

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

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				
ESMF	Environmental and Social Management Framework				
GoB	Government of Bangladesh				
HDD	Horizontal Directional Drilling				
ICT	Information and Communication Technology				
IEE	Initial Environmental Examination				
IFC	International Finance Corporation				
IPFF	Investment Promotion and Financing Facility				
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				
PM10	Particulate Matter with aerodynamic diameter < 10 µm				
PM2.5	Particulate Matter with aerodynamic diameter $\leq 2.5 \text{ µm}$				
PPR	Public Procurement Rule				
RCC	Reinforced Cement Concrete				
SMP	Social Management Plan				
SPM	Suspended Particulate Matter				
TDS	Total Dissolved Solids				
ToR	Terms of Reference				
WB	World Bank				

E.1 BACKGROUND

With a view to facilitating cheap and faster internet and ICT enabled services for the mass people, SCL has approached to Investment Promotion and Financing Facility (IPFF) cell of Bangladesh Bank through Industrial and Infrastructure Development Finance Company (IIDFC) Ltd ("Arranger") for syndication arrangement of term loan financing of BDT 792.00 million and USD 10.00 million. The proposed project includes expansion of the network infrastructure, i.e. rollout of the fiber optic network in several locations across Bangladesh.

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 through the IPFF fund. 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 E.1 and E.2 respectively.

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.Baria - Comilla - CTG	280
Dhaka -Tangail - Bogra - Rajshahi - Khulna	570

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

Ashugonj – Sylhet	199
Gazipur – Mymensing	98
Total Distance (KM)	1,767

Table E.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

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 World Bank safeguard policies for environmental protection are 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 WB project classification (OP 4.01), 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 ESMF report has been prepared to assess the environmental and social impacts and measures.For individual respective mitigation subprojects, before implementation, a limited environmental assessment (LEA) will be performed following the ESMF. 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 PROJECTACTIVITIES

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 ESMF.

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 ESMF. Form 1 has been designed to the essential features subproject activities delineate of 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 ideaabout 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.

Activity/Iss	Potential Impacts	Proposed Mitigation and	Responsibl
ues		Enhancement Measures	e 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

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

Activity/Iss	Potential Impacts	Proposed	Mitigation	and	Responsibl
ues		Enhancemen	t Measures		e Parties
		 modern con by prohibit equipment Apply release Practices preventing construction 	nstruction equipme ting excessive id when not in use. want Best Mana for excavation air pollution n activities (Annex 2	ent and ling of gement and from X)	
	• Damage/ reduction of native flora, displacement of wildlife, birds etc.	 Plantation/ tree replace least two tree each cut tree Provide provide service and the service of the service of	afforestation progr afforestation progr mement (plantation rees of similar spe- ce). per compensation struction of trees and undergrowth fully to that they may the the project active ensive movement of n vehicles. stockpiling of m done on non-ver noving mature n be should be done the introduction of n level (e.g., from equi- um level, as certain y sensitive to loud n evant Best Mana annex X) for disturb aunal habitat.	am for of at cies for if there outside y where re-grow ity. f heavy aterials getative riparian e using and by noxious ipment) n fauna oise. gement ance to	Contractor (monitoring by SCL)/ SCL
	• Water pollution by suspended solids as a result of soil erosion or by accidental fuel spills	 Remove from substrate, a substrate, a substrate, a substrate, a strate cannex excavated the sediments discharge to sediments discharge to been exposed. No in-streat crossing will Work would conditions damage to work areas. Employ the guidelines (Annex X). Hazardous drained into the substrate of the s	om site excess s and/or large rock m ot be buried i rench liment basins to in storm water p o surface water. getation when soil ed or disturbed. am river or wate l be allowed ld be halted who would lead to ex soils and vegeta ypical spill pre as outlined in th materials (fuel) will o the ground or allo	subsoil, aterials in the o trap prior to ls have r body en wet accessive tion in vention e BMP . not be powed to	Contractor (monitoring by SCL)/ SCL

Activity/Iss	Potential Impacts	Proposed Mitigation and	Responsibl
ues	Fotential impacts	Enhancement Measures	e 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/Iss ues	Potential Impacts	Proposed Enhancemen	Mitigation t Measures	and	Responsibl e Parties
		Chance Find Procedures outlined in Annex IX should be followed.			
	• Health and safety of workers, risk to pedestrian movement	 Clean bill employmen Provide the protective of against dus Contractors high visibit working in p Signposts should be locations for construction Contractor/ occupational 	of health a condit t e workers with p equipments for pro- t and noise and workers shoul- lity safety apparel public right of way. and directional provided at appr r pedestrians and tr n site. SCL should deve- al health and safety	ion for ersonal otection Id wear while signs ropriate raffic at lop an plan	Contractor (monitoring by SCL)/ SCL
	• Obstruction or interference with other utility infrastructures	During desired of the projector coord disruptions	gn and permitting p ct, efforts should b inate and m	process e made inimize	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 protocols a for environ for telecom	fiber optic cable s stated in IFC gui mental, health and nunications (Annex	safety delines safety XI)	Contractor (monitoring by SCL)/ SCL
Horizontal Directional Drilling Work	• Noise and air pollution, worker health and safety, disruption of local drainage	 As applicab air pollution measures congestion health and trenching of mobilization equipment. 	le, adopt similar no on mitigation me to prevent di and ensuring safety stated abo peration, concreting of vehicles	ise and asures, rainage worker ove for g work, and	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 direct should be shore (at a stream show annex X) Ensuring through the seepage, the the BMP followed. In water be ensured the stream show annex be an annex	ional drilling equ placed away from least 20 feet away ore according to E that no seepage the borehole. In c le procedures outli (Annex X) shou ody crossing, it has at the borehole rem	ipment stream y from BMP in occurs ase of ned in ild be s to be ains at	Contractor (monitoring by SCL)/ SCL

Activity/Iss	Potential Impacts	Proposed Mitigation and	Responsibl
<u>ues</u>		 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/World Bank Group 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

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	BaselineOne set of measurements atproperty boundaries ofselected critical locations(schools, residential areas,hospitals etc.)prior tocommencing cable layingactivitiesThree set of measurementsat the same locations duringcable laying process(trenching)Three set of measurementsat the same locations duringcable laying process(trenching)Three set of measurementsat the same locations duringcable laying process (HDDoperation)	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;
Air Quality (dust particles/ particulate matter)	BaselineOnly at selected criticallocations downwind of siteactivities (prior tocommencement of work) andin close proximity to humanreceptorsOnly at selected criticallocations downwind of siteactivities (during trenchingand cable laying work) andin close proximity to humanreceptorsOnly at selected criticallocations downwind of siteactivities (during trenchingand cable laying work) andin close proximity to humanreceptorsOnly at selected criticallocations downwind of siteactivities (during HDDactivities) and in closeproximity to humanreceptors	SPM, PM ₁₀ with GPS location, wind speed and direction	Spot checking on a Monthly basis; Contractor/SC L's Responsibility	Particulate matter sampling device, GPS Wind speed/dire ction data to be collected from local BMD station
Water Quality	<u>Baseline:</u> One measurement from the nearest surface water body ^a One measurement from the nearest surface water body	Turbidity, Total Suspended Solids, Total Solids,	Monthly and as directed by the Project team leader; Contractor/	Laboratory facilities for water/ wastewater analysis

			Monitoring	
Monitoring	Period/Location	Parameters to be monitored	Frequency and responsibility	Resources Required
	during cable laying operation by trenching	Dissolved Oxygen	SCL's Responsibility ^a	
	One measurement from the nearest surface water body during cable laying operation by HDD ^a			
General site condition	Baseline: 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; Digita Contractor/SC L's Responsibility	Digital
	Visual survey of cable laying site during the entire period of cable laying operation			camera
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 materials (if any), use of Personal Protective Equipment by workers etc.	Weekly and as directed by the Project team leader; Contractor/SC L's Responsibility	Digital camera
Occupationa l 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.

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.

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 framework (ESMF) developed for the project.

E.5 SOCIAL MANAGEMENT PROCEDURES

The social management procedure will be initiated through the environmental and social screening as presented in forms 1 to 3 (Annex III – V), the same process as for the environmental management procedure. Based on the social screening, the nature of further social assessment would be determined. If a sub-project is found to have no significant social safeguard issues (e.g., loss of income, impact on indigenous people), the screening forms will serve as the social safeguard report. From the field visit of similar projects of SCL it was observed that the nationwide fiber optic network project would not require acquisition of any private/public land. During construction phase of the project temporary loss of income may

happen to roadside vendors, which will necessitate preparation of a Social Management Plan (SMP). Since the project route is not yet finalized, it may require an indigenous and tribal people's plan (ITPP) as well if the finalized routes go through areas involving indigenous community. If the screening identifies social safeguard issues, the SIA and preparation of SMP and IPP (if needed) will be carried out following the guidelines presented in this Chapter. If an SMP and ITPP preparation is warranted, only after obtaining necessary clearance from Bangladesh Bank / World Bank, the sub-project will proceed to implementation phase, during which the provisions of the EMP, SMP and IPP will be executed, as prescribed in these documents, with monitoring by SCL. An independent third party monitoring will also be carried out to ensure compliance with the provisions of the SMF presented in this report.

Public/Stakeholder Consultation

Consultation and community participation will be undertaken at subproject identification, planning, design, implementation, and evaluation stages. Consultation and participation involves communities and other stakeholders, which will take place through interpersonal communications, focused group discussions (FGDs) and small and large community meetings.

Social Management Plan (SMP)

SMPs are designed to ensure that impacts arising from loss of income and assets are mitigated, managed and compensated. The SMP focuses on people affected by restriction of access, loss of assets and define a strategy for formalizing arrangements and responsibilities for mitigating impacts caused due to these losses. An outline of compensation and entitlement matrix and SMP is provided in the ESMF.

Indigenous People Plan (IPP)

The general sub-project areas in Chittagong and Sylhet division may have small concentration of indigenous inhabitants. The project has taken the exclusion criteria to avoid any negative impact on the indigenous communities due to undertaking of the project in those areas. The project rather, intends to extend the benefits towards their welfare. OP 4.10 is triggered when a project engages with, touches on or impacts indigenous people in any way, positive or negative. Detail guidelines have been prepared for preparation of IPP, following the World Bank's Operational Policy on Indigenous Peoples (OP 4.10), to maximize benefits to the indigenous peoples. An outline of IPP is provided in the ESMF.



Figure E.1: Institutional set up, including major activities and assignment of responsibility for their execution, for implementation of proposed subproject by the SCL.

E.6 INSTITUTIONAL ARRANGEMENT OF ESMF

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. 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 ESMF and the senior officials will report directly to the General Manager of PMU of SCL.Figure E.1 shows activities and institutional responsibilities for overall implementation of the proposed fiber optic network project by SCL.

E.7 PUBLIC PARTICIPATION, GRIEVANCE REDRESS AND DISCLOSURE

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.

Approval and Disclosure

Environmental/social screening (Annex V) of each sub-project and SMP, wherever required, are to be subject to review and clearance by Bangladesh Bank / World Bank. Whenever requested, SCL will provide Bangladesh Bank / World Bank with copies of the filled out social screening forms for all categories of subprojects to be implemented by SCL.

Executive Summary of all safeguard documents including the ESMF, SMP, ITPP and other social plans are to be translated into Bangla (local language) and disclosed locally and the English versions disclosed through the Bank's Info-shop. SCL is to upload the ESMF 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.

PART A

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

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% Upazillas'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. With a view to facilitating cheap and faster internet and ICT enabled services for the mass people, SCL has approached to Investment Promotion and Financing Facility (IPFF) cell of Bangladesh Bank through Industrial and Infrastructure Development Finance Company (IIDFC) Ltd ("Arranger") for syndication arrangement of term loan financing of BDT 792.00 million and USD 10.00 million. 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

With the launch of 3G services in 2013 increase in data usage is 7. 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 THROUGH IPFF

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 through the IPFF fund. 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.

