

DRAWINGS FORMING PART OF THE SPECIFICATION

17. Bid Drawings

17.1 General

The drawings provided in this section are solely for the purpose of bid information and bid preparation.

They present the typical details of the project facilities and plant requirements for the following.

- I. Extension of the Existing 230/132 kV Substation Rajshahi
- II. New 132/33 kV Substation Bangura
- III. Extension of the Existing 132/33 kV Substation Baghabari
- IV. New 132/33 kV Substation Miithapukur

17.2 List of Bid Drawings

No.	Drawing No.	Drawing Title
I		New 230/132 kV Substation Rajshahi
1.1	NZSS/1.1	Extension of Existing 230/132 kV Substation Rajshahi- Single Line Diagram
1.2	NZSS/1.2	Extension of Existing 230/132 kV Substation Rajshahi- Substation Layout
1.3	NZSS/1.3	Extension of Existing 230/132 kV Substation Rajshahi- Cross Section 230 kV
1.4	NZSS/1.4	Extension of Existing 230/132 kV Substation Rajshahi- Block Diagram - Line Bay 230 kV
1.5	NZSS/1.5	Extension of Existing 230/132 kV Substation Rajshahi- Block Diagram - Transformer Bay 230/132 kV
1.6	NZSS/1.6	Extension of Existing 230/132 kV Substation Rajshahi- Block Diagram - Bus Coupler Bay 230 kV
II		New 132/33 kV Substation Bangura
2.1	NZSS/2.1	New 132/33 kV Substation Bangura - Single Line Diagram
2.2	NZSS/2.2	New 132/33 kV Substation Bangura - Substation Layout
2.3	NZSS/2.3	New 132/33 kV Substation Bangura - Cross Section 132 kV
2.4	NZSS/2.4	New 132/33 kV Substation Bangura - Block Diagram - Line Bay 132 kV
2.5	NZSS/2.5	New 132/33 kV Substation Bangura - Block Diagram - Transformer Bay 132/33 kV
III		Extension of Existing 132/33 kV Substation Baghabari
3.1	NZSS/3.1	Extension of Existing 132/33 kV Substation Baghabari - Single Line Diagram
IV		New 132/33 kV Substation Miithapukur
4.1	NZSS/4.1	New 132/33 kV Substation Miithapukur - Single Line Diagram
4.2	NZSS/4.2	New 132/33 kV Substation Miithapukur - Substation Layout



No.	Drawing No.	Drawing Title
4.3	NZSS/4.3	New 132/33 kV Substation Miithapukur - Cross Section 132 kV
4.4	NZSS/4.4	New 132/33 kV Substation Miithapukur - Block Diagram - Line Bay 132 kV
4.5	NZSS/4.5	New 132/33 kV Substation Miithapukur - Block Diagram - Transformer Bay 132/33 kV
4.6	NZSS/4.6	New 132/33 kV Substation Miithapukur - Block Diagram - Bus Coupler Bay 132 kV
V-IX		General Drawings
5.1	NZSS/5.1	Switchgear 33 kV
6.1	NZSS/6.1	Substation Automation System - Architecture
7.1	NZSS/7.1 (Rev-1)	LV DC System 110 V & 48 V
7.2	NZSS/7.2	LV AC System 400/230 V & UPS
8.1	NZSS/8.1	Telecommunication System - Architecture
8.2	NZSS/8.2(Rev-1)	Typical Communication Schematic Diagram for Grid Substation
9.1	NZSS/9.1	Building - Ground Floor
9.2	NZSS/9.2	Building - First Floor - I Version
9.3	NZSS/9.3	Building - First Floor - II Version
9.4	NZSS/9.4	Building - Section I
9.5	NZSS/9.5	Building - Section II
9.6	NZSS/9.6(Rev-1)	Boundary Wall or Security Wall
9.7	NZSS/9.7	Guard House
9.8	NZSS/9.8	Gantry & Cable Trench
9.9	NZSS/9.9	Road
10.0	NZSS/10.0	Typical sectional details of property marking with continuous grade beam and column for substations
10.1	NZSS/10.1	Relative level of switchyard and different structures
10.2	NZSS/10.2	Internal Road Section

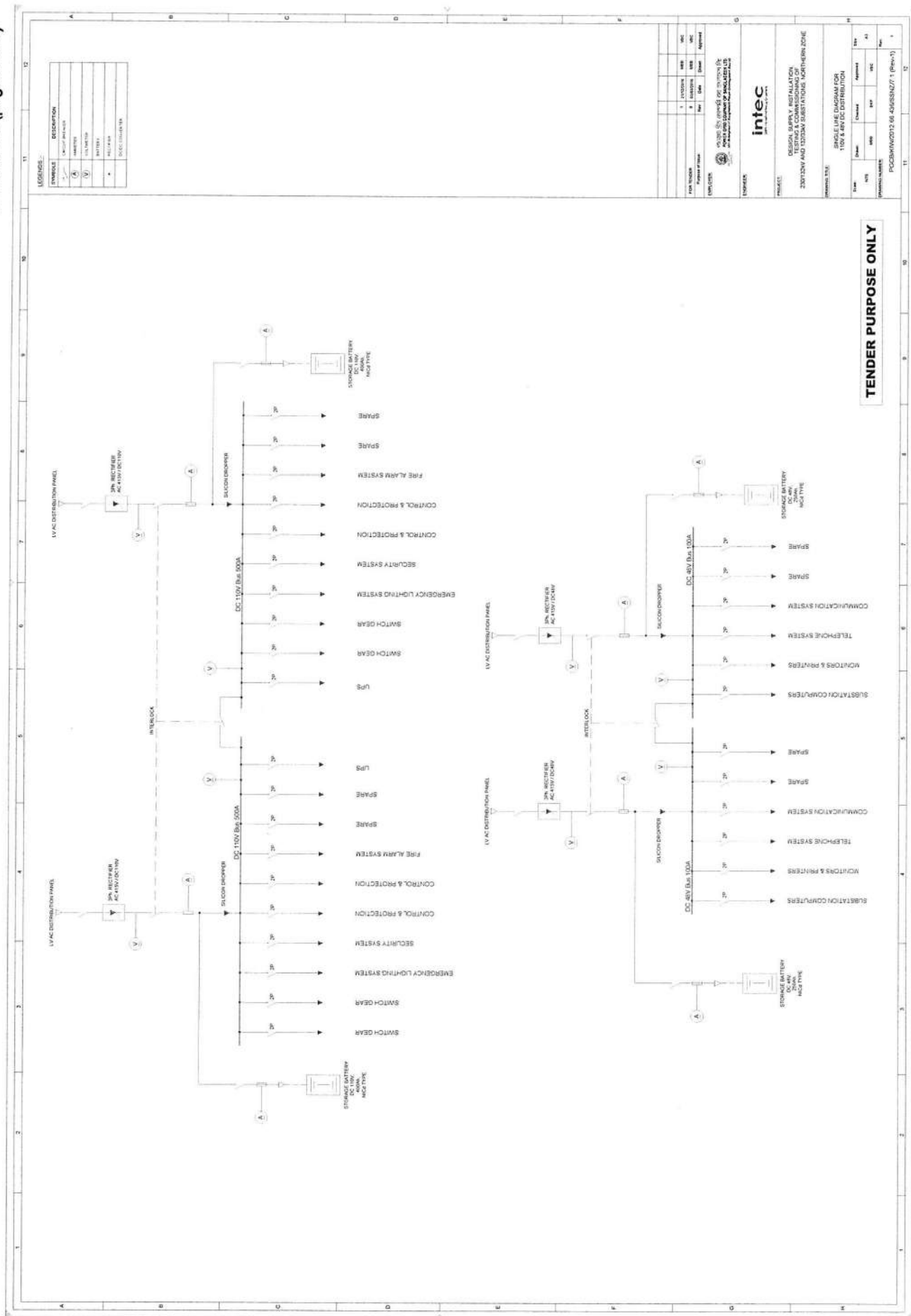
17.3 Drawings

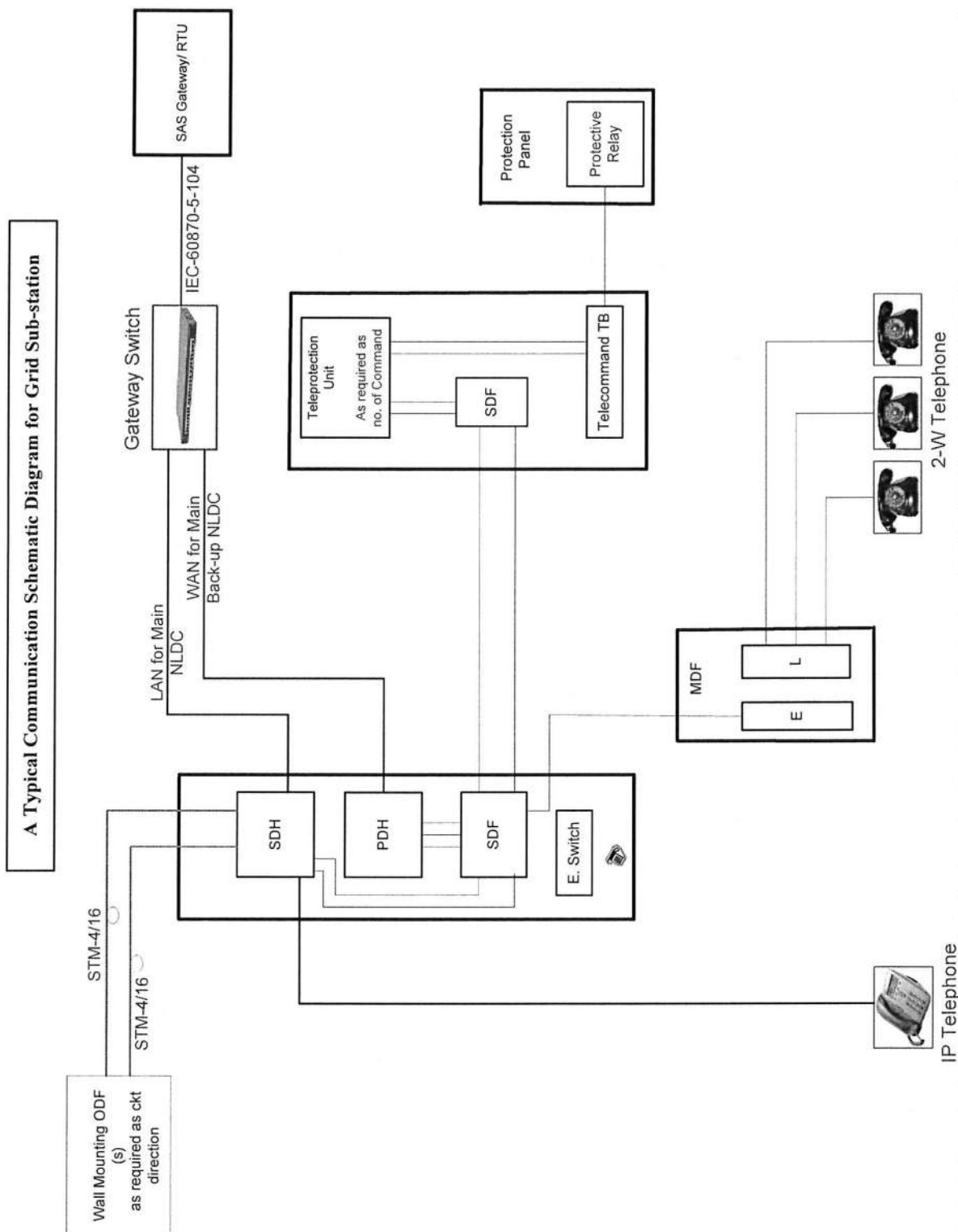
Bangladesh: Tender Documents for 230/132 kV and 132/33 kV Substations, Northern Zone

