

POWER GRID COMPANY OF BANGLADESH LIMITED



Tender Documents For

Procurement of

Design, Supply, Installation, Testing & Commissioning of Rampura-Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2)

Volume 3 of 3

Invitation for Bids No. : 27.21.0000.101.07.312.21.5537, December 22, 2021
OCB No. : PGCB/ADB/3853-BAN/DWZTGEP/UGTL/P2
Country : Peoples Republic of Bangladesh

Employer:



Power Grid Company of Bangladesh (PGCB)
Head Office, Avenue-03, Jahurul Islam City
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Schedule A: Introduction and Preamble to the Price and Technical Schedules

1. Scope of Works and General Information

1.1. General

1.2.1. The extent of supply is described in the following clauses and in the respective sections of the specification. All work not expressly called for in the specification, but necessary for the completion of the work shall be performed and furnished by the Contractor at no additional cost to the Employer.

1.2.2. The Contract shall comprise design, manufacturing, testing, supply, insurance, delivery to site of towers, poles, phase conductors, earthwire, OPGW including all associated fittings, complete insulator sets, phase and earthwire tension and non-tension joints and clamps, vibration dampers, spacer dampers, erection, setting to work, testing and the replacement and/or adjustment of defective material and workmanship for the duration of the warranty period detailed in the "Extent of Supply" and the associated **Annex 1-1**.

1.2.3. The Contract shall comprise the design, manufacture, testing, supply, insurance, delivery to site, erection and setting to work the Plants and Facilities. The plant and facilities include underground XLPE power cables, terminal towers and gantry structures, surge arrestors, cable joints, cable sealing ends, optical fibre cables, optical fiber cable termination kits and accessories. The scope also include the replacement and/or adjustment of defective material and workmanship for the duration of the 12 month warranty period of the transmission line(s) detailed in the 'Extent of Supply' and associated **Annex 1-1**.

1.2.4. Generally, the contract comprises design of towers, poles and foundations etc. as mentioned in the specification. But, some cases existing proto type load tested towers and poles are used to construct the line. In such case, the Contractor is not required to design the relevant structure. The requirements of design activities are specifically mentioned in the **Annex 1-1**.

1.2 Extent of Supply

1.2.1. Supply, delivery and construction of transmission line(s) as mentioned in the specification and in **Annex 1-1**.

1.2.2. The Extent of Supply comprises the design, manufacture, testing, supply, insurance, shipping, loading and unloading, delivery to site the Plants and Facilities. The Plants and Facilities include XLPE power cables, surge arrestors, cable joints, cable sealing ends, optical fibre cables, optical fiber cable termination kits and accessories. The scope also include checking the proposed route alignments and laying the cables as per specified manner, installation of, surge arrestor, relevant structures, cable joints and cable sealing ends. To make security, Testing and commissioning of the same and supply of spares, tools, equipment (if any) as set out in this bidding document is also included in the scope of this Contract.

1.2.3. The various items of work are described very briefly in the relevant Price Schedules. The various items of the Schedule of Prices shall be read in conjunction with the corresponding sections in



the Technical Specifications including amendments and, additions, if any. The Bidder's quoted rates shall be based on the description of activities in the Schedule of Prices as well as other necessary operations required to complete the works detailed in these Technical Specifications.

1.2.4. The **unit rates** quoted shall include minor details which are obviously and fairly intended, and which may not have been included in these documents but are essential for the satisfactory completion of the various works.

1.2.5. The unit rate quoted shall be inclusive of all plant equipment, men, material skilled and unskilled labour etc. essential for satisfactory completion of various works.

1.2.6. All **measurements for payment** shall be in S.I. units, lengths shall be measured in meters corrected to two decimal places. Areas shall be computed in square meters & volume in cubic meters rounded off to two decimals.

1.2.7. The Bidder shall submit his offer taking into consideration that the towers/poles designs /drawings shall be approved by the Employer. Bidder shall quote the unit rates for various items of towers as per units mentioned in appropriate Price Schedule. However, payment of these items identified in the price schedules shall be made as follows:

Towers / poles:

Supply items On supply of respective complete tower/pole

Erection items On supply of respective complete tower/pole

Foundation items: On completion of the respective foundation in all respects

1.2.8. All the **raw materials** such as steel, zinc for galvanising, reinforcement steel, cement, coarse and fine aggregates for tower foundation, coke and salt for tower earthing etc. are included in the Contractor's scope of supply.

1.2.9. Bidders shall also indicate in the offer, the sources from where they propose to procure the fasteners, anti-theft fasteners, step bolts, hangers, D-shackles etc., tower accessories, aviation signal (if required) etc.

1.2.10. In hilly terrain and thick forest or area with site constraints, where deployment of tension stringing machine is not possible, manual stringing may be adopted after getting approval of Employer's site Engineer. The Contractor shall deploy appropriate tools/ equipment / machinery to ensure that the stringing operation is carried out without causing damage to conductor / earth wire /OPGW and conductor / earthwire/OPGW is installed at the prescribed sag tension as per the approved stringing charts.

1.3 Details of Transmission Line Routes and Terrain

1.3.1 The detailed survey shall be carried out using Total stations, DGPS, etc. along the approved route alignment. As an alternative, the Contractor may also use ALTM (Airborne Laser Terrain Modelling) techniques of equal or better accuracy for the detailed survey.

1.3.2 Bidders may, however, visit the line route to acquaint themselves with terrain conditions, approach /accessibility to the site, salient features of the route and associated details of the proposed transmission lines. Employer may also arrange joint site visit of line route in Bangladesh for all the interested Bidders who intend to participate in the bidding and have purchased the bidding documents.

1.4 Location Details and Terminal Points

Please refer to **Annex 1-2** for terminal points.

The Contractor shall have to construct these transmission line(s) completely up to dead end towers on either ends. Stringing shall also be carried out from dead end tower to terminal gantry / tower.

1.5 Estimated and Final Quantities

The quantities set out in the schedules are, unless otherwise defined, estimated quantities of the Works required. They are not to be assumed as the actual and final quantities to be executed by the Contractor in fulfilment of his obligations under the contract.

Manufacturing and delivery quantities are to be established by the Contractor, and agreed upon by the Employer, within three (3) months from the date of signing of the Contract.

1.6 Modifications

The transmission line shall be completely in accordance with the Specification and associated design and general arrangement/outline drawings. Any modifications thereto are subject to written confirmation by the Employer/Engineer.

1.7 Terminal Points

The terminal points for the supply and/or installation of the transmission line are defined in **Annex 1-2**.

1.8 Programme of Work

- a. Within 4(four) weeks of signing of the contract the Contractor shall submit to the Employer for approval, 5(five) copies of a bar chart detailing the plant manufacture, testing, delivery and erection programme (as appropriate) for the complete Contract Works.
- b. The bar chart shall indicate the various phases of work for all appropriate items of the Contract, from commencement of the Contract to its final completion e.g. design, survey, approval of drawings, ordering of materials, manufacture, testing, delivery, erection and commissioning. The bar chart shall, when appropriate, allow the requisite periods of approval by the Employer, and/or any other regulatory body.
- c. If at any time during the execution of the contract it is found necessary to modify the approved bar chart, the Contractor shall inform the Employer and submit a modified bar chart for approval. Such approval is not deemed to be consent to any amendments to the contractual completion date(s).

