Section 6.Employer's Requirements

Table of Contents

6.1.1 Scope of Supply of Plant and Installation Services by the Contractor

General:

This section of the document describes basic equipment, sub-assembly, configuration and schedule of Goods and Services which is mandatory requirement to cover and shall be supplied and performed but not limited to implement the complete facility on turnkey basis. The works covered by the Tender/Bid is "**Design, Supply, Construction, Erection, Installation, Testing and Commissioning of 05 Nos. New 33/11kV GIS Substation, 01 Nos. 33/11kV GIS Substation (Up-gradation), 02 Nos 33 kV Bay Extension & 33 kV XLPE 1x800 mm2 underground armoured copper cable (including optical fibre) Double Circuit line with Civil works, and other related works; including automation of the sub-station (SAS) interfacing with the existing SCADA System of Chattogram, on Turnkey Basis under Power Distribution System Development, Chattogram Zone (2nd Phase)**" (LOT-4).

The scope of the plant and services also includes/covers quality assurance, packing for export, insurance & shipment to site, complete construction & installation, jointing, terminating, bonding, earthing, painting, transportation, setting to work, site testing & commissioning of all the equipment necessary for safe operation of the sub-stations along with having the full responsibility for civil works including design and construction of transformer foundations and control building, etc.

Moreover, the existing equipment dismantled from the existing substation shall be handed over and deposited to Project Store, Chattogram without any damage as per direction of Project Director or Engineer of this project. Shifting/ Modification of any existing scheme of equipment to new equipment in up gradation work scope shall be deemed included in the scope.

The scope includes the design, manufacture, supply, installation and commissioning of Substation Automation System (SAS) for both 33KV GIS system with provision for interfacing with SCADA System for 05 Nos. New 33/11kV GIS Substation, 01 Nos. 33/11kV GIS Substation (Up-gradation) .

The detail requirement is listed in the technical specification and Guaranteed Technical particulars (GTP) in the tender document. The contractor shall remedy all defects during the defect liability period of the Plant & Equipment as per contract.

The contractor is responsible for ensuring that all and any items of work required for the safe efficient and satisfactory completion and functioning of the Plant & Equipment and services. After completing all works of substation if any quantity of any item remain excess (as per BOQ & price schedule) handed over to Project Store, Chattogram .

The conceptual layout, general arrangement and single line diagram for the proposed 05 Nos. New 33/11kV GIS Substation, 01 Nos. 33/11kV GIS Substation (Up-gradation), 02 Nos 33 kV Bay Extension are attached in Annex-9. The GIS/AIS equipment building and control room and probable approach and internal roads have been shown. The arrangement is indicative and the detailed layout design will be prepared and submitted by the EPC Contractor for BPDB's approval. The station layout and equipment rating shall be based on the single line diagram. The Contractor shall work out an optimum layout based on the requirement and specific features of the manufacturer's product within the constraints of overall dimensions of the plot. The layout and equipment setup shall be optimized in such way as to keep free space, if any, for other purpose and future expansion.

The detailed design arrangement of the equipment shall be the responsibility of the Contractor subject to the approval of the Engineer. The Contractor shall submit all drawings, manuals, designs and calculations for review prior to commencing manufacturing and /or installation works.

Moreover, the contractor shall responsible for Transportation of machinery/equipment to the Project Site including moving the equipment and materials from the designated store as per site requirement and Consignee's advice. All the consumables goods or any equipment/machinery/ materials are required to complete the Plant & Equipment and services shall be the responsibilities of the contractor and all the necessary arrangement for Power, Water, accommodations or any such facilities and tools-tackles, necessary instruments required for erection, installation, testing and commissioning will be supplied/arranged by the contractor within the quoted price. The contractor

shall handover all the removable materials/goods at the place within layout plan as instructed by the consignee.

Training at Site:

The Contractor shall provide training on site to the BPDB personnel. The training shall comprise a balanced combination of classroom training and hands on experience, and shall cover all aspects of equipment installation, operation and maintenance. The BPDB personnel will be deputed full time to the Contractor for both class room and on-the-job training.

The Contractor shall provide a program for site training and course synopsis During commissioning period of each substation at site before handover to BPDB. The Contractor shall submit to the Purchaser a copy of all classroom material handed out to the trainees.

Three (03) days local training conducted by the resource person from Manufacturer's factory, expert in providing related training for 8 nos. of purchaser employees (Engineer/ Supervisor/ Technician) in each substation regarding all aspects of Fundamentals/ Basics conception of Descriptions & Functions of Plant /Equipment, Configuration, setting, testing & safe operation of substation for all operation, maintenance and troubleshooting of Substation.

Note: Tenderers shall quote a Firm Turnkey Contract Price for the Plant & Equipment and services as described in Price Schedule and in Section 6, 7, 8 & 9 of this Tender document. If the Tenderer deemed necessary any additional Plant & Equipment and services out of the list of tender schedules for completion of the said Turnkey works and site requirement, contractor shall have to do the additional works. The costs of these additional works are deemed to be included within the quoted price. Tenderer are requested to visit the site to consider all before the submission of the Tender

6.1.1.1 Scope for Design, Supply, Erection, Installation, Testing and Commissioning of 33/11KV, 2x20/26 MVA Indoor Type GIS (SHERSHAH CRESENT INDUSTRIES NEW) at S&D-Khulshi, BPDB, Chattogram.

(Not limited but at least the following works to be done by the turnkey contractor)

A. CIVIL & BUILDING WORKS:

Design, Manufacture, Supply, Installation/Erection, Construction, Testing and Commissioning, (dismantling if necessary) and so on of the following works are the scope of works:

1) Land development work with height of 1(One) Meter above the highest flood level or 1 (One) Meter above the nearest high way/road level which is higher. Employer will provide all lands only and contractor will fill it by sand (if necessary) up to ground level. Soil testing for soil resistivity and soil bearing capacity before designing, final leveling, consolidation, surfacing and compaction of entire switchyard area with crushed rock (where required) to cater for the ultimate development of the substation. Landscaping work and gardening of the whole sub-station area. Bidder shall submit the layout of the whole substation area of landscaping work for approval.

2) Construction of cable trenches including cable rack for power cable and control cable (where required);
   (a) Within the switch yard area,
   (b) Switch yard area to control room building,
   (c) For 33KV & 11kV Cable lying inside Substation Compound.

3) Construction of main entrance gate and side gate with aesthetic view. Construction/ installation of Substation NAME PLATE/ SIGN BOARD. A digital sign board (electronic sign board) to be fixed on the top of the main entrance gate.

4) Construction of R.C.C base foundations for power transformers in substation building Ground floor and all others equipment & Structure as required.

5) Construction of Guard post 10 square meter adjacent to the main gate of the substation.

6) Design & Construction of new GIS Substation Building:
750 square meter (250 Sq. m each floor) Three storied Building with four storied foundation (Ground Floor- Height 24'6" for Power Transformer , 1st Floor- Height-10'5" for Cable room, 2nd Floor- Height-14'5" for Control Room) as per price schedule for the substation control room, store, cable room, etc. including roof lime terracing, door, window, toilet etc.

Electrification of the whole substation area is within the scope. In control room high quality tiles shall be installed in floor. For this new Sub-station, in the control room building having facilities of wash basin, bath shower towel rod, soap case, auzo wash, glass rack, looking mirror, pan fitting with low-down, swan neck pillar cock, extra long bib cock, interior walls and floor finished by tiles, underground water reservoir tank and all allied civil works deemed necessary are included in the Bid complete in all respect.

Overhead water tank 2X500 liter on the top of the control room building, underground water reservoir (tank), water lifting pump, suction pump and portable water supply system complete in all respect [Design shall be based on use of 20 persons per day for overhead water tank] Construction of septic tank, soak well, inspections pits, sewerage piping by PVC 6 inches dia. Pipe, toilet/ bathroom/lavatory located.

7) Soil testing for soil resistivity and soil bearing capacity before designing final leveling of Control room area.

8) Construction of approach road from the main gate to the Substation building entrance and internal road for whole sub-station campus area and parking area (shall be carpeting/RCC flooring) as required. All roads shall be of concrete road as per technical specification. The other roads main and approach RCC road shall be min 6 meters wide. Road in front of transformer shall be min 6.0 meters wide RCC road.

9) Properly insulated False Ceiling of Control room, office, suitable for Air conditioning system.

10) Construction of drainage, sanitary system for whole sub-station area.

11) Supply and installation of Operation Key Board, Al/ Steel frame front cover glass with locking device, dust proof.

12) Supply and installation of Chain link fencing with gate for Power Transformer & Station transformer if required. Earthing for fencing required.

13) Supply of two operator working table, Steel made with extra glass on the top, and two nos. of wheel based revolving chair & ten nos. visitor chair, curtain (venetian blind) of window in the control room.

14) Supply of Steel File Cabinet (four drawers), Steel Almirah for record keeping in the control room.

15) Contractor shall supply and install 32 inch LED Television, 01 set of Desktop Computer with Printer, Scanner and complete furniture for the substation control room & office building.

16) Supply and construction of Power cable trench and control cable rack inside the Ground floor of the substation building. Proper fire and water proof sealing of the cable entry (control & Power) at Control Room building, to prevent water entering from switch yard/outside to CR Building, preventing entry of rats and reptiles, fire proof etc.

17) Dismantling work (If necessary) as per Price Schedule, BOQ & field requirement.

18) Supply and installation of office room, Control room indoor illumination. Lighting levels within the building must be generally designed to meet the requirements of IEC Standards, and in particular, meet the following specific lighting levels:

- 400 lux between rows at switchgear front panels within the Control Building;
- 400 lux at the front of control panel within the Control Building;
- 160 lux to the rear of switchgear in the Control building
- 160 lux adjacent to the Battery Storage, Load Management Equipment, AC and DC panels

19) Supply and installation of decorative LED street lights after every 15 meter interval (if required). LED Street lighting has the feature of Multiple Mounting Options Available, Rugged Precision Cast Aluminum Housing, Perforated Air Flow Venting, High Surface Area Extruded Aluminum Heat Sinks, High Output White LED Diode, Decorative Lens Cover Seals the Electrical/Optical Chamber to IP66, Electronic Driver. The pole shall be stylish, non-corrosive, easy to install and have longer service life.

20) All civil works and necessary indoor & outdoor lighting [Energy efficient (LED) and automated] are required within the scope of the Tender. The substation control room building shall have the emergency automated dc lighting system in case of power failure.

21) The scope shall include fire extinguishing equipment such as Trolley mounted fire extinguisher with foam type chemical for B type Fire (15kg), Wall mounted fire extinguisher with dry type chemical for A, B and C type Fire (5kg) and Wall mounted fire extinguisher with CO2 type chemical for A, B and C type Fire (2kg), Fire detection unit & Alarm system. The scope shall also include Air conditioning Equipment for substation.

22) Service Pile Load Test to be done for the construction of substation Control Building (where as required as per soil condition)

NOTE: All doors & windows work to be finished by aluminum frame and high quality transparent 6 mm thick glasses. Both indoor & outdoor surface finishing works of walls, roof etc, to be synthetic high quality plastic paint and moisture proof snowcem respectively and treatment to be made by lime terracing for rain water leakage proof of the roof.

B. SUB-STATION / ELECTRICAL WORKS :

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and Commissioning etc. of at least but not limited to the following works are the scope of works:

1) Supply and installation of 33kV Indoor and all others accessories complete in all respect.

2) Supply and installation of 01 nos. Station use 33/0.415 KV, 250 KVA Auxiliary transformer, ONAN, Dyn-11 to be connected with 33kV GIS panel including 0.415 kV MCCB, Power cable, cable terminating kits with structures, etc complete in all respect.

3) Supply and installation of 02 nos. of Power Transformer (Indoor type) 33/11 kV, 20/26MVA, Dyn11 with all related accessories.

4) Supply and installation of Switch yard grounding materials for required sub-station area and equipment to be installed. Earth resistance of the substation shall be less than 0.5ohm during dry season.

5) Supporting steel/RCC structure for connecting the XLPE Power Cable (HV/LV) with accessories as required.

6) Supply and installation of Control room indoor illumination.

7) Supply and installation of Emergency lighting

8) Supply and installation of Fire Fighting equipment and Fire Detection system.

9) Supply and installation of Exhaust Fan (Two nos. in battery room).

10) Supply and installation of Split type Air conditioner (At least forty eight thousand BTU per hr. capacity including MCB, switch, male female plug socket complete) - 04 nos. in the GIS substation building.

11) Supply & installation of GIS Panel for 33kV power transformer, Line feeders of the proposed 33kV & 11KV (GIS) Circuits to be installed in the control room building.

12) Supply and installation of AC Distribution Panel, DC Distribution Panel.

13) Supply and installation of Separate AC distribution Box, wall mounting for control room internal & external illumination switching, extra power supply arrangement for testing purpose, different operation and maintenance use.

14) Supply and installation of switching boards to be installed in each room for functioning of fans, lights, Air conditioner etc.

15) Supply and installation of 33kV indoor Type GIS & 11kV indoor Type GIS as describe below:

Indoor 33 KV GIS Panels having single bus 2000A:

a) Incoming Feeders (1250A): 02Nos with PT
b) Outgoing Feeders (1250 A): 02 Nos with PT
c) Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2000 A): 01 Nos.
d) Power Transformer Feeders (1250A): 02Nos with PT
e) Station Auxiliary Transformer Feeders (1250A) : 01 Nos .

Indoor 11 KV GIS Panels having single bus 2500A:

a) Incoming Feeders with PCM (2500 A) with PT: 02 Nos.
b) Outgoing Feeders with PCM (630A) with PCM: 12 Nos.
c) Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2500 A): 01Nos.

16) Supply and installation/ connection of 33kV, 11kV Power Cable, XLPE for all 33kV or 11kV line feeders and transformers feeder including cable termination (Outdoor & Indoor) as required.

17) Supply and installation/ connection of Control Cables

18) Supply and installation of Battery, Ni-Cd as per BOQ.

19) Supply and installation of Battery Charger as per BOQ.

20) Supply and lying of Rubber pad to be laid in front of the SWITCHGEAR Panels.

21) 05(Five) Sets of As-built drawings together with operation and maintenance Manual, relevant IEC standards of the installed equipment shall be submitted to the Directorate of Design & Inspection -2, BPDB, Dhaka for reviewing within 15 days of commissioning of substation .

22) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid.

Besides the above others are as follow:

23) All the 33 KV & 11kV Switchgears will be of Gas Insulated type with circuit breakers .They will be installed on the 2nd floor of the proposed Control room / substation building. All 33KV and 11KV cable shall be accommodated in the Ground floor of the proposed Control room / substation building with steel structure cable trenches. Portion of Ground floor may be used as office room of the sub-station building. All the Common Service Facility areas- Reception, Waiting/ Common Space, Rest/Wash rooms, etc shall be installed in floor. Every floor shall be

designed with Natural Ventilation system. There shall be adequate space to both end of 33kV GIS panel & 11 kV GIS panel for future extension.

24) 02 (Two) Nos. new 33/11KV,20/26MVA, ONAN/ONAF Power Transformers shall be installed in the Substation control room building and shall be connected to the 33 kV switchgear and 11 kV switchgear panels (described above) and by single core XLPE cable of required voltage and size. The volume of the transformers shall be such that these are accommodated in the space available by keeping safe electrical clearance. Both the new Transformers are to be identical and from the same manufacturer. Provision for running the transformers in parallel is to be provided. Tap Changer Control panel with AVR relay, Auto/Manual and Master/ Follower control switch. (02 panel for power transformers).

25) RCC Fire-wall shall be constructed between one and the next power transformer (where the power transformer installed inside the Substation building). Adequate free air passage space shall be maintained.

26) 01 (One) No. 33/0.415KV, 250KVA Station Transformers (Oil type) will be installed separately beside Power Transformer by 33 KV cable terminations. The LV sides of the station transformer will be connected to the LV A/C distribution Panel by LV cables of appropriate size. Single sources of D/C supply with 01 set of 110 V battery (Ni-Cd) and battery charger shall be installed and connected to the D/C distribution panel by LV cables of appropriate size.

27) The indoor 33KV XLPE copper cables will be connected to 33KV GIS panel by requisite cable termination kit.

28) The indoor 11KV XLPE copper cables will be connected to 11KV GIS panel by requisite cable termination kit. The indoor terminations of the 11KV cables with the 11 KV switchgear panel will be as per arrangement provided there. All the 33kV and 11kV cables shall be armored and cu-wire screened.

29) The outdoor cable terminations of the 33 KV cables (where required) will be heat shrink type and supported by steel structure. In the same way the 11KV cables outdoor type terminations will be heat shrink type being supported by steel structure.

30) The conventional protections to transformer feeders, line feeders and bus coupler are to be provided. However, total protection scheme is to be implemented on approval from BPDB Authority. Meters for monitoring three phase Current and voltage are to be installed in each panel.

31) All 33KV & 11KV panels (except the bus couplers) are to be provided with separate high class Digital energy meter of 0.2 class having provision of remote communication facilities. Both mechanical and electrical inter locks are to be provided along with the breakers, isolators and earth switches of various feeders as per normal convention.

32) Grounding mesh of copper conductor of requisite earth resistance (shall be <0.50ohm) will be installed for grounding the neutrals of the power transformers, station transformers, their bodies, the lightning arrestor sets, the steel supporting structure, all indoor & outdoor panels etc. The grounding system is to be implemented on approval of the design from BPDB Authority.

33) AC and DC distribution Panels, Battery Sets with battery chargers shall be accommodated on the same floor of 33 kV and 11 kV switchgear panels.

34) The 33 KV incoming feeders (from source substation/grid) shall be connected to the 33 KV

incoming GIS panel. The 11 KV sides of 33/11KV power transformers will then be connected (by 11KV XLPE cables) to the 11 KV incoming GIS Panel.

- 33KV 1Cx800mm2 cable per phase connected to 02 (Two) nos. 33 kV GIS Incoming Breaker (Supply of Cable, Indoor and outdoor termination kits and connection work is under this scope).
- 33KV 1Cx500mm2 cable connected to 02 (Two) nos. 33 kV GIS Outgoing feeder (Supply of Cable, Indoor and outdoor termination kits and connection work is under this scope).
- Connection from 33kV GIS (Transformer feeder) to power transformer will be made by 1Cx 500 mm2 XLPE Cu cable for 02 (two) nos. 33 kV GIS x-former feeder .
- 11KV incoming connection from the transformer to the breaker will be made by 2x1Cx630 mm2 XLPE Copper Cable for 33/11KV, 20/26MVA, ONAN/ONAF Power Transformers.
- 0.415 kV, 4CX120 mm2 XLPE PVC (Cu) Cable for Station Auxiliary Transformer and 33 kV, 3CX95mm2 XLPE Copper Cable with Indoor and outdoor termination kits for Station Auxiliary Transformer Incoming.
- Transformer Neutral will also be connected to ground by copper cable of 2X1CX150 mm2 with 03 (Three) Nos. of Electrode (Round Bar) of 16 mm Dia with 04 (Four) Meter Length Each and Length of the electrode will be decided as per Design calculation.The requisite termination kits are to be supplied and installed.
- The 11KV outgoing feeder of the substation from the 11KV outgoing breaker shall be connected by 3CX185 mm2 XLPE Cable and connect through underground up to the outgoing Overhead Feeder pole line (adjacent to proposed boundary wall).

Indoor and Outdoor all 33kV & 11 kV Termination is in the contractor's Scope.

35) The Scope also includes the design, manufacture, supply, Installation and commissioning of Substation Automation System (SAS) for both 33KV GIS & 11KV GIS system with provision for interfacing with SCADA System.

36) Outdoor lightning protection system for the substation shall be installed.

37) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid. One electronic copy (soft copy in a CD) of all relevant As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB, Dhaka.

38) The Bidder must visit the site and assess the works before submitting his Tender and will carefully examine the tender requirements and to determine the existing conditions, facilities and limitations. Tenderer shall have make all necessary arrangement to carry out the Contract if awarded. Any neglect to delay or failure on the part of the tenderer to obtain reliable information upon the foregoing or any matter effecting the work and completion period shall not relieve the successful tenderer of his responsibilities, risks or liabilities until final acceptance of the Supply of Goods and Related Services in case of award of the contract.

39) Any additional works not covered above but necessary for the functioning of the system & required as per specification to be incorporated by the Tenderer. The items of minor nature, which is not mentioned, shall be incorporated by the bidder.

Indicative Layout & Single line diagram in Annex-9.

6.1.2 Scope for Design, Supply, Erection, Installation, Testing and Commissioning of 33/11KV, 2x20/26 MVA Regular Type GIS (CHANDGAON RESIDENTIAL AREA NEW) at S&D-Kalurghat, BPDB, Chattogram..

(Not limited but at least the following works to be done by the turnkey contractor)

A. CIVIL & BUILDING WORKS:

Design, Manufacture, Supply, Installation/Erection, Construction, Testing and Commissioning, (dismantling if necessary) and so on of the following works are the scope of works:

1) Land development work with height of 1(One) Meter above the highest flood level or 1 (One) Meter above the nearest high way/road level which is higher. Employer will provide all lands only and contractor will fill it by sand (if necessary) up to ground level. Soil testing for soil resistivity and soil bearing capacity before designing, final leveling, consolidation, surfacing and compaction of entire switchyard area with crushed rock (where required) to cater for the ultimate development of the substation. Landscaping work and gardening of the whole sub-station area. Bidder shall submit the layout of the whole substation area of landscaping work for approval.

2) Construction of cable trenches including cable rack for power cable and control cable (where required);
   (a) Within the switch yard area,
   (b) Switch yard area to control room building,
   (c) For 33KV & 11kV Cable lying inside Substation Compound.

3) Construction of main entrance gate and side gate with aesthetic view. Construction/ installation of Substation NAME PLATE/ SIGN BOARD. A digital sign board (electronic sign board) to be fixed on the top of the main entrance gate.

4) Construction of R.C.C base foundations for power transformers and all others equipment & Structure as required.

5) Construction of Guard post 10 square meter adjacent to the main gate of the substation.

6) Design & Construction of new GIS Substation Building:
   500 square meter (250 Sq. m each floor) two storied Building with four storied foundation (Ground Floor- Height 10'5" for Cable , 1st Floor- Height-14'5" for Control Room) as per price schedule for the substation control room, store, cable room, etc. including roof lime terracing, door, window, toilet etc.

   Electrification of the whole substation area is within the scope. In control room high quality tiles shall be installed in floor. For this new Sub-station, in the control room building having facilities of wash basin, bath shower towel rod, soap case, auzo wash, glass rack, looking mirror, pan fitting with low-down, swan neck pillar cock, extra long bib cock, interior walls and floor finished by tiles, underground water reservoir tank and all allied civil works deemed necessary are included in the Bid complete in all respect.

   Overhead water tank 2X500 liter on the top of the control room building, underground water reservoir (tank), water lifting pump, suction pump and portable water supply system complete in all respect [Design shall be based on use of 20 persons per day for overhead water tank] Construction of septic tank, soak well, inspections pits, sewerage piping by PVC 6 inches dia. Pipe, toilet/ bathroom/lavatory located.

7) Soil testing for soil resistivity and soil bearing capacity before designing final leveling of Control room area.

8) Construction of approach road from the main gate to the Substation building entrance and

internal road for whole sub-station campus area and parking area (shall be carpeting/RCC flooring) as required. All roads shall be of concrete road as per technical specification. The other roads main and approach RCC road shall be min 6 meters wide. Road in front of transformer shall be min 6.0 meters wide RCC road.

9) Properly insulated False Ceiling of Control room, office, suitable for Air conditioning system.

10) Construction of drainage, sanitary system for whole sub-station area.

11) Supply and installation of Operation Key Board, Al/ Steel frame front cover glass with locking device, dust proof.

12) Supply and installation of Chain link fencing with gate for Power Transformer & Station transformer if required. Earthing for fencing required.

13) Supply of two operator working table, Steel made with extra glass on the top, and two nos. of wheel based revolving chair & ten nos. visitor chair, curtain (venetian blind) of window in the control room.

14) Supply of Steel File Cabinet (four drawers), Steel Almirah for record keeping in the control room.

15) Contractor shall supply and install 32 inch LED Television, 01 set of Desktop Computer with Printer, Scanner and complete furniture for the substation control room & office building.

16) Supply and construction of Power cable trench and control cable rack inside the Ground floor of the substation building. Proper fire and water proof sealing of the cable entry (control & Power) at Control Room building, to prevent water entering from switch yard/outside to CR Building, preventing entry of rats and reptiles, fire proof etc.

17) Dismantling work (If necessary) as per Price Schedule, BOQ & field requirement.

18) Supply and installation of office room, Control room indoor illumination. Lighting levels within the building must be generally designed to meet the requirements of IEC Standards, and in particular, meet the following specific lighting levels:

- 400 lux between rows at switchgear front panels within the Control Building;
- 400 lux at the front of control panel within the Control Building;
- 160 lux to the rear of switchgear in the Control building
- 160 lux adjacent to the Battery Storage, Load Management Equipment, AC and DC panels

19) Supply and installation of decorative LED street lights after every 15 meter interval (if required). LED Street lighting has the feature of Multiple Mounting Options Available, Rugged Precision Cast Aluminum Housing, Perforated Air Flow Venting, High Surface Area Extruded Aluminum Heat Sinks, High Output White LED Diode, Decorative Lens Cover Seals the Electrical/Optical Chamber to IP66, Electronic Driver. The pole shall be stylish, non-corrosive, easy to install and have longer service life.

20) All civil works and necessary indoor & outdoor lighting [Energy efficient (LED) and automated] are required within the scope of the Tender. The substation control room building shall have the emergency automated dc lighting system in case of power failure.

21) The scope shall include fire extinguishing equipment such as Trolley mounted fire extinguisher with foam type chemical for B type Fire (15kg), Wall mounted fire extinguisher with dry type chemical for A, B and C type Fire (5kg) and Wall mounted fire extinguisher with CO2 type chemical for A, B and C type Fire (2kg), Fire detection unit & Alarm system. The scope shall also include Air conditioning Equipment for substation.

22) Service Pile Load Test to be done for the construction of substation Control Building (where as required as per soil condition)

NOTE: All doors & windows work to be finished by aluminum frame and high quality transparent 6 mm thick glasses. Both indoor & outdoor surface finishing works of walls, roof etc, to be synthetic high quality plastic paint and moisture proof snowcem respectively and

treatment to be made by lime terracing for rain water leakage proof of the roof.

B. SUB-STATION / ELECTRICAL WORKS :

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and Commissioning etc. of at least but not limited to the following works are the scope of works:

1) Supply and installation of 33kV Indoor and all others accessories complete in all respect.