Contract No. PGCB/KfW/2012.66.436/NZSS

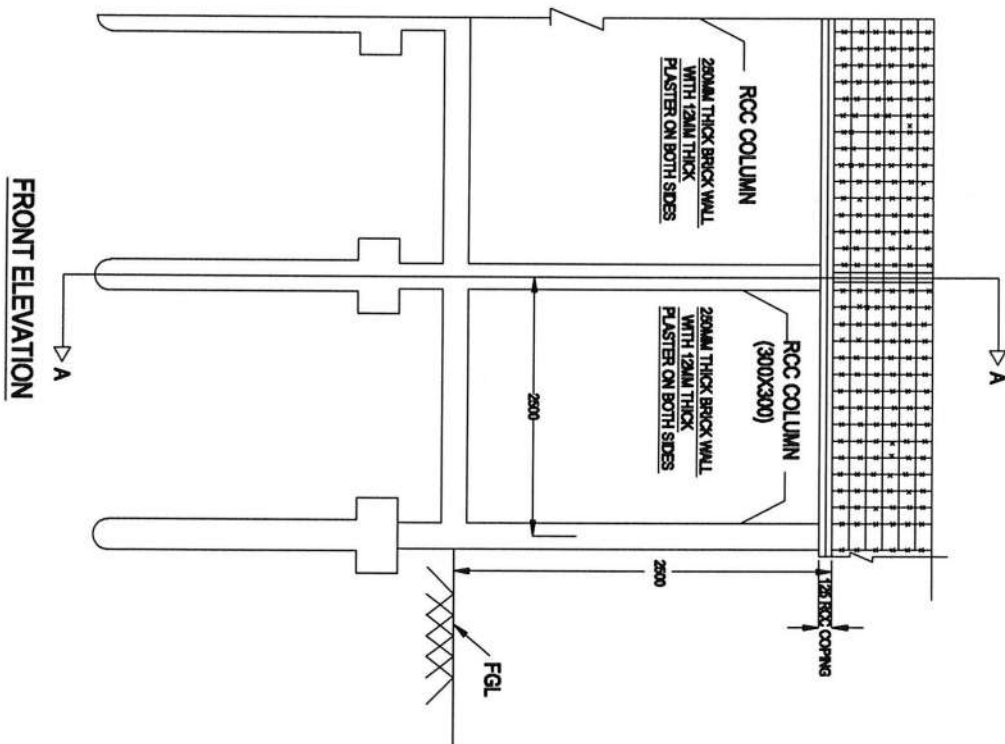
BGD 1800 NZSS Vol 2 2016 11 16.docx



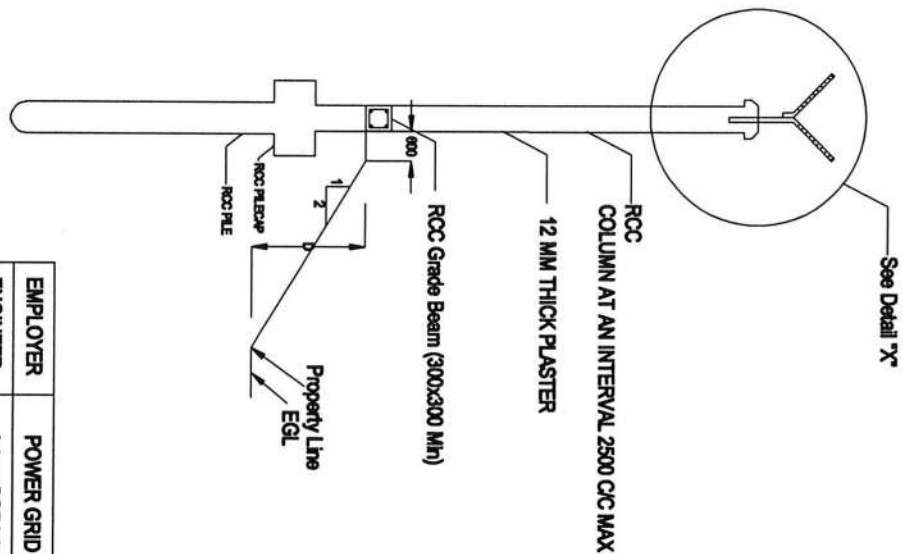




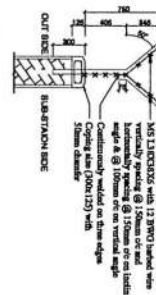
Project Name: - Design, Supply, Installation, Testing & Commissioning of 230/132 kV and 132/33 kV Substations, Northern Zone, on Turnkey Basis
 Contract No. PGC/KFW/2012.66.436/NZSS
 Drawing No:- PGC/KFW/2012.66.436/SSNZ/8.2(RV-1)



SECTION:A-A

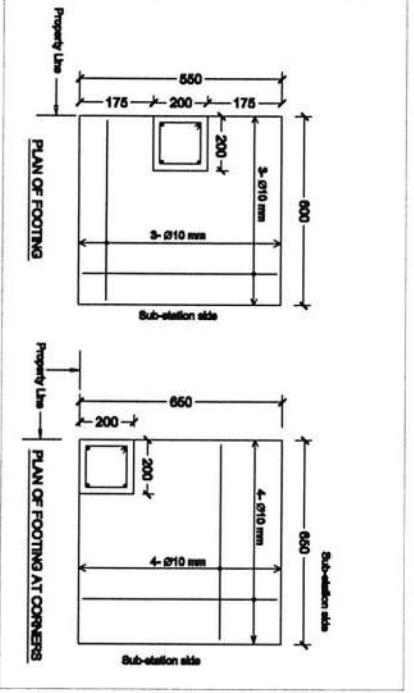
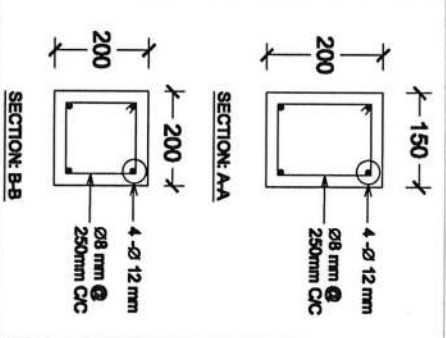
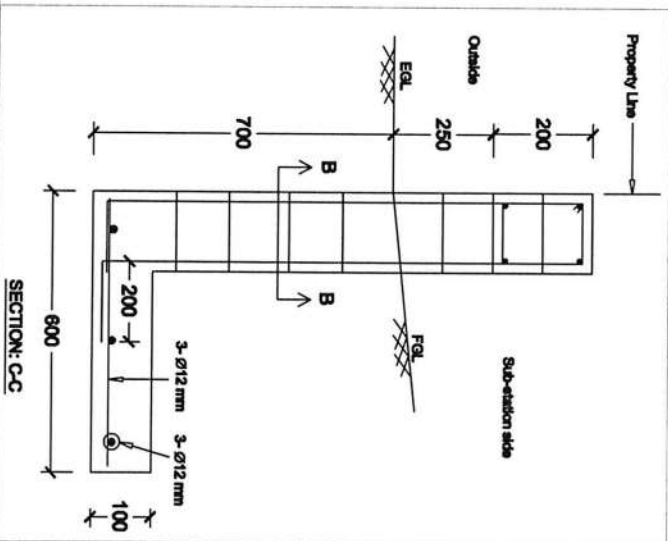
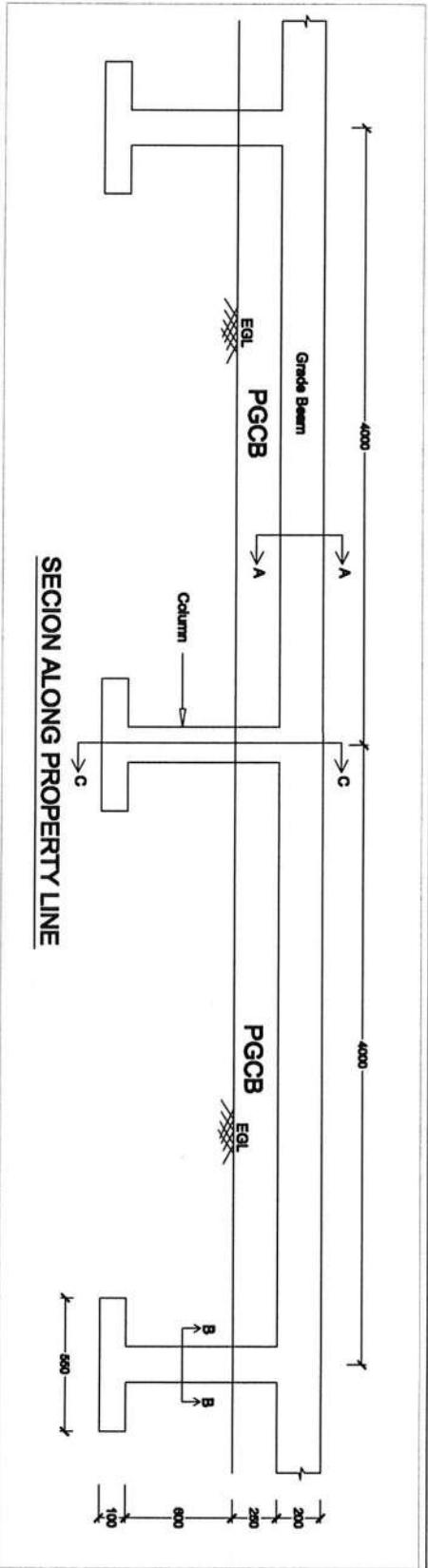


Detail 'X'



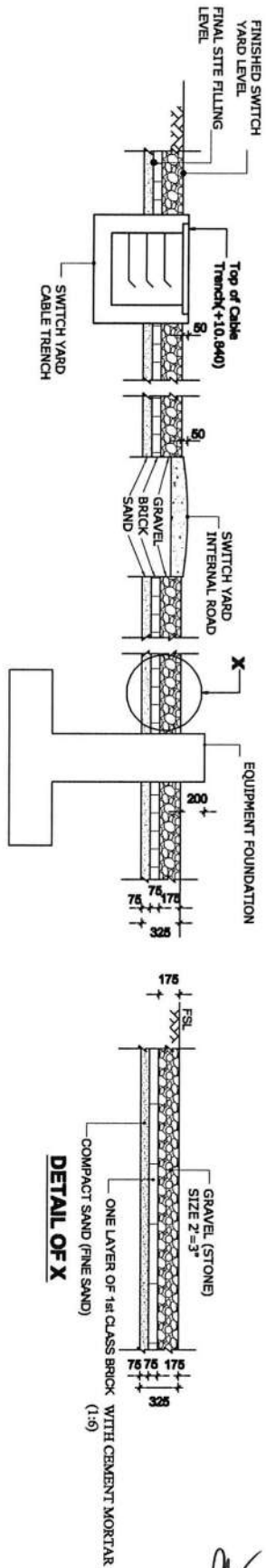
- NOTE:
- (1) "EGL" means Existing Ground level
 - (2) "FGL" means Finished Ground level
 - (3) ALL DIMENSIONS ARE IN MM
 - (4) "D"-Depth of Earth Filling for Land Development
 - (5) Construction shall have to be provided at 25m interval.
 - (6) This drawing is for tender purpose only.

EMPLOYER	POWER GRID COMPANY OF BANGLADESH LIMITED
ENGINEER	Intec: GOPA-International Energy Consultants GmbH
PROJECT	Design, Supply, Installation, Testing & Commissioning of 230/132kV and 132/33kV Substations Northern Zone on Turnkey Basis. (Contract No.- PGCB/KW/2012.66.436/NZSS)
Drawing Title	BOUNDARY WALL OR SECURITY WALL
Drawing No	PGCB/KW/2012.66.436/SSNZ/9.6 (Rev-1)

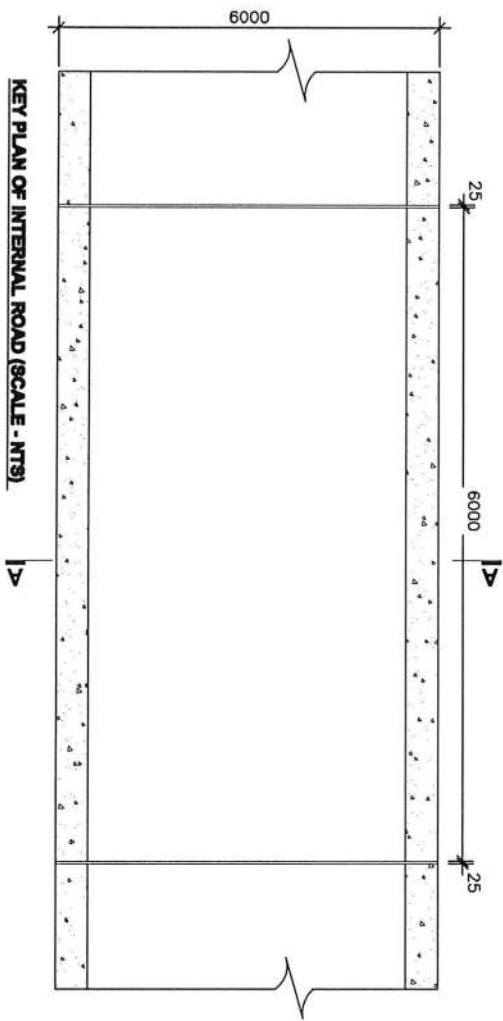
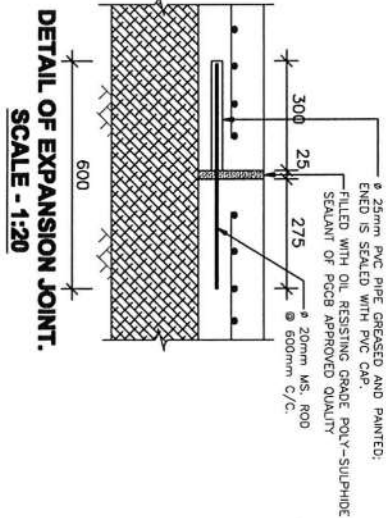
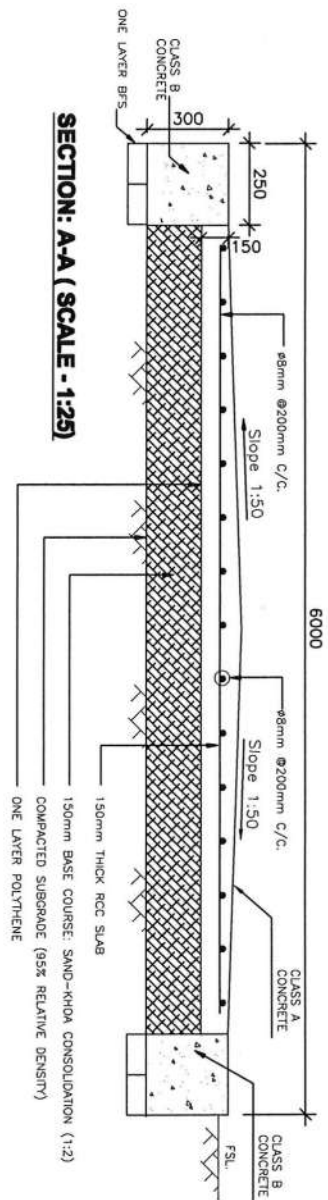


