the sub-project site(s)

²If the fiber optic cable line passes over or close to khal/river/wetland lands

³If BMD station data are not available for the proposed location

123. The characteristics of “environmental baseline” would depend on

- Nature of the sub-project location,
- Nature/ extent of a sub-project and its likely impact,
- Level of environmental assessment (e.g., screening versus full scale EIA)

124. For example, ambient air quality and noise level are important parameters for describing baseline scenario for a control station, because these parameters are likely to be impacted by the project works. However, these parameters are not likely to be important for construction of overhead fiber optic cable line. Similarly, ecological parameters (e.g., diversity of flora and fauna) are not likely to be critical for an overhead fiber optic cable line to be constructed along the main road or through the commercial area, but these could be important for a fiber optic cable line that crosses a river or marshy land, where aquatic floral and faunal habitat could be impacted by the project activities.

125. Important parameters for description of biological environment include:

- General bio-ecological features of the sub-project area and its surroundings (e.g., bio-ecological zone, rivers, wetlands, hills, agricultural lands)

- Wildlife sanctuary, protected area, park, ecologically critical area (ECA)
- Floral habitat and diversity (terrestrial and aquatic)
- Faunal (including fish) habitat and diversity (terrestrial and aquatic)
- Threatened flora and fauna

126. It should be noted that all the sub-projects to be carried out by SCL are likely to have minor ecological impacts. In most cases, the most significant direct impact would result from felling/cutting of trees/vegetation within the control station sites and along the route of the fiber optic cable lines. If the alignment of a new fiber optic cable line crosses river/wetland, then construction of intermediate tower or underground duct could generate some adverse impact on water quality and aquatic ecology. However, these may not have any significant ecological impacts, thus, general bio-ecological description of the sub-project area would be sufficient for description of baseline biological environment. Table 4.4 provides guidelines for collection and presentation of data for biological environment for the sub-projects to be implemented by SCL.

Table 4.4: Guidelines for collection of sub-project specific data/information for describing biological environment

Sub-project	Data/information from secondary source	Data from primary survey/ measurement
Construction of underground fiber optic cable line by SCL	General bio-ecological features, Wildlife sanctuary, Floral and faunal diversity; ECA	Number of trees to be felled or trimmed; Area to be cleared of vegetation; Aquatic flora and fauna diversity ¹ ; Filling up of seasonal wetland (if required)
Construction of overhead fiber optic cable line by SCL	General bio-ecological features, Wildlife sanctuary, Floral and faunal diversity; ECA	Number of trees to be felled or trimmed; Area to be cleared of vegetation; Aquatic flora and fauna diversity ¹ ; Filling up of seasonal wetland (if required)

¹If the proposed fiber optic cable line crosses river/wetland

127. For the sub-projects, it is important to have a clear understanding to the baseline socio-economic condition of people, especially those living within the sub-project influence areas. The statistical yearbook published by the Bangladesh Bureau of Statistics (BBS) is a useful source of socio-economic information of different regions of Bangladesh.

4.4.2 Analysis of Alternatives

128. The primary objective of the “analysis of alternatives” is to identify the location/technology for a particular sub-project that would generate the least adverse impact, and maximize the positive impacts. In general, for a typical fiber optic cable installation project, the analysis of alternative should focus on:

- Alternative route (for underground or overhead fiber optic cable line);
- Alternative technology (e.g. Trenching or HDD);
- Costs of alternatives; and
- No sub-project scenario.

129. A simple format for analysis of alternatives is presented in Annex IV (Form 2 for fiber optic cable line). Use of a government-owned land for construction of fiber optic cable line significantly reduces adverse socio- economic impacts. For underground laying of optical fiber lines, use of horizontal directional drilling (HDD) method may be adopted instead of traditional trenching operation for creating fewer disturbances in the surrounding environment. Sometimes during bridge crossing HDD might be more advantageous to clamping depending on distance and geological formations. The outcome of the “analysis of alternatives”, for example, with respect to route of sub-project, technology should be included in the sub- project description Form 1. Based on these guidelines, the SCL engineers would carry out the “analysis of alternatives” of sub-projects by filling Form 2.

4.4.3 Screening of Impacts

130. The purpose of “environmental/social screening” is to get a preliminary idea about the degree and extent potential environmental impacts of a particular sub-project, which would subsequently be used to assess the need for further environmental/social assessment. SCL will be responsible for carrying out environmental/social screening in accordance with the format provided in “Form 3” of Annex V. The screening form (Form 3) has been designed to conduct preliminary assessment of the impacts of major sub- project activities on the ecological, physical-chemical and socio-economic environment of the surrounding areas. Annex XIII provides a detailed explanation of all impacts associated with fiber optic cable installation.

131. As shown in Form 3 (Annex V), the potential impacts of a sub-project have been divided into: (A) impacts during construction phase, and (B) impacts during operational phase. For each phase, the impacts have been further categorized into ecological impacts, physico-chemical impacts and socio- economic impacts. A number of questions have been prepared for each of these categories which are to be answered yes/no first. If the answer is yes, then the potential impact with respect to each parameter has to be classified as “low”, “moderate” and “high”. The following provides guidelines for environmental screening of sub-projects:

Ecological Impacts:

132. **Underground fiber optic lines:** For underground fiber optic cable lines, some parameters have been considered in the checklist questioner for screening of ecological impacts during construction phase (Form 3); these include ecologically sensitivity, felling of trees, clearing of vegetation, and possible impact on aquatic ecology (for fiber optic cable lines to be constructed under river/wetland). If the construction activities occur in an ecologically highly sensitive area, the impact would be classified as “high”; if it includes an ecologically moderately sensitive area, the impact would be classified as “moderate” and if it involves an ecologically low sensitive area, the impact would be classified as “low”. If construction of the fiber optic cable line involves felling/clearing of significant number of trees/vegetation along its route, the impact would be classified as “high”; if it involves felling/clearing of few trees/vegetation, the impact could be “moderate”, while if felling/clearing of trees/vegetation is not involved, the impact would be “low”. Construction of fiber optic cable lines using HDD techniques in river/wetland could aggravate the aquatic ecology, thereby affecting aquatic flora and fauna, during construction phase. Operation of a fiber optic cable line is not likely to generate any significant adverse ecological impacts.

133. **Overhead fiber optic lines:** For standalone overhead fiber optic cable lines, some parameters have been considered in the checklist questioner for screening of ecological impacts during construction phase (Form 3); these include ecologically sensitivity, felling of trees, clearing of vegetation, and possible impact on aquatic ecology (for fiber optic cable lines to be constructed under river/wetland). If the construction activities occur in an ecologically highly sensitive area, the impact would be classified as “high”; if it includes an ecologically moderately sensitive area, the impact would be classified as “moderate” and if it involves an ecologically low sensitive area, the impact would be classified as “low”. If construction of the fiber optic cable line involves felling/clearing of significant number of trees/vegetation along its route, the impact would be classified as “high”; if it involves felling/clearing of few trees/vegetation, the impact could be “moderate”, while if felling/clearing of trees/vegetation is not involved, the impact would be “low”. Construction of fiber optic cable lines using HDD techniques in river/wetland could aggravate the aquatic ecology, thereby affecting aquatic flora and fauna, during construction phase. Operation of a fiber optic cable line is not likely to generate any significant adverse ecological impacts.

Physico-chemical Impacts:

134. **Underground fiber optic lines:** Excavation/trenching works and movement of vehicle would typically generate dust and vibration and cause air pollution. Possible air pollution and dust generation from activities involved in underground fiber optic cable line construction is not likely to be significant, and may be classified as “low”, unless the underground fiber optic cable line route is located very close to human settlements. If construction of the underground fiber optic cable lines involves use of equipment/machines producing significant noise (e.g., generators, horizontal directional drills) and if the proposed underground fiber optic cable line route is located close to human settlements/ schools/ hospitals, noise pollution would be high (in the absence of mitigation measures). Similarly, if fuel and hazardous substances are used and stored in the HDD work, then possible negative impact and assessment would be classified as “low”, “moderate” or “high” depending on the proximity to the open environment. If there is a water body (e.g., khal, pond) located close to the proposed underground fiber optic cable line route and the materials are stockpiled near surface waters or natural water, then the potential adverse impact (e.g., through discharge of waste/ wastewater from sub-project activities, spills and leaks of oil) on water quality (in the absence of any mitigation/management) could be classified as “significant” or “moderate” or “insignificant”, depending on the proximity of the proposed underground fiber optic cable line route to the water body. If the location of the proposed) underground fiber optic cable line route is such that the construction activities is included with earthwork (earth excavation, backfilling, stockpiling of excavated soil), and it obstructs the flow of natural drainage water, then it could generate “significant” drainage congestion/water logging (in the absence of using HDD method) during construction phases of the control station; otherwise impact on drainage would most likely be “minor”. Operation of an underground fiber optic cable line is not likely to generate any significant adverse physico-chemical impact.

135. **Overhead fiber optic lines:** For installation of overhead fiber optic cable line, air and noise pollution resulting from the operation of manual drilling is not likely to be significant; and resulting air and noise pollution impacts could be categorized as “minor”. From field visit it was observed that SCL would mostly use existing power line poles to deploy the fiber optic cable lines. Hence the noise and air pollution under such scenario will be insignificant. For construction of overhead fiber optic cable line, air and noise pollution impacts could be categorized as “significant”, “moderate” and “minor”, depending on the nature of construction works (e.g., construction vehicular movement) and proximity of human settlements. Construction of overhead fiber optic cable line towers in river/wetland could aggravate the water quality during construction phase. Such fiber optic cable lines are not likely to generate any significant adverse physico-chemical impacts during operational phase.

Socio-economic Impacts:

136. **Underground fiber optic lines:** Guidelines for addressing loss of income and impact on tribal population (i.e. shops, squatters, mobile vendors etc.) have been presented in Chapter 5 (under social management framework); other parameters have been addressed in this Section. If the proposed underground fiber optic cable lines are located close to a busy road/highway, then transportation and storage of construction materials could aggravate traffic congestion (especially in the absence of mitigation measures). Operation of an underground fiber optic cable line is not likely to generate any adverse socio- economic impacts; both construction and operation of an underground fiber optic cable line would generate employment opportunities.

137. **Overhead fiber optic lines:** Construction of overhead fiber optic cable lines along busy highways or along narrow roads could generate traffic congestion and interfere with pedestrian movement (in the absence of mitigation measures). Both construction and operation/maintenance of overhead fiber optic cable lines would generate employment opportunities. Overhead fiber optic cable line is not likely to generate any adverse socio- economic impacts during operational phase.

4.4.4 Preparation of the Environmental Management Plan (EMP)

138. The primary objective of the environmental management plan (EMP) is to record environmental impacts resulting from the sub-project activities and to ensure implementation of the identified “mitigation measures”, in order to reduce adverse impacts and enhance positive impacts. The EMP should clearly lay out: (a) the measures to be taken during both construction and operation phases of a sub-project to eliminate or offset adverse environmental impacts, or reduce them to acceptable levels; (b) the actions needed to implement these measures; and (c) a monitoring plan to assess the effectiveness of the mitigation measures employed. The environmental management program should be carried out as an integrated part of the project planning and execution. It must not be seen merely as an activity limited to monitoring and regulating activities against a pre-determined checklist of required actions. Rather it must interact dynamically as a sub-project implementation proceeds, dealing flexibly with environmental impacts, both expected and unexpected. For all sub-projects to be implemented under this project, the EMP should be a part of the Contract Document.

139. In addition, third party monitoring of environmental management, Special Environmental Clauses (SECs) for inclusion in the bidding document, the institutional arrangement for implementing the ESMS is discussed in Chapter 6.

140. SCL will prepare site-specific mitigation measures and monitoring protocol as shown in “Form 4” (Annex VI). The format of the site-specific EMP is shown Table 4.5. Tables 4.6 and Annex X (Best Management Practices) describes typical environmental mitigation measures adopted for impacts associated with the construction of fiber optic cables. SCL should adopt the mitigation

measures which best suits their practice and relevant to the conditions at the site. Also suggestive monitoring protocol is described in Table 4.7 which SCL should use to devise their site-specific monitoring plan.

Table 4.5: Suggestive format of site-specific EMP

Activities Associated with low to moderate environmental impacts	Suggested mitigation measures/ BMP	Mitigation Measures Adopted by the Contractor/SCL	Monitoring of mitigation measures	Frequency of monitoring during period of activities	Name of the person conducting the monitoring

Mitigation and Enhancement Measures during Construction Phase:

141. Table 4.6 shows the mitigation measures corresponding to specific adverse impacts during construction phase, along with assignment of responsibilities for their implementation. The measures presented in Table 4.6 are aimed at minimizing the effects of the possible adverse impacts and enhancing the positive impacts. It is observed from Table 4.6 that installation of overhead fiber optic cable line does not have much negative impacts (except for various injuries related to fiber optic cable handling). However, a post- project monitoring program needs to be put in place to ascertain that the potential impacts have been predicted adequately and that suggested mitigation measures are effective in minimizing adverse impacts on the environment.

Table 4.6: Environmental impact during construction phase for installation of fiber optic cables by SCL and mitigation measures

Activity/Issues	Potential Impacts	Proposed Mitigation and Enhancement Measures	Responsible Parties
Excavation and backfilling (trenching operation), concreting work, mobilization of vehicles and equipment	Air Pollution due to fugitive construction dust, fossil fuel burning by construction equipment, increased traffic	- Ensure that all project vehicles are in good operating condition - Spray water on dry surfaces/ unpaved roads/ vulnerable areas regularly to reduce dust generation - Maintain adequate moisture content of soil during transportation, compaction and handling - Sprinkle and cover stockpiles of loose materials (e.g., fine aggregates for concreting work). - Securing and covering material in open trucks while hauling excavated material, construction materials (for concreting work) - For concreting work, not using equipment such as stone crushers at site, which produce significant amount of particulate matter - Establishment of minimally intrusive and well-designed traffic patterns for onsite construction activities - Limiting GHG emission by using modern construction equipment and by prohibiting excessive idling of equipment when not in use. - Apply relevant Best Management Practices for excavation and preventing air pollution from construction activities (Annex X)	Contractor (monitoring by SCL)/ SCL

Activity/Issues	Potential Impacts	Proposed Mitigation and Enhancement Measures	Responsible Parties
	• Damage/ reduction of native flora, displacement of wildlife, birds etc.	• Plantation/afforestation program for tree replacement (plantation of at least two trees of similar species for each cut tree). • Provide proper compensation if there is any destruction of trees outside RoW. • Not removing undergrowth fully where possible, so that they may re- grow naturally after the project activity. • Control intensive movement of heavy construction vehicles. • Temporary stockpiling of materials should be done on non-vegetative surfaces • Avoid removing mature riparian vegetation. • Re-vegetationshouldbedoneusing native, non-invasive species and by preventing the introduction of noxious weeds • Keep noise level (e.g., from equipment) to a minimum level, as certain fauna may be very sensitive to loud noise. • Apply relevant Best Management Practices (Annex X)fordisturbanceto fauna and faunal habitat.	Contractor (monitoring by SCL)/ SCL
	• Water pollution by suspended solids as a result of soil erosion or by accidental fuel spills	• Remove from site excess subsoil, substrate, and/or large rock materials that cannot be buried in the excavated trench • Install sediment basins to trap sediments in storm water prior to discharge to surface water. • Replant vegetation when soils have been exposed or disturbed. • No in-stream river or water body crossing will be allowed • Work would be halted when wet conditions would lead to excessive damage to soils and vegetation in work areas. • Employ typical spill prevention guidelines as outlined in the BMP (Annex X). • Hazardous materials (fuel) will not be drained into the ground or allowed to drain into the nearest drainage	Contractor (monitoring by SCL)/ SCL

Activity/Issues	Potential Impacts	Proposed Mitigation and Enhancement Measures	Responsible Parties
		- canals. - A spill prevention, containment, and countermeasure plan would be prepared. This plan would detail the measures required of all construction, operation, and maintenance personnel for transport, storage, use, spill response/ containment, and disposal of hazardous materials, waste, and debris.	
	Noise pollution	- Use of noise suppressors and mufflers in heavy construction equipment. - Avoid using of construction equipment producing excessive noise during school hours and also at night - Avoid prolonged exposure to noise (produced by equipment) by workers/ give protective gears - Regulate use of horns and avoiding use of hydraulic horns in project vehicles.	Contractor (monitoring by SCL)/ SCL
	Disruption of local drainage	- Provide adequate diversion channel, if required - Provide facilities for pumping of congested water, if needed - Ensure adequate monitoring of drainage effects, especially if construction works are carried out during the wet season.	Contractor (monitoring by SCL)/ SCL
	Traffic congestion during roadside work	- Schedule deliveries of material/ equipment during non-school hours and after regular working hours - Employ a minimally intrusive and well-designed traffic patterns for on-site activities - Depute flagman for traffic control - Arrange for signal light at night	Contractor (monitoring by SCL)/ SCL
	Direct or indirect impact to natural, manmade or buried physical cultural resources	- Excavation activities through places of archaeological and historical importance should be avoided at all costs. - Place fences at the boundaries of these places so that construction activities or equipment movement do not harmfully affect them. - Limiting noise-generating activities near such sites, which can interfere with the use and enjoyment of PCR such as tourist destinations, historic	Contractor (monitoring by SCL)/ SCL

Activity/Issues	Potential Impacts	Proposed Mitigation and Enhancement Measures	Responsible Parties
		- buildings, religious establishments and cemeteries. - During excavation activities, if any buried PCR items are found, the Chance Find Procedures outlined in Annex IX should be followed.	
	Health and safety of workers, risk to pedestrian movement	- Clean bill of health a condition for employment - Provide the workers with personal protective equipments for protection against dust and noise - Contractors and workers should wear high visibility safety apparel while working in public right of way. - Signposts and directional signs should be provided at appropriate locations for pedestrians and traffic at construction site. - Contractor/SCL should develop an occupational health and safety plan	Contractor (monitoring by SCL)/ SCL
	Obstruction or interference with other utility infrastructures	During design and permitting process of the project, efforts should be made to coordinate and minimize disruptions	SCL
Installation of fiber optic cables	Various injuries related to fiber optic cable handling (exposure to laser, microscopic fiber optic shards), fire hazard	Follow the fiber optic cable safety protocols as stated in IFC guidelines for environmental, health and safety for telecommunications (Annex XI)	Contractor (monitoring by SCL)/ SCL
Horizontal Directional Drilling Work	Noise and air pollution, worker health and safety, disruption of local drainage	As applicable, adopt similar noise and air pollution mitigation measures, measures to prevent drainage congestion and ensuring worker health and safety stated above for trenching operation, concreting work, mobilization of vehicles and equipment.	Contractor (monitoring by SCL)/ SCL
	Water pollution due to sediment suspension (increase in suspended solids) or washing away of slurry to the	- The directional drilling equipment should be placed away from stream shore (at least 20 feet away from stream shore according to BMP in Annex X) - Ensuring that no seepage occurs through the borehole. In case of seepage, the procedures outlined in	Contractor (monitoring by SCL)/ SCL

Activity/Issues	Potential Impacts	Proposed Mitigation and Enhancement Measures	Responsible Parties
	water bodies	the BMP (Annex X) should be followed. • In water body crossing, it has to be ensured that the borehole remains at a sufficient depth below the lowest bed level of the water body. The accurate bed level of water bodies needs to be determined through morphological surveys.^a • After completion of the borehole, all slurry should be removed from the construction site and disposed in an approved site.	
Water body crossing operation of fiber optic cables by clamping to bridge	• Noise and air pollution	• As applicable, adopt similar noise and air pollution mitigation measures stated above for trenching operation, concreting work, mobilization of vehicles and equipment.	Contractor (monitoring by SCL)/ SCL
	• Disruption of bridge traffic	• Employ a minimally intrusive and well-designed traffic patterns for onsite activities • Depute flagman for traffic control • Arrange for signal light at night	Contractor (monitoring by SCL)/ SCL
	• Health and safety of workers	• Provide the workers with personal protective equipment for protection against noise. • Provide the workers with life jackets with high visibility while working on the bridge. • Signposts and directional signs should be provided at appropriate locations for diverting pedestrians and traffic on the bridge. • SCL/Contractors should comply with the relevant IFC guidelines of occupational health and safety (Annex XI)	Contractor (monitoring by SCL)/ SCL

^aAny morphological survey work performed by the Contractor or any other party has to be approved by SCL before the initiation of drilling. Detailed survey maps prepared by the Contractor or any other party will be presented to SCL who would first check the technical viability of HDD operation. Only after their approval, work can commence.

Operational Phase:

At the operational phase, SCL will be responsible for the operation and maintenance of the fiber optic cable network and ancillary facilities. Operation and maintenance will be on foot traffic only and no adverse environmental impact to environmental parameters is anticipated during this phase. However, during the maintenance and repair of fiber optic cables, the issue of worker exposure to laser and microscopic fiber optic shards would have to be considered. The safety protocols stated in the IFC EHS guidelines for fiber optic cable safety would have to be followed in order to minimize and eliminate any adverse effect on worker health and safety.

Monitoring Plan:

142. The primary objective of the environmental monitoring is to record environmental impacts resulting from the sub-project activities and to ensure implementation of the “mitigation measures” identified earlier in order to reduce adverse impacts and enhance positive impacts from project activities.

143. During implementation of all sub-projects, SCL will be responsible to monitor and make sure that the environmental mitigation/enhancement measures (including health and safety measures) outlined in the EMP for the particular sub-project are being implemented in accordance to the provisions of the Tender Document.

144. Apart from general monitoring of mitigation/enhancement measures, important environmental parameters to be monitored during the construction phase of the sub-projects include noise level, water quality, drainage congestion etc. Table 4.7 presents guidelines for monitoring of specific environmental parameters during construction phase of all the sub-projects.

Table 4.7: Guidelines for monitoring of environmental parameters during construction phase

Monitoring	Period/Location	Parameters to be monitored	Monitoring Frequency and responsibility	Resources Required
Noise Level	Baseline One set of measurements at property boundaries of selected critical locations (schools, residential areas, hospitals etc.) prior to commencing cable laying activities Three set of measurements at the same locations during cable laying process (trenching	Equivalent Noise level (L_{eq}) with GPS location, wind speed and direction	Spot checking in a monthly basis; Contractor/SCL's Responsibility	Noise level meter, GPS;

Monitoring	Period/Location	Parameters to be monitored	Monitoring Frequency and responsibility	Resources Required
	Three set of measurements at the same locations during cable laying process (HDD operation)			
Air Quality (dust particles/particulate matter)	<u>Baseline</u> Only at selected critical locations downwind of site activities (prior to commencement of work) and in close proximity to human receptors			Particulate matter sampling device, GPS
	Only at selected critical locations downwind of site activities (during trenching and cable laying work) and in close proximity to human receptors	SPM, PM ₁₀ with GPS location, wind speed and direction	Spot checking on a Monthly basis; Contractor's Responsibility	Wind speed/direction data to be collected from local BMD station
	Only at selected critical locations downwind of site activities (during HDD activities) and in close proximity to human receptors			
Water Quality	<u>Baseline:</u> One measurement from the nearest surface water body ^a			
	One measurement from the nearest surface water body during cable laying operation by trenching	Turbidity, Total Suspended Solids, Total Solids, Dissolved Oxygen	Monthly and as directed by the Project team leader; Contractor/SCL's Responsibility ^a	Laboratory facilities for water/wastewater analysis
	One measurement from the nearest surface water body during cable laying operation by HDD ^a			
General site condition	<u>Baseline:</u> Visual survey (once) of proposed cable laying site before prior to cable laying operation	General site condition, traffic condition, pedestrian movement, vegetation clearance etc. by visual survey (photographs)	Weekly and as directed by the Project team leader; Contractor/SCL's Responsibility	Digital camera
	Visual survey of cable laying site during the entire period of cable laying operation			
House-keeping activities, Safety measures during construction	Visual survey of cable laying site during the entire period of cable laying operation	Construction debris management, traffic management, management of flammable	Weekly and as directed by the Project team leader; Contractor/SCL's Responsibility	Digital camera

Monitoring	Period/Location	Parameters to be monitored	Monitoring Frequency and responsibility	Resources Required
		materials (if any), use of Personal Protective Equipment by workers etc.		
Occupational Health and safety Compliance	During the period of cable lay for workers engaged in optical fiber connection	Routine eye examination	For each worker exposed to laser light during cable installation	Eye specialist

^aNo need to perform this measurement if no water body is present in close proximity to the work site

Note: The Project Team Leader will decide actual monitoring time and location.

145. SCL anticipates no adverse environmental or social impacts during the operation phase of the proposed fiber optic cable installation project. However, the following issues need to be addressed during the operation phase:

- The trenches should be monitored over a three-year period for settling and possible cracks showing evidence of disturbance from proposed activities. Visual observation with photograph documentation in this case would be sufficient. This is the responsibility of SCL.
- The project-affected area should be monitored over a period of one year to ensure reseeding does not appear unnatural (i.e. presence of non- native or invasive species). Visual observation with photograph documentation in this case would be sufficient. This is the responsibility of SCL.
- For personnel engaged in fiber optic repair and maintenance, if they are exposed to laser during such operation, they should have their eyes examined regularly by a medical professional. This would be the responsibility of SCL and the actual frequency of monitoring would have to be determined by SCL as well.

Indicative Cost Estimation for Environmental Monitoring:

146. Cost of implementing environmental management plan (EMP) including monitoring activities needs to be estimated as a part of the preparation of EMP. Many of the activities to be carried out as a part of EMP would not involve any additional direct cost e.g., employing local work force, where appropriate; keeping sub-project vehicles in good operating condition; scheduling deliveries of materials/ goods in off-peak hours; good housekeeping, avoiding spills; etc. On the other hand, a number of activities would require additional cost. Environmental monitoring during construction phase would involve direct cost. At the same time, a number mitigation measures (including health and safety measures) would require additional cost; these include medical examination, installation of health and safety signs, awareness documents (signs/ posters), water

sprinkling on surfaces, traffic control (e.g., deputing flagman), traffic light, plantation, and protective gear. Table 4.8 provides basis/ method of estimation of costs of different items of EMP. Similar approach should be followed for estimation of cost of additional measures, if required.

Table 4.8: Method/ basis of estimation of cost of Monitoring

Item	Basis of cost/Estimated cost
Monitoring:	
Noise level	Prevailing rate (~ Tk. 5,000/- per measurement per day)
Air Quality (SPM, PM ₁₀)	Prevailing rate (~ Tk. 8,000/- per measurement)
Water quality (Turbidity, Total Suspended Solids, Total Dissolved Oxygen)	Prevailing rate (~ Tk. 2,000/- per sample)
Health/ safety signs (size and number to be estimated)	Prevailing PWD/LGED/REB/PGCB rate /Lump sum amount
Water sprinkling on aggregate	Latest PWD/LGED rate (if available)/A fixed rate per cubic meter of aggregate per day
Traffic control (estimate number of flagman needed and duration of work)	Latest PWD/ LGED rate (if available)/A fixed rate per flagman per day/ Lump sum amount
Traffic light	Latest PWD/ LGED rate (if available)/ Lump sum amount
Protective gear	Contractor/SCL to quote rate of different items of works considering the provision of adequate protective gear for workers, in accordance to the conditions of contract, specified in the Tender Document
Medical examination (routine eye examination)	Prevailing rate (~ Tk. 500/- per worker engaged in fiber optic cable connection and maintenance)
Plantation (including protection/ fencing and conservation during project period)	Prevailing rate (~ Tk. 1,000/- per plant)

* Depending on availability of facility for measurement

4.5 BEST MANAGEMENT PRACTICES (BMP)

147. The Best Management Practices (BMP) is prepared as a guideline for environment management of different parts of the project to be implemented by the SCL. The main objective of an BMP is to manage construction operations in harmony with the environment in an effort to contribute to the well-being of the community and the environment by:

- Minimizing pollution
- Sustaining eco-systems
- Conserving cultural heritage
- Enhancing amenity

148. The BMP is designed to be used during the construction of the control stations, laying of underground and overhead fiber optic lines by the SCL. The purpose of the BMP is to ensure that construction activities are conducted in a manner that minimizes impacts on the environment. It promotes awareness and use of best practice in environmental management. Responsibility lies with all the people involved in any given project to adopt environmentally responsible work practices. Best environmental management practice requires environmental awareness, and appreciation of one's environmental responsibilities. Measures taken to prevent environmental impacts are preferred to those designed to control the impact.

149. The BMP developed will address the following issues related to the above project components: (1) Protection of flora and fauna, (2) excavation, backfilling and topsoil restoration and re-vegetation (3) reuse of excavated soil, (4) protection of sensitive locations, (5) HDD operation, (6) Cable laying by bridge-crossing, (7) pole construction, (8) installation of control station, (9) waste management, (10) public health and safety, (11) natural habitats, (12) air pollution control and (13) general maintenance and erosion control.

150. A particular sub-project may involve all or some of these issues. Annex X presents the BMPs and the Table 4.9 outlines applicability of different BMPs for different sub-projects to be implemented under for proposed project.

Table 4.9: Possible Application of BMP relating to different types of sub- projects to be implemented by SCL

Best Management Practices (BMPs)	Underground fiber optic line installation and ancillary facilities	Overhead fiber optic line installation and ancillary facilities
Protection of flora and fauna	☐	☐
excavation, backfilling and topsoil restoration and re-vegetation	☐	--
reuse of excavated soil	☐	--
protection of sensitive locations	☐	☐
HDD operation	☐	--
Cable laying by bridge-crossing	☐	☐
pole construction	--	☐
installation of control station	☐	☐
waste management	☐	☐
public health and safety	☐	☐
natural habitats	☐	☐
air pollution control	☐	--
erosion control	☐	☐

✓ = BMP required; ☑ = BMP may be required depending on the site/route condition.