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.Baria - Comilla - CTG	280	
Dhaka -Tangail - Bogra - Rajshahi - Khulna	570	
Ashugonj – Sylhet	199	
Gazipur – Mymensing	98	
Total Distance (KM)	1,767	

Table 1.1: 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

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

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 WORLD BANK SAFEGUARD POLICIES AND BASIS FOR ESMF

11. Since the World Bank is the financing source of the project, the environmental and social assessment of the proposed project should comply with the policies and legislative requirements of the World Bank. Thus, the proposed project requires carrying out an Environmental and Social Assessment in accordance with the World Bank Safeguard Policies. The Bank classifies the proposed project into three major categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts: Category A (The proposed project is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented), Category B (The proposed project's potential adverse environmental impacts are less adverse than those of Category A projects, impacts are site-specific, some irreversible, mitigatory measures can be defined more readily than category A projects) and Category C (The proposed project is likely to have minimal or no adverse environmental impacts)

12. The proposed project will finance the laying operation of fiber optic cables (underground and overhead) along designated routes. This operation will involve small-scale civil works and the nature of environmental impacts arising from these activities will trigger safeguard policy OP/BP4.01 requiring environmental assessment which will be addressed through an Environmental Management Plan (EMP). The project activities are not anticipated to cause any major adverse environmental and social impacts and hence the intervention can be classified as "Category B" project requiring limited impact assessment. However, 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 Framework (ESMF) has been prepared ensure compliance with the World Bank's safeguard policies. In Part A of this report, the ESMF is presented while part B of the report provides an example of a Limited Environmental Assessment of a subproject based on the ESMF.

- 13. The objectives of the ESMF are to:
 - Establish clear procedures and methodologies for the environmental and social planning, review, approval and implementation of subprojects to be financed under the project;
 - Evaluate the potential overall environmental and social impacts of the proposed project activities and suggest subproject specific standard environmental mitigation;

- Specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to subprojects;
- Identify the institutional barriers and determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESMF; and
- Provide practical information and resources for implementing the ESMF.

1.4 SPECIFIC OBJECTIVES OF THE ESMF

14. The Environmental and Management Framework (ESMF) 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 the WB.
- 15. The ESMF 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.

16. 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 ESMF. The ESMF 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

1.5 STRUCTURE OF THE ESMF

17. The ESMF 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 relevant World Bank safeguard policies and explain its implication to the proposed project.

18. Under the framework of the ESMF, the baseline information of the areas will be established where fiber optic cable layout operations will be carried out. The ESMF 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 ESMF), 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.

19. 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 ESMF. 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.

20. 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 ESMF 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

21. The proposed Nationwide Fiber Optic Network Project will be compliance with applicable implemented in 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. The World Bank 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 subnational level, and World Bank safeguard policies.

2.1 NATIONAL ENVIRONMENTAL POLICIES, LAWS AND REGULATIONS

National Environmental Policy 1992

22. 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

23. 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.

24. 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;

25. 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.

26. 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

27. 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.

28. 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.

29. 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.

30. 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.

31. 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.

32. 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*.

33. 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

34. 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

35. 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 AppealCourt.

Bangladesh Labor Act, 2006

36. 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

37. 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.

38. 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.

39. 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".

40. 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 bye-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).

41. 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

42. 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

43. 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

44. 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

45. 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.

46. The Commission have exclusive authority to issue license for activities like establishing or operating a telecommunication system in Bangladesh or of such undertaking any construction work 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.

47. 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

48. 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.

- 49. 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 wide 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.

50. 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 the Commission. Operators issued bv (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

51. 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

Information Communication Technology (ICT) encompasses the broad 52. 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.

53. 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)

54. The Bangladesh Telecommunication Regulatory Commission is licenses for empowered to issue 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.

55. These Guidelines are intended to provide an overview of the licensing and regulatory framework for Applicant(s) seeking to obtain License under these build. guidelines to develop. 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.

56. 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.

57. 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.

58. 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

59. 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

60. 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

61. 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

The Chittagong Hill Tracts Regulation, 1900 (Regulation I of 1900) is the 62. 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 (nontransferable) 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

63. 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 INSTITUTIONAL ARRANGEMENTS AT NATIONAL AND SUB-NATIONAL LEVELS

As outlined in the National Environment Policy (1992) and National 64. Forest Policy (1994), the Ministry of Environment and Forests (MoEF) acts as the guide and custodian for the conservation and development of the environment and, in the pursuit of that goal, to ensure through appropriate laws and regulations that natural resources, including land, air, water and forests, are exploited and managed in an environmentally sustainable manner. The Department of Environment (DoE), formed in 1989 with a mandate for environmental management later formalized under the Environment Conservation Act, 1995 (ECA'95), acts as the technical arm of the Ministry and is responsible for environmental planning, management, monitoring and enforcement. A Director General heads the DoE, with Divisional offices in Dhaka, Chittagong, Bogra, Khulna, Barisal and Sylhet. The Environment Conservation Rules (1997) 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.

65. The mandate of the Department has expanded over time, evolving from an exclusive focus on pollution control to include natural resources and environmental management, now covering:

- monitoring environmental quality;
- promoting environmental awareness through public information programs;
- controlling and monitoring industrial pollution;
- reviewing environmental impact assessments and managing the environmental clearance process; and,
- establishing regulations and guidelines for activities affecting the environment

66. Thus, the GoB has well-defined legal/regulatory systems for safeguarding environment issues through the Ministry of Environment and Forest in the policy level and the Department of Environment in the implementation level. Although the environmental legal framework is relatively

modern and is in an advanced state in connection with the environmental assessment, the main limitations are in the capabilities of the regulatory agencies to enforce and promulgate these legal tools. The existing resources (manpower, technical tools etc.) of regulatory agencies are deemed largely inadequate to monitor compliance with existing rules.

67. The environmental management system in Bangladesh constitutes an extremely centralized and partially de-concentrated model of environmental management. At the divisional level, there is a Divisional Environmental Advisorv Committee headed bv the Divisional Commissioner with representation from various government agencies. The DoE does not have any representation below this level. An important gap in existing formal rules (the Constitution and other laws) is that the divisions, districts, upazillas, unions do not have a clearly defined role to play in environmental management. Lack of an appropriate mandate and institutional arrangements below the divisional level is a key factor contributing to difficulties in implementing environmental policies and regulations.

2.4 WORLD BANK ENVIRONMENTAL AND SOCIAL SAFEGUARD POLICIES

68. The objective of these policies is to prevent and mitigate undue harm to people and their environment in the development process. Safeguard policies provide a platform for the participation of stakeholders in project design, and act as an important instrument for building ownership among local populations. The effectiveness and development impact of projects and programs supported by the Bank has substantially increased as a result of attention to these policies. The World Bank has ten environmental, social, and legal safeguard policies which are listed in the following:

Environmental policies:

- OP/BP 4.01 Environmental Assessment
- OP/BP 4.04 Natural Habitats
- OP/BP 4.09 Pest Management
- OP/BP 4.11 Physical Cultural Resources
- OP/BP 4.36 Forests
- OP/BP 4.37 Safety of Dams

Social Policies

- OP/BP 4.10 Indigenous Peoples
- OP/BP 4.12 Involuntary Resettlement

Legal Policies

- OP/BP 7.50 International Waterways
- OP/BP 7.60 Disputed Areas

69. Operational Policies (OP) are the statement of policy objectives and operational principles including the roles and obligations of the Borrower and the Bank, whereas Bank Procedures (BP) is the mandatory procedures to be followed by the Borrower and the Bank. Apart from these, the World Bank Group has adopted the IFC guidelines for Environmental Health and safety, which is also relevant for environmental protection and monitoring. In addition to that the Policy on Access to Information of World Bank also relates to environmental safeguard. The environmental safeguards relevant to the project and access to information policy as well as the IFC guidelines are discussed below:

OP/BP 4.01 Environmental Assessment

70. This policy is considered to be the umbrella safeguard policy to identify, avoid, and mitigate the potential negative environmental and social impacts associated with Bank lending operations. In World Bank operations, the purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people have been properly consulted. The borrower is responsible for carrying out the EA and the Bank advises the borrower on the Bank's EA requirements. The Bank classifies the proposed project into three major categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts:

- Category A: The proposed project is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works.
- Category B: The proposed project's potential adverse environmental impacts on human population or environmentally important areasincluding wetlands, forests, grasslands, or other natural habitats- are less adverse than those of Category A projects. These impacts are site specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than Category A projects.

• Category C: The proposed project is likely to have minimal or no adverse environmental impacts.

OP/BP 4.04 Natural Habitats

71. The conservation of natural habitats is essential for long-term sustainable development. The Bank therefore supports the protection, maintenance, and rehabilitation of natural habitats and their functions in its economic and sector work, project financing, and policy dialogue. The Bank supports, and expects borrowers to apply, a precautionary approach to natural resource management to ensure opportunities for environmentally sustainable development. The Bank does not support projects that involve the significant conversion or degradation of critical natural habitats.

OP/BP 4.11 Physical Cultural Resources

Physical cultural resources are defined as movable or immovable objects, 72. sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Their cultural interest may be at the local, provincial or national level, or within the international community. Physical cultural resources are important as sources of valuable scientific and historical information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices. The Bank assists countries to avoid or mitigate adverse impacts on physical cultural resources from development projects that it finances. The impacts on physical cultural resources resulting from project activities, including mitigating measures, may not contravene either the borrower's national legislation, or its obligations under relevant international environmental treaties and agreements. The borrower addresses impacts on physical cultural resources in projects proposed for Bank financing, as an integral part of the environmental assessment (EA) process.

OP/BP 4.12 Involuntary Resettlement

73. This policy is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts. It promotes participation of displaced people in resettlement planning and implementation, and its key economic objective is to assist displaced persons in their efforts to improve or at least restore their incomes and standards of living after displacement. The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects.

OP 4.10 Indigenous People

74. The term "Indigenous Peoples" is used in a generic sense to refer to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees:

- self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;
- collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;
- customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and
- an indigenous language, often different from official language of the country/ region.

75. The Bank provides project financing only where free, prior, and informed consultation results in broad community support to the project by the affected Indigenous Peoples. Such Bank-financed projects include measures to (a) avoid potentially adverse effects on the Indigenous Peoples' communities; or (b) when avoidance is not feasible, minimize, mitigate, or compensate for such effects. Bank-financed projects are also designed to ensure that the Indigenous Peoples receive social and economic benefits that are culturally appropriate and gender and inter-generationally inclusive.

IFC Environmental, Health and Safety Guidelines

76. The Environmental, Health and Safety (EHS) Guidelines of the World Bank Group (WBG)/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.

77. 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.

World Bank Policy on Access to Information

78. In addition to the safeguard policies, the Access to Information Policy also relates to safeguards. To promote transparency and facilitate accountability, Bank Access to Information Policy supports decision making by the Borrower and Bank by allowing the public access to information on environmental and social aspects of projects in an accessible place and understandable form and language to key stakeholders. The Bank ensures that relevant project-related environmental and social safeguard documents, including the procedures prepared for projects involving subprojects, are disclosed in a timely manner before project appraisal formally begins. The policy requires disclosure in both English and Local language and must meet the World Bank standards.

World Bank Guidance on Limited Environmental Assessment (LEA)

79. An LEA is required for subprojects considered likely to have some environmental and social impacts that need to be reviewed by a specialist (World Bank, 2013). The subprojects to be implemented under the proposed 'Nationwide Fiber Optic Cable Installation' project by SCL will be suitable for LEA. An LEA screening form specific to the subproject type, and mitigation measures will be incorporated at the design stage. For subprojects requiring an LEA, 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. Technical planning guidance, and design and construction aids have been developed across a number of programs and have been proven to assist in this process.

2.5 IMPLICATIONS OF NATIONAL POLICIES AND REGULATIONS ON THE PROPOSED PROJECT

80. 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.

81. 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.

2.6 IMPLICATIONS OF WORLD BANK SAFEGUARD POLICIES ON THE PROPOSED PROJECT

82. According to WB Operational Policy (OP 4.01), the nature of environmental assessment to be carried out for a particular sub-project would largely depend on the category of the sub-project. As mentioned earlier, The World Bank Operational Policy (OP) 4.01 classifies projects into three major categories (category A, B and C), depending on the type, location, sensitivity and scale of the project, and nature and magnitude of potential impacts. The nationwide fiber optic network project will be a category B project according to World Bank classification.

83. Environmental issues during the construction phase of fiber optic network may include impacts on terrestrial and aquatic habitat. Therefore the World Bank policy related to conservation of Natural Habitats (OP/BP 4.04) has been triggered. The possible impact on natural habitats will be addressed through sub-project specific EMP.