2) Supply and installation of 01 nos. Station use 33/0.415 KV, 250 KVA Auxiliary transformer, ONAN, Dyn-11 to be connected with 33kV GIS panel including 0.415 kV MCCB, Power cable, cable terminating kits with structures, etc complete in all respect.

3) Supply and installation of 02 nos. of Power Transformer 33/11 kV, 20/26 MVA, Dyn11 with all related accessories.

4) Supply and installation of Switch yard grounding materials for required sub-station area and equipment to be installed. Earth resistance of the substation shall be less than 0.5ohm during dry season.

5) Supporting steel/RCC structure for connecting the XLPE Power Cable (HV/LV) with accessories as required.

6) Supply and installation of Control room indoor illumination.

7) Supply and installation of Emergency lighting

8) Supply and installation of Fire Fighting equipment and Fire Detection system.

9) Supply and installation of Exhaust Fan (Two nos. in battery room).

10) Supply and installation of Split type Air conditioner (At least forty eight thousand BTU per hr. capacity including MCB, switch, male female plug socket complete) - 04 nos. in the GIS substation building.

11) Supply & installation of GIS Panel for 33kV power transformer, Line feeders of the proposed 33kV & 11KV (GIS) Circuits to be installed in the control room building.

12) Supply and installation of AC Distribution Panel, DC Distribution Panel.

13) Supply and installation of Separate AC distribution Box, wall mounting for control room internal & external illumination switching, extra power supply arrangement for testing purpose, different operation and maintenance use.

14) Supply and installation of switching boards to be installed in each room for functioning of fans, lights, Air conditioner etc.

15) Supply and installation of 33kV indoor Type GIS & 11kV indoor Type GIS as describe below:

Indoor 33 KV GIS Panels having single bus 2000A:

a) Incoming Feeders (1250A): 02Nos with PT
b) Outgoing Feeders (1250 A): 02 Nos with PT
c) Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2000 A): 01 Nos.
d) Power Transformer Feeders (1250A): 02Nos with PT
e) Station Auxiliary Transformer Feeders (1250A) : 01 Nos .

Indoor 11 KV GIS Panels having single bus 2500A:

a) Incoming Feeders with PCM (2500 A) with PT: 02 Nos.
b) Outgoing Feeders with PCM (630A) with PCM: 12 Nos.
c) Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2500 A): 01Nos.

16) Supply and installation/ connection of 33kV, 11kV Power Cable, XLPE for all 33kV or 11kV line feeders and transformers feeder including cable termination (Outdoor & Indoor) as required.

17) Supply and installation/ connection of Control Cables

18) Supply and installation of Battery, Ni-Cd as per BOQ.

19) Supply and installation of Battery Charger as per BOQ.

20) Supply and lying of Rubber pad to be laid in front of the SWITCHGEAR Panels.

21) 05(Five) Sets of As-built drawings together with operation and maintenance Manual, relevant IEC standards of the installed equipment shall be submitted to the Directorate of Design & Inspection -2, BPDB, Dhaka for reviewing within 15 days of commissioning of substation .

22) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid.

Besides the above others are as follow:

23) All the 33 KV & 11kV Switchgears will be of Gas Insulated type with circuit breakers.They will be installed on the 1st floor of the proposed Control room / substation building. All 33KV and 11KV cable shall be accommodated in the Ground floor of the proposed Control room / substation building with steel structure cable trenches. Portion of Ground floor may be used as office room of the sub-station building. All the Common Service Facility areas- Reception, Waiting/ Common Space, Rest/Wash rooms, etc shall be installed in floor. Every floor shall be designed with Natural Ventilation system. There shall be adequate space to both end of 33kV GIS panel & 11 kV GIS panel for future extension.

24) 02 (Two) Nos. new 33/11KV,20/26MVA, ONAN/ONAF Power Transformers shall be installed in the Substation and shall be connected to the 33 kV switchgear and 11 kV switchgear panels (described above) and by single core XLPE cable of required voltage and size. The volume of the transformers shall be such that these are accommodated in the space available by keeping safe electrical clearance. Both the new Transformers are to be identical and from the same manufacturer. Provision for running the transformers in parallel is to be provided. Tap Changer Control panel with AVR relay, Auto/Manual and Master/ Follower control switch. (02 panel for power transformers).

25) RCC Fire-wall shall be constructed between one and the next power transformer (where the power transformer installed inside the Substation building). Adequate free air passage space shall be maintained.

26) 01(One) No. 33/0.415KV, 250KVA Station Transformers (Oil type) will be installed separately beside Power Transformer by 33 KV cable terminations. The LV sides of the station transformer will be connected to the LV A/C distribution Panel by LV cables of appropriate size. Single sources of D/C supply with 01 set of 110 V battery (Ni-Cd) and battery charger shall be installed and connected to the D/C distribution panel by LV cables of appropriate size.

27) The indoor 33KV XLPE copper cables will be connected to 33KV GIS panel by requisite cable termination kit.

28) The indoor 11KV XLPE copper cables will be connected to 11KV GIS panel by requisite cable termination kit. The indoor terminations of the 11KV cables with the 11 KV switchgear panel will be as per arrangement provided there. All the 33kV and 11kV cables shall be armored and cu-wire screened.

29) The outdoor cable terminations of the 33 KV cables (where required) will be heat shrink type and supported by steel structure. In the same way the 11KV cables outdoor type terminations will be heat shrink type being supported by steel structure.

30) The conventional protections to transformer feeders, line feeders and bus coupler are to be provided. However, total protection scheme is to be implemented on approval from BPDB Authority. Meters for monitoring three phase Current and voltage are to be installed in each panel.

31) All 33KV & 11KV panels (except the bus couplers) are to be provided with separate high class Digital energy meter of 0.2 class having provision of remote communication facilities. Both mechanical and electrical inter locks are to be provided along with the breakers, isolators and earth switches of various feeders as per normal convention.

32) Grounding mesh of copper conductor of requisite earth resistance (shall be <0.50ohm) will be installed for grounding the neutrals of the power transformers, station transformers, their bodies, the lightning arrestor sets, the steel supporting structure, all indoor & outdoor panels etc. The grounding system is to be implemented on approval of the design from BPDB Authority.

33) AC and DC distribution Panels, Battery Sets with battery chargers shall be accommodated on the same floor of 33 kV and 11 kV switchgear panels.

34) The 33 KV incoming feeders (from source substation/grid) shall be connected to the 33 KV incoming GIS panel. The 11 KV sides of 33/11KV power transformers will then be connected (by 11KV XLPE cables) to the 11 KV incoming GIS Panel.

- 33KV 1Cx800mm2 cable per phase connected to 02 (Two) nos. 33 kV GIS Incoming Breaker (Supply of Cable, Indoor and outdoor termination kits and connection work is under this scope).
- 33KV 1Cx500mm2 cable connected to 02 (Two) nos. 33 kV GIS Outgoing feeder (Supply of Cable, Indoor and outdoor termination kits and connection work is under this scope).
- Connection from 33kV GIS (Transformer feeder) to power transformer will be made by 1Cx 500 mm2 XLPE Cu cable for 02 (two) nos. 33 kV GIS x-former feeder .
- 11KV incoming connection from the transformer to the breaker will be made by 2x1Cx630 mm2 XLPE Copper Cable for 33/11KV, 16/20MVA, ONAN/ONAF Power Transformers.
- 0.415 kV, 4CX120 mm2 XLPE PVC (Cu) Cable for Station Auxiliary Transformer and 33 kV, 3CX95mm2 XLPE Copper Cable with Indoor and outdoor termination kits for Station Auxiliary Transformer Incoming.
- Transformer Neutral will also be connected to ground by copper cable of 2X1CX150 mm2 with 03 (Three) Nos. of Electrode (Round Bar) of 16 mm Dia with 04 (Four) Meter Length Each and Length of the electrode will be decided as per Design calculation.The requisite termination kits are to be supplied and installed.
- The 11KV outgoing feeder of the substation from the 11KV outgoing breaker shall be connected by 3CX185 mm2 XLPE Cable and connect through underground up to the outgoing OVERHEAD Feeder pole line (adjacent to proposed boundary wall).

Indoor and Outdoor all 33kV & 11 kV Termination is in the contractor's Scope.

35) The Scope also includes the design, manufacture, supply, Installation and commissioning of Substation Automation System (SAS) for both 33KV GIS & 11KV GIS system with provision for interfacing with SCADA System.

36) Outdoor lightning protection system for the substation shall be installed.

37) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid. One electronic copy (soft copy in a CD) of all relevant As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB, Dhaka.

38) The Bidder must visit the site and assess the works before submitting his Tender and will carefully examine the tender requirements and to determine the existing conditions, facilities and limitations. Tenderer shall have make all necessary arrangement to carry out the Contract if awarded. Any neglect to delay or failure on the part of the tenderer to obtain reliable

information upon the foregoing or any matter effecting the work and completion period shall not relieve the successful tenderer of his responsibilities, risks or liabilities until final acceptance of the Supply of Goods and Related Services in case of award of the contract.

39) Any additional works not covered above but necessary for the functioning of the system & required as per specification to be incorporated by the Tenderer. The items of minor nature, which is not mentioned, shall be incorporated by the bidder.

Indicative Layout & Single line diagram in Annex-9.

6.1.1.3 Scope for Design, Supply, Erection, Installation, Testing and Commissioning of 33/11KV, 2x20/26 MVA Regular Type GIS (BORO DIGHIR PAR NEW) at S&D-Hathazari, BPDB, Chattogram.

(Not limited but at least the following works to be done by the turnkey contractor)

A. CIVIL & BUILDING WORKS:

Design, Manufacture, Supply, Installation/Erection, Construction, Testing and Commissioning, (dismantling if necessary) and so on of the following works are the scope of works:

1) Land development work with height of 1(One) Meter above the highest flood level or 1 (One) Meter above the nearest high way/road level which is higher. Employer will provide all lands only and contractor will fill it by sand (if necessary) up to ground level. Soil testing for soil resistivity and soil bearing capacity before designing, final leveling, consolidation, surfacing and compaction of entire switchyard area with crushed rock (where required) to cater for the ultimate development of the substation. Landscaping work and gardening of the whole sub-station area. Bidder shall submit the layout of the whole substation area of landscaping work for approval.

2) Construction of cable trenches including cable rack for power cable and control cable (where required);
   (a) Within the switch yard area,
   (b) Switch yard area to control room building,
   (c) For 33KV & 11kV Cable lying inside Substation Compound.

3) Construction of main entrance gate and side gate with aesthetic view. Construction/ installation of Substation NAME PLATE/ SIGN BOARD. A digital sign board (electronic sign board) to be fixed on the top of the main entrance gate.

4) Construction of R.C.C base foundations for power transformers and all others equipment & Structure as required.

5) Construction of Guard post 10 square meter adjacent to the main gate of the substation.

6) Design & Construction of new GIS Substation Building:
   500 square meter (250 Sq. m each floor) two storied Building with four storied foundation (Ground Floor- Height 10'5", 1st Floor- Height-14'5" for Control Room) as per price schedule for the substation control room, store, cable room, etc. including roof lime terracing, door, window, toilet etc.

   Electrification of the whole substation area is within the scope. In control room high quality tiles shall be installed in floor. For this new Sub-station, in the control room building having facilities of wash basin, bath shower towel rod, soap case, auzo wash, glass rack, looking mirror, pan fitting with low-down, swan neck pillar cock, extra long bib cock,

interior walls and floor finished by tiles, underground water reservoir tank and all allied civil works deemed necessary are included in the Bid complete in all respect.

Overhead water tank 2X500 liter on the top of the control room building, underground water reservoir (tank), water lifting pump, suction pump and portable water supply system complete in all respect [Design shall be based on use of 20 persons per day for overhead water tank] Construction of septic tank, soak well, inspections pits, sewerage piping by PVC 6 inches dia. Pipe, toilet/ bathroom/lavatory located.

7) Soil testing for soil resistivity and soil bearing capacity before designing final leveling of Control room area.

8) Construction of approach road from the main gate to the Substation building entrance and internal road for whole sub-station campus area and parking area (shall be carpeting/RCC flooring) as required. All roads shall be of concrete road as per technical specification. The other roads main and approach RCC road shall be min 6 meters wide. Road in front of transformer shall be min 6.0 meters wide RCC road.

9) Properly insulated False Ceiling of Control room, office, suitable for Air conditioning system.

10) Construction of drainage, sanitary system for whole sub-station area.

11) Supply and installation of Operation Key Board, Al/ Steel frame front cover glass with locking device, dust proof.

12) Supply and installation of Chain link fencing with gate for Power Transformer & Station transformer if required. Earthing for fencing required.

13) Supply of two operator working table, Steel made with extra glass on the top, and two nos. of wheel based revolving chair & ten nos. visitor chair, curtain (venetian blind) of window in the control room.

14) Supply of Steel File Cabinet (four drawers), Steel Almirah for record keeping in the control room.

15) Contractor shall supply and install 32 inch LED Television, 01 set of Desktop Computer with Printer, Scanner and complete furniture for the substation control room & office building.

16) Supply and construction of Power cable trench and control cable rack inside the Ground floor of the substation building. Proper fire and water proof sealing of the cable entry (control & Power) at Control Room building, to prevent water entering from switch yard/outside to CR Building, preventing entry of rats and reptiles, fire proof etc.

17) Dismantling work (If necessary) as per Price Schedule, BOQ & field requirement.

18) Supply and installation of office room, Control room indoor illumination. Lighting levels within the building must be generally designed to meet the requirements of IEC Standards, and in particular, meet the following specific lighting levels:

- 400 lux between rows at switchgear front panels within the Control Building;
- 400 lux at the front of control panel within the Control Building;
- 160 lux to the rear of switchgear in the Control building
- 160 lux adjacent to the Battery Storage, Load Management Equipment, AC and DC panels

19) Supply and installation of decorative LED street lights after every 15 meter interval (if required). LED Street lighting has the feature of Multiple Mounting Options Available, Rugged Precision Cast Aluminum Housing, Perforated Air Flow Venting, High Surface Area Extruded Aluminum Heat Sinks, High Output White LED Diode, Decorative Lens Cover Seals the Electrical/Optical Chamber to IP66, Electronic Driver. The pole shall be stylish, non-corrosive, easy to install and have longer service life.

20) All civil works and necessary indoor & outdoor lighting [Energy efficient (LED) and automated] are required within the scope of the Tender. The substation control room building

shall have the emergency automated dc lighting system in case of power failure.

21) The scope shall include fire extinguishing equipment such as Trolley mounted fire extinguisher with foam type chemical for B type Fire (15kg), Wall mounted fire extinguisher with dry type chemical for A, B and C type Fire (5kg) and Wall mounted fire extinguisher with CO2 type chemical for A, B and C type Fire (2kg), Fire detection unit & Alarm system. The scope shall also include Air conditioning Equipment for substation.

22) Service Pile Load Test to be done for the construction of substation Control Building (where as required as per soil condition)

NOTE: All doors & windows work to be finished by aluminum frame and high quality transparent 6 mm thick glasses. Both indoor & outdoor surface finishing works of walls, roof etc, to be synthetic high quality plastic paint and moisture proof snowcem respectively and treatment to be made by lime terracing for rain water leakage proof of the roof.

B. SUB-STATION / ELECTRICAL WORKS :

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and Commissioning etc. of at least but not limited to the following works are the scope of works:

1) Supply and installation of 33kV Indoor GIS and all others accessories complete in all respect.

2) Supply and installation of 01 nos. Station use 33/0.415 KV, 250 KVA Auxiliary transformer, ONAN, Dyn-11 to be connected with 33kV GIS panel including 0.415 kV MCCB, Power cable, cable terminating kits with structures, etc complete in all respect.

3) Supply and installation of 02 nos. of Power Transformer 33/11 kV, 20/26 MVA, Dyn11 with all related accessories.

4) Supply and installation of Switch yard grounding materials for required sub-station area and equipment to be installed. Earth resistance of the substation shall be less than 0.5ohm during dry season.

5) Supporting steel/RCC structure for connecting the XLPE Power Cable (HV/LV) with accessories as required.

6) Supply and installation of Control room indoor illumination.

7) Supply and installation of Emergency lighting

8) Supply and installation of Fire Fighting equipment and Fire Detection system.

9) Supply and installation of Exhaust Fan (Two nos. in battery room).

10) Supply and installation of Split type Air conditioner (At least forty eight thousand BTU per hr. capacity including MCB, switch, male female plug socket complete) - 04 nos. in the GIS substation building.

11) Supply & installation of GIS Panel for 33kV power transformer, Line feeders of the proposed 33kV & 11KV (GIS) Circuits to be installed in the control room building.

12) Supply and installation of AC Distribution Panel, DC Distribution Panel.

13) Supply and installation of Separate AC distribution Box, wall mounting for control room internal & external illumination switching, extra power supply arrangement for testing purpose, different operation and maintenance use.

14) Supply and installation of switching boards to be installed in each room for functioning of

fans, lights, Air conditioner etc.

15) Supply and installation of 33kV indoor Type GIS & 11kV indoor Type GIS as describe below:

Indoor 33 KV GIS Panels having single bus 2000A:

f) Incoming Feeders (1250A): 02Nos with PT
g) Outgoing Feeders (1250 A): 02 Nos with PT
h) Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2000 A): 01 Nos.
i) Power Transformer Feeders (1250A): 02Nos with PT
j) Station Auxiliary Transformer Feeders (1250A) : 01 Nos .

Indoor 11 KV GIS Panels having single bus 2500A:

a) Incoming Feeders with PCM (2500 A) with PT: 02 Nos.
b) Outgoing Feeders with PCM (630A) with PCM: 8 Nos.
c) Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2500 A): 01Nos.

16) Supply and installation/ connection of 33kV, 11kV Power Cable, XLPE for all 33kV or 11kV line feeders and transformers feeder including cable termination (Outdoor & Indoor) as required.

17) Supply and installation/ connection of Control Cables

18) Supply and installation of Battery, Ni-Cd as per BOQ.

19) Supply and installation of Battery Charger as per BOQ.

20) Supply and lying of Rubber pad to be laid in front of the SWITCHGEAR Panels.

21) 05(Five) Sets of As-built drawings together with operation and maintenance Manual, relevant IEC standards of the installed equipment shall be submitted to the Directorate of Design & Inspection -2, BPDB, Dhaka for reviewing within 15 days of commissioning of substation .

22) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid.

Besides the above others are as follow:

23) All the 33 KV & 11kV Switchgears will be of Gas Insulated type with circuit breakers.They will be installed on the 1st floor of the proposed Control room / substation building. All 33KV and 11KV cable shall be accommodated in the Ground floor of the proposed Control room / substation building with steel structure cable trenches. Portion of Ground floor may be used as office room of the sub-station building. All the Common Service Facility areas- Reception, Waiting/ Common Space, Rest/Wash rooms, etc shall be installed in floor. Every floor shall be designed with Natural Ventilation system. There shall be adequate space to both end of 33kV GIS panel & 11 kV GIS panel for future extension.

24) 02 (Two) Nos. new 33/11KV,20/26MVA, ONAN/ONAF Power Transformers shall be installed in the Substation and shall be connected to the 33 kV switchgear and 11 kV switchgear panels (described above) and by single core XLPE cable of required voltage and size. The volume of the transformers shall be such that these are accommodated in the space available by keeping safe electrical clearance. Both the new Transformers are to be identical and from the same manufacturer. Provision for running the transformers in parallel is to be provided. Tap Changer Control panel with AVR relay, Auto/Manual and Master/ Follower control switch. (02 panel for power transformers).

25) RCC Fire-wall shall be constructed between one and the next power transformer (where the power transformer installed inside the Substation building). Adequate free air passage space shall be maintained.

26) 01 (One) No. 33/0.415KV, 250KVA Station Transformers (Oil type) will be installed separately beside Power Transformer by 33 KV cable terminations. The LV sides of the station transformer will be connected to the LV A/C distribution Panel by LV cables of appropriate size. Single sources of D/C supply with 01 set of 110 V battery (Ni-Cd) and battery charger shall be installed and connected to the D/C distribution panel by LV cables of appropriate size.

27) The indoor 33KV XLPE copper cables will be connected to 33KV GIS panel by requisite cable termination kit.

28) The indoor 11KV XLPE copper cables will be connected to 11KV GIS panel by requisite cable termination kit. The indoor terminations of the 11KV cables with the 11 KV switchgear panel will be as per arrangement provided there. All the 33kV and 11kV cables shall be armored and cu-wire screened.

29) The outdoor cable terminations of the 33 KV cables (where required) will be heat shrink type and supported by steel structure. In the same way the 11KV cables outdoor type terminations will be heat shrink type being supported by steel structure.

30) The conventional protections to transformer feeders, line feeders and bus coupler are to be provided. However, total protection scheme is to be implemented on approval from BPDB Authority. Meters for monitoring three phase Current and voltage are to be installed in each panel.

31) All 33KV & 11KV panels (except the bus couplers) are to be provided with separate high class Digital energy meter of 0.2 class having provision of remote communication facilities. Both mechanical and electrical inter locks are to be provided along with the breakers, isolators and earth switches of various feeders as per normal convention.

32) Grounding mesh of copper conductor of requisite earth resistance (shall be <0.50ohm) will be installed for grounding the neutrals of the power transformers, station transformers, their bodies, the lightning arrestor sets, the steel supporting structure, all indoor & outdoor panels etc. The grounding system is to be implemented on approval of the design from BPDB Authority.

33) AC and DC distribution Panels, Battery Sets with battery chargers shall be accommodated on the same floor of 33 kV and 11 kV switchgear panels.

34) The 33 KV incoming feeders (from source substation/grid) shall be connected to the 33 KV incoming GIS panel. The 11 KV sides of 33/11KV power transformers will then be connected (by 11KV XLPE cables) to the 11 KV incoming GIS Panel.

- 33KV 1Cx800mm2 cable per phase connected to 02 (Two) nos. 33 kV GIS Incoming Breaker (Supply of Cable, Indoor and outdoor termination kits and connection work is under this scope).
- 33KV 1Cx500mm2 cable connected to 02 (Two) nos. 33 kV GIS Outgoing feeder (Supply of Cable, Indoor and outdoor termination kits and connection work is under this scope).

- Connection from 33kV GIS (Transformer feeder) to power transformer will be made by 1Cx 500 mm2 XLPE Cu cable for 02 (two) nos. 33 kV GIS x-former feeder .

- 11KV incoming connection from the transformer to the breaker will be made by 2x1Cx630 mm2 XLPE Copper Cable for 33/11KV, 20/26MVA , ONAN/ONAF Power Transformers.
- 0.415 kV, 4CX120 mm2 XLPE PVC (Cu) Cable for Station Auxiliary Transformer and 33

kV, 3CX95mm2 XLPE Copper Cable with Indoor and outdoor termination kits for Station Auxiliary Transformer Incoming.

- Transformer Neutral will also be connected to ground by copper cable of 2X1CX150 mm2 with 03 (Three) Nos. of Electrode (Round Bar) of 16 mm Dia with 04 (Four) Meter Length Each and Length of the electrode will be decided as per Design calculation. The requisite termination kits are to be supplied and installed.
- The 11KV outgoing feeder of the substation from the 11KV outgoing breaker shall be connected by 3CX185 mm2 XLPE Cable and connect through underground up to the outgoing OVERHEAD Feeder pole line (adjacent to proposed boundary wall).

Indoor and Outdoor all 33kV & 11 kV Termination is in the contractor's Scope.

35) The Scope also includes the design, manufacture, supply, Installation and commissioning of Substation Automation System (SAS) for both 33KV GIS & 11KV GIS system with provision for interfacing with SCADA System.

36) Outdoor lightning protection system for the substation shall be installed.

37) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid. One electronic copy (soft copy in a CD) of all relevant As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB, Dhaka.

38) The Bidder must visit the site and assess the works before submitting his Tender and will carefully examine the tender requirements and to determine the existing conditions, facilities and limitations. Tenderer shall have make all necessary arrangement to carry out the Contract if awarded. Any neglect to delay or failure on the part of the tenderer to obtain reliable information upon the foregoing or any matter effecting the work and completion period shall not relieve the successful tenderer of his responsibilities, risks or liabilities until final acceptance of the Supply of Goods and Related Services in case of award of the contract.

39) Any additional works not covered above but necessary for the functioning of the system & required as per specification to be incorporated by the Tenderer. The items of minor nature, which is not mentioned, shall be incorporated by the bidder.

Indicative Layout & Single line diagram in Annex-9.

6.1.1.4 Scope for Design, Supply, Erection, Installation, Testing and Commissioning of 33/11KV, 2x20/26 MVA Regular Type GIS (A K KHAN SCHOOL, MOHORA NEW) at S&D-Mohora, BPDB, Chattogram.

(Not limited but at least the following works to be done by the turnkey contractor)

A. CIVIL & BUILDING WORKS:

Design, Manufacture, Supply, Installation/Erection, Construction, Testing and Commissioning, (dismantling if necessary) and so on of the following works are the scope of works:

1) Land development work with height of 1(One) Meter above the highest flood level or 1 (One) Meter above the nearest high way/road level which is higher. Employer will provide all lands only and contractor will fill it by sand (if necessary) up to ground level. Soil testing for soil resistivity and soil bearing capacity before designing, final leveling, consolidation, surfacing and compaction of entire

switchyard area with crushed rock (where required) to cater for the ultimate development of the substation. Landscaping work and gardening of the whole sub-station area. Bidder shall submit the layout of the whole substation area of landscaping work for approval.

2) Construction of cable trenches including cable rack for power cable and control cable (where required);
   (a) Within the switch yard area,
   (b) Switch yard area to control room building,
   (c) For 33KV & 11kV Cable lying inside Substation Compound.

3) Construction of main entrance gate and side gate with aesthetic view. Construction/ installation of Substation NAME PLATE/ SIGN BOARD. A digital sign board (electronic sign board) to be fixed on the top of the main entrance gate.

4) Construction of R.C.C base foundations for power transformers and all others equipment & Structure as required.

5) Construction of Guard post 10 square meter adjacent to the main gate of the substation.

6) Design & Construction of new GIS Substation Building:
   500 square meter (250 Sq. m each floor) two storied Building with four storied foundation (Ground Floor- Height 10'5", 1st Floor- Height-14'5" for Control Room) as per price schedule for the substation control room, store, cable room, etc. including roof lime terracing, door, window, toilet etc.

   Electrification of the whole substation area is within the scope. In control room high quality tiles shall be installed in floor. For this new Sub-station, in the control room building having facilities of wash basin, bath shower towel rod, soap case, auzo wash, glass rack, looking mirror, pan fitting with low-down, swan neck pillar cock, extra long bib cock, interior walls and floor finished by tiles, underground water reservoir tank and all allied civil works deemed necessary are included in the Bid complete in all respect.

