

Bidding Document For

Procurement of

Design, Supply, Installation, Testing & Commissioning of 400kV and 230kV
Transmission Lines' LILO at Kaliganj and Purbachal Substation on Turnkey Basis
(Package-1)

[Contract No.: PGCB/ADB/3853-BAN/DWZTGEP/400kV&230kV LILO/P1]

Addendum 01

1. Volume 2 of 3, Section-3, Annex 3-5 (Page 3-7)

In "Annex 3-5: Field Quality Plan for Transmission Lines" table, No. 4 & 5 Tower Foundation & Pile foundations will be replaced by the following:

4.	Tower Foundati on	A. Material s 1. Cement	1. Source approval	Source meeting Employer's Specification /a pproved vendor	Contractor	As proposed by Contractor	To verify the proposal based on the supply made and factory test results.	Line in charge
			2. Physical tests	As per Annex 3- 6	Samples to be taken jointly with Employer and tested at Employer approved lab	Review of all MTC's and one sample for every 500 MT	100% review of lab test results	Line in charge
			3. Chemical Tests Chemical composition of Cement	-do-	Contractor to submit MTC	100% review of MTC by Contractor	100% review of MTC	Line in charge
		2. Reinforcem ent Steel	1. Source approval	To be procured from main producers only.	Contractor	As proposed by Contractor	To review the proposal based on the documents.	Line in charge.
			2. Physical and chemical analysis test	As per Annex 3- 6	Contractor to submit MTC	All MTCs	100% review of MTC	Line in charge
		3. Coarse Aggregates	1. Source approval	Source meeting Employer Specification	Contractor	Proposed by the Contractor, indicating the location of the quarry and based on the test results of Joint samples tested in Employer approved lab	To review the proposal based on the documents	Line in charge
			2. Physical tests	As per Annex 3- 6	Samples to be taken jointly and tested in Employer-approved lab	One sample per lot of 200 cum or part thereof	100% review of lab test results	Line in charge

		4. Fine aggregate	1. Source approval	Source meeting Employer Specification	Contractor	Proposed by the Contractor, indicating the location of the quarry and based on the results of Joint samples tested in Employer approved lab.	To review the proposal based on the documents.	Line in charge
			2. Physical test	As per Annex 3-6	Samples to be taken jointly and tested in Employer approved lab	One sample per lot of 200 cum or part thereof	100% review of lab test results	Line in charge
		5. Water	1. Cleanness (Water shall be fresh and clean)	Employer's Specification	Contractor	100% visual check at Field	Verification at random	Site Engineer
			2. Suitability of water for concreting	Employer's Specification	Contractor	100% Visual Check at Field	Verification at random	Site Engineer
		B. Classification	1. Visual observation of soil strata 2. Groundwater level 3. History of water table in adj. area/surface water 4. Soil Investigation wherever required	Employer's Specification	Contractor	100% at Field	100% at Field	a. Section in charge b. In case of WBC/SFR / FS acceptance by line in charge c. For Spl. foundations / pile foundations acceptance by Project Engineer in charge
		C. Concrete Works a. Before concreting						
		1. Bottom of excavated earth	Depth of foundation	Approved drawings	Contractor	100% at field	100% check by Employer	Site Engineer

		2. Stub setting	1) Centre Line 2) Diagonals 3) Level of stubs	-do-	-do-	-do-	-do-	-do-
		3. Reinforcement steel	Placement	Bar bending schedule	-do-	-do-	-do-	-do-
		b. During concreting						
		1. Workability	Slump test	Range 50 mm to 100 mm refer document at Annex 3-6(5)	Contractor	100% at field	40% check at random	Site Engineer
		2. Concrete strength	Cubes compressive strength	As per Annex 3-6(5)	Contractor. One set of cubes (min. 3 pieces) to be taken and tested for 7 & 28 days strength at Employer approved laboratory	One set for each leg of tower. Two set for Pile caps & Chimney at each location.	100% cubes to be taken in presence of Employer's officials. 100% review of test results	Section in charge
5.	Pile foundations	1. All materials like cement, steel, coarse / fine aggregate, water	To be tested as per procedure enumerated in the respective columns above					
		2. Before concreting	1. Check for centre line of each pile	Approved Drawings	Contractor	100%	100%	Site Engr.
			2. Check for diameter /verticality of each pile	-do-	-do-	-do-	-do-	-do-
			3. Check for depth of each pile	-do-	-do-	-do-	-do-	-do-
		3. During concreting						
		a. Workability	1. Slump test	150-200mm as per Employer's Specif.	Contractor	For each pile	100% at field	Site ENGINEER
		b. Concrete strength	2. Cubes compressive strength	As per Annex 3-6(5)	Contractor. One set of cubes (min. 3 pieces) to be taken and tested for 7 & 28 days strength at Employer-approved laboratory	One set for each leg of tower. Two set for Pile caps & Chimney at each location.	100% cubes to be taken in presence of Employer's officials. 100% review of test results.	Section in charge.

2. Volume 2 of 3, Section-3, Annex 3-6(5) (Page 3-19)

Annex 3-6(5) will be replaced by the following:

Annex 3-6(5): Acceptance Criteria and Permissible Limits for Concrete Work

1)	Concrete	a) Workability	Slump shall be recorded by slump cone method and it shall be between 50-100 mm for pile cap and chimney, 150mm to 200mm for concrete pile.
		b) Compressive strength	One set for each leg of tower. Two set for Pile caps & Chimney at each location. Each set consists of three cubes, one for 7 days testing and two for 28 days testing shall be taken.