THIS DRAWING IS FOR TENDER PURPOSE ONLY

EMPLOYER: POWER GRID COMPANY OF BANGLADESH LTD.	DESIGNER: TYPICAL SECTIONAL DETAILS OF PROPERTY LINE MARKING WITH CONTINUOUS GRADE BEAM & COLUMN FOR SUB-STATIONS.
ENGINEER: Inrac-GOPA-International Energy Consultants Limited	DRAWING NO.: PGCANW2012.0A.00000270.0



EMPLOYER	POWER GRID COMPANY OF BANGLADESH LIMITED
ENGINEER	Intec: GOPA-International Energy Consultants GmbH
PROJECT	Design, Supply, Installation, Testing & Commissioning of 230/132kV and 132/33kV Substations Northern Zone on Turnkey Basis. (Contract No:- PGCB/KMW/2012.68.436/NZSS)
Drawing Title	RELATIVE LEVEL OF SWITCHYARD AND DIFFERENT STRUCTURES
Drawing No	PGCB/KMW/2012.68.436/SSNZ/10.1



EMPLOYER	POWER GRID COMPANY OF BANGLADESH LIMITED
ENGINEER	Intec: GOPA-International Energy Consultants GmbH
PROJECT	Design, Supply, Installation, Testing & Commissioning of 230/132kV and 132/33kV Substations Northern Zone on Tumley Beale (Contract No- PGCB/KW/2012.06.439/288)
Drawing Title	INTERNAL ROAD SECTION
Drawing No	PGCB/KW/2012.06.439/SSN/10.2

1C2.2	Two (2) sets of 36 kV, 100 A, 25 kA, 50 Hz, 170/70 kV BIL, three pole, centre break, post type, manually operated disconnectors with integrated fuse of 10 A
1C3.1	Six (6) single-phase, 4-core, single ratio, 36 kV, 1600/1A, 25 kA, 50 Hz, 170/70 kV BIL, post type current transformer.
1C3.2	Six (6) (12) single-phase, 4-core, single ratio, 36 kV, 10/1A, 25 kA, 50 Hz, 170/70 kV BIL, post type current transformer.
1C4	Twelve (12) single-phase, 2-secondary winding, 36 kV, 33/V3 / 110/V3 / 110/V3 kV/V/V, 25 kA, 50 Hz, 170/70 kV BIL, inductive type voltage transformers.
1C5	Six (6) 36 kV, 30 kV continuous operating voltage, 10 kA nominal discharge current, 50 Hz, 170/70 kV BIL, gapless metal oxide type, single phase surge arresters.
1C7.X	One (1) lot of conductors for double busbar and for connection of the 33 kV switchgear, 36 kV, 2000 A, 25 kA.
1C8.X	One (1) lot of insulators and fittings including all necessary clamps and connectors required for completing 33 kV switchgear.
1C9.X	One (1) lot of gantry steel structures and equipment supports required for completing 33 kV switchgear.
1C10.X	All other necessary material and equipment to complete the 33 kV switchgear.
1D	Transformers
1D2	Two (2) 132/33 kV three phase 50/75 MVA, Dyn1, ONAN/ONAF Power transformer unit shall be designed, calculated, supplied, delivered, installed, tested and commissioned, under this contract.
1D4	Two (2) sets of Nitrogen Injection Fire Protection System (NIFPS) shall be provided for new 132/33 kV three phase 50/75 MVA, Dyn1, ONAN/ONAF power transformer units
1D10.X	All other necessary material and equipment to complete the transformers
1F	Earthing/Auxiliary Transformers
1F2	Two (2) 200 kVA, 33/0.4 kV, Dyn11, 3-phase earthing transformers to supply the substation auxiliary loads shall be designed, calculated, supplied, delivered, installed, tested and commissioned, under this contract.
1F10.X	All other necessary material and equipment to complete the auxiliary transformers.
1G	Control, Protection, Substation Automation and Metering One (1) lot of complete equipment for control, protection, alarm, SAS and metering panels for 132, 33 kV as well as LV AC and LV DC system shall be designed, calculated, supplied, delivered, installed, tested and commissioned, under this contract. The sequence of the control panels and protection panels shall mirror the actual switchyard layout. Space shall be provided adjacent to the control and relay suites for each voltage level to accommodate sufficient panels for the future circuits indicated in the substation layout drawings. A control panel shall accommodate the complete switchgear. 132 kV transmission line protection relay panels of Main-1 & Main-2 protection shall be supplied and installed. The equipment to be supplied, installed and commissioned is shown on Bid Drawings comprising the following.
1G1.2	Control, protection and SAS for one (1) sets of 132 kV overhead line circuit.



1C2.2	Two (2) sets of 36kV, 100A, 25kA, 50Hz, 170/70 kV BIL, three pole, centre break, post type, manually operated disconnectors with integrated fuse of 10A
1C3.1	Six (6) single-phase, 4-core, single ratio, 36kV, 1600/1A, 25kA, 50Hz, 170/70 kV BIL, post type current transformer.
1C3.2	Six (6) (12) single-phase, 4-core, single ratio, 36kV, 10/1A, 25kA, 50Hz, 170/70 kV BIL, post type current transformer.
1C4	Twelve (12) single-phase, 2-secondary winding, 36kV, 33/V3 / 110/V3 / 110/V3 kV/V/V, 25kA, 50Hz, 170/70 kV BIL, inductive type voltage transformers.
1C5	Six (6) 36kV, 30kV continuous operating voltage, 10kA nominal discharge current, 50Hz, 170/70 kV BIL, gapless metal oxide type, single phase surge arresters.
1C7.X	One (1) lot of conductors for double busbar and for connection of the 33 kV switchgear, 36 kV, 2000A, 25 kA.
1C8.X	One (1) lot of insulators and fittings including all necessary clamps and connectors required for completing 33 kV switchgear.
1C9.X	One (1) lot of gantry steel structures and equipment supports required for completing 33 kV switchgear.
1C10.X	All other necessary material and equipment to complete the 33 kV switchgear.
1D	Transformers
1D2	Two (2) 132/33 kV three phase 50/75 MVA, Dyn1, ONAN/ONAF Power transformer unit shall be designed, calculated, supplied, delivered, installed, tested and commissioned, under this contract.
1D4	Two (2) sets of Nitrogen Injection Fire Protection System (NIFPS) shall be provided for new 132/33 kV three-phase 50/75 MVA, Dyn1, ONAN/ONAF power transformer units
1D10.X	All other necessary material and equipment to complete the transformers.
1F	Earthing/Auxiliary Transformers
1F2	Two (2) 200 kVA, 33/0.4 kV, Dyn11, 3-phase earthing transformers to supply the substation auxiliary loads shall be designed, calculated, supplied, delivered, installed, tested and commissioned, under this contract.
1F10.X	All other necessary material and equipment to complete the auxiliary transformers.
1G	Control, Protection, Substation Automation and Metering One (1) lot of complete equipment for control, protection, alarm, SAS and metering panels for 132, 33 kV as well as LV AC and LV DC system shall be designed, calculated, supplied, delivered, installed, tested and commissioned, under this contract. The sequence of the control panels and protection panels shall mirror the actual switchyard layout. Space shall be provided adjacent to the control and relay suites for each voltage level to accommodate sufficient panels for the future circuits indicated in the substation layout drawings. A control panel shall accommodate complete switchgear. 132 kV transmission line protection relay panels of Main-1 & Main-2 protection shall be supplied and installed. The equipment to be supplied, installed and commissioned is shown on Bid Drawings comprising the following.
1G1.2	Control, protection and SAS for four (4) sets of 132kV Overhead Line circuit.



Schedule 4: Installation and Other Services

Item	Description	Unit	Quantity (1)	Foreign Currency (in....) Unit Price ² foreign portion (2)	Total Price ² foreign portion (3) = (1) x (2)	Local Currency (in BDT) Unit Price local portion (4)	Total Price local portion (5)=(1) x (4)
H Fibre Optic Multiplexer Equipment for Teleprotection & Communication							
31.X	Installation, testing and commissioning of the equipment, necessary adjustment, adaptation, modification, integration and configuration of the equipment	Lump sum	1				
I Multicore Low Voltage Auxiliary Power and Control Cables							
31.X	Installation, testing and commissioning of the equipment, necessary adjustment, adaptation, modification, integration and configuration of the equipment	Lump sum	1				
J LV DC, Batteries, Chargers and DC Distribution							
31.X	Installation, testing and commissioning of the equipment, necessary adjustment, adaptation, modification, integration and configuration of the equipment	Lump sum	1				
K LV AC Distribution							
31.X	Installation, testing and commissioning of the equipment, necessary adjustment, adaptation, modification, integration and configuration of the equipment	Lump sum	1				
L Civil Works, Control Building and Foundations							
L1.X	Land development of complete switchyard area by cutting, land filling, compacting up to a suitable level including slope protection. Approximate total area of the substation is 5 acres and additional land between S/s site and adjacent Highway = 0.9 acre	Lot	1				
L2.X	Complete outdoor civil works, including 132 kV and 33 kV gantry foundation, 132 kV and 33 kV equipment foundation, power transformers and auxiliary transformers foundation, oil pit, blast wall, substation main gate and guard house, security boundary wall and internal fencing, access road, internal roads and parking, concrete culvert, surface and switchyard drainage system including outfall, cable trench including soak pit, PVC pipes etc., switchyard surface finishing and gravel surfacing						
1	Outdoor gantry foundation 132 kV switchyard	Lot	1				
2	Outdoor gantry foundation 33 kV switchyard	Lot	1				




Schedule 4: Installation and Other Services

Item	Description	Unit	Quantity (1)	Foreign Currency (in....)		Local Currency (in BDT)	
				Unit Price ² foreign portion (2)	Total Price ² foreign portion (3) = (1) x (2)	Unit Price local portion (4)	Total Price local portion (5) = (1) x (4)
3	Outdoor equipment foundation 33 kV switchyard	Lot	1				
4	Power Transformer foundation including oil pit	Lot	1				
5	Blast wall	Lot	1				
6	part of the security boundary wall, around the required 230 kV switchyard						
7	Internal roads, concrete culverts	Lot	1				
8	Surface and switchyard drainage system including outfall.	Lot	1				
9	Cable Trench including soak pit, PVC pipes etc.	Lot	1				
10	Switchyard surface finishing.	Lot	1				
11	Gravel surfacing.	Lot	1				
12	Property Line Demarcation for whole substation area (15 acre)	Lot	1				
L3.X	Complete civil works and facilities for extension of existing control building, including finishing works like rendering, colour, floor finishing, etc.	Lot	1				

N**Switchyard Lighting**

31.X	Installation, testing and commissioning of the equipment, necessary adjustment, adaptation, modification, integration and configuration of the equipment	Lump sum	1				
------	--	----------	---	--	--	--	--

P**Earthing and Lightning Protection**

31.X	Installation, testing and commissioning of the equipment, necessary adjustment, adaptation, modification, integration and configuration of the equipment	Lump sum	1				
------	--	----------	---	--	--	--	--

Installation and Other Services

31.X	Installation, testing and commissioning of the equipment, necessary adjustment, adaptation, modification, integration and configuration of the equipment - General, not mentioned before	Lump sum	1				
41.X	Transport of material and equipment	Lump sum	1				
42.X	Insurance of material and equipment during transport	Lump sum	1				



