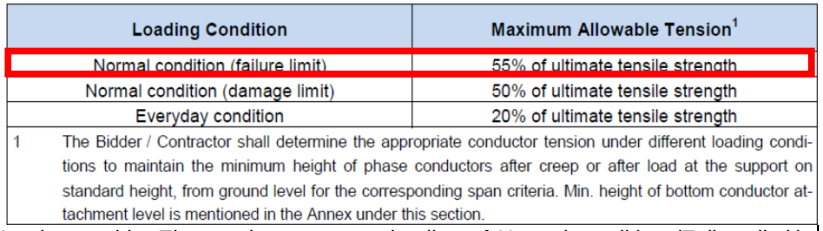
POWER GRID COMPANY OF BANGLADESH LIMITED
BIDDING DOCUMENT
FOR
Plant Design, Supply and Installation of Package - 2 (TL-2)
400kV Madunaghat - Matarbari Double Circuit Transmission Line on Turnkey Basis
(Bid Identification No.: 27.21.0000.101.07.217.18.2354), (Reference Identification No.: PGCB/ MUSCCFPP /Package-2/TL-02)

Clarifications No. 1
Project: 400kV Madunaghat - Matarbari Double Circuit Transmission Line

[A pre-bid meeting was held on 26th April, 2018. Clarifications to the queries received from the prospective bidders regarding the bidding document prior to, during the pre-bid meeting & after the pre-bid meeting and associated Addendum No.1s are given below which will form part of bidding document.]

SL No.	Clause/Reference	Bidder's Query	PGCB's Reply
VOLUME-1			
1	Vol.1 Sec.I ITA 7.1, BDS-2	In the bid data sheet Clause no. ITA 7.1 where it is mentioned that "Response to any request for clarification, if any will not be published on the employer's webpage". Does this mean that only hard copy of the clarification and addendum shall be issued to the bidder and no scanned copies of such addendum and clarifications be uploaded on PGCB website for the ease of the bidder. If yes, we request you to please upload the same on the website also for ease of the bidder though the hard copy shall prevail for any contractual reference Pls clarify.	Please follow as Bid Documents. And responses to Clarification from Bidder/Contractor will be distributed in hard copy.
2	Vol.1 Sec VIII PC 10.2 Employer's Responsibility PC-2	Refer Particular Conditions Clause PC 10.2 where it is mentioned that Employer shall give administrative support to accord all rights of access for transmission line thereto on or before the date(s) specified in that Appendix at the cost of the Contractor. Such cost shall deem to be included in the Contract Price. Employer shall also give all necessary support for providing legal and physical possession of the transmission line Sites and access thereto during the construction period, and for acquiring possession of and access to all other areas reasonably required for the proper execution of the Contract, including all requisite rights of way, as specified in the Appendix (Scope of Works and Supply by the Employer) to the Contract Agreement. We have the following clarification ● It is not clear from the above clause that who shall bear all the compensation for Land Acquisition. We understand that any land acquisition if required as per the site condition and ROW issue, shall be the responsibility of the employer while the compensation for crop etc shall be borne by the contractor. Pls confirm if the understanding is correct.	All compensation cost including crop compensation as related to ROW is the responsibility of the contractor. Land acquisition is not part of the compensation. In the price schedule, there is a provision of quoting price against the above compensation.