84. Since the routes of the fiber optic lines are unknown at this stage, there is a possibility that the fiber optic network lines may pass through areas with physical cultural resources. However, the impacts will be examined as part of the environmental screening/assessment of different subprojects and the criteria for assessment will be provided in the ESMF. In addition, 'Chance find' procedures conforming to local legislation on heritage would be evaluated so that any physical or cultural resources are not impacted. Therefore, OP 4.11 (Physical Cultural Resources) has been triggered.

85. The activities of the project will not involve any pesticide application, include activities in forest areas or relate to protection of dams.

86. The fiber optic network lines may intervene in areas where indigenous people live (specific subproject locations will be determined during implementation). As such OP 4.10 may be triggered for the project. The ESMF will include an Tribal Peoples Development Framework, based on which site specific Tribal Peoples Plan will be developed as and when required.

87. Deployment of overhead fiber optic cable lines will not require any land acquisition for establishment of drop points; since the drop points will be installed in existing PGCB substations. Thus OP 4.12 will not be triggered for the project. The ESMF will include a temporary resettlement action framework,

based on which site-specific temporary social management plan will be developed as and when required.

88. The project do not involve any infrastructure development in international waterways or in disputed areas.

89. The IFC guidelines provide guidance on certain EHS issues, which include standards for environmental parameters (ambient air quality, water and wastewater quality, noise level, waste management), hazard and accident prevention, occupational and community health and safety (during commissioning and decommissioning works) etc. These guidelines will be directly applicable to the proposed project. As a general rule, the IFC guidelines should complement the existing Bangladesh guidelines or standards. In case the Bangladesh guidelines or standards differ from the IFC guidelines, project is expected to follow the more stringent ones.

90. The World Bank access to information policy would be directly followed. The project will make the ESMF documents available to the public by publishing it in their websites. In addition, Hard copies of these documents in English (including a summary in Bengali and English) will be made available in publicly accessible locations in the project area (e.g. city corporation offices) 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 ESMF documents would be available.

CHAPTER3

PROJECT DESCRIPTION

3.1 MAJOR SUB-PROJECT ACTIVITIES

91. 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.

92. The following sections describes the basic construction and installationtechniques:

3.2 DEPLOYMENT OF UNDERGROUND FIBER OPTIC CABLE

93. 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

94. 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.

95. 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.

96. Trench cutting is done by labor using spade, gaite, 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.

97. 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)

98. 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.

99. 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.

100. 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

101. 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 appeasing.
- 102. 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.

103. 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.

104. 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 DWC Pipe with Clamping.

3.2.4 Handhole Construction

105. 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 gaite, spread shable, hammer, cheni 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 the 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

106. 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 Alco pad.
- 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.

107. 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.

3.3DEPLOYMENT OF OVERHEAD FIBER OPTIC CABLE:

108. 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 cable line.

109. 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. Lightening 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.

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

111. 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.

112. 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 SCLSERVICE MAINTENANCE

113. 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.

114. 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)

115. 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.

116. 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.

S1.	SCL System/ Service	NOC	NOC Clint		
		Primary	Care Centre		
1	Data equipment consisting routers and switches	Х			
2	Data equipment consisting of MPLS systems	Х			
3	Element Management Systems for Data Service	Х			
4	Network Management Systems for Data Services	Х			
5	SDH equipment	Х			
6	Element Management System for SDH equipment	Х			
7	Network Management system for SDH Equipment				
	(if any)				
8	Recording faults reported over Telephone		Х		
9	Recording faults reported over email/fax/letter or		Х		
	web based system				
10	Monitoring and Escalating fault reports	Х	Х		
11	Resolution of Faults to immediate Supervisors	Х	Х		
12	Resolution of TT faults to Clients		Х		
13	Resolution of Dark core faults		Х		

 Table 3.1: Primary Responsibilities by SCL Operations Centre

SCL's network operation centre is equipped with modern technology and equipments.



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

3.4.2 SCL Field Operations

117. 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 Vendorprovided 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 Diagnostic and corrective actions performed by on-site SCL time. 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

118. 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 World Bank funded projects, an environmental and social assessment under the proposed fiber optic network project needs to be carried out (and consequently an ESMF needs to be prepared) following the provisions of the relevant World Bank Operational Policies [e.g., Environmental Assessment OP/BP 4.01; Natural Habitats OP/BP 4.04, Physical Cultural Resources OP/BP 4.11, and Indigenous People OP/BP 4.10). 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 ESMF presents guidelines for probable environmental impacts and environmental management procedures. The ESMF also presents a simple format "analysis alternatives" Section for of (see 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

119. For proper environmental assessment, it is important that each subproject 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

120. 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	 Keeping the route layout of fiber optic cable line to follow existing roadway network or other public land
Cable Line and	• Keeping layout of fiber optic cable line such that the future maintenance work would least interfere with movement of
associated	manitematice 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

121. 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.

122. 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

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

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

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

125. 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,
- Noise level,
- Water quality, and
- Traffic.

IEFs and Maps:

126. 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.

127. 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:

128. 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:

129. 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:

130. 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:

131. 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 (e.g., from Bangladesh Water Development Board, BWDB).

Air quality:

132. 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:

133. 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:

134. 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:

135. 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.

136. Table 4.3 presents 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.

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

Sub-project	secondary source	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

137. 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)

138. 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.

139. 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

140. 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.

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 falled or trimmed; Area to be cleared of vegetation; Aquatic flora and fauna diversity ¹ ; Filling up of seasonal wetland (if required)

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

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

141. 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

142. 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.

143. 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 socioeconomic impacts. 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 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

144. The purpose of "environmental/social screening" is to get a preliminary ideaabout 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.

145. 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:

146. **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 feeling/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.

147. **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 feeling/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:

148. 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 to 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.

149. **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 physic-chemical impacts during operational phase.

Socio-economic Impacts:

150. **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 socioeconomic impacts; both construction and operation of an underground fiber optic cable line would generate employment opportunities.

151. **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)

152. 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.

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

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

Mitigation and Enhancement Measures during Construction Phase:

155. 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 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 /Icouco	ivity/Issues Potential Impacts Proposed Mitigation and		Responsible
Activity/issues	i otentiai impacts	Enhancement Measures	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. 	Contractor (monitoring by SCL)/ SCL
	 Not removing undergrowth fully where possible, so that they may grow naturally after the project activity. Control intensive movement of he construction vehicles. Temporary stockpiling of materia should be done on non-vegetative surfaces Avoid removing mature riparian vegetation. Re-vegetation should be done usi native, non-invasive species and preventing the introduction of noxious weeds Keep noise level (e.g., from equipment) to a minimum level, a certain fauna may be very sensiti loud noise. Apply relevant Best Management Practices (Annex X) for disturbant. 		
	• 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	Responsible
Activity/issues	Fotential impacts	Enhancement Measures	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 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 	Contractor (monitoring by SCL)/ SCL

Activity/Issues	Potential Impacts	Proposed Mitigation and	Responsible
1000000/155005	- oconciar impacts	Enhancement Measures	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:

156. 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/World Bank Group 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:

157. 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.

158. 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.

159. 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.

Monitoring	Period/Location	Parameters to be monitored	Monitoring Frequency and responsibility	Resources Required
Noise Level	BaselineOne set of measurements at property boundaries of selected critical locations (schools, residential areas, hospitals etc.) prior to commencing cable laying activitiesThree 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;

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
	Three set of measurements at the same locations during cable laying process (HDD operation)			
Air Quality (dust particles/ particulate matter)	BaselineOnly at selected criticallocations downwind of siteactivities (prior tocommencement of work) andin close proximity to humanreceptorsOnly at selected criticallocations downwind of siteactivities (during trenchingand cable laying work) and inclose proximity to humanreceptorsOnly at selected criticallocations downwind of siteactivities (during trenchingand cable laying work) and inclose proximity to humanreceptorsOnly at selected criticallocations downwind of siteactivities (during HDDactivities) and in closeproximity to human receptors	SPM, PM ₁₀ with GPS location, wind speed and direction	Spot checking on a Monthly basis; Contractor?/SC L's Responsibility	Particulate matter sampling device, GPS Wind speed/dire ction data to be collected from local BMD station
Water Quality	Baseline:One measurement from the nearest surface water bodyaOne measurement from the nearest surface water body during cable laying operation by trenchingOne 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/ wastewate r analysis
General site condition	Baseline:Visual survey (once) ofproposed cable laying sitebefore prior to cable layingoperationVisual survey of cable layingsite during the entire period ofcable 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
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.		
Occupationa 1 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.

160. 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:

161. 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.

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	Prevailing rate (~ Tk. 2,000/- per
Suspended Solids, Total Solids,	sample)
Dissolved Oxygen)	
Health/ safety signs (size and number to	Prevailing PWD/LGED/REB/PGCB rate
be estimated)	/Lump sum amount
Water sprinkling on aggregate	Latest PWD/LGED rate (if available)/A
	fixed rate per cubic meter of aggregate
	per day
Iranic control (estimate number of	Latest PWD/ LGED rate (ii available)/A
hagman needed and duration of work)	inxed rate per liagman per day/ Lump
Troffic light	Latest DWD / LCED rate (if available) /
frame light	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	Prevailing rate (~ Tk. 500/- per worker
examination)	engaged in fiber optic cable connection
	and maintenance)
Plantation (including protection/ fencing	Prevailing rate (~ Tk. 1,000/- per plant)
and conservation during project period)	

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

* Depending on availability of facility for measurement

4.5 BEST MANAGEMENT PRACTICES (BMP)

162. 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

163. 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.

164. 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.

165. 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 subprojects 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	\checkmark	\checkmark
excavation, backfilling and topsoil restoration and re- vegetation	\checkmark	
reuse of excavated soil	\checkmark	
protection of sensitive locations		
HDD operation	\checkmark	
Cable laying by bridge- crossing	\checkmark	\checkmark
pole construction		\checkmark
installation of control station		
waste management	\checkmark	\checkmark
public health and safety	✓	\checkmark
natural habitats	\checkmark	\checkmark
air pollution control	\checkmark	
erosion control	\checkmark	\checkmark

 \checkmark = BMP required; \square = BMP may be required depending on the site/route condition.

4.6 OCCUPATIONAL HEALTH AND SAFETY GUIDELINES

166. 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. 167. 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

168. 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

169. 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.

170. 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

171. 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.

172. 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.

173. 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.

174. 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 SPECIAL ENVIRONMENTAL CLAUSES (SECS) FOR TENDER DOCUMENT

175. 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):

176. 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:

177. 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:

178. 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 wellmarked 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:

179. 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.

4.8 THIRD PARTY MONITORING

180. 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 framework (ESMF) developed for the project.

CHAPTER 5

SOCIAL MANAGEMENT PROCEDURES

5.1 INTRODUCTION

181. 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. The small-scale socio-economic impacts such as traffic congestion, worker health and safety, inconvenience of roadside vendors etc. which were screened using forms 1-3 of this document (Annex III – IV), will be addressed as a part of the site-specific Environmental Management Plan (EMP) outlined in form 4 (Annex V) and preparation of a separate Social Management Plan would not be necessary. However, if the project activities cause losses of income and livelihood, displacement of people, land acquisition and affects indigenous and tribal people, separate management plans need to be prepared. This chapter outlines the principles, processes and guidelines for social screening, social impact assessment and preparation of social management plans (SMP) and also indigenous and tribal people's plan (ITPP), where necessary. It also includes detail guidelines for consultation and participation at different stages of project implementation.

5.2 OBJECTIVES OF THE SMF

182. The SMF is intended to provide the necessary bases to determine applicability of the World Bank safeguard policies, identify the safeguards impacts, prepare and implement the social management plans (SMP) includingresettlement plan (RP) and indigenous and tribal people's plan (ITPP) as and when required. The objectives of the SMF are the following:

- 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;

- Identify and compensate for unavoidable adverse social impacts that sub-projects might cause on people, including protection against loss of livelihoods;
- Ensure compliance with the relevant GoB policies and those of the World Bank on social safeguards and other social issues; and
- Strengthen social management capacity within SCL.

5.3 SOCIAL MANAGEMENT PRINCIPLES

Inclusion

183. 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

184. 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

185. 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. Sub-project information will be disclosed in public domain including the environmental / social screening / assessment reports and social management plan, where applicable.