Schedule 4: Installation and Other Services

Item	Description	Unit	Quantity (1)	Foreign Currency (in...)		Local Currency (in BDT)	
				Unit Price ² foreign portion (2)	Total Price ² foreign portion (3) = (1) x (2)	Unit Price local portion (4)	Total Price local portion (5) = (1) x (4)
3	Outdoor equipment foundation 132 kV switchyard	Lot	1				
4	Outdoor equipment foundation 33 kV switchyard	Lot	1				
5	Power Transformer foundation including oil pit	Lot	1				
6	Auxiliary/Station Transformer foundation.	Lot	1				
7	Blast wall	Lot	1				
8	Substation Main gate	Lot	1				
9	Guard house.	Lot	1				
10	Security Boundary Wall	Lot	1				
11	Internal fence	Lot	1				
12	Access road	Lot	1				
13	Internal roads and parking, concrete culverts	Lot	1				
14	Surface and switchyard drainage system including outfall.	Lot	1				
15	Cable Trench including soak pit, PVC pipes etc.	Lot	1				
16	Switchyard surface finishing.	Lot	1				
17	Gravel surfacing.	Lot	1				
18	Property Line Demarcation	Lot	1				
L3.X	Complete civil works and facilities for new two-storey control room building with cable basement, including foundation works, super structure works, finishing works like rendering, colour, water supply, sanitary, floor finishing, rain water drainage system, lightning protection, water supply including deep tube well for drinking water, pump house, pump, water reservoir, water pipe lines, etc., sewage facilities including septic tank, etc.						
1	Complete Foundation works.	Lot	1				
2	Complete Super structures works.	Lot	1				
3	Complete all finishing works like rendering, colour, water supply & sanitary works, floor finish, furniture, drain & apron, rain water pipes etc.	Lot	1				
4	Water supply, including Pump house with deep tube well for drinking water, motor, pump, water reservoir, water pipe line, necessary fittings etc. all complete.	Lot	1				




Schedule 4: Installation and Other Services

Item	Description	Unit	Quantity (1)	Foreign Currency (in....)		Local Currency (in BDT)	
				Unit Price ² foreign portion (2)	Total Price ² foreign portion (3) = (1) x (2)	Unit Price local portion (4)	Total Price local portion (5) = (1) x (4)
3	Outdoor equipment foundation 132 kV switchyard	Lot	1				
4	Outdoor equipment foundation 33 kV switchyard	Lot	1				
5	Power Transformer foundation including oil pit	Lot	1				
6	Auxiliary/Station Transformer foundation.	Lot	1				
7	Blast wall	Lot	1				
8	Substation Main gate	Lot	1				
9	Guard house.	Lot	1				
10	Security Boundary Wall	Lot	1				
11	Internal fence	Lot	1				
12	Access road	Lot	1				
13	Internal roads and parking, concrete culverts	Lot	1				
14	Surface and switchyard drainage system including outfall.	Lot	1				
15	Cable Trench including soak pit, PVC pipes etc.	Lot	1				
16	Switchyard surface finishing.	Lot	1				
17	Gravel surfacing.	Lot	1				
18	Property Line Demarcation	Lot	1				
L3.X	Complete civil works and facilities for new two-storey control room building with cable basement, including foundation works, super structure works, finishing works like rendering, colour, water supply, sanitary, floor finishing, rain water drainage system, lightning protection, water supply including deep tube well for drinking water, pump house, pump, water reservoir, water pipe lines, etc., sewage facilities including septic tank, etc.						
1	Complete Foundation works.	Lot	1				
2	Complete Super structures works.	Lot	1				
3	Complete all finishing works like rendering, colour, water supply & sanitary works, floor finish, furniture, drain & apron, rain water pipes etc.	Lot	1				
4	Water supply, including Pump house with deep tube well for drinking water, motor, pump, water reservoir, water pipe line, necessary fittings etc. all complete.	Lot	1				





Schedule 1: Plant & Equipment (including Mandatory Spare Parts) Supplied from Abroad

Item	Description	Code	Unit	Quantity (1)	Foreign Currency (in.....)	
					Unit Price ² CIP (2)	Total Price ² CIP (3) = (1) x (2)
Extension of the New 230/132 kV Substation Rajshahi						
A230 kV Switchgear						
A1.1	245 kV, 3150 A, 50 kA, 50 Hz, 1050/460 kV BIL, three pole, live tank, SF6 gas circuit breaker with three spring-stored energy operating mechanism		set	2		
A1.2	245 kV, 3150 A, 50 kA, 50 Hz, 1050/460 kV BIL, three pole, live tank, SF6 gas circuit breaker with one spring-stored energy operating mechanism		set	3		
A2.1	245 kV, 3150 A, 50 kA, 50 Hz, 1050/460 kV BIL, three pole, centre break, post type, motor operated disconnector with motor operated earthing switch		set	2		
A2.2	245 kV, 2000 A, 50 kA, 50 Hz, 1050/460 kV BIL, three pole, centre break, post type, motor operated disconnector with motor operated earthing switch		set	2		
A2.3	245 kV, 2000 A, 50 kA, 50 Hz, 1050/460 kV BIL, three pole, centre break, post type, motor operated disconnector		set	8		
A3.1	245 kV, 50 kA, 50 Hz, 1050/460 kV BIL, single phase, 5-cores, 3200-1600/1/1/1/1/1 A, 0.2, 0.2, 5P20, 5P20, Fs=10; 10 /15 / 30 / 30 / 30 VA, head type, post type current transformer		set	3		
A3.2	245 kV, 50 kA, 50 Hz, 1050/460 kV BIL, single phase, 5-cores, 1600-800/1/1/1/1/1 A, 0.2, 0.2, 5P20, 5P20, Fs=10; 10 /15 / 30 / 30 / 30 VA, head type, post type current transformer		set	12		
A4	245 kV, 50 kA, 50 Hz, 1050/460 kV BIL, single phase, 2-secondary windings, 230V/3 / 110V/3 / 110V/3 kV/V/V, 0.2, 3P; 25 / 75 VA, capacitor voltage transformer		set	12		
A5	245 kV, Um = 245 kV, Ur = 192 kV, Uc = 154 kV, 10 kA nominal discharge current, 50 Hz, 1050/460 kV BIL, single phase, heavy duty, gapless, metal oxide type surge arrester		set	12		
A7.X	245 kV, 3150 A and 2000 A, 50 kA, Conductors for double busbars and for connection of the 230 kV switchgears		lot	1		
A8.X	245 kV, 3150 A and 2000 A, 50 kA, Insulators and fittings including all necessary clamps and connectors for double busbars and for connection and completing of the 230 kV switchgears		lot	1		




Schedule 1: Plant & Equipment (including Mandatory Spare Parts) Supplied from Abroad

Item	Description	Code	Unit	Quantity (1)	Foreign Currency (in.....)	
					Unit Price ² CIP (2)	Total Price ² CIP (3) = (1) x (2)
C						
33 kV Switchgear						
C5	36 kV, Um = 36 kV, Ur = 30 kV, Uc = 24 kV, 10 kA nominal discharge current, 50 Hz, 170/70 kV BIL, single phase, gapless, metal oxide type surge arrester		set	1		
D						
Transformers						
DS.1	Transformer Bushing 230 kV		piece	1		
DS.2	Transformer Bushing 132 kV		piece	1		
DS.3	Transformer Bushing 33 kV		piece	1		
DS.4	Transformer oil		kg	10,000		
DS.5	Transformer silica gel		kg	40		
DS.6	Transformer ventilator with motor		set	2		
DS.7	Contactors, relays, selector switches, push buttons, counters, heaters, etc., in transformer control cabinet, one of each type		lot	1		
DS.8	Contactors, relays, auxiliary contacts, selector switches, push buttons, counters, heaters, etc., in OLTC Motor Drive mechanism, one of each type		lot	1		
DS.9	Thermometer, one of each type		lot	1		
DS.10	Thermostat, one of each type		lot	1		

Schedule 1: Plant & Equipment (including Mandatory Spare Parts) Supplied from Abroad

Item	Description	Code	Unit	Quantity (1)	Foreign Currency (in.....)	
					Unit Price ² CIP (2)	Total Price ² CIP (3) = (1) x (2)
III						
B						
132 kV Switchgear						
B1.1	145 kV, 1250 A, 40 kA, 50 Hz, 650/275 kV BIL, three pole, live tank, SF6 gas circuit breaker with three spring-stored energy operating mechanism		set	1		
B1.4	145 kV, 1250 A, 40 kA, 50 Hz, 650/275 kV BIL, three pole, live tank, SF6 gas circuit breaker with one spring-stored energy operating mechanism		set	2		
B2.3	145 kV, 1250 A, 40 kA, 50 Hz, 650/275 kV BIL three pole, centre break, post type, motor operated disconnect with motor operated earthing switch		set	1		
B2.5	145 kV, 1250 A, 40 kA, 50 Hz, 650/275 kV BIL, three pole, centre break, post type, motor operated disconnect		set	3		
B3.2	145 kV, 40 kA, 50 Hz, 650/275 kV BIL, single phase, 5-cores, 1600-800-400/1/1/1/1 A, 0.2, 0.2, 5P20, 5P20, Fs=10; 10 /15 / 30 / 30 VA, head type, post type current transformer		set	9		
B4	145 kV, 40 kA, 50 Hz, 650/275 kV BIL, single phase, 2-secondary windings, 132/√3 / 110/√3 / 110/√3 kV/V/V, 0.2, 3P; 25 / 75 VA, capacitor voltage transformer		set	6		
B5	145 kV, Um = 145 kV, Ur = 120 kV, Uc = 96 kV, 10 kA nominal discharge current, 50 Hz, 650/275 kV BIL, single phase, heavy duty, gapless, metal oxide type surge arrester		set	9		
B6	145 kV, 50 Hz, 650/275 kV BIL, single phase, post insulator		set	3		
B7.X	145 kV, 2000 A and 1250 A, 40 kA, conductors for single busbars and for connection of the 132 kV switchgears		lot	1		
B8.X	145 kV, 2000 A and 1250 A, 40 kA, Insulators and fittings including all necessary clamps and connectors for single busbars and for connection and completing of the 132 kV switchgears		lot	1		
B9.X	145 kV, Gantry steel structure and equipment support for completing of the 132 kV switchgears		lot	1		
B10.X	Necessary material and equipment to complete 132 kV Switchgear		lot	1		




Schedule 1: Plant & Equipment (including Mandatory Spare Parts) Supplied from Abroad

Item	Description	Code	Unit	Quantity (1)	Foreign Currency (in.....)	
					Unit Price ² CIP (2)	Total Price ² CIP (3) = (1) x (2)
C 33 kV Switchgear						
C1	36 kV, 1600 A, 25 kA, 50 Hz, 170/70 kV BIL, three pole, live tank, vacuum circuit breaker, for outdoor installation, with spring-stored energy operating mechanism		set	2		
C2.1	36 kV, 1600 A, 25 kA, 50 Hz, 170/70 kV BIL, three pole, vertical break, post type, hand operated disconnect		set	3		
C2.2	36 kV, 100 A, 25 kA, 50 Hz, 170/70 kV BIL, three pole, vertical break, post type, hand operated disconnect, with integrated fuse 10 A		set	2		
C3.1	36 kV, 25 kA, 50 Hz, 170/70 kV BIL, single phase, 4-cores, 1600/1/1/1/1, 0.2, 0.2, 5P20, 5P20; Fs=10, Fs=10; 10 / 15 / 30 / 30 VA, post type current transformer		set	6		
C3.2	36 kV, 25 kA, 50 Hz, 170/70 kV BIL, single phase, 4-cores, 10/1/1/1/1, 0.2, 0.2, 5P20, 5P20; Fs=10, Fs=10; 5 / 15 / 30 / 30 VA, post type current transformer		set	6		
C4	36 kV, 25 kA, 50 Hz, 170/70 BIL, single phase, 2-secondary windings, 33/√3 / 110/√3 / 110/√3 kV/√V, 0.2, 3P; 25 / 75 VA, inductive voltage transformer		set	12		
C5	36 kV, Um = 36 kV, Ur = 30 kV, Uc = 24 kV, 10 kA nominal discharge current, 50 Hz, 170/70 kV BIL, single phase, gapless, metal oxide type surge arrester		set	6		
C7.X	36 kV, 2000 A, 25 kA, Conductors for double busbars and for connection of the 33 kV switchgears		lot	1		
C8.X	36 kV, 2000 A, 25 kA, Insulators and fittings including all necessary clamps and connectors for double busbars and for connection and completing of the 33 kV switchgears		lot	1		
C9.X	33 kV, Gantry steel structure and equipment support for completing of the 33 kV switchgears		lot	1		
C10.X	Necessary material and equipment to complete 33 kV Switchgear		lot	1		
D Transformers						
D2	132/33 kV, 50/75 MVA, Dyn1, ONAN/ONAF, three phase, oil-immersed, hermetically sealed, power transformer, with On-load tap changer		set	2		

Schedule 1: Plant & Equipment (including Mandatory Spare Parts) Supplied from Abroad