- d. Modifications that may affect site work and associated local arrangements must provide a sufficient notice period to allow for any necessary re-arrangements. It should be recognised that where certain power line outages for crossing purposes have been specified, it may not be possible for these to be replanted due to system operational constraints and this should be allowed for in the overall programme.
- e. The Employer intends that access will be given to a reasonable number of sites to provide continuity of work. However, the Contractor shall accommodate reasonable delays in access to some individual sites that may prevent sequential foundation installation and support erection work being carried out. Provided he has overall continuity of work, this shall not affect the Contractor's programme.

1.9 Safety Measures

The Contract Price shall include the cost for all necessary safety and health procedures to be taken by Contractor and Sub-Contractors under the Project, including following safety measures (not limited to):

- The Contractor shall submit to the Project Manager the work program including concrete safety plans to be done by Contractor (and Sub-Contractors) for protection of general public from accidents and for prevention of traffic accident in the project sites.
- "Health & Safety (Accident Prevention) Officer" shall be continuously stationed in the project construction site throughout the construction period.
- In case power shutdown of existing facility of PGCB/PDB/REB is required for Contractor's works, the Contractor shall submit a safety and work plan and request the power outage at an appropriate time, subject to approval of the Project Manager.
- The Contractor shall immediately notify to the Project Manager in case any fatal, major or other accident, which may involve serious injuries, occurs during the period throughout implementation of Project.

1.10 Coordination and Cooperation with other Contracts

- a. The Contractor shall cooperate with the Employer and other contractors to ensure the satisfactory completion of the Project.
- b. The Contractor shall be responsible for design on the Plant interfacing with any items of equipment which will be installed by other contractor(s), when needed.
- c. The Project Manager may call a coordination meeting(s) with other contractors. The Contractor shall dispatch qualified engineer(s) and settle all design parameters, interface conditions and other matters by these coordination meetings. The necessary expenses such as round-trip international air ticket, accommodation, inland travel charge, etc shall be borne by the Contractor, and such a cost shall be deemed to be included in the Contract Price.

1.11 Inspection

Please refer to Clause no 18.1.11 of section 18 of Technical Specification of Bidding Document.

Annex 1-1: Scope and Extent of Definite Works

Design, Supply, Installation, Testing & Commissioning of 132kV Underground Cable Line in Western Zone on Turnkey Basis (Package-2)

Rampura-Bashundhara 132kV Double Circuit Transmission Line.

Design, Supply, Installation, Testing and Commissioning of 132kV Rampura-Bashundhara Double Circuit Transmission line (Approximately 9.5km Underground Cable line and Approximately 1.5km Overhead line) to be done under this contract.

Underground Cable portion:

Approximately 9.5km from Rampura substation to Bashundhara substation, 132 kV double circuit underground cables with 6 nos. of single-core Cu 1200mm² XLPE cables and one (1) no. of 48 core optical fibre cable shall be installed.

Overhead Line portion:

Approximately 1.5km 132kV double circuit overhead transmission line using pole structure with single ACCC Grosbeak conductor per phase and one (01) no. 48 fibre 7x3.25 GS earthwire equivalent OPGW shall be installed. In case of construction of Overhead line in low land, foundation shall be raised to Highest Flood Level or highest elevation point of road used for underground line construction whichever is higher.

At the connection point of the 132kV overhead line and 132kV underground cables, six (6) nos. of outdoor cable sealing end and six (6) nos. of 132kV surge arrestors will be installed on the terminal pole.

Above mentioned underground cable line will pass through different housing society, may cross underground cable, gas pipeline etc. and will cross canal/khal, roads etc. at different locations through Cable Bridge or Horizontal Directional Drilling (HDD) or any other possible means acceptable to the Employer. The maximum length shall be 200m for HDD.

The scope of works has been described briefly in this section which may not covered all the works to be done under this Contract. Bidders are requested to go through carefully the complete bidding document to understand the detailed scope of works.

It may be mentioned here that, if the contract consists of multiple section/part/line then, in case of non-availability of a particular tower/item for a line section, the Contractor will be allowed to use that particular tower/item from another section without any change in the quoted rate.

Annex 1-2: Terminal Points

Rampura-Bashundhara 132kV Double Circuit Underground Cable Transmission Line.

132kV Underground cables at Rampura Substation:

Six (6) nos. of XLPE underground cables shall be installed through concrete cable trench and connected to Existing 132kV AIS switchgear equipment including supply and installation of cable termination equipment with necessary support structure. Cable trench in the premises of Rampura substation will be constructed by the contractor of this contract.

Fiber optic underground cable shall be terminated at the termination box inside the control room building of Rampura substation. The termination boxes shall be supplied and installed under this Contract.

132kV Underground cables at Bashundhara Substation:

Six (6) nos. of XLPE underground cables shall be installed through concrete cable trench and connected to 132kV GIS switchgear equipment including supply and installation of cable terminal equipment compatible with the existing 132kV GIS equipment. Cable trench in the premises of Bashundhara substation will be constructed by the contractor of this contract. Any required modification of existing cable trench in Bashundhara Substation shall be done the contractor of this contract. The contractor shall make the substation premises after the work as it was before the work.

The Contractor shall arrange "Expert service for work in existing GIS cable chambers" to perform necessary work for GIS cable termination socket and associated parts replacement in existing GIS (make-Mitsubishi) cable chamber under the Contract. The expert shall be experienced to work above mentioned GIS make & model and shall use his own tools/tackles as well as SF6 gas cart. New GIS cable sockets and associated parts for replacement shall be supplied under the Contract.

Fiber optic underground cable shall be terminated at the termination box inside the control room building of Bashundhara substation. The termination boxes shall be supplied and installed under this Contract.

Schedule B: Bid Prices & Schedules

1. General

1. The Price Schedules are divided as follows:

Schedule No. 1: Plant and Mandatory Spare Parts Supplied from Abroad
 Schedule No. 2: Plant and Mandatory Spare Parts Supplied from within the Employer's Country
 Schedule No. 3: Design Services
 Schedule No. 4: Installation and Other
 Services Schedule No. 5: Grand Summary
 Schedule No. 6: Recommended Spare Parts

2. The Schedules do not generally give a full description of the plant to be supplied and the services to be performed under each item. Bidders shall be deemed to have read the Employer's Requirements and other sections of the Bidding Document and reviewed the Drawings to ascertain the full scope of the requirements included in each item prior to filling in the rates and prices. The entered rates and prices shall be deemed to cover the full scope as previously mentioned, including overheads and profit.
3. If Bidders are unclear or uncertain as to the scope of any item, they shall seek clarification in accordance with ITB 7 prior to submitting their bid.

2. Pricing

1. The units and rates in figures entered into the price schedules should be type written or if written by hand, must be in print form. Price schedules not presented accordingly may be considered nonresponsive. Any alterations necessary due to errors, etc., shall be initialed by the Bidder.

As specified in the bid data sheet and special conditions of contract, prices shall be fixed and firm for the duration of the contract, or prices shall be subject to adjustment in accordance with the corresponding appendix (price adjustment) to the contract agreement.

2. Bid prices shall be quoted in the manner indicated and in the currencies specified in the Instructions to Bidders in the bidding document.