Social Accountability

186. Social accountability tools are to be implemented to improve peoples' participation and transparency. Steps to strengthen transparency and accountability include display of information of all activities including cost, at prominent and public places, participation of communities in monitoring and evaluation, and use simple formats for reporting the findings at planning, implementation and operational phases. Specific measures are to be designed on (i) consultation, feedback and grievance-redress mechanisms to all project staff to problems identified by beneficiaries, affected people, and other

stakeholders; (ii) participatory planning to ensure the project meets the needs of beneficiaries; and (iii) participatory monitoring and evaluation for identification of problems.

Social Safeguards

187. Legal and policy framework provides guidelines for compensation measures for temporary displacement associated with the implementation of sub-projects. The project is to be designed to avoid or minimize, to the extent possible, the adverse impacts caused by temporary displacement associated with different sub-project implementation. The SCL is to prepare sub-project proposals based on the following principles, which are to be mainstreamed by adopting appropriate process for social impact assessment and mitigation of impacts:

- No acquisition of private land: All impacts on income and livelihoods will be compensated for, and livelihood restoration programs will be undertaken.
- People whose businesses would be temporarily affected will be compensated and assisted for livelihood restoration, and demolished physical structures will be replaced or compensated commensurate to ground situations.

Communication Strategy

188. The communication strategy aims to enhance the ability of stakeholders to engage, influence local institutions and hold them accountable for their work. The communications model is a community owned communication strategy that encourages civic engagement, where the community is part of the planning and monitoring process of the proposal. This is a long-term process of continued dialogue, clarifying issues under discussions and finding solutions of common concern matters. Through engagement, a space is created where issues can be openly discussed, compromises can be negotiated and solutions acceptable to the majority are accepted and ratified. This strategy seeks to foster social, political, and institutional changes at different levels by building among implementers and the users, promoting а two-way trust communication, exchanging knowledge and skills for a sustainable change in both availability of services and behavior that is consistent with fact on the ground.

Grievance Response

189. The proposed project needs to establish a Grievance Redress Mechanism (GRM) to answer to queries, receive suggestions and address complaints and

grievances about any irregularities in application of the guidelines adopted in the SMF, and assessment and mitigation of social impacts. The mechanism will assist in resolving issues/conflicts amicably and quickly, saving the aggrieved persons from having to resort to expensive, time-consuming legal action. The mechanism will, however, not deprive a person of his/her right to go to the courts of law. Grievance response focal points are to be available at the project level; a Grievance Redress Committee (GRC) is to be formed. Details of the GRM are provided in Chapter 7.

5.4 SOCIAL MANAGEMENT FRAMEWORK

190. The social management procedure will be initiated through the environmental and social screening as presented in forms 1 to 3 (Annex III - V), the same process as for the environmental management procedure. Based on the social screening, the nature of further social assessment would be determined. If a sub-project is found to have no significant social safeguard issues (e.g., loss of income, impact on indigenous people), the screening forms will serve as the social safeguard report. From the field visit of similar projects of SCL it was observed that the nationwide fiber optic network project would not require acquisition of any private/public land. During construction phase of the project temporary loss of income may happen to roadside vendors, which will necessitate preparation of a Social Management Plan (SMP). Since the project route is not yet finalized, it may require an indigenous and tribal people's plan (ITPP) as well if the finalized routes go through areas involving indigenous community. If the screening identifies social safeguard issues, the SIA and preparation of SMP and ITPP (if needed) will be carried out following the guidelines presented in this Chapter. If an SMP and ITPP preparation is warranted, only after obtaining necessary clearance from Bangladesh Bank / World Bank, the sub-project will proceed to implementation phase, during which the provisions of the EMP, SMP and ITPP will be executed, as prescribed in these documents, with monitoring by SCL. An independent third party monitoring will also be carried out to ensure compliance with the provisions of the SMF presented in this report.

5.4.1 Social Screening

191. The different categories of subprojects (Overhead or underground fiber optic lines) to be implemented at different locations will be identified by SCL during the project preparation phase. Participation from the community will be sought regarding the selection of route and adoption of technology (e.g. trenching vs. HDD). As discussed in Chapter 4, SCL will be responsible for carrying out environmental and social screening of sub-projects. The screening would involve: (i) reconnaissance of the sub-project areas/routes and their surroundings; (ii) identification of the major sub-project activities; and (iii) preliminary assessment of the impacts of these activities on the ecological, physico-chemical and socio-economic environment of the sub-project surrounding areas. This section provides guideline for social screening, focusing on social parameters, including loss of income, and impact on indigenous population. Other socio-economic parameters for social screening have been addressed as a part of the Environmental management procedures.

Underground Fiber Optic Lines

192. The parameters considered for screening of social impacts during construction phase of the underground fiber optic lines and control stations include loss of income, and impact on indigenous population. If the construction of underground fiber optic cable lines are laid along roadsides having shops and street side vendors then it could generate temporary income loss to them due to construction work as the shops will remain inaccessible. The loss of income to the street side shops may be "significant" or "moderate" depending on the extent of the work, where as temporary relocation of the squatters can make impact on the loss of income to be "minor". As a part of screening, it would be identified whether the project activities during construction phase are likely to affect indigenous population. A fiber optic cable is not likely to generate any adverse social impacts during its operational phase.

Overhead Fiber Optic Lines

193. The parameters considered for screening of social impacts during construction phase of aerial fiber optic lines include possible loss of income, and impact on indigenous population. Loss of income may result from temporary disruption of commercial activities at structures/ entities (e.g., shops) located very close to the routes of the proposed fiber optic line (e.g., on footpaths close to the optic fiber line alignment). Depending on the extent and duration of the disruption of commercial activities the impact may be

categorized as "significant", "moderate", or "minor" during social screening. Presence of indigenous population within/surrounding project areas and possible adverse impact of project activities on indigenous population will be identified during social screening. The fiber optic cable line is not likely to generate any adverse social impacts during its operational phase.

194. The social screening process will determine the nature of Social Assessment that should be subsequently undertaken. The social screening will provide a rapid assessment of the project characteristics, its beneficiaries, the socio-economic dimensions of the area, and its potential social impacts and risks. The results of the social screening will determine whether or not a sub-project requires Social Impact Assessment (SIA) with Social Management Plan (SMP) and Indigenous People Plan (IPP).

Subproject Exclusion Criteria:

195. To ensure that the sub-projects meet the main objectives of the project, legal requirements and safeguards, a set of exclusion criteria will be applied during social screening including the following:

- Subprojects requiring any kind of land acquisition or permanent population displacement;
- Subproject affecting mosques, temples, graveyards and cremation grounds, and other places/objects of religious, cultural and historical significance;
- Subprojects threatening cultural tradition and way of life of indigenous peoples; severely restrict their access to common property resources and livelihood activities;
- Subproject interventions with objections from communities on social issues that cannot be resolved through design alternatives.

5.4.2 Guideline for Carrying out SIA and Preparation of SMP and IPP

196. The principal objectives of the SIA are to identify viable alternatives; identify potential social impacts, including direct or indirect, permanent or temporary, physical or economic; assessing their significance; design least-cost mitigation measures; develop SMPs and monitoring requirements; develop IPP; formulate institutional arrangements; and ensure meaningful public consultation and information disclosure procedures. The SIA will identify and estimate impacts, risks and opportunities and suggest measures to avoiding or

minimizing, mitigating and managing, and compensating adverse social impacts.

197. The major activities carried out for the Social Impact Assessment (SIA) are summarized below.

- Baseline social surveys covering areas in and around the proposed locations/routes of overhead/underground optic fiber lines;
- Identification and scoping of possible social impacts of the proposed subproject activities, and selection of parameters for social impact assessment;
- Prediction and evaluation of social impacts and suggestion of mitigation measures to offset adverse impacts;
- Analysis of alternatives;
- Public/stakeholder consultations, including Focus Group Discussions (FGDs) and Interviews;
- Preparation of SIA report;
- Preparation of SMP, if needed;
- Preparation of IPP, if needed.

Socio-economic baseline

198. For carrying out SIA, 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 (see Table 4.2 for typical sub-project influence areas). A common approach for quick assessment of baseline socio-economic condition is by analyzing the data on socio-economic characteristics of the study area (collected from secondary sources such as BBS database).

Project activities and parameters for SIA

199. Chapter 3 provides detail description of activities during construction and operational phases of these sub-projects. These activities should be considered for assessment of social impacts of these sub-projects. The typical socio-economic impacts from implementation of these sub-projects include loss of income; impact on indigenous population, impact on archaeological / historical sites; traffic congestion; and employment generation. This SMF presented in this Chapter provides guidelines for assessment of social impacts focusing on:

- Loss of income associated with temporary displacement; andImpact on indigenous population.
- The guidelines for addressing the other socio-economic parameters are presented in Chapter 4 (section 4.4.3under EMF). Guidelines for carrying out "analysis of alternatives" are also presented in Chapter 4 (Section 4.4.2 under EMF).

Public/stakeholder consultation

200. The objectives of consultation and participation process are to inform, consult, engage, collaborate and empower the communities and other local stakeholders in the sub-project cycle at the field level. Consultation and community participation will be undertaken to achieve the following specific objectives at subproject identification, planning, design, implementation and evaluation stages:

- Identification to sensitize the community about the sub-project and their role and identify inclusive ground needs;
- Planning to ensure transparency of the planning process, reflect community expectations in project design, acceptable work schedule and procedures; ensure identification of adverse impacts and measures to mitigate them;
- Implementation to ensure that benefit accrues to the targeted beneficiaries inclusive of all groups including the very poor and vulnerable groups and the quality of works are satisfactory to the communities.
- Review and evaluation to evaluate the beneficiary satisfaction and outcomes of the subprojects for intended benefits to targeted beneficiaries.

201. Involvement of communities is not limited to interactions with them but also disclosing relevant information pertaining to the project tasks and targets. Consultation and participation involves communities and other stakeholders, which will take place through interpersonal communications, focused group discussions (FGDs) and small and large community meetings, whichever suitable. The following section presents guidelines for carrying out public consultations at different stages of a sub-project cycle:

Subproject Planning and Design Stage

202. SCL will disseminate subproject information (layout of overhead/ underground fiber optic cable line) among local people for increasing their awareness with the help of local representatives. In case of voluntary land donation, direct land purchase, displacement and involuntary land taking, consultation with the beneficiaries and affected persons and their profiling are mandatory as per the requirements of the SIA and preparation of SMP. This needs to be done as socioeconomic and field surveys as part of the SMP preparation. Consultations with respect to cultural aspects are to be carried out as part of the SIA for the subprojects.

Implementation Stage

203. Consultations as part of the implementation stage would be direct interactions of the SCL with the beneficiaries and affected persons, if any. These would comprise of consultations towards the role of beneficiaries in subproject implementation, establishments of grievance mechanism, compensation for income or asset loss, relocation of project affected persons and / or cultural properties, and towards addressing impacts on common property resources.

Review and Evaluation Stage

204. Communities will be consulted for their views on implementation process, social management measures for inclusion, participation, transparency, and impacts of resettlement, livelihood restoration and grievance response. The independent social reviewer will make use of the consultation and participation process and involve the communities.

5.5.3Social Management Plan (SMP)

205. Installation of underground / overhead fiber optic cable lines may cause temporary loss of income resulting from temporary disruption of commercial activities at structures/ entities (e.g., shops) and that of the squatters located very close to the fiber optic cable routes (e.g., on footpaths close to the optic fiber line alignment). The loss of income to the street side shops or squatters may be significant, moderate or minor depending on the extent of the work. Once it is determined through the social screening that a sub-project will cause loss of income, a Social Management Plan (SMP) needs to be prepared.

206. SMPs are designed to ensure that impacts arising from loss of income and assets are mitigated, managed and compensated. The SMP focuses on people affected by restriction of access, loss of assets and define a strategy for formalizing arrangements and responsibilities for mitigating impacts caused due to these losses. The detailed guideline for preparing a SMP is given in the following sections:

Temporary Resettlement Issues

207. Temporary resettlement issues are expected to arise where subprojects require use of the occupied land for construction purpose for a short time period and where sub-project activities induce temporary displacement of people (i.e. road side squatters) or loss of income (e.g. in road side shops, felling of grown up trees etc.). If the number of project affected person (PAP) is less than 200, an abbreviated resettlement plan (ARP) should be carried out instead of a full scale resettlement plan.

