Design, Supply, Installation, Testing and Commissioning of 400kV and 132kV Transmission Lines under ESPNER Project [Contract No.: PGCB/WB/ESPNERP/TL/Package-1]

Addendum No. 02

Following revisions/changes are made in the Bidding Document which will form part of the Bidding Document:

Volume 1 of 2

1. **Section IV. Bidding Forms**

   Clause 2.2.5. 132 kV Tower – For ACSR Grosbeak Conductor
   The table under this clause shall be replaced with the following table:

Tower Type Particulars	1DL (Highest extension)	1D1 (Highest extension)	1D25 (Highest extension)	1DT6 (Highest extension)	1QL (Highest Extension)	1Q15 (Highest Extension)	1Q30 (Highest Extension)	1QT6 (Highest Extension)
Type of piled foundation								
Number of piles per leg*								
Length of pile* (mm)								
Diameter of pile* (mm)								

2. **Section X. Contract Forms**
   Appendix 2. Price Adjustment

   Page no. 308 shall be replaced with the revised page no. 308 (Rev1) [**Attachment 1**].

3. **Section I. Instruction to Bidders (ITB)**
   Clause 20.9 (b) (ii)

   The text 'furnish a Performance Security in accordance with ITB 451' shall be replaced with the following:

   'furnish a Performance Security in accordance with ITB 45'

4. **Section IV. Bidding Forms**
   Page 134. Form of Bid Security

   The text under **Beneficiary:**

   'Power Grid Company of Bangladesh Limited
   Institution of Engineers Bangladesh (IEB) Building (New), 4th Floor
   8/A Ramna, Dhaka-1000, Bangladesh.'

   shall be replaced by the following text:

   'Power Grid Company of Bangladesh Limited
   PGCB Head Office, Avenue-3, Jahurul Islam City, Aftabnagar, Badda, Dhaka-1212, Bangladesh.'

Volume 2 of 2

1. The reply of query no. 8 under volume 2, Clarification-1 is replaced with the following texts:

   "If the type tests for insulator sets are not available as offered combination of insulator & fitting manufacturer with proposed design, the tests shall be performed for all the insulator sets of the 400kV line (except low duty sets) and only suspension set of 132kV line under this project during execution stage in presence of Employer's Engineers."

2. **Section 11. ACCC Conductors**

   i. Page no. 11-16 is replaced with the revised page no. 11-16 (Rev. 1). [**Attachment-2**]

   ii. Clause 1.4 D.C. Resistance Test on Stranded Conductor, Page 11-24
   The texts "The value obtained shall be corrected to the value at 200C as per relevant IEC/BS/equivalent standard. The resistance corrected at 200C shall conform to the requirements indicated in the STP." are replaced with the following texts:

   "The value obtained shall be corrected to the value at **20 deg C** as per relevant IEC/BS/equivalent standard. The resistance corrected at **20 deg C** shall conform to the requirements indicated in the STP."

   iii. Clause 1.8 Radial Crush Test, Page 11-25

   The texts "All the strands shall be subsequently disassembled and tensile tested. All the strands shall exhibit full strength retention" are replaced with the following texts:

   "All the core strands/core shall be subsequently disassembled and tensile tested. All the core strands/core shall exhibit full strength retention"

   iv. Clause 1.15 Coefficient of linear expansion for composite core/ core wires, Page 11-26

   The texts "The temperature and elongation on a sample shall be continuously measured and recorded at interval of approximately 15 degree C from 15 degree C to maximum continuous operating temperature by changing the temperature by suitable means." are replaced with the following texts:

   "The temperature and elongation on a sample shall be continuously measured and recorded at interval of approximately 15 degree C from **laboratory ambient temperature** to maximum continuous operating temperature by changing the temperature by suitable means."

   v. Clause 1.35 Galvanic Protection Barrier Layer Thickness, Page 11-30

   The texts "The minimum thickness shall be at least 0.5 mm" are replaced with the following texts:

"The minimum thickness shall be at least **0.38** mm"

3. **Section 11B. ACSR & AAAC Conductors**

   i. Appendix 11B.A1/3, Page 11B/21

   The texts "Ref IEC 61232" are replaced with the following texts:

   "Ref IEC 60889"