Item	Description	Code	Unit	Quantity (1)	Foreign Currency (in.....)	
					Unit Price ² CIP (2)	Total Price ² CIP (3) = (1) x (2)
P						
Earthing and Lightning Protection						
P1.X	Complete equipment of earthing system and lightning protection screen including connections, connectors and clamps, to suit the substation overall arrangement, including supporting design calculations.		lot	1		
P2	3-phase portable (maintenance) earthing equipment devices with connectors and telescopic glass fibre operating pole suitable for plant supplied.		set	2		
B						
Mandatory Spare Parts						
132 kV Switchgear						
BS.1	Circuit breaker 132 kV, Tripping coil		set	1		
BS.2	Circuit breaker 132 kV, Closing coil		set	1		
BS.3	Circuit breaker 132 kV, Motor, in motor drive mechanism, complete with accessories		set	1		
BS.4	Circuit breaker 132 kV, auxiliary contacts, in motor drive mechanism, complete with accessories, one of each type		set	1		
BS.5	Circuit breaker 132 kV, Contactors, relays, selector switches, push buttons, counters, heaters, etc., in motor drive mechanism and control cubicle, one of each type		set	1		
BS.6	Circuit breaker 132 kV, SF6 temperature compensated manometer		set	1		
BS.7	Circuit breaker 132 kV, SF6 gas (40 kg) cylinder		set	1		
BS.8	Disconnecter 132 kV with earthing switch - complete pole, together with one complete Motor drive mechanism of main blades and one complete Motor drive mechanism of the earthing blades		set	1		
B3.2	145 kV, 40 kA, 50 Hz, 650/275 kV BIL, single phase, 5-cores, 1600-800-400/1/1/1/1 A, 0.2, 0.2, 5P20, 5P20, 5P20; Fs=10; 10 /15 / 30 / 30 / 30 VA, head type, post type current transformer		set	1		
B4	145 kV, 40 kA, 50 Hz, 650/275 kV BIL, single phase, 2-secondary windings, 132N/3 / 110V/3 / 110V/3 kV/V/V, 0.2, 3P; 25 / 75 VA, capacitor voltage transformer		set	1		
B5	145 kV, U _m = 145 kV, U _r = 120 kV, U _c = 96 kV, 10 kA nominal discharge current, 50 Hz, 650/275 kV BIL, single phase, heavy duty, gapless, metal oxide type surge arrester		set	1		




Schedule 1: Plant & Equipment (including Mandatory Spare Parts) Supplied from Abroad

Item	Description	Code	Unit	Quantity (1)	Foreign Currency (in.....)	
					Unit Price ² CIP (2)	Total Price ² CIP (3) = (1) x (2)
C						
33 kV Switchgear						
CS.1	Circuit breaker 33 kV, Tripping coil		set	1		
CS.2	Circuit breaker 33 kV, Closing coil		set	1		
CS.3	Circuit breaker 33 kV, Motor, in motor drive mechanism, complete with accessories		set	1		
CS.4	Fuse 10 A		set	3		
C3.1	36 kV, 25 kA, 50 Hz, 170/70 kV BIL, single phase, 4-cores, 1600/11/1/1, 0.2, 0.2, 5P20, 5P20; Fs=10; 10 / 15 / 30 / 30 VA, post type current transformer		set	1		
C3.2	36 kV, 25 kA, 50 Hz, 170/70 kV BIL, single phase, 4-cores, 10/11/1/1/1, 0.2, 0.2, 5P20, 5P20; Fs=10; 5 / 15 / 30 / 30 VA, post type current transformer		set	1		
C4	36 kV, 25 kA, 50 Hz, 170/70 BIL, single phase, 2-secondary windings, 33/V3 / 110/V3 / 110/V3 kV/V/V, 0.2, 3P; 25 / 75 VA, inductive voltage transformer		set	1		
C5	36 kV, Um = 36 kV, Ur = 30 kV, Uc = 24 kV, 10 kA nominal discharge current, 50 Hz, 170/70 kV BIL, single phase, gapless, metal oxide type surge arrester		set	1		
D						
Transformers						
DS.2	Transformer Bushing 132 kV		piece	1		
DS.3	Transformer Bushing 33 kV		piece	1		
DS.4	Transformer oil		kg	5,000		
DS.5	Transformer silica gel		kg	20		
DS.6	Transformer ventilator with motor		set	2		
DS.7	Contactors, relays, selector switches, push buttons, counters, heaters, etc., in Transformer control cabinet, one of each type		lot	1		
DS.8	Contactors, relays, auxiliary contacts, selector switches, push buttons, counters, heaters, etc., in OLTC Motor Drive mechanism, one of each type		lot	1		
DS.9	Thermometer, one of each type		lot	1		




Schedule 1: Plant & Equipment (including Mandatory Spare Parts) Supplied from Abroad

Item	Description	Code	Unit	Quantity (1)	Foreign Currency (in.....)	
					Unit Price ² CIP (2)	Total Price ² CIP (3) = (1) x (2)
V						
B						
132 kV Switchgear						
B1.1	145 kV, 1250 A, 40 kA, 50 Hz, 650/275 kV BIL, three pole, live tank, SF6 gas circuit breaker with three spring-stored energy operating mechanism		set	4		
B1.3	145 kV, 2000 A, 40 kA, 50 Hz, 650/275 kV BIL, three pole, live tank, SF6 gas circuit breaker with one spring-stored energy operating mechanism		set	1		
B1.4	145 kV, 1250 A, 40 kA, 50 Hz, 650/275 kV BIL, three pole, live tank, SF6 gas circuit breaker with one spring-stored energy operating mechanism		set	2		
B2.2	145 kV, 2000 A, 40 kA, 50 Hz, 650/275 kV BIL three pole, centre break, post type, motor operated disconnectors with motor operated earthing switch		set	2		
B2.3	145 kV, 1250 A, 40 kA, 50 Hz, 650/275 kV BIL three pole, centre break, post type, motor operated disconnectors with motor operated earthing switch		set	4		
B2.5	145 kV, 1250 A, 40 kA, 50 Hz, 650/275 kV BIL, three pole, centre break, post type, motor operated disconnectors		set	12		
B3.2	145 kV, 40 kA, 50 Hz, 650/275 kV BIL, single phase, 5-cores, 1600-800-400/1/1/1/1 A, 0.2, 0.2, 5P20, 5P20, 5P20; Fs=10, Fs=10; 10 /15 / 30 / 30 VA, head type, post type current transformer		set	21		
B4	145 kV, 40 kA, 50 Hz, 650/275 kV BIL, single phase, 2-secondary windings, 132N/3 / 110N/3 / 110N/3 kV/V/V, 0.2, 3P; 25 / 75 VA, capacitor voltage transformer		set	18		
B5	145 kV, Um = 145 kV, Ur = 120 kV, Uc = 96 kV, 10 kA nominal discharge current, 50 Hz, 650/275 kV BIL, single phase, heavy duty, gapless, metal oxide type surge arrester		set	18		
B7.X	145 kV, 2000 A and 1250 A, 40 kA, Conductors for double busbars and for connection of the 132 kV switchgears		lot	1		
B8.X	145 kV, 2000 A and 1250 A, 40 kA, Insulators and fittings including all necessary clamps and connectors for double busbars and for connection and completing of the 132 kV switchgears		lot	1		




Schedule 1: Plant & Equipment (including Mandatory Spare Parts) Supplied from Abroad

Item	Description	Code	Unit	Quantity (1)	Foreign Currency (in.....)	
					Unit Price ² CIP (2)	Total Price ² CIP (3) = (1) x (2)
B9.X	145 kV, Gantry steel structure and equipment support for completing of the 132 kV switchgears		lot	1		
B10.X	Necessary material and equipment to complete 132 kV Switchgear		lot	1		
C 33 kV Switchgear						
C1	36 kV, 1600 A, 25 kA, 50 Hz, 170/70 kV BIL, three pole, live tank, vacuum circuit breaker, for outdoor installation, with spring-stored energy operating mechanism		set	2		
C2.1	36 kV, 1600 A, 25 kA, 50 Hz, 170/70 kV BIL, three pole, vertical break, post type, hand operated disconnecter		set	3		
C2.2	36 kV, 100 A, 25 kA, 50 Hz, 170/70 kV BIL, three pole, vertical break, post type, hand operated disconnecter, with integrated fuse 10 A		set	2		
C3.1	36 kV, 25 kA, 50 Hz, 170/70 kV BIL, single phase, 4-cores, 1600/11/1/1, 0.2, 0.2, 5P20, 5P20; Fs=10; 10 / 15 / 30 / 30 VA, post type current transformer		set	6		
C3.2	36 kV, 25 kA, 50 Hz, 170/70 kV BIL, single phase, 4-cores, 10/11/1/1, 0.2, 0.2, 5P20, 5P20; Fs=10; 5 / 15 / 30 / 30 VA, post type current transformer		set	6		
C4	36 kV, 25 kA, 50 Hz, 170/70 BIL, single phase, 2-secondary windings, 33/V3 / 110/V3 / 110/V3 kV/V/V, 0.2, 3P; 25 / 75 VA, inductive voltage transformer		set	12		
C5	36 kV, Um = 36 kV, Ur = 30 kV, Uc = 24 kV, 10 kA nominal discharge current, 50 Hz, 170/70 kV BIL, single phase, gapless, metal oxide type surge arrester		set	6		
C7.X	36 kV, 2000 A, 25 kA, Conductors for double busbars and for connection of the 33 kV switchgears		lot	1		
C8.X	36 kV, 2000 A, 25 kA, Insulators and fittings including all necessary clamps and connectors for double busbars and for connection and completing of the 33 kV switchgears		lot	1		
C9.X	33 kV, Gantry steel structure and equipment support for completing of the 33 kV switchgears		lot	1		
C10.X	Necessary material and equipment to complete 33 kV Switchgear		lot	1		




Schedule 1: Plant & Equipment (including Mandatory Spare Parts) Supplied from Abroad

Item	Description	Code	Unit	Quantity (1)	Foreign Currency (in.....)	
					Unit Price ² CIP (2)	Total Price ² CIP (3) = (1) x (2)
B						
Mandatory Spare Parts						
132 kV Switchgear						
BS.1	Circuit breaker 132 kV, Tripping coil		set	2		
BS.2	Circuit breaker 132 kV, Closing coil		set	2		
BS.3	Circuit breaker 132 kV, Motor, in motor drive mechanism, complete with accessories		set	1		
BS.4	Circuit breaker 132 kV, auxiliary contacts, in motor drive mechanism, complete with accessories, one of each type		set	1		
BS.5	Circuit breaker 132 kV, Contactors, relays, selector switches, push buttons, counters, heaters, etc., in motor drive mechanism and control cubicle, one of each type		set	1		
BS.6	Circuit breaker 132 kV, SF6 temperature compensated manometer		set	3		
BS.7	Circuit breaker 132 kV, SF6 gas (40 kg) cylinder		set	1		
BS.8	Disconnecter 132 kV with earthing switch - complete pole, together with one complete Motor drive mechanism of main blades and one complete Motor drive mechanism of the earthing blades		set	3		
B3.2	145 kV, 40 kA, 50 Hz, 650/275 kV BIL, single phase, 5-cores, 1600-800-400/1/1/1/1/1 A, 0.2, 0.2, 5P20, 5P20, 5P20; Fs=10; 10 /15 / 30 / 30 / 30 VA, head type, post type current transformer		set	3		
B4	145 kV, 40 kA, 50 Hz, 650/275 kV BIL, single phase, 2-secondary windings, 132N/3 / 110N/3 / 110N/3 kV/V/V, 0.2, 3P; 25 / 75 VA, capacitor voltage transformer		set	3		
B5	145 kV, Um = 145 kV, Ur = 120 kV, Uc = 96 kV, 10 kA nominal discharge current, 50 Hz, 650/275 kV BIL, single phase, heavy duty, gapless, metal oxide type surge arrester		set	3		
C						
33 kV Switchgear						
CS.1	Circuit breaker 33 kV, Tripping coil		set	1		
CS.2	Circuit breaker 33 kV, Closing coil		set	1		




Schedule 1: Plant & Equipment (including Mandatory Spare Parts) Supplied from Abroad

Item	Description	Code	Unit	Quantity (1)	Foreign Currency (in.....)	
					Unit Price ² CIP (2)	Total Price ² CIP (3) = (1) x (2)
CS.3	Circuit breaker 33 kV, Motor, in motor drive mechanism, complete with accessories		set	1		
CS.4	Fuse 10 A		set	3		
C3.1	36 kV, 25 kA, 50 Hz, 170/70 kV BIL, single phase, 4-cores, 1600/1/1/1/1, 0.2, 0.2, 5P20, 5P20; Fs=10; 10 / 15 / 30 / 30 VA, post type current transformer		set	1		
C3.2	36 kV, 25 kA, 50 Hz, 170/70 kV BIL, single phase, 4-cores, 10/1/1/1/1/1, 0.2, 0.2, 5P20, 5P20; Fs=10; 5 / 15 / 30 / 30 VA, post type current transformer		set	1		
C4	36 kV, 25 kA, 50 Hz, 170/70 BIL, single phase, 2-secondary windings, 33/V3 / 110/V3 / 110/V3 kV/V/V, 0.2, 3P; 25 / 75 VA, inductive voltage transformer		set	1		
C5	36 kV, Um = 36 kV, Ur = 30 kV, Uc = 24 kV, 10 kA nominal discharge current, 50 Hz, 170/70 kV BIL, single phase, gapless, metal oxide type surge arrester		set	1		