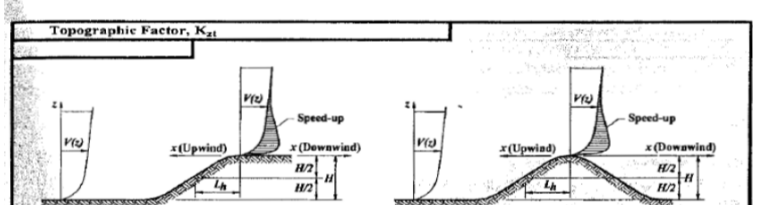
3	Vol.1 Sec.VIII PC 14.1, 14.2 Taxes and Duties PC-3 to 5	Refer Clause 14.1 & 14.2 of the Particular Conditions (PC) from where we understand the following a. For direct import of the Employer i.e. for all items of Schedule No. 1, Employer shall bear all Custom, import duties, VAT, TDS (Advance income tax – 7.5%) and other charges related to port of entry incurred in the employer's country. Please confirm if our understanding is correct. b. For all other schedules i.e Sch 2,3 & 4 the bidders are required to quoted their prices inclusive of TDS as applicable in the country and the employer shall deduct the TDS as applicable while making the payment to the contractors. Pls confirm if the understanding is correct. c. The contract prices shall be exclusive of any VAT applicable in the country. Pls clarify	3.a Please follow bid document, clause 14.1 & 14.2 as applicable in the country. 3.b Please follow bid document, clause 14.1 & 14.2 as applicable in the country. 3.c The contract prices shall be exclusive of any VAT applicable in the country.
4	Vol.1 Sec.VIII GC 14.4 PC-14.4 Tax and Duties	Refer clause 14.4 of GC where for applicability of the taxes and duties has been specified as prevailing on the base date in the country where the site is located. However the base date is not defined in PC or GC. We have referred to appendix 2 "Price Adjustment" to the contract agreement where base date has been defined as 28 days before bid submission. We presume that the same date shall also be the base date for consideration of taxes and duties as per above referred GC Clause. Please confirm if the understanding is correct.	The understanding is correct
5	Vol.1 Sec.VII GC 34 PC 34 Insurance	Refer Clause 34 of the GC "Insurance" where no name of the company has been specified for taking the insurance. Please clarify whether insurance for the project is mandatorily be taken from Sadharan Bima Corporation of B'desh or bidder is free to take Project insurance from any of the reputed insurance company.	It is advisable to take insurance from SADHARAN BIMA CORPORATION as per existing insurance act of the Government of Bangladesh
		VOLUME-2	
1	Vol.2 Sec.8 Tower 8.7.7 Tests –Lattice Steel Tower Clause 8.7.7.9 P8-33	Refer Section 8 Towers Clause 8.7.7.9 where it is mentioned that any of the tower subject to type testing shall not be used in the construction of the line. We have the following clarification in this regards a. Whether the above clause applies to the tower which are subject to destruction or the same is applicable for tower that are subject to full load test. Pls clarify. b. If the answer to the above query is yes, then we understand that all the tower which are subject to type test can not be utilized in the construction of the line. Pls confirm if the understanding is correct. c.Also, confirm whether the tested tower shall be acceptable as Spares or not?	1.a The clause applicable for towers which have been subjected to Prototype Load Test 1.b The understanding is correct. 1.c Prototype Load Tested towers shall not be accepted as spares
2	Vol.2 Sec.8 Tower Annex 8-1 Design	Kindly refer Annexure 8-1 Design Parameter and Conductor System Loading, where it is mentioned that the wind speed for the Tower Designing for all applicable types of tower in this project is 80 m/s. In few of the recent tenders in	The wind speed applicable for this project tower design shall be 80 m/s (3s gust at 10m level) only.