For each item, Bidders shall complete each appropriate column in the respective schedules, giving the price breakdown as indicated in the schedules.

Prices given in the schedules against each item shall be for the scope covered by that item as detailed in Volume II (Employer's Requirements) or elsewhere in the bidding document.

3. Payments will be made to the Contractor in the currency or currencies indicated under each respective item.

4. When requested by the Employer for the purposes of making payments or part payments, valuing variations or evaluating claims, or for such other purposes as the Employer may reasonably require, the Contractor shall provide the Employer with a breakdown of any composite or lump sum items included in the schedules.

3. Schedules of Rates and Prices

Schedule No. 1: Plant and Mandatory Spare Parts Supply from Abroad

Schedule No. 2: Plant and Mandatory Spare Parts Supplied from Within the Employer's Country

Schedule No. 3: Design Services

Schedule No. 4: Installation and Other Services

Schedule No. 5: Grand Summary

Schedule No. 6: Recommended Spare Parts

Please see the separate EXCEL file for the above.

The Bidder shall fill, sign and stamp the attached price schedules and shall attach them to the bid.

(Price schedules are attached at the end of this document.)

Schedule C: Bar Chart Program of Key Activities - Delivery & Completion Time Schedule

The Bidder shall fill, sign and stamp the attached time schedule and shall attach it to the bid.

Time for completion of the whole facilities shall be **30 (Thirty) months** from the effective date as described in Section 8 - Special Conditions of Contract, Sub-Clause 8.2.

The Bidder shall provide

- filled general time schedule, provided below and as Appendix 4 to the Section 9: Contract Forms,
- a detailed proposal for mobilization schedule, Section 4: Bidding Forms, item 5.3. and
- a detailed proposal for the construction schedule, Section 4: Bidding Forms, item 5.4.

Please find the time schedule attached.



Time Schedule (Show Activity in Bar Chart for 30 months.)

Work under this contract shall be completed within thirty (30) months from contract effective date.

Rampura-Bashundhara 132kV Underground Cable Line	Duration	Month																													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Line Route Survey																															
Geotechnical Investigation																															
Cable and Line Design																															
Approval of the Cable and Line Design																															
Civil Design																															
Approval of the Civil Design																															
Manufacturing of the Poles																															
Pole Testing																															
Manufacturing of XLPE Cable, Cable Joints & Accessories, Conductor, Insulator, Earthwire, OPGW & Fittings																															
Testing of all the major line equipment																															
Civil Works/Installation																															
Testing & Commissioning																															



Schedule D: Manufacturers, Places of Manufacture and Testing

The following form shall be filled and attached to the bid. Bidders are free to propose more than one Manufacturer for each item.

Manufacturers

Item	Description	Manufacturer	Place of Manufacture	Place of Testing and Inspection	Country of Origin
Overhead Line Part					
1.	Pole				
	Nuts, bolts, washers etc.				
2.	Conductor (ACCC)				
3.	Earthwire				
4.	OPGW				
5.	Insulator				
6.	Hardware fittings for ACCC Conductor & Insulator				
7.	Hardware fittings for OPGW				
Underground Cable Line Part					
1.	XLPE Power cable				
2.	Outdoor Cable Sealing end				
3.	GIS Cable sealing end				
4.	Cable Joint				
5.	Fiber optic cable				
6.	Surge Arrester				

Subcontractors

No.	Service	Subcontractor's Name and Address	Nationality
1	Electrical Works		
2	Civil Works		

Name of Bidder: _____

Signature of Bidder: _____



Schedule E: Technical Particulars and Guarantees

1. General

The technical data schedules hereafter provide more details on the specific technical criteria and complement the Information given in the bidding document.

They form an essential part of bid submission and will be used in bid evaluation.

They should be fully completed and submitted with the bid.

2. Technical Data Schedules

The technical data schedules hereafter provide more details on the specific technical criteria and complement the Information given in the bidding documents.

They form an essential part of bid submission and will be used in bid evaluation.

They should be fully completed and submitted with the bid.

2.1 Poles

2.1.1 Particulars of Steel

	Mild Steel			High Yield Steel		
	Standard	Grade	Yield Stress	Standard	Grade	Yield Stress
Steel standard and grades						
Bolt standard and grades						

2.2 Piled Foundation Details

2.2.1 132kV Poles

Tower Type Particulars	1DLP (Highest extension)	1D1P (Highest extension)	1D25P (Highest extension)	1DT6P (Highest extension)	1D9P (Highest Extension)
Type of piled foundation					
Number of piles per leg*					
Length of pile* (mm)					
Diameter of pile* (mm)					

* The final figures will be obtained during detailed design of tower foundations and the approval thereof after award of contract, and the foundations shall be supplied accordingly within the contract price.

2.3 Conductor, Earthwire & OPGW

2.3.1 132 kV Line – ACCC Conductor

Fill out 1 form for each manufacturer

Conductor	Phase		Earthwire	
	As per Bid requirement	As per Bid Proposal	As per Bid requirement	As per Bid Proposal
Designation (Code Name)				
Type				
Reference standards				
Aluminium/ Aluminium alloy grade				
Steel grade				
Galvanising Thickness				
Aluminium class (AS wire)				
Aluminium type (AS wire)				
Conductor max. continuous operating temperature (°C)				
Minimum mass of grease (kg/km)				
Creep period of conductor to be considered (years)				
No. and diameter of aluminium wire (No./mm)				
No. and diameter of steel wire (No./mm)				
Overall diameter of conductor (mm)				
Overall sectional area of conductor (mm ²)				
Rated tensile strength of conductor (kN)				
Weight (kg/km)				
Direction of external lay				
Cross Sectional Area of Al (mm ²)				
Cross Sectional Area of Composite Core (mm ²)				
No. of Composite Core (mm)				
Shape of wires				
Diameter of Composite Core (mm)				
Rated tensile strength of core (kN)				
Current carrying capacity at 180 Deg C (amp)				
Max. allowable emergency operating temp. (Deg C)				
Maximum DC Resistance at 20 Deg C (ohm/km)				

Name & Signature of
Manufacturer's Representative:

Stamp of Manufacturer



2.4 OPGW & Fittings

2.4.1 132kV Line

Fill out 1 form for each manufacturer

Parameter	Unit	Overland Portion		River Crossing Portion	
		As per Bid requirement	As per Bid Proposal	As per Bid requirement	As per Bid Proposal
OPGW designation & type					
Number of fibres					
Reference standard					
Number and diameter of aluminium strands	mm				
Number and diameter of steel strands	mm				
Corrosion protection of steel strands					
Internal fibre tube diameter	mm				
Overall diameter	mm				
Guaranteed ultimate tensile strength	kN				
Final modulus of elasticity	N/mm ²				
Coefficient of linear expansion	1/degree				
DC resistance at 20°C	ohms/m				
Maximum short circuit current capacity	kA ² sec				
Assumed temperature rise	°C				
Standard weight	kg/m				
Weight of grease	kg/m				
Standard length on drum*	m				
Weight of complete drum	kg				
Maximum drum length	m				
Installation minimum bending radius	m				
Optical Characteristics:					
Cut-off wave length	nm				
Attenuation at Nm	dB/km				
Zero dispersion wave length	nm				
Chromatic dispersion at nm	ps/km				
Individual splice loss	dB				
Bit error rate					
OPGW Fittings:					
Guaranteed ultimate					

Parameter	Unit	Overland Portion		River Crossing Portion	
		As per Bid requirement	As per Bid Proposal	As per Bid requirement	As per Bid Proposal
tensile strength	kN				
• Suspension set	kN				
• Tension set					
Overall length of set					
• Suspension set	mm				
• Tension set	mm				
Mass of set					
• Suspension set	kg				
• Tension set	kg				
Drawing numbers					
Cross section of OPGW					
Cross section of non-metallic cable					
Joint box					
Fixing clamps					
OPGW suspension set					
OPGW tension set					
OPGW vibration damper					

* Drum length to be finalized after finalization of tower locations as per check survey.