Impact Mitigation Objectives

208. The principles and guidelines provided in this framework are to avoid or minimize temporary loss of income due to sub-project activity, mitigate the impacts that are unavoidable, and assist to improve, or at least restore income earning or production capacity to pre-project levels. To achieve the objectives, SCL will adhere to the following strategic guidelines.

- Avoid or minimize displacement of persons/street side stalls who may have been using public lands for livelihood purposes;
- Collectively decide on impact mitigation measures (SCL meeting with the affected persons) where temporary displacement of persons and disruptions of economic activity as a result of undertaking sub-project works.

Impact Mitigation Principles

209. Where physical activities affect persons/economic activities on public lands, SCL will adhere to the following principles to avoid/minimize adverse impacts and adopt appropriate mitigation measures:

• As a first step toward mitigating adverse impacts, SCL will always try to avoid adversely affecting persons/businesses that are socioeconomically vulnerable.

- Where adverse impacts are absolutely unavoidable, the SCL will ensure that the affected persons / businesses are economically rehabilitated with measures acceptable to them.
- Where temporary displacement of public land users is unavoidable, SCLwill assist the affected persons/businesses to relocate on available public lands in the vicinity to ensure that they remain operational and do not lose income.

Eligibility for Compensation/Assistance

210. The persons/businesses affected directly and indirectly by the physical activities under a subproject are eligible for compensation and assistance. The most likely eligible groups are:

- Squatters: Persons/households who do not have legal rights to the affected lands, but use them for residential and livelihood purposes constructing structures on the lands. "Squatters" are persons who occupy/possess an asset without legal title. Squatters will not be entitled for compensation for lands but the structures and assets developed on it. They will be entitled for temporary relocation and livelihood restoration assistance in addition to compensation for structures following the entitlement matrix.
- Encroachers: Persons/households who do not have legal rights to the affected lands attached to their own titled land, but encroach them for productive purpose without other with or anv construction. "Encroachers" are those owners of land adjacent to public property, who have illegally extended their land holdings or structures into public land. Like the squatters, the encroachers will not be entitled for compensation for lands but the structures and assets developed on it. They will be entitled for temporary relocation and livelihood restoration assistance in addition to compensation for structures following the entitlement matrix.
- Market traders: Affected shop owners and operators displaced or closed temporarily due to undertaking of sub-project works.Compensation will be transition allowance for the permanent loss of business, incomes & wages equivalent to the loss of income/wages for a period of 3 months for each affected members.In case of temporary relocation and temporary loss of business incomes, compensation will be wages equivalent to closure period OR alternative business site for continued income stream.

Compensation/Assistance Principles
211. Depending on an affected person's preference, SCL may consider using both financial and material forms of compensation and assistance. SCL will ensure delivery of the agreed compensation/assistance in a timely and transparent manner. Compensation for the affected assets and income will be according to the following principles:

- Current market prices of trees that are to be felled (owners will retain ownership of un-felled trees).
- Other acceptable in-kind compensation.
- Compensation in cash will be made in public.

Consultation

212. Consultations will be inclusive of all stakeholders and used as a twoway communication strategy to provide information about the project and solicit support and agreements on the mitigations proposed. In addition to general consultation about the benefits and feasibility of specific physical activity, SCL will make certain that the users of the required lands (with and without legal rights) are consulted very early in the subproject preparation process. Consultations will focus on the issue of land availability and the conditions under which they could be used for subprojects. In cases where the would-be affected persons are indigenous or women, SCL will arrange culturally appropriate or separate consultations. SCLwill prepare consultations minutes, indicating dates, venues, compensation issues discussed, and the details of the agreements reached. The affected persons will be provided with copies of the minutes signed by the affected persons and the SCL. Copies of all such signed minutes will be kept by SCL and will be made available for review by SCL to the World Bank.

Preparation of Subproject SMP

213. The SCL will carry out Inventory of Losses (IoL) and census of affected persons and establish cut-off date for recognition of entities for compensation and assistance. Temporary or permanent displacement of traders for project works will be included in the census. The end date IoL/Census will be cut-off date for recognizing losses for resettlement assistance. The SCL and the occupants will jointly determine the replacement costs of business based on the most recent installations made in the same or adjacent localities, in view of the land type, productive quality and accessibility. Current prices of other assets, such as building materials, trees, etc. will be in accord with those in the

local markets. The SCL will review the rates and approve through council resolution. The valuation process has been discussed in more detail in a following section.Following the SIA, Census of affected persons, the SCL will prepare SMP for the subproject following this SMF. A typical SMP will contain information, on the number of people with socio-economic profile & loss of income, details of the impacts/ losses, the alternatives considered to minimize displacement, review of the application of legal and policy framework, mitigation measures and an entitlement matrix, detailed budget, time schedule, arrangement for implementation and monitoring and evaluation. The SMP preparation process will seek active participation of the communities including the SCL. SCL will document the impacts and affected persons, mitigation measures agreed with them, and verifiable evidence that the agreed measures have been implemented.

Implementation of SMP

214. SCL will forward the subproject SMP (where required) for review and approval from IPFF/World Bank. The SMP has to be reviewed and cleared before allowing implementation on site. SCL upon approval from the Bank and the IPFF will implement the SMP with assistance from the consultants and the SCL staff. Individual payment plan will be prepared for each affected persons and mitigation plans including replacement of affected physical structures by the SCL will be also be documented as a reference for future tracking.

Suggested Methods for Market Price Surveys

215. In line with the proposed compensation principles, SCL assisted by the consultants, will conduct market price surveys to determine the replacement costs of replaceable assets and market prices of irreplaceable assets by using the methods suggested below:

- Built Structures: Replacement costs will be based on the current prices of various building materials, labor and other cost items in the local markets. The costs of building materials, such as bricks, cement, steel, sand, bamboo, timber, GI sheet, roofing materials etc, and labor will be based on survey of current prices of different types of materials with five or so dealers/manufacturers in the local markets. The replacement cost of the house/structure will be based on the lowest quoted price for each type of material, plus their carrying costs to the sites.
- The current costs of labor with different skills will be determined by interviewing local contractors, assigned Upazilla engineers, or local construction workers.

- Replacement costs of any other items will be determined based on the current prices of materials, labor, etc. As and when required, SCLwill seek technical assistance of Upazilla engineers and the project consultants for estimates of materials and labor for particular structures.
- Trees & Other Irreplaceable Assets: Current market price of trees will be determined based on (a) Net Present Value or (b) Current age, life span, productivity and current market price of output. Market prices of different varieties of trees will be determined by surveying the prevailing prices paid by five or so timber and fuel-wood traders in the local markets. The compensation for trees will be fixed at the highest prices offered by a trader. Compensation for all other irreplaceable assets (if any) will also be based on survey of their prevailing prices with dealers/traders in the local markets.
- Fruits and Other Crops: Compensation will be fixed at the harvest prices of the fruits and other crops. Harvest prices of different varieties of fruits and crops will be collected from a sample of 7-10 dealers in the local markets. The compensation for each type of fruit and crop will be fixed at the highest price offered by trader.

Matrix No.	Type of Loss	Application	Entitled Person	Compensation
<u>No.</u> M – 1	Loss of business / income or employment due to temporary displacement or temporary removal of structures	Temporary loss of business/ incomes/ employment	Affected individuals (titled/non- titled)	In case of temporary relocation and temporary loss of business incomes, compensation will be wages equivalent to closure period OR Alternative business site (usually within a few feet) for continued income stream. All temporarily removed structures and losses will have to be at replacement
M – 2	Trees on affected lands	Trees lost	Owner of affected trees(titled/ non-titled)	Compensation in cash calculated on the basis of type, age and productive value of affected trees.
M –3	Loss of public infrastructure	Infrastructure (electric water supply, sewerage &telephone	Relevant agencies.	Compensation in cash at replacement cost to respective agencies or restoration of affected assets.

Compensation and Entitlement Matrices

Matrix No.	Type of Loss	Application	Entitled Person	Compensation
		lines; public		
		health center;		
		public water		
		tanks)		
М –4	Unforeseen	As identified	As	Appropriate mitigation
	Losses		identified	measures as determined to
				meet the objectives of this
				policy framework

Outline of SMP

J	
Project	Brief introduction about the project, description of project
Background	interventions and areas of jurisdiction of SCL description of project
	components causing resettlement, scope of resettlement, an
	account of the alternatives considered to avoid and/or minimize
	the adverse impacts
Census and	Identify all categories of PAP and their vulnerability, identify all
Socioeconomic	categories of impacts (loss of property and assets, loss of livelihood;
Surveys	impacts on groups and communities, impact on physical cultural
-	resources)
	An account of impacts by gender and vulnerability due to project
	and the special assistance that is to be provided
Participation and	An account of the disclosure of SMF and consultations with the
Consultation	project affected people about the mitigation measures and
	implementation procedure;
Legal and policy	Analysis of the legal framework for compensation, applicable legal
framework	and administrative procedures, gaps between local laws and the
	Bank's resettlement policy, and the mechanisms to bridge such
	gaps;
Compensation	Description of compensation and other assistance that will be
Entitlements	provided according to the principles and guidelines adopted in this
	SMF;
Grievance	Describe specific arrangement and procedure for receiving and
redress	resolution of complaints and grievances from the PAP and their
mechanism	community
Social	Budget with breakdowns by loss categories and the number of
Management	persons entitled to compensation/assistance, Fund flow and
Budget	disbursement procedures
Implementation	Institutional arrangement and management of preparation and
Arrangement	implementation of compensation activities, grievance resolution,
	and implementation time schedule

Monitoring and	Describe monitoring arrangement involving PMU and SCLand
Evaluation	mechanism for independent review and evaluation as well as
	reporting

5.5.4Indigenous People Plan (IPP)

216. The general sub-project areas in Chittagong and Sylhet division may have small concentration of indigenous inhabitants. The project has taken the exclusion criteria (see Section 5.4.1) to avoid any negative impact on the indigenous communities due to undertaking of the project in those areas. The project rather, intends to extend the benefits towards their welfare. OP 4.10 is triggered when a project engages with, touches on or impacts indigenous people in any way, positive or negative. Detail guidelines have been prepared for preparation of IPP, following the World Bank's Operational Policy on Indigenous Peoples (OP 4.10), to maximize benefits to the indigenous peoples. The guidelines on indigenous people management, presented in the following sections, will apply where sub-projects will be proposed in areas inhabited by indigenous peoples:

Objectives of the Indigenous Peoples Plan

217. Depending on the presence of indigenous peoples (IP) in the subproject areas, divisional SCL will prepare their subprojects with the following strategic objectives:

- Select subproject interventions and determine their scopes to avoid impacts on tribal peoples.
- Ensure free, prior and informed consultation with the indigenous peoples where subproject identifies indigenous peoples among the beneficiaries.
- Ensure project benefits are accessible to the indigenous community living in the subproject area.
- Ensure indigenous peoples participation in the entire process of identification, planning, and implementation of subprojects.
- Wherever possible, adopt measures to reinforce and promote any available opportunities for socioeconomic development of the indigenous communities.

Identifying the Indigenous Peoples

218. Although the indigenous peoples in Bangladesh are well recognized locally, SCLwill examine the following characteristics to make formal identification:

- Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;
- Collective attachment to geographically distinct habitats or ancestral territories in the subproject area and to the natural resources in these habitats and territories;
- Customary cultural, economic, social or political institutions that are separate from those of the dominant society and culture; and
- Indigenous language, often different from the official language of the country or region.

IP Consultation Strategy

219. In order to hold free, prior and informed consultations, SCL will provide IPs with all information related to the subproject interventions, need for lands, and intended benefits, including those on potential adverse impacts. SCLwill ensure that their local representatives include indigenous representatives in wards with presence of indigenous peoples. To facilitate consultations SCL will,

- Prepare a time-table for IP consultations leading to selection, design and implementation of the subprojects, and consult them in manners so that they can express their views and preferences freely.
- In addition to the communities in general, consult IP organizations, community elders/leaders and others with adequate gender and generational representation; and civil society organizations like NGOs and groups knowledgeable of TP issues.
- In addition to the choice of alternative subproject design and locations, consultations will concentrate on the adverse impacts, if any, perceived ways to avoid those impacts, as well as exploring additional development activities that could be promoted under the subproject. This will provide the inputs necessary to prepare and implement a ITPP for a subproject in an area inhabited tribal peoples. SCLwill keep minutes of these consultation meetings and make them available for review by the World Bank and other interested groups and persons.