D**Transformers**

DS.2	Transformer Bushing 132 kV		piece	1		
DS.3	Transformer Bushing 33 kV		piece	1		
DS.4	Transformer oil		kg	5,000		
DS.5	Transformer silica gel		kg	20		
DS.6	Transformer ventilator with motor		set	2		
DS.7	Contactors, relays, selector switches, push buttons, counters, heaters, etc., in transformer control cabinet, one of each type		lot	1		
DS.8	Contactors, relays, auxiliary contacts, selector switches, push buttons, counters, heaters, etc., in OLTC Motor Drive mechanism, one of each type		lot	1		
DS.9	Thermometer, one of each type		lot	1		
DS.10	Thermostat, one of each type		lot	1		




Schedule 2: Plant & Equipment (including Mandatory Spare Parts) Supplied from within the Employer's Country

Item	Description	Unit	Quantity	Foreign Currency (in....)		Local Currency (in BDT)	
				Unit Price2 EXW (2)	Total Price2 EXW (3)=(1)x(2)	Unit Price EXW (4)	Total Price EXW (5)=(1)x(4)
I	Extension of NEW 230/132 kV Substation Rajshahi						
A	230 kV Switchgear						
A1.1	245 kV, 3150 A, 50 kA, 50 Hz, 1050/460 kV BIL, three pole, live tank, SF6 gas circuit breaker with three spring-stored energy operating mechanism	set	2				
A1.2	245 kV, 3150 A, 50 kA, 50 Hz, 1050/460 kV BIL, three pole, live tank, SF6 gas circuit breaker with one spring-stored energy operating mechanism	set	3				
A2.1	245 kV, 3150 A, 50 kA, 50 Hz, 1050/460 kV BIL, three pole, centre break, post type, motor operated disconnect with motor operated earthing switch	set	2				
A2.2	245 kV, 2000 A, 50 kA, 50 Hz, 1050/460 kV BIL, three pole, centre break, post type, motor operated disconnect with motor operated earthing switch	set	2				
A2.3	245 kV, 2000 A, 50 kA, 50 Hz, 1050/460 kV BIL, three pole, centre break, post type, motor operated disconnect	set	8				
A3.1	245 kV, 50 kA, 50 Hz, 1050/460 kV BIL, single phase, 5-cores, 3200-1600/1/1/1/1 A, 0.2, 0.2, 5P20, 5P20, 5P20; Fs=10; 10/15/30/30/30 VA, head type, post type current transformer	set	3				
A3.2	245 kV, 50 kA, 50 Hz, 1050/460 kV BIL, single phase, 5-cores, 1600-800/1/1/1/1 A, 0.2, 0.2, 5P20, 5P20, 5P20; Fs=10; 10/15/30/30/30 VA, head type, post type current transformer	set	12				
A4	245 kV, 50 kA, 50 Hz, 1050/460 kV BIL, single phase, 2-secondary windings, 230V/3/110V/3 kV/VN, 0.2, 3P; 25/75 VA, capacitor voltage transformer	set	12				
A5	245 kV, Um = 245 kV, Ur = 192 kV, Uc = 154 kV, 10 kA nominal discharge current, 50 Hz, 1050/460 kV BIL, single phase, heavy duty, gapless, metal oxide type surge arrester	set	12				
A7.X	245 kV, 3150 A and 2000 A, 50 kA, Conductors for double busbars and for connection of the 230 kV switchgears	lot	1				
A8.X	245 kV, 3150 A and 2000 A, 50 kA, Insulators and fittings including all necessary clamps and connectors for double busbars and for connection and completing of the 230 kV switchgears	lot	1				
A9.X	245 kV, Gantry steel structure and equipment support for completing of the 230 kV switchgears	lot	1				




Schedule 2: Plant & Equipment (including Mandatory Spare Parts) Supplied from within the Employer's Country

Item	Description	Unit	Quantity	Foreign Currency (in....)		Local Currency (in BDT)	
				Unit Price2 EXW (2)	Total Price2 EXW (3)=(1)x(2)	Unit Price EXW (4)	Total Price EXW (5)=(1)x(4)
C							
33 kV Switchgear							
C5	36 kV, Um = 36 kV, Ur = 30 kV, Uc = 24 kV, 10 kA nominal discharge current, 50 Hz, 170/70 kV BIL, single phase, gapless, metal oxide type surge arrester	set	1				
D							
Transformers							
DS.1	Transformer Bushing 230 kV	piece	1				
DS.2	Transformer Bushing 132 kV	piece	1				
DS.3	Transformer Bushing 33 kV	piece	1				
DS.4	Transformer oil	kg	10,000				
DS.5	Transformer silica gel	kg	40				
DS.6	Transformer ventilator with motor	set	2				
DS.7	Contactors, relays, selector switches, push buttons, counters, heaters, etc., in Transformer control cabinet, one of each type	lot	1				
DS.8	Contactors, relays, auxiliary contacts, selector switches, push buttons, counters, heaters, etc., in OLTC Motor Drive mechanism, one of each type	lot	1				
DS.9	Thermometer, one of each type	lot	1				
DS.10	Thermostat, one of each type	lot	1				




Schedule 2: Plant & Equipment (including Mandatory Spare Parts) Supplied from within the Employer's Country

Item	Description	Unit	Quantity (1)	Foreign Currency (in....)		Local Currency (in BDT)	
				Unit Price EXW (2)	Total Price2 EXW (3)=(1)x(2)	Unit Price EXW (4)	Total Price EXW (5)=(1)x(4)
III							
B							
New 132/33 kV Substation Bangura							
132 kV Switchgear							
B1.1	145 kV, 1250 A, 40 kA, 50 Hz, 650/275 kV BIL, three pole, live tank, SF6 gas circuit breaker with three spring-stored energy operating mechanism	set	1				
B1.4	145 kV, 1250 A, 40 kA, 50 Hz, 650/275 kV BIL, three pole, live tank, SF6 gas circuit breaker with one spring-stored energy operating mechanism	set	2				
B2.3	145 kV, 1250 A, 40 kA, 50 Hz, 650/275 kV BIL three pole, centre break, post type, motor operated disconnect with motor operated earthing switch	set	1				
B2.5	145 kV, 1250 A, 40 kA, 50 Hz, 650/275 kV BIL, three pole, centre break, post type, motor operated disconnect	set	3				
B3.2	145 kV, 40 kA, 50 Hz, 650/275 kV BIL, single phase, 5-cores, 1600-800-400/11/11/11/1 A, 0.2, 0.2, 5P20, 5P20, 5P20; Fs=10; 10 /15 / 30 / 30 / 30 VA, head type, post type current transformer	set	9				
B4	145 kV, 40 kA, 50 Hz, 650/275 kV BIL, single phase, 2-secondary windings, 132V/3 / 110V/3 / 110V/3 kV/V/V, 0.2, 3P; 25 / 75 VA, capacitor voltage transformer	set	6				
B5	145 kV, Um = 145 kV, Ur = 120 kV, Uc = 96 kV, 10 kA nominal discharge current, 50 Hz, 650/275 kV BIL, single phase, heavy duty, gapless, metal oxide type surge arrester	set	9				
B6	145 kV, 50 Hz, 650/275 kV BIL, single phase, post insulator	set	3				
B7.X	145 kV, 2000 A and 1250 A, 40 kA, Conductors for single busbars and for connection of the 132 kV switchgears	lot	1				
B8.X	145 kV, 2000 A and 1250 A, 40 kA, Insulators and fittings including all necessary clamps and connectors for single busbars and for connection and completing of the 132 kV switchgears	lot	1				
B9.X	145 kV, Gantry steel structure and equipment support for completing of the 132 kV switchgears	lot	1				
B10.X	Necessary material and equipment to complete 132 kV Switchgear	lot	1				




Schedule 2: Plant & Equipment (including Mandatory Spare Parts) Supplied from within the Employer's Country

Item	Description	Unit	Quantity	Foreign Currency (in....)		Local Currency (in BDT)	
				Unit Price2 EXW (2)	Total Price2 EXW (3)=(1)x(2)	Unit Price EXW (4)	Total Price EXW (5)=(1)x(4)
C 33 kV Switchgear							
C1	36 kV, 1600 A, 25 kA, 50 Hz, 170/70 kV BIL, three pole, live tank, vacuum circuit breaker, for outdoor installation, with spring-stored energy operating mechanism	set	2				
C2.1	36 kV, 1600 A, 25 kA, 50 Hz, 170/70 kV BIL, three pole, vertical break, post type, hand operated disconnecter	set	3				
C2.2	36 kV, 100 A, 25 kA, 50 Hz, 170/70 kV BIL, three pole, vertical break, post type, hand operated disconnecter, with integrated fuse 10 A	set	2				
C3.1	36 kV, 25 kA, 50 Hz, 170/70 kV BIL, single phase, 4-cores, 1600/1/1/1/1, 0.2, 0.2, 5P20, 5P20; Fs=10, Fs=10; 10 / 15 / 30 / 30 VA, post type current transformer	set	6				
C3.2	36 kV, 25 kA, 50 Hz, 170/70 kV BIL, single phase, 4-cores, 10/1/1/1/1, 0.2, 0.2, 5P20, 5P20; Fs=10, Fs=10; 5 / 15 / 30 / 30 VA, post type current transformer	set	6				
C4	36 kV, 25 kA, 50 Hz, 170/70 BIL, single phase, 2-secondary windings, 33/√3 / 110/√3 / 110/√3 kV/VV, 0.2, 3P; 25 / 75 VA, inductive voltage transformer	set	12				
C5	36 kV, Um = 36 kV, Ur = 30 kV, Uc = 24 kV, 10 kA nominal discharge current, 50 Hz, 170/70 kV BIL, single phase, gapless, metal oxide type surge arrester	set	6				
C7.X	36 kV, 2000 A, 25 kA, Conductors for double busbars and for connection of the 33 kV switchgears	lot	1				
C8.X	36 kV, 2000 A, 25 kA, Insulators and fittings including all necessary clamps and connectors for double busbars and for connection and completing of the 33 kV switchgears	lot	1				
C9.X	33 kV, Gantry steel structure and equipment support for completing of the 33 kV switchgears	lot	1				
C10.X	Necessary material and equipment to complete 33 kV Switchgear	lot	1				
D Transformers							
D2	132/33 kV, 50/75 MVA, Dyn1, ONAN/ONAF, three phase, oil-immersed, hermetically sealed, power transformer, with On-load tap changer	set	2				



Schedule 2: Plant & Equipment (including Mandatory Spare Parts) Supplied from within the Employer's Country

Item	Description	Unit	Quantity (1)	Foreign Currency (in....)		Local Currency (in BDT)	
				Unit Price EXW (2)	Total Price EXW (3)=(1)x(2)	Unit Price EXW (4)	Total Price EXW (5)=(1)x(4)

P**Earthing and Lightning Protection**

P1.X	Complete equipment of earthing system and lightning protection screen including connections, connectors and clamps, to suit the substation overall arrangement, including supporting design calculations.	lot	1				
P2	3-phase portable (maintenance) earthing equipment devices with connectors and telescopic glass fibre operating pole suitable for plant supplied.	set	2				

Mandatory Spare Parts**B****132 kV Switchgear**

BS.1	Circuit Breaker 132 kV, Tripping coil	set	1				
BS.2	Circuit Breaker 132 kV, Closing coil	set	1				
BS.3	Circuit Breaker 132 kV, Motor, in motor drive mechanism, complete with accessories	set	1				
BS.4	Circuit Breaker 132 kV, Auxiliary contacts, in motor drive mechanism, complete with accessories, one of each type	set	1				
BS.5	Circuit Breaker 132 kV, Contactors, relays, selector switches, push buttons, counters, heaters, etc., in motor drive mechanism and control cubicle, one of each type	set	1				
BS.6	Circuit Breaker 132 kV, SF6 temperature compensated manometer	set	1				
BS.7	Circuit Breaker 132 kV, SF6 gas (40 kg) cylinder	set	1				
BS.8	Disconnecter 132 kV with Earthing Switch - complete pole, together with one complete Motor drive mechanism of main blades and one complete Motor drive mechanism of the earthing blades	set	1				
B3.2	145 kV, 40 kA, 50 Hz, 650/275 kV BIL, single phase, 1600-800-400/11/11/1 A, 0.2, 0.2, 5P20, 5P20, 5P20; Fs=10; 10 /15 / 30 / 30 / 30 VA, head type, post type current transformer	set	1				
B4	145 kV, 40 kA, 50 Hz, 650/275 kV BIL, single phase, 2-secondary windings, 132V/3 / 110V/3 / 110V/3 kV/VV, 0.2, 3P; 25 / 75 VA, capacitor voltage transformer	set	1				



Schedule 2: Plant & Equipment (including Mandatory Spare Parts) Supplied from within the Employer's Country