   Overhead water tank 2X500 liter on the top of the control room building, underground water reservoir (tank), water lifting pump, suction pump and portable water supply system complete in all respect [Design shall be based on use of 20 persons per day for overhead water tank] Construction of septic tank, soak well, inspections pits, sewerage piping by PVC 6 inches dia. Pipe, toilet/ bathroom/lavatory located.

7) Soil testing for soil resistivity and soil bearing capacity before designing final leveling of Control room area.

8) Construction of approach road from the main gate to the Substation building entrance and internal road for whole sub-station campus area and parking area (shall be carpeting/RCC flooring) as required. All roads shall be of concrete road as per technical specification. The other roads main and approach RCC road shall be min 6 meters wide. Road in front of transformer shall be min 6.0 meters wide RCC road.

9) Properly insulated False Ceiling of Control room, office, suitable for Air conditioning system.

10) Construction of drainage, sanitary system for whole sub-station area.

11) Supply and installation of Operation Key Board, Al/ Steel frame front cover glass with locking device, dust proof.

12) Supply and installation of Chain link fencing with gate for Power Transformer & Station transformer if required. Earthing for fencing required.

13) Supply of two operator working table, Steel made with extra glass on the top, and two nos. of wheel based revolving chair & ten nos. visitor chair, curtain (venetian blind) of window in the control room.

14) Supply of Steel File Cabinet (four drawers), Steel Almirah for record keeping in the control

room.

15) Contractor shall supply and install 32 inch LED Television, 01 set of Desktop Computer with Printer, Scanner and complete furniture for the substation control room & office building.

16) Supply and construction of Power cable trench and control cable rack inside the Ground floor of

the substation building. Proper fire and water proof sealing of the cable entry (control & Power) at Control Room building, to prevent water entering from switch yard/outside to CR Building, preventing entry of rats and reptiles, fire proof etc.

17) Dismantling work (If necessary) as per Price Schedule, BOQ & field requirement.

18) Supply and installation of office room, Control room indoor illumination. Lighting levels within the building must be generally designed to meet the requirements of IEC Standards, and in particular, meet the following specific lighting levels:

- 400 lux between rows at switchgear front panels within the Control Building;
- 400 lux at the front of control panel within the Control Building;
- 160 lux to the rear of switchgear in the Control building
- 160 lux adjacent to the Battery Storage, Load Management Equipment, AC and DC panels

19) Supply and installation of decorative LED street lights after every 15 meter interval (if required). LED Street lighting has the feature of Multiple Mounting Options Available, Rugged Precision Cast Aluminum Housing, Perforated Air Flow Venting, High Surface Area Extruded Aluminum Heat Sinks, High Output White LED Diode, Decorative Lens Cover Seals the Electrical/Optical Chamber to IP66, Electronic Driver. The pole shall be stylish, non-corrosive, easy to install and have longer service life.

20) All civil works and necessary indoor & outdoor lighting [Energy efficient (LED) and automated] are required within the scope of the Tender. The substation control room building shall have the emergency automated dc lighting system in case of power failure.

21) The scope shall include fire extinguishing equipment such as Trolley mounted fire extinguisher with foam type chemical for B type Fire (15kg), Wall mounted fire extinguisher with dry type chemical for A, B and C type Fire (5kg) and Wall mounted fire extinguisher with CO2 type chemical for A, B and C type Fire (2kg), Fire detection unit & Alarm system. The scope shall also include Air conditioning Equipment for substation.

22) Service Pile Load Test to be done for the construction of substation Control Building (where as required as per soil condition)

NOTE: All doors & windows work to be finished by aluminum frame and high quality transparent 6 mm thick glasses. Both indoor & outdoor surface finishing works of walls, roof etc, to be synthetic high quality plastic paint and moisture proof snowcem respectively and treatment to be made by lime terracing for rain water leakage proof of the roof.

B. SUB-STATION / ELECTRICAL WORKS :

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and Commissioning etc. of at least but not limited to the following works are the scope of works:

1) Supply and installation of 33kV Indoor GIS and all others accessories complete in all respect.

2) Supply and installation of 01 nos. Station use 33/0.415 KV, 250 KVA Auxiliary transformer, ONAN, Dyn-11 to be connected with 33kV GIS panel including 0.415 kV MCCB, Power cable, cable terminating kits with structures, etc complete in all respect.

3) Supply and installation of 02 nos. of Power Transformer 33/11 kV, 20/26MVA, Dyn11 with all related accessories.

4) Supply and installation of Switch yard grounding materials for required sub-station area and equipment to be installed. Earth resistance of the substation shall be less than 0.5ohm during dry season.

5) Supporting steel/RCC structure for connecting the XLPE Power Cable (HV/LV) with accessories as required.

6) Supply and installation of Control room indoor illumination.

7) Supply and installation of Emergency lighting

8) Supply and installation of Fire Fighting equipment and Fire Detection system.

9) Supply and installation of Exhaust Fan (Two nos. in battery room).

10) Supply and installation of Split type Air conditioner (At least forty eight thousand BTU per hr. capacity including MCB, switch, male female plug socket complete) - 04 nos. in the GIS substation building.

11) Supply & installation of GIS Panel for 33kV power transformer, Line feeders of the proposed 33kV & 11KV (GIS) Circuits to be installed in the control room building.

12) Supply and installation of AC Distribution Panel, DC Distribution Panel.

13) Supply and installation of Separate AC distribution Box, wall mounting for control room internal & external illumination switching, extra power supply arrangement for testing purpose, different operation and maintenance use.

14) Supply and installation of switching boards to be installed in each room for functioning of fans, lights, Air conditioner etc.

15) Supply and installation of 33kV indoor Type GIS & 11kV indoor Type GIS as describe below:

Indoor 33 KV GIS Panels having single bus 2000A:

a) Incoming Feeders (1250A): 02Nos with PT
b) Outgoing Feeders (1250 A): 02 Nos with PT
c) Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2000 A): 01 Nos.
d) Power Transformer Feeders (1250A): 02Nos with PT
e) Station Auxiliary Transformer Feeders (1250A) : 01 Nos .

Indoor 11 KV GIS Panels having single bus 2500A:

a) Incoming Feeders with PCM (2500 A) with PT: 02 Nos.
b) Outgoing Feeders with PCM (630A) with PCM: 12 Nos.
c) Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2500 A): 01Nos.

16) Supply and installation/ connection of 33kV, 11kV Power Cable, XLPE for all 33kV or 11kV line feeders and transformers feeder including cable termination (Outdoor & Indoor) as required.

17) Supply and installation/ connection of Control Cables

18) Supply and installation of Battery, Ni-Cd as per BOQ.

19) Supply and installation of Battery Charger as per BOQ.

20) Supply and lying of Rubber pad to be laid in front of the SWITCHGEAR Panels.

21) 05(Five) Sets of As-built drawings together with operation and maintenance Manual, relevant IEC standards of the installed equipment shall be submitted to the Directorate of Design & Inspection -2, BPDB, Dhaka for reviewing within 15 days of commissioning of substation .

22) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid.

Besides the above others are as follow:

23) All the 33 KV & 11kV Switchgears will be of Gas Insulated type with circuit breakers.They will be installed on the 1st floor of the proposed Control room / substation building. All 33KV and 11KV cable shall be accommodated in the Ground floor of the proposed Control room / substation building with steel structure cable trenches. Portion of Ground floor may be used as office room of the sub-station building. All the Common Service Facility areas- Reception, Waiting/ Common Space, Rest/Wash rooms, etc shall be installed in floor. Every floor shall be designed with Natural Ventilation system. There shall be adequate space to both end of 33kV GIS panel & 11 kV GIS panel for future extension.

24) 02 (Two) Nos. new 33/11KV,20/26MVA, ONAN/ONAF Power Transformers shall be installed in the Substation and shall be connected to the 33 kV switchgear and 11 kV switchgear panels (described above) and by single core XLPE cable of required voltage and size. The volume of the transformers shall be such that these are accommodated in the space available by keeping safe electrical clearance. Both the new Transformers are to be identical and from the same manufacturer. Provision for running the transformers in parallel is to be provided. Tap Changer Control panel with AVR relay, Auto/Manual and Master/ Follower control switch. (02 panel for power transformers).

25) RCC Fire-wall shall be constructed between one and the next power transformer (where the power transformer installed inside the Substation building). Adequate free air passage space shall be maintained.

26) 01 (One) No. 33/0.415KV, 250KVA Station Transformers (Oil type) will be installed separately beside Power Transformer by 33 KV cable terminations. The LV sides of the station transformer will be connected to the LV A/C distribution Panel by LV cables of appropriate size. Single sources of D/C supply with 01 set of 110 V battery (Ni-Cd) and battery charger shall be installed and connected to the D/C distribution panel by LV cables of appropriate size.

27) The indoor 33KV XLPE copper cables will be connected to 33KV GIS panel by requisite cable termination kit.

28) The indoor 11KV XLPE copper cables will be connected to 11KV GIS panel by requisite cable termination kit. The indoor terminations of the 11KV cables with the 11 KV switchgear panel will be as per arrangement provided there. All the 33kV and 11kV cables shall be armored and cu-wire screened.

29) The outdoor cable terminations of the 33 KV cables (where required) will be heat shrink type and supported by steel structure. In the same way the 11KV cables outdoor type terminations will be heat shrink type being supported by steel structure.

30) The conventional protections to transformer feeders, line feeders and bus coupler are to be

provided. However, total protection scheme is to be implemented on approval from BPDB Authority. Meters for monitoring three phase Current and voltage are to be installed in each panel.

31) All 33KV & 11KV panels (except the bus couplers) are to be provided with separate high class Digital energy meter of 0.2 class having provision of remote communication facilities. Both mechanical and electrical inter locks are to be provided along with the breakers, isolators and earth switches of various feeders as per normal convention.

32) Grounding mesh of copper conductor of requisite earth resistance (shall be <0.50ohm) will be installed for grounding the neutrals of the power transformers, station transformers, their bodies, the lightning arrestor sets, the steel supporting structure, all indoor & outdoor panels etc. The grounding system is to be implemented on approval of the design from BPDB Authority.

33) AC and DC distribution Panels, Battery Sets with battery chargers shall be accommodated on the same floor of 33 kV and 11 kV switchgear panels.

34) The 33 KV incoming feeders (from source substation/grid) shall be connected to the 33 KV incoming GIS panel. The 11 KV sides of 33/11KV power transformers will then be connected (by 11KV XLPE cables) to the 11 KV incoming GIS Panel.

- 33KV 1Cx800mm2 cable per phase connected to 02 (Two) nos. 33 kV GIS Incoming Breaker (Supply of Cable, Indoor and outdoor termination kits and connection work is under this scope).
- 33KV 1Cx500mm2 cable connected to 02 (Two) nos. 33 kV GIS Outgoing feeder (Supply of Cable, Indoor and outdoor termination kits and connection work is under this scope).

- Connection from 33kV GIS (Transformer feeder) to power transformer will be made by 1Cx 500 mm2 XLPE Cu cable for 02 (two) nos. 33 kV GIS x-former feeder .

- 11KV incoming connection from the transformer to the breaker will be made by 2x1Cx630 mm2 XLPE Copper Cable for 33/11KV, 20/26MVA, ONAN/ONAF Power Transformers.

- 0.415 kV, 4CX120 mm2 XLPE PVC (Cu) Cable for Station Auxiliary Transformer and 33 kV, 3CX95mm2 XLPE Copper Cable with Indoor and outdoor termination kits for Station Auxiliary Transformer Incoming.

- Transformer Neutral will also be connected to ground by copper cable of 2X1CX150 mm2 with 03 (Three) Nos. of Electrode (Round Bar) of 16 mm Dia with 04 (Four) Meter Length Each and Length of the electrode will be decided as per Design calculation.The requisite termination kits are to be supplied and installed.

- The 11KV outgoing feeder of the substation from the 11KV outgoing breaker shall be connected by 3CX185 mm2 XLPE Cable and connect through underground up to the outgoing OVERHEAD Feeder pole line (adjacent to proposed boundary wall).

Indoor and Outdoor all 33kV & 11 kV Termination is in the contractor's Scope.

35) The Scope also includes the design, manufacture, supply, Installation and commissioning of Substation Automation System (SAS) for both 33KV GIS & 11KV GIS system with provision for interfacing with SCADA System.

36) Outdoor lightning protection system for the substation shall be installed.

37) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid. One electronic copy (soft copy in a CD) of all relevant As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB, Dhaka.

38) The Bidder must visit the site and assess the works before submitting his Tender and will carefully examine the tender requirements and to determine the existing conditions, facilities and limitations. Tenderer shall have make all necessary arrangement to carry out the Contract if awarded. Any neglect to delay or failure on the part of the tenderer to obtain reliable information upon the foregoing or any matter effecting the work and completion period shall not relieve the successful tenderer of his responsibilities, risks or liabilities until final acceptance of the Supply of Goods and Related Services in case of award of the contract.

39) Any additional works not covered above but necessary for the functioning of the system & required as per specification to be incorporated by the Tenderer. The items of minor nature, which is not mentioned, shall be incorporated by the bidder.

Indicative Layout & Single line diagram in Annex-9.

6.1.1.5 Scope for Design, Supply, Erection, Installation, Testing and Commissioning of 33/11KV, 2x20/26 MVA Regular Type GIS (MURADPUR NEW) at S&D-Kalurghat, BPDB, Chattogram.

(Not limited but at least the following works to be done by the turnkey contractor)

A. CIVIL & BUILDING WORKS:

Design, Manufacture, Supply, Installation/Erection, Construction, Testing and Commissioning, (dismantling if necessary) and so on of the following works are the scope of works:

1) Land development work with height of 1(One) Meter above the highest flood level or 1 (One) Meter above the nearest high way/road level which is higher. Employer will provide all lands only and contractor will fill it by sand (if necessary) up to ground level. Soil testing for soil resistivity and soil bearing capacity before designing, final leveling, consolidation, surfacing and compaction of entire switchyard area with crushed rock (where required) to cater for the ultimate development of the substation. Landscaping work and gardening of the whole sub-station area. Bidder shall submit the layout of the whole substation area of landscaping work for approval.

2) Construction of cable trenches including cable rack for power cable and control cable (where required);
   (a) Within the switch yard area,
   (b) Switch yard area to control room building,
   (c) For 33KV & 11kV Cable lying inside Substation Compound.

3) Construction of main entrance gate and side gate with aesthetic view. Construction/ installation of Substation NAME PLATE/ SIGN BOARD. A digital sign board (electronic sign

board) to be fixed on the top of the main entrance gate.

4) Construction of R.C.C base foundations for power transformers and all others equipment & Structure as required.
5) Construction of Guard post 10 square meter adjacent to the main gate of the substation.
6) Design & Construction of new GIS Substation Building:
500 square meter (250 Sq. m each floor) two storied Building with four storied foundation (Ground Floor- Height 10'5" for Cable room, 1st Floor- Height-14'5" for Control Room) as per price schedule for the substation control room, store, cable room, etc. including roof lime terracing, door, window, toilet etc.

Electrification of the whole substation area is within the scope. In control room high quality tiles shall be installed in floor. For this new Sub-station, in the control room building having facilities of wash basin, bath shower towel rod, soap case, auzo wash, glass rack, looking mirror, pan fitting with low-down, swan neck pillar cock, extra long bib cock, interior walls and floor finished by tiles, underground water reservoir tank and all allied civil works deemed necessary are included in the Bid complete in all respect.

Overhead water tank 2X500 liter on the top of the control room building, underground water reservoir (tank), water lifting pump, suction pump and portable water supply system complete in all respect [Design shall be based on use of 20 persons per day for overhead water tank] Construction of septic tank, soak well, inspections pits, sewerage piping by PVC 6 inches dia. Pipe, toilet/ bathroom/lavatory located.

7) Soil testing for soil resistivity and soil bearing capacity before designing final leveling of Control room area.
8) Construction of approach road from the main gate to the Substation building entrance and internal road for whole sub-station campus area and parking area (shall be carpeting/RCC flooring) as required. All roads shall be of concrete road as per technical specification. The other roads main and approach RCC road shall be min 6 meters wide. Road in front of transformer shall be min 6.0 meters wide RCC road.

9) Properly insulated False Ceiling of Control room, office, suitable for Air conditioning system.

10) Construction of drainage, sanitary system for whole sub-station area.
11) Supply and installation of Operation Key Board, Al/ Steel frame front cover glass with locking device, dust proof.
12) Supply and installation of Chain link fencing with gate for Power Transformer & Station transformer if required. Earthing for fencing required.

13) Supply of two operator working table, Steel made with extra glass on the top, and two nos. of wheel based revolving chair & ten nos. visitor chair, curtain (venetian blind) of window in the control room.
14) Supply of Steel File Cabinet (four drawers), Steel Almirah for record keeping in the control room.
15) Contractor shall supply and install 32 inch LED Television, 01 set of Desktop Computer with Printer, Scanner and complete furniture for the substation control room & office building.

16) Supply and construction of Power cable trench and control cable rack inside the Ground floor of the substation building. Proper fire and water proof sealing of the cable entry (control & Power) at Control Room building, to prevent water entering from switch yard/outside to CR Building, preventing entry of rats and reptiles, fire proof etc.

17) Dismantling work (If necessary) as per Price Schedule, BOQ & field requirement.

18) Supply and installation of office room, Control room indoor illumination. Lighting levels within the building must be generally designed to meet the requirements of IEC Standards, and in particular, meet the following specific lighting levels:

- 400 lux between rows at switchgear front panels within the Control Building;
- 400 lux at the front of control panel within the Control Building;
- 160 lux to the rear of switchgear in the Control building
- 160 lux adjacent to the Battery Storage, Load Management Equipment, AC and DC panels

19) Supply and installation of decorative LED street lights after every 15 meter interval (if required). LED Street lighting has the feature of Multiple Mounting Options Available, Rugged Precision Cast Aluminum Housing, Perforated Air Flow Venting, High Surface Area Extruded Aluminum Heat Sinks, High Output White LED Diode, Decorative Lens Cover Seals the Electrical/Optical Chamber to IP66, Electronic Driver. The pole shall be stylish, non-corrosive, easy to install and have longer service life.

20) All civil works and necessary indoor & outdoor lighting [Energy efficient (LED) and automated] are required within the scope of the Tender. The substation control room building shall have the emergency automated dc lighting system in case of power failure.

21) The scope shall include fire extinguishing equipment such as Trolley mounted fire extinguisher with foam type chemical for B type Fire (15kg), Wall mounted fire extinguisher with dry type chemical for A, B and C type Fire (5kg) and Wall mounted fire extinguisher with CO2 type chemical for A, B and C type Fire (2kg), Fire detection unit & Alarm system. The scope shall also include Air conditioning Equipment for substation.

22) Service Pile Load Test to be done for the construction of substation Control Building (where as required as per soil condition)

NOTE: All doors & windows work to be finished by aluminum frame and high quality transparent 6 mm thick glasses. Both indoor & outdoor surface finishing works of walls, roof etc, to be synthetic high quality plastic paint and moisture proof snowcem respectively and treatment to be made by lime terracing for rain water leakage proof of the roof.

B. SUB-STATION / ELECTRICAL WORKS :

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and Commissioning etc. of at least but not limited to the following works are the scope of works:

1) Supply and installation of 33kV Indoor and all others accessories complete in all respect.

2) Supply and installation of 01 nos. Station use 33/0.415 KV, 250 KVA Auxiliary transformer, ONAN, Dyn-11 to be connected with 33kV GIS panel including 0.415 kV MCCB, Power cable, cable terminating kits with structures, etc complete in all respect.

3) Supply and installation of 02 nos. of Power Transformer 33/11 kV, 20/26 MVA, Dyn11 with all related accessories.

4) Supply and installation of Switch yard grounding materials for required sub-station area and equipment to be installed. Earth resistance of the substation shall be less than 0.5ohm during dry season.

5) Supporting steel/RCC structure for connecting the XLPE Power Cable (HV/LV) with accessories as required.

6) Supply and installation of Control room indoor illumination.

7) Supply and installation of Emergency lighting

8) Supply and installation of Fire Fighting equipment and Fire Detection system.

9) Supply and installation of Exhaust Fan (Two nos. in battery room).

10) Supply and installation of Split type Air conditioner (At least forty eight thousand BTU per hr. capacity including MCB, switch, male female plug socket complete) - 04 nos. in the GIS substation building.

11) Supply & installation of GIS Panel for 33kV power transformer, Line feeders of the proposed 33kV & 11KV (GIS) Circuits to be installed in the control room building.

12) Supply and installation of AC Distribution Panel, DC Distribution Panel.

13) Supply and installation of Separate AC distribution Box, wall mounting for control room internal & external illumination switching, extra power supply arrangement for testing purpose, different operation and maintenance use.

14) Supply and installation of switching boards to be installed in each room for functioning of fans, lights, Air conditioner etc.

15) Supply and installation of 33kV indoor Type GIS & 11kV indoor Type GIS as describe below:

Indoor 33 KV GIS Panels having single bus 2000A:
a) Incoming Feeders (1250A): 02Nos with PT
b) Outgoing Feeders (1250 A): 02 Nos with PT
c) Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2000 A): 01 Nos.
d) Power Transformer Feeders (1250A): 02Nos with PT
e) Station Auxiliary Transformer Feeders (1250A) : 01 Nos .

Indoor 11 KV GIS Panels having single bus 2500A:
a) Incoming Feeders with PCM (2500 A) with PT: 02 Nos.
b) Outgoing Feeders with PCM (630A) with PCM: 12 Nos.
c) Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2500 A): 01Nos.

16) Supply and installation/ connection of 33kV, 11kV Power Cable, XLPE for all 33kV or 11kV line feeders and transformers feeder including cable termination (Outdoor & Indoor) as required.

17) Supply and installation/ connection of Control Cables

18) Supply and installation of Battery, Ni-Cd as per BOQ.

19) Supply and installation of Battery Charger as per BOQ.

20) Supply and lying of Rubber pad to be laid in front of the SWITCHGEAR Panels.

21) 05(Five) Sets of As-built drawings together with operation and maintenance Manual, relevant IEC standards of the installed equipment shall be submitted to the Directorate of Design & Inspection -2, BPDB, Dhaka for reviewing within 15 days of commissioning of substation .

22) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid.

Besides the above others are as follow:

23) All the 33 KV & 11kV Switchgears will be of Gas Insulated type with circuit breakers.They will be installed on the 1st floor of the proposed Control room / substation building. All 33KV and 11KV cable shall be accommodated in the Ground floor of the proposed Control room / substation building with steel structure cable trenches. Portion of Ground floor may be used as office room of the sub-station building. All the Common Service Facility areas- Reception, Waiting/ Common Space, Rest/Wash rooms, etc shall be installed in floor. Every floor shall be designed with Natural Ventilation system. There shall be adequate space to both end of 33kV GIS panel & 11 kV GIS panel for future extension.

24) 02 (Two) Nos. new 33/11KV,20/26MVA, ONAN/ONAF Power Transformers shall be installed in the Substation and shall be connected to the 33 kV switchgear and 11 kV switchgear panels (described above) and by single core XLPE cable of required voltage and size. The volume of the transformers shall be such that these are accommodated in the space available by keeping safe electrical clearance. Both the new Transformers are to be identical and from the same manufacturer. Provision for running the transformers in parallel is to be provided. Tap Changer Control panel with AVR relay, Auto/Manual and Master/ Follower control switch. (02 panel for power transformers).

25) RCC Fire-wall shall be constructed between one and the next power transformer (where the power transformer installed inside the Substation building). Adequate free air passage space shall be maintained.

26) 01 (One) No. 33/0.415KV, 250KVA Station Transformers (Oil type) will be installed separately beside Power Transformer by 33 KV cable terminations. The LV sides of the station transformer

will be connected to the LV A/C distribution Panel by LV cables of appropriate size. Single sources of D/C supply with 01 set of 110 V battery (Ni-Cd) and battery charger shall be installed and connected to the D/C distribution panel by LV cables of appropriate size.

27) The indoor 33KV XLPE copper cables will be connected to 33KV GIS panel by requisite cable termination kit.

28) The indoor 11KV XLPE copper cables will be connected to 11KV GIS panel by requisite cable termination kit. The indoor terminations of the 11KV cables with the 11 KV switchgear panel will be as per arrangement provided there. All the 33kV and 11kV cables shall be armored and cu-wire screened.

29) The outdoor cable terminations of the 33 KV cables (where required) will be heat shrink type and supported by steel structure. In the same way the 11KV cables outdoor type terminations will be heat shrink type being supported by steel structure.

30) The conventional protections to transformer feeders, line feeders and bus coupler are to be provided. However, total protection scheme is to be implemented on approval from BPDB Authority. Meters for monitoring three phase Current and voltage are to be installed in each panel.

31) All 33KV & 11KV panels (except the bus couplers) are to be provided with separate high class Digital energy meter of 0.2 class having provision of remote communication facilities. Both mechanical and electrical inter locks are to be provided along with the breakers, isolators and earth switches of various feeders as per normal convention.

32) Grounding mesh of copper conductor of requisite earth resistance (shall be <0.50ohm) will be installed for grounding the neutrals of the power transformers, station transformers,

their bodies, the lightning arrestor sets, the steel supporting structure, all indoor & outdoor panels etc. The grounding system is to be implemented on approval of the design from BPDB Authority.

33) AC and DC distribution Panels, Battery Sets with battery chargers shall be accommodated on the same floor of 33 kV and 11 kV switchgear panels.

34) The 33 KV incoming feeders (from source substation/grid) shall be connected to the 33 KV incoming GIS panel. The 11 KV sides of 33/11KV power transformers will then be connected (by 11KV XLPE cables) to the 11 KV incoming GIS Panel.

- 33KV 1Cx800mm2 cable per phase connected to 02 (Two) nos. 33 kV GIS Incoming Breaker (Supply of Cable, Indoor and outdoor termination kits and connection work is under this scope).
- 33KV 1Cx500mm2 cable connected to 02 (Two) nos. 33 kV GIS Outgoing feeder (Supply of Cable, Indoor and outdoor termination kits and connection work is under this scope).
- Connection from 33kV GIS (Transformer feeder) to power transformer will be made by 1Cx 500 mm2 XLPE Cu cable for 02 (two) nos. 33 kV GIS x-former feeder .

- 11KV incoming connection from the transformer to the breaker will be made by 2x1Cx630 mm2 XLPE Copper Cable for 33/11KV, 20/26MVA, ONAN/ONAF Power Transformers.