4.6 OCCUPATIONAL HEALTH AND SAFETY GUIDELINES

151. In general, the objectives of occupational health and safety (OHS) plan are: (a) To develop, in the workplace, a collaborative approach to managing Occupational health and Safety between management and workers; (b) To provide and maintain safe working procedures and operations; (c) To ensure awareness of all potential work related risks and hazards and to develop preventive strategies against these risks and hazard; (d) To provide appropriate training to all concerned to work safely and effectively; (e) To maintain a constant and continuing interest in the improvement of occupational health and safety performance and to provide the required resources necessary for the implementation and maintenance of the OHS plan.

152. For the sub-projects to be implemented by SCL, the occupational health and safety primarily focuses on work equipment and protective gear. The following section provides guidelines/ directives for: (a) work equipment, (b) protective gear, and (c) safety and health signs.

4.6.1 Suggested Safety Directives for Work Equipment

153. It is employer's (contractor/SCL) obligation that every possible measure is taken to ensure the safety of the work equipment made available to workers. During the selection of the work equipment the employer shall pay attention to the specific working conditions, which exist at the workplace, especially in relation of safety and health of the workers. A brief list of work equipment safety issues is given below:

- Work equipment control devices which affect safety must be clearly visible and identifiable and appropriately marked where necessary.
- Where there is a risk of mechanical contact with moving parts of work equipment, which could lead to accidents, those parts must be provided with guards or devices to prevent access to danger zones or to halt movements of dangerous parts before the danger zones are reached.
- Work equipment may be used only for operations and under conditions for which it is appropriate.
- Work equipment must bear the warnings and markings essential to ensure the safety of workers.
- All work equipment must be appropriate for protecting workers against the risk of the work equipment catching fire or overheating, or of discharges of gas, dust, liquid, vapor or other substances produced, used or stored in the work equipment.
- Work equipment must be erected or dismantled under safe conditions, in particular observing any instructions, which may have been furnished by the manufacturer.

4.6.2 Safety Directives for Protective Gears

154. Personal protective equipment is suggested for use when the risks cannot be avoided or sufficiently limited by technical means. All personal protective equipment must:

- be appropriate for the risks involved, without itself leading to any increased risk
- correspond to existing conditions at the workplace
- fit the wearer correctly after any necessary adjustment.

155. The Contractor/SCL shall organize orientation to use of personal protective equipment. Workers shall be informed of all measures to be taken. Consultation and participation shall take place on the matters related to the use of the protective equipment. A partial list of protective gears to be worn by the workers at designated work areas is given below:

- Head Protection: Protective helmets will be put on at all times mainly at the control center construction sites, under scaffolds, erection and stripping of formworks, etc., where there are possibilities of head injuries from falling/flying objects.
- Eye and Face Protection: Spectacles, Goggles, Face Shield or Arc-welding Mask with Hand Masks, whichever is appropriate

4.6.3 Safety and Health Signs

156. Safety signs, health signs, prohibition sign, warning sign, mandatory sign, emergency escape sign, first-aid sign, information sign, signboard, supplementary signboard, safety color, symbol, pictogram, illuminated sign, acoustic signal, verbal communication and hand signal are essential tools for preventing accidents by providing information in advance.

157. When working on or with overhead lines the provisions of the paragraphs shall be complied with:

- Prior to climbing poles, ladders, scaffolds, or other elevated structures, an inspection shall be made to determine that the structures are capable of sustaining the additional or unbalanced stresses to which they will be subjected.
- Where poles or structures may be unsafe for climbing, they shall not be climbed until made safe by guying, bracing, or other adequate means.
- Before installing or removing fiber optic cable, strains to which poles and structures will be subjected shall be considered and necessary action taken to prevent failure of supporting structures.
- Pole holes shall not be left unattended or unguarded in areas where employees are currently working.

158. The erecting of poles, hoisting machinery, site preparation machinery, and other types of construction machinery shall conform to following applicable requirements:

- No one shall be permitted under a tower, which is in the process of erection or assembly, except as may be required to guide and secure the section being set.
- Equipment and rigging shall be regularly inspected and maintained in safe operating condition.
- Adequate traffic control shall be maintained when crossing highways and railways with equipment as required.

159. The Contractor/SCL will provide or ensure that appropriate safety and/or health signs are in place at their work sites where hazards cannot be avoided or reduced. The Contractor/SCL should comply with the relevant IFC guidelines of occupational health and safety (Annex XI) Workers and their representatives must be informed of all the measures taken concerning health and safety signs at work and must be given suitable instruction about these signs.

4.7 TRAFFIC MANAGEMENT PLAN

Principles

160. One of the prime objectives of this TMP is to ensure the safety of all the road users along the work zone, and to address the following issues:

- the safety of pedestrians, bicyclists, and motorists travelling through the construction zone;
- protection of work crews from hazards associated with moving traffic;
- mitigation of the adverse impact on road capacity and delays to the road users;
- maintenance of access to adjoining properties; and
- addressing issues that may delay the project.

Operating Policies for TMP

161. The following principles will help promote safe and efficient movement for all road users (motorists, bicyclists, and pedestrians, including persons with disabilities) through and around work zones while reasonably protecting workers and equipment.

- Make traffic safety and temporary traffic control an integral and high-priority element of every project from planning through design, construction, and maintenance.
- Inhibit traffic movement as little as possible.
- Provide clear and positive guidance to drivers, bicyclists, and pedestrians as they approach and travel through the temporary traffic control zone.
- Inspect traffic control elements routinely, both day and night, and make modifications when necessary.
- Pay increased attention to roadside safety in the vicinity of temporary traffic control zones.
- Train all persons that select, place, and maintain temporary traffic control devices.
- Keep the public well informed.
- Make appropriate accommodation for abutting property owners, residents, businesses, emergency services, railroads, commercial vehicles, and transit operations.

162. Figure 4.2 to Figure 4.12 illustrates the operating policy for TMP for the installations of optic fibre cables-both underground and overhead where applicable.

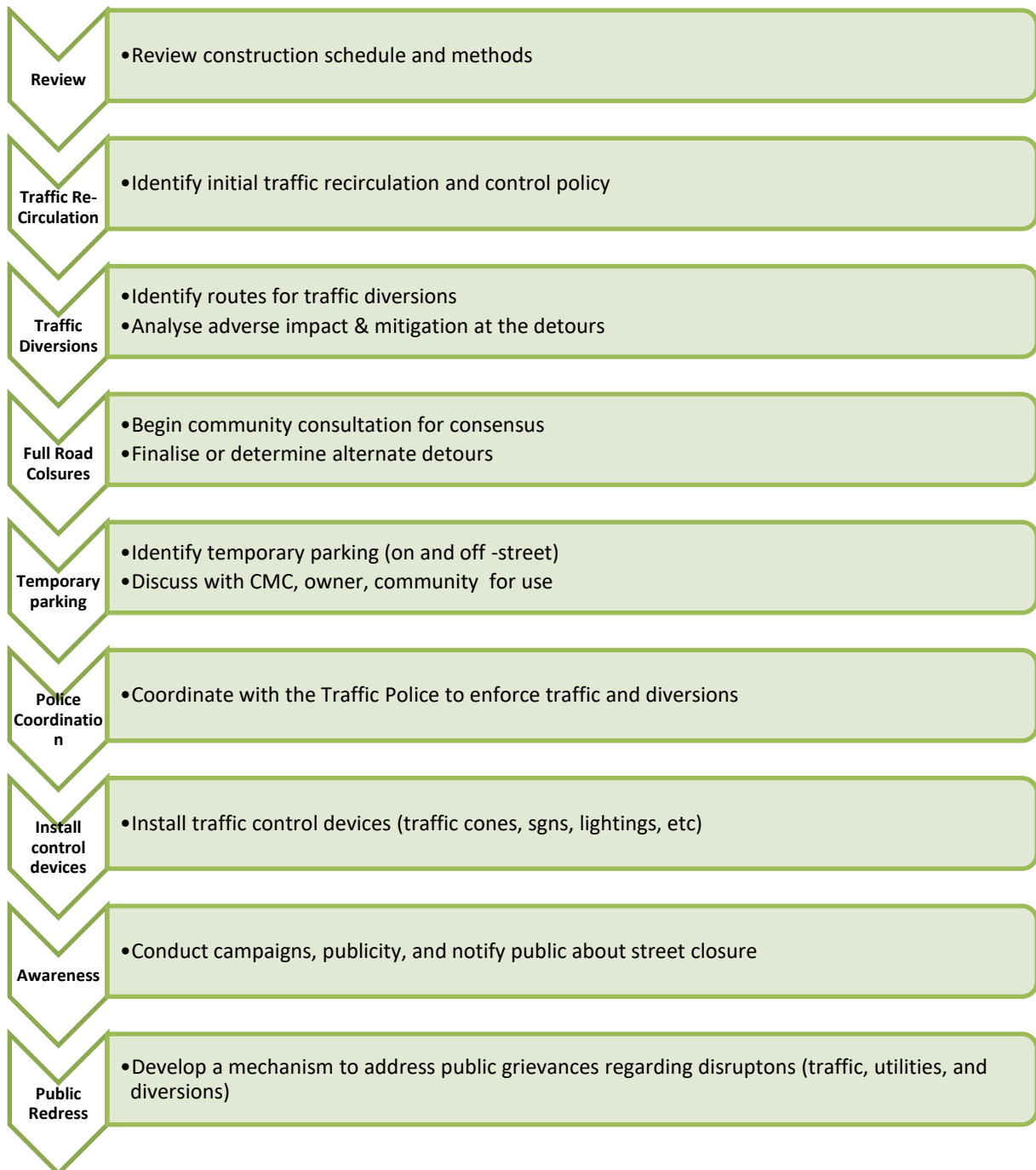
Analyze the impact due to street closure

163. Apart from the capacity analysis, a final decision to close a particular street and divert the traffic should involve the following steps:

- approval from the respective local government as well as government entities to use the local streets as detours;
- consultation with relevant stakeholders primarily: businesses, community members, traffic police, and so on, among other, regarding the mitigation measures necessary at the detours where the road is diverted during the construction;
- determining of the maximum number of days allowed for road closure, and incorporation of such provisions into the contract documents;
- determining if additional traffic control or temporary improvements are needed along the detour route;
- considering how access will be provided to the worksite;
- contacting emergency service, school officials, and transit authorities to determine if there are impacts to their operations; and
- developing a notification program to the public so that the closure is not a surprise. As part of this program, the public should be advised of alternate routes that commuters can take or will have to take as result of the traffic diversion.

164. If full road-closure of certain streets within the area is not feasible due to inadequate capacity of the detour street or public opposition, the full closure can be restricted to weekends with the construction commencing on Saturday night and ending on Monday morning prior to the morning peak period.

Figure 4.1: Policy Steps for the TMP



Public awareness and notifications

165. As per discussions in the previous sections, there will be travel delays during the constructions, as is the case with most construction projects, albeit on a reduced scale if utilities and traffic management are properly coordinated. There are additional grounds for travel delays in the area, as most of the streets lack sufficient capacity to accommodate additional traffic from diverted traffic as a result of street closures to accommodate the works.

166. The awareness campaign and the prior notification for the public will be a continuous activity which the project will carry out to compensate for the above delays and minimize public claims as result of these problems. These activities will take place sufficiently in advance of the time when the roadblocks or traffic diversions take place at the particular streets. The reason for this is to allow sufficient time for the public and residents to understand the changes to their travel plans. The project will notify the public about the roadblocks and traffic diversion through public notices, ward level meetings and city level meeting with the elected representatives.

167. The PIU will also conduct an awareness campaign to educate the public about the following issues:

- traffic control devices in place at the work zones (signs, traffic cones, barriers, etc.);
- defensive driving behaviour along the work zones; and
- reduced speeds enforced at the work zones and traffic diversions.

168. It may be necessary to conduct the awareness programs/campaigns on road safety during construction.

169. The campaign will cater to all types of target groups i.e. children, adults, and drivers. Therefore, these campaigns will be conducted in schools and community centres. In addition, the project will publish a brochure for public information. These brochures will be widely circulated around the area and will also be available at the PIU, and the contractor's site office. The text of the brochure should be concise to be effective, with a lot of graphics. It will serve the following purpose:

- explain why the brochure was prepared, along with a brief description of the project;
- advise the public to expect the unexpected;
- educate the public about the various traffic control devices and safety measures adopted at the work zones;
- educate the public about the safe road user behaviour to emulate at the work zones;
- tell the public how to stay informed or where to inquire about road safety issues at the work zones (name, telephone, mobile number of the contact person; and
- indicate the office hours of relevant offices.

Install traffic control devices at the work zones and traffic diversion routes

170. The purpose of installing traffic control devices at the work zones is to delineate these areas to warn, inform, and direct the road users about a hazard ahead, and to protect them as well as the workers. As proper delineation is a key to achieve the above objective, it is important to install good traffic signs at the work zones. The following traffic control devices are used in work zones:

- Signs
- Pavement Markings
- Channelizing Devices
- Arrow Panels
- Warning Lights

171. Procedures for installing traffic control devices at any work zone vary, depending on road configuration, location of the work, construction activity, duration, traffic speed and volume, and pedestrian traffic. Work will take place along major roads, and the minor internal roads. As such, the traffic volume and road geometry vary. The main roads carry considerable traffic; internal roads in the new city areas are wide but in old city roads very narrow and carry considerable traffic. However, regardless of where the construction takes place, all the work zones should be cordoned off, and traffic shifted away at least with traffic cones, barricades, and temporary signs (temporary “STOP” and “GO”).

172. Figure 4.2 to Figure 4.12 illustrates a typical set-up for installing traffic control devices at the work zone of the area, depending on the location of work on the road way, and road geometrics:

- Work on shoulder or parking lane
- Shoulder or parking lane closed on divided road
- Work in Travel lane
- Lane closure on road with low volume
- Lane closure on a two-line road with low volume (with yield sign)
- Lane closure on a two-line road with low volume (one flagger operation)
- Lane closure on a two lane road (two flagger operation)
- Lane closure on a four lane undivided Road
- Lane closure on divided roadway
- Half road closure on multi-lane roadway
- Street closure with detour

173. The work zone should take into consideration the space required for a buffer zone between the workers and the traffic (lateral and longitudinal) and the transition space required for delineation, as applicable. For the works, a 30 cm clearance between the traffic and the temporary STOP and GO signs should be provided. In

addition, at least 60 cm is necessary to install the temporary traffic signs and cones.

174. Traffic police should regulate traffic away from the work zone and enforce the traffic diversion result from full street closure in certain areas during construction. Flaggers/ personnel should be equipped with reflective jackets at all times and have traffic control batons (preferably the LED type) for regulating the traffic during night time.

175. In addition to the delineation devices, all the construction workers should wear fluorescent safety vests and helmets in order to be visible to the motorists at all times. There should be provision for lighting beacons and illumination for night constructions.

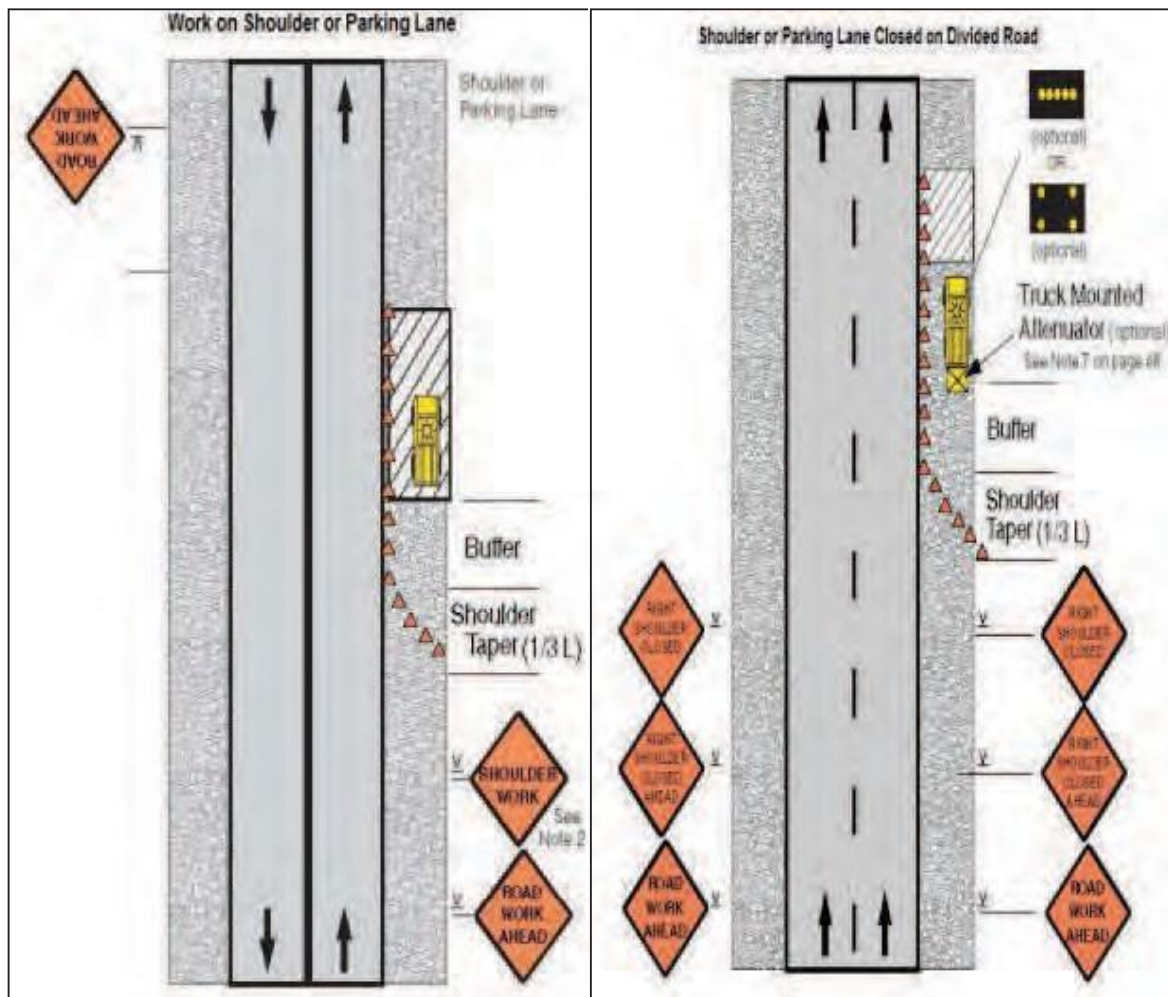


Figure 4.2 & 4.3: Work on shoulder or parking lane and shoulder or parking lane closed on divided road

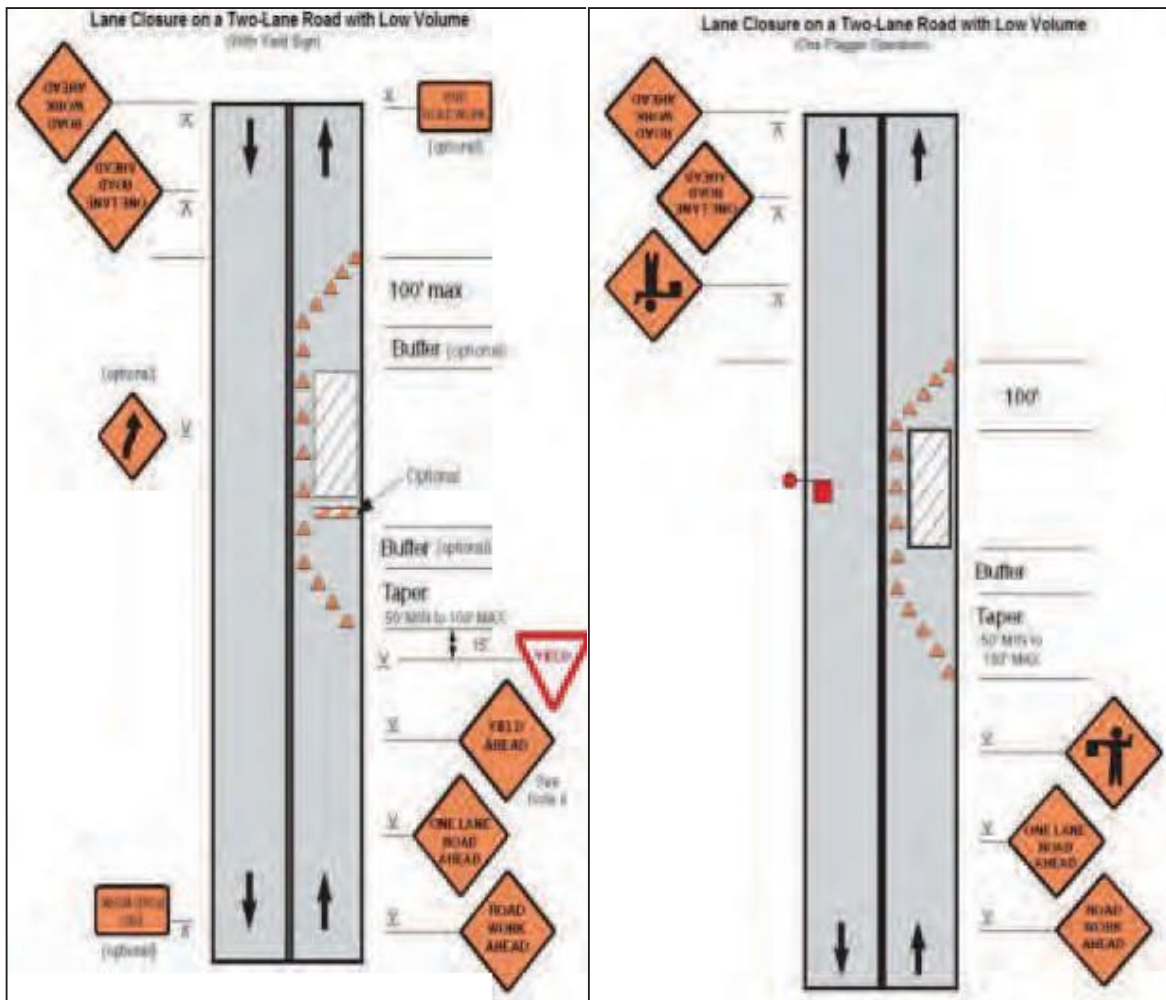


Figure 4.6 & 4.7: Lane closure on a two-line road with low volume (with yield sign) & Lane closure on a two-line road with low volume (one flagger operation)

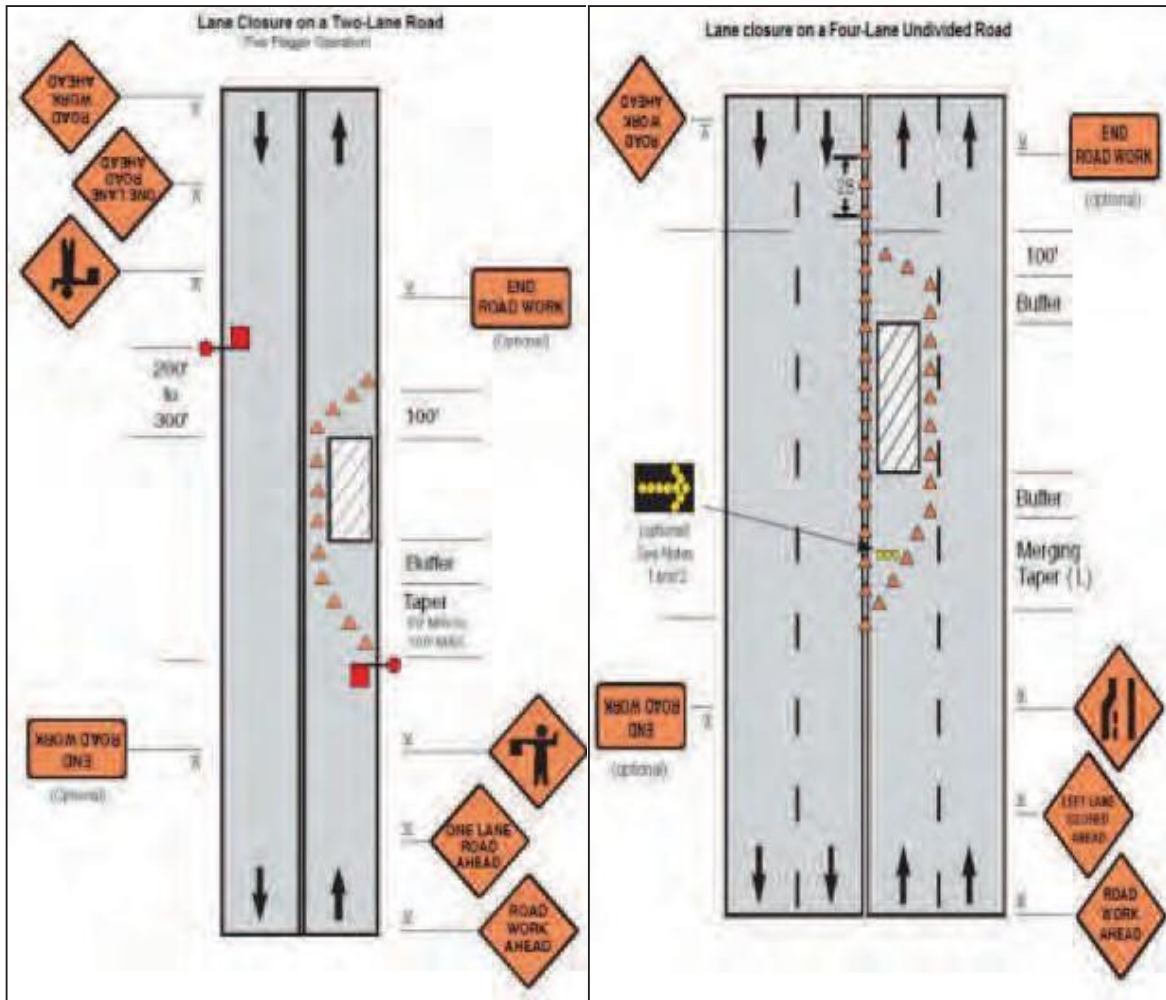
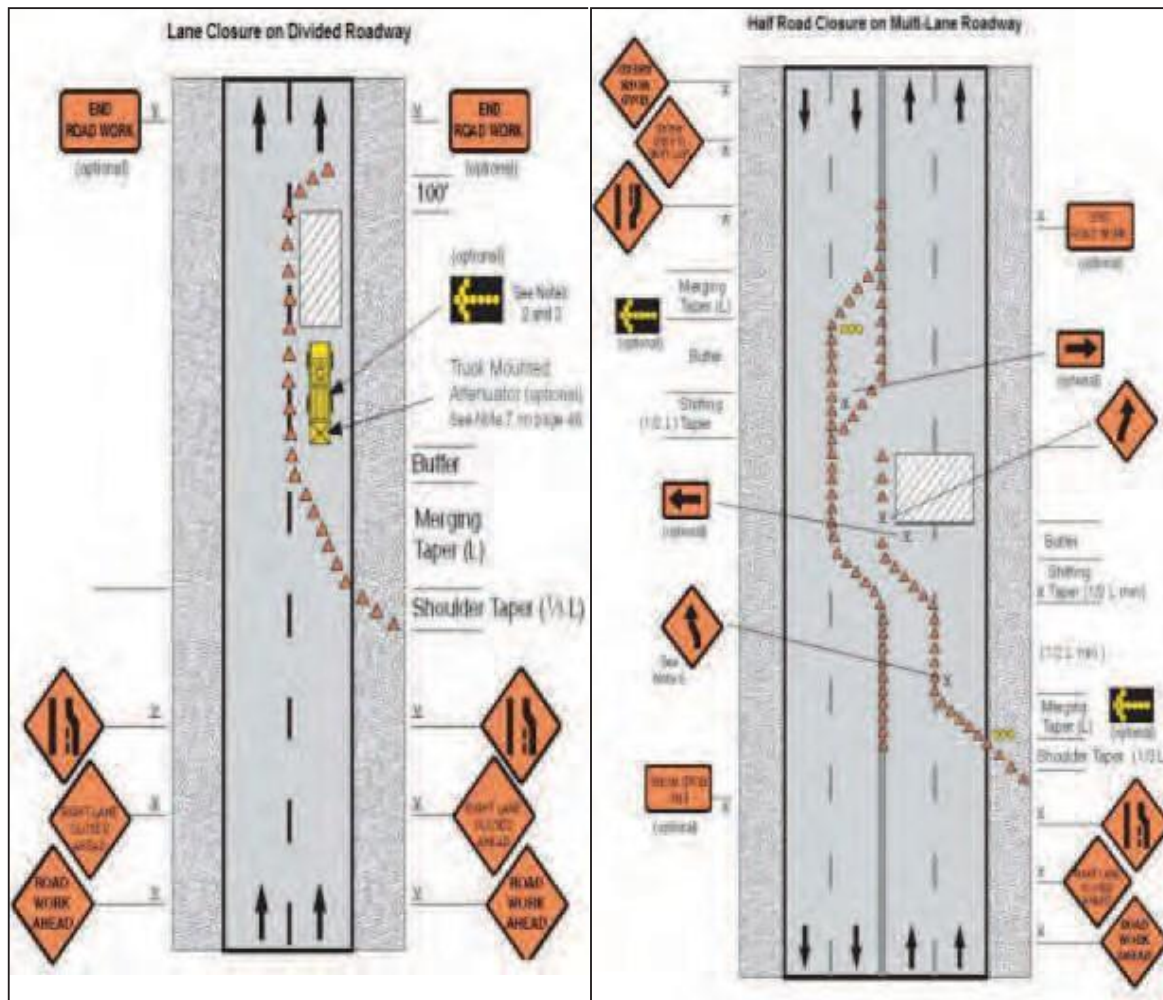


Figure 4.8 & 4.9: Lane Closure on a Two-Lane Road (Two Flagger Operation) & Lane Closure on a Four-Lane Undivided Road



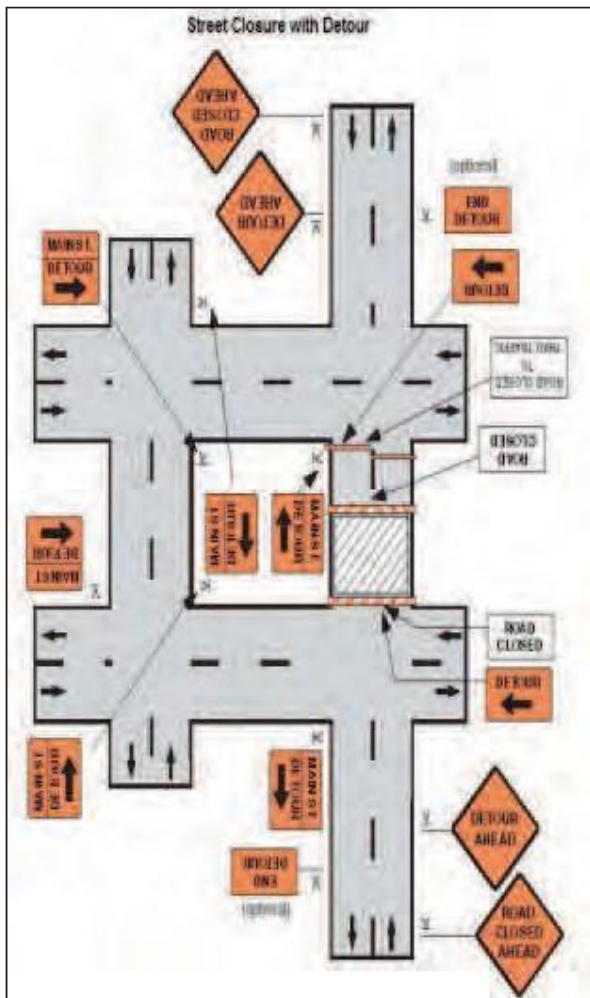


Figure 4.12: Street closure with detour

4.8 SPECIAL ENVIRONMENTAL CLAUSES (SECS) FOR TENDER DOCUMENT

176. Apart from the provisions under “General Specification” and “Particular Specification” for different sub-project components, the following special environmental clauses (SECs) shall be included in the Tender Document under General/Particular Specification. These clauses are aimed at ensuring that the Contractor/SCL carries out his responsibility of implementing the EMP and other environmental and safety measures.