Item	Description	Unit	Quantity	Foreign Currency (in....)		Local Currency (in BDT)	
				Unit Price2 EXW (2)	Total Price2 EXW (3)=(1)x(2)	Unit Price EXW (4)	Total Price EXW (5)=(1)x(4)
B5	145 kV, Um = 145 kV, Ur = 120 kV, Uc = 96 kV, 10 kA nominal discharge current, 50 Hz, 650/275 kV BIL, single phase, heavy duty, gapless, metal oxide type surge arrester	set	1				
C 33 kV Switchgear							
CS.1	Circuit Breaker 33 kV, Tripping coil	set	1				
CS.2	Circuit Breaker 33 kV, Closing coil	set	1				
CS.3	Circuit Breaker 33 kV, Motor, in motor drive mechanism, complete with accessories	set	1				
CS.4	Fuse 10 A	set	3				
C3.1	36 kV, 25 kA, 50 Hz, 170/70 kV BIL, single phase, 4-cores, 1600/11/1/1/1, 0.2, 0.2, 5P20, 5P20; Fs=10, Fs=10; 10 / 15 / 30 / 30 VA, post type current transformer	set	1				
C3.2	36 kV, 25 kA, 50 Hz, 170/70 kV BIL, single phase, 4-cores, 10/11/1/1/1, 0.2, 0.2, 5P20, 5P20; Fs=10, Fs=10; 5 / 15 / 30 / 30 VA, post type current transformer	set	1				
C4	36 kV, 25 kA, 50 Hz, 170/70 BIL, single phase, 2-secondary windings, 33/√3 / 110/√3 / 110/√3 kV/VV, 0.2, 3P; 25 / 75 VA, inductive voltage transformer	set	1				
C5	36 kV, Um = 36 kV, Ur = 30 kV, Uc = 24 kV, 10 kA nominal discharge current, 50 Hz, 170/70 kV BIL, single phase, gapless, metal oxide type surge arrester	set	1				
D Transformers							
DS.2	Transformer Bushing 132 kV	piece	1				
DS.3	Transformer Bushing 33 kV	piece	1				
DS.4	Transformer oil	kg	5,000				
DS.5	Transformer silica gel	kg	20				
DS.6	Transformer ventilator with motor	set	2				
DS.7	Contactors, relays, selector switches, push buttons, counters, heaters, etc., in Transformer control cabinet, one of each type	lot	1				

Schedule 2: Plant & Equipment (including Mandatory Spare Parts) Supplied from within the Employer's Country

Item	Description	Unit	Quantity (1)	Foreign Currency (in....)		Local Currency (in BDT)	
				Unit Price2 EXW (2)	Total Price2 EXW (3)=(1)x(2)	Unit Price EXW (4)	Total Price EXW (5)=(1)x(4)
V							
B							
132 kV Switchgear							
B1.1	145 kV, 1250 A, 40 kA, 50 Hz, 650/275 kV BIL, three pole, live tank, SF6 gas circuit breaker with three spring-stored energy operating mechanism	set	4				
B1.3	145 kV, 2000 A, 40 kA, 50 Hz, 650/275 kV BIL, three pole, live tank, SF6 gas circuit breaker with one spring-stored energy operating mechanism	set	1				
B1.4	145 kV, 1250 A, 40 kA, 50 Hz, 650/275 kV BIL, three pole, live tank, SF6 gas circuit breaker with one spring-stored energy operating mechanism	set	2				
B2.2	145 kV, 2000 A, 40 kA, 50 Hz, 650/275 kV BIL three pole, centre break, post type, motor operated disconnector with motor operated earthing switch	set	2				
B2.3	145 kV, 1250 A, 40 kA, 50 Hz, 650/275 kV BIL three pole, centre break, post type, motor operated disconnector with motor operated earthing switch	set	4				
B2.5	145 kV, 1250 A, 40 kA, 50 Hz, 650/275 kV BIL, three pole, centre break, post type, motor operated disconnector	set	12				
B3.2	145 kV, 40 kA, 50 Hz, 650/275 kV BIL, single phase, 5-cores, 1600-800-400/1/1/1/1 A, 0.2, 0.2, 5P20, 5P20, 5P20; Fs=10; 10 /15 / 30 / 30 / 30 VA, head type, post type current transformer	set	21				
B4	145 kV, 40 kA, 50 Hz, 650/275 kV BIL, single phase, 2-secondary windings, 132/110V / 110/110V / 110/110V, 0.2, 3P; 25 / 75 VA, capacitor voltage transformer	set	18				
B5	145 kV, Um = 145 kV, Ur = 120 kV, Uc = 96 kV, 10 kA nominal discharge current, 50 Hz, 650/275 kV BIL, single phase, heavy duty, gapless, metal oxide type surge arrester	set	18				
B7.X	145 kV, 2000 A and 1250 A, 40 kA, Conductors for double busbars and for connection of the 132 kV switchgears	lot	1				
B8.X	145 kV, 2000 A and 1250 A, 40 kA, Insulators and fittings including all necessary clamps and connectors for double busbars and for connection and completing of the 132 kV switchgears	lot	1				
B9.X	145 kV, Gantry steel structure and equipment support for completing of the 132 kV switchgears	lot	1				




Schedule 2: Plant & Equipment (including Mandatory Spare Parts) Supplied from within the Employer's Country

Item	Description	Unit	Quantity (1)	Foreign Currency (in....)		Local Currency (in BDT)	
				Unit Price EXW (2)	Total Price EXW (3)=(1)x(2)	Unit Price EXW (4)	Total Price EXW (5)=(1)x(4)
B10.X	Necessary material and equipment to complete 132 kV Switchgear	lot	1				
C 33 kV Switchgear							
C1	36 kV, 1600 A, 25 kA, 50 Hz, 170/70 kV BIL, three pole, live tank, vacuum circuit breaker, for outdoor installation, with spring-stored energy operating mechanism	set	2				
C2.1	36 kV, 1600 A, 25 kA, 50 Hz, 170/70 kV BIL, three pole, vertical break, post type, hand operated disconnector	set	3				
C2.2	36 kV, 100 A, 25 kA, 50 Hz, 170/70 kV BIL, three pole, vertical break, post type, hand operated disconnector, with integrated fuse 10 A	set	2				
C3.1	36 kV, 25 kA, 50 Hz, 170/70 kV BIL, single phase, 4-cores, 1600/1/1/1/1, 0.2, 0.2, 5P20, 5P20; Fs=10, Fs=10; 10 / 15 / 30 / 30 VA, post type current transformer	set	6				
C3.2	36 kV, 25 kA, 50 Hz, 170/70 kV BIL, single phase, 4-cores, 10/1/1/1/1, 0.2, 0.2, 5P20, 5P20; Fs=10, Fs=10; 5 / 15 / 30 / 30 VA, post type current transformer	set	6				
C4	36 kV, 25 kA, 50 Hz, 170/70 BIL, single phase, 2-secondary windings, 33V3 / 110V3 / 110V3 kV/VV, 0.2, 3P; 25 / 75 VA, inductive voltage transformer	set	12				
C5	36 kV, Um = 36 kV, Ur = 30 kV, Uc = 24 kV, 10 kA nominal discharge current, 50 Hz, 170/70 kV BIL, single phase, gapless, metal oxide type surge arrester	set	6				
C7.X	36 kV, 2000 A, 25 kA, Conductors for double busbars and for connection of the 33 kV switchgears	lot	1				
C8.X	36 kV, 2000 A, 25 kA, Insulators and fittings including all necessary clamps and connectors for double busbars and for connection and completing of the 33 kV switchgears	lot	1				
C9.X	33 kV, Gantry steel structure and equipment support for completing of the 33 kV switchgears	lot	1				
C10.X	Necessary material and equipment to complete 33 kV Switchgear	lot	1				
D Transformers							
D2	132/33 kV, 50/75 MVA, Dyn1, ONAN/ONAF, three phase, oil-immersed, hermetically sealed, power transformer, with On-load tap changer	set	2				




Schedule 2: Plant & Equipment (including Mandatory Spare Parts) Supplied from within the Employer's Country

Item	Description	Unit	Quantity (1)	Foreign Currency (in...)		Local Currency (in BDT)	
				Unit Price2 EXW (2)	Total Price2 EXW (3)=(1)x(2)	Unit Price EXW (4)	Total Price EXW (5)=(1)x(4)

P**Earthing and Lightning Protection**

P1.X	Complete equipment of earthing system and lightning protection screen including connections, connectors and clamps, to suit the substation overall arrangement, including supporting design calculations.	lot	1				
P2	3-phase portable (maintenance) earthing equipment devices with connectors and telescopic glass fibre operating pole suitable for plant supplied.	set	2				

Mandatory Spare Parts**B****132 kV Switchgear**

BS.1	Circuit Breaker 132 kV, Tripping coil	set	2				
BS.2	Circuit Breaker 132 kV, Closing coil	set	2				
BS.3	Circuit Breaker 132 kV, Motor, in motor drive mechanism, complete with accessories	set	1				
BS.4	Circuit Breaker 132 kV, Auxiliary contacts, in motor drive mechanism, complete with accessories, one of each type	set	1				
BS.5	Circuit Breaker 132 kV, Contactors, relays, selector switches, push buttons, counters, heaters, etc., in motor drive mechanism and control cubicle, one of each type	set	1				
BS.6	Circuit Breaker 132 kV, SF6 temperature compensated manometer	set	3				
BS.7	Circuit Breaker 132 kV, SF6 gas (40 kg) cylinder	set	1				
BS.8	Disconnector 132 kV with Earthing Switch - complete pole, together with one complete Motor drive mechanism of main blades and one complete Motor drive mechanism of the earthing blades	set	3				
B3.2	145 kV, 40 kA, 50 Hz, 650/275 kV BIL, single phase, 5-cores, 1600-800-400/11/11/1 A, 0.2, 0.2, 5P20, 5P20, 5P20; Fs=10; 10 /15 / 30 / 30 / 30 VA, head type, post type current transformer	set	3				
B4	145 kV, 40 kA, 50 Hz, 650/275 kV BIL, single phase, 2-secondary windings, 132V/3 / 110V/3 / 110V/3 kV/VV, 0.2, 3P; 25 / 75 VA, capacitor voltage transformer	set	3				




Schedule 2: Plant & Equipment (including Mandatory Spare Parts) Supplied from within the Employer's Country

Item	Description	Unit	Quantity	Foreign Currency (in ...)		Local Currency (in BDT)	
				Unit Price2 EXW (2)	Total Price2 EXW (3)=(1)x(2)	Unit Price EXW (4)	Total Price EXW (5)=(1)x(4)
B5	145 kV, Um = 145 kV, Ur = 120 kV, Uc = 96 kV, 10 kA nominal discharge current, 50 Hz, 650/275 kV BIL, single phase, heavy duty, gapless, metal oxide type surge arrester	set	3				
C 33 kV Switchgear							
CS.1	Circuit Breaker 33 kV, Tripping coil	set	1				
CS.2	Circuit Breaker 33 kV, Closing coil	set	1				
CS.3	Circuit Breaker 33 kV, Motor, in motor drive mechanism, complete with accessories	set	1				
CS.4	Fuse 10 A	set	3				
C3.1	36 kV, 25 kA, 50 Hz, 170/70 kV BIL, single phase, 4-cores, 1600/11/11/1, 0.2, 0.2, 5P20, 5P20; Fs=10, Fs=10; 10 / 15 / 30 / 30 VA, post type current transformer	set	1				
C3.2	36 kV, 25 kA, 50 Hz, 170/70 kV BIL, single phase, 4-cores, 10/11/11/1, 0.2, 0.2, 5P20, 5P20; Fs=10, Fs=10; 10 / 15 / 30 / 30 VA, post type current transformer	set	1				
C4	36 kV, 25 kA, 50 Hz, 170/70 BIL, single phase, 2-secondary windings, 33/V3 / 110/V3 / 110/V3 kV/V/V, 0.2, 3P; 25 / 75 VA, inductive voltage transformer	set	1				
C5	36 kV, Um = 36 kV, Ur = 30 kV, Uc = 24 kV, 10 kA nominal discharge current, 50 Hz, 170/70 kV BIL, single phase, gapless, metal oxide type surge arrester	set	1				
D Transformers							
DS.2	Transformer Bushing 132 kV	piece	1				
DS.3	Transformer Bushing 33 kV	piece	1				
DS.4	Transformer oil	kg	5,000				
DS.5	Transformer silica gel	kg	20				
DS.6	Transformer ventilator with motor	set	2				
DS.7	Contactors, relays, selector switches, push buttons, counters, heaters, etc., in transformer control cabinet, one of each type	lot	1				




Schedule 1: Plant & Equipment (including Mandatory Spare Parts) Supplied from Abroad