Name & Signature of
Manufacturer's Representative:

Stamp of Manufacturer

2.5 Insulator Sets & Fittings

2.5.1 132 kV Line

Parameter	Unit	As per Bid requirement		As per Bid Proposal	
		Insulator Set Type			
		Suspension	Tension	Suspension	Tension
Insulator unit type no.					
Dielectric material					
Total creepage per unit	mm				
Spacing	mm				
Overall shed diameter	mm				
Puncture voltage	kV				
Electro-mechanical failing load of unit	kN				
Drawing no. of unit					
Type test certificate no.					
Number of units per string	pcs.				
Total creepage of string	mm				
Overall length of set	mm				
Sag adjuster type and step	mm				
Ultimate strength of set	kN				
Mass of set	kg				
Anticipated					
• lightning impulse withstand voltage	kV				
• Power frequency withstand voltage	kV				
• Corona extinction level	kV				

Name & Signature of
Manufacturer's Representative:

Stamp of Manufacturer

2.6 Vibration Dampers

Fill out 1 form for each manufacturer

Parameter	Unit	As per Bid requirement	As per Bid Proposal	As per Bid requirement	As per Bid Proposal
		Overland		River Crossing -Not required	
Unit weight of vibration dampers					
• for phase conductor	kg				
• for earthwire	kg				
• for OPGW	kg				
Number of vibration dampers to be used for phase conductor per standard span	pcs.				
Number of vibration dampers to be used for earthwire per standard span	pcs.				
Number of vibration dampers to be used for OPGW per standard span	pcs.				

These quantities shall be based on the design of the proposed vibration dampers. Actual number of vibration damper will be decided according to the Manufacturer's recommendation for each span.

Name & Signature of
Manufacturer`s Representative:

Stamp of Manufacturer

2.7 132kV XLPE Cable

Fill out 1 form for each manufacturer

	Description	Requirement	Manufacturer's Particulars
1	Manufacturer name and address		
2	Voltage		
	Rated voltage	132kV	
	Maximum system voltage	145kV	
3	Cores		
	Number of cores	1 (one)	
4	Conductor		
	Cross sectional area	1200mm ²	
	Material	Copper	
	Design	Milliken type	
5	Conductor Screen		
	Material	Semi conducting tape & extruded semi conducting compound	
	Thickness (approx)		
6	Insulation	XLPE	
	Thickness	17mm	
	Extrusion Process	VCV/CCV	
	Type of curing (dry)	Dry Curing	
7	Insulation screen		
	Material	Extruded semi conducting compound	
	Thickness approx.	Min 1.0 mm	
8	Protection Tapes		
	Material	Semi-conducting water blocking tapes under metallic screen/sheath	
	Nominal thickness	.	
9	Metallic Screen/Sheath		
	Type		
10	Outer Sheath		
	Material	MDPE	
	Minimum average thickness		
	Type of termite repellent		
11	Completed Cable		
	Overall diameter (approx)		
	Weight per meter (approx)		
	Maximum drum length	500 m	
12	Cable Drums		
	Overall diameter (approx)		
	Width (approx)		
	Weight loaded (approx)		

	Description	Requirement	Manufacturer's Particulars
13	Continuous current carrying capacity based on the conditions laid in the ground.		
	One circuit		
	Two circuit		
	Four circuit		
	Drawn into ducts		
	One circuit		
	Two circuit		
	Four circuit		
	In air		
14	Permissible overload in service conditions for a period of	2 hrs in a day 100 hrs in a month 500 hrs in total life	
15	Max conductor temperature		
	Laid direct in ground	°C	
	Drawn into ducts	°C	
	Laid in air	°C	
16	Conductor short circuit current for one second cable loaded as above prior to short circuit	90kA for 1 sec.	
	-do- for three second		
	Final conductor temperature	°C	
17	Sheath earth fault current carrying capacity for three second cable loaded as above prior to earth fault	31.5 kA for 3 sec.	
	Final metallic sheath temperature	°C	
18	Max. dielectric stress all the conductor screen (assumed smooth)		
19	Minimum radius of bend around which cable can be laid		
	Laid direct	20 x overall diameter of cable in meters	
	In ducts		
	In air		
20	Nominal internal diameter of pipes on ducts through which cable may be pulled		
21	Maximum DC resistance per km of cable at 20°C		
	Of conductor		
	Of metallic layer		
22	Maximum AC resistance per km of cable at maximum conductor temperature		
23	Insulation resistance per km of cable per core		
	At 20°C	mega ohm. km	
	At maximum rated temperature	mega ohm. km	

Item	Description	Requirement	Manufacturer's Particulars
24	Equivalent star reactance per meter of 1- phase circuit at nominal frequency		
25	Maximum electrostatic capacitance per meter of cable		
26	Maximum charging current per core per meter of cable at nominal voltage U_0		
27	Maximum dielectric loss of cable per 3 phase circuit when laid direct in the ground at nominal voltage U_0 , normal sequence at maximum conductor temperature.		
28	Maximum induced voltage on metal sheath under fault condition		
29	Maximum dielectric dissipation factor of charging of cable when laid direct in the ground at nominal voltage U_0 , normal frequency at :		
	Conductor temperature of 20°C		
	Maximum conductor temperature of 90deg. C		
30	Sheath loss of cable per meter of 3 phase circuit at nominal voltage U_0 , normal frequency		
31	Earth continuity copper conductor (If required)	400 mm ²	
32	Condition on which current carrying capacity are based		
	Soil thermal resistivity	°C. cm/W	
	Ground temperature	°C	
	Air temperature	°C	
	Burial depth	m	
	Axial spacing between phase cables	mm	
	Axial spacing between circuits	mm	
	Type of earth bonding system of metallic sheath.		

2.8 OPTICAL FIBRE CABLE

Description	Requirement	Manufacturer's Particulars
Manufacturer name and address		
Optical fibre cable designation & type		
Reference standard		
No. of fibre	48	
Central strength member	FRP	
Luse tube Material		
Diameter	Nom. 2.5mm	
Filling compound in tube	Jelly	
Strength element	Aramid yarn	
Inner sheath Material	HDPE	
Thickness	Nom. 1.0mm	
Armouring Material	Corrugated steel tape	
Thickness	mm	

Outer sheath Material	HDPE	
Thickness	mm	
Anti-termite layer		
Cable diameter	mm	
Weight of cable	kg/km	
Mode field diameter at 1310nm	9.0um±0.5um	
Mode field concentricity error	Max. 0.8um	
Cladding diameter	125.0±1.0um	
Cladding non-circularity	Max. 1%	
Attenuation at 1310nm	dB/km	
at 1550nm	dB/km	
Dispersion at range 1285-1300nm	ps/nm · km	
At1550nm	ps/nm · km	
Zero dispersion wavelength	≤ 1310 nm	
Zero dispersion slope	ps/nm · km	
Cable cut-off wavelength	≤ 1270 nm	

* Drum length to be finalized after finalization of route as per route survey.