4. **Section 24. Environment and Social Management**

   The text 'Reconductoring of Transmission lines: Impact of Reconductoring of transmission lines and corresponding mitigation and enhancement measures' shall be replace with the following text:

   'Transmission lines: Impact of construction of transmission lines and corresponding mitigation and enhancement measures'

P_o = Contract price (base price)

a = percentage of fixed elements in the contract price (a = 10%)

b = percentage of labour components in the contract price (b = 10%)

c = percentage of material (aluminium) components in the contract price (c = 80%)

d = percentage of materials (steel) components in the contract price (d = 0%)

L_0, L_1 = labour indices applicable to the appropriate industry in the country of origin at the base date and at the date for adjustment, respectively

M_0, M_1 = material (aluminium) indices applicable to the appropriate industry in the country of origin at the base date and at the date for adjustment, respectively

N_0, N_1 = material (steel) indices applicable to the appropriate industry in the country of origin at the base date and at the date for adjustment, respectively

Conductor (ACSR)

The formula for calculating the price adjustment of the contract price component of the ACSR Conductor is as follows:

$$P_1 = P_0 x(a + b\frac{L_1}{L_0} + c\frac{M_1}{M_0} + d\frac{N_1}{N_0}) - P_0$$

Where,

P_1 = Price adjustment for conductors,

P_o = Contract price (base price)

a = percentage of fixed elements in the contract price (a = 10%)

b = percentage of labour components in the contract price (b = 6%)

c = percentage of material (aluminium) components in the contract price (c = 70%)

d = percentage of materials (steel) components in the contract price (d = 14%)

L_0, L_1 = labour indices applicable to the appropriate industry in the country of origin at the base date and at the date for adjustment, respectively

M_0, M_1 = material (aluminium) indices applicable to the appropriate industry in the country of origin at the base date and at the date for adjustment, respectively

N_0, N_1 = material (steel) indices applicable to the appropriate industry in the country of origin at the base date and at the date for adjustment, respectively

Annex 11-1: Conductor - Types and Uses

Annex11-1(1): 400kV – Overland Portion (ACCC Dhaka)

Conductor	Phase	Earthwires	
Designation (Code Name)	ACCC 724/71 Dhaka (ACSR Finch equiv. diameter)	ACSR Dorking	OPGW
Type	ACCC	ACSR	-
Reference standards	ASTM/IEC/BSEN	ASTM/IEC/BSEN	IEC, ITU, IEEE
Aluminium/Aluminium alloy grade	1350 O	-	-
Steel grade	-	-	-
Galvanising Thickness	-	-	-
Aluminium class (AS wire)	-	-	-
Aluminium type (AS wire)	-	-	20SA
Conductor max. continuous operating temperature (°C)	180	-	-
Minimum mass of grease (kg/km)	-	12	-
Creep period of conductor to be considered (years)	-	-	-
No. and diameter of aluminium wire (No./mm)	Refer Note (ii)	12/3.2	7/4.0 GS
No. and diameter of steel wire (No./mm)	-	7/3.2	
Overall diameter of conductor (mm)	32.87	16.03	16.7
Overall sectional area of conductor (mm^2)	794.8	153.1	158
Rated tensile strength of conductor (kN)	**192.2**	83.18	101.41
Weight (kg/km)	2137	708	860
Direction of external lay	Right hand	Right hand	Right hand
Cross Sectional Area of Al (mm^2)	724	-	-
Cross Sectional Area of Composite Core (mm^2)	71	-	-
No. of Composite Core (mm)	1	-	-
Shape of wires	All trapezoidal	Round	Round
Diameter of Composite Core (mm)	9.53	-	-
Rated tensile strength of core (kN)	**151.7**	-	-
Current carrying capacity at 180 Deg C (amp)	2096 [Refer Note (iii)]	-	-
Max. allowable emergency operating temp.(Deg C)	200	-	-
Maximum DC Resistance at 20 Deg C (ohm/km)	0.0387	-	0.323

Note:
(i) The code name of this conductor shall be ACCC 724/71 Dhaka.
(ii) Number and diameter of the aluminium strands will depend on the conductor manufacturer. The manufacturer must show the aluminum cross-section meets the nominal cross-sectional area shown.
(iii) 40degC ambient, 0.61m/sec wind, 1033 W/sq.m sun
(iv) Absorptivity 0.9 and Emissivity 0.7