Item	Description	Code	Unit	Quantity (1)	Foreign Currency (in.....)	
					Unit Price ² CIP (2)	Total Price ² CIP (3) = (1) x (2)
D4	Nitrogen Injection Fire Protection System (NIFPS), for new 132/33 kV, three phase, 50/75 MVA, Dyn1, ONAN/ONAF Power transformer unit		set	2		
D10.X	Necessary material and equipment to complete Transformers		lot	1		
F						
Earthing/Auxiliary Transformer						
F2	33/0.415 kV, 200 kVA, Dyn11, ONAN, three phase, oil-immersed, power transformer, with Off-load tap changer, (to provide an earthing point for the neutral and) to supply the substation auxiliary loads		set	2		
F10.X	Necessary material and equipment to complete Auxiliary Transformers		lot	1		
G						
Control, Protection, Substation Automation System and Metering						
G1.2	Control, protection and SAS for 132 kV Overhead Line circuit		set	1		
G2.2	Control, protection and SAS for 132/33 kV Power transformer circuit		set	2		
G2.3	Control, protection and SAS for 33/0.415 kV Auxiliary power transformer circuit and AC & DC Auxiliary Power Supply		set	2		
G3.2	Control, protection and SAS for 132 kV Busbars		set	1		
G4.X	Tariff metering pane(s) to accommodate for each line, transformer and auxiliary transformer feeder minimum two (2) (main-1 & main-2) programmable & recordable digital 3-phase, 4-wire import and export MWh and MVar meters with accuracy class 0.2		set	1		
G6.X	The hardware and software to provide telecontrol & telemetering facilities required both at the existing National Load Dispatch Centre (NLDC) at Aftabnagar and back-up station at Biddut Bhaban for integration of complete new 230/132 kV Substation. All required electrical signals shall be transmitted to the NLDC and back-up station through the Industrial Gateway of the Substation automation system. All HV circuit breakers, motorized disconnectors, tap changer, etc., shall be controlled from NLDC through the Gateway of the Substation automation system using IEC 60870-5-104 protocol. All necessary modification works in the software of the master station of NLDC and back-up station are to be carried out.		set	1		
G7.X	Extension of the existing equipment, necessary adjustment, adaptation, modification, integration and configuration of new and existing equipment in NLDC		set	1		




Schedule 1: Plant & Equipment (including Mandatory Spare Parts) Supplied from Abroad

Item	Description	Code	Unit	Quantity (1)	Foreign Currency (in.....)	
					Unit Price ² CIP (2)	Total Price ² CIP (3) = (1) x (2)
D	Transformers					
D2	132/33 kV, 50/75 MVA, Dyn1, ONAN/ONAF, three phase, oil-immersed, hermetically sealed, power transformer, with On-load tap changer		set	2		
D4	Nitrogen Injection Fire Protection System (NIFPS), for new 132/33 kV, three phase, 50/75 MVA, Dyn1, ONAN/ONAF Power transformer unit		set	2		
D10.X	Necessary material and equipment to complete Transformers		lot	1		
F	Earthing/Auxiliary Transformer					
F2	33/0.415 kV, 200 kVA, Dyn11, ONAN, three phase, oil-immersed, power transformer, with Off-load tap changer, (to provide an earthing point for the neutral and) to supply the substation auxiliary loads		set	2		
F10.X	Necessary material and equipment to complete Auxiliary Transformers		lot	1		
G	Control, Protection, Substation Automation System and Metering					
G1.2	Control, protection and SAS for 132 kV Overhead Line circuit		set	4		
G2.2	Control, protection and SAS for 132/33 kV Power transformer circuit		set	2		
G2.3	Control, protection and SAS for 33/0.415 kV Auxiliary power transformer circuit and AC & DC Auxiliary Power Supply		set	2		
G3.2	Control, protection and SAS for 132 kV Busbars		set	1		
G4.X	Tariff Metering pane(s) to accommodate for each line, transformer and auxiliary transformer feeder minimum two (2) (main-1 & main-2) programmable & recordable digital 3-phase, 4-wire import and export MWh and MVAr meters with accuracy class 0.2		set	1		



Schedule 2: Plant & Equipment (including Mandatory Spare Parts) Supplied from within the Employer's Country

Item	Description	Unit	Quantity	Foreign Currency (in....)		Local Currency (in BDT)	
				Unit Price ² EXW (2)	Total Price ² EXW (3)=(1)x(2)	Unit Price EXW (4)	Total Price EXW (5)=(1)x(4)
D4	Nitrogen Injection Fire Protection System (NIFPS), for new 132/33 kV, three phase, 50/75 MVA, Dyn1, ONAN/ONAF Power transformer unit	set	2				
D10.X	Necessary material and equipment to complete Transformers	lot	1				
F							
Earthing/Auxiliary Transformer							
F2	33/0.415 kV, 200 kVA, Dyn11, ONAN, three phase, oil-immersed, power transformer, with Off-load tap changer, (to provide an earthing point for the neutral and) to supply the substation auxiliary loads	set	2				
F10.X	Necessary material and equipment to complete Auxiliary Transformers	lot	1				
G							
Control, Protection, Substation Automation System and Metering							
G1.2	Control, Protection and SAS for 132 kV Overhead Line circuit	set	1				
G2.2	Control, Protection and SAS for 132/33 kV Power transformer circuit	set	2				
G2.3	Control, Protection and SAS for 33/0.415 kV Auxiliary power transformer circuit and AC & DC Auxiliary Power Supply	set	2				
G3.2	Control, Protection and SAS for 132 kV Busbars	set	1				
G4.X	Tariff Metering pane(s) to accommodate for each line, transformer and auxiliary transformer feeder minimum two (2) (main-1 & main-2) programmable & recordable digital 3-phase, 4-wire import and export MWh and MVar meters with accuracy cl. 0.2	set	1				
G6.X	The hardware and software to provide telecontrol & telemetering facilities required both at the existing National Load Dispatch Centre (NLDC) at Aftabnagar and Back up station at Biddut Bhaban for integration of complete new 230/132 kV Substation. All required electrical signals shall be transmitted to the NLDC and Back up station through the Industrial Gateway of the Substation automation system. All HV circuit breakers, motorized disconnectors, tap changer, etc., shall be controlled from NLDC through the Gateway of the Substation automation system using IEC 60870-5-104 protocol. All necessary modification works in the software of the master station of NLDC and Back up station are to be carried out.	set	1				
G7.X	Extension of the existing equipment, necessary adjustment, adaptation, modification, integration and configuration of new and existing equipment in NLDC	set	1				

44



Schedule 2: Plant & Equipment (including Mandatory Spare Parts) Supplied from within the Employer's Country

Item	Description	Unit	Quantity	Foreign Currency (in...)		Local Currency (in BDT)	
				Unit Price EXW (2)	Total Price EXW (3)=(1)x(2)	Unit Price EXW (4)	Total Price EXW (5)=(1)x(4)
D4	Nitrogen Injection Fire Protection System (NIFPS), for new 132/33 kV, three phase, 50/75 MVA, Dyn1, ONAN/ONAF Power transformer unit	set	2				
D10.X	Necessary material and equipment to complete Transformers	lot	1				
F							
Earthing/Auxiliary Transformer							
F2	33/0.415 kV, 200 kVA, Dyn11, ONAN, three phase, oil-immersed, power transformer, with Off-load tap changer, (to provide an earthing point for the neutral and) to supply the substation auxiliary loads	set	2				
F10.X	Necessary material and equipment to complete Auxiliary Transformers	lot	1				
G							
Control, Protection, Substation Automation System and Metering							
G1.2	Control, Protection and SAS for 132 kV Overhead Line circuit	set	4				
G2.2	Control, Protection and SAS for 132/33 kV Power transformer circuit	set	2				
G2.3	Control, Protection and SAS for 33/0.415 kV Auxiliary power transformer circuit and AC & DC Auxiliary Power Supply	set	2				
G3.2	Control, Protection and SAS for 132 kV Busbars	set	1				
G4.X	Tariff Metering panel(s) to accommodate for each line, transformer and auxiliary transformer feeder minimum two (2) (main-1 & main-2) programmable & recordable digital 3-phase, 4-wire import and export MWh and MVAR meters with accuracy cl. 0.2	set	1				
G6.X	The hardware and software to provide telecontrol & telemetering facilities required both at the existing National Load Dispatch Centre (NLDC) at Aftabnagar and Back up station at Biddut Bhaban for integration of complete new 230/132 kV Substation. All required electrical signals shall be transmitted to the NLDC and Back up station through the Industrial Gateway of the Substation automation system. All HV circuit breakers, motorized disconnectors, tap changer, etc., shall be controlled from NLDC through the Gateway of the Substation automation system using IEC 60870-5-104 protocol. All necessary modification works in the software of the master station of NLDC and Back up station are to be carried out.	set	1				
G7.X	Extension of the existing equipment, necessary adjustment, adaptation, modification, integration and configuration of new and existing equipment in NLDC	set	1				




CONTRACT DOCUMENT

Contract Agreement for NLDC SCADA Integration – Unit Price Fixation Agreement

Between

POWER GRID COMPANY OF BANGLADESH LIMITED

&

ALSTOM T&D INDIA LIMITED



ক.এস ০৭৯৬৬১৮

NLDC SCADA Integration - Unit Price Fixation Agreement

This agreement made on this the 25th May 2016 between Power Grid Company of Bangladesh Ltd., IEB Bhaban (New), 3rd & 4th Floor, Ramna, Dhaka, Bangladesh (hereinafter called "the Employer") of the one part and ALSTOM T&D India Ltd, A-7, Sector-65, Noida-201301, U.P., India (hereinafter called "the Contractor") of the other part.

Whereas the employer desires that the works known as "SCADA Integration both in main & backup control center for new power station, substation, line bay, transformer bay, generator bay" to be executed by the contractor, and has accepted an offer by the contractor for the execution and completion of following works as per below details:

Sl No	Work Description	Unit	Qty.	Unit Price EURO + BDT	Total Price EURO + BDT
1	Integration of New RTU/SAS at Control Center (as per technical specs)	Substation	1	Euro 28,500.00 + BDT 15,00,000.00	Euro 28,500.00 + BDT 15,00,000.00
2	Integration of New Power Plant at Control Center (as per the technical specs)	Power Station	1	Euro 28,500.00 + BDT 15,00,000.00	Euro 28,500.00 + BDT 15,00,000.00
3	Integration of New Line Bay /Transformer /Generator of existing station at Control Center. The same price shall be applicable for integration of 2 bays of the same station.	Bays	1-2	Euro 10,000.00 + BDT 10,00,000.00	Euro 10,000.00 + BDT 10,00,000.00
4	Integration of New Line Bay /Transformer /Generator of existing station at Control Center - 3 & 4 bays (in the same station).	Bays	3-4	Euro 20,000.00 + BDT 15,00,000.00	Euro 20,000.00 + BDT 15,00,000.00

Employer (PGCB) and the Contractor (ALSTOM T&D India Ltd.) agree as follows:

- RTU/SAS supplier has to provide inter-operable data till main & backup control center as per NLDC philosophy.

Handwritten signatures of the Employer and Contractor.

Continued to page 2



০৭৯৫৬১৯

- Page 2 -

- b. All SCADA database development, power system database modeling and EMS tuning shall be covered by ALSTOM.
- c. No hardware shall be in ALSTOM scope.
- d. Data validation at main control center with field data.
- e. Existing data license of NLDC SCADA system shall be utilized for this purpose.
- f. Integration price is valid for the bids which will be invited within December 2017.
- g. Above price shall be applicable for a single order for new bays integration in existing substation.
- h. In case more than 4 new bays/transformer/generator need to be integrated to existing substation, price of new substation integration (Point No. 1/2) shall be applicable.
- i. The above prices are exclusive of all local VAT & TAX.
- j. This price will be applicable for all the integration works to NLDC Bangladesh under PGCB or owner of any power plant /Grid sub-station or Nominated EPC Contractors.
- k. This price will be applicable for all the projects which are in pipeline and on-going which will be integrate in near future to NLDC.

The following documents shall deem to form and be read and construed as part of this Agreement:

- a. Power Of Attorney for Signatory of the Contract
- b. Letter of Intent (LOI)
- c. Acceptance of Letter of Intent (LOI)
- d. Technical Scope of Works

The Governing law shall be the law of Bangladesh

[Handwritten signatures and marks]

Continued in page 3



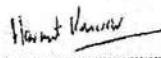
ক-৩৪ ০৭৯৫৬২০

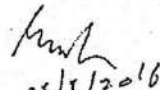
- Page 3 -

In Witness whereof the parties hereto have caused this Agreement to be executed the day and year first above written.

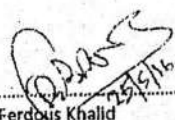
Authorized Signature of the Contractor:

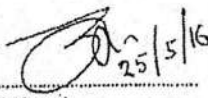
Authorized Signature of the Employer.

1. 
Harneet Kanwar
Senior Manager - Sales
ALSTOM T&D India Ltd.

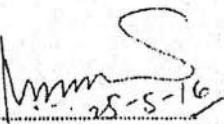
1. 
25/5/2016
Md. Ashraf Hossain
Company Secretary.
Power Grid Company of Bangladesh Ltd.

In the Presence of:

1. 
Ferdous Khalid
Assistant Project Manager,
ALSTOM T&D India Ltd.,
Dhaka, Bangladesh.

1. 
25/5/16
Jamil Ahmed
Superintending Engineer,
Design & Quality Control
Power Grid Company of Bangladesh Ltd.

2. 
Mohammed Fahim Rasekh
Manager, Telecom
ALSTOM T&D India Ltd.,
Dhaka, Bangladesh.

2. 
25-5-16
Md. Rafiqul Islam
Superintending Engineer,
Communication Circle,
Power Grid Company of Bangladesh Ltd.