- 0.415 kV, 4CX120 mm2 XLPE PVC (Cu) Cable for Station Auxiliary Transformer and 33 kV, 3CX95mm2 XLPE Copper Cable with Indoor and outdoor termination kits for Station Auxiliary Transformer Incoming.

- Transformer Neutral will also be connected to ground by copper cable of 2X1CX150 mm2 with 03 (Three) Nos. of Electrode (Round Bar) of 16 mm Dia with 04 (Four) Meter Length Each and Length of the electrode will be decided as per Design calculation.The requisite termination kits are to be supplied and installed.

- The 11KV outgoing feeder of the substation from the 11KV outgoing breaker shall be connected by 3CX185 mm2 XLPE Cable and connect through underground up to the outgoing OVERHEAD Feeder pole line (adjacent to proposed boundary wall).

Indoor and Outdoor all 33kV & 11 kV Termination is in the contractor's Scope.

35) The Scope also includes the design, manufacture, supply, Installation and commissioning of Substation Automation System (SAS) for both 33KV GIS & 11KV GIS system with provision for interfacing with SCADA System.

36) Outdoor lightning protection system for the substation shall be installed.

37) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid. One electronic copy (soft copy in a CD) of all relevant As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB, Dhaka.

38) The Bidder must visit the site and assess the works before submitting his Tender and will carefully examine the tender requirements and to determine the existing conditions, facilities and limitations. Tenderer shall have make all necessary arrangement to carry out the Contract if awarded. Any neglect to delay or failure on the part of the tenderer to obtain reliable information upon the foregoing or any matter effecting the work and completion period shall not relieve the successful tenderer of his responsibilities, risks or liabilities until final

acceptance of the Supply of Goods and Related Services in case of award of the contract.

39) Any additional works not covered above but necessary for the functioning of the system & required as per specification to be incorporated by the Tenderer. The items of minor nature, which is not mentioned, shall be incorporated by the bidder.

Indicative Layout & Single line diagram in Annex-9.

6.1.1.6 Scope for Design, Supply, Erection, Installation, Testing and Commissioning of 33/11KV, 2x16, 1x16/20 MVA to 2x20/26 MVA GIS UP-GRADATION (SHOLOSHOHOR) at S&D-Sholoshohor, BPDB, Chattogram.

(Not limited but at least the following works to be done by the turnkey contractor)

A. CIVIL & BUILDING WORKS:

Design, Manufacture, Supply, Installation/Erection, Construction, Testing and Commissioning, (dismantling if necessary) and so on of the following works are the scope of works:

1) Land development work with height of 1(One) Meter above the highest flood level or 1 (One) Meter above the nearest high way/road level which is higher. Employer will provide all lands only and contractor will fill it by sand (if necessary) up to ground level. Soil testing for soil resistivity and soil bearing capacity before designing, final leveling, consolidation, surfacing and compaction of entire switchyard area with crushed rock (where required) to cater for the ultimate development of the substation. Landscaping work and gardening of the whole sub-station area. Bidder shall submit the layout of the whole substation area of landscaping work for approval.

2) Construction of cable trenches including cable rack for power cable and control cable (where required);
   (a) Within the switch yard area,
   (b) Switch yard area to control room building,
   (c) For 33KV & 11kV Cable lying inside Substation Compound.

3) Construction of main entrance gate and side gate with aesthetic view. Construction/ installation of Substation NAME PLATE/ SIGN BOARD. A digital sign board (electronic sign board) to be fixed on the top of the main entrance gate.

4) Construction of R.C.C base foundations for power transformers and all others equipment & Structure as required.

5) Construction of Guard post 10 square meter adjacent to the main gate of the substation.

6) Design & Construction of new GIS Substation Building:
   750 square meter (250 Sq. m each floor) Three storied Building with four storied foundation (Ground Floor- Height 24'6" for Power Transformer, 1st Floor- Height-10'6" for Cable Room, 2nd Floor- Height-14'6" for Control Room) as per price schedule for the substation control room, store, cable room, etc. including roof lime terracing, door, window, toilet etc.

   Electrification of the whole substation area is within the scope. In control room high quality tiles shall be installed in floor. For this new Sub-station, in the control room building having facilities of wash basin, bath shower towel rod, soap case, auzo wash, glass rack, looking mirror, pan fitting with low-down, swan neck pillar cock, extra long bib cock, interior walls and floor finished by tiles, underground water reservoir tank and all allied

civil works deemed necessary are included in the Bid complete in all respect.

Overhead water tank 2X500 liter on the top of the control room building, underground water reservoir (tank), water lifting pump, suction pump and portable water supply system complete in all respect [Design shall be based on use of 20 persons per day for overhead water tank] Construction of septic tank, soak well, inspections pits, sewerage piping by PVC 6 inches dia. Pipe, toilet/ bathroom/lavatory located.

7) Soil testing for soil resistivity and soil bearing capacity before designing final leveling of Control room area.

8) Construction of approach road from the main gate to the Substation building entrance and internal road for whole sub-station campus area and parking area (shall be carpeting/RCC flooring) as required. All roads shall be of concrete road as per technical specification. The other roads main and approach RCC road shall be min 6 meters wide. Road in front of transformer shall be min 6.0 meters wide RCC road.

9) Properly insulated False Ceiling of Control room, office, suitable for Air conditioning system.

10) Construction of drainage, sanitary system for whole sub-station area.

11) Supply and installation of Operation Key Board, Al/ Steel frame front cover glass with locking device, dust proof.

12) Supply and installation of Chain link fencing with gate for Power Transformer & Station transformer if required. Earthing for fencing required.

13) Supply of two operator working table, Steel made with extra glass on the top, and two nos. of wheel based revolving chair & ten nos. visitor chair, curtain (venetian blind) of window in the control room.

14) Supply of Steel File Cabinet (four drawers), Steel Almirah for record keeping in the control room.

15) Contractor shall supply and install 32 inch LED Television, 01 set of Desktop Computer with Printer, Scanner and complete furniture for the substation control room & office building.

16) Supply and construction of Power cable trench and control cable rack inside the Ground floor of the substation building. Proper fire and water proof sealing of the cable entry (control & Power) at Control Room building, to prevent water entering from switch yard/outside to CR Building, preventing entry of rats and reptiles, fire proof etc.

17) Dismantling work (If necessary) as per Price Schedule, BOQ & field requirement.

18) Supply and installation of office room, Control room indoor illumination. Lighting levels within the building must be generally designed to meet the requirements of IEC Standards, and in particular, meet the following specific lighting levels:

- 400 lux between rows at switchgear front panels within the Control Building;
- 400 lux at the front of control panel within the Control Building;
- 160 lux to the rear of switchgear in the Control building
- 160 lux adjacent to the Battery Storage, Load Management Equipment, AC and DC panels

19) Supply and installation of decorative LED street lights after every 15 meter interval (if required). LED Street lighting has the feature of Multiple Mounting Options Available, Rugged Precision Cast Aluminum Housing, Perforated Air Flow Venting, High Surface Area Extruded Aluminum Heat Sinks, High Output White LED Diode, Decorative Lens Cover Seals the

Electrical/Optical Chamber to IP66, Electronic Driver. The pole shall be stylish, non-corrosive, easy to install and have longer service life.

20) All civil works and necessary indoor & outdoor lighting [Energy efficient (LED) and automated] are required within the scope of the Tender. The substation control room building shall have the emergency automated dc lighting system in case of power failure.

21) The scope shall include fire extinguishing equipment such as Trolley mounted fire extinguisher with foam type chemical for B type Fire (15kg), Wall mounted fire extinguisher with dry type chemical for A, B and C type Fire (5kg) and Wall mounted fire extinguisher with CO2 type chemical for A, B and C type Fire (2kg), Fire detection unit & Alarm system. The scope shall also include Air conditioning Equipment for substation.

22) Service Pile Load Test to be done for the construction of substation Control Building (where as required as per soil condition)

NOTE: All doors & windows work to be finished by aluminum frame and high quality transparent 6 mm thick glasses. Both indoor & outdoor surface finishing works of walls, roof etc, to be synthetic high quality plastic paint and moisture proof snowcem respectively and treatment to be made by lime terracing for rain water leakage proof of the roof.

B. SUB-STATION / ELECTRICAL WORKS :

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and Commissioning etc. of at least but not limited to the following works are the scope of works:

1) Supply and installation of 33kV Indoor GIS and all others accessories complete in all respect.

2) Supply and installation of 01 nos. Station use 33/0.415 KV, 250 KVA Auxiliary transformer, ONAN, Dyn-11 to be connected with 33kV GIS panel including 0.415 kV MCCB, Power cable, cable terminating kits with structures, etc complete in all respect.

3) Supply and installation of 02 nos. of Power Transformer 33/11 kV, 20/26MVA, Dyn11 with all related accessories.

4) Supply and installation of Switch yard grounding materials for required sub-station area and equipment to be installed. Earth resistance of the substation shall be less than 0.5ohm during dry season.

5) Supporting steel/RCC structure for connecting the XLPE Power Cable (HV/LV) with accessories as required.

6) Supply and installation of Control room indoor illumination.

7) Supply and installation of Emergency lighting

8) Supply and installation of Fire Fighting equipment and Fire Detection system.

9) Supply and installation of Exhaust Fan (Two nos. in battery room).

10) Supply and installation of Split type Air conditioner (At least forty eight thousand BTU per hr. capacity including MCB, switch, male female plug socket complete) - 04 nos. in the GIS substation building.

11) Supply & installation of GIS Panel for 33kV power transformer, Line feeders of the proposed 33kV & 11KV (GIS) Circuits to be installed in the control room building.

12) Supply and installation of AC Distribution Panel, DC Distribution Panel.

13) Supply and installation of Separate AC distribution Box, wall mounting for control room internal & external illumination switching, extra power supply arrangement for testing purpose, different operation and maintenance use.

14) Supply and installation of switching boards to be installed in each room for functioning of fans, lights, Air conditioner etc.

15) Supply and installation of 33kV indoor Type GIS & 11kV indoor Type GIS as describe below:

Indoor 33 KV GIS Panels having Double bus 3150A:

a) Incoming Feeders (2500A): 02Nos with PT
b) Outgoing Feeders (1250 A): 14 Nos with PT
c) Bus Coupler Breaker with Riser (Bus Coupler with Riser) (3150A): 01 Nos.
d) Power Transformer Feeders (1250A): 02Nos with PT
e) Station Auxiliary Transformer Feeders (1250A) : 01 Nos .

Indoor 11 KV GIS Panels having single bus 2500A:

a) Incoming Feeders with PCM (2000 A) with PT: 02 Nos.
b) Outgoing Feeders with PCM (630A) with PCM: 12Nos.
c) Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2500 A): 01Nos.

16) Supply and installation/ connection of 33kV, 11kV Power Cable, XLPE for all 33kV or 11kV line feeders and transformers feeder including cable termination (Outdoor & Indoor) as required.

17) Supply and installation/ connection of Control Cables

18) Supply and installation of Battery, Ni-Cd as per BOQ.

19) Supply and installation of Battery Charger as per BOQ.

20) Supply and lying of Rubber pad to be laid in front of the SWITCHGEAR Panels.

21) 05(Five) Sets of As-built drawings together with operation and maintenance Manual, relevant IEC standards of the installed equipment shall be submitted to the Directorate of Design & Inspection -2, BPDB, Dhaka for reviewing within 15 days of commissioning of substation .

22) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid.

Besides the above others are as follow:

23) All the 33 KV & 11kV Switchgears will be of Gas Insulated type with circuit breakers. They will be installed on the 1st floor of the proposed Control room / substation building. All 33KV and 11KV cable shall be accommodated in the Ground floor of the proposed Control room / substation building with steel structure cable trenches. Portion of Ground floor may be used as office room of the sub-station building. All the Common Service Facility areas- Reception, Waiting/ Common Space, Rest/Wash rooms, etc shall be installed in floor. Every floor shall be designed with Natural Ventilation system. There shall be adequate space to both end of 33kV GIS panel & 11 kV GIS panel for future extension.

24) 02 (Two) Nos. new 33/11KV,20/26MVA, ONAN/ONAF Power Transformers shall be installed in the Substation control room building and shall be connected to the 33 kV switchgear and 11 kV switchgear panels (described above) and by single core XLPE cable of required voltage and size. The volume of the transformers shall be such that these are accommodated in the space available by keeping safe electrical clearance. Both the new Transformers are to be identical and from the same manufacturer. Provision for running the transformers in parallel is to be provided. Tap Changer Control panel with AVR relay, Auto/Manual and Master/ Follower control switch. (02 panel for power transformers).

25) RCC Fire-wall shall be constructed between one and the next power transformer (where the power transformer installed inside the Substation building). Adequate free air passage space shall be maintained.

26) 01 (One) No. 33/0.415KV, 250KVA Station Transformers (Oil type) will be installed separately beside Power Transformer by 33 KV cable terminations. The LV sides of the station transformer will be connected to the LV A/C distribution Panel by LV cables of appropriate size. Single sources of D/C supply with 01 set of 110 V battery (Ni-Cd) and battery charger shall be installed and connected to the D/C distribution panel by LV cables of appropriate size.

27) The indoor 33KV XLPE copper cables will be connected to 33KV GIS panel by requisite cable termination kit.

28) The indoor 11KV XLPE copper cables will be connected to 11KV GIS panel by requisite cable termination kit. The indoor terminations of the 11KV cables with the 11 KV switchgear panel will be as per arrangement provided there. All the 33kV and 11kV cables shall be armored and cu-wire screened.

29) The outdoor cable terminations of the 33 KV cables (where required) will be heat shrink type and supported by steel structure. In the same way the 11KV cables outdoor type terminations will be heat shrink type being supported by steel structure.

30) The conventional protections to transformer feeders, line feeders and bus coupler are to be provided. However, total protection scheme is to be implemented on approval from BPDB Authority. Meters for monitoring three phase Current and voltage are to be installed in each panel.

31) All 33KV & 11KV panels (except the bus couplers) are to be provided with separate high class Digital energy meter of 0.2 class having provision of remote communication facilities. Both mechanical and electrical inter locks are to be provided along with the breakers, isolators and earth switches of various feeders as per normal convention.

32) Grounding mesh of copper conductor of requisite earth resistance (shall be <0.50ohm) will be installed for grounding the neutrals of the power transformers, station transformers, their bodies, the lightning arrestor sets, the steel supporting structure, all indoor & outdoor panels etc. The grounding system is to be implemented on approval of the design from BPDB Authority.

33) AC and DC distribution Panels, Battery Sets with battery chargers shall be accommodated on the same floor of 33 kV and 11 kV switchgear panels.

34) The 33 KV incoming feeders (from source substation/grid) shall be connected to the 33 KV incoming GIS panel. The 11 KV sides of 33/11KV power transformers will then be connected (by 11KV XLPE cables) to the 11 KV incoming GIS Panel.

- 33KV 3x 1Cx800mm2 cable per phase connected to 02 (Two) nos. 33 kV GIS Incoming Breaker (Supply of Indoor and outdoor termination kits and connection work is under this scope).

- 33KV 1Cx500mm2 cable connected to 14 (Two) nos. 33 kV GIS Outgoing feeder (Supply of Cable, Indoor and outdoor termination kits and connection work is under this scope).

- Connection from 33kV GIS (Transformer feeder) to power transformer will be made by 1Cx 500 mm2 XLPE Cu cable for 02 (two) nos. 33 kV GIS x-former feeder .

- 11KV incoming connection from the transformer to the breaker will be made by 2x1Cx630 mm2 XLPE Copper Cable for 33/11KV, 20/26MVA, ONAN/ONAF Power Transformers.

- 0.415 kV, 4CX120 mm2 XLPE PVC (Cu) Cable for Station Auxiliary Transformer and 33 kV, 3CX95mm2 XLPE Copper Cable with Indoor and outdoor termination kits for Station Auxiliary Transformer Incoming.

- Transformer Neutral will also be connected to ground by copper cable of 2X1CX150 mm2 with 03 (Three) Nos. of Electrode (Round Bar) of 16 mm Dia with 04 (Four) Meter Length Each and Length of the electrode will be decided as per Design calculation.The requisite termination kits are to be supplied and installed.

- The 11KV outgoing feeder of the substation from the 11KV outgoing breaker shall be connected by 3CX185 mm2 XLPE Cable and connect through underground up to the outgoing OVERHEAD Feeder pole line (adjacent to proposed boundary wall).

Indoor and Outdoor all 33kV & 11 kV Termination is in the contractor's Scope.

35) The Scope also includes the design, manufacture, supply, Installation and commissioning of Substation Automation System (SAS) for both 33KV GIS & 11KV GIS system with provision for interfacing with SCADA System.

36) Outdoor lightning protection system for the substation shall be installed.

37) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid. One electronic copy (soft copy in a CD) of all relevant As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB, Dhaka.

38) The Bidder must visit the site and assess the works before submitting his Tender and will carefully examine the tender requirements and to determine the existing conditions, facilities and limitations. Tenderer shall have make all necessary arrangement to carry out the Contract if awarded. Any neglect to delay or failure on the part of the tenderer to obtain reliable information upon the foregoing or any matter effecting the work and completion period shall not relieve the successful tenderer of his responsibilities, risks or liabilities until final acceptance of the Supply of Goods and Related Services in case of award of the contract.

39) Any additional works not covered above but necessary for the functioning of the system & required as per specification to be incorporated by the Tenderer. The items of minor nature, which is not mentioned, shall be incorporated by the bidder.

Indicative Layout & Single line diagram in Annex-9.

6.1.1.7 Scope for Design, Supply, Erection, Installation, Testing and Commissioning of 33 KV BAY EXTENSION AT SHOLOSHOHOR 132/33 KV Grid Substation under S&D-Sholoshohor, BPDB, Chattogram.

(Not limited but at least the following works to be done by the turnkey contractor)

A. CIVIL & BUILDING WORKS:

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and commissioning and so on of the following works are the scope of works:

1) Earth filling, Land escaping, Leveling, Dressing of the proposed switchyard area. Employer will provide all lands only and contractor will fill it by sand (if necessary) upto ground level. Soil testing for soil resistivity and soil bearing capacity before designing, final leveling, consolidation, surfacing and compaction of related switchyard area with crushed rock (where required) to cater for the ultimate development of the substation.

2) Construction of cable trenches for control cable:
   (a) Within the switch yard area
   (b) Switch yard area to control room building

3) Construction of R.C.C foundations for, switch yard equipment & Structure as required.
4) Supply of gravel and finishing the Switchyard surface by the gravel to the switchyard.

5) Soil testing for soil resistivity and soil bearing capacity before designing final leveling of Control room area.

6) Supply and construction of Power cable trench and control cable rack inside the Ground floor of the substation building. Proper fire and water proof sealing of the cable entry (control & Power) at Control Room building, to prevent water entering from switch yard/outside to CR Building, preventing entry of rats and reptiles, fire proof etc.

7) Dismantling work as per Price Schedule, BOQ & field requirement.

B. SUB-STATION / ELECTRICAL WORKS:

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and Commissioning etc. of the following works are the scope of works:

1) Supply and installation of 2(**Two) nos. 33kV Line Feeders** comprising: 33kV VCB, CT, DS, LA, Control cable, Cable termination kit, PCM Panel, Supporting structures etc.

3) Supply and installation of Switch yard shielding materials.

4) Supply and installation of Switch yard grounding materials for extended sub-station area and equipment to be installed. Earth resistance of the substation shall be less than 0.5ohm.

5) Supply and installation/ connection of Control Cables.

6) 3 (Three) sets of As-built drawings together with operation and maintenance manual, **relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB, Dhaka**. One electronic copy (soft copy in a CD) of all relevant As-built drawings together with operation and maintenance manual, **relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB.**

7) The Bidder must visit the site and assess the works before tender submission.

8) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid

6.1.1.8 Estimate for Design, Supply, Erection, Installation, Testing and Commissioning of 33 KV BAY EXTENSION AT KALURGHAT 132/33 KV Grid Substation Under S&D-Kalurghat, BPDB, Chattogram.

(Not limited but at least the following works to be done by the turnkey contractor)

A. CIVIL & BUILDING WORKS:

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and commissioning and so on of the following works are the scope of works:

1) Construction of cable trenches for control cable:
   (a) Within the switch yard area
   (b) Switch yard area to control room building

2) Construction of R.C.C foundations for, switch yard & Structure as required.
3) Supply of gravel and finishing the Switchyard surface by the gravel to the switchyard.

4) Supply and construction of cable trench and control cable rack inside the Ground floor of the substation building. Proper fire and water proof sealing of the cable entry (control & Power) at Control Room building, to prevent water entering from switch yard/outside to CR Building, preventing entry of rats and reptiles, fire proof etc.

20) Dismantling work as per Price Schedule, BOQ & field requirement.

B. SUB-STATION / ELECTRICAL WORKS:

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and Commissioning etc. of the following works are the scope of works:

1) Supply and installation of 4(**four) nos. 33kV Line Feeders** comprising: 33kV VCB, CT, DS, LA, Control cable, Cable termination kit, PCM Panel, Supporting structures etc.

2) Supply and installation of Switch yard shielding materials.

3) Supply and installation of Switch yard grounding materials for extended sub-station area and equipment to be installed. Earth resistance of the substation shall be less than 0.5ohm.

4) Supply and installation/ connection of Control Cables.

5) 3 (Three) sets of As-built drawings together with operation and maintenance manual, **relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB, Dhaka**. One electronic copy (soft copy in a CD) of all relevant As-built drawings together with operation and maintenance manual, **relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB.**

6) The Bidder must visit the site and assess the works before tender submission.

12) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid

6.1.2 Bill of Quantités (BOQ)

1. All the items mentioned in the BOQ (as follows) shall be quoted in the respective format of the price schedule, otherwise bid will be rejected.
2. Schedule No: 3 & 5 is applicable for total price of all Substations (Not for individual substation).
3. Tenderer shall quote a Firm Turnkey Contract Price for the Supply and Related Services as described in Price Schedule according to Section 6, Section 7 & Section 8 of this Tender document. If the Tenderer deemed necessary any additional machineries/equipment/ materials / Supply and Related Services out of the list of tender Price Schedule for completion of the said Turnkey basis works (Supply and Related Services), contractor shall have to do the additional works (Supply and Related Services) without any additional cost. The costs of these additional works (Supply and Related Services) are deemed to be included within the quoted price.
4. Individual sub-station Bill of Quantity (BoQ) as follows:

6.1.2.1 Bill of Quantities Design, Supply, Erection, Installation, Testing and Commissioning of 33/11KV, 2x20/26 MVA Indoor Type GIS (Shershah Cresent Industries New) at S&D-Khulshi, BPDB, Chattogram.

Line Item No	Description of Item	Quantity	
1	2	3	
1	Supply of 33 kV indoor Gas Insulated Switchgear (GIS) unit comprising 2000 Ampere Bus including surge arresters and other related accessories. All 33 kV Control, Protection and Metering System shall be housed in the same 33 kV GIS panels. All the Circuit Breaker's control with Local/Remote switch and metering data shall be brought under Substation Automation System (SAS) and provision for interfacing with the existing/future BPDB's SCADA system in Chattogram Zone .	Set	1
	GIS cubicles Incoming Feeders (1250A) with PT- 2 Nos.		
	GIS cubicles Outgoing Feeders (1250A) with PT-2 Nos.		
	GIS cubicles Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2000 A) -1 No.		
	GIS cubicles Power Transformer Feeders (1250A) with PT-2 Nos.		
	GIS cubicles Station Auxiliary Transformer Feeders (1250A) -1No.		
2	Supply of 33 kV, Single phase Lightning Arrester (ZnO-type) along with supporting structure and required accessories-5Set (1 set =03 Nos).	Lot	1
3	Supply of 11 kV indoor Gas Insulated Switchgear (GIS) cubicles comprising 2500A Bus including surge arresters other related accessories. All 11 kV Control, Protection and Metering System shall be housed in the same 11 kV GIS panels.All circuit breaker's control with Local/ Remote switch and metering data shall be brought under Substation Automation System (SAS) and is to be interfaced with the existing/future BPDB's SCADA system in Chattogram Zone.	Set	1
	GIS cubicles Incoming Feeders (2500A) with PT-2 Nos.		
	GIS cubicles Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2500 A)-1 No.		
	GIS cubicles Outgoing Feeders (630 A) -12Nos.		
4	Supply of 33/11 kV, 20/26MVA ONAN/ONAF Power Transformer (Outdoor type) with cable end termination facilities, On Load Tap Changer, all internal protection elements in built with complete accessories including Remote Tap changer Control Panel.	Set	2
5	Station Transformer 33/0.4 KV, 250 kVA including all accessories.	Set	1
6	Supply of LV AC Distribution Panel 3 phase, 415 volts with interlocking including Kwh meter (accuracy class 1.0) and all accessories for station transformer.	Set	1
7	Battery Charger, constant voltage type (adjustable) with current limiting for boost and float charge, input- 415 volts, output DC 110 - 150 volts including all accessories.	Set	1
8	a)Battery, 110volt DC nominal, ≥160Ah minimum with mounting rack including accessories.	Set	1

Line Item No	Description of Item	Quantity	
1	2	3	
	b)DC Distribution Panel including all accessories.	Set	1
9	Supply of 33kV 1C×500 sq.mm XLPE (Cu) Cable as required for Transformer Feeder. As per field requirement but not less than 150 meter. Supply of 1C×500sq. mm XLPE (Cu) Cable for 33kV Outgoing feeder as per requirement. As per field requirement but not less than 480 meter.	Lot	1
10	Supply of 11kV Single core XLPE copper cable for Transformer 2x1Cx630 Sq. mm per phase. As per field requirement but not less than 300 meter.	Lot	1
11	Supply of 33kV 3C×95 sq.mm XLPE (Cu) Cable and 0.415 kV, 4CX120 sq.mm PVC (Cu) Cable for Station Transformer as required.	Lot	1
12	Supply of 11 kV 3C×185 sq. mm XLPE (Cu) Cable per phase for Outgoing feeder from 11 kV GIS as required. As per field requirement but not less than 960 meter.	Lot	1
13	Supply of all Cable termination kits in line with BOQ (For all 33 kV, 11 kV and 0.415 kV cable, cable tray along with all requirement (both for indoor and outdoor) including all accessories.	Lot	1
14	Supply of All Control cables of different sizes and all LV PVC copper cable of different sizes as necessary and MCCB, connectors to connect different panels/auxiliary transformer etc. 4x4mm2, 4x6mm2, 4x2.5mm2, 8x2.5mm2, 16x 2.5mm2, 24x2.5 mm2, 2x1Cx150 mm2 PVC (Cu) Cable for power transformer neutral etc including all accessories.	Lot	1
15	Supply of all material for Grounding System, Earthing mesh with earthling electrode. a) Supply of grounding copper conductor (As per scope of works and technical Specification). (b) Supply of Grounding copper rod (Earthing electrode) dia 16 mm each 4 Meter length to achieve Earth Resistance as per standard/ requirement.	Lot	1
16	Supply of Station type 11 kV Surge Arrester including all accessories- 14 Set (1 set =03 Nos).	Lot	1
17	Supply of Substation Automation System (SAS) with Server, Monitor, UPS with 30 Minute battery back-up and Printer etc.	Lot	1
18	Supply of split type Air conditioner 48,000 BTU/hour capacity (4 Nos).	Lot	1
19	Outdoor and Indoor Lighting System.	Lot	1
20	All Steel Supporting Structures (including EM Tower, LA Structure, surge monitor/counter,Supporting Steel Structure and other accessories etc.) of Equipment as applicable.	Lot	1

Line Item No	Description of Item	Quantity	
1	2	3	
21	Supply of **Fire Detection** (Smoke Detection & alarm System) **& Fire Fighting Equipment** a) CO2-2Sets, b) Foam Type -2 Sets & c) Dry Chemical Type-2 Sets.	Lot	1
22	**Civil Works.**	Lot	1
(a)	Earth filling, Land escaping, Leveling, Dressing / Preparation of Gravel Pit, Laying of Gravel etc.	Lot	1
(b)	**Three Storied GIS Sub-Station Building :** Including Control Room, Office Room, Store, Evacuation, O/H Tank, Water Supply with new Deep Tube well, Sanitary system, Internal Electrification, Emergency Lighting, False Ceiling, CCTV system with night vision camera and other related items etc. (If required Dismantling, Demolishing).	Sqm	750
(c)	Foundation of Transformer, Equipment, Power & Control Cable Trench, Cable Tray/Rack & others.	Lot	1
(d)	Road (approach including internal road & walkway etc).	Lot	1
(e)	Guard Post (10 sq-m) & Boundary Wall (with retaining wall where necessary) and Drainage System including gate etc. (As per site requirement).	Lot	1
(f)	Tree plantation, gardening and beautification etc.	Lot	1
(g)	Computer, laser printer, Operation Key Board, Table, chair, Steel Almirah, File Cabinet, Exhaust fans, Ceiling Fans etc.	Lot	1
23	Installation, Testing, Commissioning of all Equipment.	Lot	1
24	Design, Drawing, Training and Inspection of the substation.	Lot	1

6.1.2.2 Bill of Quantities Design, Supply, Erection, Installation, Testing and Commissioning of 33/11KV, 2x20/26 MVA Regular Type GIS (Chandgaon Residential Area New) at S&D-Kalurghat, BPDB, Chattogram.