2.9 CABLE SEALING END

2.9.1 132kV Outdoor Cable Sealing End

Item	Description	Unit	Requirement	Manufacturer's Particulars
1	Manufacturer name and address			
2	Voltage rating	kV	132	
3	Current rating	amp	As per cable	
4	Type		Porcelain/polymeric insulator.	
5	Insulator material		Porcelain/Polymeric bushing	
6	Pollution severity levels		Heavy	
7	Pitch circle diameter	mm		
8	Overall length of insulator	mm		
9	Weight of bushing including sealing compound	kg		
10	Total creepage distance of outdoor sealing end	mm	4500mm	
11	Total creepage distance of shedding	mm	450mm (approx)	
12	Impulse withstand voltage (External)			
	(a) Positive	kV	650	
	(b) negative	kV	650	
	Standards		IEC 60840	
13	Height of steel mounting structure over the finished switchyard level	mm	2000 (min.)	

2.9.2 132kV GIS Cable Sealing End

Item	Description	Unit	Requirement	Manufacturer's Particulars
1	Manufacturer name and address			
2	Voltage rating	kV	132	
3	Current rating	amp	As per cable	
4	Type		Elastomeric stress cone	
5	Insulator material		Epoxy bushing	
6	Pollution severity levels		Heavy	
7	Pitch circle diameter	mm		
8	Overall length of insulator	mm		
9	Weight of bushing including sealing compound	kg		
10	Total creepage distance of shedding	mm	450mm (approx)	
11	Impulse withstand voltage (External)			
12	(a) Positive	kV	1050	
	(b) negative	kV	1050	
	Standards		IEC 60840	

2.10 CABLE JOINT

2.10.1 132 kV Straight Through Joint

Item	Description	Unit	Requirement	Manufacturer's Particulars
1	Manufacturer name and address			
2	Voltage rating	kV	132	
3	Current rating	amp	As per cable	
4	Type		Pre-molded (One piece)	
5	Stress relief cone			
	Material		EPDM/EPR/ Silicone Rubber	
6	The Interface pressure between cable insulation and joint rubber block insulator		Min. 0.2MPa	
7	Conductor connecting method			
8	Impulse withstand voltage			
	(a) Positive	kV	650	
	(b) negative	kV	650	
	Standards		IEC 60840	

2.10.2 132 kV Insulated Joint

Item	Description	Unit	Requirement	Manufacturer's Particulars
1	Manufacturer name and address			
2	Voltage rating	kV	132	
3	Current rating	amp	As per cable	
4	Type		Pre-molded (One piece)	
5	Stress relief cone			
	Material		EPDM/EPR/ Silicone Rubber	
6	The Interface pressure between cable insulation and joint rubber block insulator		Min. 0.2MPa	
7	Conductor connecting method			
8	DC voltage withstand of the insulation flange	kV		
9	Impulse withstand voltage			
	(a) Positive	kV	650	
	(b) negative	kV	650	
	Standards		IEC 60840	

2.11 132KV SURGE ARRESTER

Item	Description	Unit	Specified	Manufacturer's Particulars
1	Manufacturer name and address			
2	Type & model No.		Outdoor	
3	Catalog No.			
4	Rated voltage	kV	120	
5	System voltage	kV	132	
6	Pollution severity levels	--	Heavy	
7	Rated discharge current	kA	10	
8	(a) BILL (b) Power frequency withstand voltage for	kV kV	650 275	
9	Discharge residual voltage at rated current	kV	336	
10	Discharge voltage when discharging on (4x20) us current wave of, for gapless type only: 5kA 10kA 20kA			
10	Height of the steel mounting structure over the finished switchyard level	mm	2000(min.)	

SCHEDULE F

PROPOSED SUBCONTRACTORS

The bidder shall propose a list of the Sub-contractors in the following table as per sub-clause 2.5.2, Subcontractors, Section-3, Evaluation and Qualification Criteria, Volume 1 of 3 of the Bidding Document.

Sl. No.	Name and Address of the Subcontractor

Signature _____
Date _____



Attachment-Price Schedule



Design, Supply, Installation, Testing Commissioning of Rampura-Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2)

Design, Supply, Installation, Testing & Commissioning of Rampura-Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2)

Item	Description	Country of origin ²	Unit	Quantity	Unit Price:	Total Price:	Taxes and Duties
					Foreign Currency [xxx] CIP	Foreign Currency [xxx] CIP	Local Currency [XXX]
1	2	3*	4	5	6	7= 5 x 6	8
Schedule No. 1 Plant and Mandatory Spare Parts Supplied from Abroad							
1	Scope: Rampura-Bashundhara 132 kV double circuit Underground cable line portion (1200 mm² XLPE):						
1.1	132kV XLPE Underground Power Cable with Necessary Accessories						
1.1.1	132kV single core 1200sqmm copper conductor, XLPE insulated, corrugated Al sheathed & MDPE outer sheathed cable		km	57			
1.1.2	Straight Through Joint suitable for above cable mentioned in item 1.1.1 including all related accessories		Set	48			
1.1.3	Insulated Joint suitable for above cable mentioned in item 1.1.1 including all related accessories		Set	66			
1.1.4	Outdoor Cable Sealing End for above cable mentioned in item 1.1.1 including all related accessories (Composite polymar)		Set	18			
1.1.5	GIS Cable sealing end terminations complete kit with filling compound for above cable mentioned in item 1.1.1(Male Part)		Set	6			
1.1.6	Link Box for cross bonding including all related accessories		Set	22			
1.1.7	Link Box for earthing at straight through joint including all related accessories		Set	16			
1.1.8	Link Box for earthing at cable sealing end including all related accessories		Set	12			
1.2	Fibre Optic Cable inclusive of joint boxes including all related accessories						
1.2.1	Fibre Optic Cable including joint boxes and all related accessories		km	9.50			
1.2.2	Fibre Optic Cable Termination Box inclusive all related accessories		set	4			
1.3	Connection of Underground and Overhead Transmission Lines						
1.3.1	Support Structures for Cable Sealing End(CSE) at Rampura substation		Lot	1			
1.3.2	132kV Lightenning Arrester with all fittings		Set	12			

Design, Supply, Installation, Testing Commissioning of Rampura-Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2)