Preparation of an IPP

220. In order to prepare an IPP, the following steps will be taken:

- Social screening to establish the presence of tribes in the subproject area or have collective attachment to the subproject area
- Detailed social assessment establish a socioeconomic baseline data on the indigenous people in the subproject area
- Review laws and policy guidelines applicable to the indigenous communities
- Demonstrate measures to avoid negative impacts to the indigenous people
- Identify areas for improvement of indigenous settlement and extending benefits of the subproject to them
- Disclose the ITPP locally and in Bank Info shop before award of project works contract.

221. The ITPP will primarily aim at avoid potential adverse impacts, and reinforcing and promoting any existing opportunities. The ITPP will basically consist of IP profile and baseline information, consultation and participation strategy, benefits enhancement measures, implementation arrangement including institutional and financial and a monitoring and evaluation plan. The draft outline of the ITPP is given below.

	······································
Baseline and IP	Baseline data, including analysis of cultural characteristics,
Profile	social structure and economic activities, land tenure,
	customary rights to common property resources, relationship
	with the local mainstream peoples, occupation, language
	skills, costumes, etc.
Participation	Process and timing of consultation and the participants such
Strategy	as IP community leaders, elders, community based IP
	organizations, NGOs, individuals, generational representatives,
	feedback
Subproject benefits	Identify subproject benefits to the IP communities and the
and enhancement	areas where the benefits can be enhanced
areas	
Enhancement	Identify IP preferences and priorities, develop enhancement
measures and	measures agreed with the communities

Outline of Indigenous People's Plan

activities			
Implementation	Describe responsibilities for implementation of the		
Arrangements	enhancement measures including SCL, IP communities,		
	consultants with time schedule, costing and sources of		
	financing		
Monitoring and	Design monitoring and evaluation plan involving the IP		
evaluation	communities, the consultants and the SCL		

Access to Information

222. Summary of the SMF report and impact mitigation measures will be translated into Bengali language and disseminated locally. Copies of the full report (in English) and the summary (in Bengali) will be sent to all the concerned offices of SCL, and will be made available to the public. During the implementationstage of project, the sub-project specific screening/assessment report will periodically be posted in the SCL website before the bidding process.

5.6 CAPACITY BUILDING AND TRAINING REQUIREMENTS

223. The environmental and social screening carried out through Forms 1 to 3 are relatively straightforward and SCL engineers/officials who are part of the PMU have the necessary expertise the carry out these activities. However, they have limited exposure to social assessment and management. Therefore, basic training on regulatory requirements, social impacts, and social assessment and management would greatly improve the capability of relevant SCL engineers and experts in carrying out their responsibilities.

224. SCLwill employ individual consultants, who would support SCL in overall social management (including preparation of SMP and ITPP, if required). However, since the overall responsibility of social management lies with SCL, they need to ensure that the consultants are carrying out their responsibilities properly. For this purpose, it is important that the SCL engineers/officials receive advanced training on social management and monitoring. Such training will assist them in properly overseeing the activities of the consultant engaged in social management of the proposed project, following the SMF.

5.7 MONITORING AND EVALUATION

225. Monitoring and Evaluation (M&E) of sub-projects for social development and safeguard issues are critical activities in order to identify implementation problems and develop solutions. Monitoring is a periodic assessment of planned activities providing midway inputs, facilitating changes and giving necessary feedback on the activities and the directions on which they are going; whereas evaluation is a summing up activity at the end of the project assessing whether the activities have actually achieved their intended goals and purposes.

226. As discussed in chapter 4 (section 4.8), apart from regular monitoring by SCL, a third party consulting firm (to be hired separately by SCL) will be given the responsibility to independently monitor the overall performance of social management of the proposed project, including compliance with relevant WB regulations and the provision of the social management framework (SMF) developed for the project.

CHAPTER 6

INSTITUTIONAL ARRANGEMENT OF ESMF

6.1 INSTITUTIONAL ARRANGEMENT FOR IMPLEMENTATION OF EMF

227. 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 ESMF 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 ESMF and will report directly to the General Manager SCL.

228. 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 subprojects where physical interventions are being made, following the guidelines contained in the Environmental and Social Management Framework (ESMF).
- Assessing the nature of the impacts and planning of site specific Environmental mitigation plan.
- Preparing Environmental Management Plan (EMP) or BMP where necessary (High or Moderate impacts),
- 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.

229. 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 INSTITUTIONAL ARRANGEMENT FOR IMPLEMENTATION OF SMF

230. Institutional arrangement for implementation of SMF is the same as that for EMF. The officials will be responsible for the activities of "Environmental and Social Unit" in undertaking social screening and monitoring as per the provisions of ESMF and will report directly to the General Manager SCL.

231. The activities of Institutional Arrangement under Social 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 subprojects where physical interventions are being made, following the guidelines contained in the Environmental and Social Management Framework (ESMF).
- Assessing the nature of the impacts and planning of site specific Environmental mitigation plan.
- Preparing Social Management Plan (SMP) where necessary (High or Moderate impacts),
- Preparing Indigenous People's Plan (IPP) where impacts are moderate or high in case of indigenous and tribal people are affected.

• Carry out monitoring activities at the sub-project sites to assess the implementation of the SMP preparing reports of monitoring activities from time to time.

232. For the purpose of preparing SMP and IPP, SCL will hire individual consultants. The "Environmental and Social Unit" under PMU of SCL will be responsible for implementation of SMP and IPP) with support from individual consultants.

6.3 MONITORING AND REPORTING

233. 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/BMPs.

234. Reporting on the EMF 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 EMF and other safeguard requirements including the results of new subproject screening and safeguards documentation.

235. The environmental and social focal person of PMU (General Manager of SCL) will share half yearly progress report on EMF implementation with the IPFF/ World Bank. 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.

236. 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.

237. 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.

238. As discussed in Section 4.8 of Chapter 4, apart from regular monitoring by SCL, 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 relevant WB regulations and the provision of the environmental and social management framework (ESMF) developed for the project.

6.4ACTIVITIES AND RESPONSIBILITIES

239. Figure 6.1 shows activities and institutional responsibilities for overall implementation of the proposed fiber optic network project by SCL.



Figure 6.1: Institutional set up, including major activities and assignment of responsibility for their execution, for implementation of proposed sub-project by the SCL.

CHAPTER 7

GRIEVANCE REDRESS AND DISCLOSURE

7.1GRIEVANCE REDRESS MECHANISM (GRM)

240. 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.

7.1.1Grievance Receive and Registry

241. **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).

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

243. 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.

7.1.2Grievance Redress Modes:

Solution at the Project Level:

244. 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)

245. 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.

246. 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.

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

Chairman	Local Govt. Representative	
Member-	Project Team Leader of the subproject (General	
Secretary	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.	

Table 7.1: Structure of Grievance Redress Committee (GRC)

*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

248. Figure 7.1 shows the grievance redress mechanism:



Figure 7.1: Grievance redress mechanism

7.2APPROVAL AND DISCLOSURE

249. Environmental/social screening (Annex V) of each sub-project and SMP, wherever required, are to be subject to review and clearance by IPFF / World Bank. Whenever requested, SCL will provide IPFF/ World Bank with copies of

the filled out social screening forms for all categories of subprojects to be implemented by SCL.

250. Executive Summary of all safeguard documents including the ESMF, SMP, ITPP and other social plans are to be translated into Bangla (local language) and disclosed locally and the English versions disclosed through the Bank's Info-shop. SCL is to upload the ESMF 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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ANNEX I

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 to Investment Promotion and Financing Facility (IPFF) cell of Bangladesh Bank through Industrial and Infrastructure Development Finance Company (IIDFC) Ltd ("Arranger") for syndication arrangement of term loan financing of BDT 792.00 million and USD 10.00 million.

SCL has an ambitious plan of being the largest fiber optic infrastructure operator in the country extending its presence to 100% of 489 Upazilas (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 Upazilas 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 Upazilas. SCL has obligation to cover 40% Upazila's Headquarters within its 5th years of operation and currently it is running 6th year's operation and has connected 59% Upazilas from 489 Upazilas. It has obligation to cover upto 100% Upazilas 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 119.44 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 upazilas. 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 \$25.6 million.

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 the World Bank 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, the World Bank 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). Social screening and assessment are mandated under Bank OP 4.01 Environmental Assessment and considers natural and social aspects in an integrated way. 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 Framework (ESMF) 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 ESMF. The ESMF will outline the procedures of screening and assessment.

OBJECTIVES

The main objective is the assignment is to formulate an Environmental and Social Management Framework (ESMF) 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 World Bank safeguard policies and explain its implication to the proposed project;

Overall Project Baseline and Environmental and Social Impacts

- i) Under the framework of the ESMF, the baseline information of the areas will be established where fiber optic cable layout operations will be carried out. The ESMF 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 ESMF 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 ESMF 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 ESMF

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)

<u>Resettlement Policy</u>: 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.

<u>Tribal Peoples Planning</u>: 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, Patuakhlai 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 (IPPF) in the SMP will lay out the process to comply with OP 4.10 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

প্রান্থনিয় সন্তাগর্ব নির্বাচনে সন্দর্ভনকে জেট নিব গর্গ ইয় করন 3 www.new?wonders.com জেন করন 3 cos84abacobaba (৭৭২৪)

গণপ্রজাতত্রী বাংলাদেশ সরকার পরিবেশ অধিনতার www.doe-bd.org পরিবেশ ভবন, ই/১৬ আগারগাঁও পেরে বাংলা নগর, ঢাকা-১২০৭।

নং- গরিবেশ/ছাড়পত্র/৫০৯৭/২০১১/ ৭ 98

তারিশ : ১০০ / ৬২.৮ খন ১০০ / ০৭ /২০১১ বৃঃ

বিষয় ঃ সামিট কম্যুনিকেশনস লিমিটেড কর্তৃক ঢাকা সহ পর্যায়ক্রমে সায়াদেশের সকল উপজেলা সদরে ভূ-গর্জহ টেলিকম্যুনিকেশন নেটওয়ার্ক ছাপনের জন্য অনাগত্তি হানান প্রসংগে।

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

শূদ্রোষ্ট্রিখিত বিষয়ের গরিশ্রেম্বিডে আনানো যান্তে যে, বাংলাদেশ টেলিকয়ুনিবেশন রেগুলেটরী কমিশন (BTRC)-র ন্যাশনওয়াইত টেলিকয়ুনিকেশন ট্রান্সমিশন নেটওয়ার্ক ((NTTN) লাইনেলঞ্জাও সামিট ক্য্যুনিকেশনস লিমিটেড, সামিট সেন্টার, ১৮, কাওরান বাজার বা/এ, ঢাকা-১২১৫ নামক প্রতিষ্ঠান কর্তৃক সক্রাসহ সারাদেশের সকল উপজেলা সদরে ভূ-গর্ভস্থ টেলিকয়ুনিকেশন নেটওয়ার্ক হাপনের লক্ষ্যে দাখিলকৃত কাগজপত্র পরিবেশগত ছাড়পর বিষয়েক কমিটির ৩০৮তম সভায় গর্যালোচনা করা হয়। উচ্চ সভায় পৃথীত লিছান্ডের আলোকে সামিট কয়ুনিকেশনস লিমিটেড এর অনুকৃলে নিয়বর্ণিত বিষয়াদি প্রতিপালনের শর্তে অত্র দণ্ডর হতে নিদের্শক্রমে অনাপত্তি প্রদান করা হলো ৪