Environmental Management Plan (EMP):

177. The Contractor/SCL shall carry out all mitigation and enhancement measures (including those related to mitigation of air/noise/water pollution; drainage/traffic congestion) as specified in the Environmental Management Plan (EMP), annexed to this Contract.

Temporary Works:

178. The Contractor/SCL shall make sure that all equipment and safeguards required for the construction work such as temporary stair, ladder, ramp, scaffold, hoist, run away, barricade, etc. are substantially constructed and erected, so as not to create any unsafe situation for the workmen using them or the workmen and general public passing under, on or near them.

Health and Safety:

179. SECs related to Health and safety clauses will be the followings:

- The Contractor/SCL shall observe and maintain standards of Health and Safety towards all of his employees not less than those laid down by the national standards or statutory regulations.
- The Contractor/SCL shall provide all appropriate protective clothing and equipment for the work to be done and ensure its proper use. Where required, safety nets, the contractor/SCL shall provide belts, harnesses and lines. The “safety directives for work equipment” and “safety directives for protective gears”, as specified in the Occupational Health and Safety Guidelines (attached) shall be followed.
- The Contractor/SCL shall provide and maintain in prominent and well- marked positions all necessary first-aid equipment, medical supplies and other related facilities. A sufficient number of trained personnel will be required to be available at all times to render first aid.
- The Contractor/SCL must provide or ensure that appropriate safety and/or health signs are in place at their work sites where hazards cannot be avoided or reduced.
- The Contractor/SCL shall report to the Engineer promptly and in writing particulars of any accident or unusual or unforeseen occurrences on the site, whether these are likely to affect progress of the work or not.

Disposal and Pollution:

180. SECs related to disposal and pollution will be the followings:

- The Contractor/SCL shall not dispose any waste, rubbish or offensive matter in any place not approved by the Engineer or Statutory Authority having jurisdiction. The Contractor/SCL shall not discharge into any watercourse oil, solids, noxious or floating materials.
- The Contractor/SCL shall take all reasonable precautions to keep public or private roads clean of any spillage or droppings from his vehicles or equipment. Any spillage or

droppings, which accrue, shall be cleaned without delay to the satisfaction of the Engineer.

- The Contractor/SCL shall provide waste bins/ cans for collection of solid waste at appropriate locations (as directed by the Engineer), and ensure proper transfer/ disposal of solid waste.

4.9 THIRD PARTY MONITORING

181. In order to ensure proper environmental management a third party consulting firm (to be hired separately by SCL) will be given the responsibility to independently monitor the overall performance of environmental management of the proposed project, including compliance with the DoE conditions (Annex II) and the provisions of the Environmental and Social Management System (ESMS) developed for the project.

CHAPTER 5

SOCIAL MANAGEMENT PROCEDURES

5.1 INTRODUCTION

182. The Social Management Framework (SMF) proposed here to deal with specific social safeguard issues that are likely to arise under the proposed fiber optic cable laying project by SCL, from the planning stage to its implementation and operational phase.

5.2 OBJECTIVES OF THE SMF

183. The SMF is intended to provide the necessary bases to determine applicability of the SPS 2009 with the objectives:

- Enhance social development outcomes of the activities to be implemented under individual sub-projects;
- Promote transparency in project implementation through the use of extensive stakeholder consultation and disclosure procedures;
- Avoid, minimize, and mitigate adverse social impacts including loss of livelihood, if any;
- Strengthen social management capacity within SCL.

5.3 SOCIAL MANAGEMENT PRINCIPLES

Inclusion

184. The vulnerable section of the communities including the very poor, women, indigenous people, minority communities, and the marginalized and/or, disabled people, etc. are to get benefit from the sub-projects and the SMF.

Participation

185. The communities are empowered with an opportunity to decide, implement and monitor the development programs. Accordingly, the focus should be to promote participatory processes throughout the project design and implementation cycle.

Transparency

186. Stakeholders can exercise their rights to access information on the proposed project. SCL is to disclose project information in public domain. This creates an enabling environment to develop trust among implementing partners and builds in checks and balances to strengthen the system.

Social Safeguards

187. Based on the type, scale and intensity of project works, it is assumed that there is no substantial adverse impacts in relevant to involuntary resettlement and indigenous people. So, no social management plan is warranted. Nevertheless, to cater any unforeseen social impacts in future SCL will adopt required social management plan.

CHAPTER 6

INSTITUTIONAL ARRANGEMENT OF ESMS

6.1 INSTITUTIONAL ARRANGEMENT FOR IMPLEMENTATION OF ESMS

188. For sub-projects to be implemented by Summit Communications Ltd., a Project Management Unit (PMU) headed by the General Manager of SCL will be formed who will oversee the project activities and will act as the focal person for implementation of EMF. An “Environmental and Social Unit” within the PMU will oversee the environmental and social management issues associated with the project. For effective and timely implementation of environmental safeguard activities, two senior officials (Deputy Manager and Senior Manager of SCL) will work and report to the General Manager who will assist the ESMS focal person (General Manager of SCL). These officials will be responsible for the activities of “Environmental and Social Unit” in undertaking environmental screening and monitoring as per the provisions of ESMS and will report directly to the General Manager SCL.

189. The activities of Institutional Arrangement under Environmental Management Framework with support from relevant local communities (if necessary) will include:

- Preparing a “Sub-project Description” to have access to the basic information about sub-project work package particulates, description of the activities, baseline information and to get a primary idea about the sensitivity of that particular project.
- “Environmental screening” and “Analysis of Alternatives” in different sub- projects where physical interventions are being made, following the guidelines contained in the Environmental and Social Management System (ESMS).
- Assessing the nature of the impacts and planning of site specific Environmental mitigation plan.
- Preparing Environmental Management Plan (EMP),
- If the sub-project is carried out by contractor rather than SCL, then ensuring that the EMP is adequately reflected in the Contractor’s bidding documents and monitoring contractors work.
- Carry out monitoring activities at the sub-project sites to assess the implementation of the EMP preparing reports of monitoring activities from time to time.
- Oversee the enhancement measures (if any) and tracking their progress.

190. The Environment and Social Unit, as required, will carry out further environmental and social assessment of the sub-project. For environmental assessment, SCL will not hire individual consultants. 'The Environment and Social Unit' under PMU of SCL will be responsible for implementation of EMP and preparation of quarterly reports, with support from "Environmental and Social Unit" (see Figure 6.1).

6.2 MONITORING AND REPORTING

191. Timing, frequency and duration of monitoring protocols should be linked to the overall implementation schedule of the project and will be decided by the head (General Manager) of PMU. However the timing, frequency and duration of these protocols should be at such intervals which would allow sufficient information to be conveyed regarding the smooth progress of implementation of the EMP.

192. Reporting on the ESMS implementation will not be done separately. The safeguard performance will be included in subproject and project progress reports. At the project level, the PMU will prepare a safeguard performance report twice per year to be included in the progress report describing the project compliance with the ESMS and other safeguard requirements including the results of new subproject screening and safeguards documentation.

193. The environmental and social focal person of PMU (General Manager of SCL) will periodically share ESMS implementation status to relevant stakeholders. The report will contain the initial screening report of all subproject proposals, identified environmental concerns, appropriate mitigation measures and monitoring plan. It will also present the monitoring and management status of the EMP implementation of the ongoing activities in the selected subprojects as well as progress regarding the implementation of enhancement measures.

194. Implementation of mitigation measures mentioned in the EMP may involve an initial investment cost as well as recurrent costs. The EMP should include costs estimates for each measure, which will be part of the sub-project cost.

195. A sample monitoring report format is provided in Form 5 of Annex XIII. The PMU may decide to adopt a similar format or make alterations to it depending on the nature and mechanism of sub-project and its monitoring protocol.

CHAPTER 7

GRIEVANCE REDRESS AND DISCLOSURE

7.1 GRIEVANCE REDRESS MECHANISM (GRM)

196. Grievance Redress Mechanism (GRM) is a valuable tool, which will allow affected people to voice concerns regarding environmental and social impacts of the proposed project. SCL should be the first-line recipient of any grievance.

7.1.1 Grievance Receive and Registry

197. **Grievance Receive Modes:** The sub-project-affected persons can register their grievances by the modes of receive set by SCL. All grievances are accumulated directly to the SCL head office. The Receive modes are:

- **24-7 Hotline:** Grievances are received mainly by a 24-7 hotline (Number: +8801938432480, +8801938432481). SCL representatives with qualification of B.Sc. in engineering are available at the hotline to receive any grievance at the first time.
- **Fax:** The sub-project-affected persons can also register their grievances via a fax (Fax Number: 02-8189577).
- **Email:** Any kind of complain can also be received by SCL via Email (Email address: support@summitcommunications.net).

198. After receiving complaints, grievances will be categorized according to the severity level of the Grievance and registered to the databank of SCL.

199. SCL would duly address their grievances within one month of the receipt of the complaint. A Grievance Redress Committee (GRC) will be considered in outstanding cases that cannot be resolved directly and require mediation by a third party.

7.1.2 Grievance Redress Modes:

Solution at the Project Level:

200. The first stage of grievance redress involves solution of the problem directly at the field level. A representative of SCL (having the rank of Deputy Manager) will be designated to oversee

the project level grievance redress issues. Most of the grievances are to be solved at the project level. After addressing the complainant's grievance, a written confirmation will be taken and finally the database will be compiled to the databank.

Grievance Redress Committee (GRC)

201. A GRC will be formed for each sub-project, headed by a local Govt. representative of relevant area (an official of the city corporation). Members will be taken to represent the communities and other stakeholders, which may include representatives from local administration, principle of the nearest college, local NGO and women. The local Govt. representative will nominate members of the GRC. The local Govt. representative will form the GRC and forward the composition to the PMU of the sub-project. Table 7.1 shows a possible composition of the GRC. The size of the GRC may be changed depending on the extent of the sub-project to make its operation feasible and acceptable to the project affected persons (PAPs). The GRC will ensure proper presentation of complaints and grievances, as well as impartial hearings and transparent decisions. If required, the GRCs will meet periodically to discuss the merit of outstanding cases and fix a date for hearing and notify the PAP to submit necessary documents in proof of her/his claim/case; resolve grievances within one month of receipt of complaint.

202. SCL will try to address the grievances on their own as a first-line recipient, however, if a GRC formation becomes necessary in certain cases, the committee has to be funded by SCL.

203. GRC will not certainly prohibit the complainant's right to go to the court.

Table 7.1: Structure of Grievance Redress Committee (GRC)

Chairman	Local Govt. Representative
Member-Secretary	Project Team Leader of the subproject (General Manager of SCL)
Member*	Representative from local administration Teacher from a local educational institution Representative of a local NGO Representative of civil society Female ward councilor (relevant area) Representative of religious society (e.g., Imam) Representative of tribal society, if any Representative of SCL.

*Total number of members will be selected based on the extent of sub-project to make the operation of the GRC feasible and acceptable to the PAPs.

7.1.3 Grievance Redress Mechanism Flowchart

204. Figure 7.1 shows the grievance redress mechanism:

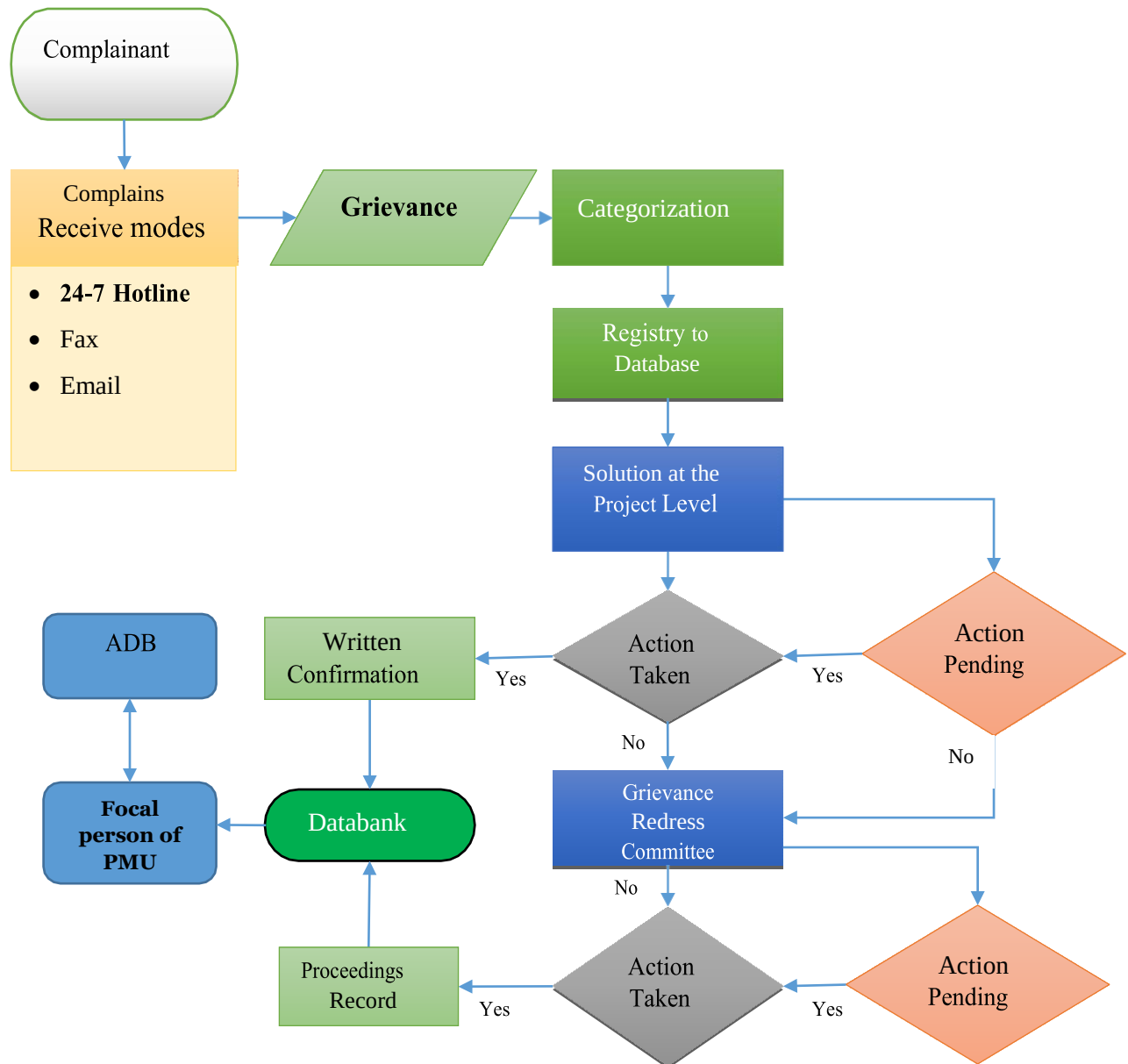


Figure 7.1: Grievance redress mechanism

7.2 APPROVAL AND DISCLOSURE

205. SCL is to upload the ESMS in their official websites along with a Bangla translation of the executive summary. In addition, hard copies of these documents in English (including an executive summary in Bengali and English) will be made available in publicly accessible locations in the project area of influence as well as at SCL office. Any public notices (or any other means of communication) posted ahead of the construction work at a certain location should also contain the information as to where the ESIA documents would be available.

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TERMS OF REFERENCE FOR ENVIRONMENTAL AND SOCIAL ASSESSMENT

INTRODUCTION

With a view to expanding the fiber optic network to develop the ICT infrastructure of the country and in the process, facilitating the cheap and faster internet and ICT enabled services for the mass people, the company, Summit Communications Limited has approached Infrastructure Development Company (IDCOL) for USD 12.5 Million Term Loan facility under the Third Public-Private Infrastructure Development Facility extended by Asian Development Bank (ADB).

SCL has an ambitious plan of being the largest fiber optic infrastructure operator in the country extending its presence to 100% of 489 Upazillas (Sub-districts) by 2017: Extensive coverage is one of the success factors in the Telco industry. Having adopted this strategy, SCL has its expansion plan to cover 489 Upazillas with broadband internet and data facilities through fiber optic network. SCL's strategy is to build a future proof underground network in densely populated cities of Bangladesh and major aggregation points and extend overhead network in the long haul and access points.

Summit Communications intends to hire a consultant to carry out an Environmental and Social Assessment (ESA) of the proposed project at the preparation stage to ensure that the proposed infrastructure takes environmental concerns into account. The objective of the environmental and social management of the proposed project is to ensure that neither the fiber optic network development nor the social and environmental aspects of the project area is compromised through the project activities.

PROJECT INFORMATION

Project Description

Summit Communications Limited (SCL) was established in 22 March, 2009. Summit Holdings Limited holds 95% share of Summit Communications Limited. It received NTTN (Nationwide Telecommunication Transmission Network) license on 09 December 2009, ITC (International Terrestrial Cable) 05 January, 2012, IIG (International Internet Gateway) license on 12 April, 2012, and ICX (Interconnection Exchange) License on 03 May, 2012 etc. from BTRC. It started NTTN commercial operation on 01 January 2010. It successfully launched ICX service on 26 December 2012, IIG service on 01 February 2013 and ITC service on 01 November, 2013. The company was incorporated with RJSC, Dhaka with authorized capital of Tk. 1,000.00 million and Paid Up capital of Tk. 501.60 million. The company is promoted by Mr. Muhammed Aziz Khan and his family members (several family members are on the Board of Directors of the group). Other business concerns of Summit Group are Summit Power Limited (SPL), Khulna Power Company Limited (KPCL), Summit Alliance Port Limited (SAPL), Summit Purbanchol Power Company Limited (SPPCL), listed in both Dhaka and Chittagong Stock Exchanges.

SCL has already established its network access to over 26,618 Kilometers fiber optic network nationwide through which it is serving all Telcos, ISPs, Gateway operators. Out of this coverage SCL owned 19,857 km, leased from PGCB 1,800 km and leased from other operators 4,961 km. It has successfully connected around 2500 nos Base Stations (BTS) for leading mobile and Wi-Max operators. It has already established network coverage over 64 no of districts and 319 Upazilla's. SCL has obligation to cover 40% Upazilla's Headquarters within its 5th years of operation and currently it is running 6th year's operation and has connected 59% Upazillas from 489 Upazillas. It has obligation to cover up to 100% Upazillas within its 10th year of operation. Summit communication limited started its commercial operation in 2010 and successfully achieved break even in 2012. Within its 3rd year (2013) of commercial operation, it accomplished positive net profit amounting to BDT million. In the CY 2014, Revenue of SCL was BDT 1,260.07 million (USD 15.75 Million), Net Profit was BDT 372.28 million (USD 4.65 million). Moreover it achieved 4 years CAGR of 152%. Nevertheless it is expected to earn net profit of BDT 475.7 million in the CY 2015. However SCL is planning to get listed in DSE by 2016.

Investment in NTTN

SCL has access to around 26,618 km of fiber optic network all over the country covering 61 districts and 319 Upazillas. This includes 19,857 km owned, 1,800 km from Power Grid Company Bangladesh Ltd and 4,961 km from other operators.

Investment to expand nationwide coverage

- i) SCL is planning to deploy around 13,980 Km of overhead fiber and 4110 Km underground fiber all around the country within the year 2016-2018 which requires an approx. investment of \$108.9 million over next three years. This investment is required to cater to continuous demand from the market for long haul transmission capacity at different places of the country by Telcos and ISPs.
- ii) In the metro cities, the 3G Base Stations connectivity requirements are forthcoming for which SCL will need to expand the backbone underground network to have quality service level and wider reach.
- iii) This metro city network will also another step closer to the corporate and household market for consumer driver services like triple play (broadband, voice and TV bundle package). The fiber optic network SCL is building has huge capacity which can be only tapped into by providing consumer driver services like triple play. However, in this plan total investments and revenue for triple play is not considered.

Investment in Government Digitization Project

Current Government is implementing its plan of digitizing total Government set ups all over the country within 2021. SCL has completed and handed over 3650 connectivity within 14 Districts and 96 upazilas for „Info-Sarker“ Project Phase-II.

- iv) According to „Info-Sarker“ Project Phase-II, there is scope of 55 government offices connectivity at each District and 30 government offices connectivity at each Upazila; all together total 18000 government offices connectivity at 64 Districts and 489 Upazilas. Such connectivity will be provided by three NTTN operators. According to „Info-Sarker Project“ Phase-III, government is targeting to cover 4550 Union Parishads (smallest rural administrative and local government units in Bangladesh) where Government is initially starting facilitating the nation with 1200 Union Information Service Centre (UISC).
- v) Another Government project of connecting 96,000 Educational Institution will start in 2015 and according to business plan SCL will provide 31,500 Connectivity over next five years under this project.

Investment in Mobile Backhauling

- vi) With the launch of 3G services in 2013 increase in data usage is forthcoming, while the backplane capacity is being built by all the operators. All the telecom operators are required to upgrade their access capacity at the base stations through fiber optic. As an NTTN licensee, SCL has this opportunity to provide the backhauling service to the mobile operators. Currently SCL are working with the country's leading operators Grameenphone, Robi and Teletalk. Till date SCL has connected over 2356 base stations. SCL is expecting work orders of over 3,550 no. of base stations in between of 2016-2018 which will require an investment amounting to \$25.6million.

Investment in capacity enhancement: Gateways (ITC, IIG and ICX)

- vii) The International Terrestrial Cable provides a flexible global connectivity to the information traffic of Bangladesh as previously Bangladesh was solely dependent on the single international connectivity through SEA-ME-WE-4. Currently SCL has Terrestrial Cable Landing Station at Benapole and we have connected up with TATA Communications and Bharti Airtel Limited. SCL plans to invest for backhaul till Noman's land in Akaura, Darshana, Tamabil and Teknaf to connect seven sisters of India and Myanmar. The main investment is already made here; there will be requirement of nominal investments in ITC, IIG and ICX network which will create a cost of \$1.2 million.

Project Implementation and Institutional Arrangements

- viii) Summit Communications has arranged a syndication arrangement in managing the fund with lead arranger IIDFC Ltd. At the implementation level of the project, company has to undergo two basic types of jobs: passive network development i.e. layout of optical fiber cable and active network development i.e. equipment installation for lighting up and connectivity. Summit Communications Ltd. has its own operation and maintenance team to implement the project in the ground. In some occasions, the company uses sub-contractors and local partners in developing its network.

Project Duration

- ix) Both passive and active network expansion work will require not less than 24 months for Summit Communications Ltd. The company has scheduled the project to be commenced on 1st January 2016 and got an end on 31st December 2018 for all sort of tasks under major job head including Resource Mobilization , Equipment pricing negotiation, Civil work (duct laying), Civil work (fiber blowing), Active Equipment import, Active Equipment installation and Connectivity Progression.

EA AND SA REQUIREMENTS

The EAs and SAs that will be prepared to comply with the policies and legislative requirement of ADB and the GoB.

The Government's Environment Conservation Act (amended 2010) is currently the main legislation relating to environment protection in Bangladesh. This Act is promulgated for environment conservation, environmental standards development and environment pollution control and abatement. Environment Conservation Rules (ECR), 1997 and Amendments provide categorization of industries and projects and identify types of environmental assessment required against respective categories of industries or projects. In addition, the government has several other legislative instruments for urban area development. The Consultant will also need to identify any other laws, regulations and guidelines both at national and regional levels related to environmental assessment.

In addition, ADB will require environmental and social assessment (ESA) of projects selected for Bank financing to ensure that they are environmentally sound and sustainable, and thus decision making. ESA will take into account the natural environment (air, water, and land), human health and safety, physical cultural resources, trans-boundary and global environmental aspects. In addition the ESA will take into account social aspects (involuntary resettlement, tribal peoples, and physical cultural resources). The borrower is responsible for carrying out the ESA. The project is expected to be classified as Category 'B' project in accordance Bank's policy since fiber optic network may not have significant and irreversible environmental and social impacts if design and implementation are planned and managed properly.

The actual layout of the fiber optic cable (overhead and underground) is not completely known and the details of the route may only be available just prior to the implementation of the different subcomponents. Therefore a framework approach will be adopted and an Environmental and Social Management System (ESMS) will be prepared. The different subcomponents will go through initial environmental and social screening, a component-specific assessment and mitigation measures will be prepared under the provisions of the ESMS. The ESMS will outline the procedures of screening and assessment.

OBJECTIVES

The main objective of the assignment is to formulate an Environmental and Social Management Framework (ESMS) of different sub-components of the proposed project. In addition the consultant will prepare overall Mitigation with Monitoring Plan for the project components.

SCOPES

The scopes of consultant services include the following, but not necessarily limited to:

Review of Relevant Policies and Legislation

- i) Review current relevant policies, legislations, EIA procedures/practices and land acquisition procedure for transmission line of the Government of Bangladesh (GoB) related to the sustainable urban sector development and explain its implication to the proposed project;
- ii) Review the relevant ADB safeguard policies and explain its implication to the proposed project;

Overall Project Baseline and Environmental and Social Impacts

- i) Under the framework of the ESMS, the baseline information of the areas will be established where fiber optic cable layout operations will be carried out. The ESMS will outline the procedures of collecting baseline social and environmental information during the detail survey of the project subcomponents and how the baseline information would be presented. The information will be mainly on human settlement, land use, livelihoods, and crops, physical, biological and socio-cultural environment obtained through primary surveys as well as secondary information at representative and sensitive locations. A sample baseline survey report will be presented in the Annex based on field visit at a selected location.
- ii) In accordance baseline data, the consultant will identify the stages or elements of the various activities of the subprojects those are sensitive on the environmental and social parameters, assess overall environment impacts of the project – level of significance, extent, irreversible vs. reversible etc., assess the social impacts of the project, on, among others – land use (land acquisition, if required), business income/livelihoods, displacement (physical, economic) of people, gender impacts, impacts on vulnerable groups, loss of community infrastructure etc., assess whether the project will create additional liability i.e., the current environmental and social condition will be improved or worsened as a result of the proposed investments. A sample environmental and social impact assessment checklist will be provided in the Annex based on the baseline survey report at a selected location.

Stakeholder Analysis, Consultation and Participation

The objective of the stakeholder analysis and consultation is to:

- i) Identify key stakeholders of the proposed project and assess the influence and interests of stakeholders involved in development of the project;
- ii) Inform, consult, and be engaged in dialogue with stakeholders regarding proposed project design, likely impacts of the interventions (both positive and negative), environmental and social enhancement measures, possible measures for environmental mitigation/compensation, implementation and monitoring of mitigation/compensation measures;
- iii) Document the consultation process (photographs, signature of participants) and record the discussions including options and suggestions provided by the participants for consideration in the project design, implementation and monitoring.

The ESMS will outline procedures for engaging key stakeholders for the purpose of Environmental and Social Assessment. Some sample stakeholder engagement exercises (FGDs, interviews) will be presented in the ESMS report annex. Several Key Informant Interviews (KIIs) will be conducted to assess the general perception among key stakeholders of the project.