Line Item No	Description of Item	Quantity	
1	2	3	
1	Supply of 33 kV indoor Gas Insulated Switchgear (GIS) unit comprising 2000 Ampere Bus including surge arresters and other related accessories. All 33 kV Control, Protection and Metering System shall be housed in the same 33 kV GIS panels. All the Circuit Breaker's control with Local/Remote switch and metering data shall be brought under Substation Automation System (SAS) and provision for interfacing with the existing/future BPDB's SCADA system in Chattogram Zone .	Set	1
	GIS cubicles Incoming Feeders (1250A) with PT- 2 Nos.		
	GIS cubicles Outgoing Feeders (1250A) with PT-2 Nos.		
	GIS cubicles Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2000 A) -1 No.		
	GIS cubicles Power Transformer Feeders (1250A) with PT-2 Nos.		
	GIS cubicles Station Auxiliary Transformer Feeders (1250A) -1No.		
2	Supply of 33 kV, Single phase Lightning Arrester (ZnO-type) along with supporting structure and required accessories-5Set (1 set =03 Nos).	Lot	1
3	Supply of 11 kV indoor Gas Insulated Switchgear (GIS) cubicles	Set	1

Line Item No	Description of Item	Quantity	
1	2	3	
	comprising 2500A Bus including surge arresters other related accessories. All 11 kV Control, Protection and Metering System shall be housed in the same 11 kV GIS panels.All circuit breaker's control with Local/ Remote switch and metering data shall be brought under Substation Automation System (SAS) and is to be interfaced with the existing/future BPDB's SCADA system in Chattogram Zone.		
	GIS cubicles Incoming Feeders (2500A) with PT-2 Nos.		
	GIS cubicles Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2500 A)-1 No.		
	GIS cubicles Outgoing Feeders (630 A) -12Nos.		
4	Supply of 33/11 kV, 20/26MVA ONAN/ONAF Power Transformer (Outdoor type) with cable end termination facilities, On Load Tap Changer, all internal protection elements in built with complete accessories including Remote Tap changer Control Panel.	Set	2
5	Station Transformer 33/0.4 KV, 250 kVA including all accessories.	Set	1
6	Supply of LV AC Distribution Panel 3 phase, 415 volts with interlocking including Kwh meter (accuracy class 1.0) and all accessories for station transformer.	Set	1
7	Battery Charger, constant voltage type (adjustable) with current limiting for boost and float charge, input- 415 volts, output DC 110 - 150 volts including all accessories.	Set	1
8	a)Battery, 110volt DC nominal, ≥160Ah minimum with mounting rack including accessories.	Set	1
	b)DC Distribution Panel including all accessories.	Set	1
9	Supply of 33kV 1C×500 sq.mm XLPE (Cu) Cable as required for Transformer Feeder. As per field requirement but not less than 210 meter.	Lot	1
	Supply of 1C×500sq. mm XLPE (Cu) Cable for 33kV Outgoing feeder as per requirement. As per field requirement but not less than 480 meter.		
10	Supply of 11kV Single core XLPE copper cable for Transformer 2x1Cx630 Sq. mm per phase. As per field requirement but not less than 420 meter.	Lot	1
11	Supply of 33kV 3C×95 sq.mm XLPE (Cu) Cable and 0.415 kV, 4CX120 sq.mm PVC (Cu) Cable for Station Transformer as required.	Lot	1
12	Supply of 11 kV 3C×185 sq. mm XLPE (Cu) Cable per phase for Outgoing feeder from 11 kV GIS as required. As per field requirement but not less than 960 meter.	Lot	1
13	Supply of all Cable termination kits in line with BOQ (For all 33 kV, 11 kV and 0.415 kV cable, cable tray along with all requirement (both for indoor and outdoor) including all accessories.	Lot	1
14	Supply of All Control cables of different sizes and all LV PVC copper cable of different sizes as necessary and MCCB, connectors to connect different panels/auxiliary transformer etc. 4x4mm2, 4x6mm2, 4x2.5mm2, 8x2.5mm2, 16x 2.5mm2, 24x2.5 mm2, 2x1Cx150 mm2	Lot	1

Line Item No	Description of Item	Quantity	
1	2	3	
	PVC (Cu) Cable for power transformer neutral etc including all accessories.		
15	Supply of all material for Grounding System, Earthing mesh with earthling electrode.		
	a) Supply of grounding copper conductor (As per scope of works and technical Specification). (b) Supply of Grounding copper rod (Earthing electrode) dia 16 mm each 4 Meter length to achieve Earth Resistance as per standard/ requirement.	Lot	1
16	Supply of Station type 11 kV Surge Arrester including all accessories- 14 Set (1 set =03 Nos).	Lot	1
17	Supply of Substation Automation System (SAS) with Server, Monitor, UPS with 30 Minute battery back-up and Printer etc.	Lot	1
18	Supply of split type Air conditioner 48,000 BTU/hour capacity (4 Nos).	Lot	1
19	Outdoor and Indoor Lighting System.	Lot	1
20	All Steel Supporting Structures (including EM Tower, LA Structure, surge monitor/counter,Supporting Steel Structure and other accessories etc.) of Equipment as applicable.	Lot	1
21	Supply of **Fire Detection** (Smoke Detection & alarm System) **& Fire Fighting Equipment** a) CO2-2Sets, b) Foam Type -2 Sets & c) Dry Chemical Type-2 Sets.	Lot	1
22	**Civil Works.**	Lot	1
(a)	Earth filling, Land escaping, Leveling, Dressing / Preparation of Gravel Pit, Laying of Gravel etc.	Lot	1
(b)	**Two Storied GIS Sub-Station Building :** Including Control Room, Office Room, Store, Evacuation, O/H Tank, Water Supply with new Deep Tube well, Sanitary system, Internal Electrification, Emergency Lighting, False Ceiling, CCTV system with night vision camera and other related items etc. (If required Dismantling, Demolishing).	Sqm	500
(c)	Foundation of Transformer, Equipment, Power & Control Cable Trench, Cable Tray/Rack & others.	Lot	1
(d)	Road (approach including internal road & walkway etc).	Lot	1
(e)	Guard Post (10 sq-m) & Boundary Wall (with retaining wall where necessary) and Drainage System including gate etc. (As per site requirement).	Lot	1
(f)	Tree plantation, gardening and beautification etc.	Lot	1
(g)	Computer, laser printer, Operation Key Board, Table, chair, Steel Almirah, File Cabinet, Exhaust fans, Ceiling Fans etc.	Lot	1
23	Installation, Testing, Commissioning of all Equipment.	Lot	1
24	Design, Drawing, Training and Inspection of the substation.	Lot	1

6.1.2.3 Bill of Quantities Design, Supply, Erection, Installation, Testing and Commissioning of 33/11KV, 2x20/26 MVA Regular Type GIS (Boro Dighir Par New) at S&D-Hathazari, BPDB, Chattogram.

Line Item No	Description of Item	Quantity	
1	2	3	
1	Supply of 33 kV indoor Gas Insulated Switchgear (GIS) unit comprising 2000 Ampere Bus including surge arresters and other related accessories. All 33 kV Control, Protection and Metering System shall be housed in the same 33 kV GIS panels. All the Circuit Breaker's control with Local/Remote switch and metering data shall be brought under Substation Automation System (SAS) and provision for interfacing with the existing/future BPDB's SCADA system in Chattogram Zone .	Set	1
	GIS cubicles Incoming Feeders (1250A) with PT- 2 Nos.		
	GIS cubicles Outgoing Feeders (1250A) with PT-2 Nos.		
	GIS cubicles Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2000 A) -1 No.		
	GIS cubicles Power Transformer Feeders (1250A) with PT-2 Nos.		
	GIS cubicles Station Auxiliary Transformer Feeders (1250A) -1No.		
2	Supply of 33 kV, Single phase Lightning Arrester (ZnO-type) along with supporting structure and required accessories-5Set (1 set =03 Nos).	Lot	1
3	Supply of 11 kV indoor Gas Insulated Switchgear (GIS) cubicles comprising 2500A Bus including surge arresters other related accessories. All 11 kV Control, Protection and Metering System shall be housed in the same 11 kV GIS panels.All circuit breaker's control with Local/ Remote switch and metering data shall be brought under Substation Automation System (SAS) and is to be interfaced with the existing/future BPDB's SCADA system in Chattogram Zone.	Set	1
	GIS cubicles Incoming Feeders (2500A) with PT-2 Nos.		
	GIS cubicles Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2500 A)-1 No.		
	GIS cubicles Outgoing Feeders (630 A) -8Nos.		
4	Supply of 33/11 kV, 20/26 MVA ONAN/ONAF Power Transformer with cable end termination facilities, On Load Tap Changer, all internal protection elements in built with complete accessories including Remote Tap changer Control Panel.	Set	2
5	Station Transformer 33/0.4 KV, 250 kVA including all accessories.	Set	1
6	Supply of LV AC Distribution Panel 3 phase, 415 volts with interlocking including Kwh meter (accuracy class 1.0) and all accessories for station transformer.	Set	1
7	Battery Charger, constant voltage type (adjustable) with current limiting for boost and float charge, input- 415 volts, output DC 110 - 150 volts including all accessories.	Set	1
8	a)Battery, 110volt DC nominal, ≥160Ah minimum with mounting rack including accessories.	Set	1
	b)DC Distribution Panel including all accessories.	Set	1
9	Supply of 33kV 1C×500 sq.mm XLPE (Cu) Cable as required for Transformer Feeder. As per field requirement but not less than 210 meter.	Lot	1

Line Item No	Description of Item	Quantity	
1	2	3	
	Supply of 1C×500sq. mm XLPE (Cu) Cable for 33kV Outgoing feeder as per requirement. As per field requirement but not less than 480 meter .		
10	Supply of 11kV Single core XLPE copper cable for Transformer 2x1Cx630 Sq. mm per phase. As per field requirement but not less than 420 meter.	Lot	1
11	Supply of 33kV 3C×95 sq.mm XLPE (Cu) Cable and 0.415 kV, 4CX120 sq.mm PVC (Cu) Cable for Station Transformer as required.	Lot	1
12	Supply of 11 kV 3C×185 sq. mm XLPE (Cu) Cable per phase for Outgoing feeder from 11 kV GIS as required. As per field requirement but not less than 640 meter.	Lot	1
13	Supply of all Cable termination kits in line with BOQ (For all 33 kV, 11 kV and 0.415 kV cable, cable tray along with all requirement (both for indoor and outdoor) including all accessories.	Lot	1
14	Supply of All Control cables of different sizes and all LV PVC copper cable of different sizes as necessary and MCCB, connectors to connect different panels/auxiliary transformer etc. 4x4mm2, 4x6mm2, 4x2.5mm2, 8x2.5mm2, 16x 2.5mm2, 24x2.5 mm2, 2x1Cx150 mm2 PVC (Cu) Cable for power transformer neutral etc including all accessories.	Lot	1
15	Supply of all material for Grounding System, Earthing mesh with earthling electrode. a) Supply of grounding copper conductor (As per scope of works and technical Specification). (b) Supply of Grounding copper rod (Earthing electrode) dia 16 mm each 4 Meter length to achieve Earth Resistance as per standard/ requirement.	Lot	1
16	Supply of Station type 11 kV Surge Arrester including all accessories- 10 Set (1 set =03 Nos).	Lot	1
17	Supply of Substation Automation System (SAS) with Server, Monitor, UPS with 30 Minute battery back-up and Printer etc.	Lot	1
18	Supply of split type Air conditioner 48,000 BTU/hour capacity (4 Nos).	Lot	1
19	Outdoor and Indoor Lighting System.	Lot	1
20	All Steel Supporting Structures (including EM Tower, LA Structure, surge monitor/counter,Supporting Steel Structure and other accessories etc.) of Equipment as applicable.	Lot	1
21	Supply of **Fire Detection** (Smoke Detection & alarm System) **& Fire Fighting Equipment** a) CO2-2Sets, b) Foam Type -2 Sets & c) Dry Chemical Type-2 Sets.	Lot	1
22	**Civil Works.**	Lot	1
(a)	Earth filling, Land escaping, Leveling, Dressing / Preparation of Gravel Pit, Laying of Gravel etc.	Lot	1
(b)	**Two Storied GIS Sub-Station Building :** Including Control Room, Office Room, Store, Evacuation, O/H Tank, Water Supply with new Deep Tube well, Sanitary system, Internal Electrification, Emergency Lighting, False Ceiling, CCTV system with night vision camera and other related items etc. (If required Dismantling, Demolishing).	Sqm	500

Line Item No	Description of Item	Quantity	
1	2	3	
(c)	Foundation of Transformer, Equipment, Power & Control Cable Trench, Cable Tray/Rack & others.	Lot	1
(d)	Road (approach including internal road & walkway etc).	Lot	1
(e)	Guard Post (10 sq-m) & Boundary Wall (with retaining wall where necessary) and Drainage System including gate etc. (As per site requirement).	Lot	1
(f)	Tree plantation, gardening and beautification etc.	Lot	1
(g)	Computer, laser printer, Operation Key Board, Table, chair, Steel Almirah, File Cabinet, Exhaust fans, Ceiling Fans etc.	Lot	1
23	Installation, Testing, Commissioning of all Equipment.	Lot	1
24	Design, Drawing, Training and Inspection of the substation.	Lot	1

6.1.2.4 Bill of Quantities Design, Supply, Erection, Installation, Testing and Commissioning of 33/11KV, 2x20/26 MVA Regular Type GIS (A K Khan School, Mohora New) at S&D-Mohora, BPDB, Chattogram.

Line Item No	Description of Item	Quantity	
1	2	3	
1	Supply of 33 kV indoor Gas Insulated Switchgear (GIS) unit comprising 2000 Ampere Bus including surge arresters and other related accessories. All 33 kV Control, Protection and Metering System shall be housed in the same 33 kV GIS panels. All the Circuit Breaker's control with Local/Remote switch and metering data shall be brought under Substation Automation System (SAS) and provision for interfacing with the existing/future BPDB's SCADA system in Chattogram Zone .	Set	1
	GIS cubicles Incoming Feeders (1250A) with PT- 2 Nos.		
	GIS cubicles Outgoing Feeders (1250A) with PT-2 Nos.		
	GIS cubicles Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2000 A) -1 No.		
	GIS cubicles Power Transformer Feeders (1250A) with PT-2 Nos.		
	GIS cubicles Station Auxiliary Transformer Feeders (1250A) -1No.		
2	Supply of 33 kV, Single phase Lightning Arrester (ZnO-type) along with supporting structure and required accessories-5Set (1 set =03 Nos).	Lot	1
3	Supply of 11 kV indoor Gas Insulated Switchgear (GIS) cubicles comprising 2500A Bus including surge arresters other related accessories. All 11 kV Control, Protection and Metering System shall be housed in the same 11 kV GIS panels.All circuit breaker's control with Local/ Remote switch and metering data shall be brought under Substation Automation System (SAS) and is to be interfaced with the existing/future BPDB's SCADA system in Chattogram Zone.	Set	1
	GIS cubicles Incoming Feeders (2500A) with PT-2 Nos.		
	GIS cubicles Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2500 A)-1 No.		
	GIS cubicles Outgoing Feeders (630 A) -12Nos.		
4	Supply of 33/11 kV, 20/26MVA ONAN/ONAF Power Transformer with cable end termination facilities, On Load Tap Changer, all internal protection elements in built with complete accessories including	Set	2

Line Item No	Description of Item	Quantity	
1	2	3	
	Remote Tap changer Control Panel.		
5	Station Transformer 33/0.4 KV, 250 kVA including all accessories.	Set	1
6	Supply of LV AC Distribution Panel 3 phase, 415 volts with interlocking including Kwh meter (accuracy class 1.0) and all accessories for station transformer.	Set	1
7	Battery Charger, constant voltage type (adjustable) with current limiting for boost and float charge, input- 415 volts, output DC 110 - 150 volts including all accessories.	Set	1
8	Battery, 110volt DC nominal, ≥160Ah minimum with mounting rack including accessories and DC Distribution Panel including all accessories.	Set	1
9	Supply of 33kV 1C×500 sq.mm XLPE (Cu) Cable as required for Transformer Feeder. As per field requirement but not less than 420 meter. Supply of 1C×500sq. mm XLPE (Cu) Cable for 33kV Outgoing feeder as per requirement. As per field requirement but not less than 480 meter.	Lot	1
10	Supply of 11kV Single core XLPE copper cable for Transformer 2x1Cx630 Sq. mm per phase. As per field requirement but not less than 960 meter.	Lot	1
11	Supply of 33kV 3C×95 sq.mm XLPE (Cu) Cable and 0.415 kV, 4CX120 sq.mm PVC (Cu) Cable for Station Transformer as required.	Lot	1
12	Supply of 11 kV 3C×185 sq. mm XLPE (Cu) Cable per phase for Outgoing feeder from 11 kV GIS as required. As per field requirement but not less than 640 meter.	Lot	1
13	Supply of all Cable termination kits in line with BOQ (For all 33 kV, 11 kV and 0.415 kV cable, cable tray along with all requirement (both for indoor and outdoor) including all accessories.	Lot	1
14	Supply of All Control cables of different sizes and all LV PVC copper cable of different sizes as necessary and MCCB, connectors to connect different panels/auxiliary transformer etc. 4x4mm2, 4x6mm2, 4x2.5mm2, 8x2.5mm2, 16x 2.5mm2, 24x2.5 mm2, 2x1Cx150 mm2 PVC (Cu) Cable for power transformer neutral etc including all accessories.	Lot	1
15	Supply of all material for Grounding System, Earthing mesh with earthling electrode. a) Supply of grounding copper conductor (As per scope of works and technical Specification). (b) Supply of Grounding copper rod (Earthing electrode) dia 16 mm each 4 Meter length to achieve Earth Resistance as per standard/ requirement.	Lot	1
16	Supply of Station type 11 kV Surge Arrester including all accessories- 14 Set (1 set =03 Nos).	Lot	1
17	Supply of Substation Automation System (SAS) with Server, Monitor, UPS with 30 Minute battery back-up and Printer etc.	Lot	1

Line Item No	Description of Item	Quantity	
1	2	3	
18	Supply of split type Air conditioner 48,000 BTU/hour capacity (4 Nos).	Lot	1
19	Outdoor and Indoor Lighting System.	Lot	1
20	All Steel Supporting Structures (including EM Tower, LA Structure, surge monitor/counter,Supporting Steel Structure and other accessories etc.) of Equipment as applicable.	Lot	1
21	Supply of **Fire Detection** (Smoke Detection & alarm System) **& Fire Fighting Equipment** a) CO2-2Sets, b) Foam Type -2 Sets & c) Dry Chemical Type-2 Sets.	Lot	1
22	**Civil Works.**	Lot	1
(a)	Earth filling, Land escaping, Leveling, Dressing / Preparation of Gravel Pit, Laying of Gravel etc.	Lot	1
(b)	**Two Storied GIS Sub-Station Building :** Including Control Room, Office Room, Store, Evacuation, O/H Tank, Water Supply with new Deep Tube well, Sanitary system, Internal Electrification, Emergency Lighting, False Ceiling, CCTV system with night vision camera and other related items etc. (If required Dismantling, Demolishing).	Sqm	500
(c)	Foundation of Transformer, Equipment, Power & Control Cable Trench, Cable Tray/Rack & others.	Lot	1
(d)	Road (approach including internal road & walkway etc).	Lot	1
(e)	Guard Post (10 sq-m) & Boundary Wall (with retaining wall where necessary) and Drainage System including gate etc. (As per site requirement).	Lot	1
(f)	Tree plantation, gardening and beautification etc.	Lot	1
(g)	Computer, laser printer, Operation Key Board, Table, chair, Steel Almirah, File Cabinet, Exhaust fans, Ceiling Fans etc.	Lot	1
23	Installation, Testing, Commissioning of all Equipment.	Lot	1
24	Design, Drawing, Training and Inspection of the substation.	Lot	1

6.1.2.5 Bill of Quantities Design, Supply, Erection, Installation, Testing and Commissioning of 33/11KV, 2x20/26 MVA Regular Type GIS (Muradpur New) at S&D-Kalurghat, BPDB, Chattogram.

Line Item No	Description of Item	Quantity	
1	2	3	
1	Supply of 33 kV indoor Gas Insulated Switchgear (GIS) unit comprising 2000 Ampere Bus including surge arresters and other related accessories. All 33 kV Control, Protection and Metering System shall be housed in the same 33 kV GIS panels. All the Circuit Breaker's control with Local/Remote switch and metering data shall be brought under Substation Automation System (SAS) and provision for interfacing with the existing/future BPDB's SCADA system in Chattogram Zone .	Set	1
	GIS cubicles Incoming Feeders (1250A) with PT- 2 Nos.		
	GIS cubicles Outgoing Feeders (1250A) with PT-2 Nos.		
	GIS cubicles Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2000 A) -1 No.		

Line Item No	Description of Item	Quantity	
1	2	3	
	GIS cubicles Power Transformer Feeders (1250A) with PT-2 Nos.		
	GIS cubicles Station Auxiliary Transformer Feeders (1250A) -1No.		
2	Supply of 33 kV, Single phase Lightning Arrester (ZnO-type) along with supporting structure and required accessories-5Set (1 set =03 Nos).	Lot	1
3	Supply of 11 kV indoor Gas Insulated Switchgear (GIS) cubicles comprising 2500A Bus including surge arresters other related accessories. All 11 kV Control, Protection and Metering System shall be housed in the same 11 kV GIS panels.All circuit breaker's control with Local/ Remote switch and metering data shall be brought under Substation Automation System (SAS) and is to be interfaced with the existing/future BPDB's SCADA system in Chattogram Zone.	Set	1
	GIS cubicles Incoming Feeders (2500A) with PT-2 Nos.		
	GIS cubicles Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2500 A)-1 No.		
	GIS cubicles Outgoing Feeders (630 A) -12Nos.		
4	Supply of 33/11 kV, 20/26MVA ONAN/ONAF Power Transformer with cable end termination facilities, On Load Tap Changer, all internal protection elements in built with complete accessories including Remote Tap changer Control Panel.	Set	2
5	Station Transformer 33/0.4 KV, 250 kVA including all accessories.	Set	1
6	Supply of LV AC Distribution Panel 3 phase, 415 volts with interlocking including Kwh meter (accuracy class 1.0) and all accessories for station transformer.	Set	1
7	Battery Charger, constant voltage type (adjustable) with current limiting for boost and float charge, input- 415 volts, output DC 110 - 150 volts including all accessories.	Set	1
8	Battery, 110volt DC nominal, ≥160Ah minimum with mounting rack including accessories and DC Distribution Panel including all accessories.	Set	1
9	Supply of 33kV 1C×500 sq.mm XLPE (Cu) Cable as required for Transformer Feeder. As per field requirement but not less than 210 meter.	Lot	1
	Supply of 1C×500sq. mm XLPE (Cu) Cable for 33kV Outgoing feeder as per requirement. As per field requirement but not less than 480 meter.		
10	Supply of 11kV Single core XLPE copper cable for Transformer 2x1Cx630 Sq. mm per phase. As per field requirement but not less than 420 meter.	Lot	1
11	Supply of 33kV 3C×95 sq.mm XLPE (Cu) Cable and 0.415	Lot	1

Line Item No	Description of Item	Quantity	
1	2	3	
	kV, 4CX120 sq.mm PVC (Cu) Cable for Station Transformer as required.		
12	Supply of 11 kV 3C×185 sq. mm XLPE (Cu) Cable per phase for Outgoing feeder from 11 kV GIS as required. As per field requirement but not less than 960 meter.	Lot	1
13	Supply of all Cable termination kits in line with BOQ (For all 33 kV, 11 kV and 0.415 kV cable, cable tray along with all requirement (both for indoor and outdoor) including all accessories.	Lot	1
14	Supply of All Control cables of different sizes and all LV PVC copper cable of different sizes as necessary and MCCB, connectors to connect different panels/auxiliary transformer etc. 4x4mm2, 4x6mm2, 4x2.5mm2, 8x2.5mm2, 16x 2.5mm2, 24x2.5 mm2, 2x1Cx150 mm2 PVC (Cu) Cable for power transformer neutral etc including all accessories.	Lot	1
15	Supply of all material for Grounding System, Earthing mesh with earthling electrode. a) Supply of grounding copper conductor (As per scope of works and technical Specification). (b) Supply of Grounding copper rod (Earthing electrode) dia 16 mm each 4 Meter length to achieve Earth Resistance as per standard/ requirement.	Lot	1
16	Supply of Station type 11 kV Surge Arrester including all accessories-14 Set (1 set =03 Nos).	Lot	1
17	Supply of Substation Automation System (SAS) with Server, Monitor, UPS with 30 Minute battery back-up and Printer etc.	Lot	1
18	Supply of split type Air conditioner 48,000 BTU/hour capacity (4 Nos).	Lot	1
19	Outdoor and Indoor Lighting System.	Lot	1
20	All Steel Supporting Structures (including EM Tower, LA Structure, surge monitor/counter,Supporting Steel Structure and other accessories etc.) of Equipment as applicable.	Lot	1
21	Supply of **Fire Detection** (Smoke Detection & alarm System) **& Fire Fighting Equipment** a) CO2-2Sets, b) Foam Type -2 Sets & c) Dry Chemical Type-2 Sets.	Lot	1
22	**Civil Works.**	Lot	1
(a)	Earth filling, Land escaping, Leveling, Dressing / Preparation of Gravel Pit, Laying of Gravel etc.	Lot	1
(b)	**Two Storied GIS Sub-Station Building :** Including Control Room, Office Room, Store, Evacuation, O/H Tank, Water Supply with new Deep Tube well, Sanitary system, Internal Electrification, Emergency	Sqm	500

Line Item No	Description of Item	Quantity	
1	2	3	
	Lighting, False Ceiling, CCTV system with night vision camera and other related items etc. (If required Dismantling, Demolishing).		
(c)	Foundation of Transformer, Equipment, Power & Control Cable Trench, Cable Tray/Rack & others.	Lot	1
(d)	Road (approach including internal road & walkway etc).	Lot	1
(e)	Guard Post (10 sq-m) & Boundary Wall (with retaining wall where necessary) and Drainage System including gate etc. (As per site requirement).	Lot	1
(f)	Tree plantation, gardening and beautification etc.	Lot	1
(g)	Computer, laser printer, Operation Key Board, Table, chair, Steel Almirah, File Cabinet, Exhaust fans, Ceiling Fans etc.	Lot	1
23	Installation, Testing, Commissioning of all Equipment.	Lot	1
24	Design, Drawing, Training and Inspection of the substation.	Lot	1

6.1.2.6 Bill of Quantities Design, Supply, Erection, Installation, Testing and Commissioning of 33/11KV, 2x16, 1x16/20 MVA to 2x20/26 MVA GIS Up-gradation (Sholoshohor) at S&D-Sholoshohor, BPDB, Chattogram.