Item	Description	Country of origin ²	Unit	Quantity	Unit Price:	Total Price:	Taxes and Duties
					Foreign Currency [xxx] CIP	Foreign Currency [xxx] CIP	Local Currency [XXX]
1	2	3*	4	5	6	7= 5 x 6	8
Schedule No. 1 Plant and Mandatory Spare Parts Supplied from Abroad							
2	Support Structures						
2.1	Fabrication, galvanising and supply of Cable Bridge including all kinds of accessories		per route-km	0.65			
2.2	Poles						
2.2.1	Fabrication, galvanising and supply of various types of poles, including crossarms, base plates, anchor bolt, stiffener, bolts & nuts, including hangers, D-shackles, spring washer, plain washer, pole earthing, danger plate, number plate, bird guards, anti-climbing device, ladder, rest platform (if required), etc. as per specification (payment shall be released for identified complete pole).						
2.2.1.1	Pole Type 1DLP		each	7			
2.2.1.2	Pole Type 1D25P		each	1			
2.2.1.3	Pole Type 1DT6P		each	1			
2.2.1.4	Pole Type 1DT6P (with CSE & LA support Structure)		each	2			
2.2.1.5	Auxiliary crossarms		per set of three	1			
3	Phase conductor, earthwire and OPGW cable, complete with repair sleeves and joints						
3.1	"ACCC Grosbeak Phase Conductor (3 Phase, Double Circuit, one conductor per phase on the line)		Route km ³	1.5			
3.2	7x3.25mm equivalent OPGW inclusive of joint boxes, fixing clamps, fusion splices and connections to the joint boxes. One OPGW earthwire on the line.		Route km ³	1.5			
4	Insulator strings, with associated suspension and tension clamps for Single ACCC Grosbeak Conductor						
4.1	a) Single suspension string, 70 kN -disc only		Set	42			
	b) Single suspension string, 70 kN -fittings only		Set	42			
4.2	a) Tension string, 120kN -disc only		Set	48			
	b) Tension string, 120kN -fittings only		Set	48			
4.3	a) Single jumper suspension string, having each string 70 kN-disc only		Set	9			
	b) Single jumper suspension string, having each string 70 kN-fittings only		Set	9			
5	OPGW sets, complete with all accessories, incl. armour rods and earth bounds						
5.1	Suspension set (including all fittings and accessories for surplus and to guide the OPGW to the joint box)		set	7			
5.2	Tension set (including all fittings and accessories for surplus and to guide the OPGW to the joint box)		set	8			
6	Dampers						
6.1	Vibration damper for phase conductor		per span	10			
6.2	Vibration damper for OPGW		per span	10			

Design, Supply, Installation, Testing Commissioning of Rampura-Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2)

Item	Description	Country of origin ²	Unit	Quantity	Unit Price ¹	Total Price ¹	Taxes and Duties
					Foreign Currency [xxx] CIP	Foreign Currency [xxx] CIP	Local Currency [XXX]
1	2	3*	4	5	6	7= 5 x 6	8
Schedule No. 1 Plant and Mandatory Spare Parts Supplied from Abroad							
7	Spares						
7.1	Outdoor Cable sealing end terminations complete kit with filling compound for above cable mentioned in item 1.1.1		set	2			
7.2	GIS Cable sealing end terminations complete kit with filling compound for above cable mentioned in item 1.1.1(Male Part)		set	3			
7.3	Cable joint (straight through suitable for above cable mentioned in item 1.1.1)		set	3			
7.4	70kN single suspension Insulators set for single ACCC Conductor - Complete Assembly		set	3			
7.6	120kN tension set for single ACCC Conductor - Complete Assembly		set	3			
7.7	Midspan Joint for single ACCC conductor		each	2			
7.8	Repair sleeve for single ACCC conductor		each	2			
Sub-total Columns 7 to be carried forward to Schedule No. 5 - Grand Summary							

Name of Bidder _____
Signature of Bidder _____

- 1 Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of two foreign currencies, if so required.
- 2 Bidders shall enter a code representing the country of origin of all imported plant and equipment.
- 3 Definition of route km: Route km is the transmission line distance between two terminal points in plan view. Route km is exclusive sag and other electrical clearances, elevation differences etc. The Contractor shall incorporate all such extra costs in his unit rate.

Country of Origin Declaration Form

Item	Description	Code	Country

Design, Supply, Installation, Testing Commissioning of Rampura-Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2)

Design, Supply, Installation, Testing & Commissioning of Rampura-Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2)

Item	Description	Country of origin ¹	Unit	Quantity	Local Currency in BDT		Taxes and Duties
					Unit EXW Price ¹	Total EXW Price	Local Currency [BDT]
1	2	3*	4	5	6	7= 5 x 6	8
Schedule No.2 Plant and Mandatory Spare Parts Supplied from Within the Employer's Country							
1	Scope: Rampura-Bashundhara 132 kV double circuit Underground cable line portion (1200 mm² XLPE):						
1.1	132kV XLPE Underground Power Cable with Necessary Accessories						
1.1.1	132kV single core 1200sqmm copper conductor, XLPE insulated, corrugated Al sheathed & MDPE outer sheathed cable		km	57			
1.1.2	Straight Through Joint suitable for above cable mentioned in item 1.1.1 including all related accessories		Set	48			
1.1.3	Insulated Joint suitable for above cable mentioned in item 1.1.1 including all related accessories		Set	66			
1.1.4	Outdoor Cable Sealing End for above cable mentioned in item 1.1.1 including all related accessories(Long rod type polymar)		Set	18			
1.1.5	GIS Cable sealing end terminations complete kit with filling compound for above cable mentioned in item 1.1.1(Male Part)		Set	6			
1.1.6	Link Box for cross bonding including all related accessories		Set	22			
1.1.7	Link Box for earthing at straight through joint including all related accessories		Set	16			
1.1.8	Link Box for earthing at cable sealing end including all related accessories		Set	12			
1.2	Fibre Optic Cable inclusive of joint boxes including all related accessories						
1.2.1	Fibre Optic Cable including joint boxes and all related accessories		km	9.50			
1.2.2	Fibre Optic Cable Termination Box inclusive all related accessories		set	2			
1.3	Connection of Underground and Overhead Transmission Lines						
1.3.1	Support Structures for Cable Sealing End(CSE) at Rampura		Lot	1			
1.3.2	132kV Lightning Arrester with all fittings		Set	12			
2	Support Structures						
2.1	Fabrication, galvanising and supply of Cable Bridge including all kinds of accessories		per route-km	0.65			

Design, Supply, Installation, Testing Commissioning of Rampura-Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2)

Item	Description	Country of origin ¹	Unit	Quantity	Local Currency in BDT		Taxes and Duties
					Unit EXW Price1	Total EXW Price	Local Currency [BDT]
1	2	3*	4	5	6	7= 5 x 6	8
Schedule No.2 Plant and Mandatory Spare Parts Supplied from Within the Employer's Country							
2.2	Poles						
2.2.1	Fabrication, galvanising and supply of various types of poles, including crossarms, base plates, anchor bolt, stiffener, bolts & nuts, including hangers, D-shackles, spring washer, plain washer, pole earthing, danger plate, number plate, bird guards, anti-climbing device, ladder, rest platform (if required), etc. as per specification (payment shall be released for identified complete pole).						
2.2.1.1	Pole Type 1DLP		each	7			
2.2.1.2	Pole Type 1D25P		each	1			
2.2.1.3	Pole Type 1DT6P		each	1			
2.2.1.4	Pole Type 1DT6P (with CSE & LA support Structure)		each	2			
2.2.1.5	Auxiliary crossarms		per set of three	1			
3	Phase conductor, earthwire and OPGW cable, complete with repair sleeves and joints						
3.1	"ACCC Grosbeak Phase Conductor (3 Phase, Double Circuit, one conductor per phase on the line)		Route km ²	1.5			
3.2	7x3.25mm equivalent OPGW inclusive of joint boxes, fixing clamps, fusion splices and connections to the joint boxes. One OPGW earthwire on the line.		Route km ²	1.5			
4	Insulator strings, with associated suspension and tension clamps for Single ACCC Grosbeak Conductor						
4.1	a) Single suspension string, 70 kN -disc only		Set	42			
	b) Single suspension string, 70 kN -fittings only		Set	42			
4.2	a) Tension string, 120kN -disc only		Set	48			
	b) Tension string, 120kN -fittings only		Set	48			
4.3	a) Single jumper suspension string, having each string 70 kN-disc only		Set	9			
	b) Single jumper suspension string, having each string 70 kN-fittings only		Set	9			
5	OPGW sets, complete with all accessories, incl. armour rods and earth bounds						
5.1	Suspension set (including all fittings and accessories for surplus and to guide the OPGW to the joint box)		set	2			
5.2	Tension set (including all fittings and accessories for surplus and to guide the OPGW to the joint box)		set	6			
6	Dampers						
6.1	Vibration damper for phase conductor		per span	10			
6.2	Vibration damper for OPGW		per span	10			