Environmental and Social Management Plan

- i) Identify feasible and cost effective mitigation/compensation measures for each impact predicted to reduce potentially significant adverse environmental and social impacts to acceptable levels;
- ii) Estimate the costing of ESMS

Institutional Capacity and Responsibility

- i) Evaluate the institutional and staff capacity of Summit Communications and carryout training needs assessment for environmental and social management;
- ii) Provide guidelines for required staffing, resources and training for Summit Communications environmental and social staff;
- iii) Describe the steps to be followed to ensure environmental and social considerations are properly addressed in final civil engineering design and estimation;

STRUCTURE OF REPORTS

The Consultant is required to prepare the reports that are concise and limited to significant policy, institutional and environmental and social issues. The main text should focus on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used in interpreting those data.

The consultant will organize the report according to the outline below:

- Executive Summary
- Introduction, approach and Methodology
- Overall Description of the Project
- Policy, Legal and Administrative Framework ((a)description of available policies, legislation and practice; and (b) list of the required clearance, permission and disclosure requirements)
- Project Baseline: Procedures for collecting project baseline information focusing on (a) Physical Resources (Topography, climate, soils, geology, land use etc.); (b) Ecological Resources (Natural ecosystem, flora and fauna, wildlife and wetland); (c) Environmental Quality; (d) Cultural Resources sites (historical, religious, or architectural); and (e) Environmentally sensitive areas. (e) socio-economic environment
- Overall environmental and social impacts of the project: guidelines for assessing social and environmental impacts of the project.
- Stakeholder analysis, consultation and participation during environment assessment
- Mitigation measures and Environmental and Social Management Plan
- Conclusion and Recommendations

The Social Management Framework will propose a Resettlement Policy Framework (if land acquisition issues are involved) and Tribal Peoples Planning Framework (if the project activities affect the tribal people and their livelihoods)

Resettlement Policy: The purpose of the Resettlement Policy Framework (RPF) is to provide a framework for project implementation agencies to follow in order to identify impacts and eligible affected people, and ensure mitigation measures for those impacts, once the subproject sites have been identified. The RPF will describe the project, legal framework, applicable laws and policies, the process of consultation, types of impacts and eligibility criteria.

Tribal Peoples Planning: There are approximately 2-3 million tribal people residing in Bangladesh belonging to more than 45 communities and tribes. While the largest concentration of TPs can be found in the Chittagong Hill Tracts Area, there are also relatively large concentrations found in Chittagong, Mymensingh, Rajshahi, Sylhet, Patuakhilai and Barguna. Many live in remote hills and forest areas and most are among the most disadvantaged and vulnerable people in the country. The Tribal Peoples Planning Framework (TPPF) in the SMP will lay out the process to comply with SPS, 2009, ADB, with a particular focus on consultative processes that are culturally acceptable and sensitive to the needs, customs and norms of TPs.

DURATION OF ASSIGNMENT

The assignment shall be of 3 (three) months from the date of contract signing. However, the Consultant is required to submit an acceptable draft report for disclosure within 2 (two) months of the contract signing.

CONSULTANT INPUT

The assignment requires interdisciplinary analysis and the team must include professional with EIA and SIA specialist, environmental management specialist, ecologist, communication specialist and field investigators. The Consultant is free to employ resources i.e. support staff as they see fit to carry out the assignment within stipulated time and meet the requirement of this service.

The consultants shall provide for all tools, models, software, hardware and supplies, as required to complete the assignment satisfactorily. These should be widely recognised or accepted. All supporting information gathered by the consultant in undertaking these terms of reference would be made available to the client.

REPORT SUBMISSION

The consultant is expected to provide the following reports, as per the schedule given. The Consultants are expected to allocate resources, such as for surveys, keeping this output schedule in mind.

Item	Due date
Interim study progress presentation	06 weeks after contract signing
Draft Report	10 weeks after contract signing
Final Report	13 weeks after contract signing
Final Report with executive summary translated in Bengali	14 weeks after contract signing

INPUTS TO BE PROVIDED BY SUMMIT COMMUNICATIONS

Summit Communications will make experienced officials available and will ensure that the Consultant has access to all information required and documentation pertaining to the project. Summit Communications will provide liaison and communication with other Government Authorities if and when required and facilitate different meetings, focus group discussion and workshops based on initial planning.

ANNEX II DEPARTMENT OF ENVIRONMENT CLEARANCE

প্রকৃতির সুরক্ষার নিমিত্তে সম্প্রদায়কে সুরক্ষিত
লগ ইন করুন : www.doe-bd.org
ফোন করুন : ০০৪৪ ৭২৮০০১২৩০ (৭৭২৪)

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
পরিবেশ অধিদপ্তর
www.doe-bd.org
পরিবেশ ভবন, ই/১৬ আগারগাঁও
শেরে বাংলা নগর, ঢাকা-১২০৭।

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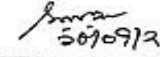
২৮/০৩/১৪১৮ সন
তারিখ :
০৮/০৭/২০১১ খৃঃ

বিষয় : সামিট কম্যুনিকেশনস লিমিটেড কর্তৃক ঢাকা সহ পর্যায়ক্রমে সাদ্যবেশের সকল উপজেলা সদরে জু-গর্ভস্থ টেলিকম্যুনিকেশন নেটওয়ার্ক স্থাপনের জন্য অনাপত্তি প্রদান প্রদশে।

সূত্র : সামিট কম্যুনিকেশনস লিমিটেড-এর ১৬/০৬/২০১১ তারিখের আবেদন।

সূত্রোদ্ধিত বিষয়ের পরিপ্রেক্ষিতে জানানো যাচ্ছে যে, বাংলাদেশ টেলিকম্যুনিকেশন রেগুলেটরী কমিশন (BTRC)-র ন্যাশনওয়াইড টেলিকম্যুনিকেশন ট্রান্সমিশন নেটওয়ার্ক (NTN) লাইসেন্সপ্রাপ্ত সামিট কম্যুনিকেশনস লিমিটেড, সামিট সেন্টার, ১৮, কাওরান বাজার বা/এ, ঢাকা-১২১৫ নামক প্রতিষ্ঠান কর্তৃক সংকলিত সাদ্যবেশের সকল উপজেলা সদরে জু-গর্ভস্থ টেলিকম্যুনিকেশন নেটওয়ার্ক স্থাপনের লক্ষ্যে দাখিলকৃত কাগজপত্র পরিবেশগত ছাড়পত্র বিষয়ে কমিটির ৩০৮তম সভায় পর্যালোচনা করা হয়। উক্ত সভায় গৃহীত সিদ্ধান্তের আলোকে সামিট কম্যুনিকেশনস লিমিটেড এর অনুকূলে নিম্নবর্ণিত বিষয়াদি প্রতিপালনের শর্তে অত্র দপ্তর হতে নির্দেশক্রমে অনাপত্তি প্রদান করা হলো :

- জু-গর্ভস্থ টেলিকম্যুনিকেশন নেটওয়ার্ক স্থাপনকালে খননকার্যক্রমের মাধ্যমে যাতে পারিপার্শ্বিক পরিবেশ ও জীব বৈচিত্র্যের উপর কোন বিরূপ প্রভাব না ফেলে সে বিষয়ে যথাযথ সতর্কতা অবলম্বন করা হবে।
- জু-গর্ভস্থ টেলিকম্যুনিকেশন নেটওয়ার্ক স্থাপনের কার্যক্রম শুরু পূর্বে সড়ক, পানি, গ্যাস, বিদ্যুৎ, ড্রেনেজ, সিওয়েজ, টেলিকোম, অপটিক্যাল ফাইবার ও অন্যান্য সকল জু-গর্ভস্থ নেটওয়ার্কের মাধ্যমে সেবা প্রদানকারী সংস্থার অনুমতি গ্রহণ করতে হবে এবং তাদের সাথে সার্বক্ষণিক যোগাযোগ ও সমন্বয় রক্ষা করে চলতে হবে।
- জু-গর্ভস্থ টেলিকম্যুনিকেশন নেটওয়ার্ক স্থাপনের মাধ্যমে সকল ধরনের স্থানান্তর টেলিকম্যুনিকেশন, ডিশপাইন ও অন্যান্য কেবল রাস্তা থেকে অপসারণ করতে হবে।
- জু-গর্ভস্থ টেলিকম্যুনিকেশন নেটওয়ার্ক স্থাপনের সময় রাস্তা খননের কারণে সৃষ্ট নৃহত নিয়ন্ত্রণের জন্য প্রয়োজনীয় ব্যবস্থা গ্রহণ করতে হবে।
- জু-গর্ভস্থ টেলিকম্যুনিকেশন নেটওয়ার্ক স্থাপনের সময় সাধারণ জনগণের চলাচলের যাতে কোন অসুবিধা না হয় সেদিকে লক্ষ্য রাখতে হবে।
- ঢাকা শহরে ওয়ার্ডভিত্তিক ও উপজেলা পর্যায়ে জু-গর্ভস্থ টেলিকম্যুনিকেশন নেটওয়ার্ক স্থাপনের কার্যক্রম শুরুর পূর্বে এ সংক্রান্ত কর্মপরিকল্পনা পরিবেশ অধিদপ্তরে দাখিল করতে হবে।


০৮/০৭/২০১১
(পেয়দা নজমুল হোসেন)
উপ-পরিচালক (পরিবেশগত ছাড়পত্র)
ফোন # ৮১২১৭৯৩০

✓ জনাব মোঃ আরিফ আল ইসলাম
ব্যবস্থাপনা পরিচালক ও সিইও
সামিট কম্যুনিকেশনস লিমিটেড
সামিট সেন্টার
১৮, কাওরান বাজার বা/এ, ঢাকা-১২১৫।

অনুলিপিঃ

- ১) পরিচালক, পরিবেশ অধিদপ্তর, ঢাকা/চট্টগ্রাম/রাজশাহী/খুলনা বিভাগীয় কার্যালয়, ঢাকা/চট্টগ্রাম/বরগুড়া/খুলনা।
- ২) উপ-পরিচালক, পরিবেশ অধিদপ্তর, সিলেট/বরিশাল বিভাগীয় কার্যালয়, সিলেট/বরিশাল।
- ৩) সহকারী পরিচালক, মহাপরিচালক মহোদয়ের শাখা, পরিবেশ অধিদপ্তর, সদর দপ্তর, ঢাকা।

Government of the People's Republic of Bangladesh
Department of Environment
www.doe-bd.org
Paribesh Bhaban, E/16 Agargaon
Sher E Bangla Nagar, Dhaka-1207.

Date: 26/03/1418 BY
11/07/2011

Ref No: Environment/Certificate/5097/2011/764

Subject: NOC for deployment of Underground Telecommunication Infrastructure by Summit Communications Limited at Dhaka and consecutively all the Upazila headquarters nationwide.

Reference: Application submitted by Summit Communications Limited on 16/06/2011.

Referring to the above mentioned subject We are informing that, the necessary documents to establish Underground Telecommunication Optical Fiber Infrastructure at Dhaka and all the Upazila headquarters nationwide submitted by Summit Communications Limited, Summit Centre, 18 Kawran Bazar C/A, Dhaka, the NTTN operator having license from Bangladesh Telecommunication Regulatory Commission, have been reviewed in the 308th general meeting of Environmental NOC providing committee. As per the decision taken in the meeting, Summit Communications Limited has been provided NOC from this department based on the following terms and conditions:

- A. During digging for underground telecommunication infrastructure installation, necessary precautions should be taken to avoid any negative impact in the surrounding environment and bio-diversity.
- B. Before deployment of the underground telecommunication infrastructure installation it is necessary to receive approval from the authority of road, water, gas, electricity, drainage, sewerage, telephone, optical fiber and other organizations who are giving services through underground network and continuous communication and coordination to be maintained with them.
- C. It is required to remove all the overhead cable for telecommunication dish line and other cables from the road through deployment of underground telecommunication network infrastructure installation.
- D. It is required to take necessary precautions for eliminating the hazards created by digging the roads while installing the underground telecommunication network infrastructure.
- E. It is required to take necessary steps for the movement of general people while installing the underground telecommunication network infrastructure.
- F. It is necessary to submit the detailed work plan at the Department of Environment as per respective ward of Dhaka City and Upazilla before the deployment of underground telecommunication network.

Mr. Md. Arif Al Islam
Managing Director & CEO
Summit Communications Limited
Summit Centre
18, Kawran Bazar C/A, Dhaka-1215

-----Sd/-
Syed Nazmul Ahsan
Deputy Director (Environmental Certificate)
Telephone # 8121793

Copy To:

1. Director, Department of Environment, Dhaka/Chittagong/Rajshahi/Khulna Divisional Office, Dhaka/Chittagong/Bagura/Khulna.
2. Deputy Director, Department of Environment, Sylhet/Barisal Divisional Office, Sylhet/Barisal.
3. Assistant Director, Office of Director General, Head Office, Dhaka.

ANNEX III

FORM 1: SUB-PROJECT DESCRIPTION: OPTICAL FIBER LINE (to be completed by Summit Communication Ltd.)

General Description of the Sub-project

Subproject Name and Location:

.....

Name of Ward: Name of the Upazilla/Area:

.....

Sub-project Objectives:

.....

.....

.....

Sub-project Components:

.....

.....

.....

(1) Work Package Particulates :

(a) Type of Line :

☐ Underground

☐ Overhead

☐ Both

(b) Total Length (km) :

_____ Underground

_____ Overhead

(c) Start/ End Point :

:

(d) Number of Control Stations to be Constructed :

(e) Number of Handholes to be Constructed :

(f) Mode of Operation for Underground :

☐ Cutand Fill ☐ HDD ☐ Both

(g) Mode of Operation for Overhead :

☐ Existing BREB Poles Numbers_____

☐ New Poles to be Constructed Numbers_____

(2) Local SCL office/ PGCB Substation :

(3) Layout of proposed Fiber optic Line :

(attach layout map)

(4) Does the work package involve :

(a) Railway crossing ☐ Yes ☐ No

(b) Road crossing ☐ Yes ☐ No

(c) Stream/River crossing ☐ Yes ☐ No

(d) Bridge Crossing ☐ Yes ☐ No

(5) Land ownership and permissions :

(a) Will land acquisition be used? ☐ Yes ☐ No

(b) Names of the govt. agencies owning the land :

(c) Area of land to be used (acre) :

(attach a copy of the agency's permission to use their land)

(6) Baseline Environment¹ :

- Characteristics of route of optical fiber line :
..... % paddy/crop field; % along road/highway; % village/human settlement;
..... % industrial area; % forest; % wetland/river; % other (specify)
- Brief Information on human settlement, industrial/commercial establishments, tribal people, waterbody, flora, fauna, historical or culturally important sites, ecologically sensitive areas, traffic

(7) Key activities of sub-project :

(8) Estimated cost of sub-project : (Mil BDT)

(9) Schedule of implementation :

- | | | |
|-----|-------------------------------|---|
| (a) | Sub-project duration (months) | : |
| (b) | Tentative start date | : |
| (c) | Tentative completion date | : |

Prepared by: (Name, designation, mobile number, signature, date)-----

Reviewed by: (Name, designation, mobile number, signature, date) -----

¹Follow Table 4.2 in determining the influence area.

FORM 2: ANALYSIS OF ALTERNATIVES: OPTICAL FIBER LINE*(to be completed by
SCL)***Subproject Name and Location:**

.....

Name of Ward: **Name of the Upazilla/Area:**

.....

Work Package Particulates :

- (a) **Type of Line** : ☐ Underground ☐ Overhead
☐ Both
- (b) **Total Length (km)** : _____ Underground
 _____ Overhead
- (c) **Start/ End Point** :
- (d) **Number of Control Stations to be constructed** :
- (e) **Number of Handholes to be Constructed** :
- (f) **Mode of Operation for Underground** :
☐ Cut and Fill ☐ HDD ☐ Both
- (g) **Mode of Operation for Overhead** :
☐ Existing BREB Poles Numbers _____
☐ New Poles to be Constructed Numbers _____

1) Analysis of alternative routes:

Note: The SCL authority will identify alternative routes of the optical fiber line. Then the advantages and disadvantages of these alternatives will be listed in the following table. Important considerations include avoiding sensitive/physical cultural resources, private land, disruption of vendor activities as much as possible. Based on the assessment the relative advantages and disadvantages, a location for the sub-project will be proposed.

Alternative Routes	Advantages/ Considerations	Disadvantages/ Considerations

Proposed Route:

2) Analysis of alternative technologies/designs:

Note: For underground laying of optical fiber lines, use of horizontal directional drilling (HDD) method may be adopted instead of traditional trenching operation for creating fewer disturbances in the surrounding environment. Sometimes during bridge crossing HDD might be more advantageous to clamping or vice versa depending on distance and geological formations.

Technology/ Design Alternatives	Advantages	Disadvantages

Selected Technology/Design:

3) No Sub-project Scenario: Briefly mention the difficulties the SCL will face if the sub-project is not implemented

4) Conclusion: On selected method/design/technology and route/location of subproject.

ANNEX V

FORM 3: ENVIRONMENTAL /SOCIAL SCREENING: OPTICAL FIBER LINE
(to be completed by SCL following Guideline in Section 4.4.5 and 5.4.1 of ESMS)

Subproject Name and Location:

.....

Name of Ward:

Name of the Upazilla/Area:

.....

Work Package Particulates :

- (a) Type of Line : ☐ Underground ☐ Overhead
☐ Both
- (b) Total Length (km) : _____ Underground
_____ Overhead
- (c) Start/ End Point :

(d) Number of Control Stations to be constructed :

(e) Number of Handholes to be Constructed :

(f) Mode of Operation for Underground :

☐ Cut and Fill ☐ HDD ☐ Both

(g) Mode of Operation for Overhead :

☐ Existing BREB Poles Numbers _____

☐ New Poles to be Constructed Numbers _____

(1) Potential Environmental Impact During Construction Phase Checklist

Sl	Screening Questions	Yes	No	Not Aware	Remarks/ Possible Negative Impact and assessment (low/moderate/high)*
(a) Ecological impacts:					
1	Is the construction being carried out in an ecologically sensitive area?				
2	Will the topsoil and vegetation be cleared as a result of the construction?				<i>Please mention how many trees will be cut</i>
3	Is there a possibility of fragmentation of natural floral or faunal habitats?				
(b) Physico-chemical impacts:					
4	Will dust and vibration-generating equipment be used?				<i>(mention what kind of equipment be used)</i>
5	Will the excavation/ trenching works and movement of vehicles generate air pollution?				<i>(specify the method of air pollution)</i>
6	Will noise pollution be occurred during the operation?				
7	Will fuel and/or hazardous goods be used in construction activities?				
8	Will fuel and/or hazardous substances be stored at the construction site?				

9	Is there a possibility of discharging liquid effluent from the construction site?				
10	Will construction materials be stockpiled near surface waters, and natural water courses?				
11	Will construction activities affect the natural drainage pattern of the site (e.g. filling up low-lying land)?				
12	Is earthwork (earth excavation, backfilling, stockpiling of excavated soil) involved in construction activities?				
13	Is there a possibility of water stagnation at the construction site?				
14	Will the construction involve road blocking?				
(c) General Socio-economic impacts (including occupational health and safety):					
15	Is the project area densely populated?				
16	Will there be any pedestrian and safety related issue?				<i>(Mention the type of measures that will be adopted, i.e. Traffic safety</i>
					<i>signs, protection fence with warnings)</i>
17	Is significant movement of vehicles involved during construction activities?				<i>(Mention the type of measures that will be adopted, i.e. Traffic safety signs, protection fence with warnings)</i>
18	Will child and pregnant women be used in construction activities?				
19	Is there a safe source of drinking water and adequate sanitation facilities available for the workers at or near the construction site?				<i>(mention the location of the facilities)</i>

20	Will the workers be provided Personal Protective Equipment (PPE), devices and clothing and be ensured those are used?				(Provision of PPE such as helmets, boots and face masks for the workers; Provision of first aid box with basic items.)
21	Will enough health and safety direction and insurance be provided to the workers?				
22	Is there a risk to safety and human health to people other than workers?				<i>(Mention the type of measures that will be adopted, i.e. Traffic safety signs, protection fence with warnings)</i>
23	Will any archaeological and historical Structure be affected?				
24	Will any structure(s)/ entity(s) (e.g., shops) be temporarily affected during sub-project activity?				<i>(mention the numbers of structure(s)/ entity(s))</i>
25	Will any squatter(s) be temporarily displaced during sub-project activity?				<i>(mention the numbers of squatter(s))</i>
26	Will any mobile vendor(s) be affected potentially?				<i>(mention the numbers of mobile vendor(s))</i>
27	Will any kind of land acquisition or permanent population displacement be made?				
28	Will the subproject affect the way of life adversely and restrict access to common property resources of any indigenous people?				

** Prepare a separate Environmental Management Plan (EMP) if environmental impacts are assessed to be High or Moderate*

*** Attach an Indigenous People's Plan (IPP) if impact is Significant or Moderate*

Potential Environmental Impact during Operational Phase: No significant adverse impact anticipated that cannot be addressed by routine O&M activities, and no such impacts are expected that could potentially affect nature of subsequent ESA.

(2) Category of sub-project :

- (a) According to ECR 1997 : Orange A
- (b) According to ADB classification : Category B

Prepared by: (Name, designation, mobile number, signature, date)-----

Reviewed by: (Name, designation, mobile number, signature, date) -----

ANNEX VI

**FORM 4: SITE-SPECIFIC ENVIRONMENTAL MITIGATION PLAN AND
MONITORING PROTOCOL**

(1) Mitigation Protocol

Activities Associated with low to moderate environmental impacts	Suggested mitigation measures/ BMPs	Mitigation Measures Adopted by the Contractor/ SCL	Monitoring of mitigation measures	Frequency of monitoring during period of activities	Name of the person conducting the monitoring
<i>(From screening checklists in Annex I and II)</i>	<i>(From Annex III and IV)</i>	<i>(Mention which mitigation measure the contractor has adopted)</i>	<i>(Describe the method of monitoring)</i>	<i>(Once/week, once/month etc. depending on the activities)</i>	<i>(Typically will be performed by the focal person at the subproject level)</i>
Example: Noise pollution from HDD, concreting work, mobilization of vehicles and equipment	Contractor/ SCL shall use noise suppressors and mufflers in heavy construction equipment., Avoid using of construction equipment producing excessive noise during school hours and also at night, Avoid prolonged exposure to noise (produced by equipment) by workers/give protective gears, Regulate use of horns and avoiding use of hydraulic horns in project vehicles.	Contractor has avoided using of construction equipment producing excessive noise during school hours and also at night.	Noise level meter, GPS	Once/Week	Mr. X

If the project involves land acquisition and temporary displacement, prepare a separate Resettlement Action Plan (RAP), Social Management Plan (SMP), and Tribal People's Plan (TPP) as per social management procedure stated in the chapter.

ANNEX VII

GUIDELINE FOR ARCHAEOLOGICAL IMPACT ASSESSMENT

Bangladesh has long cultural history right from 3rd century BC onwards. Enormous major and minor historical records are scattered in different parts of the country. The features of these antiquities have separated values and identities. During implementation of large-scale infrastructural development work/s an archaeologist needs to be present to rescue or recover any cultural resources present at the site.

To reduce the possibility of damaging archaeological objects, in case they are found while undertaking excavation works for optical fiber line installation, an authorized archaeological unit or at least an archaeologist should be asked to monitor the site periodically. The archaeologist, according to the Rules and Regulation of the Government of Bangladesh will study, make inventory and record it for the future.

Tasks:

- (i) Conduct archaeological impact assessment for development projects.
- (ii) Execute sampling excavation and assess the significance of the materials found, propose mitigation measures to safeguard buried archaeology or erected/surface remains and suggest future research activity.
- (iii) Assess risks to these archaeological materials by the proposed infrastructure and suggest changes to the infrastructural works.
- (iv) Identify suitable mitigation measures and prepare environmental management plan.

Investigation

Archaeological impact assessment in the project area and its vicinity to identify impacted sites/remains in relation to the infrastructural work proposed. A team of experts needs to conduct an extensive study and survey at the sub-project areas. The objective of this survey will also be to develop proposal of appropriate mitigation measures to be undertaken to safeguard the buried or surface archaeology. The other objective is to suggest for changes, if any, to the proposed infrastructure works which could better assure the safeguarding of archaeological materials of cultural and historical significance and also suggest for future archaeological research and excavation of the buried archaeology.

The team can adopt three different methods for this purpose.

- a. Examination of available cartographic and other photographic records.
- b. Review of available literature, reports of archaeological researches and explorations conducted at project areas.
- c. Combing the city block-by-block or lane by lane through site inspection to unveil the historical facts.
- d. On-site interaction with local people and to investigate clues if any in their traditions and legends.

ANNEX VIII

IMPACT SCREENING AND ASSESSMENT GUIDELINE FOR PHYSICAL

The PCR policy applies to projects having any one or more of the following three features:

- (i) Projects involving significant excavations, demolition, movement of earth, flooding or other major environmental changes
 - (ii) Projects located within or in the vicinity of a recognized PCR conservation area or heritage site
 - (iii) Projects designed to support the management or conservation of PCR
- The sub-projects under the proposed project will involve significant excavation works, and movement/storage of earth. The proposed routes of the fiber optic lines may have religious institutions (mosques, temples, Buddhist temples), few sites of archaeological importance, public libraries, cinema halls, community centers, which can be considered PCRs. However, the sub-project area of influence may or may not intersect these regions (since the sub-projects will mostly follow the roadway alignment and actual locations of most of them still undetermined). Therefore a generic impact assessment of Physical Cultural Resources is outlined in this section.

Guidance on identification of PCR

In the context of the proposed project, the probable examples of PCR may be the following:

1. Human made: Religious buildings such as temples, mosques, churches, exemplary indigenous or vernacular architecture Buildings, or the remains of buildings of architectural or historic interest, historic or architecturally important townscapes Archaeological sites (unknown or known, excavated or unexcavated), Commemorative monuments
2. Natural: historic trees, natural landscapes of outstanding aesthetic quality
3. Combined man-made or natural: Sites used for religious or social functions such as weddings, funerals, or other traditional community activities (community centers), burial grounds, family graves, cultural landscapes
4. Movable: registered or unregistered artifacts in temples or mosques, paintings, statues of important historical figures, religious artifacts, cultural artifacts etc.

Assessment of probable impacts due to activities:

Below is a list of project activities or features under the context of the proposed project, which may commonly give rise to negative impacts on PCR, divided into two periods: construction phase and operational phase.

Construction phase:

1. Excavation, and construction:
 - Direct physical damage to natural, manmade and buried PCR on site
2. Construction traffic:
 - Vibration, soil, air and water pollution causing damage to natural or manmade PCR on site.
 - Noise pollution can interfere with the use and enjoyment of PCR such as tourist destinations, historic buildings, religious establishments and cemeteries.
3. Mobilization of heavy construction equipment:
 - Damage to natural or manmade PCR on site
 - Damaging buried PCR (archaeological) onsite, and damaging pipelines and drains serving built PCR in the vicinity.
4. Flooding and Inundation:
 - Submergence or destruction of human-made, natural or buried PCR.
 - Barrier to access of all types of PCR.
 - Raised water table can lead to damage to all types of PCR.
 - Damage to aesthetics of scenic landscapes.

Operation phase:

1. Induced development:
 - Induced development leading to increased wear and damage, sacrilege of sacred sites, theft and vandalism of movable and breakable PCR, and damage to the aesthetics of scenic landscapes and townscapes.
2. Urban development:
 - Changes in demography or settlement patterns leading to decay of inner cities and abandonment and neglect of older residential areas containing built PCR such as vernacular architecture.
 - Developments which are out-of-character with their surroundings diminishing the aesthetic value of the townscape, decline in property values and ultimately, neglect of built PCR in the area.
 - Damage to the aesthetics of scenic landscapes and townscapes.

Guidelines for ToR for the PCR component:

In case of a sub-project, which is not expected to have any impacts on PCR, it may be sufficient to include procedures for chance finds (Annex IX). In case of Category “B” project where there may be a likely impact on PCR due to activities carried out under any of the sub-projects, the ToR may be tailor-made to the specific requirements. The ToR is expected to include potential major PCR issues, the likely impacts on PCR, the PCR impact areas, which will set boundaries for collecting the PCR baseline data along with any specialized PCR knowledge or skills

required. In projects such as the proposed project, since the subproject locations are not yet determined, it will not be possible at this stage to identify the PCR impact areas and the type of PCR data that should be collected. In such cases, the ToR should require the EA team to establish these parameters at the beginning of the assignment, and propose provisions for identifying and managing PCR during project implementation. The EA report for the corresponding sub- projects should be modified accordingly to incorporate the issues related to PCR in those cases. The investigations and findings with respect to PCR should form an integrated part of the EA report. Therefore the ToR for consultants for the generic EA assessment of sub-projects would still be valid with a few additional assignments on behalf of the consultants with respect to PCR:

- Regulatory environment: (Identification of any regulations and guidelines which will govern the conduct of the assessment) This section should also list any relevant national acts or regulations pertaining to the safeguarding of PCR
- Background information: (description of the physico-chemical, ecological and socioeconomic environment) All registered and unregistered, movable or immovable PCRs in the sub-project areas need to be identified in this part preferably using visual identification, consulting with local people. The report should have descriptions and visual illustrations of the PCRs.
- Impact assessment: (the consultant will identify the likely biophysical and social impacts in sufficient detail to be able to design suitable mitigation measures). Impacts on all types of PCR should be considered, both natural and man-made, registered and unregistered, movable and immovable.
- Analysis of alternatives: (the consultant will include PCR aspects when considering alternative projects or project locations)
- Environmental Management Plan including institutional arrangement for implementation and monitoring: (The ToR should state that mitigating measures arising from PCR impacts should be agreed to by the concerned and affected parties before they are submitted as recommendations in the EMP.)
- Public Participation (The ToR should point out the importance of the consultative process for the physical cultural resources component)

ANNEX IX

CHANCE FIND PROCEDURES

Works could impact sites of social, sacred, religious, or heritage value. “Chance find” procedures would apply when those sites are identified during the design phase or during the actual construction period and the related activity will not be eligible for financing under the project.