3. Volume 2 of 3, Section-7, Clause 7.7 (Page 7-29)

Article 7.7.7 will be replaced by the following:

7.7.7 Works Cubes

Compliance with the specified characteristic strength shall be based on tests made on cubes at twenty eight days. Cubes shall be made, cured and tested in accordance with BS EN 12350-1. Samples of Concrete shall be taken at the point of discharge from the delivery vehicle.

Unless otherwise directed by the Engineer for sampling of working cubes Annexure 3-6(5) shall be followed.

In preparation of test cubes/specimens vibrators shall not be used.

Concrete shall be tested for slump at every 1 hour interval.

Each set of cubes shall be accompanied by a certificate noting the details required by BS EN 12350-1.

Cubes shall be tested in accordance with BS EN 12350-1 to determine the density and characteristic strength as follows:

- (a) One cube shall be tested at seven days to provide an early indication as to whether the twenty eight day strength is likely to be achieved;
- (b) Two cubes shall be tested at twenty eight days, the average strength shall be deemed the test results;

The test report shall provide information in accordance with BS EN 12350-1.

Concrete shall be assumed to have achieved its characteristic strength when, at twenty eight days, the conditions specified in BS 8500 and BS EN 206 are met.

Copies of the test reports shall be made available to the Engineer on a regular basis. This is a **Notification Point**.

The Employer will consider whether the concrete in the Works represented by cubes falling below the limits laid down can be accepted, and he may order that any or all of the following, actions shall be taken:

- i) Penetration resistance or surface hardness tests;
- ii) The drilling of test cylinders in the concrete and testing the samples to destruction by compression;
- iii) The cutting out and replacement of such volumes at their discretion which they consider to be defective;

4. Volume 2 of 3, Section-9 (Page 9-18)

Please refer to **Attachment-1.**

5. Volume 2 of 3, Section-10 (Page 10-21)

Please refer to **Attachment-2.**

6. Volume 2 of 3, Section-18, Clause 18.1.11(b) (Page 18-2)

The text "Proto type load test of towers: Not applicable." shall be replaced by following text

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"Proto type load test of towers: Two Engineers of the Employer shall visit at testing station for witnessing of each inspection."

7. Volume 2 of 3, Section-18, Clause 18.1.11(e) (Page 18-3)

The text in the paragraph shall be replaced by the text "**Not Applicable**".

8. Volume 2 of 3, Section-18, Clause 18.1.12.2 (Page 18-3)

The text in the paragraph shall be replaced by the text "**Training within Employer's Country- Not Applicable**".

9. Volume 2 of 3, Section-18 (Page 18-4)

Following texts shall be added after clause no. 18.1.12.2 -

18.1.12.3 PLS CADD, TOWER, POLE License

PGCB's existing six Licenses of PLS CADD, PLS TOWER and PLS POLE shall be updated for one year. Three of these licenses shall include PLS Pole (LW + Mast) at prorate under this contract. All available existing features of licenses should be extended. The price of updating of PLS CADD, Tower and Pole License and inclusion of PLS Pole (LW + Mast) shall be deemed to be included in the Contract Price.

10. Volume 3 of 3, Price Schedule

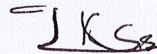
Price schedule is updated and attached with the Addendum as **Attachment-3.**

3. 230kV Four Circuit Line (LILO of Tongi-Ghorashal TL)

Parameter Insulator Set Type		Suspension/ Jumper Suspension	Heavy Suspension	Tension	Upright Low Duty	Inverted Low Duty
Pollution category		Medium II				
Nominal creepage	mm	4900				
Insulator type		Cap & pin type disc insulators				
Insulator unit reference		U120B	U210B	U120B	U120B	U120B
Glaze colour		Brown	Grey	Brown	Brown	Brown
Unit puncture voltage	kV	110	125	110	110	110
Number of insulator units per string		17	14	2 x 17	17	17
Dielectric material		Porcelain				
Dry lightning impulse withstand voltage	kV	1050				
Wet power frequency withstand voltage	kV	460				
Power arc for insulator set						
• Current	kA	31,5				
• Duration	s	0.5				
Power arc for string insulator units: Current for duration	kA for s	12 for 0.1 or 6 for 0.2				
Arc gap nominal	mm	2100	2100	2100	1910	1910
RIV level per unit	δB	36				
RIV level per set	δB	45				
Test voltage for RIV & Corona	kV	150				
Mechanical/electromechanical failing load	kN	120	210	2 x 120	120	120









Annex 10-1(6): Insulator Sets - Types & Uses - 230kV LILO of Tongi-Gorashal TL at Kaliganj Substation

Insulator Set Type	Suspension	Heavy Suspension	Tension	Low Duty	Pilot Suspension
Reference drawing					
Set configuration	Single	Single	Twin	Single	Single
No. of insulator strings	1	1	2	1	1
Min. separation between centres of parallel strings (mm)	--	--	--	--	--
Coupling type	Ball & Socket	Ball & Socket	Ball & Socket	Ball & Socket	Ball & Socket
Security clip type	R	R	R	R	R
No. of sub-conductor	1	1	1	1	1
Sub-conductor spacing (mm)	-	-	-	-	-
Live line working	Required	Required	Required	Not required	Required
Sag adjuster type	-	-	Quadrant	Turnbuckle	-
Linear range (mm)	-	-	300	230	-
Increment (mm)	-	-	6	-	-
Overall set length (mm)	3100	3100	3600-3900	3500 (A) 4100-4330 (B)	3100
Min. failing load of complete set:					
• Common to all conductors (kN)	120	210	2 x 120	120	120
• Common to individual conductor (kN)	120	210	2 x 120	120	120
Insulator protective devices:					
Type					
• Live end	Raquet	Raquet	Raquet	Raquet	Raquet
• Earth end	Single Point	Single Point	Single Point	Single Point	Single Point

(A) Upright (B) Inverted

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JKS