- ক) ভূ-গর্জন্থ টেলিকম্যুনিকেশন মেটওয়ার্ক ত্থাপনকালে খননকার্যক্রমের মাধ্যমে যাতে পারিপার্শ্বিক পরিবেশ ও জীব বৈচিত্রের উপর কোন বিরপ প্রভাব না ফেলে সে বিষয়ে যথোপযুক্ত ব্যবস্থা গ্রহণ করতে হবে।
- খ) ভূ-গর্জন্থ টেলিকহ্যনিকেশন মেটওয়ার্ক ছাগনের কার্যক্রম থরুর পূর্বে সড়ক, পানি, গ্যাস, বিদ্যুৎ, দ্রেনেজ, সিওয়েজ, টেলিফোন, অপটিক্যাল ফাইবার ও অন্যান্য সকল ভূ-গর্জন্থ নেটওয়ার্কের যাধ্যমে সেবা প্রদানকারী সংস্থার অনুমতি গ্রহণ করতে হবে এবং তানের সাথে সার্বক্ষণিক যোগাযোগ ও সমন্বর রক্ষা করে চলতে হবে।
- গ) ভূ-গর্ভছ টেলিকম্যুনিকেশন নেটওয়ার্ক ছাপনের মাধ্যমে সকল ধরনের ঝুলন্ত টেলিকম্যুনিকেশন, তিশলাইন ও অন্যান্য কেবল রান্তা থেকে অপসারণ খনতে হবে।
- মৃ জু-গর্ভন্থ টেলিকয়্যানিকেশন নেটওয়ার্ক ছাঁপনের সময় রাজা খনদের কারনে সৃষ্ট দূষণ নিয়য়পের জন্য প্রয়োজনীয় ব্যবহা
 রহিণ করতে হবে।
- ৬) ভূ-গর্ভছ টেলিকম্যুনিকেশন নেটওয়ার্ক স্থাপনের সময় সাধারণ জনগণের চলাচলের যাতে কোন অসুবিধা না হয় সেলিকে লক্ষ্য রাখতে হবে।
- চ) ঢাকা শহরে ওয়ার্ভিন্ডিক ও উপজেলা পর্যায়ে ভূ-গর্জন্থ টেলিকমুনিকেশন নেটওয়ার্ক স্থাপনের কার্যক্রম শুরুর পূর্বে এ সংক্রান্ত কর্মপরিকল্পনা পরিবেশ অধিদপ্তরে দাখিল করতে হবে।

5010912022

(সৈয়দ নহুমূল আহ্বসান) উপ-পরিচালক (পরিবেশগত ছাড়গত্র) কোন # ৮১২১৭৯৩

ভনাব মোঃ আরিফ আল ইসলাম ব্যবস্থাপনা পরিচালক ও সিইও সামিট কম্যুনিকেশনস লিমিটেড সামিট সেন্টার ১৮. লণ্ডরান বাজ্ঞার বা/এ, ঢাকা-১২১৫।

অনুশিপিঃ

- ১) পরিচালক, পরিবেশ অধিদণ্ডর, চাকা/চট্টগ্রাম/রাজশাহী/খুলনা বিভাগীয় কার্যালয়, ঢাকা/চট্টগ্রায/বগুড়া/খুলনা।
- উপ-পরিচালক, পরিবেশ অধিদপ্তর, সিলেট/বরিশাল বিন্ডাগীয় কার্যালয়, সিলেট/বরিশাল।
- সহকারী পরিচালক, মহাপরিচালক মহোদয়ের শাখা, পরিবেশ অধিদগুর, সদর দণ্ডর, 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: <u>26/03/1418 BY</u> 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					
Sub	Subproject Name and Location:				
 Nar	ne of Ward: Nam	ne of th	 1e Upaz	zilla/Area:	
••••			•		
Sub	-project Objectives:				
••••		•••••		••••••••••••	•••••
••••		•••••			
••••	•••••••••••••••••••••••••••••••••••••••	•••••	• • • • • • • • • • • •		
Sub	-project Components:				
		•••••			
••••		•••••		•••••	
•••••		•••••	• • • • • • • • • • • • •		
(1)	Warls Declarge Dertion later				
(1)	(a) Type of Line	:	⊓ Und	erground	□ Overhead
	(a) 1990 of 2000	•		1	
	(b) Total Length (km)	:		-	Underground
					Overhead
	(c) Start/ End Point	:			
	(d) Number of Control Station	ns to b	e Cons	structed	:
	(e) Number of Handholes to b	oe Con	structe	ed	:
	(f) Mode of Operation for Und	lergrou	ınd		•
	Cut and Fill	. [] HDD	□Both	
	(g) Mode of Operation for Ove	erhead		_	:
	Existing BREB Poles			Numbers_	
	□ New Poles to be Const	ructed		Numbers_	
(2)	Local SCL office/ PGCB Subs	station	:		
(3)	Layout of proposed Fiber opt (attach layout map)	tic Lin	e:		
(4)	Does the work package invol	ve	:		
. ,	a) Railway crossing			□ Yes	□ No
,		118			

(b) Road crossing	□ Yes	\square No
(c) Stream/River crossing	□ Yes	\square No
(d) Bridge Crossing	□ Yes	□ No

(5) Land ownership and permissions :

(a) Will land acquisition be used?
(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, water body, 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 4.2in determining the influence area.

ANNEX IV

FORM 2: ANALYSIS OF ALTERNATIVES: OPTICAL FIBER LINE

(to be completed by SCL)

Subproject Name and Location:					
Name of Ward:	Name o	f the Upaz	zilla/Area:		
Work Package Particulates	:				
(a) Type of Line	:	□ Und □ Both	erground 1	□ Overhead	
(b) Total Length (km)	:			_Underground	
				Overhead	
(c) Start/ End Point	:				
(d) Number of Control S	tations t	to be cons	tructed	:	
(e) Number of Handhole	s to be C	Constructe	d	:	
(f) Mode of Operation fo	r Underg	ground		:	
🗆 Cut an	d Fill	\square HDD	🗆 Both		
(g) Mode of Operation fo	or Overh	ead		:	
Existing BREB F	Poles		Numbers_		
□ New Poles to be	Construc	ted	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 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.

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 ESMF)

Subproject Name and Location:							
Name of Ward:	Name o	f the Upaz					
Work Package Particulates	:						
(a) Type of Line	:	□ Und □ Both	erground 1	□ Overhead			
(b) Total Length (km)	:			_Underground			
				Overhead			
(c) Start/ End Point	:						
(d) Number of Control S	tations t	o be cons	tructed	:			
(e) Number of Handhole	s to be C	onstructe	d	:			
(f) Mode of Operation fo	r Underg	ground		:			
□ Cut ar	nd Fill	🗆 HDD	□Both				
(g) Mode of Operation fo	or Overh	ead		:			
🗆 Existing BREB F	Poles		Numbers_				
New Poles to be	Construc	ted	Numbers_				

(1) Potential Environmental Impact During Construction Phase Checklist

SI	Screening Questions	Yes	No	Not Awar e	Remarks/ Possible Negative Impact and assessment (low/moderate/hi gh)*	
(a) Ecological impacts:						
1	Is the construction being carried					
	out in an ecologically sensitive					
	area?					
2	Will the topsoil and vegetation be				Please mention	
	cleared as a result of the				how many trees	
	construction?				will be cut	
3	Is there a possibility of					
	fragmentation of natural floral or					
	faunal habitats?					
SI	Screening Questions	Yes	No	Not Awar e	Remarks/ Possible Negative Impact and assessment (low/moderate/hi gb)*	
------------	---	--------	--------	------------------	---	
(b) P	hysico-chemical impacts:				S ¹¹)	
4	Will dust and vibration-generating equipment be used?				(mention what kind of equipment be used)	
5	Will the excavation/ trenching works and movement of vehicles generate air pollution?				(specify the method of air pollution)	
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) G s	eneral Socio-economic impacts (ine afety):	cludin	g occi	ipationa	l health and	
15	Is the project area densely populated?					
16	Will there be any pedestrian and safety related issue?				(Mention the type of measures that will be adopted, i.e. Traffic safety	

S1	Screening Questions	Yes	No	Not	Remarks/
				Awar	Possible Negative
				е	Impact and
				-	assessment
					(low/moderate/hi
					(,, gh)*
					sians. protection
					fence with
					warnings)
17	Is significant movement of vehicles				(Mention the type
	involved during construction				of measures that
	activities?				will be adopted.
					i.e. Traffic safety
					signs, protection
					fence with
					warnings)
18	Will child and pregnant women be				
10	used in construction activities?				
19	Is there a safe source of drinking				(mention the
	water and adequate sanitation				location of the
	facilities available for the workers				facilities)
	at or near the construction site?				<i>J</i>
20	Will the workers be provided				(Provision of PPE
	Personal Protective Equipment				such as helmets.
	(PPE), devices and clothing and be				boots and face
	ensured those are used?				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				(Mention the type
	health to people other than				of measures that
	workers?				will be adopted.
					i.e. Traffic safety
					signs, protection
					fence with
					warnings)
23	Will any archaeological and				-9-7
	historical Structure be affected?				
24	Will any structure(s) / entity(s) (e.g.,				(mention the
	shops) be temporarily affected				numbers of
	during sub-project activity?				structure(s)/
					entitu(s))

S 1	Screening Questions	Yes	No	Not	Remarks/
				Awar	Possible Negative
				е	Impact and
					assessment
					(low/moderate/hi
					gh)*
25	Will any squatter(s) be temporarily				(mention the
	displaced during sub-project				numbers of
	activity?				squatter(s))
26	Will any mobile vendor(s) be				(mention the
	affected potentially?				numbers of mobile
					vendor(s))
27	Will any kind of land acquisition or				
	permanent population				
	displacement is 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 a 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 WB 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) Mitigati	ion Protocol				
Activities Associated with low to moderate environment al impacts (From screening checklists in Annex I and II)	Suggested mitigation measures/ BMPs (From Annex III and IV)	Mitigation Measures Adopted by the Contractor/S CL (Mention which mitigation measure the contractor has adopted)	Monitoring of mitigation measures (Describe the method of monitoring)	Frequen cy of monitori ng during period of activities (Once/w eek, once/mo nth etc. dependi ng on the activities)	Name of the person conducting the monitoring (Typically will be performed by the focal person at the subproject level)
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/W eek	Mr. X

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

(Ref: Physical Cultural Resources Safeguard Policy Guidebook, World Bank, 2009)

As stated in the World Bank PCR Safeguard Policy Guidebook, 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 subprojects 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 since OP 4.11 does not call for a separate 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 an 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 (Ref: The World Bank Operational Manual, 1999 OP4.11)

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 World Bank Supervision Reports and Implementation Completion Reports will assess the overall effectiveness of the project's cultural property mitigation, management, and activities, as appropriate.

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.

<u>BMPs related to excavation, backfilling and topsoil restoration and re-</u>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 revegetation, 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 cheatgrass.

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.

<u>BMPs related to pole construction (Aerial installation of fiber optic</u> <u>cable line)</u>

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.
 - As per the World Bank OP 4.04, the conservation of natural habitats, like other measures that protect and enhance the environment, is essential for long-term sustainable development. A precautionary approach to natural resource management to ensure opportunities for environmentally sustainable development has been adopted for the project.
- 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/WORLD BANK GROUP 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
 - \circ Use of laser safety glasses during live optical fiber systems installation
 - Prohibition of intentionally looking into the laser of 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.

Reference: IFC and World Bank Group (2007) Environmental, Health and Safety Guidelines for Telecommunications. Available at the following link: http://www.ifc.org/wps/wcm/connect/0985310048855454b254f26a6515b b18/Final%2B-%2BTelecommunications.pdf?MOD=AJPERES&id=1323152343828

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ANNEX XII

FORM 5: PROJECT IMPLEMENTATION RECORD

Sub	project Name and Location:		
Nan	ne of Ward: Name of t	he Upazilla/Area	a:
Wor	k Package Particulates :		
	(a) Type of Line :	□ Underground □ Both	□ Overhead
	(b) Total Length (km) :		Underground Overhead
	(c) Start/ End Point :		
	(d) Number of Control Stations to	o be constructed	:
	(e) Number of Handholes to be C	onstructed	:
	(f) Mode of Operation for Underg	round	:
	\Box Cut and Fill \Box I	HDD 🗆 Both	
	(g) Mode of Operation for Overhe	ad	:
	Existing BREB Pole	es N	umbers
	□ New Poles to be Co	nstructed N	umbers
1)	Local SCL office/ PGCB Substati	on :	
2)	Layout of proposed Fiber optic L (attach layout map)	ine :	
3)	Land ownership and permissions	:	
	(d) Names of the govt. agencies owni	ng the land:	
	(e) Area of land to be used (acre)	:	
	(attach a copy of the agency's permissio	n 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:

Seri	Aspects of Environmenta	Environmental issues to be	Compliance Status						
al Nos	1 issues Monitorea		FC	PC	NC				
Cond	itions at Subproi	ect Site							
Δ	General				<u> </u>				
	1	Employment Record keeping							
	1.	arrangement							
	2.	Legal working hours approval							
	3	Provision for monthly meeting for		+	+				
	0.	inspection of site activities							
В.	Health and San	itation		<u> </u>					
	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							
		equipments (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							
С.	Labour Welfare								
	1. Workers' complains taken care								
		by the site engineer		<u> </u>	<u> </u>				
	2.	Provision of leaves (national and							
		emergency)							

8) Environmental Monitoring Checklist for Routine Site Inspection

Seri	Aspects of Environmenta 1 issues	Environmental issues to be	Compliance Status			
al Nos.		Monitored	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 emissi	on 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	L .				
	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	L		1	
	1.	Field Office possesses all				
		Environmental Documents				
		relevant to proposed scheme				
		implementation and contract				

Seri	Aspects of Environmenta 1 issues	Environmental issues to be	Compliance Status			
Nos.		Monitorea	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 subproject:

 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 subprojects 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 subprojects, 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 shortterm 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 socioeconomic 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, following the World Bank Operational Policy OP 4.11 (Physical cultural resources).