- (1) Cultural property includes monuments, structures, works of art, or sites of significant points of view, and are defined as sites and structures having archaeological, historical, architectural, or religious significance, and natural sites with cultural values. This includes cemeteries, graveyards and graves.
- (2) The list of negative subproject attributes which would make a subproject ineligible for support includes any activity that would adversely impact cultural property.
- (3) In the event of finding of properties of cultural value during construction, the following procedures for identification, protection from theft, and treatment of discovered artifacts should be followed and included in standard bidding document.
 - (a) Stop the construction activities in the area of the chance find;
 - (b) Delineate the discovered site or area;
 - (c) Secure the site to prevent any damage or loss of removable objects.
 - (d) Notify the supervisory Engineer who in turn will notify the responsible local authorities;
 - (e) Responsible local authorities and the relevant Ministry would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures.
 - (f) Decisions on how to handle the finding shall be taken by the responsible authorities and the relevant Ministry. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance), conservation, restoration and salvage.
 - (g) Implementation of the authority decision concerning the management of the finding shall be communicated in writing by the relevant Ministry.
 - (h) Construction work could resume only after permission is given from the responsible local authorities and the relevant Ministry concerning safeguard of the heritage.
- (4) These procedures must be referred to as standard provisions in construction contracts. During project supervision, the Site Engineer shall monitor the above regulations relating to the treatment of any chance find encountered.
- (5) Relevant findings will be recorded in Supervision Reports and Implementation Completion Reports will assess the overall effectiveness of the projects cultural property mitigation, management, and activities, as appropriate.

ANNEX X

BEST MANAGEMENT PRACTICES (BMPs) FOR FIBER OPTIC CABLE INSTALLATION

The Best Management Practices (BMPs) are guidelines to reduce or eliminate environment risk due to various activities associated with the construction and installation of Fiber Optic Cable Lines of SCL.

Best Management Practices (BMPs) related to the protection of flora and fauna:

1. Where stream crossings would include excavation or other activities that would result in suspended sediment, disturbance or modification of stream banks and beds, and/or removal of native riparian vegetation, measures will be employed to avoid or reduce the effect of these impacts.
2. Where the potential for suspended solids resuspension exists, monitoring for elevated turbidity levels will be planned, with contingencies in place to avoid elevated levels of suspended sediment that could result in adverse effect to sensitive aquatic species and other fish-bearing streams.
3. Removal of mature native riparian vegetation will be avoided, where avoidance is not possible, as few trees as possible will be removed to support the construction.
4. Where placement of cable or other infrastructure would result in removal of tree nests for migratory birds, surveys for all species of concern will be performed, and survey findings will be applied to include protective timing measures or other protections that ensure compliance with related local laws and guidelines.
5. Removal of trees needs to be avoided where such activities would result in mortality of eggs or nestlings or the abandonment of eggs and nestlings of birds
6. If sensitive plant species are found in the planning area while project activities are occurring, an ecologist would be consulted as to measures required to protect the species and its essential habitat. Also restrictions should be imposed on noise-generating activities and application of artificial lighting that disturbs sensitive species. If threatened or endangered species are affected due to project activities, appropriate measures should be taken for their rescue and relocation.

7. Tree felling, if unavoidable, shall be done only after compensatory plantation of at least three saplings for every tree cut is done.
8. The species shall be identified in consultation with officials of forest department/local community, giving due importance to local flora. It is recommended to plant mixed species in case of both avenue or cluster plantation.
9. The plantation strategy shall suggest the planting of fruit bearing trees and other suitable trees.
10. During the operational phase regular trimming of trees along the route of aerial installation of fiber optic cable line may become essential to prevent accidents due to over-growth onto the power lines. However, his activity should be conducted with minimal damage to the existing vegetation.
11. The project proponents would take up the planting of fruit bearing and other suitable trees, on both sides of the roads or other infrastructure development projects location from their own funds.

BMPs related to excavation, backfilling and topsoil restoration and re-vegetation:

12. Topsoil lift material would be replaced as the surface soil layer during backfilling. Excess subsoil, substrate, and/or large rock materials that cannot be buried in the excavated trench (trenching method) would be removed from the site.
13. Some compacting of backfill soil materials would be required while when closing trenched portions of the fiber optic line so as to eliminate excess soil settling. Backfilled sites should be mounded slightly at the completion of backfilling to accommodate for a reasonable amount of settling. Backfilling and compaction must be complete in all areas within 50 yards of road drainage culverts or natural channels before crews leave the job site for an extended period (weekend, holiday, etc.).

14. Restoration of topsoil will be required where soil is disturbed by project activities. The goal is to provide long-term soil cover and reduce the risk of weed infestation. Native plant materials are the first choice in re-vegetation, but non-native, non-invasive plant species may also be used. Prompt re-vegetation is critical to restoration of backfilled areas. Installation of native rather than imported plants will increase vegetation viability, avoid immediate or long-term irrigation needs, and promote rapid ground cover. Plant diversity also will create useful wildlife habitat and more opportunities for future activities or site reuse.

15. If grass seed is not established within two years of initial seeding then reseed as necessary.

16. The topsoil salvaging provision applies to all areas along the proposed fiber line installation route where one or more of the following conditions exist: 1) trenching would be used for cable installation, 2) the fiber optic line would be buried in a borrow ditch or along other drainage features, 3) any areas where the fiber optic line passes through mature stands of conifers or deciduous trees, i.e.: areas obviously lacking previous disturbance. Topsoil salvaging would not be required in any areas where the soil surface is characterized as rubbly, extremely stony, or extremely bouldery based on the size and amount of rock fragments on the surface. Topsoil salvaging would also not be required in areas that are severely infested by noxious weeds or cheat grass.

17. Drainage congestion may result from possible obstruction to natural flow of drainage water due to the storage of materials, digging/back-filling of water fiber optic line trenches. Therefore, care should be taken to avoid any drainage congestion during these activities.

BMPs related to reuse of excavated soil

18. Reusing excavated soil can be done from construction activities, where appropriate, to support similar construction development activities. This limits the need to import soil from natural or virgin sources. It also reduces the environmental impacts and costs associated with taking excess soils to commercial fill or landfill sites. All soils imported to a site for reuse should be of a quality appropriate for anticipated future land uses and to prevent adverse effects. Municipalities are encouraged to consider these soil reuse options in their procurement practices, and when issuing approvals or permits that include soil management and importation

BMPs related to protection of sensitive locations

19. At boundaries of sensitive areas (places of historical or archaeological importance), their buffers, and other areas stake or wire fences may be used to protect them from any harmful effects due to project activities. The fences will also assist in controlling vehicle access to and on these areas.

BMPs related to HDD operation

20. Directional Drilling equipment will be located outside of stream buffers - typically 20 feet or more from stream shore.
21. During directional boring operations the following mitigation measures may be adopted if seeping occurs:
- (A) Containment and cleanup equipment will be present for use at the site, as needed
 - (B) If boring under stream crossings, a qualified hydrological monitor will be present at all bore sites to monitor construction activities for prompt detection of any releases.
 - (C) Releases will be immediately controlled and the drilling fluid will be contained and removed
 - (D) A remediation plan will be developed based on the site-specific conditions.
22. Upon completion of a directional bore, all slurry will be removed from the construction site and deposited at an approved site.

BMPs related to Cable lying by bridge-crossing

23. Safety netting will be installed under aerial and bridge attachment installations over water bodies to avoid equipment, tools, or workers from falling into the water body.

BMPs related to pole construction (Aerial installation of fiber optic cable line)

24. Erection of poles/towers for installation aerial fiber optic cable lines of the SCL involves:
- i. Informing the local community about the installation schedule;
 - ii. Marking and clearance of the designated locations for installation/replacement of poles.
25. Pole Erection Activities by SCL.
- Informing the community and local city/village councils about the likely schedule of erection;
 - After obtaining the consent of the community SCL shall be responsible to stake out the designated locations.
26. Pole Erection Activities by the Contractor
- The contractor shall submit the schedules and methods of operations for various items during the Pole erection operations to the SCL for approval.
 - The clearance of sites shall involve the removal of all materials such as trees, bushes, shrubs, stumps, roots, grass, weeds, part of topsoil and rubbish. Towards this end, the Contractor shall adopt the following measures:
 - ♦ To minimize the adverse impact on flora and vegetation, only ground cover/shrubs that impinge directly on the permanent works shall be removed.

- ◆ In locations where erosion or sedimentation is likely to be a problem, clearing and grubbing operations should be so scheduled and performed that grading operations and permanent erosion and sedimentation control features can follow immediately, if the project conditions permit.
- ◆ The disposal of wastes shall be in accordance with the provisions of BMPs related to Waste Management.
- All regulatory clearances shall be obtained before actual start of work. River Crossing Towers are very high electric towers specially designed to cross large rivers. Tower construction for river crossing will require proper protective measures against bank collapse. Sheet-Piling or Shore protection measures should be ensured while laying the foundation of the tower near the river bank or in the river bed. Pre-cast piles should be driven in with extreme care so as to expose the workers to the least possible danger.
- Foundation should be checked for damages or uneven settlement following construction.
- Proper safety measures should be ensured prior to River crossing jobs.
- The work plans should be submitted by the contractor/engineer prior to commencement of the erection work. The work plan should provide detailed steps of foundation works in the river. River traffic movement should not be obstructed to any stage.
- Proper protective measures should be adopted to prevent or minimize river water pollution.

BMPs related to installation of control station for fiber optic line

27. The clearance of site shall involve the removal of all materials such as trees, bushes, shrubs, stumps, roots, grass, weeds, part of topsoil and rubbish. Towards this end, the Contractor shall adopt the following measures:

- To minimize the adverse impact on flora and vegetation, only ground cover/shrubs that impinge directly on the permanent works shall be removed.
- In locations where erosion or sedimentation is likely to be a problem, clearing and grubbing operations should be so scheduled and performed that grading operations and permanent erosion and sedimentation control features can follow immediately, if the project conditions permit.
- The disposal of wastes shall be in accordance with the provisions of BMPs related to Waste Management.
- All regulatory clearances shall be obtained before actual start of work.

BMPs related to Waste Management

28. Construction Stage:

- The contractor shall either re-use or dispose the waste generated during construction depending upon the nature of waste.
- The contractor shall dispose of wastes that could not be re-used safely.
- SCL shall review the waste management practices adopted by the Contractor during the progress of construction.

29. Post-construction Stage

- In case of disposal of wastes on private land, certificate of Completion of Reclamation is to be obtained by the Contractor from the landowner that “the land is restored to his satisfaction”.

BMPs related to Public Health and Safety

30. Pre-construction Phase

- In order to incorporate public health and safety concerns, SCL and the Contractor shall disseminate the following information to the community:
 - i. Location of project activities,
 - ii. Borrow areas,
 - iii. Extent of work

- iv. Time of construction
 - v. Involvement of local labors in the road construction
 - vi. Health issues - exposure to dust, communicable diseases etc.
31. Construction Phase
- The Contractor shall schedule the construction activities taking into consideration factors such as:
 - i. Sowing of crops
 - ii. Harvesting
 - iii. Local hindrances such as festivals, etc.
 - iv. Availability of labor during particular periods
 - Proper safety/warning signs are to be installed by the contractor to inform the public of potential health and safety hazard situations during the construction phase in the vicinity of the project.
 - SCL shall carry out periodic inspections in order to ensure that all the measures are being undertaken as per this BMP.
32. Post-construction Phase
- The construction site shall be cleaned of all debris, scrap materials and machinery on completion of construction for the safety of public and users. During operation phase (especially during regular maintenance) following issues should be addressed for overhead fiber optic cable lines:
- Regular patrolling along the overhead fiber optic cable lines to identify the need for regular and immediate maintenance operation.
 - Inspection immediately after a major storm/rainfall event
 - Regular cutting and trimming of trees around fiber optic cable lines.

BMPs related to Natural Habitats

33. General
- This code of practice envisages measures to be undertaken during implementation of the said projects by the SCL near natural habitats. These measures shall be undertaken in addition to the measures laid down in the other BMPs.
34. Pre-construction Phase

Contractor in consultation with forest ranger or any other concerned authority shall prepare a schedule of construction within the natural habitat. Due consideration shall be given to the time of migration, time of crossing, breeding habits and any other special phenomena taking place in the area for the concerned flora or fauna.

35. Construction Phase

- Collection of any kind of construction material from within the natural habitat shall be strictly prohibited.
- Disposal of construction waste within the natural habitat shall be strictly prohibited.

36. Post-construction Phase

- The infrastructure development projects near the natural habitat shall be declared as a silence zone.
- Compensatory tree plantation within the project area shall be done.

BMPs related to Air Pollution Control

37. Field generation of contaminated or uncontaminated dust and mobilization of volatile organic compounds can be reduced by new and traditional BMPs such as:

- Covering excavated areas with biodegradable fabric that also can control erosion and serve as a substrate for favorable ecosystems, or with synthetic material that can be reused for other onsite or offsite purposes
- Spraying water in vulnerable areas, in conjunction with water conservation and runoff management techniques
- Securing and covering material in open trucks while hauling excavated material, and reusing the covers
- Revegetating excavated areas as quickly as possible
- Limiting onsite vehicle speeds to 10 miles per hour BMPs related to safety during fueling operations and cleaning of spills

38. Fueling of equipment is not to be done in close proximity to sensitive aquifers designated wetlands, wetland buffers, or other waters of the State.

39. The presence and constant observation/monitoring of the driver/operator at the fuel transfer location at all times will be implemented. Fueling will be located at least 25 feet from the nearest storm drain or covering the storm drain to ensure no inflow of spilled or leaked fuel.

40. The local fire department contact names and numbers will be on-site in case of any spill entering the surface or ground waters or in the event of fire.
41. Petroleum products will be stored in tightly sealed containers which are clearly marked.
42. All onsite vehicles will be checked for leaks and receive regular preventive maintenance to reduce the chance of leakage.
43. Manufacturer-recommended methods, materials, and equipment for spill cleanup will be available on site, and personnel will be made aware of the procedures and the location of the information and cleanup supplies.
44. All spills will be cleaned up immediately after discovery. Personnel will wear appropriate protective clothing to prevent contact with hazardous substances.

BMPs related to general maintenance and erosion control

45. When water or sediments are removed from vaults, inspect for the presence of oil or sheen. If oil or sheen is present, the liquid will be pumped out and disposed of properly via the sanitary sewer or directly at a wastewater plant.
46. Storm drain inlets will be protected to prevent coarse sediment from entering drainage systems prior to permanent stabilization of the disturbed areas. It may be necessary to build a temporary dike, use a block and gravel filter around the inlet using standard concrete blocks and gravel. Other methods recommended are gravel and wire mesh filters, catch basin filters, curb inlet protection with wooden weir, block and gravel curb inlet protection, or curb and gutter sediment barrier.
47. All construction and maintenance activities would be conducted in a manner that would minimize disturbance to drainage channels, and stream banks.

ANNEX XI

IFC OCCUPATIONAL HEALTH AND SAFETY GUIDELINES FOR FIBER OPTIC CABLE INSTALLATION

Workers involved in fiber optic cable installation or repair may be at risk of permanent eye damage due to exposure to laser light during cable connection and inspection activities. When extending a cable or mounting a cable connector, a microscope is typically attached to the end of the fiber optic cable allowing the worker to inspect the cable end and prepare the thin glass fibers for extension or connection assembly. Workers may also be exposed to minute or microscopic glass fiber shards that can penetrate human tissue through skin or eyes, or by ingestion or inhalation. Optical fiber installation activities may also pose a risk of fire due to the presence of flammable materials in high-powered laser installation areas.

Recommendations to prevent, minimize, and control injuries related to fiber optic cables installation and maintenance include:

- Worker training on specific hazards associated with laser lights, including the various classes of low and high power laser lights, and fiber management;
- Preparation and implementation of laser light safety and fiber management procedures which include:
 - Switching off laser lights prior to work initiation, when feasible
 - Use of laser safety glasses during live optical fiber systems installation
 - Prohibition of intentionally looking into the laser or fiber end or pointing it at another person
 - Restricting access to the work area, placing warning signs and labeling of areas with potential for exposure to laser radiation, and providing adequate background
 - Lighting to account for loss of visibility with the use of protective eyewear
 - Inspecting the work area for the presence of flammable materials prior to the installation of high-powered laser lights
- Implementation of a medical surveillance program with initial and periodic eye examinations;
- Avoiding exposure to fibers through use of protective clothing and separation of work and eating areas.

ANNEX XII

FORM 5: PROJECT IMPLEMENTATION RECORD

Subproject Name and Location:

Name of Ward: **Name of the Upazilla/Area:**

Work Package Particulates :

(a) **Type of Line** : ☐ Underground ☐ Overhead
☐ Both

(b) **Total Length (km)** : _____ **Underground**
 _____ **Overhead**

(c) **Start/ End Point** :

(d) **Number of Control Stations to be constructed** :

(e) **Number of Handholes to be Constructed** :

(f) **Mode of Operation for Underground** :

☐ Cut and Fill ☐ HDD ☐ Both

(g) **Mode of Operation for Overhead** :

☐ Existing BREB Poles Numbers _____

☐ New Poles to be Constructed Numbers _____

1) Local SCL office/ PGCB Substation :

2) Layout of proposed Fiber optic Line :
(attach layout map)

3) Land ownership and permissions:

(d) Names of the govt. agencies owning the land:

(e) Area of land to be used (acre) :

(attach a copy of the agency's permission to use their land)

4) Estimated cost of sub-project : (Mil. BDT)

5) Schedule of implementation :

a) Sub-project duration (months) :

b) Start date :

c) Completion date :

6) Number of structures/ entities (e.g., shops) temporarily affected during sub-project activity:

7) **Number of squatters temporarily displaced during sub-project activity:**

8) **Environmental Monitoring Checklist for Routine Site Inspection**

Serial Nos.	Aspects of Environmental issues	Environmental issues to be Monitored	Compliance Status		
			FC	PC	NC
Conditions at Subproject Site					
A.	General				
	1.	Employment Record keeping arrangement			
	2.	Legal working hours approval			
	3.	Provision for monthly meeting for inspection of site activities			
B.	Health and Sanitation				
	Public Health				
	1.	Emergency medical facilities and First Aid Box at Field Office and work sites			
	2.	Safe water supply arrangements			
	3.	Waste disposal arrangement at camp and work sites			
	Occupational Health				
	1.	First-Aid Box and safety management plan availability at work sites			
	2.	Provision of personal protection equipment (PPEs) and working clothing to workers			
	3.	Protection fence at HDD work site			
	4.	Handling of cement and other hazardous materials by workers			
	5.	Traffic safety at work sites			
	6.	Working hour and vacation days maintained			
	C.	Labour Welfare			
1.		Workers' complaints taken care of by the site engineer			
2.		Provision of leaves (national and emergency)			

Serial Nos.	Aspects of Environmental issues	Environmental issues to be Monitored	Compliance Status		
			FC	PC	NC
	3.	Arrangement for settlement of conflicts amongst the workers			
	4.	Children below 15 years and pregnant women are not employed			
D.	Environmental Pollution				
	Dust and emission control				
	1.	Proper storage of construction materials			
	2.	Excavated material properly covered			
	3.	Construction vehicles and HDD equipment maintained properly to reduce emission			
	Noise Pollution				
	1.	Movement of vehicles and operation of HDD fixed at desired hours			
	2.	Noise control measures at sensitive sites			
	Water Pollution				
	1.	Wastes, slurry, cement, and junks not disposed in water			
	2.	Spills from fuel tanks are properly disposed			
	3.	Pits, holes and ditches dug during implementation are filled after completion of work			
	Land Pollution				
	1.	Arrangement adequate to check pollution of soil by noxious chemicals, and cement spillage			
	2.	Arrangement for restoration of original site conditions (e.g. roads to pliable condition)			
E.	Environmental documents at Field Office				
	1.	Field Office possesses all Environmental Documents relevant to proposed scheme implementation and contract			

Serial Nos.	Aspects of Environmental issues	Environmental issues to be Monitored	Compliance Status		
			FC	PC	NC
		documents			
	2.	All accidents at work sites recorded and reported to the project management unit			
F.	Emergency				
	1.	Emergency contact numbers (police, fire station, nearest hospital) available at the site during work			
	2.	Portable fire extinguishers available at the site			

Note: FC = fully complied, PC = partly complied and NC = not complied

9) Any unforeseen impacts (damage to existing infrastructures such as water supply and sewerage lines, gas line, telephone line, electric cable line, optic fiber line etc.)? If so, how the compensation was provided? (Show documentation of compensation)

10) Were any buried PCR found during construction phase of the project? If so, what protocols were adopted as per Annex VIII?

11) Which parameters were monitored during Construction phase? (attach monitoring reports)

12) Community's opinion regarding the environmental impacts of the subproject implementation

Significant ☐

Moderate ☐

Insignificant ☐

13) Grievance/Complaints Redress

i) No. of complaints/grievances on environmental issues in the sub- project:

Received: Resolved:

Sent to higher bodies:

ii) Three of the most important complaints were:

- a)
- b)
- c)

Prepared by :(Name, designation, mobile number, signature, date)-----

Reviewed by : (Name, designation, mobile number, signature, date)-----

ANNEX XIII

GENERALIZED IMPACT OF FIBER OPTIC CABLE INSTALLATION

Assessment and Prediction of Impacts During Construction

The potential environmental impacts during construction phase of sub- projects could be categorized into: (a) ecological impacts; (b) physic-chemical impacts; and (c) socio-economic impacts.

Ecological impacts:

Based on primary assessment of the nature and scale of the proposed sub- projects, it appears that ecological impacts of most sub-projects would be limited to loss of trees/vegetation, and possible adverse impact on aquatic habitat located close to the project location. Assessment of ecological impacts of the sub-projects should therefore focus on loss of vegetation/trees and aquatic habitat. In general, the ecological impact should focus on:

Impact on flora (aquatic and terrestrial);

Impact on fauna (aquatic and terrestrial) including fish.

Physicochemical impacts:

Possible Physicochemical impacts from the sub-project activities to be carried out in different locations may include the following:

Drainage congestion,

Noise pollution,

Air pollution, Water
pollution,

Environmental pollution from solid/construction waste

Drainage congestion:

During execution of civil engineering projects, temporary drainage congestion often results from obstruction to natural flow of drainage water due to the storage of materials, piled up excavated material/ soil, and temporary embankments constructed to keep the work area dry. Such congestion is particularly important at the project sites adjacent to low-lying areas. Drainage congestions could create significant discomfort to people living in project-surrounding areas.

Noise pollution:

For the proposed fiber optic cable installation there will be no long-term impacts on noise levels. During construction, minor short-term noise impacts will be incurred. For underground installation, depending on soil conditions and routing, 0.5 - 1 miles of cable will be installed per day. Noise impacts from underground construction would occur for less than one day for any given area. The traffic-related noise at the area of construction is also not expected to exceed the prevailing baseline noise levels. In summary, no long-term direct impacts on noise levels will occur as a result of the fiber optic cable laying operation. There will also be no indirect or secondary impacts.

Noise produced by Auger Drill Rig used for installation of poles for fiber optic lines is relatively low, and not likely to generate significant noise pollution.

Air pollution:

Impacts to air quality associated with the proposed fiber optic cable installation are limited to temporary and incidental increases in particulate matter (fugitive dust) during construction. Temporary traffic disruption may cause increased motor vehicle exhaust. Construction equipment, which uses fossil fuel, will cause a short-term increase in GHG emissions into the air and potentially create additional dust. With typical mitigation measures and BMPs, construction will have no long-term impacts to air quality and short-term impacts will be minimized.

Water pollution:

Water pollution may result from discharge of water containing eroded soil (high suspended solids), spills and leaks of oils/ chemical into nearby water bodies (e.g., drain, pond, khal, drain, river). The presence and existing use of water bodies surrounding the sub-project site would determine the level of impact. For example, if a pond located close to a sub-project site is being used for washing/ bathing or for fish culture, pollution of the pond from sub-project activities would generate significant adverse impacts.

Environmental pollution from solid/ construction waste:

In some sub-projects, construction debris is likely to be generated from different sub-project activities. Improper management of construction debris and solid waste could cause blockage of drainage line/ path and environmental pollution.

Socio-economic impacts:

The most significant potential socio-economic impact from the proposed project would be loss of income due to temporary use of land in front of shops and vendors for construction of underground fiber optic cable lines. Possible impact on indigenous population is also an important consideration. The social management framework (SMF) presented in Chapter 5 addresses the temporary resettlement issues, and impact on indigenous population. This section addresses the other possible socio-economic impacts, which include the following:

- traffic congestion,
- health and safety,
- employment and commercial activities,
- Aesthetic and Visual Resources
- impact on archaeological and historical sites, and
- safeguarding physical cultural resources (PCR),

Traffic congestion:

During construction phase of sub-projects, traffic congestion may result from stock piling of material by the sides of roads, increased movement of people and vehicles carrying material

and equipment. Installation of fiber optic cable lines in densely populated areas, and construction of fiber optic cable lines along busy highway could aggravate the existing traffic problem during construction phase. This should be addressed with proper traffic management, and avoiding stockpiling of materials in a way that could hamper traffic movement.

Health and safety:

Construction activities in densely populated areas and along narrow roads (e.g. during installation of optical fiber lines within city areas) could increase risks to pedestrian and vehicular movement. Safety/ stability of structures (buildings, walls) located very close to the alignment of fiber optic cable lines could be an important issue, especially during construction of optical fiber lines along narrow roads. Besides this, workers involved in fiber optic cable installation or repair may be at risk of permanent eye damage due to exposure to laser light during cable connection and inspection activities. When extending a cable or mounting a cable connector, a microscope is typically attached to the end of the fiber optic cable allowing the worker to inspect the cable end and prepare the thin glass fibers for extension or connection assembly. Workers may also be exposed to minute or microscopic glass fiber shards that can penetrate human tissue through skin or eyes, or by ingestion or inhalation. Optical fiber installation activities may also pose a risk of fire due to the presence of flammable materials in high-powered laser installation areas. Safety is an important issue during construction phase. General construction activities pose safety risks, which should be addressed as part of occupational health and safety plan.

Employment and Commercial Activities:

Construction and installation activities related to this project would provide some relatively small, temporary increases in income and employment in the sub-project area. For example, labor-intensive sub-project works (e.g., manual excavation) could generate employment for considerable number of semi-skilled workforce. These job opportunities would be located in different areas as the work progresses. However, given the size of the labor force in the project area and in surrounding areas, most jobs could be filled by residents of the general area where the work is located except perhaps for a few specialized tasks. Additional facilities for workers (camps, water supply and sanitation, solid waste management) will not be required. Therefore, there likely would be no adverse impacts on community services, schools, housing, or other local services and facilities.

Aesthetic and Visual Resources

If the cables are buried underground, they will not have any long-term visual impact. Temporary impacts to visual and aesthetic resources will occur because of the presence of construction equipment such as trucks, horizontal directional drilling/boring machines, road safety equipment and other construction related items. Along the construction route, sidewalks within cities may be temporarily closed for safety reasons. Long-term impacts include any influences maintenance crews may have during routine maintenance or repairs. „Handholes“ will be located in existing right-of-way and will project slightly above the ground surface. However, the top of the Handholes provide as a base for street side vendors to locate their

stalls for business after they are relocated back following the construction works. This will result in insignificant long-term impact on visual aesthetics in the locations chosen for installation. Cable will be laid at a rate of 0.5 – 1 miles per day but it is not anticipated that any construction equipment or activities will be present in any particular location within the project area for more than three days (except HDD work).

Impact on archeological and historical sites:

Archeological and historical sites are protected resources. Damage of such sites by digging, crushing by heavy equipment, uprooting trees, exposing sites to erosion, or by making the sites more accessible to vandals are of particular concern. A guideline for archaeological impact assessment is presented in Annex VII.

Safeguarding physical cultural resources (PCR):

Since the exact locations of the sub-projects to be implemented are not known at this moment, a guideline for identification of physical cultural resources (PCR) and determination of the suitability of the sub-projects from the perspective of PCR is provided in Annex VIII. The likely impacts to PCR for typical activities of the sub-projects are also discussed in Annex VIII. The “Chance Find” procedure for protection of cultural property is presented in Annex IX.

Assessment and Prediction of Impacts During Operation

The potential environmental impacts could also be categorized into: (a) ecological impacts; (b) physico-chemical impacts; and (c) socio-economic impacts. In general, the potential adverse impacts of the sub-projects during operational phase are not likely to be significant.

Ecological impacts:

During operational phase, the possible impact of the sub-project activities on the biological environment would be insignificant. Some of the sub-projects could cause a change in the habitation characteristics of aquatic/terrestrial fauna in the vicinity of the sub-project locations.

Physicochemical impacts:

No impacts on physico-chemical parameters are anticipated during the operation phase of the project.

Socio-economic impacts:

This section provides an overview of the possible socio-economic impacts of the sub-projects during operational phase that are not covered under the social management framework (SMF).