Design, Supply, Installation, Testing Commissioning of Rampura-Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2)

Item	Description	Country of origin ¹	Unit	Quantity	Local Currency in BDT		Taxes and Duties
					Unit EXW Price ¹	Total EXW Price	Local Currency [BDT]
1	2	3*	4	5	6	7= 5 x 6	8
Schedule No.2 Plant and Mandatory Spare Parts Supplied from Within the Employer's Country							
7	Spares						
7.1	Outdoor Cable sealing end terminations complete kit with filling compound for above cable mentioned in item 1.1.1		set	2			
7.2	GIS Cable sealing end terminations complete kit with filling compound for above cable mentioned in item 1.1.1(Male Part)		set	3			
7.3	Cable joint (straight through suitable for above cable mentioned in item 1.1.1)		set	3			
7.4	70kN single suspension Insulators set for single ACCC Conductor - Complete Assembly		set	3			
7.6	120kN tension set for single ACCC Conductor - Complete Assembly		set	3			
7.7	Midspan Joint for single ACCC conductor		each	2			
7.8	Repair sleeve for single ACCC conductor		each	2			
	Sub-total Columns 7 to be carried forward to Schedule No. 5 - Grand Summary						

Name of Bidder _____

Signature of Bidder _____

¹ Bidders shall enter a code representing the country of origin of all imported plant and equipment.

² Definition of route km: Route km is the transmission line distance between two terminal points in plan view. Route km is exclusive sag and other electrical clearances, elevation differences etc. The Contractor shall incorporate all such extra costs in his unit rate.

Design, Supply, Installation, Testing & Commissioning of Rampura-Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2)

Item	Description	Unit	Quantity	Unit Price ¹		Total Price ¹	
				Local Currency [BDT]	Foreign Currency [XXX]	Local Currency [BDT]	Foreign Currency [XXX]
1	2	3	4	5	6	7=4X5	8= 4 x 6
Schedule No. 3 Design Services							
1	Scope: Rampura-Bashundhara 132 kV double circuit Underground cable line portion (1200 mm² XLPE):						
1.1	Design services for underground cable and accessories	Lump sum	1				
2	Rampura-Bashundhara 132 kV double circuit Overhead line portion:						
2.1	Design services (including line design, foundation design and prototype testing etc. as per bid requirement) for overland portion.	Lump sum	1				
3	Foundation Design						
3.1	Foundation design for all soil types including additional soil investigation and additional soil resistivity measurement	Lump sum	1				
4	Test and Inspection						
4.1	Costs and Expenses related to test witness ³ (Provisional Sum)	Lump sum	1		\$30,000.00		\$30,000.00
5	18.1.12.3 PLS CADD, TOWER, POLE License						
5.1	PGCB's existing five Licenses of PLS CADD, PLS TOWER and PLS POLE shall be updated for one year and one existing license of PLS CADD, PLS TOWER and PLS POLE shall be updated for approximately 3 month at prorate under this contract. All available existing features of licenses should be extended.	Set	6				
Total	Sub-total Columns 7 & 8 to be carried forward to Schedule No. 5 - Grand Summary						

Name of Bidder _____

Signature of Bidder _____

1. Specify currencies in accordance with ITB 19.1 of the BDS.

2. Bidder shall quote the amount considering clause 14.1 of section 8(Special Conditions of Contract), Volume 1 of 3 of the bidding document. The amount quoted by bidder is subject to arithmetic correction by Employer as required.

3 These costs are fixed ceiling and will be included in total price. But the payment shall be at actual upon submission of relevant documents.

Design, Supply, Installation, Testing Commissioning of Rampura-Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2)

Schedule No. 4 Installation and Other Services							
Item	Description	Unit	Quantity	Unit Price ¹		Total Price ¹	
				Foreign Currency [xxx]	Local Currency [BDT]	Foreign Currency [xxx]	Local Currency [BDT]
1	2	3	4		5		7 = 4 x 5
Schedule No. 4 Installation and Other Services							
	Scope: Rampura-Bashundhara 132 kV double circuit Underground cable line portion (1200 mm² XLPE):						
1	Survey and soil investigation works						
1.1	Survey Work						
1.1.1	Check survey in accordance with the requirements of the technical specification, incl. Full ground survey with change of route, if any, tower plotting and preparation and submission of route maps, profile drawings, SIMM documents, etc.	Km	11				
1.2	Geotechnical Investigations incl. taking samples, logging and lab testing						
1.2.1	Boreholes for geotechnical investigation, incl. laboratory test, borehole logs, sampling and interpretive report as per geotechnical specification						
(a)	Level 2	borehole	NIL				
(b)	Level 4	borehole	NIL				
1.2.2	Soil resistivity tests (one per pole)	unit	5				
2	Foundations for poles including all setting out, Concrete, Reinforcement, Excavation, Pumping, anchor bolt Setting, Geotechnical Investigation (Level 2), Shuttering, Leveling, Timbering, supply & Installation of foundation steelwork, Earthing Materials, Backfilling, approved Protective Coating & site clearing etc.						
2.1	Pole Type 1DLP						
2.1.1	Pile Foundation for any soil category with 4 meter Raised chimney	per pole	3				
2.1.2	Pile Foundation for any soil category with 6 meter Raised chimney	per pole	4				
2.2	Pole Type 1D25P						
2.2.1	Pile Foundation for any soil category with 6 meter Raised chimney	per pole	1				
2.3	Pole Type 1DT6P						
2.3.1	Pile Foundation for any soil category with 6 meter Raised chimney	per pole	1				
2.4	Pole Type 1DT6P (with CSE & LA support Structure)						
2.4.1	Pile Foundation for any soil category with 1 meter Raised chimney	per pole	2				
3	Erection of 132kV double circuit poles complete with all stubs, nuts, bolts, locking nuts, washers, phase conductor and earthwire swivels/shackles, step bolts, tower notice and identification plates, ACDs, protective coating, earthing etc.						
3.1	Pole Type 1DLP	each	7				
3.2	Pole Type 1D25P	each	1				
3.3	Pole Type 1DT6P	each	1				
3.4	Pole Type 1DT6P (with CSE & LA support Structure)	each	2				
3.5	Auxiliary crossarms	per set of three	1				
4	Testing of Foundations						
4.1	Individual Pile test including supply, install and test to prove compliance with technical specification, payment for successful test only (applicable for all pole types selected by the Employer's Engineer):						
(a)	Compression test	per test	1				
(b)	Uplift test	per test	1				
(c)	Pile Integrity test	per test	11				