Line Item No	Description of Item	Quantity	
1	2	3	
1	33 kV indoor Gas Insulated Switchgear (GIS) unit comprising 3150 Ampere Double Bus,, GIS cubicles for 1 Bus Sectionaliser (3150A), 2 sets of 33 kV Bus PTs and 33 kV Isolators, Lightning Arrestors and other related accessories as needed along with 33 kV Control, Protection and Metering system housed in the same 33 kV GIS panels and 17 Circuit Breakers (1250A) . All the Circuit Breaker's control with Local/ Remote switch metering and status data shall be brought under Substation Automation System and interfaced with the existing BPDB's SCADA system in Chattogram but not limited to.	Set	1
	GIS cubicles Incoming Feeders (1250A) with PT- 2 Nos.		
	GIS cubicles Outgoing Feeders (1250A) with PT-14 Nos.		
	GIS cubicles Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2000 A) -1 No.		
	GIS cubicles Power Transformer Feeders (1250A) with PT-2 Nos.		
	GIS cubicles Station Auxiliary Transformer Feeders (1250A) -1No.		
2	Supply of 33 kV, Single phase Lightning Arrester (ZnO-type) along with supporting structure and required accessories-17Set (1 set =03 Nos).	Lot	1
3	Supply of 11 kV indoor Gas Insulated Switchgear (GIS) cubicles comprising 2500A Bus including surge arresters other related accessories. All 11 kV Control, Protection and Metering System shall be housed in the same 11 kV GIS panels. All circuit breaker's control with Local/ Remote switch and metering data shall be brought under Substation Automation System (SAS) and is to be interfaced with the existing/future BPDB's SCADA system in Chattogram Zone.	Set	1
	GIS cubicles Incoming Feeders (2500A) with PT-2 Nos.		
	GIS cubicles Bus Coupler Breaker with Riser (Bus Coupler with Riser) (2500 A)-1 No.		
	GIS cubicles Outgoing Feeders (630 A) -12Nos.		
4	Supply of 33/11 kV, 20/26 MVA ONAN/ONAF Power Transformer with cable end termination facilities, On Load Tap Changer, all internal protection elements in built with complete accessories including Remote Tap changer Control Panel.	Set	2
5	Station Transformer 33/0.4 KV, 250 kVA including all accessories.	Set	1

Line Item No	Description of Item	Quantity	
1	2	3	
6	Supply of LV AC Distribution Panel 3 phase, 415 volts with interlocking including Kwh meter (accuracy class 1.0) and all accessories for station transformer.	Set	1
7	Battery Charger, constant voltage type (adjustable) with current limiting for boost and float charge, input- 415 volts, output DC 110 - 150 volts including all accessories.	Set	1
8	a)Battery, 110volt DC nominal, ≥160Ah minimum with mounting rack including accessories and DC Distribution Panel including all accessories.	Set	1
	b)DC Distribution Panel including all accessories.	Set	1
9	Supply of 33kV 1C×500 sq.mm XLPE (Cu) Cable as required for Transformer Feeder. As per field requirement but not less than 210 meter.	Lot	1
	Supply of 1C×500sq. mm XLPE (Cu) Cable for 33kV Outgoing feeder as per requirement. As per field requirement but not less than 1120 meter.		
10	Supply of 11kV Single core XLPE copper cable for Transformer 2x1Cx630 Sq. mm per phase. As per field requirement but not less than 420 meter.	Lot	1
11	Supply of 33kV 3C×95 sq.mm XLPE (Cu) Cable and 0.415 kV, 4CX120 sq.mm PVC (Cu) Cable for Station Transformer as required.	Lot	1
12	Supply of 11 kV 3C×185 sq. mm XLPE (Cu) Cable per phase for Outgoing feeder from 11 kV GIS as required. As per field requirement but not less than 960 meter.	Lot	1
13	Supply of all Cable termination kits in line with BOQ (For all 33 kV, 11 kV and 0.415 kV cable, cable tray along with all requirement (both for indoor and outdoor) including all accessories.	Lot	1
14	Supply of All Control cables of different sizes and all LV PVC copper cable of different sizes as necessary and MCCB, connectors to connect different panels/auxiliary transformer etc. 4x4mm2, 4x6mm2, 4x2.5mm2, 8x2.5mm2, 16x 2.5mm2, 24x2.5 mm2, 2x1Cx150 mm2 PVC (Cu) Cable for power transformer neutral etc including all accessories.	Lot	1
15	Supply of all material for Grounding System, Earthing mesh with earthling electrode.	Lot	1
	a) Supply of grounding copper conductor (As per scope of works and technical Specification). (b) Supply of Grounding copper rod (Earthing electrode) dia 16 mm each 4 Meter length to achieve Earth Resistance as per standard/ requirement.		
16	Supply of Station type 11 kV Surge Arrester including all	Lot	1

Line Item No	Description of Item	Quantity	
1	2	3	
	accessories-14 Set (1 set =03 Nos).		
17	Supply of Substation Automation System (SAS) with Server, Monitor, UPS with 30 Minute battery back-up and Printer etc.	Lot	1
18	Supply of split type Air conditioner 48,000 BTU/hour capacity (4 Nos).	Lot	1
19	Outdoor and Indoor Lighting System.	Lot	1
20	All Steel Supporting Structures (including EM Tower, LA Structure, surge monitor/counter,Supporting Steel Structure and other accessories etc.) of Equipment as applicable.	Lot	1
21	Supply of **Fire Detection** (Smoke Detection & alarm System) **& Fire Fighting Equipment** a) CO2-2Sets, b) Foam Type -2 Sets & c) Dry Chemical Type-2 Sets.	Lot	1
22	**Civil Works.**	Lot	1
(a)	Earth filling, Land escaping, Leveling, Dressing / Preparation of Gravel Pit, Laying of Gravel etc.	Lot	1
(b)	**Three Storied GIS Sub-Station Building :** Including Transformer (indoor) floor, Control Room, Office Room, Store, Evacuation, O/H Tank, Water Supply with new Deep Tube well, Sanitary system, Internal Electrification, Emergency Lighting, False Ceiling, CCTV system with night vision camera and other related items etc. (If required Dismantling, Demolishing).	Sqm	750
(c)	Foundation of Transformer, Equipment, Power & Control Cable Trench, Cable Tray/Rack & others.	Lot	1
(d)	Road (approach including internal road & walkway etc).	Lot	1
(e)	Guard Post (10 sq-m) & Boundary Wall (with retaining wall where necessary) and Drainage System including gate etc. (As per site requirement).	Lot	1
(f)	Tree plantation, gardening and beautification etc.	Lot	1
(g)	Computer, laser printer, Operation Key Board, Table, chair, Steel Almirah, File Cabinet, Exhaust fans, Ceiling Fans etc.	Lot	1
23	Installation, Testing, Commissioning of all Equipment.	Lot	1
24	Design, Drawing, Training and Inspection of the substation.	Lot	1

6.1.2.7 Bill of Quantities for Design, Supply, Erection, Installation, Testing and Commissioning of 33 KV Bay Extension at Sholoshohor 132/33 KV Grid Substation under S&D-Sholoshohor, BPDB, Chattogram.

Sl No	Description of Item	Unit	Quantity
1	33 kV Vacuum Circuit Breaker, 2500 A, 31.5 kA for 3 sec. outdoor type along with supporting structure and accessories.	Set	2
2	33 kV Isolator 2500A, 31.5 kA for 3 sec. without earthling blade gang operated vertical mounted vertical break with galvanized steel support structure and necessary connectors and accessories.	Set	2
3	33 kV line isolator 2500A, 31.5 kA for 3 sec. with earthling blade gang operated vertical mounted vertical break with galvanized steel support structure and necessary connectors and all accessories.	Set	2
4	Supply of 33 kV, Single phase Lightning Arrester (ZnO-type) along with supporting structure and required accessories. (2 Sets)	Lot	1
5	33 kV 3 × single phase Current Transformer (3 nos. per circuit) outdoor type ratio 1200-2400/5/5A class 5P20 for protection and 0.2 for measuring along with supporting steel structure and suitable bi-metallic connectors and accessories as per field requirement.	Set	2
6	33 kV Control, Metering and Protection panel for 33 kV outgoing feeder with all indicating and integrating meters and 3 O/C, 1 E/F (IDMT and Ins). 3 Directional O/C + 1 Directional E/F relays. (2 sets)	Lot	1
7	Control Cables including CT and PT cables and LV Power Cables with all accessories between Control Room panels and 33 kV switchyard equipment.	Lot	1
8	Suitable busbar Droppers, Conductors, Connectors, outdoor marshal kiosk, hardware clamps, nuts and bolts, etc. as required for connecting the individual items of equipment of 33 kV switchyard & complete bay extension.	Lot	1
9	PG Clamps including all other Clamps as Required	Lot	1
10	33 kV Disc Insulator set with necessary suitable front and back connecting clamps.	Lot	1
11	Shield wire extension, overall diameter 9.252 mm standard steel with terminal tension clamp and fitting, Tension Clamp, Support Clamp set for fixing the shield wire with	Lot	1

	the gantry steel structure and all accessories.		
12	All material for grounding connection of individual equipment with substation mesh, 185 mm² grounding copper conductor, suitable connector and earthling electrode as required to achieve Earth Resistance as per standard and all accessories.	Lot	1
16	**Civil Works.**		
a)	Earth filling and compaction as needed etc.	Lot	1
b)	Foundation of Equipment, Power & Control Cable Trench etc.		
18	Installation of complete Bay with existing system including Inspection, design, drawing, as-built drawing, erection, testing & commissioning.	Lot	1

6.1.2.8 Bill of Quantities for Design, Supply, Erection, Installation, Testing and Commissioning of 33 KV Bay Extension at Kalurghat R 132/33 KV Grid Substation Under S&D-Kalurghat, BPDB, Chattogram.

Sl No	Description of Item	Unit	Quantity
	33 kV Vacuum Circuit Breaker, 1600 A, 31.5 kA for 3 sec. outdoor type along with supporting structure and accessories.	Set	4
1.	33 kV Isolator 1600A, 31.5 kA for 3 sec. without earthling blade gang operated vertical mounted vertical break with galvanized steel support structure and necessary connectors and accessories.	Set	4
2.	33 kV Line Isolator 1600A, 31.5 kA for 3 sec. with earthling blade gang operated vertical mounted vertical break with galvanized steel support structure and necessary connectors and accessories.	Set	4
3.	Supply of 33 kV, Single phase Lightning Arrester (ZnO-type) along with supporting structure and required accessories.	Set (1 Set= 3Nos)	4
4.	33 kV 3 × single phase Current Transformer (3 nos. per circuit) outdoor type ratio 600-1200/5/5A class 5P20 for protection and 0.2 for measuring along with supporting steel structure and suitable bi-metallic connectors and accessories as per field requirement.	Set	4
5.	33 kV Control, Metering and Protection panel for 33 kV outgoing feeder with all indicating and integrating meters and 3 O/C, 1 E/F (IDMT and Ins). 3 Directional O/C + 1 Directional E/F relays.	Nos	4

6.	Suitable busbar Droppers, Conductors, Connectors, outdoor marshal kiosk, hardware clamps, nuts and bolts, etc. as required for connecting the individual items of equipment of 33 kV switchyard & complete bay extension.	Lot	1
7.	PG Clamps.	Lot	1
8.	33 kV Disc Insulator set with necessary suitable front and back connecting clamps.	Lot	1
9.	33 kV Bus Bar Conductor (ACSR Martin).	Lot	1
10.	Control Cables including CT and PT cables and LV Power Cables with all accessories between Control Room panels and 33 kV switchyard equipment.	Lot	1
11.	All material for grounding connection of individual equipment with substation/ earthing mesh, 185 mm^2 grounding copper conductor, suitable connector and earthling electrode as required to achieve Earth Resistance as per standard.	Lot	1
12.	Shield wire extension, overall diameter 9.252 mm standard steel with terminal tension clamp and fitting, Tension Clamp, Support Clamp set for fixing the shield wire with the gantry steel structure	Lot	1
14	**Civil Works.**		
	a) Earth filling and compaction as needed etc.	Lot	1
	b) Foundation of Equipment, Power & Control Cable Trench etc.	Lot	1
15	Installation of complete Bay with existing system including Inspection, design, drawing, as-built drawing, erection, testing & commissioning.	Lot	1

6.1.3 Scope of Supply of Plant and Installation Services by the Contractor for 33kV Underground Cable Double Circuit Source Line

General:

The works covered by the Bid/Tender is Design, supply, erection, installation, testing and commissioning and inspection of 33kV Double circuit line of 1x800mm2 XLPE insulated Underground armoured copper Cable including Civil works and other related works on Turnkey Basis under Power Distribution System Development, Chattogram Zone (2nd Phase).

The scope of work and services include design, manufacture, quality assurance, inspection & testing, packing for export, insurance & shipment to site, complete construction & installation, jointing, terminating, bonding, earthing, painting, transportation, setting to work, site testing & commissioning of all the equipment necessary for operation of the 33kV Source Line and Interconnection between sub-stations along with having the full responsibility for civil works including design and construction of cable trench, HDD Boring for Road, Culvert/Bridge and Railway level cross, Excavation of Soil as required, Backfilling by fine graded sand/ Picket/Brick chips with sand etc.

The detail requirement is listed in the technical specification and Guaranteed Technical particulars (GTP) in the tender document.

The contractor is responsible for ensuring that all and any items of work required for the safe, efficient and satisfactory completion and functioning of the works are included in the Bid price whether they will be described in the specification or not.

Moreover, the contractor shall responsible for Transportation of machineries/equipment to the Project Site including moving the equipment and materials from the designated store as per site requirement and Consignee's advice. All the consumables goods or any equipment/machineries/ materials are required to complete the Plant & Equipment and services shall be responsibilities of the contractor and all the necessary arrangement for Power, Water, accommodations or any such facilities and tools-tackles, necessary instruments required for erection, installation, testing and commissioning will be supplied/arranged by the contractor within the quoted price. The contractor shall handover all the removable materials/goods at the place within layout plan as instructed by the consignee.

33kV, 800mm2 XLPE Armoured Underground Cable Supply, Laying & Commissioning:

The bidder shall be deemed to have visited site, inspected, gathered data and verified details of the as-built system in order to design, supply and interface their new equipment. All necessary materials, adjustments, dismantling, remedial and tiding-up work in order to complete the work specified shall be included in the contract price.

The scope of works include survey, design, manufacture, quality assurance, inspection & testing, packing for export, insurance & shipment to site, complete construction & installation etc. as per Employer's Requirement, but not limited to, including all related civil works to complete the work in all respect up to the commercial operation.

The conceptual layout, general arrangement and route line diagram for the proposed 5 (five) 33kV Double circuit source lines are attached in Annex-2.

Tenderer shall quote a Firm Turnkey Contract Price for the Supply and Related Services as described in Price Schedule according to Section 6 of this Tender document. If the Tenderer deemed necessary any additional machineries/equipment/ materials / Supply and Related Services out of the list of tender Price Schedule for completion of the said Turnkey basis works (Supply and Related Services), contractor shall have to do the additional works (Supply and Related Services) without any additional cost. The costs of these additional works (Supply and Related Services) are deemed to be included within the quoted price.

Scope of Work:

1. Route Survey will be conducted for the correct assessment of the cable route and finalization of the cable length of the same route. The contractor shall submit the actual route survey to the Project office for approval.
2. Design, Manufacture and Supply of 33 kV, 1x800 mm^2 XLPE (Cu) Cable with non-magnetic Armour and termite repellent outer covering as per latest relevant IEC Standard.
3. Excavation, Installation, Testing and Commissioning of **aforesaid** Cable with supply of necessary Straight Through Joints, with each section of cable length 500 m ± 10%, ensuring protection from all possible external mechanical injury from the side as well as from the top in cable trench and back filling with prominent marker tape as per prevailing standard of BPDB.
4. Supply & Installation of 33KV GIS/AIS Terminations at the both ends of source and destination substation as mentioned hereafter.
5. Supply of Plastic Marker Tape with Caution Notice during work execution.
6. Design, Manufacture and Supply of 24 core, Optical Fiber Cable (OFC) with FOTE (Fiber Optic Terminal Equipment) at both ends to connect the Cable monitoring system and communication.
7. The quantity of 33 kV 1x800 mm2 XLPE (Cu) Cable, route direction & length, no. of circuit, no. of straight through joint & no. of termination kits are mentioned in the following table. It is to be noted that all these quantities are tentative & mentioned as per initial route survey. These figures may change after final approved route survey.

33 kV Double circuit Source Lines including Fiber Optic Cable, Cable monitoring system with DTS & DAS and all other accessories are shown below:

Sl. No.	Description of 33kV double circuit source Line	Length	Quantity of 33kV, 1x800mm^2 XLPE armored Cu Cable	Jointing Kits with spare and all accessories	Indoor GIS Termination Kit and all accessories
		KM	KM	Nos.	Nos.
1	Sholosahar 33/11 kV GIS Substation to Crescent Industries 33/11 kV Substation	5.5	36.3		
2	Kalurghat Grid to Chandgaon 33/11 kV Substation	4.0	26.4		
3	Sholosahar 33/11 kV GIS Substation to Muradpur 33/11 kV Substation	4.0	26.4		
4	Kalurghat Grid to A K Khan School New 33/11 kV	6.0	39.6		
5	Sholosahar 33/11 kV GIS Substation to Baro Dghir Par 33/11 kV Substation	6.0	39.6		
6	Sholosahar Grid to Sholosahar 33/11 kV GIS Substation	0.25	1.65		
Total		**25.75**	**169.95**		

Note:

1. *Materials to be supplied and works to be done are included in the above tables for the 33kV Double circuit source line for each of the newly constructed Substation under this scope of the Tender. If any additional materials are required to complete the works which are not included in the above table has to be supplied by the bidder within the quoted price.*
2. *Also if any additional works are required for functioning the system properly and as per standard, have to be incorporated by the bidder within the quoted price.*
3. *Road cutting & repairing Compensation will be paid by the Contractor at per rates of the owner of road.*

Training at Site:

The Contractor shall provide training without additional cost will train the Employer's employees in the operation and maintenance of the Cables to the BPDB personnel. The training shall comprise a balanced combination of classroom training and hands on experience, and shall cover all aspects of equipment installation, operation and maintenance. The BPDB personnel will be deputed full time to the Contractor for both class room and on-the-job training.

The Contractor shall provide a program for site training and course synopses not later than 4 (four) weeks prior to mobilization to sites. The Contractor shall submit to the Purchaser a copy of all classroom material handed out to the trainees. Course notes and handbooks as appropriate are to be issued to attendees, and full reference is to be made to the Operation and Maintenance manuals issued by the Contractor.

03(Three) days local training conducted by the ^expert in providing related training for 15 nos. of purchaser employees (Engineer/ Supervisor/ Technician) in each substation regarding all aspects of Fundamentals/ Basics conception of Descriptions & Functions of Plant /Equipment, Configuration, setting, testing & safe operation of cable for all operation, maintenance and troubleshooting of Cable.

Importance shall be emphasized on the following particulars but not limited to during training:-

Routine Operation, Maintenance, Testing and Repair of:-

- 33 kV 1x800 sq.mm XLPE underground cable
- 33 kV Straight through jointing
- 33 kV & 11kV GIS plug-end type termination
- 33 kV & 11kV AIS plug-end type termination
- Optical Fibre cable
- Cable Monitoring System (DAS, DTS)
- Cable Fault Identification

The employers operational staffs are to be instructed in operational procedures, i.e., switching fault reporting, sequence of operations following fault occurrence etc. Practical demonstrations and simulated events are to be performed in the control rooms provided, and the contractor is to monitor and advise the employer's attendants during substation energization and initial commercial operation. This training is required to ensure that the Employers staffs are made fully familiar with the plant operational design, maintenance procedures, etc.

Note: Tenderers shall quote a Firm Turnkey Contract Price for the Plant & Equipment and services as described in Price Schedule and in Section 6, 7, 8 & 9 of this Tender document. If the Tenderer deemed necessary any additional Plant & Equipment and services out of the list of tender schedules for completion of the said Turnkey works and site requirement, contractor shall have to do the additional works. The costs of these additional works are deemed to be included within the quoted price. Tenderer are requested to visit the site to consider all before the submission of the Tender.

6.1.3.1 Design, Supply, Construction, Erection, Installation, Testing and Commissioning of 33 kV Underground Cable from SHOLOSAHAR GRID TO CRESCENT INDUSTRIES 33/11 kV Substation BPDB, Chattogram.

(Not limited but at least the following works to be done by the turnkey contractor)

A. CIVIL WORKS:

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and commissioning and so on of the following works are the scope of works:

1) Conducting of Route survey and Soil investigation for the correct assessment of the cable route and finalization of the cable length. The contractor shall submit the actual route survey to the employer for its due approval. The proposed route length of the double circuit line is around 5.5km.

2) Sholo Shahar Grid S/S & 33/11 KV S/S are situated at the same place. From this Substation 3 (Three) double Ckt. cable line will be drawn through cable trench (1.75m x 1.65m). From the Substation gate to Hathazari road (100 meter) is to be crossed (5 meter width). There is no alternate route for consideration.

   From Hathazari road (turning) to proposed 33/11 KV Substation at Crescent & Muradpur 4 Ckt. cable trench (1.25m x 1.5m) will be made upto Oxygen More (Turning). The width of the road is 20 meter. Trench can be made although Gas, Water & T&T lines are not visible.

   From the Oxygen road turning to proposed Crescent 33/11 KV Substation double Ckt. cable trench (1.0m x 1.05m) upto Bayezid Bostami road can be made. Here overhead electric line exists but cable trench can be made although Water, T&T & Gas line are not visible.

3) Construction of cable trenches for power cable as per design drawing:

   (a) Throughout the cable route (buried cable)
   (b) Across the roads/railway track
   (c) Within the substation area including cable rack
   (d) Switch yard area to 33kV feeder poles
   (e) Control room building to 33kV feeder poles
   (f) H.D Boring for Road and Railway track crossing
   (g) Soil excavation for cable trench and backfilling with fine graded sand/picket/brick chicps.
   (h) R.C.C cable trench and R.C.C. slab

4) Supply and construction of Power cable trench including cable rack inside the ground floor of the control room building. Proper sealing of the cable entry at Control Room building, to prevent water entering from switch yard/outside to Control Room Building, preventing entry of rats and reptiles, Fire proof etc.

5) All civil works for minimum trench excavation with required protective measures for cable laying including RCC precast cover, laying of warning tape, foundations associated with equipment support structure and cable joint pit and earthing.

6) Restoration/upgradation work of roads, sidewalks/footpath (all type) (when and as required) as per specification of relevant road department

7) Any minor electrical/communication equipment/items which are not mentioned in the bidding documents but are required for the successful completion of the project shall be in the scope of contractor for which no extra payment will be made.

8) The Contractor should lay extra cable at terminations through snake laying with clamping accessories considering easy maintenance when there is fault at terminations.

9) The cable route markers, at a suitable distance and danger boards/warning tapes shall be provided for the information of all concerned and for their safety. Any additional requirement in terms of safety perspective shall be provided by the contractor without any extra cost. The cable route marker shall also be visible during night.

10) It is the responsibility of the contractor to maintain the required statutory clearances from other utility services. Any damage caused to any utility services/ human life / public property etc. shall be the sole responsibility of the contractor.

11) The methodology of laying shall be documented in details and shall be submitted to the Employer.

12) The Contractor shall not start the work of excavation/drilling/boring without having permission/consultation from the Employer.

13) Any property belongs to public or government (e.g. water pipe, telecommunication cable, power cable, sewerage pipe, road, footpaths etc.) damaged during the excavation/drilling/boring or during construction shall immediately be restored by the Contractor without any cost to Employer.