Human Health:

In general, during the operation phase of the project human health and safety is anticipated to be improved by the project through the provision of improved broadband service to unserved or underserved communities, including direct connection to medical facilities or emergency

services providers. Improved broadband connectivity may potentially encourage the expansion of remote health services (e.g. connecting health facilities to specialty consultation services, and providing remote assessment and diagnostic services). By providing additional, more reliable, and faster internet services, the proposed optical fiber network would result in beneficial, regional, long-term, moderate impacts to human health and safety.

Infrastructure:

It will facilitate several services which were thought to be not feasible in the past such as online and internet banking, distant learning facilities for educational institutions, resource sharing for libraries as well as other research institutions, telemedicine (remote provision of health services, connecting health facilities to specialty consultation services, providing remote assessment and diagnostic services). This will bring forth a long-term positive impact in the socio-economic landscape of the metropolitan areas.

Employment, commercial activities and other benefits

The properties and anchor institutions that will receive broadband Internet and telecommunication services will provide a significant positive impact to the areas served by the project through shared use of the installed optical fiber network. These impacts include providing disadvantaged and vulnerable populations with access to affordable broadband services in un-served and underserved areas. Once the project is completed, it would directly create a small number of additional jobs. These new jobs would tend to accrue over time, as part of a gradual expansion of the economy. In addition, the increased availability of high-speed broadband infrastructure would provide opportunities for improved efficiencies in commercial and industrial operations and in Government. An improved broadband network will expand competition and will reduce the cost of Internet service to the consumers (i.e. reduced bandwidth price to be paid by the end users).

PART B

LIMITED ENVIRONMENTAL ASSESSMENT OF SIRAJGONJ SUB-PROJECT

(This part describes the particulars of the subproject, baseline environment of the subproject area, site-specific environmental and social screening, assessment of impacts and preparation of site-specific environmental mitigation and monitoring plan. Such limited-scale environmental assessment are to be applied to all subprojects to be implemented by SCL)

Limited Environmental Assessment (LEA) of Sirajgonj Sub-project

DESCRIPTION OF THE SUB-PROJECT AND BASELINE INFORMATION

1. General Description:

The proposed sub-project will lay out 22.58 km-long underground fiber optic cable line in Sirajgonj starting from Sirajgonj PGCB substation to Enayetpur Robi Telecom tower. The fiber optic cable will be laid parallel to the existing road within its right-of-way by taking permission from the Roads and Highways Department. 30 handholes will be constructed. As a part of the Environmental and Social Impact Assessment (ESIA) of the proposed sub-project, an overall project baseline survey was carried out along and around the proposed routes of the fiber optic cablelines.

Subproject Name: Fiber optic cable installation from Sirajgonj PGCB Substation to Enayetpur Robi Tower

Name of the Upazilla: Belkuchi

Sub-project Objectives:

22.58 km fiber optic cable installation from Sirajgonj PGCB Substation to Enayetpur Robi Tower

2. Work Package Particulates :

(a) Type of Line : ☒ Underground ☐ Overhead
☐ Both

(b) Total Length (km) : 22.578 km Underground
Overhead

(c) Start/ End Point :

Start Point : Sirajgonj PGCB
Coordinates: N 24°23'20.2", E 89°44'34.4"
End Point : Enayetpur Robi Tower
Coordinates: N 24°14'1.6", E 89°41'42.9"

(d) Number of Control Stations to be Constructed : 1

(e) Number of Handholes to be Constructed : 30

(f) Mode of Operation for Underground :

☐ Cut and Fill ☒ HDD ☐ Both

(g) Mode of Operation for Overhead : X

☐ Existing BREB Poles

Numbers _____

☐ New Poles to be Constructed

Numbers _____

3. Local SCL office/ PGCB Substation :

Sirajgonj PGCB (Coordinates: N 24°23'20.2", E 89°44'34.4")

4. Layout of proposed Fiber optic Line :

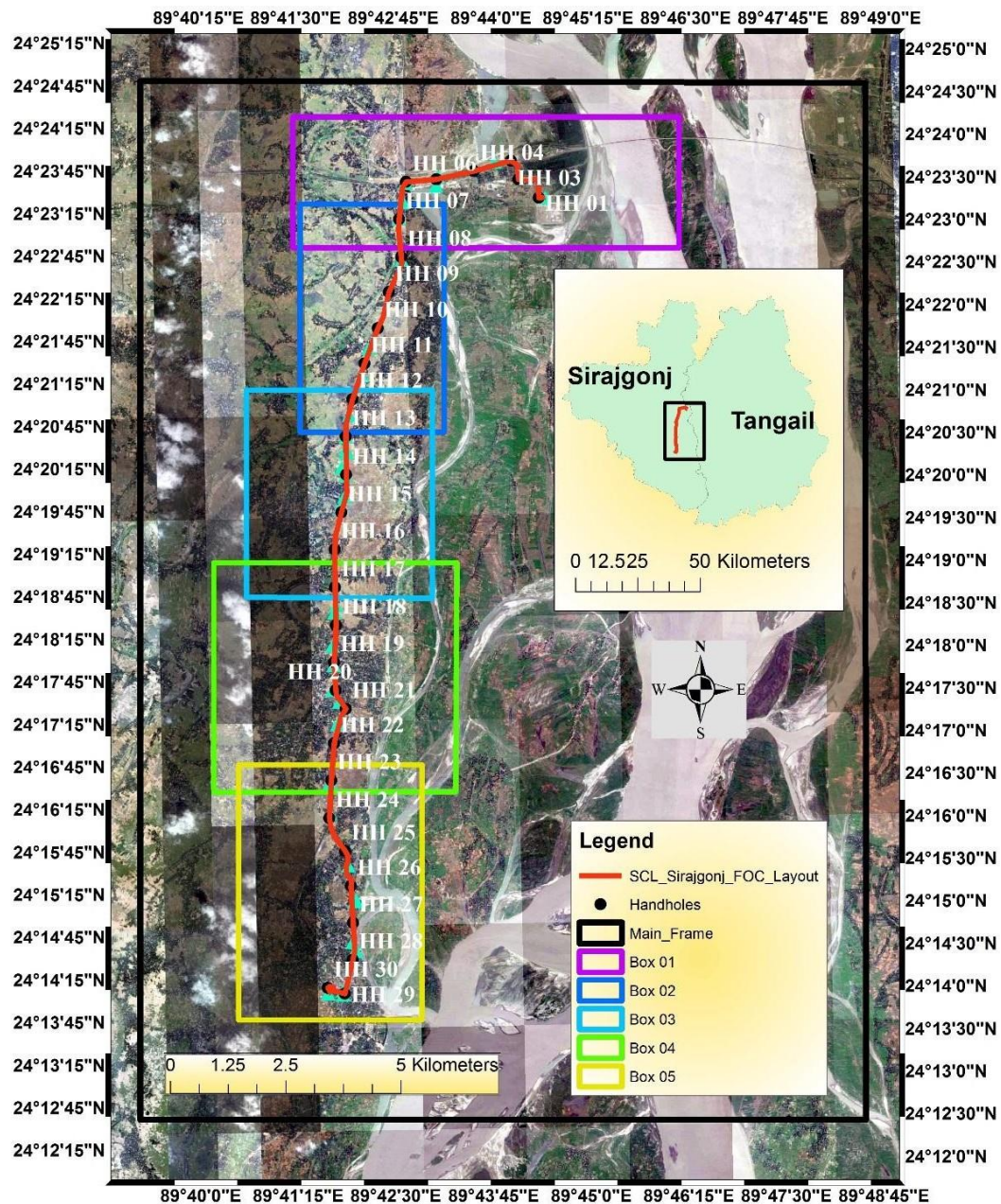


Figure B-1: Layout of Fiber Optic Cable from Sirajgonj PGCB to Enayetpur Robi tower.

5. Does the work package involve :

- | | | |
|---------------------------|------------------------------|--|
| (e) Railway crossing | ☐ Yes | ☒ No |
| (f) Road crossing | ☐ Yes | ☒ No |
| (g) Stream/River crossing | ☐ Yes | ☒ No |
| (h) Bridge Crossing | ☐ Yes | ☒ No |

6. Land ownership and permissions :

- | | | |
|---|------------------------------|--|
| (f) Will land acquisition be used? | ☐ Yes | ☒ No |
| (g) Names of the govt. agencies owning the land | :NA | |
| (h) Area of land to be used(acre) | :NA | |

7. Baseline Environment:

The Belkuchi upazila under Sirajgonj district occupies an area of 158.87 sq. km. It lies between 24°13' and 24°22' north latitudes and between 89°37' and 89°47' east longitudes. The upazila is bounded on the north by Kamarkanda upazila, on the east by Tangail Sadar and Kalihati upazilas of Tangail zila, on the south by Shahjampur and Chowhaliupazilas and on the west by Ullahpara and Kamarkhanda upazilas. Total population is 367337 of which 180200 female. Total household is 74450 and household size 4.72 with population density of 2221 person per sq. km. Urbanization is 21.36%, literacy rate is 45.7% and school attendance (5 to 24 years) is 46.7%.

The fiber optic cable route was along the roadway alignment and the area surrounding the route consisted of infrastructures like educational institutions, offices (both private and public), hospitals, religious institutions, police station, and residential buildings. Fiber optic cable laying from handhole 04 to 06, falls along the Jamuna Bridge Approach Road which is about 110 ft in width, while rest of the layout roadways have a width of about 20 ft. The detail alignments of individual zones along with significant physical infrastructures are presented in Figures B-2 to B-12.

Inventory of major features along the road of fiber optic cable layout of the proposed sub project area are provided in Table B-1

Table B-1: Inventory of major physical features along the proposed fiber optic line in Sirajgonj

Hand-hole No	Socio-economic Features		Note
	Features	Number (approx.)	
1 to 5	House (tin-shed)	4	Land owned by RHD
	Small shop (Tong)	30	

Hand-hole No	Socio-economic Features		Note
	Features	Number (approx.)	
	Mosque	2	Land owned by RHD. Flora planted by RHD but mango tree, bamboo and banana by local people.
	Water-bodies (pond)	2	
	Flora	Acacia	
		Eucalyptus	
		Mango	
		Koroi	
		Sisu	
		Jackfruit	
		Shimul	
		Bamboo	
		Banana	
6 to 30	House (tin-shed)	0	Along road no house but water- body side has few house not more than 20.
	Small shop (Tong)	100+	Both side of the road. Land owned by RHD.
	Mosque	5	Land owned by RHD. Flora planted by RHD but mango tree, bamboo and banana by local people.
	Shashan	3	
	Water-bodies (pond)	10+	
	Flora	Acacia	
		Eucalyptus	
		Mango	
		Koroi	
		Sisu	
		Jackfruit	
		Shimul	
		Fig / Bot	
		Bamboo	
		Banana	

A remarkable number of planted exotic trees are available on both side of the road, owned by the Roads and Highway Department. A Few single shops and local markets were also observed along the road. Most of the people seem to be Muslim. Paddy cultivation continues along the roadside low land while fish culture was also observed along the roadside water-bodies. Local transports run frequently over the paved road. Electric line is available here, though sanitation system seems to be very poor and no pipe gas line connection is available either. A Few tube wells serve as drinking water source. Medicine shop and a clinic on a market as well as school, college, religious institutions were also observed along the road. Cattle and poultry seem to be a good earning source of the local people besides agro-product.

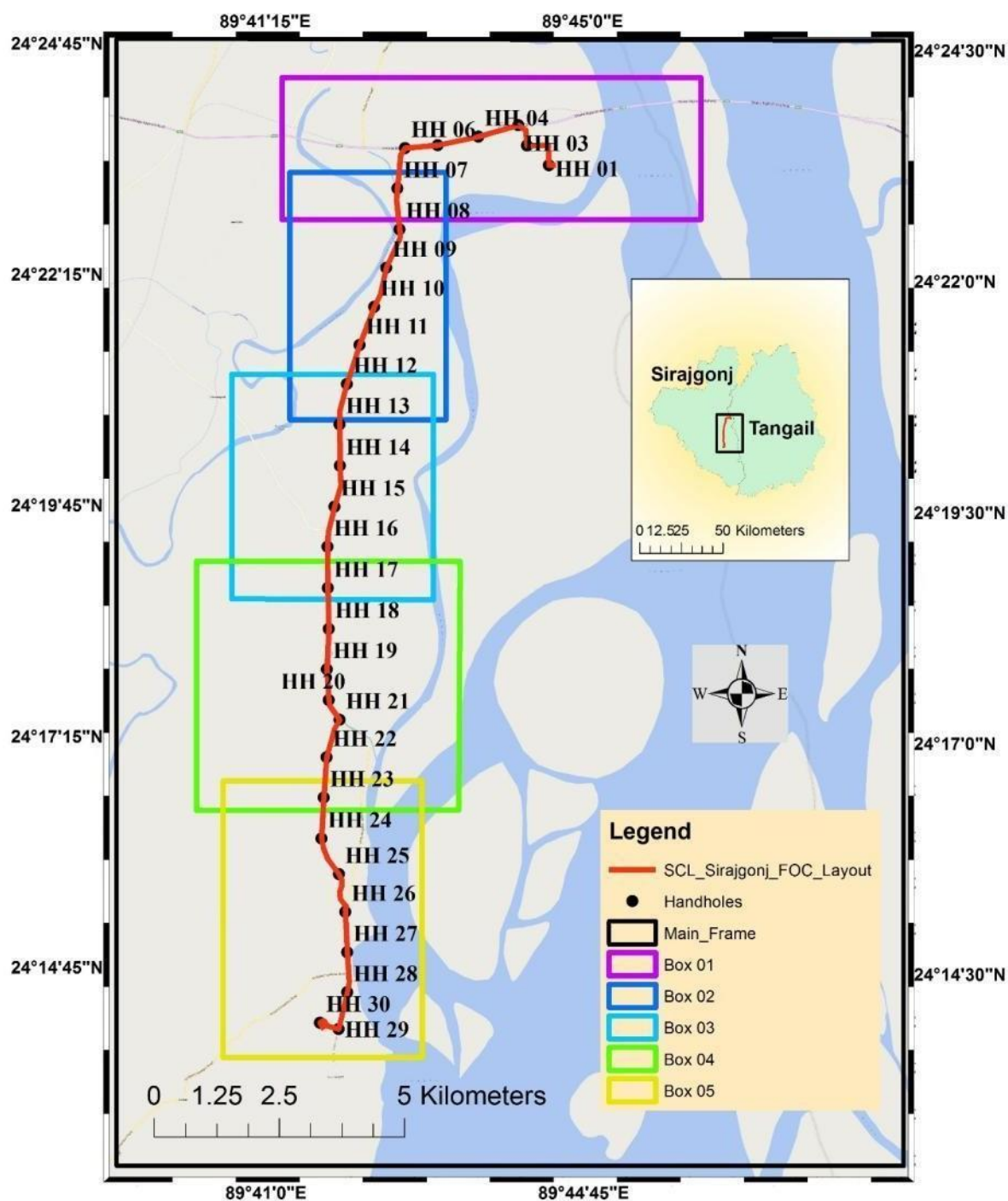
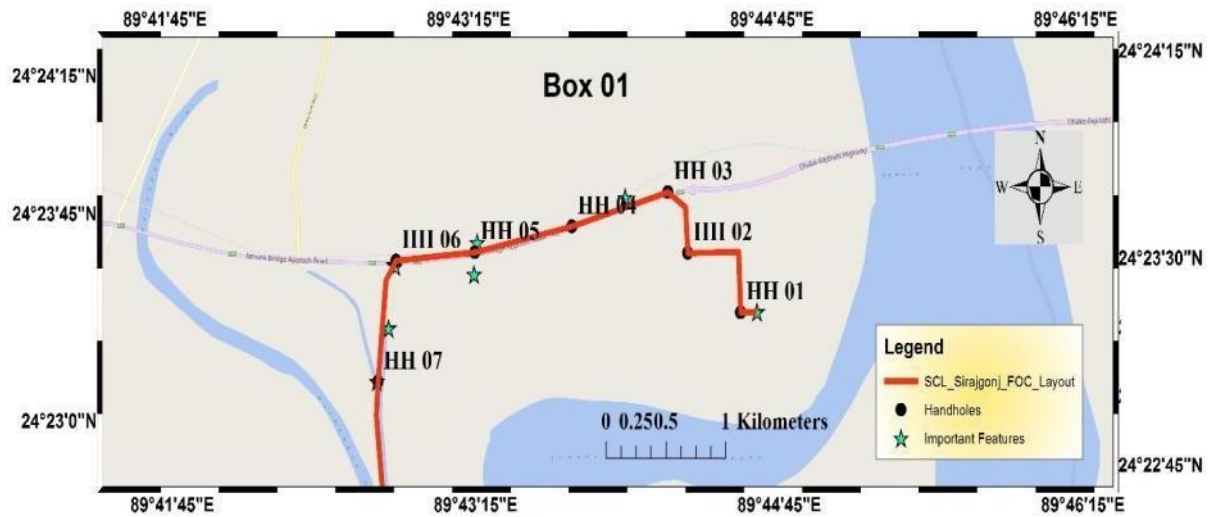
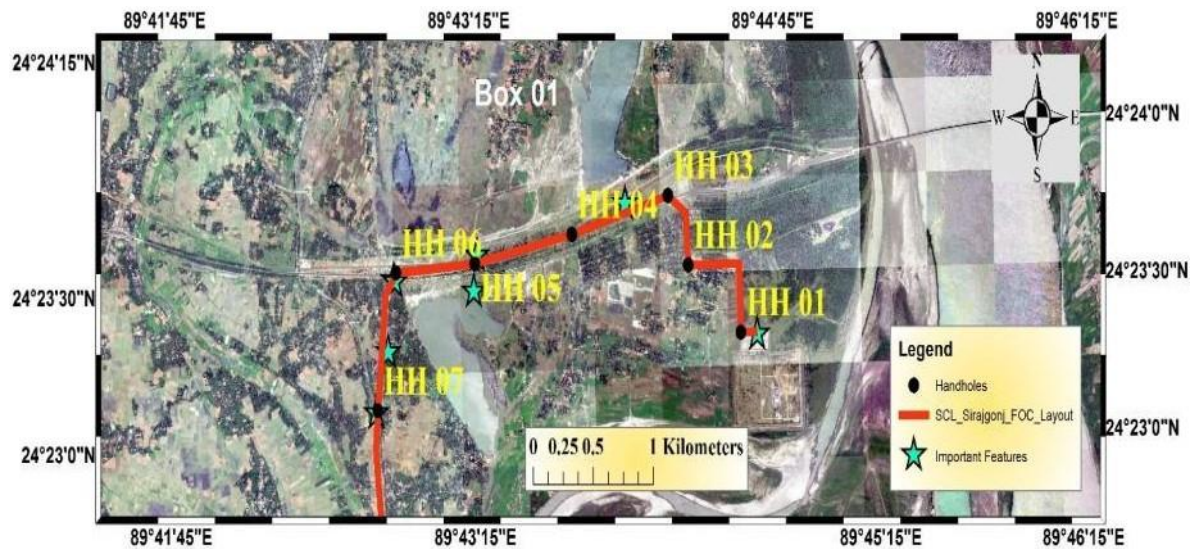


Figure B-2: Map showing fiber optic cable routes in the Sirajgonj PGCB substation to EnayetpurRobi Telecom tower. The fiber optic cable route has been divided into five areas as indicated using boxes in the figure.



(a)

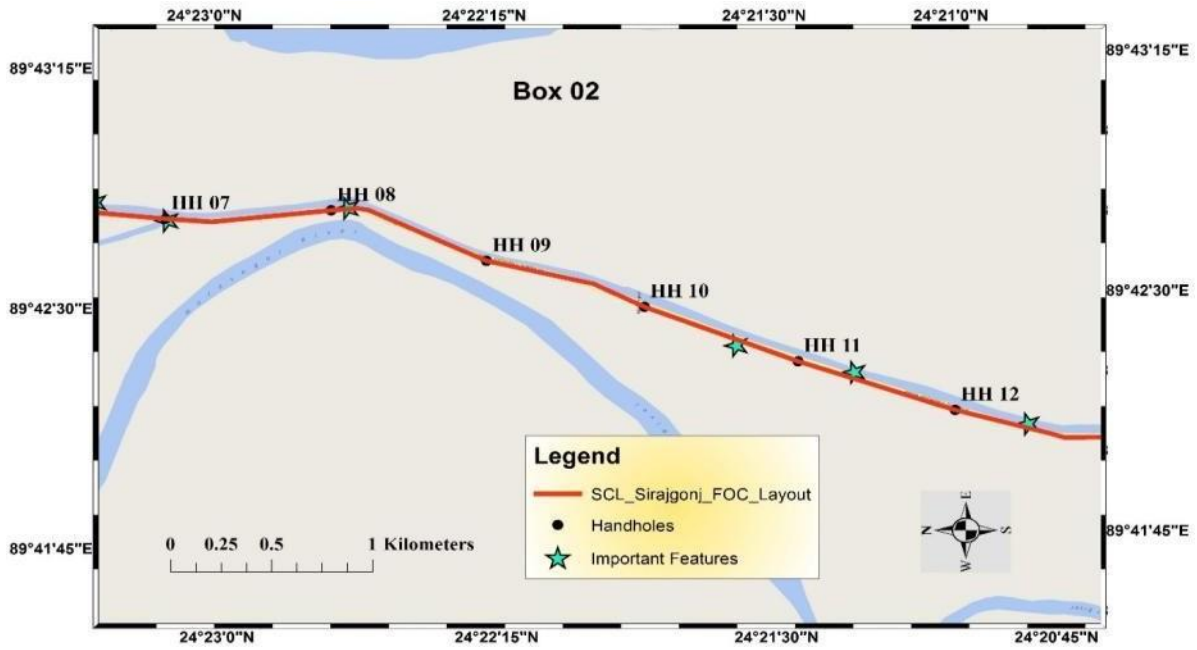


(b)

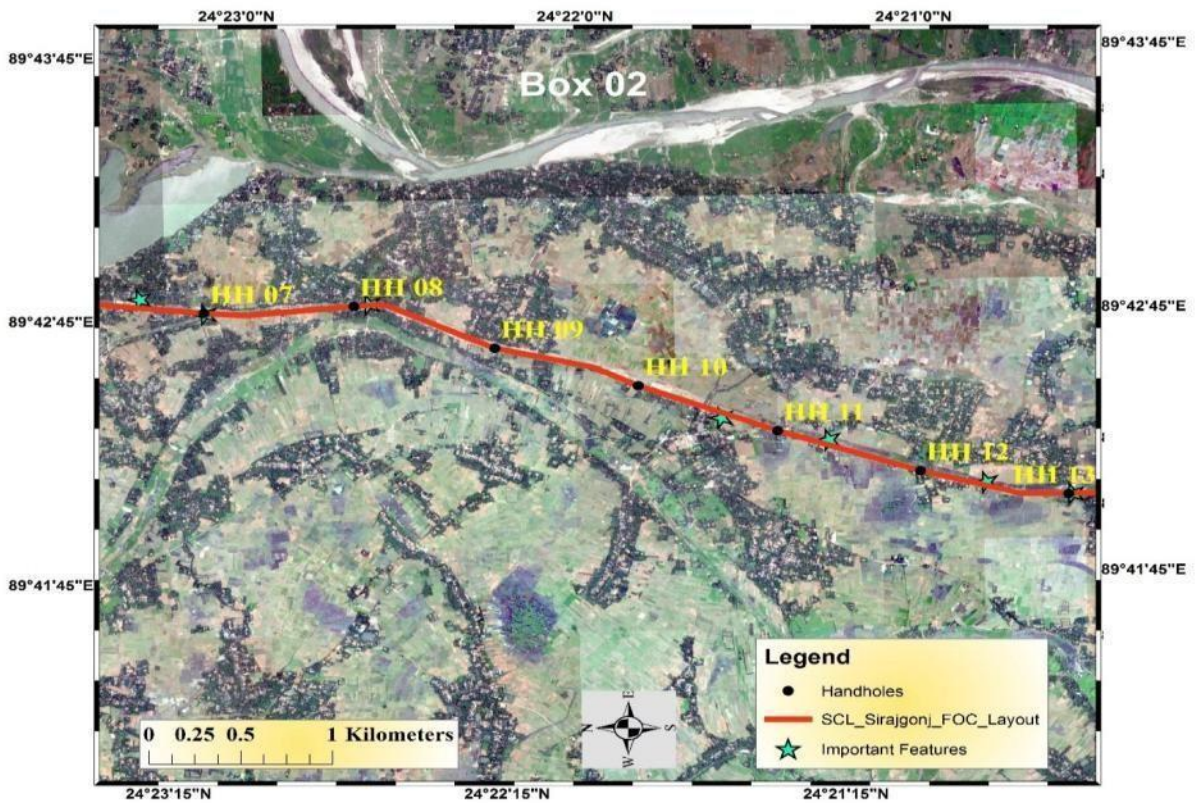
Figure B-3: (a) Map of Box Area 01 of proposed fiber optic cable route; (b) Satellite image of Box Area 01 showing proposed fiber optic cable route



Figure B-4: Important physical infrastructures located around box area 01 in Sirajgonj.



(a)



(b)

Figure B-5: (a) Map of Box Area 02 of proposed fiber optic cable route; (b) Satellite image of Box Area 02 showing proposed fiber optic cable route