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 subprojects 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 physic-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 unserved 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 cable lines.

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

Name of the Upazilla: Belkuchi

Sub-project Objectives:

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

Work Pack (a) Type of I	age Particulates Line	:	✓□ Underground □ Both	🗆 🗆 Overhead
(b) Total Lei	ngth (km)	:	22.578 km	Underground _Overhead
(c) Start/ E	nd Point	:		
Start Point	: Sirajgonj PGCB			
	Coordinates: N 24	4°23'2	0.2", E 89°44'34.4	"
End Point	: Enayetpur Robi	Tower		
	Coordinates: N 24	4°14'1	.6", E 89°41'42.9"	
(d) Number	of Control Statior	ıs to b	e Constructed	:1
(e) Number	of Handholes to b	e Con	structed	: 30
(f) Mode of Oper	:			
-------------------	-------------------------	-------	---------	--
Cut and Fill	\checkmark \Box HDD	□Both		
(g) Mode of Oper	: X			
Existing BREB	Poles		Numbers	
□ New Poles to be	e 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 :

	89°40'15"E 89°4	1'30"E 89°42'4	5"E 89°44'0"E 8	9°45'15" <u>E 89°46</u>	30"E 8 <u>9°47'45</u> "E	89°49'0	"E
24°25'15"N	The state	的教育		A B			24°25'0"N
24°24'45"N	14 63	1 And	1. 100 . 201	A 10			24°24'30"N
24°24'15"N			ни од		A GE		24°24'0"N
24°23'45"N				03			24°23'30"N
24°23'15"N		S. S. Ho					24°23'0"N
24°22'45"N		50. 2	11 09	THEN		A	24°22'30"N
24°22'15"N	B. A.		110	5	1 cm		24°22'0"N
24°21'45"N	M. X		n / S		$\mathcal{Y} \in \mathcal{Y}$		24°21'30"N
24°21'15"N			2	Sirajgonj		新生活	24°21'0"N
24°20'45"N					Tangail	The second	24°20'30"N
24°20'15"N					3		24°20'0"N
24°19'45"N		HH.16	1 pat / 1		These second		24°19'30"N
24°19'15"N				0 12.525	50 Kilometers		24°19'0''N
24°18'45"N		1111-1/8					24°18'30''N
24°18'15"N		HH 19	AM Ca		N		24°18'0"N
24°17'45"N				w -	E E		24°17'30"N
24°17'15"N		HH 22	MA N		S S		24°17'0"N
24°16'45"N		HII 23				14	24°16'30"N
24°16'15"N					(The second		24°16'0"N
24°15'45"N		HIH 2	6				24°15'30"N
24°15'15"N	A B	S HTL2		Handhol	es	大地	24°15'0"N
24°14'45"N		HH 2		Main_Fra	ame		24°14'30"N
24°14'15"N			1 Edt	Box 01 Box 02		54	24°14'0"N
24°13'45"N			1 90	Box 03			24°13'30"N
24°13'15"N	0 1.25 2.	5 5	Kilometers	Box 04		· No	24°13'0"N
24°12'45"N			Ser ale		VERSER		24°12'30"N
24°12'15"N			1:	1			24°12'0"N

89°40'0"E 89°41'15"E 89°42'30"E 89°43'45"E 89°45'0"E 89°46'15"E 89°47'30"E 89°48'45"E

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 Shahjadpur 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 l	ine in	Sirajgonj								

Hand-	Socio-economic Fea	Note	
holeNo	Features Number		
		(approx.)	
1 to 5	House (tin-shed)	4	Land owned by RHD
	Small shop (Tong)	30	

Hand-	So	cio-economic Fe	atures	Note		
holeNo	Features		Number			
			(approx.)			
	Mosque		2			
	Water-bo	dies (pond)	2			
		Acacia	260	Land owned by RHD. Flora		
		Eucalyptus	12	planted by RHD but mango		
		Mango	42	tree, bamboo and banana by		
		Koroj	4 (big &	local people.		
	Flora		old)			
	11012	Sisu	8			
		Jackfruit	28			
		Shimul	1			
		Bamboo	9			
		Banana	12			
6 to 30	House (ti	n-shed)	0	Along road no house but water-		
				body side has few house not		
				more than 20.		
	Small sho	op (Tong)	100+	Both side of the road. Land		
				owned by RHD.		
	Mosque		5	_		
	Shashan		3	_		
	Water-bo	dies (pond)	10+			
	Flora	Acacia	8	Land owned by RHD. Flora		
		Eucalyptus	0	planted by RHD but mango		
		Mango	6	tree, bamboo and banana by		
		Koroi	0	local people.		
		Sisu	0	_		
		Jackfruit	15	_		
		Shimul	0	_		
		Fig / Bot	1	_		
		Bamboo	8	_		
		Banana	6			

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.







(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.







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.



(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.



(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, 2014to 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.

			JO J	1	3	,	1 /					
Paramete						М	onth					
r	Apr,	May,	Jun,	Jul,	Aug,	Sep,	Oct,	Nov,	Dec,	Jan,	Feb,	Mar,
	14	14	14	14	14	14	14	14	14	15	15	15
Solar	242	199	166	188	157	185	188	158	115	131	166	218
radiation,												
Inr												
(watt/m ²)												
Relative	61.9	73.1	85.2	83.9	91.2	84.2	77.7	74.9	83.4	76.8	70.2	60.5
Humidity												
1 hr (%)												
Ambient	32.4	31.2	28.7	28.9	28.2	28.5	27.2	23.6	18.2	18.3	21.3	25.2
Temp. 1												
hr (°C)												
Rainfall 1	0.05	0.08	0.17	0.11	0.19	0.13	0.07	0.03	DNA*	0.08	0.06	0.03
hr (mm)												

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 lieson 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 P 16 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 $SO_2(24 \text{ hrs})$, NO_2 (24 hrs), CO (1 hr),CO (8 hrs),O_3 (1 hr), O_3 (8 hrs) $PM_{2.5}$ (24 hrs), and $PM_{10}(24 \text{ hrs})$ 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) SO_2 - 24hr, (b) NO_2 - 24hr, (c) CO-1hr, (d) CO-8hr (e) O_3 -1hr, (f) O_3 -8hr, (g) $PM_{2.5}$ - 24hr, (h) PM_{10} - 24hr.

Darame	Monthly Average											
ter	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 PM_{10} recorded during the period of November to March. The average concentration of $PM_{2.5}$ and PM_{10} 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 subproject 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.

			0 5		
Location	Noise level measurement locations	Latitude	Longitude	Equivalent Noise level (dBA),L _{eq}	Maximum Noise level (dBA),L _{max}
	Saydabad More	N 24°23'32.3"	E 89°42'49.5"	78.2	92.8
Sirajgonj PGCB to	Mosque	N 24°19'51.7"	E 89°42'0.8"	53.6	93
EnayetpurRob Tower	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

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

[Note: <u>The equivalent level is the level (L_{eq})</u> 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:

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

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.]

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

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

	One Hour L _{Aeq} (dBA)					
Receptor	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)(*Ref*: Environmental, Health, and Safety General Guidelines, WBG, 2007)

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.

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

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

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 CaCO3 (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	
тс	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)

Location	concentration in surface water
рН	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

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

Note: EC= ElectricalConductivity, 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)

	Parameter						
Best Practice Based Classification	рН	BOD (mg/L)	DO (mg/L)	Total Coliform (CFU/100ml)			
a. Source of drinking water							
for supply only after	6.5-8.5	2 or less	6 or above	50 or less			
disinfecting							
b. Water usable for	6585	3 or less	5 or more	200 or less			
recreational activity	0.5-8.5	5 01 1688	5 01 11016	200 01 1688			
c. Source of drinking water							
for supply after conventional	6.5-8.5	6 or less	6 or more	5000 or less			
treatment							
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)



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.



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.



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
justific	ation								

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 confliction 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

S1	Screening Questions	Yes	No	Not Aware	Remarks/ Possible Negative Impact
					and assessment (low/moderate/hig h)*
(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?	V			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 floral or faunal habitats?				
(b) P	hysico-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?	✓ 			<i>Low</i> 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		✓		

Potential Environmental Impact During Construction Phase Checklist

S1	Screening Questions	Yes	No	Not Aware	Remarks/ Possible Negative Impact and assessment (low/moderate/hig h)*
	stockpiled near surface waters, and				
1.1	natural water courses?				
	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 Only during handhole construction
13	Is there a possibility of water stagnation at the construction site?		~		
14	Will the construction involve road blocking?		V		Low Only during HDD operation and handhole construction
(c) G	eneral Socio-economic impacts (includ	ing occ	cupatio	onal heal	th and safety):
15	Is the project area densely populated?		~		
16	Will there be any pedestrian and safety related issue?	V			(Traffic safety signs, protection fence with warnings will be provided)
17	Is significant movement of vehicles involved during construction activities?	√			(Traffic safety signs, protection fence with warnings will be provided)
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?	v			SCL temporary Storage at Sayda Amena Filling Station Public tubewell at N 24°22'37.9", E 89°42'21.7" Supplied by SCL
20	Will the workers be provided Personal Protective Equipment (PPE), devices and clothing and be ensured those are used?	V			(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	✓			

S1	Screening Questions	Yes	No	Not Aware	Remarks/ Possible Negative Impact and assessment (low/moderate/hig h)*
	direction and insurance be				
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 is 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 mitigation measures monitoring	for and
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 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 mitigation measures monitoring	for and
	• 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 mitigation measures monitoring	for and
		 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 SCL)/ SCL	by
	• Direct or indirect impact to 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 SCL)/ SCL	by
	• 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 	Visual observation of mitigation measures (digital photographs)	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
		 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 WBG 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

Serial	Aspects of Environment	Environmental issues to be Monitored	Compliance Status		
Nos.	al issues		FC	PC	NC
Condit	ions at Subproje	ect Site			
Α.	General				
	1.	Employment Record keeping	\checkmark		
		arrangement			
	2.	Legal working hours approval	\checkmark		
	3.	Provision for monthly meeting for	\checkmark		
		inspection of site activities			
В.	Health and Sar	nitation			
	Public Health				
	1.	Emergency medical facilities and	\checkmark		
		First Aid Box at Field Office and			
		work sites			
	2.	Safe water supply arrangements	✓		
	3.	Waste disposal arrangement at	\checkmark		
		camp and work sites			
	Occupational H	ealth	1		-
	1.	First-Aid Box and safety	\checkmark		
		management plan availability at			
		work sites			
	2.	Provision of personal protection	✓		
		equipments (PPEs) and working			
		clothing to workers			-
	3.	Protection fence at HDD work site	✓ (
	4.	Handling of cement and other	\checkmark		
		hazardous materials by workers			-
	5.	Traffic safety at work sites	✓		-
	6.	Working hour and vacation days	✓		
		maintained			
С.	Labour Welfare			1	1
	1.	Workers' complains taken care of	V		
	<u> </u>	by the site engineer			+
	2.	Provision of leaves (national and	×		
	2	American and family the sector			+
	J.	Arrangement for settlement of	v		
		connicts amongst the workers			

Environmental Monitoring Checklist for Routine Site Inspection

Serial	Aspects of Environment al issues	Environmental issues to be Monitored	Compliance Status		
Nos.			FC	PC	NC
	4.	Children below 15 years and	\checkmark		
		pregnant women are not employed			
D.	Environmental	Pollution	I		
	Dust and emiss	ion 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	\checkmark		

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