Design, Supply, Installation, Testing Commissioning of Rampura-Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2)

Item	Description	Unit	Quantity	Unit Price ₁		Total Price ₁	
				Foreign Currency [xxx]	Local Currency [BDT]	Foreign Currency [xxx]	Local Currency [BDT]
1	2	3	4		5		7 = 4 x 5
Schedule No. 4 Installation and Other Services							
5	Stringing of double circuit line, one conductors per phase, 1 OPGW (length approx. Route km)						
5.1	"Single ACCC Grosbeak (ACSR Grosbeak Equivalent)" (double circuit line, both circuits erected, one conductors per phase) including: Installation of insulation strings, compressed dead-ends, compression junction sleeves, suspension clamps, Sagging and clipping, Installation of armour rods and Dampers, Pilot strings and jumpers and any other works required as per specification.	route km	1.5				
5.2	One optical fibre ground wire, 24 fibres 7×3.25 steel earthwire equivalent OPGW shield wire, including joint box, including: Tension and semi-tension joints, suspension clamps, armour rods and dampers, Sagging and clipping, Installation of intermediate junction boxes and terminal junction boxes at substation gantries, Earthing jumpers	route km	1.5				
6	Installation and Erection of 132kV XLPE cables and Fibre Optic Cable Circuit						
6.1	Laying of cables (double circuit of single core cables and one fibre optic cable) as per the requirements of the technical specification.	per route km	9.50				
6.2	Excavation and construction of all civil related works of cable trench as per the requirements of the technical specification	per route km	7.93				
6.3	Excavation and construction of all civil related works of cable trench for road crossing using cable ducts for individual cables as per the requirements of the technical specification.	per route km	0.15				
6.4	Making arrangement /installation of cable trench for Road crossing using cable ducts for individual cables as per the requirements of the technical specification (double circuit of single core cables and one fiber optic cable) through Horizontal Directional Drilling (HDD) method or any other means. One spare cable duct is to be provided in the Road crossing cable trench. Total cost of making/installing all arrangements including supply of materials/accessories required for the Road crossing arrangement/installation are included in this item.	per route km	0.12				
6.5	Making arrangement /installation including pile foundations or any other type foundations as required for the crossing of the canal/khal into/within the canal/khal crossing arrangement/installation through cable bridge. Total cost of making/installing all arrangements including supply of reinforcement and other materials/accessories required for the above canal/khal crossing arrangement/installation are included in this item.						
6.5.1	Up to 20 meter width of canal	per route km	0.15				
6.5.2	Above 20 meter width of canal	per route km	0.50				
6.6	Making arrangement /installation for the crossing of the canal/khal using cable ducts for individual cables as per the requirements of the technical specification (double circuit of single core cables and one fiber optic cable) through Horizontal Directional Drilling (HDD) method or any other means into/within the canal/khal. Total cost of making/installing all arrangements including supply of materials/accessories required for the above canal/khal crossing arrangement/installation are included in this item.	per route km	0.65				

Design, Supply, Installation, Testing Commissioning of Rampura-Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2)

Item	Description	Unit	Quantity	Unit Price ¹		Total Price ¹	
				Foreign Currency [xxx]	Local Currency [BDT]	Foreign Currency [xxx]	Local Currency [BDT]
1	2	3	4		5		7 = 4 x 5
Schedule No. 4 Installation and Other Services							
6.7	Excavation and construction of all civil related works of cable joint bay as per the requirements of the technical specification.	Set	12				
6.8	Installation and jointing of 132kV insulated/straight through joints as per the requirements of the technical specification including installation of link box and associated earthing works with provision for link pit as per the requirements and all related works	Set	66				
6.9	Installation and terminating of 132kV Outdoor Cable sealing end termination as per the requirements of the technical specification including installation of link box and associated earthing works as per the requirements and all related works	Set	18				
6.1	Installation and terminating of 132kV GIS Cable sealing end termination as per the requirements of the technical specification including installation of link box and associated earthing works as per the requirements and all related works	Set	6				
6.11	Installation and jointing of Fibre optic cable joint inclusive all related accessories	Lot	1				
6.12	Installation and terminating of Fibre optic cable terminal box inclusive all related accessories	Set	4				
6.13	Installation of 132kV Lighting Arrester including earthing & all related accessories	Set	12				
7	Testing and Commissioning						
7.1	Testing and commissioning of 132kV cable circuit and fibre optic cable with provision of all test equipment as per the requirements of technical specification	Lot	1				
8	MISCELLANEOUS						
8.1	Outdoor termination/connection from slack span conductor to Cable sealing end and LA	Lot	1				
8.2	Complete civil works including foundation for Cable Sealing End at Rampura substation	Lot	1				
8.3	Establishment of as-built drawings, manuals and all requested documents as per specifications	lump sum	1				
8.4	Expert Service for GIS termination to existing GIS cable chamber	Lot	1				
8.5	Payment for Compensation(For resettlement of affected people, dwelling/commercial structures, trees, crops etc. on the Right of Way)	lump sum	1		4,059,792.00		
	Sub-total Columns 7 to be carried forward to Schedule No. 5 - Grand Summary						

Name of Bidder
Signature of Bidder

1 Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies, if so required.¹⁰

2 As described in SCC 22.2.7

3. Bidder shall quote the amount considering clause 14.1 of section 8(Special Conditions of Contract), Volume 1 of 3 of the bidding document. The amount quoted by bidder is subject to arithmetic correction by Employer as required.

Design, Supply, Installation, Testing & Commissioning of Rampura-Bashundhara 132kV Underground Cable Line on Turnkey Basis (Package-2)

Schedule No. 5. Grand Summary

Item	Description	Total Price ¹	
		Local Currency Portion [BDT]	Foreign Currency Portion [xxx]
Rampura-Bashundhara 132 kV double circuit Underground cable line portion			
1	Schedule No. 1 Plant and Mandatory Spare Parts Supplied from Abroad		
2	Schedule No. 2 Plant and Mandatory Spare Parts Supplied from Within the Employer's Country		
3	Schedule No. 3 Design Services		
4	Schedule No. 4 Installation and Other Services -		
	GRAND TOTAL		
		Name of Bidder _____	
		Signature of Bidder _____	

1. Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies, if so required.

**Design, Supply, Installation, Testing & Commissioning of Rampura-Bashundhara 132kV
Underground Cable Line on Turnkey Basis (Package-2)**

Schedule No. 6. Recommended Spare Parts

Item	Description	Unit	Quantity	Unit Price ¹		Total Price ¹	
				Local Currency Portion [BDT]	Foreign Currency Portion [xxx]	Local Currency Portion [BDT]	Foreign Currency Portion [xxx]
1	2	3	4	5	6	7 = 4 x 5	8 = 4 x 6
						Name of Bidder _____	
						Signature of Bidder _____	

1. Specify currencies in accordance with ITB 19.1 of the BDS. Create additional columns for up to a maximum of three foreign currencies, if so required.