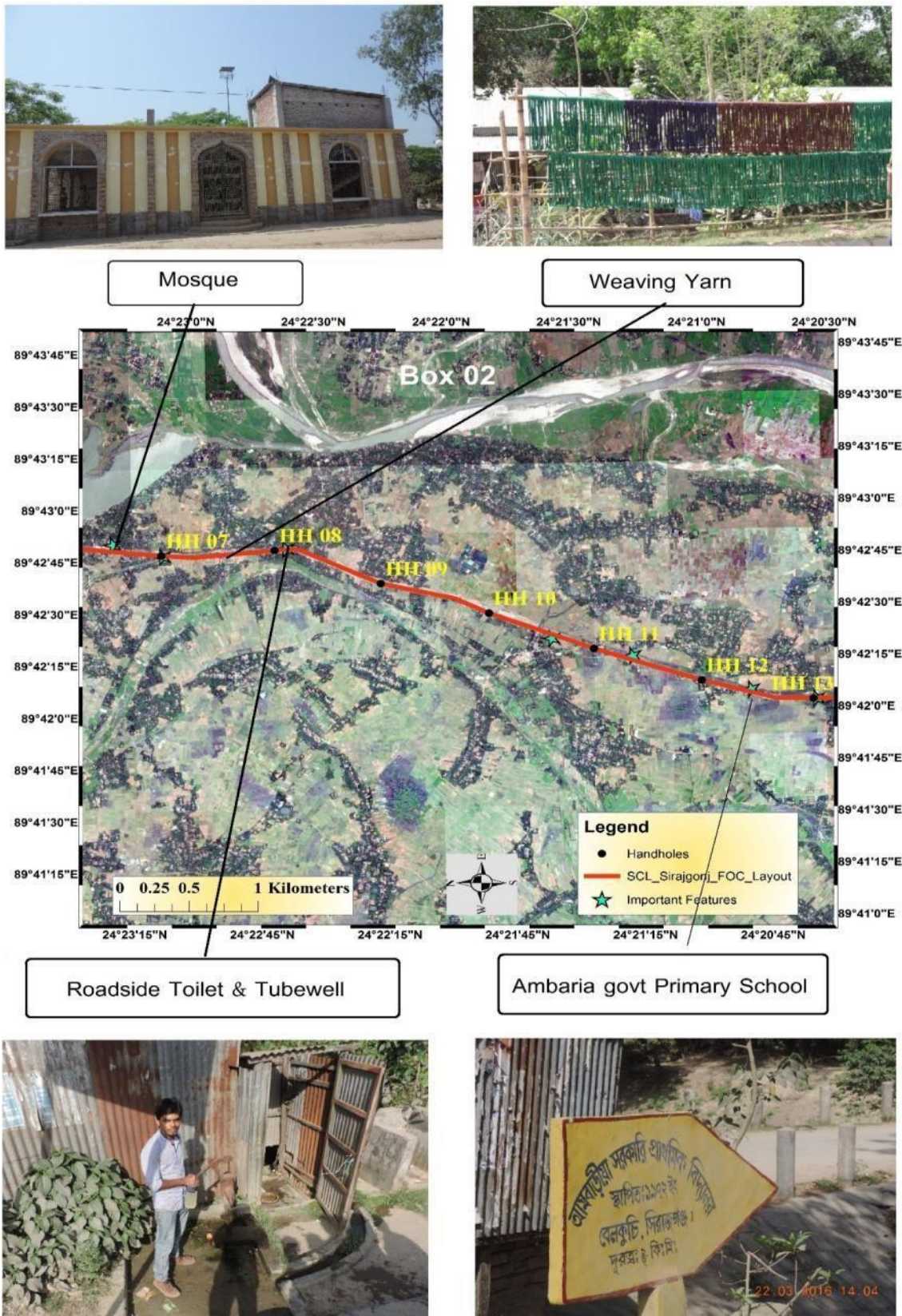
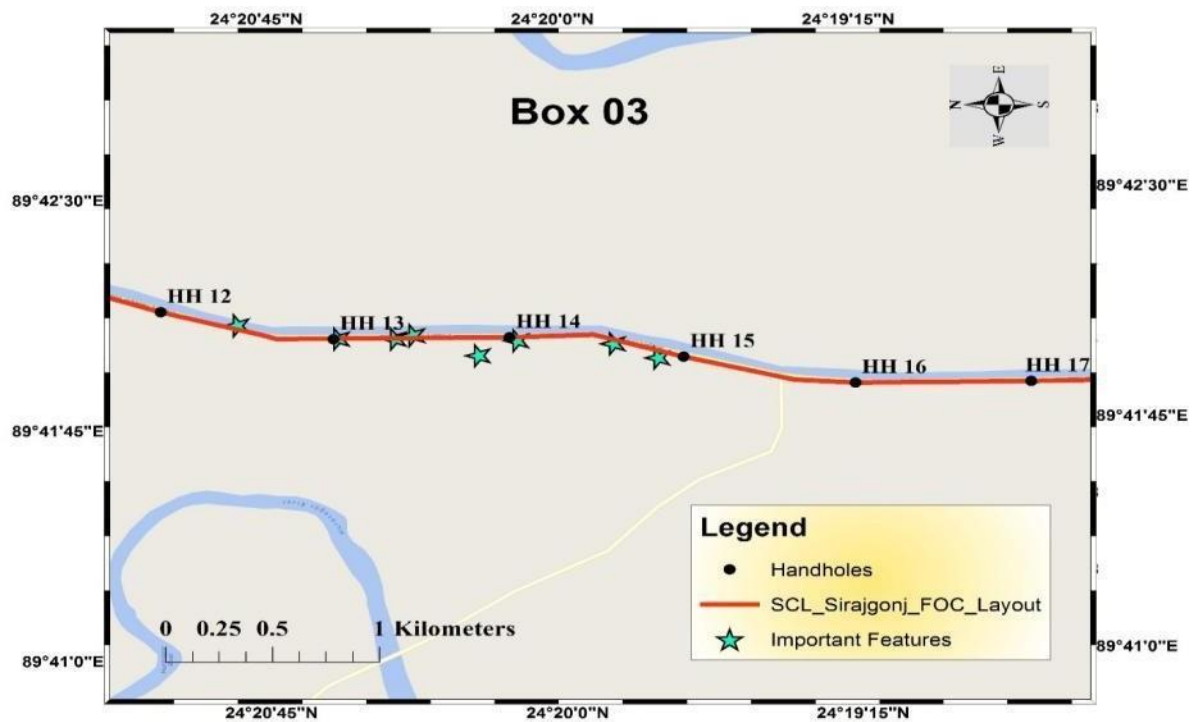
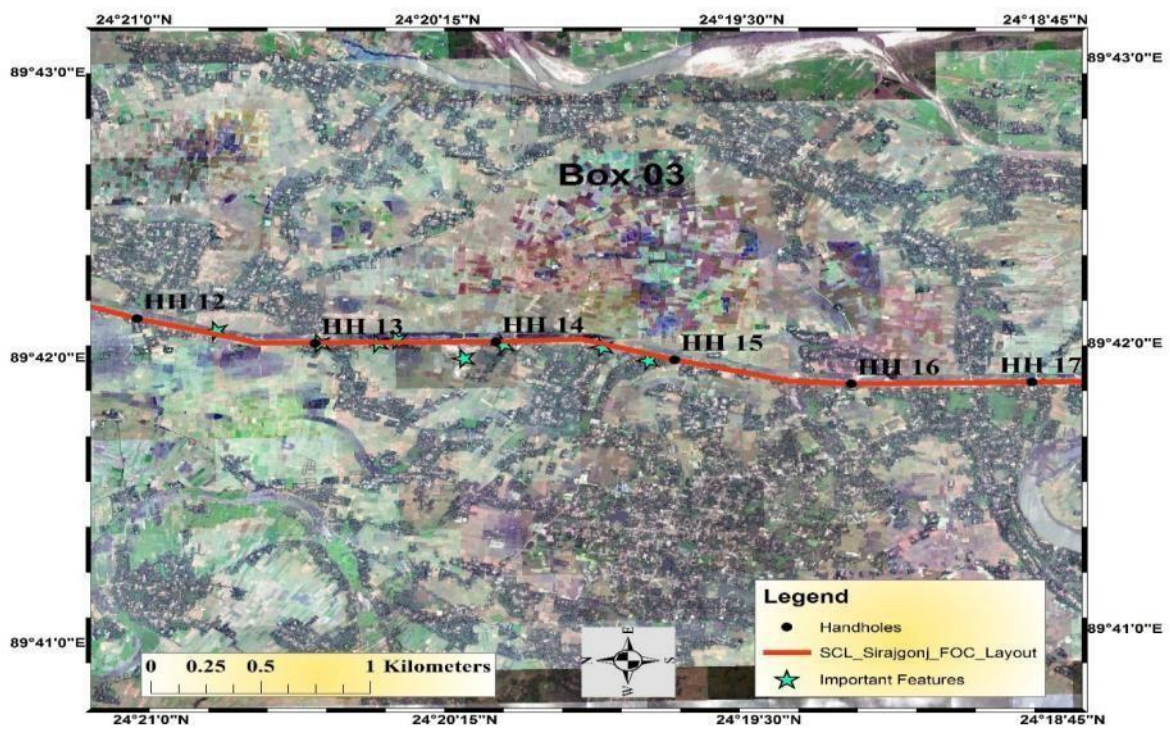


Figure B-6: Important physical infrastructures located around box area 02 in Sirajgonj.



(a)



(b)

Figure B-7: (a) Map of Box Area 03 of proposed fiber optic cable routes; (b) Satellite image of Box Area 03 showing proposed fiber optic cable route.

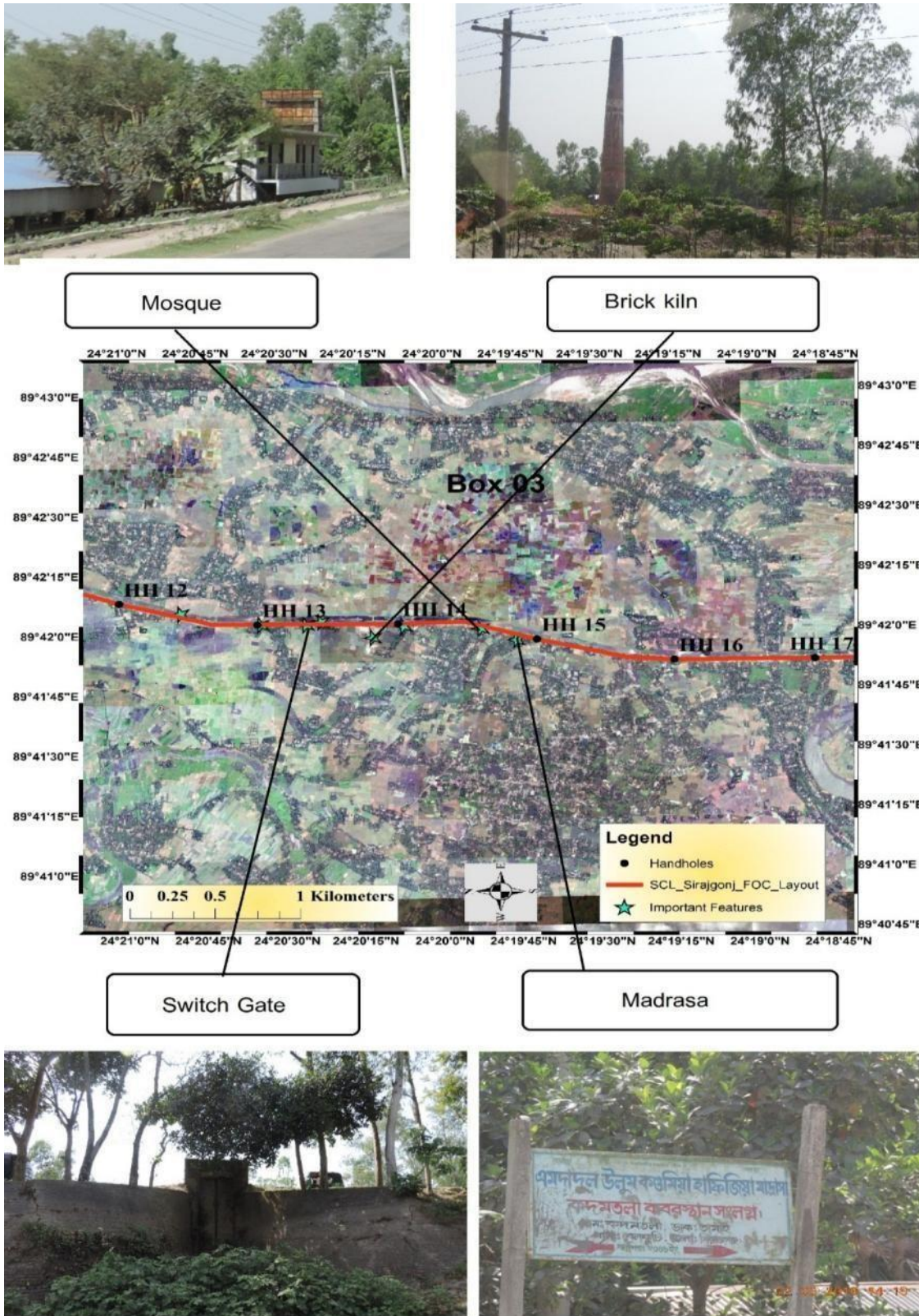
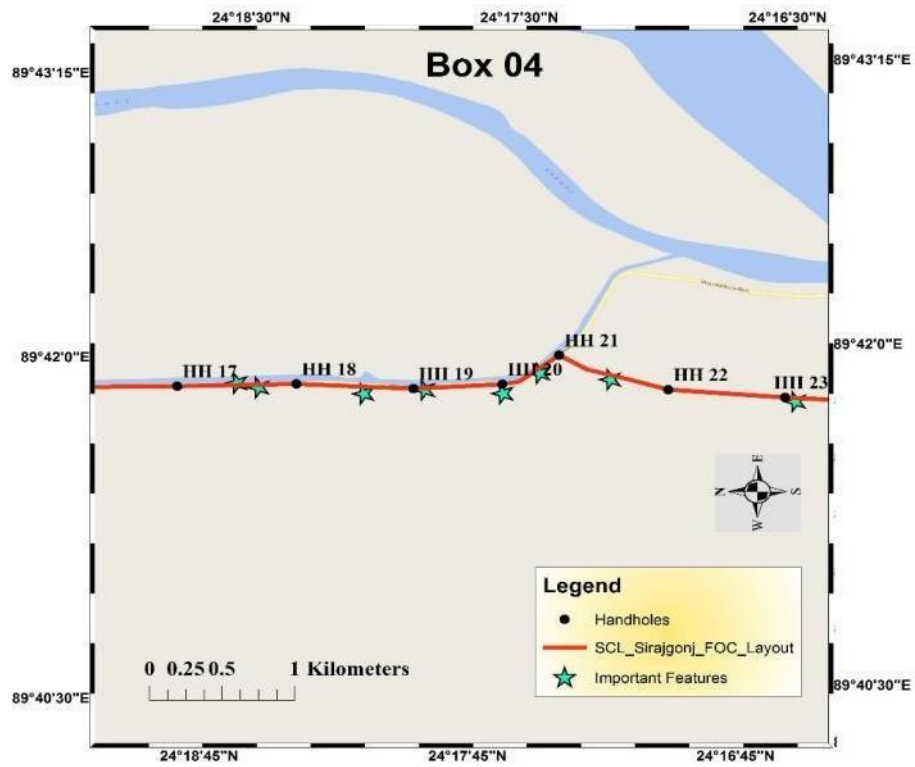
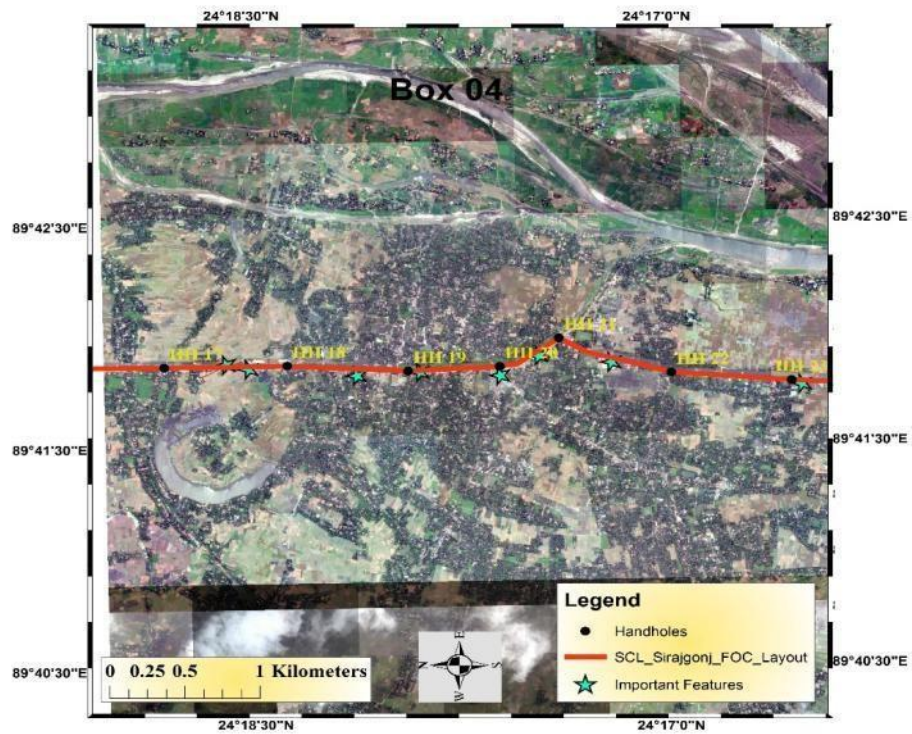


Figure B-8: Important physical infrastructures located around box area 03 in Sirajgonj.



(a)



(b)

Figure B-9: (a) Map of Box Area 04 of proposed fiber optic cable route; (b) Satellite image of Box Area 04 showing proposed fiber optic cable route.

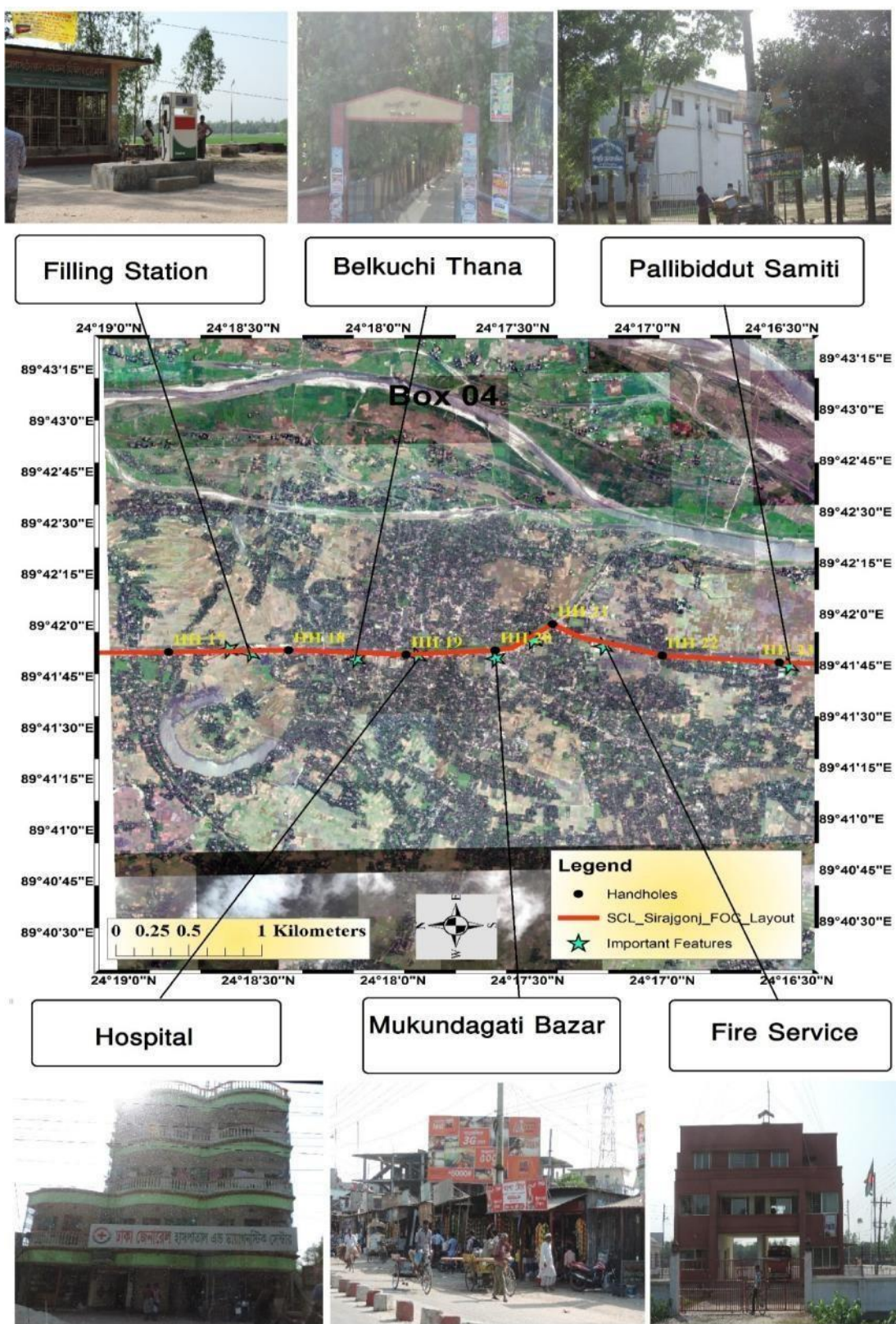
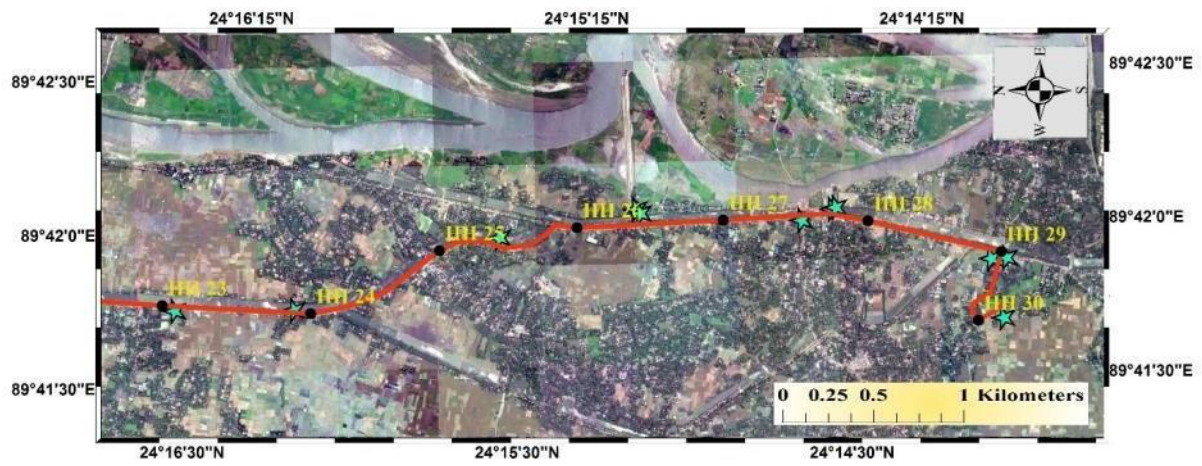


Figure B-10: Important physical infrastructures located around box area 04 in Sirajgonj.



(a)



(b)

Figure B-11: (a) Map of Box Area 05 of proposed fiber optic cable route; (b) Satellite image of Box Area 05 showing proposed fiber optic cable route.

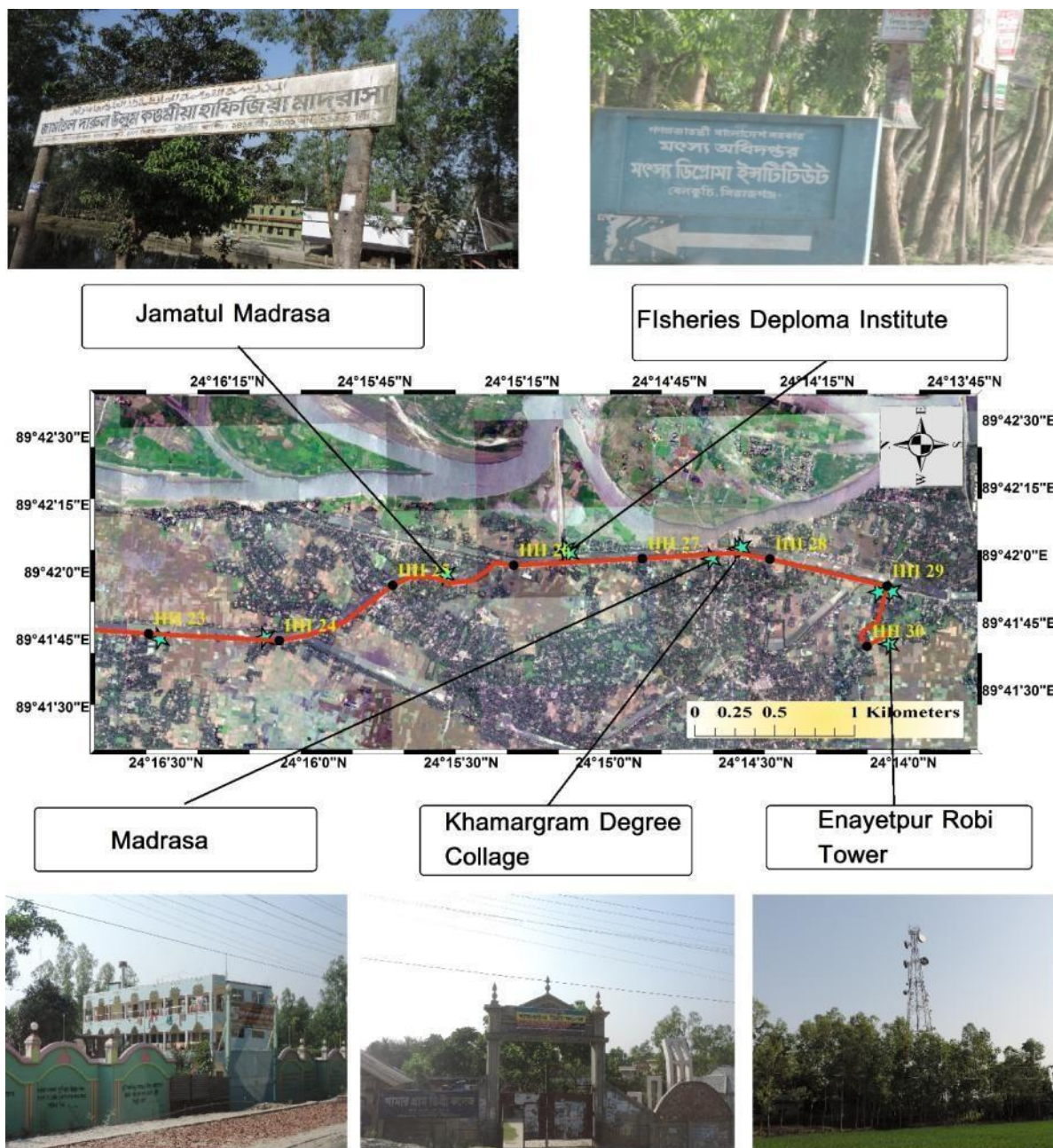


Figure B-12: Important physical infrastructures located around box area 05 in Sirajgonj.

Climate

Different meteorological data like solar radiation, relative humidity, ambient temperature and rainfall measured in these stations during the period April, 2014 to March, 2015 are summarized in Table B-2.

Table B-2: Monthly averages of climatic variables at CAMS-4 at Gazipur nearest to the Sirajgonj Sub-project area, April, 2014 to March 2015.

Parameter	Month											
	Apr, 14	May, 14	Jun, 14	Jul, 14	Aug, 14	Sep, 14	Oct, 14	Nov, 14	Dec, 14	Jan, 15	Feb, 15	Mar, 15
Solar radiation, 1hr (watt/m ²)	242	199	166	188	157	185	188	158	115	131	166	218
Relative Humidity 1 hr (%)	61.9	73.1	85.2	83.9	91.2	84.2	77.7	74.9	83.4	76.8	70.2	60.5
Ambient Temp. 1 hr (°C)	32.4	31.2	28.7	28.9	28.2	28.5	27.2	23.6	18.2	18.3	21.3	25.2
Rainfall 1 hr (mm)	0.05	0.08	0.17	0.11	0.19	0.13	0.07	0.03	DNA*	0.08	0.06	0.03

DNA= Data Not Available, *=DNA due to malfunction of the analyzer/sensor

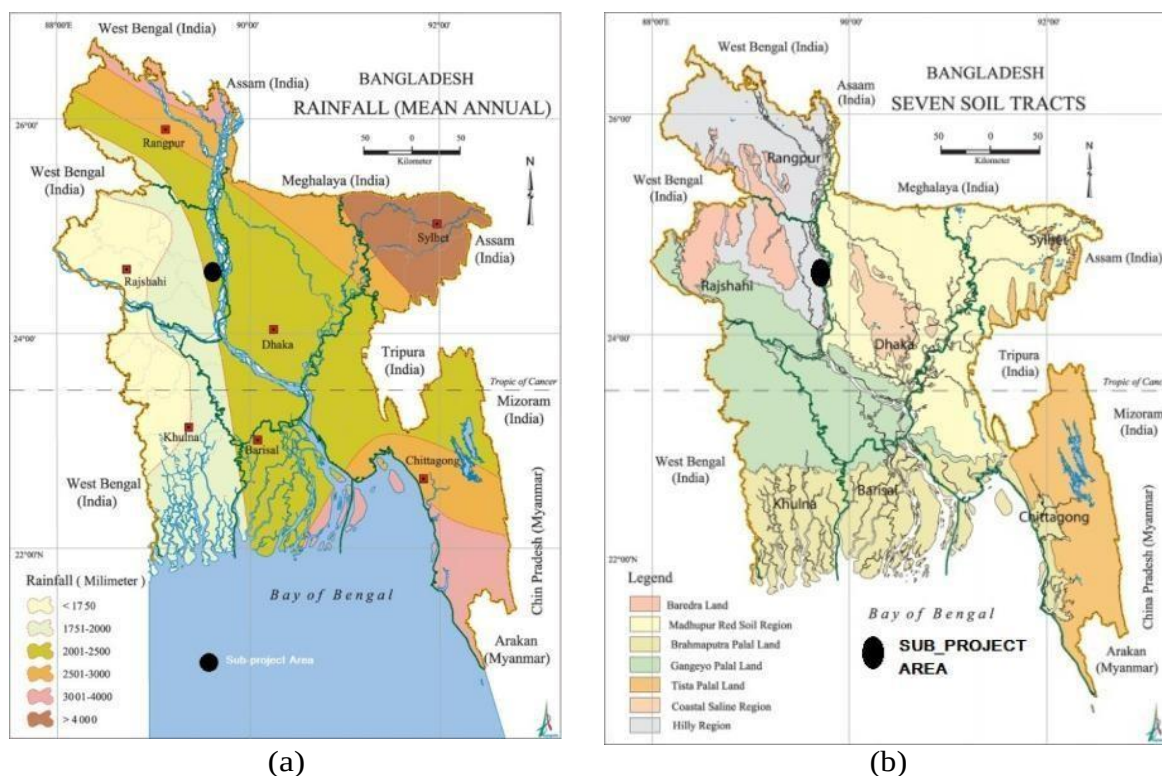


Figure B-13: The locations of Sirajgonj sub-project area on (a) the mean annual rainfall, (b) the seven soil tracts map of Bangladesh. (Map source: www.banglapedia.org)

Soil, Seismicity and Flood Risk

The soil formation of Sirajgonj sub project area lies on Hill tracts of the Garo Hills of the former greater Mymensingh district. Hill Tracts cover an area of around 15,000 sq km. The soils consist of hard red clay with a mixture of

fine sand of the same colour and nodules containing a large percentage of sesquioxides. The soils are moderately to strongly acidic. The soils are highly leached and have a low natural fertility. Hills are mainly under natural and plantation forests. Shifting cultivation is practiced in some places. Sirajgonj sub-project area falls in earthquake zone II. Figure B-14 shows the locations of the sub-project area in the seismic map of Bangladesh. The fiber optic cable sub-project area falls in river/ monsoon flood area of Bangladesh. Figure B-14(b) shows the positions of sub-project over the flood risk map of Bangladesh.