B. ELECTRICAL WORKS:

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and Commissioning etc. of the following works are the scope of works:

1) Supply and installation of two nos. 33kV Line Feeder comprising: 33kV 1Cx800 Sq.mm XLPE power cable, cable indoor GIS terminating kits, straight through jointing kits including all accessories complete in all respect.

2) Supply and installation of Supporting steel structure, cable holder clamp, HDPE pipe for road crossing, MPP pipe for Culvert/Bridge and Railway crossing, cable ties throughout the burial length, cable rack including cable cleats throughout the cable trench within substation area, etc. with necessary accessories as required.

3) Undergrounding and laying of 33kV Power cables, Optical Fiber, DAS & DTS system (for cable monitoring & protection) using open excavation and Trenchless boring methodology (HDD) wherever applicable. Where open excavation is not possible/permitted, with Employers approval trenchless boring (Horizontal drilling) shall be used for undergrounding works.

4) Installation, laying, splicing and termination of Underground Optical Fibre Cables along with all the accessories to establish communication network for SCADA communication and DAS & DTS system.

5) Installation of DAS & DTS system and necessary accessories, processor panels for cable monitoring, protection and fault detection and its integration to existing SAS/SCADA system of Substations.

6) Any other equipment/material required to complete the specified scope of work. Any minor electrical/communication equipment/items which are not mentioned in the bidding documents but are required for the successful completion of the project shall be in the scope of contractor for which no extra payment will be made.

3) The Bidder must visit the site and assess the works before tender submission.

4) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid.

5) 3 (Three) sets of As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB, Dhaka. One electronic copy (soft copy in a CD) of all relevant As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection-2, BPDB

Route line diagram in Annex-2.

6.1.3.2 Design, Supply, Construction, Erection, Installation, Testing and Commissioning of 33 kV Underground Cable from KALURGHAT GRID TO CHANDGAON 33/11 kV Substation BPDB, Chattogram.

(Not limited but at least the following works to be done by the turnkey contractor)

A. CIVIL WORKS:

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and commissioning and so on of the following works are the scope of works:

1) Conducting of Route survey for the correct assessment of the cable route and finalization of the cable length. The contractor shall submit the actual route survey to the employer for its due approval. The proposed route length of the double circuit line is around 4.0km.

2) Kalurghat Grid S/S & 33/11 KV S/S situated in adjacent place. From this point 4 Ckt. Cable trench are to be made for connecting the proposed 33/11 KV S/S at A. K. Khan School & Chandgaon S/S by 33/11 KV XLPE underground cable.

   From Kalurghat S/S to FIDC road is about 100 meter (8 meter width) after that the width of road is 20 meter. The cable trench will be made upto C&B road turning . from C&B road turning Double Ckt. cable will be drawn through trench (1.0m x 1.05m) Arakan road (Highway) at Chandgaon Residential Area for the proposed S/S. There exists electric overhead lines. Inspite of Water, T&T & Gas lines existence, cable trench can be made.

3) Construction of cable trenches for power cable as per design drawing:

   (a) Throughout the cable route (buried cable)
   (b) Across the roads/railway track
   (c) Within the substation area including cable rack
   (d) Switch yard area to 33kV feeder poles
   (e) Control room building to 33kV feeder poles
   (f) H.D Boring for Road and Railway track crossing
   (g) Soil excavation for cable trench and backfilling with fine graded sand/picket/brick chips.
   (h) R.C.C cable trench and R.C.C. slab

4) Supply and construction of Power cable trench including cable rack inside the ground floor of the control room building. Proper sealing of the cable entry at Control Room building, to prevent water entering from switch yard/outside to Control Room Building, preventing entry of rats and reptiles, Fire proof etc.

5) All civil works for minimum trench excavation with required protective measures for cable laying including RCC precast cover, laying of warning tape, foundations associated with equipment support structure and cable joint pit and earthing.

6) Restoration/upgradation work of roads, sidewalks/footpath (all type) (when and as required) as per specification of relevant road department

7) Any minor electrical/communication equipment/items which are not mentioned in the bidding documents but are required for the successful completion of the project shall be in the scope of contractor for which no extra payment will be made.

8) The Contractor should lay extra cable at terminations through snake laying with clamping accessories considering easy maintenance when there is fault at terminations.

9) The cable route markers, at a suitable distance and danger boards/warning tapes shall be provided for the information of all concerned and for their safety. Any additional requirement in terms of safety perspective shall be provided by the contractor without any extra cost. The cable route marker shall also be visible during night.

10) It is the responsibility of the contractor to maintain the required statutory clearances from other utility services. Any damage caused to any utility services/ human life / public property etc. shall be the sole responsibility of the contractor.

11) The methodology of laying shall be documented in details and shall be submitted to the Employer.

12) The Contractor shall not start the work of excavation/drilling/boring without having permission/consultation from the Employer.

13) Any property belongs to public or government (e.g. water pipe, telecommunication cable, power cable, sewerage pipe, road, footpaths etc.) damaged during the excavation/drilling/boring or during construction shall immediately be restored by the Contractor without any cost to Employer.

B. ELECTRICAL WORKS:

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and Commissioning etc. of the following works are the scope of works:

1) Supply and installation of two nos. 33kV Line Feeder comprising: 33kV 1Cx800 Sq.mm XLPE power cable, cable indoor GIS terminating kits, straight through jointing kits including all accessories complete in all respect.

2) Supply and installation of Supporting steel structure, cable holder clamp, HDPE pipe for road crossing, MPP pipe for Culvert/Bridge and Railway crossing, cable ties throughout the burial length, cable rack including cable cleats throughout the cable trench within substation area, etc. with necessary accessories as required.

3) Undergrounding and laying of 33kV Power cables, Optical Fiber, DAS & DTS system (for cable monitoring & protection) using open excavation and Trenchless boring methodology (HDD) wherever applicable. Where open excavation is not possible/permitted, with Employers approval trenchless boring (Horizontal drilling) shall be used for undergrounding works.

4) Installation, laying, splicing and termination of Underground Optical Fibre Cables along with all the accessories to establish communication network for SCADA communication and DAS & DTS system.

5) Installation of DAS & DTS system and necessary accessories, processor panels for cable monitoring, protection and fault detection and its integration to existing SAS/SCADA system of Substations.

6) Any other equipment/material required to complete the specified scope of work. Any minor electrical/communication equipment/items which are not mentioned in the bidding documents but are required for the successful completion of the project shall be in the scope of contractor for which no extra payment will be made.

7) The Bidder must visit the site and assess the works before tender submission.

8) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid.

9) 3 (Three) sets of As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB, Dhaka. One electronic copy (soft copy in a CD) of all relevant As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB

Route line diagram in Annex-2.

6.1.3.3 Design, Supply, Construction, Erection, Installation, Testing and Commissioning of 33 kV Underground Cable from SHOLOSAHAR GRID TO MURADPUR 33/11 kV Substation BPDB, Chattogram.

(Not limited but at least the following works to be done by the turnkey contractor)

A. CIVIL WORKS:

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and commissioning and so on of the following works are the scope of works:

1) Conducting of Route survey and Soil investigation for the correct assessment of the cable route and finalization of the cable length. The contractor shall submit the actual route survey to the employer for its due approval. The proposed route length of the double circuit line is around 4,0 km.

2) Sholo Shahar Grid S/S & 33/11 KV S/S are situated at the same place. From this Substation 3 (Three) double Ckt. cable line will be drawn through cable trench (1.75m x 1.65m). From the Substation gate to Hathazari road (100 meter) is to be crossed (5 meter width). There is no alternate route for consideration.

   From Hathazari road (turning) to proposed 33/11 KV Substation at Crescent & Muradpur 4 Ckt. cable trench (1.25m x 1.5m) will be made upto Oxygen Morr (Turning). The width of the road is 20 meter. Trench can be made although Gas, Water & T&T lines are not visible.

   From the Oxygen road turning to proposed Muradpur(new) 33/11 KV Substation double Ckt. cable trench (1.0m x 1.05m) Through Hathazari- Chattagram road can be made. Here overhead electric line exists but cable trench can be made although Water, T&T & Gas line are not visible.

3) Construction of cable trenches for power cable as per design drawing:

   (a) Throughout the cable route (buried cable)
   (b) Across the roads/railway track
   (c) Within the substation area including cable rack
   (d) Switch yard area to 33kV feeder poles
   (e) Control room building to 33kV feeder poles
   (f) H.D Boring for Road and Railway track crossing
   (g) Soil excavation for cable trench and backfilling with fine graded sand/picket/brick chicps.
   (h) R.C.C cable trench and R.C.C. slab

4) Supply and construction of Power cable trench including cable rack inside the ground floor of the control room building. Proper sealing of the cable entry at Control Room building, to prevent water entering from switch yard/outside to Control Room Building, preventing entry of rats and reptiles, Fire proof etc.

5) All civil works for minimum trench excavation with required protective measures for cable laying including RCC precast cover, laying of warning tape, foundations associated with equipment support structure and cable joint pit and earthing.

6) Restoration/upgradation work of roads, sidewalks/footpath (all type) (when and as required) as per specification of relevant road department

7) Any minor electrical/communication equipment/items which are not mentioned in the bidding documents but are required for the successful completion of the project shall be in the scope of contractor for which no extra payment will be made.

8) The Contractor should lay extra cable at terminations through snake laying with clamping accessories considering easy maintenance when there is fault at terminations.

9) The cable route markers, at a suitable distance and danger boards/warning tapes shall be provided for the information of all concerned and for their safety. Any additional requirement in terms of safety perspective shall be provided by the contractor without any extra cost. The cable route marker shall also be visible during night.

10) It is the responsibility of the contractor to maintain the required statutory clearances from other utility services. Any damage caused to any utility services/ human life / public property etc. shall be the sole responsibility of the contractor.

11) The methodology of laying shall be documented in details and shall be submitted to the Employer.

12) The Contractor shall not start the work of excavation/drilling/boring without having permission/consultation from the Employer.

13) Any property belongs to public or government (e.g. water pipe, telecommunication cable, power cable, sewerage pipe, road, footpaths etc.) damaged during the excavation/drilling/boring or during construction shall immediately be restored by the Contractor without any cost to Employer.

B. ELECTRICAL WORKS:

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and Commissioning etc. of the following works are the scope of works:

1) Supply and installation of two nos. 33kV Line Feeder comprising: 33kV 1Cx800 Sq.mm XLPE power cable, cable indoor GIS terminating kits, straight through jointing kits including all accessories complete in all respect.

2) Supply and installation of Supporting steel structure, cable holder clamp, HDPE pipe for road crossing, MPP pipe for Culvert/Bridge and Railway crossing, cable ties throughout the burial length, cable rack including cable cleats throughout the cable trench within substation area, etc. with necessary accessories as required.

3) Undergrounding and laying of 33kV Power cables, Optical Fiber, DAS & DTS system (for cable monitoring & protection) using open excavation and Trenchless boring methodology (HDD) wherever applicable. Where open excavation is not possible/permitted, with Employers approval trenchless boring (Horizontal drilling) shall be used for undergrounding works.

4) Installation, laying, splicing and termination of Underground Optical Fibre Cables along with all the accessories to establish communication network for SCADA communication and DAS & DTS system.

5) Installation of DAS & DTS system and necessary accessories, processor panels for cable monitoring, protection and fault detection and its integration to existing SAS/SCADA system of Substations.

6) Any other equipment/material required to complete the specified scope of work. Any minor electrical/communication equipment/items which are not mentioned in the bidding documents but are required for the successful completion of the project shall be in the scope of contractor for which no extra payment will be made.

7) The Bidder must visit the site and assess the works before tender submission.

8) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid.

9) 3 (Three) sets of As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB, Dhaka. One electronic copy (soft copy in a CD) of all relevant As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB

Route line diagram in Annex-2.

6.1.3.4 Design, Supply, Construction, Erection, Installation, Testing and Commissioning of 33 kV Underground Cable from KALURGHAT GRID TO A K KHAN SCHOOL NEW 33/11 kV Substation BPDB, Chattogram.

(Not limited but at least the following works to be done by the turnkey contractor)

A. CIVIL WORKS:

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and commissioning and so on of the following works are the scope of works:

1) Conducting of Route survey and Soil investigation for the correct assessment of the cable route and finalization of the cable length. The contractor shall submit the actual route survey to the employer for its due approval. The proposed route length of the double circuit line is around 6.0 km.

2) Kalurghat Grid S/S & 33/11 KV S/S situated in adjacent place. From this point 4 Ckt. Cable trench are to be made for connecting the proposed 33/11 KV S/S at A. K. Khan School & Chandgaon S/S by 33/11 KV XLPE underground cable.

   From Kalurghat S/S to FIDC road is about 100 meter (8 meter width) after that the width of road is 20 meter. The cable trench will be made upto C&B road turning From C&B turning Double Ckt. cable will be laid through cable trench (1.0 mx 1.05m) which will go through Arakan road (Highway)-WASA road-Mohora Noor Ahmed Chowdhury road, proposed 33 KV S/S at A.K. Khan School.

3) Construction of cable trenches for power cable as per design drawing:

   (a) Throughout the cable route (buried cable)
   (b) Across the roads/railway track
   (c) Within the substation area including cable rack
   (d) Switch yard area to 33kV feeder poles
   (e) Control room building to 33kV feeder poles
   (f) H.D Boring for Road and Railway track crossing
   (g) Soil excavation for cable trench and backfilling with fine graded sand/picket/brick chicps.
   (h) R.C.C cable trench and R.C.C. slab

4) Supply and construction of Power cable trench including cable rack inside the ground floor of the control room building. Proper sealing of the cable entry at Control Room building, to prevent water entering from switch yard/outside to Control Room Building, preventing entry of rats and reptiles, Fire proof etc.
5) All civil works for minimum trench excavation with required protective measures for cable laying including RCC precast cover, laying of warning tape, foundations associated with equipment support structure and cable joint pit and earthing.

6) Restoration/upgradation work of roads, sidewalks/footpath (all type) (when and as required) as per specification of relevant road department

7) Any minor electrical/communication equipment/items which are not mentioned in the bidding documents but are required for the successful completion of the project shall be in the scope of contractor for which no extra payment will be made.

8) The Contractor should lay extra cable at terminations through snake laying with clamping accessories considering easy maintenance when there is fault at terminations.

9) The cable route markers, at a suitable distance and danger boards/warning tapes shall be provided for the information of all concerned and for their safety. Any additional requirement in terms of safety perspective shall be provided by the contractor without any extra cost. The cable route marker shall also be visible during night.

10) It is the responsibility of the contractor to maintain the required statutory clearances from other utility services. Any damage caused to any utility services/ human life / public property etc. shall be the sole responsibility of the contractor.

11) The methodology of laying shall be documented in details and shall be submitted to the Employer.

12) The Contractor shall not start the work of excavation/drilling/boring without having permission/consultation

from the Employer.

13) Any property belongs to public or government (e.g. water pipe, telecommunication cable, power cable, sewerage pipe, road, footpaths etc.) damaged during the excavation/drilling/boring or during construction shall immediately be restored by the Contractor without any cost to Employer.

B. ELECTRICAL WORKS:

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and Commissioning etc. of the following works are the scope of works:

1) Supply and installation of two nos. 33kV Line Feeder comprising: 33kV 1Cx800 Sq.mm XLPE power cable, cable indoor GIS terminating kits, straight through jointing kits including all accessories complete in all respect.

2) Supply and installation of Supporting steel structure, cable holder clamp, HDPE pipe for road crossing, MPP pipe for Culvert/Bridge and Railway crossing, cable ties throughout the burial length, cable rack including cable cleats throughout the cable trench within substation area, etc. with necessary accessories as required.

3) Undergrounding and laying of 33kV Power cables, Optical Fiber, DAS & DTS system (for cable monitoring & protection) using open excavation and Trenchless boring methodology (HDD) wherever applicable. Where open excavation is not possible/permitted, with Employers approval trenchless boring (Horizontal drilling) shall be used for undergrounding works.

4) Installation, laying, splicing and termination of Underground Optical Fibre Cables along with all the accessories to establish communication network for SCADA communication and DAS & DTS system.

5) Installation of DAS & DTS system and necessary accessories, processor panels for cable monitoring, protection and fault detection and its integration to existing SAS/SCADA system of Substations.

6) Any other equipment/material required to complete the specified scope of work. Any minor electrical/communication equipment/items which are not mentioned in the bidding documents but are required for the successful completion of the project shall be in the scope of contractor for which no extra payment will be made.

7) The Bidder must visit the site and assess the works before tender submission.

8) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid.

9) 3 (Three) sets of As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB, Dhaka. One electronic copy (soft copy in a CD) of all relevant As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB

Route line diagram in Annex-2

6.1.3.5 Design, Supply, Construction, Erection, Installation, Testing and Commissioning of 33 kV Underground Cable from Sholosahar Grid to Baro Dghir Par 33/11 kV Substation BPDB, Chattogram.

(Not limited but at least the following works to be done by the turnkey contractor)

A. CIVIL WORKS:

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and commissioning and so on of the following works are the scope of works:

1) Conducting of Route survey and Soil investigation for the correct assessment of the cable route and finalization of the cable length. The contractor shall submit the actual route survey to the employer for its due approval. The proposed route length of the double circuit line is around 6.0km .

2) Sholo Shahar Grid S/S & 33/11 KV S/S are situated at the same place. From this Substation 3 (Three) double Ckt. cable line will be drawn through cable trench (1.75m x 1.65m). From the Substation gate to Hathazari road (100 meter) is to be crossed (5 meter width). There is no alternate route for consideration.

   Via Hathazari Highway road the double Ckt. trench (1.0m x 1.05 m) will go through Vatenary link road-railway crossing-upto Borodighirpar proposed 33/11 KV Substation. In the route the electric overhead line exists but Water, T&T & Gas line are not visible. The cable trench can be made.

3) Construction of cable trenches for power cable as per design drawing:

   (a) Throughout the cable route (buried cable)
   (b) Across the roads/railway track
   (c) Within the substation area including cable rack
   (d) Switch yard area to 33kV feeder poles
   (e) Control room building to 33kV feeder poles
   (f) H.D Boring for Road and Railway track crossing
   (g) Soil excavation for cable trench and backfilling with fine graded sand/picket/brick chicps.
   (h) R.C.C cable trench and R.C.C. slab

4) Supply and construction of Power cable trench including cable rack inside the ground floor of the control room building. Proper sealing of the cable entry at Control Room building, to prevent water entering from switch yard/outside to Control Room Building, preventing entry of rats and reptiles, Fire proof etc.
5) All civil works for minimum trench excavation with required protective measures for cable laying including RCC precast cover, laying of warning tape, foundations associated with equipment support structure and cable joint pit and earthing.

6) Restoration/upgradation work of roads, sidewalks/footpath (all type) (when and as required) as per specification of relevant road department

7) Any minor electrical/communication equipment/items which are not mentioned in the bidding documents but are required for the successful completion of the project shall be in the scope of contractor for which no extra payment will be made.

8) The Contractor should lay extra cable at terminations through snake laying with clamping accessories considering easy maintenance when there is fault at terminations.

9) The cable route markers, at a suitable distance and danger boards/warning tapes shall be provided for the information of all concerned and for their safety. Any additional requirement in terms of safety perspective shall be provided by the contractor without any extra cost. The cable route marker shall also be visible during night.

10) It is the responsibility of the contractor to maintain the required statutory clearances from other utility services. Any damage caused to any utility services/ human life / public property etc. shall be

the sole responsibility of the contractor.

11) The methodology of laying shall be documented in details and shall be submitted to the Employer.

12) The Contractor shall not start the work of excavation/drilling/boring without having permission/consultation from the Employer.

13) Any property belongs to public or government (e.g. water pipe, telecommunication cable, power cable, sewerage pipe, road, footpaths etc.) damaged during the excavation/drilling/boring or during construction shall immediately be restored by the Contractor without any cost to Employer.

B. ELECTRICAL WORKS:

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and Commissioning etc. of the following works are the scope of works:

1) Supply and installation of two nos. 33kV Line Feeder comprising: 33kV 1Cx800 Sq.mm XLPE power cable, cable indoor GIS terminating kits, straight through jointing kits including all accessories complete in all respect.

2) Supply and installation of Supporting steel structure, cable holder clamp, HDPE pipe for road crossing, MPP pipe for Culvert/Bridge and Railway crossing, cable ties throughout the burial length, cable rack including cable cleats throughout the cable trench within substation area, etc. with necessary accessories as required.

3) Undergrounding and laying of 33kV Power cables, Optical Fiber, DAS & DTS system (for cable monitoring & protection) using open excavation and Trenchless boring methodology (HDD) wherever applicable. Where open excavation is not possible/permitted, with Employers approval trenchless boring (Horizontal drilling) shall be used for undergrounding works.

4) Installation, laying, splicing and termination of Underground Optical Fibre Cables along with all the accessories to establish communication network for SCADA communication and DAS & DTS system.

5) Installation of DAS & DTS system and necessary accessories, processor panels for cable monitoring, protection and fault detection and its integration to existing SAS/SCADA system of Substations.

6) Any other equipment/material required to complete the specified scope of work. Any minor electrical/communication equipment/items which are not mentioned in the bidding documents but are required for the successful completion of the project shall be in the scope of contractor for which no extra payment will be made.

7) The Bidder must visit the site and assess the works before tender submission.

8) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid.

9) 3 (Three) sets of As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB, Dhaka. One electronic copy (soft copy in a CD) of all relevant As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB

Route line diagram in Annex-2.

6.1.3.6 Design, Supply, Construction, Erection, Installation, Testing and Commissioning of 33 kV Underground Cable from SHOLOSAHAR GRID TO SHOLOSAHAR 33/11 kV Substation BPDB, Chattogram.

(Not limited but at least the following works to be done by the turnkey contractor)

A.CIVIL WORKS:

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and commissioning and so on of the following works are the scope of works:

1) Conducting of Route survey and Soil investigation for the correct assessment of the cable route and finalization of the cable length. The contractor shall submit the actual route survey to the employer for its due approval. The proposed route length of the double circuit line is around 0.25km .

2) Double Ckt. cable (1x800mm2) to be connected the 132/33kV Grid Substation and 33/11 Sholosahar new substation.

3) Construction of cable trenches for power cable as per design drawing:

(a) Throughout the cable route (buried cable)
(b) Across the roads/railway track
(c) Within the substation area including cable rack
(d) Switch yard area to 33kV feeder poles
(e) Control room building to 33kV feeder poles
(f) R.C.C cable trench and R.C.C. slab

4) Supply and construction of Power cable trench including cable rack inside the ground floor of the control room building. Proper sealing of the cable entry at Control Room building, to prevent water entering from switch yard/outside to Control Room Building, preventing entry of rats and reptiles, Fire proof etc.

B. ELECTRICAL WORKS:

Design, Manufacture, Supply, Installation/ Erection, Construction, Testing and Commissioning etc. of the following works are the scope of works:

1) Supply and installation of two nos. 33kV Line Feeder comprising: 33kV 1Cx800 Sq.mm XLPE power cable, cable indoor GIS terminating kits, straight through jointing kits including all accessories complete in all respect.

2) The Bidder must visit the site and assess the works before tender submission.

3) Transportation of all equipment and materials, all installations, connections and testing, commissioning, inspection are within the scope of the Bid.

4) 3 (Three) sets of As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB, Dhaka. One electronic copy (soft copy in a CD) of all relevant As-built drawings together with operation and maintenance manual, relevant IEC standards of the installed equipment shall be submitted for the Directorate of Design & Inspection -2, BPDB

Route line diagram in Annex-2.

6.1.4.0 Bill of Quantities (BOQ)

1. All the items mentioned in the BOQ (as follows) shall be quoted in the respective format of the price schedule, otherwise bid will be rejected.

2. Schedule No: 3 & 5 is applicable for total price of all Substations (Not for individual substation).

5. Tenderer shall quote a Firm Turnkey Contract Price for the Supply and Related Services as described in Price Schedule according to Section 6, Section 7 & Section 8 of this Tender document. If the Tenderer deemed necessary any additional machineries/equipment/ materials / Supply and Related Services out of the list of tender Price Schedule for completion of the said Turnkey basis works(Supply and Related Services), contractor shall have to do the additional works (Supply and Related Services) without any additional cost. The costs of these additional works (Supply and Related Services) are deemed to be included within the quoted price.

6. Individual sub-station Bill of Quantity (BoQ) as follows:

6.1.4.1 Design, Supply, Construction, Erection, Installation, Testing and Commissioning of 33 kV Underground Cable from SHOLOSAHAR 33/11 kV GIS Substation To CRESCENT INDUSTRIES 33/11 kV Substation BPDB, Chattogram.

Line Item No.	Description of Item	Quantity	
1	2	3	
1.	33kV, 1x800mm^2 XLPE U/G Armoured Copper Cable	KM	36.3
2.	Heat Shrinkable Straight through jointing kit suitable for the 33kV, 1x800mm^2 XLPE Cable including all accessories	Sets	72
3.	Supply of 24 core, Optical Fiber Cable (OFC) inclusive joint boxes, fixing clamps, fusion splices and connections to joint boxes, FOTE (Fiber Optic Terminal Equipment) at both ends for cable monitoring and communication		
	a) Fiber Optic Cable	KM	12.10
	b) Fiber Optic Cable Joint Box inclusive of all accessories	Lot	1
	c) Fiber Optic Cable Termination Equipment inclusive of all accessories	Sets	2
	d) Distributed Acoustic Sensing (DAS) & Distributed Temperature Sensing (DTS) system with all necessary accessories as per scope of work and technical specification for the double circuit Underground Power Cable	Lot	1
4.	Ø150 mm MPP Pipe for Road/Culvert/Bridge/Railway crossing for each power cable.	Meter	2910
5.	Ø40 mm HDPE Pipe for Road/Culvert/Bridge/Railway crossing for Fiber Optic Cable	Lot	1
6.	Plastic Cable ties suitable for trefoil of 33kV, 1x800mm^2 XLPE Cable including Fiber Optic Cable at 3 meter interval.	Lot	1
7.	**Civil Works:**		
	a) HDD Boring for Road/Culvert/Bridge/Railway level crossing.	Meter	2910
	b) Excavation of Soil as required.	Lot	1
	c) Breaking of pucca surface as required.	Lot	1
	d) Backfilling by fine graded sand as required.	Lot	1
	e) Backfilling by Picket/Brick chips with sand (1:1)	Lot	1
	f) R.C.C cable trench with R.C.C. slab (1:1.5:3)	Lot	1
	g) R.C.C. precast slab through the buried portion of cable for cover and side.	Lot	1

	h) R.C.C cable inspection pit at each jointing of the Cable	Lot	1
8.	Installation, Testing, Pre-Commissioning, Commissioning of all Equipment in complete with all respect.	Lot	1
9.	Design, Drawing, Inspection and Training complete with all respect.	Lot	1

6.1.4.2 Design, Supply, Construction, Erection, Installation, Testing and Commissioning of 33 kV Underground Cable from KALURGHAT GRID TO CHANDGAON 33/11 kV Substation BPDB, Chattogram.

Line Item No.	Description of Item	Quantity	
1	**2**	**3**	
1.	33kV, 1x800mm^2 XLPE U/G Armoured Copper Cable	KM	26.4
2.	Heat Shrinkable Straight through jointing kit suitable for the 33kV, 1x800mm^2 XLPE Cable including all accessories	Sets	48
3.	33KV Cable Outdoor termination Complete kit Including all accessories.	Sets	6
4.	Supply of 24 core, Optical Fiber Cable (OFC) inclusive joint boxes, fixing clamps, fusion splices and connections to joint boxes, FOTE (Fiber Optic Terminal Equipment) at both ends for cable monitoring and communication		
	a) Fiber Optic Cable	KM	8.8
	b) Fiber Optic Cable Joint Box inclusive of all accessories	Lot	1
	c) Fiber Optic Cable Termination Equipment inclusive of all accessories	Sets	2
	d) Distributed Acoustic Sensing (DAS) & Distributed Temperature Sensing (DTS) system with all necessary accessories as per scope of work and technical specification for the double circuit Underground Power Cable	Lot	1
5.	Ø150 mm MPP Pipe for Road/Culvert/Bridge/Railway crossing for each power cable.	Meter	1200
6.	Ø40 mm HDPE Pipe for Road/Culvert/Bridge/Railway crossing for Fiber Optic Cable	Lot	1
7.	Plastic Cable ties suitable for trefoil of 33kV, 1x800mm^2 XLPE Cable including Fiber Optic Cable at 3 meter interval.	Lot	1
8.	**Civil Works:**		
	a) HDD Boring for Road/Culvert/Bridge/Railway level crossing.	Meter	1200
	b) Excavation of Soil as required.	Lot	1
	c) Breaking of pucca surface as required.	Lot	1
	d) Backfilling by fine graded sand as required.	Lot	1
	e) Backfilling by Picket/Brick chips with sand (1:1)	Lot	1
	f) R.C.C cable trench with R.C.C. slab (1:1.5:3)	Lot	1
	g) R.C.C. precast slab through the buried portion of cable for cover and side.	Lot	1
	h) R.C.C cable inspection pit at each jointing of the Cable	Lot	1
9.	Installation, Testing, Pre-Commissioning, Commissioning of all Equipment in complete with all respect.	Lot	1
10.	Design, Drawing, Inspection and Training complete with all respect.	Lot	1

6.1.4.3 Design, Supply, Construction, Erection, Installation, Testing and Commissioning of 33 kV Underground Cable from SHOLOSAHAR 33/11 kV GIS Substation TO MURADPUR 33/11 kV Substation BPDB, Chattogram.

Line Item No.	Description of Item	Quantity	
1	**2**	**3**	
1.	33kV, 1x800mm^2 XLPE U/G Armoured Copper Cable	KM	26.4
2.	Heat Shrinkable Straight through jointing kit suitable for the 33kV, 1x800mm^2 XLPE Cable including all accessories	Sets	48
3.	Supply of 24 core, Optical Fiber Cable (OFC) inclusive joint boxes, fixing clamps, fusion splices and connections to joint boxes, FOTE (Fiber Optic Terminal Equipment) at both ends for cable monitoring and communication		
	a) Fiber Optic Cable	KM	8.8
	b) Fiber Optic Cable Joint Box inclusive of all accessories	Lot	1
	c) Fiber Optic Cable Termination Equipment inclusive of all accessories	Sets	2
	d) Distributed Acoustic Sensing (DAS) & Distributed Temperature Sensing (DTS) system with all necessary accessories as per scope of work and technical specification for the double circuit Underground Power Cable	Lot	1
4.	Ø150 mm MPP Pipe for Road/Culvert/Bridge/Railway crossing for each power cable.	Meter	4140
5.	Ø40 mm HDPE Pipe for Road/Culvert/Bridge/Railway crossing for Fiber Optic Cable	Lot	1
6.	Plastic Cable ties suitable for trefoil of 33kV, 1x800mm^2 XLPE Cable including Fiber Optic Cable at 3 meter interval.	Lot	1
7.	**Civil Works:**		
	a) HDD Boring for Road/Culvert/Bridge/Railway level crossing.	Meter	4140
	b) Excavation of Soil as required.	Lot	1
	c) Breaking of pucca surface as required.	Lot	1
	d) Backfilling by fine graded sand as required.	Lot	1
	e) Backfilling by Picket/Brick chips with sand (1:1)	Lot	1
	f) R.C.C cable trench with R.C.C. slab (1:1.5:3)	Lot	1
	g) R.C.C. precast slab through the buried portion of cable for cover and side.	Lot	1
	h) R.C.C cable inspection pit at each jointing of the Cable	Lot	1
8.	Installation, Testing, Pre-Commissioning, Commissioning of all Equipment in complete with all respect.	Lot	1
9.	Design, Drawing, Inspection and Training complete with all respect.	Lot	1

6.1.4.4 Design, Supply, Construction, Erection, Installation, Testing and Commissioning of 33 kV Underground Cable from KALURGHAT GRID TO A K KHAN SCHOOL NEW 33/11 kV Substation BPDB, Chattogram.

Line Item No.	Description of Item	Quantity	
1	**2**	**3**	
1.	33kV, 1x800mm^2 XLPE U/G Armoured Copper Cable	KM	39.6
2.	Heat Shrinkable Straight through jointing kit suitable for the 33kV, 1x800mm^2 XLPE Cable including all accessories	Sets	78
3.	33KV Cable Outdoor termination Complete kit Including all accessories.	Sets	6
4.	Supply of 24 core, Optical Fiber Cable (OFC) inclusive joint boxes, fixing clamps, fusion splices and connections to joint boxes, FOTE (Fiber Optic Terminal Equipment) at both ends for cable monitoring and communication		
	a) Fiber Optic Cable	KM	13.2
	b) Fiber Optic Cable Joint Box inclusive of all accessories	Lot	1
	c) Fiber Optic Cable Termination Equipment inclusive of all accessories	Sets	2
	d) Distributed Acoustic Sensing (DAS) & Distributed Temperature Sensing (DTS) system with all necessary accessories as per scope of work and technical specification for the double circuit Underground Power Cable	Lot	1
5.	Ø150 mm MPP Pipe for Road/Culvert/Bridge/Railway crossing for each power cable.	Meter	3060
6.	Ø40 mm HDPE Pipe for Road/Culvert/Bridge/Railway crossing for Fiber Optic Cable	Lot	1
7.	Plastic Cable ties suitable for trefoil of 33kV, 1x800mm^2 XLPE Cable including Fiber Optic Cable at 3 meter interval.	Lot	1
8.	**Civil Works:**		
	a) HDD Boring for Road/Culvert/Bridge/Railway level crossing.	Meter	3060
	b) Excavation of Soil as required.	Lot	1
	c) Breaking of pucca surface as required.	Lot	1
	d) Backfilling by fine graded sand as required.	Lot	1
	e) Backfilling by Picket/Brick chips with sand (1:1)	Lot	1
	f) R.C.C cable trench with R.C.C. slab (1:1.5:3)	Lot	1
	g) R.C.C. precast slab through the buried portion of cable for cover and side.	Lot	1
	h) R.C.C cable inspection pit at each jointing of the Cable	Lot	1
9.	Installation, Testing, Pre-Commissioning, Commissioning of all Equipment in complete with all respect.	Lot	1
10.	Design, Drawing, Inspection and Training complete with all respect.	Lot	1

6.1.4.5 Design, Supply, Construction, Erection, Installation, Testing and Commissioning of 33 kV Underground Cable from SHOLOSAHAR 33/11 KV GIS SUBSTATION TO BARO DGHIR PAR 33/11 kV Substation BPDB, Chattogram.

Line Item No.	Description of Item	Quantity	
1	**2**	**3**	
1.	33kV, 1x800mm^2 XLPE U/G Armoured Copper Cable	KM	39.6
2.	Heat Shrinkable Straight through jointing kit suitable for the 33kV, 1x800mm^2 XLPE Cable including all accessories	Sets	78
3.	Supply of 24 core, Optical Fiber Cable (OFC) inclusive joint boxes, fixing clamps, fusion splices and connections to joint boxes, FOTE (Fiber Optic Terminal Equipment) at both ends for cable monitoring and communication		
	a) Fiber Optic Cable	KM	13.2
	b) Fiber Optic Cable Joint Box inclusive of all accessories	Lot	1
	c) Fiber Optic Cable Termination Equipment inclusive of all accessories	Sets	2
	d) Distributed Acoustic Sensing (DAS) & Distributed Temperature Sensing (DTS) system with all necessary accessories as per scope of work and technical specification for the double circuit Underground Power Cable	Lot	1
4.	Ø150 mm MPP Pipe for Road/Culvert/Bridge/Railway crossing for each power cable.	Meter	2580
5.	Ø40 mm HDPE Pipe for Road/Culvert/Bridge/Railway crossing for Fiber Optic Cable	Lot	1
6.	Plastic Cable ties suitable for trefoil of 33kV, 1x800mm^2 XLPE Cable including Fiber Optic Cable at 3 meter interval.	Lot	1
7.	**Civil Works:**		
	a) HDD Boring for Road/Culvert/Bridge/Railway level crossing.	Meter	2580
	b) Excavation of Soil as required.	Lot	1
	c) Breaking of pucca surface as required.	Lot	1
	d) Backfilling by fine graded sand as required.	Lot	1
	e) Backfilling by Picket/Brick chips with sand (1:1)	Lot	1
	f) R.C.C cable trench with R.C.C. slab (1:1.5:3)	Lot	1
	g) R.C.C. precast slab through the buried portion of cable for cover and side.	Lot	1
	h) R.C.C cable inspection pit at each jointing of the Cable	Lot	1
8.	Installation, Testing, Pre-Commissioning, Commissioning of all Equipment in complete with all respect.	Lot	1
9.	Design, Drawing, Inspection and Training complete with all respect.	Lot	1

6.1.4.6 Design, Supply, Construction, Erection, Installation, Testing and Commissioning of 33 kV Underground Cable from Sholosahar Grid to Sholosahar 33/11 kV GIS Substation BPDB, Chattogram.

Line Item No.	Description of Item	Quantity	
1	2	3	
1.	33kV, 1x800mm^2 XLPE U/G Armoured Copper Cable	KM	1.65
2.	33KV Cable Outdoor termination Complete kits including all accessories	Sets	6
3.	33KV Cable Indoor GIS termination Complete kits including all accessories	Sets	6
4.	Clamp, Cable holder in S/S Side..as required	Sets	12
5.	**Civil Works:**		
	a) Excavation of Soil as required.	Lot	1
	b) Breaking of pucca surface as required.	Lot	1
	c) Backfilling by fine graded sand as required.	Lot	1
	d) Backfilling by Picket/Brick chips with sand (1:1)	Lot	1
	e) R.C.C cable trench with R.C.C. slab (1:1.5:3)	Lot	1
6.	Installation, Testing, Pre-Commissioning, Commissioning of all Equipment in complete with all respect.	Lot	1
7.	Design, Drawing, Inspection and Training complete with all respect.	Lot	1

6.1.5.0 Mandatory Spare parts

S/L No	Description of Item	Unit	Quantity
1.	Supply of HT Bushing for 20/26MVA Power Transformer (1 Set = 3 Nos.)	Sets	2
2.	Supply of LT Bushing for 20/26MVA Power Transformer (1 Set = 4 Nos.)	Sets	2
3.	Supply of 33kV, Single phase Post type Lightning Arrester (ZnO-type), Class-3	Sets (3 nos.= 1 set)	5
4.	Supply of 11kV, Single phase Post type Lightning Arrester (ZnO-type), Class-2	Sets (3 nos.= 1 set)	10
5.	Supply of Closing Coil for GIS panel	Sets	10
6.	Supply of Tripping Coil for GIS panel	Sets	10
7.	Supply of Universal Motor/Spring Charge motor for 11kV GIS panel	Sets	5
8.	Supply of Universal Motor/Spring Charge motor for 33kV GIS panel	Sets	5
9.	Supply of Differential Relay, 3 O/C + 1 E/F + 3 Directional O/C + 1 Directional E/F for 33kV Control Metering and Relay Panel as per	Sets	2

	technical specification.		
10.	Supply of Bay Control and Protection Unit (BCPU), 3 Over Current + 2 Earth fault (1 E/F + 1 Separate Standby Earth Fault) + Directional O/C & E/F relay for 33kV Control Metering and Relay Panel as per technical specification.	Sets	2
11.	Supply of Bay Control and Protection Unit (BCPU), 3 Over Current + 2 Earth fault (1 E/F + 1 Separate Standby Earth Fault) + Directional O/C & E/F relay for 11kV Control Metering and Relay Panel as per technical specification.	Sets	5
12.	Supply of Heat shrinkable Straight through Jointing kits for 33kV, 800mm^2 Cable including all accessories	Sets	30
13.	Supply of Heat shrinkable Indoor GIS termination kit including all accessories for 33kV, 800mm^2 Cable	Sets	12
14.	Supply of Heat shrinkable Indoor GIS termination kit including all accessories for 33kV, 500mm^2 Cable	Sets	6
15.	Supply of Heat shrinkable Outdoor termination kit including all accessories for 33kV, 500mm^2 Cable	Sets	6
16.	Supply of Heat shrinkable Indoor GIS termination kit including all accessories for 11kV, 630mm^2 Cable	Sets	6
17.	Supply of Heat shrinkable Outdoor termination kit including all accessories for 11kV, 630mm^2 Cable	Sets	6
18.	Supply of Heat shrinkable Indoor GIS termination kit including all accessories for 11kV, 3x185mm^2 Cable	Sets	30
19.	Supply of Heat shrinkable Outdoor termination kit including all accessories for 11kV, 3x185mm^2 Cable	Sets	30
20.	Supply of Tool box for HV Cable Jointing and Termination	Set	2
21.	Supply of Test plug for Power Cable	Sets	2
22.	Supply of SFRA Testing Kit with all accessories and Software	Sets	2
23.	Supply of Cable fault locator with all accessories (EU/UK/USA/Korea/Japan/Australia make)	Sets	2
24.	Supply of Partial Discharge Measurement and Analysis of Transformer & Cable	Sets	2
25.	DS/ES Motor Control Unit/ Device/ Card for 33kV	sets	5
26.	DS/ES Motor Control Unit/ Device/ Card for 11kV	sets	5

6.2 Specification

The Plant & Equipment shall comply with following Technical Specifications:

Item No	Name of Item or Related Service	Technical Specification and Standards
1	**2**	**3**
	Plant & Equipment	Bidder shall comply the Technical Specifications as per **Section 7** & Guaranteed Technical Particular (GTP) as per **Section-8,** otherwise bid will be rejected.
	Inspection and Tests	*As per Section 7 and Section 8*

6.3Form of Completion Certificate

Contract No: Date:
To:

[Name of Contractor]

Pursuant to GCC Clause 39 (Completion of the Facilities) of the General Conditions of the Contract entered into between yourselves and the Employer dated *[insert date]*, for the supply and installation of plant and Services for *[name of contract],* we hereby notify you that the following part(s) of the Facilities was (were) complete on the date specified below, and that, in accordance with the terms of the Contract, the Employer hereby takes over the said part(s) of the Facilities, together with the responsibility for care and custody and the risk of loss thereof on the date mentioned below.

1. Description of the Facilities or part thereof: _____

2. Date of Completion: _____

However, you are required to complete the outstanding items listed in the attachment hereto as soon as practicable.

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defect Liability Period.

Very truly yours,

for and on behalf of the Employer

[***Signature***]

[***Title of the Project Manager***]

6.4 Form of Operational Acceptance Certificate

Contract No: Date:
To:

[Name of Contractor]

Pursuant to GCC Clause 40.3 (Operational Acceptance) of the General Conditions of the Contract entered into between yourselves and the Employer dated *[insert date]*, for the supply and installation of plant and Services for *[name of contract]*, we hereby notify you that the Functional Guarantees of the following part(s) of the Facilities were satisfactorily attained on the date specified below.

1. Description of the Facilities or part thereof: _____

2. Date of Operational Acceptance: _____

This letter does not relieve you of your obligation to complete the execution of the Facilities in accordance with the Contract nor of your obligations during the Defect Liability Period.

Very truly yours,

for and on behalf of the Employer

[***Signature***]

[***Title of the Project Manager***]

6.5 Form of Change Order Procedure and Forms

Contract No: Date:
To:

[Name of Contractor]

CONTENTS

ANNEXES

Change Order Procedure

1. General

This section provides samples of procedures and forms for implementing changes in the Facilities during the performance of the Contract in accordance with GCC Clause 64 (Change in the Facilities) of the General Conditions.

2. Change Order Log

The Contractor shall keep an up-to-date Change Order Log to show the current status of Requests for Change and Changes authorized or pending, as Annex 8. Entries of the Changes in the Change Order Log shall be made to ensure that the log is up-to-date. The Contractor shall attach a copy of the current Change Order Log in the monthly progress report to be submitted to the Employer.

3. References for Changes

(1) Request for Change as referred to in GCC Clause64 shall be serially numbered CR-X-nnn.

(2) Estimate for Change Proposal as referred to in GCC Clause 64 shall be serially numbered CN-X-nnn.

(3) Acceptance of Estimate as referred to in GCC Clause 64 shall be serially numbered CA-X-nnn.

(4) Change Proposal as referred to in GCC Clause 64 shall be serially numbered CP-X-nnn.

(5) Change Order as referred to in GCC Clause 64 shall be serially numbered CO-X-nnn.

Note: (a) Requests for Change issued from the Employer's Home Office and the Site representatives of the Employer shall have the following respective references:

Home Office	CR-H-nnn
Site	CR-S-nnn

(b) The above number "nnn" is the same for Request for Change, Estimate for Change Proposal, Acceptance of Estimate, Change Proposal and Change Order.

Annex 1. Request for Change Proposal

(Employer's Letterhead)

To: Date:

Attention:

Contract Name:
Contract Number:

With reference to the captioned Contract, you are requested to prepare and submit a Change Proposal for the Change noted below in accordance with the following instructions within _____ days of the date of this letter _____.

1. Title of Change: _____
2. Change Request No. _____
3. Originator of Change: Employer: _____
   Contractor (by Application for Change Proposal No. _____[16]:
4. Brief Description of Change: _____
5. Facilities and/or Item No. of equipment related to the requested Change: _____

6. Reference drawings and/or technical documents for the request of Change:

   Drawing No./Document No. Description

7. Detailed conditions or special requirements on the requested Change: _____

8. General Terms and Conditions:
   (a) Please submit your estimate to us showing what effect the requested Change will have on the Contract Price.
   (b) Your estimate shall include your claim for the additional time, if any, for completion of the requested Change.
   (c) If you have any opinion negative to the adoption of the requested Change in connection with the conformability to the other provisions of the Contract or the safety of the Plant or Facilities, please inform us of your opinion in your proposal of revised provisions.
   (d) Any increase or decrease in the work of the Contractor relating to the services of its personnel shall be calculated.
   (e) You shall not proceed with the execution of the work for the requested Change until we have accepted and confirmed the amount and nature in writing.

Signature:	*[insert signature of authorised representative of the Employer]*
Name:	*[insert full name of signatory with National ID Number]*
Title of the Signatory:	*[insert title of the Signatory]*
Name of the Employer:	*[insert name of the Employer]*

Annex 2. Estimate for Change Proposal

(Contractor's Letterhead)

To: Date:

Attention:

Contract Name:
Contract Number:

With reference to your Request for Change Proposal, we are pleased to notify you of the approximate cost of preparing the below-referenced Change Proposal in accordance with GCC Sub-Clause64.2.1 of the General Conditions. We acknowledge that your agreement to the cost of preparing the Change Proposal, in accordance with GCC Sub-Clause64.2.2, is required before estimating the cost for change work.

1. Title of Change: _____

2. Change Request No./Rev.: _____

3. Brief Description of Change: _____

4. Scheduled Impact of Change: _____

5. Cost for Preparation of Change Proposal: _____[17]

   (a) Engineering (Amount)

   (i) Engineer _____hrs x _____ rate/hr =
   (ii) Draftsperson _____hrs x _____ rate/hr =
   Sub-total _____hrs

   Total Engineering Cost

   (b) Other Cost

   Total Cost (a) + (b)

Signature:	*[insert signature of authorised representative of the Employer]*
Name:	*[insert full name of signatory with National ID Number]*
Title of the Signatory:	*[insert title of the Signatory]*
Name of the Employer:	*[insert name of the Employer]*

[17] Costs shall be in the currencies of the Contract.

Annex 3. Acceptance of Estimate

(Employer's Letterhead)

To: Date:

Attention:

Contract Name:
Contract Number:

We hereby accept your Estimate for Change Proposal and agree that you should proceed with the preparation of the Change Proposal.

1. Title of Change: _____

2. Change Request No./Rev.: _____

3. Estimate for Change Proposal No./Rev.: _____

4. Acceptance of Estimate No./Rev.: _____

5. Brief Description of Change: _____

6. Other Terms and Conditions: In the event that we decide not to order the Change accepted, you shall be entitled to compensation for the cost of preparation of Change Proposal described in your Estimate for Change Proposal mentioned in para. 3 above in accordance with GCC Clause64 of the General Conditions.

Signature:	*[insert signature of authorised representative of the Employer]*
Name:	*[insert full name of signatory with National ID Number]*
Title of the Signatory:	*[insert title of the Signatory]*
Name of the Employer:	*[insert name of the Employer]*

Annex 4. Change Proposal

(Contractor's Letterhead)

To: Date:

Attention:

Contract Name:
Contract Number:

In response to your Request for Change Proposal No. _____, we hereby submit our proposal as follows:

1. Title of Change: _____

2. Change Proposal No./Rev.: _____

3. Originator of Change: Employer: *[*_____
   Contractor: _____

4. Brief Description of Change: _____

5. Reasons for Change: _____

6. Facilities and/or Item No. of Equipment related to the requested Change: _____

7. Reference drawings and/or technical documents for the requested Change:

   Drawing/Document No. Description

8. Estimate of increase/decrease to the Contract Price resulting from Change Proposal:[18]

(Amount)

   (a) Direct material

   (b) Major construction equipment

   (c) Direct field labor (Total _____hrs)

   (d) Subcontracts

   (e) Indirect material and labor

   (f) Site supervision

   (g) Head office technical staff salaries

   Process engineer _____hrs @ _____ rate/hr
   Project engineer _____hrs @ _____ rate/hr

[18] Costs shall be in the currencies of the Contract.

Equipment engineer _____hrs @ _____ rate/hr
Procurement _____hrs @ _____ rate/hr
Draftsperson _____hrs @ _____ rate/hr
Total _____hrs

(h) Extraordinary costs (computer, travel, etc.)

(i) Fee for general administration, _____ % of Items

(j) Taxes and customs duties

Total lump sum cost of Change Proposal
(Sum of items (a) to (j))

Cost to prepare Estimate for Change Proposal
(Amount payable if Change is not accepted)

9. Additional time for Completion required due to Change Proposal

10. Effect on the Functional Guarantees

11. Effect on the other terms and conditions of the Contract

12. Validity of this Proposal: within *[Number]* days after receipt of this Proposal by the Employer

13. Other terms and conditions of this Change Proposal:

(a) You are requested to notify us of your acceptance, comments or rejection of this detailed Change Proposal within _____ days from your receipt of this Proposal.

(b) The amount of any increase and/or decrease shall be taken into account in the adjustment of the Contract Price.

(c) Contractor's cost for preparation of this Change Proposal:[2]

Signature:	*[insert signature of authorised representative of the Contractor]*
Name:	*[insert full name of signatory with National ID Number]*
Title of the Signatory:	*[insert title of the Signatory]*
Name of the Contractor:	*[insert name of the Contractor]*

[2] Specify where necessary.

Annex 5. Change Order

(Employer's Letterhead)

To: Date:

Attention:

Contract Name:
Contract Number:

We approve the Change Order for the work specified in the Change Proposal (No. _____), and agree to adjust the Contract Price, Time for Completion and/or other conditions of the Contract in accordance with GCC Clause64 of the General Conditions.

1. Title of Change: _____

2. Change Request No./Rev.: _____

3. Change Order No./Rev.: _____

4. Originator of Change: Employer: _____
   Contractor: _____

5. Authorized Price:

   Ref. No.: _____ Date:
   _____
   Foreign currency portion _____ plus Local currency portion _____

6. Adjustment of Time for Completion

   None Increase _____ days Decrease _____ days

7. Other effects, if any

Authorized by: _____ Date:
(Employer)

Accepted by: _____ Date:
(Contractor)

Annex 6. Pending Agreement Change Order

(Employer's Letterhead)

To: Date:

Attention:

Contract Name:
Contract Number:

We instruct you to carry out the work in the Change Order detailed below in accordance with GCC Clause64 of the General Conditions.

1. Title of Change: _____

2. Employer's Request for Change Proposal No./Rev.: _____ dated: _____

3. Contractor's Change Proposal No./Rev.: _____ dated: _____

4. Brief Description of Change: _____

5. Facilities and/or Item No. of equipment related to the requested Change: _____

6. Reference Drawings and/or technical documents for the requested Change:

   Drawing/Document No. Description

7. Adjustment of Time for Completion:

8. Other change in the Contract terms:

9. Other terms and conditions:

Signature:	*[insert signature of authorised representative of the Employer]*
Name:	*[insert full name of signatory with National ID Number]*
Title of the Signatory:	*[insert title of the Signatory]*
Name of the Employer:	*[insert name of the Employer]*

Annex 7. Application for Change Proposal

(Contractor's Letterhead)

To: Date:

Attention:

Contract Name:
Contract Number:

We hereby propose that the below-mentioned work be treated as a Change in the Facilities.

1. Title of Change: _____
2. Application for Change Proposal No./Rev.: _____ dated: _____
3. Brief Description of Change: _____
4. Reasons for Change:
5. Order of Magnitude Estimation (in the currencies of the Contract):
6. Scheduled Impact of Change:
7. Effect on Functional Guarantees, if any:
8. Appendix:

Signature:	*[insert signature of authorised representative of the Contractor]*
Name:	*[insert full name of signatory with National ID Number]*
Title of the Signatory:	*[insert title of the Signatory]*
Name of the Contractor:	*[insert name of the Contractor]*

Signature Seal

6.6 Supplementary Information

[The Tenderer shell furnish additional description/information covering all activities, if any]