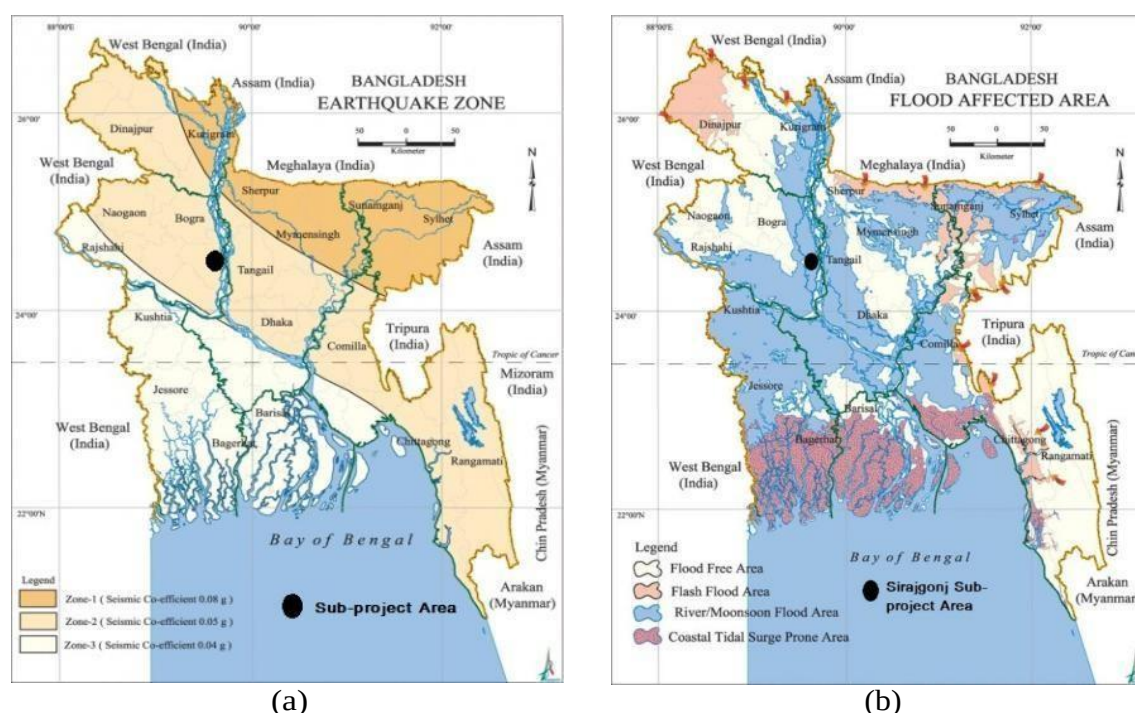


Figure B-14: Locations of Sirajgonj sub-project area on the (a) the seismic map, (b) the flood risk map of Bangladesh (map source: www.banglapedia.org)

Air Quality

CAMS-4 located in Gazipur district can represent the air quality in the subproject site. Different ambient air quality data such as SO₂(24 hrs), NO₂ (24 hrs), CO (1 hr), CO (8 hrs), O₃ (1 hr), O₃ (8 hrs) PM_{2.5} (24 hrs), and PM₁₀(24 hrs) measured monthly in these CAMS during the period of April, 2014 – March, 2016 are summarized in Table B-3.

Table B-3: Monthly air quality monitoring monthly average data from the CAMS located at Gazipur for the time period of November 2012–October 2013. The air quality parameters monitored are (a) SO₂- 24hr, (b) NO₂- 24hr, (c) CO-1hr, (d) CO-8hr (e) O₃-1hr, (f) O₃-8hr, (g)PM_{2.5}- 24hr, (h) PM₁₀- 24hr.

Parameter	Monthly Average											
	Nov, 12	Dec, 12	Jan, 13	Feb, 13	Mar, 13	Apr, 13	May, 13	Jun, 13	Jul, 13	Aug, 13	Sep, 13	Oct, 13
SO ₂ 24 hr (ppb)	0.61	1.11	8	22.2	17.4	6.88	6.74	4.21	2.2	2.61	8.02	9.04
NO ₂ 24 hr (ppb)	8.88	6.59	10.8	12.9	11.1	15.7	14.8	12	10	12.4	48.2	35.6
CO- 1 hr (ppm)	0.93	1.38	2.29	2.16	2.11	1.7	1.54	1.17	1.07	DNA*	DNA*	1.28
CO 8 hr (ppm)	0.92	1.41	2.3	2.15	2.09	1.7	1.54	1.08	1.03	DNA*	DNA*	1.02
O ₃ 1 hr (ppb)	9.62	8.07	14.15	21.47	17.65	10.67	10.57	9.35	14.6	12.5	24.5	1.6
O ₃ 8 hr (ppb)	10.2	8.67	14.6	21.6	17.9	10.8	10.7	9.4	14.7	12.5	24.5	1.7
PM _{2.5} 24hr (µg/m ³)	115.64	164.66	220.9	147.4	130.8	68.4	28.34	33	19	25.5	44.4	43.8
PM ₁₀ - 24hr (µg/m ³)	150.89	206.6	302.4	240.5	232.3	125.8	38.58	51.7	30.7	41.3	63.4	64.4

DNA= Data Not Available

The salient features of the monthly air quality monitoring data represented in Table B-3 are as follows,

- Concentration of SO₂ and NO₂ are higher from November to February in the sub project area. From the observed data set, the average concentration of SO₂ and NO₂ is lower than the National Ambient Air Quality Standard value.
- Particulate matter concentrations varied throughout the year with the maximum concentration of PM_{2.5} and PM₁₀ recorded during the period of November to March. The average concentration of PM_{2.5} and PM₁₀ was higher than the annual national ambient air quality standard value.

Noise level

Table B-4 shows that noise levels at several locations in Sirajgonj sub- project area are often high during daytime with Leq exceeding 85-95. This is

due to noise associated with vehicular movement and dense gathering of people.

Table B-4: Noise level measurements during daytime at selected locations

Location	Noise level measurement locations	Latitude	Longitude	Equivalent Noise level (dBA), L_{eq}	Maximum Noise level (dBA), L_{max}
Sirajgonj PGCB to EnayetpurRobi Tower	Saydabad More	N 24°23'32.3"	E 89°42'49.5"	78.2	92.8
	Mosque	N 24°19'51.7"	E 89°42'0.8"	53.6	93
	Mukundagati Bazar	N 24°17'38.3"	E 89°41'50.7"	66.7	86.3
	Sohagpur Bazar	N 24°14'1.8"	E 89°42'1.2"	62	84.1
	Enayetpur Bazar	N 24°14'1.6"	E 89°41'52.9"	73.5	92.6

[Note: The equivalent level is the level (L_{eq}) of a hypothetical steady sound that would have the same energy (i.e., the same time-averaged mean square sound pressure) as the actual fluctuating sound observed. The equivalent level represents the time average of the fluctuating sound pressure and is close to the maximum level observed during the measurement period. For the fluctuating noise scenario the equivalent noise level (L_{eq}) is generally used for more complete noise sample and is calculated as follows:

$$L_{eq} = 10 \log \left[\sum_{i=1}^n P_i 10^{L_i/10} \right]$$

Where P_i is the probability of the noise level lying in the i -th measurement interval and L_i is the mid-point of that interval.]

Table B-5: Bangladesh standards for sound level (GoB, 2006)

Locations	Noise level (dBA) at day	Noise level (dBA) at night
Silent zone	50	40
Residential area	55	45
Mixed area	60	50
Commercial area	70	60
Industrial area	75	70

Table B-6: Noise Level Guidelines Measure Out of Doors. (Guidelines for Community Noise, WHO, 1999)

Receptor	One Hour L_{Aeq} (dBA)	
	Daytime 07:00 – 22:00	Nighttime 22:00 – 7:00
Residential, institutional, educational	55	45
Industrial, commercial	70	70

Note: For acceptable indoor noise levels for residential, institutional, and education settings refer to WHO (1999)

Water Quality

Table B-7 and Table B-8 shows water sampling locations and the characteristics of the groundwater in the study area respectively. The groundwater quality mostly showed compliance with drinking water standards except the color value. This might be due to the presence of high iron content in water.

Table B-7: Water (both ground and surface) sampling locations

Location	District/Division	Sample ID	GW Sampling Location	Latitude	Longitude
Sirajgonj PGCB to Enayetpur Robi Tower	Sirajgonj/ Rajshahi	GW	Deep tubewell	N 24°22'37.9"	E 89°42'47.8"
	Sirajgonj/ Rajshahi	SW	Pond	N24°21'16.9"	E 89°42'14.4"

Table B-8: Analysis of drinking water samples collected at the study area

Sampling locations	Sirajgonj (GW)	WHO drinking water guidelines	Bangladesh drinking water standards
pH	8.58	6.5 – 8.5	6.5 – 8.5
Color (Pt-Co Unit)	23	15	15
Turbidity (NTU)	6.77	5	10
Total Hardness as CaCO ₃ (mg/L)	92	500	200 - 500
Fe (mg/L)	0.26	0.3	0.3 – 1.0
Mn (mg/L)	0.009	0.4	0.1
As (ppb)	4.2	10	50
Cl ⁻ (mg/L)	33.8- 35.3	250	150 - 600
TC	17	0	0
FC	13	0	0
TDS (mg/L)	110	1000	1000

Note: ** Ground water is typically TC/FC free but contamination can happen if ground level seal is not properly done.

The main surface water environment in the study area includes ponds, lowlands and ditches. Pond water is often used for drinking in rural areas while it serves other purposes (washing, bathing etc.) due to longer periods of water retention. An analysis of a pond water sample in the study area is shown in Table B-9. The results indicate that there is no significant organic pollution in any of the surface water resources as the BOD, COD, Ammonia and Nitrate values are relatively low. The Bangladesh Standards for inland surface water bodies are given in Table B-10 (ECR, 1997)

Table B-9: Analysis of surface water samples collected at sub-project

Location	concentration in surface water
pH	7.25
Color (Pt. Co Unit)	203
Cl ⁻ (mg/L)	35.3-37.2
COD (mg/L)	0.8
BOD ₅ (mg/L)	4
NO ₃ -N (mg/L)	0.8
NH ₃ -N (mg/L)	0.689
PO ₄ ³⁻ (mg/L)	0.164
TDS (mg/L)	170
TSS (mg/L)	17

Note: EC= Electrical Conductivity, COD= Chemical Oxygen Demand, BOD= Biochemical Oxygen Demand, TDS= Total Dissolved Solids, TSS= Total Suspended Solids

Table B-10: Bangladesh Standards for Inland Surface Water Bodies (ECR, 1997)

Best Practice Based Classification	Parameter			
	pH	BOD (mg/L)	DO (mg/L)	Total Coliform (CFU/100ml)
a. Source of drinking water for supply only after disinfecting	6.5-8.5	2 or less	6 or above	50 or less
b. Water usable for recreational activity	6.5-8.5	3 or less	5 or more	200 or less
c. Source of drinking water for supply after conventional treatment	6.5-8.5	6 or less	6 or more	5000 or less
d. Water usable by fisheries	6.5-8.5	6 or less	5 or more	---
e. Water usable by various	6.5-8.5	10 or less	5 or more	5000 or less

process and cooling industries				
f. Water usable for irrigation	6.5-8.5	10 or less	5 or more	1000 or less

Ecological Environment

Bio-ecologically this segment site of the proposed sub-project falls under Ganges floodplain (IUCN-BD, 2002) and agro-ecologically it falls under Karatoya-Bangali Floodplain (Figure B-15). The calcareous grey floodplain soil / calcareous brown floodplain soil is the prime soil characteristic of the site, which provides habitat for growing certain type of flora in which local adaptive fauna make relationship through their ecological niche. The study site has some roadside floral species that provide habitat for certain type of adapted faunal species. Almost all of these floral species were planted by the Roads and Highways (RHD) Department. Few native floral species were observed beside the road. Water-bodies beside the road provide habitat for aquatic flora and fauna with native fish. No migratory birds were observed during the field study. There are also no protected areas, game reserves, national park and ecologically critical areas in the site of the sub-project.

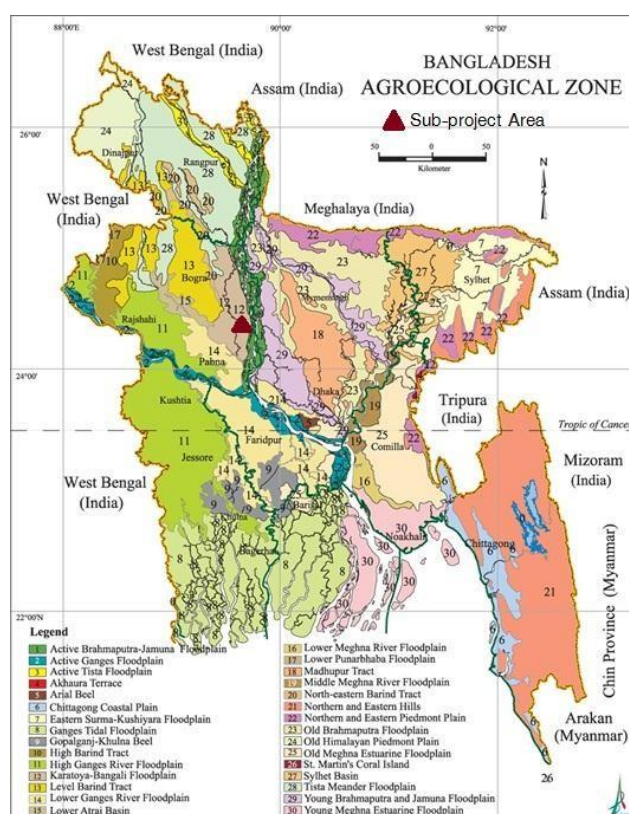


Figure B-15: Locations of Sirajgonj sub-project area on the agro-ecological zone map of Bangladesh (map source: www.banglapedia.org)



(a)



(b)

Figure B-16: Roadside terrestrial flora observed that exist within and adjacent to the segment site of the proposed fiber optic network project, (a) mature native fig tree, (b) long grass grows naturally beside a road.



(a)



(b)

Figure B-17: Roadside aquatic flora observed that exist along the water-bodies, adjacent to the segment site of the proposed fiber optic network project: (a) kachuripana (water hyacinth), fully covered the roadside water-bodies, (b) Topapana, fully covered the roadside water-bodies.



(a)



(b)

Figure B-18: Roadside terrestrial fauna observed that exist within and adjacent to the segment site of the proposed fiber optic network project: (a) Asian Pied Starling walking beside a roadside water-body, and (b) Common Myna walking on soil beside a road.

8. Key activities of sub-project :

- Collection of permission from relevant authorities (i.e. LGED, RHD)
- Mobilization of construction equipments and manpower facilitating by storing Duct, Cable, HDD machine, Cable blowing machine and other necessary requirements for the project in the site.
- Construction of ancillary facilities ("handholes" for cable splicing) and control stations (point of connectivity (PoC)) to house the drop points from PGCB towers.
- Pulling and splicing of the communications cable through the conduit and any necessary final restoration and cleanup operations.
- Pit cutting for the purpose of HDD operation and handhole construction.
- Application of horizontal directional boring to carry out the underground fiber optic cable laying operation for installation of HDPE ducts.
- Mobilization of construction equipment and manpower.

9. Estimated cost of sub-project : 28 Million BDT

10. Schedule of implementation :

- | | |
|-------------------------------|--------------|
| (a) Sub-project duration | : 1.5 Months |
| (b) Tentative start date | : TBD |
| (c) Tentative completion date | : TBD |

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ANALYSIS OF ALTERNATIVES

Analysis of alternative routes:

SCL will carry out the HDD work from one handhole to next consecutive handhole as a single segment. The standard practice of the length per drill/segment is usually 800 meter with a variation of ± 50 m. However in several locations, alteration to the standard practice has been made considering the local scenario. These are summarized in Table B-11

Table B-11: Alternate positions and segment lengths adopted and their justification

Alternative Routes adopted	Advantages/ Considerations	Disadvantages/ Considerations
Distance of Handhole no 02 is 1274m from handhole 01 (>800 m as per standard practice)	There are no important features within the length, so a larger length is preferable Less handhole requirement will lessen cut and fill and civil works. Consequently, less environmental impacts More economical	
- Handhole 06 at Sayedabad More at a distance 661m from handhole 05 - Handhole 20 at Sayedabad More at a distance 616m from handhole 19 - Handhole 21 at Sayedabad More at a distance 463m from handhole 20 - Handhole 29 at Sayedabad More at a distance 652m from handhole 28	Changing of direction Avoiding roadside Entities, less impacts (environmental and social) Avoiding Important features like mosque, cutting of trees, road side vendors. (less environmental and social impacts) handhole will be constructed away from crowded locations.	More Handholes is needed. Greater cost.

Analysis of alternative technologies/designs:

For underground lying of optical fiber lines, use of horizontal directional drilling (HDD) method may be adopted instead of traditional trenching operation for creating fewer disturbances in the surrounding environment. Sometimes during bridge crossing HDD might be more advantageous to clamping or vice versa depending on distance and geological formations. For the proposed project, HDD option was selected and the considerations are given below in Table B-12

Table B-12: Considerations for selecting the technology of installation of fiber optic cable by SCL

Technology/ Alternatives	Advantages	Disadvantages
Trenching	• Lower initial cost • Less excellence in operation implementation field.	• Rupture of trees, roadways, disruption of public entities, vendors • Difficult to avoid sensitive/physical cultural resources • High risk of conflict with other pipelines during trenching work • Cutting and filling will disrupt road way activities • Creates drainage congestion
HDD	• Avoids sensitive/physical cultural resources, private land, disruption of vendor activities as much as possible. • In a word least disruption of surrounding environment.	• Initial high cost • skilled personnel requirement during implementation.

Selected Technology/Design: HDD method

ENVIRONMENTAL /SOCIAL SCREENING OF OPTICAL FIBER LINE

Potential Environmental Impact During Construction Phase Checklist

Sl	Screening Questions	Yes	No	Not Aware	Remarks/ Possible Negative Impact and assessment (low/moderate/high)*
(a) Ecological impacts:					
1	Is the construction being carried out in an ecologically sensitive area?		✓		
2	Will the topsoil and vegetation be cleared as a result of the construction?	✓			Low Only at the location of the excavation of handholes. Majority of the route not affected as HDD method is adopted
3	Is there a possibility of fragmentation of natural flora or faunal habitats?				
(b) Physico-chemical impacts:					
4	Will dust and vibration-generating equipment be used?	✓			Moderate due to operation of the HDD equipment
5	Will the excavation/ trenching works and movement of vehicles generate air pollution?	✓			Low Only at the location of the excavation of handholes.
6	Will noise pollution be occurred during the operation?	✓			Moderate due to operation of the HDD equipment
7	Will fuel and/or hazardous goods be used in construction activities?	✓			Low Low quantities of Fuel will be used for HDD machine operation
8	Will fuel and/or hazardous substances be stored at the construction site?		✓		
9	Is there a possibility of discharging liquid effluent from the construction site?		✓		
10	Will construction materials be		✓		

Sl	Screening Questions	Yes	No	Not Aware	Remarks/ Possible Negative Impact and assessment (low/moderate/high)*
	stockpiled near surface waters, and natural water courses?				
11	Will construction activities affect the natural drainage pattern of the site (e.g. filling up low-lying land)?		✓		
12	Is earthwork (earth excavation, backfilling, stockpiling of excavated soil) involved in construction activities?	✓			Low <i>Only during handhole construction</i>
13	Is there a possibility of water stagnation at the construction site?		✓		
14	Will the construction involve road blocking?		✓		Low <i>Only during HDD operation and handhole construction</i>
(c) General Socio-economic impacts (including occupational health and safety):					
15	Is the project area densely populated?		✓		
16	Will there be any pedestrian and safety related issue?	✓			<i>(Traffic safety signs, protection fence with warnings will be provided)</i>
17	Is significant movement of vehicles involved during construction activities?	✓			<i>(Traffic safety signs, protection fence with warnings will be provided)</i>
18	Will child and pregnant women be used in construction activities?		✓		
19	Is there a safe source of drinking water and adequate sanitation facilities available for the workers at or near the construction site?	✓			<i>SCL temporary Storage at Sayda Amena Filling Station Public tubewell at N 24°22'37.9", E 89°42'21.7" Supplied by SCL</i>
20	Will the workers be provided Personal Protective Equipment (PPE), devices and clothing and be ensured those are used?	✓			<i>(Provision of PPE such as helmets, boots and face masks for the workers; Provision of first aid box with basic items.)</i>
21	Will enough health and safety	✓			

Sl	Screening Questions	Yes	No	Not Aware	Remarks/ Possible Negative Impact and assessment (low/moderate/high)*
	direction and insurance be provided to the workers?				
22	Is there a risk to safety and human health to people other than workers?		✓		
23	Will any archaeological and historical Structure be affected?		✓		
24	Will any structure(s)/ entity(s) (e.g., shops) be temporarily affected during sub-project activity?		✓		
25	Will any squatter(s) be temporarily displaced during sub-project activity?		✓		
26	Will any mobile vendor(s) be affected potentially?		✓		
27	Will any kind of land acquisition or permanent population displacement be made?		✓		
28	Will the subproject affect the way of life adversely and restrict access to common property resources of any indigenous people?		✓		

Potential Environmental Impact during Operational Phase: No significant adverse impact anticipated that cannot be addressed by routine O&M activities, and no such impacts are expected that could potentially affect nature of subsequent ESA.

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SITE-SPECIFIC ENVIRONMENTAL MITIGATION PLAN AND MONITORING PROTOCOL

Activities Associated with low to moderate environmental impacts	Potential Impacts	Mitigation and Enhancement Measures	Monitoring of mitigation measures	Frequency of monitoring during period of activities	Responsible Parties for mitigation measures and monitoring
Concreting work, mobilization of vehicles and equipment	Air Pollution due to fugitive construction dust, fossil fuel burning by construction equipment, increased traffic	- Ensure that all project vehicles are in good operating condition - Sprinkle and cover stockpiles of loose materials (e.g., fine aggregates for concreting work). - For concreting work, not using equipment such as stone crushers at site, which produce significant amount of particulate matter - Establishment of minimally intrusive and well-designed traffic patterns for onsite construction activities - Limiting GHG emission by using modern construction equipment and by prohibiting excessive idling of equipment when not in use. - Apply relevant Best Management Practices for excavation and preventing air pollution from construction activities (Annex VIII)	Visual observation, SPM, PM ₁₀ with GPS location, Only at selected critical locations downwind of site activities	Spot checking on a Monthly basis	Contractor (monitoring by SCL)/ SCL

Activities Associated with low to moderate environmental impacts	Potential Impacts	Mitigation and Enhancement Measures	Monitoring of mitigation measures	Frequency of monitoring during period of activities	Responsible Parties for mitigation measures and monitoring
	Water pollution by suspended solids as a result of soil erosion or by accidental fuel spills	Hazardous materials (fuel) will not be drained into the ground or allowed to drain into the nearest drainage canals.	Turbidity, Total Suspended Solids, One measurement from the nearest surface water body during cable laying operation by HDD	Monthly and as directed by the Project team leader;	Contractor (monitoring SCL)/ SCL by
	Noise pollution	- Use of noise suppressors and mufflers in heavy construction equipment. - Avoid using of construction equipment producing excessive noise during school hours and also at night - Avoid prolonged exposure to noise (produced by equipment) by workers/ give protective gears - Regulate use of horns and avoiding use of hydraulic horns in project vehicles.	Equivalent Noise level (L_{eq}) with GPS location (at selected critical locations during HDD operation/ handhole construction)	Spot checking during construction activities	Contractor (monitoring SCL)/ SCL by
	Disruption of local drainage	- Provide adequate diversion channel, if required - Provide facilities for pumping of	Visual observation of mitigation measures (digital	Weekly and as directed by the Project team leader	Contractor (monitoring SCL)/ SCL by

Activities Associated with low to moderate environmental impacts	Potential Impacts	Mitigation and Enhancement Measures	Monitoring of mitigation measures	Frequency of monitoring during period of activities	Responsible Parties for mitigation measures and monitoring
		congested water, if needed • Ensure adequate monitoring of drainage effects, especially if construction works are carried out during the wet season.	photographs)		
	• Traffic congestion during roadside work	• Schedule deliveries of material/ equipment during non-school hours and after regular working hours • Employ a minimally intrusive and well- designed traffic patterns for onsite activities • Depute flagman for traffic control • Arrange for signal light at night	Visual observation of mitigation measures (digital photographs)	Weekly and as directed by the Project team leader	Contractor (monitoring by SCL)/ SCL
	• Direct or indirect impact on natural, manmade or buried physical cultural resources	• During excavation activities, if any buried PCR items are found, the Chance Find Procedures outlined in Annex VII should be followed.	Visual observation of mitigation measures (digital photographs)	As necessary	Contractor (monitoring by SCL)/ SCL
	• Health and safety of workers, risk to pedestrian movement	• Clean bill of health a condition for employment • Provide the workers with personal protective equipment for protection against dust and noise • Contractors and workers should wear	Visual observation of mitigation measures (digital photographs)	Weekly and as directed by the Project team leader	Contractor (monitoring by SCL)/ SCL

Activities Associated with low to moderate environmental impacts	Potential Impacts	Mitigation and Enhancement Measures	Monitoring of mitigation measures	Frequency of monitoring during period of activities	Responsible Parties for mitigation measures and monitoring
		high visibility safety apparel while working in public right of way. • Signposts and directional signs should be provided at appropriate locations for pedestrians and traffic at construction site. • Contractor/SCL should develop an occupational health and safety plan			
	• Obstruction or interference with other utility infrastructures	• During design and permitting process of the project, efforts should be made to coordinate and minimize disruptions	-	-	SCL
	• Various injuries related to fiber optic cable handling (exposure to laser, microscopic fiber optic shards), fire hazard	• Follow the fiber optic cable safety protocols as stated in IFC guidelines for environmental, health and safety for telecommunications (Annex XI)	Routine eye exam of the personnel involved by an eye-specialist	as directed by the Project team leader	Contractor (monitoring by SCL)/ SCL
Installation of fiber optic cables	• Noise and air pollution, worker health and safety, disruption of local drainage	• As applicable, adopt similar noise and air pollution mitigation measures, measures to prevent drainage congestion and ensuring worker health and safety stated above	Noise and air monitoring protocol stated above	stated above	Contractor (monitoring by SCL)/ SCL

Activities Associated with low to moderate environmental impacts	Potential Impacts	Mitigation and Enhancement Measures	Monitoring of mitigation measures	Frequency of monitoring during period of activities	Responsible Parties for mitigation measures and monitoring
Horizontal Directional Drilling Work	Water pollution due to sediment suspension (increase in suspended solids) or washing away of slurry to the water bodies	- Ensuring that no seepage occurs through the borehole. In case of seepage, the procedures outlined in the BMP (Annex X) should be followed. - After completion of the borehole, all slurry should be removed from the construction site and disposed in an approved site.	Evidence of mitigation measures through visual observation (digital photographs)	After completion of work	Contractor (monitoring by SCL)/ SCL

Environmental Monitoring Checklist for Routine Site Inspection

Serial Nos.	Aspects of Environmental issues	Environmental issues to be Monitored	Compliance Status		
			FC	PC	NC
Conditions at Subproject Site					
A.	General				
	1.	Employment Record keeping arrangement	✓		
	2.	Legal working hours approval	✓		
	3.	Provision for monthly meeting for inspection of site activities	✓		
B.	Health and Sanitation				
	Public Health				
	1.	Emergency medical facilities and First Aid Box at Field Office and work sites	✓		
	2.	Safe water supply arrangements	✓		
	3.	Waste disposal arrangement at camp and work sites	✓		
	Occupational Health				
	1.	First-Aid Box and safety management plan availability at work sites	✓		
	2.	Provision of personal protection equipment (PPEs) and working clothing to workers	✓		
	3.	Protection fence at HDD work site	✓		
	4.	Handling of cement and other hazardous materials by workers	✓		
	5.	Traffic safety at work sites	✓		
	6.	Working hour and vacation days maintained	✓		
C.	Labour Welfare				
	1.	Workers' complaints taken care of by the site engineer	✓		
	2.	Provision of leaves (national and emergency)	✓		
	3.	Arrangement for settlement of conflicts amongst the workers	✓		

Serial Nos.	Aspects of Environmental issues	Environmental issues to be Monitored	Compliance Status		
			FC	PC	NC
	4.	Children below 15 years and pregnant women are not employed	✓		
D.	Environmental Pollution				
	Dust and emission control				
	1.	Proper storage of construction materials	✓		
	2.	Excavated material properly covered	✓		
	3.	Construction vehicles and HDD equipment maintained properly to reduce emission	✓		
	Noise Pollution				
	1.	Movement of vehicles and operation of HDD fixed at desired hours	✓		
	2.	Noise control measures at sensitive sites	✓		
	Water Pollution				
	1.	Wastes, slurry, cement, and junks not disposed in water	✓		
	2.	Spills from fuel tanks are properly disposed	✓		
	3	Pits, holes and ditches dug during implementation are filled after completion of work	✓		
	Land Pollution				
	1.	Arrangement adequate to check pollution of soil by noxious chemicals, and cement spillage	✓		
	2.	Arrangement for restoration of original site conditions (e.g. roads to pliable condition)	✓		
E.	Environmental documents at Field Office				
	1.	Field Office possesses all Environmental Documents	✓		

Serial Nos.	Aspects of Environmental issues	Environmental issues to be Monitored	Compliance Status		
			FC	PC	NC
		relevant to proposed scheme implementation and contract documents			
	2.	All accidents at work sites recorded and reported to the project management unit	✓		
F.	Emergency				
	1.	Emergency contact numbers (police, fire station, nearest hospital) available at the site during work	✓		
	2.	Portable fire extinguishers available at the site	✓		

Note: FC = fully complied, PC = partly complied and NC = not complied

1. Number of structures/ entities (e.g., shops) temporarily affected during sub-project activity:

Ans: 0

2. Number of squatters temporarily displaced during sub-project activity:

Ans: 0.

3. Any unforeseen impacts (damage to existing infrastructures such as water supply and sewerage lines, gas line, telephone line, electric cable line, optic fiber line etc.)? If so, how the compensation was provided? (Show documentation of compensation)

Ans: No unforeseen impact.

4. Were any buried PCR found during construction phase of the project? If so, what protocols were adopted as per Annex VIII?

Ans: No buried PCR was found.

**5. Which parameters were monitored during Construction phase?
(attach monitoring reports)**

**6. Community's opinion regarding the environmental impacts of the
subproject implementation**

Significant ☐

Moderate ☒

Insignificant ☐

7. Grievance/Complaints Redress

ii) No. of complaints/grievances on environmental issues in the sub-project: Received: 0
complaint Resolved: N/A

Sent to higher bodies: N/A

ii) Three of the most important complaints were:

d)

e)

f)

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