	Parameter and Conductor System Loading P8-36	B'desh we have observed that the wind speed had been specified as 68.1m/s. Please re confirm that the wind speed applicable for this project tower design shall be 80 m/s only.	
3	Vol. 2 Sec.8 Tower Annex 8-1 Design Parameter and Conductor System Loading P8-36	Refer Annex 8-1: Design Parameters and Conductor System Loading, 3. Conductor System Loading 3.1 400 kV Overland Portion,  In above table, The conductor system loading of Normal condition (Failure limit) will be availed up to 55% of UTS. In this case, the 55% is based on "Creep condition" or "Initial condition"? Please clarify.	Maximum allowable tensions at Annex 8-1 of Volume 2 of the bidding document are based on "creep condition".
4	Vol.2 Sec.8 Tower 8.2 Design 8.2.4 Design Criteria P8-5	As per Cl. 8.2.4 Design criteria, page 8-5. Below table "Wind speed (Failure Limit), weather load factor and exposure category shall be considered as mentioned in Annex 8-1 ". In Annex 8-1: 2. Design parameters, table indicated term "wind load factor". The term "Wind load factor" and "Weather load factor" both are same for this case. Please confirm.	The term "Wind load factor" and "Weather load factor" are same.
5	Vol.2 Sec.8 Tower 8.2 Design Clause 8.2.5.1.1 P8-6	As per Clause 8.2.5.1.1, Maximum Load factor on all wire will be 1.25. In that case, should we consider load factor on Tower as 1.25? If 1.25 load Factor is to be applied on the towers, is it to be applied on self-weight or both self-weight and wind on tower in addition to wind load factor of 1.0 for Overland towers.	Load factor shall not be applied on self-weight of tower. Remaining load factors shall be applied as per the provision of the Contract document.
6	Vol 2 Sec.8 Tower 8.2 Design Clause 8.2.5.1 P8-6	As per Clause 8.2.5.1.2(b), High intensity local wind loadings, We understand that there is no wind on Conductor, Earthwire & OPGW. Please confirm our understanding is correct.	The understanding is correct.
7	Vol.2 Sec.8 Tower 8.2 Design Clause 8.2.8 P8-9	As per Clause 8.2.8 Allowable Ultimate Unit stresses, tower member limit stress shall be as per ASCE std. 10-15, but still at PLS Tower software, ASCE 10-97 code is followed, it is not updated as per ASCE 10-15 code. In that case, can we use ASCE 10-97 code for determination of allowable Ultimate Unit stress?	Available code in PLS, as on the date 30days prior to the bid submission, shall be followed.
8	Vol.2 Sec.8 Tower 8.2 Design Clause 8.2.4 P8-5	Refer Clause 8.2.4 - "Design Criteria", under the loading conditions the coincident temperature is given as 50 degree & 5 degrees. Kindly clarify the Minimum temperature & Everyday temperature (EDT), Maximum temperature of conductor & Earthwire/OPGW to be considered for the Sag tension calculations & in the design.	Please refer to the Annex 2-1 of Volume 2 of the bidding document for Every Day Temperature (30degC) and Annex 11-3 for Min. temperature (5deg C) and Max. Operating Temperature (80deg C for Conductor and 50deg C for earthwire/OPGW).

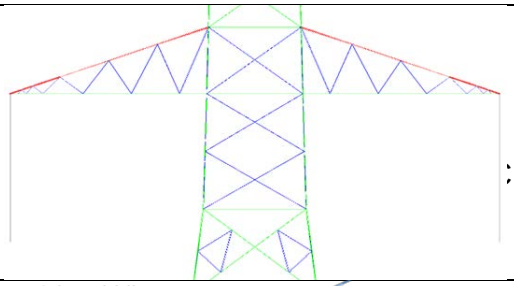
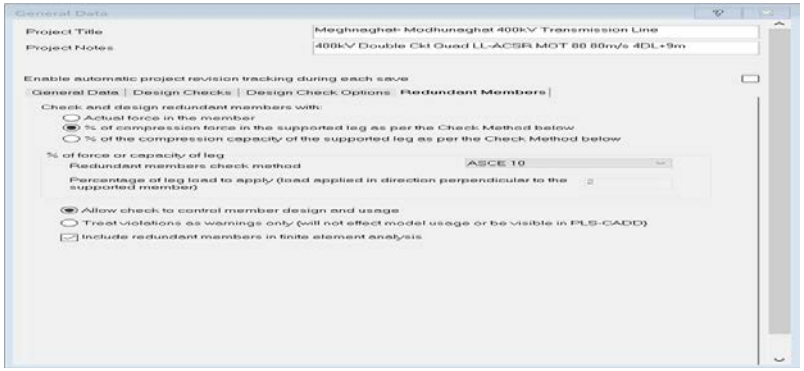
Loading Condition	Maximum Allowable Tension[1]
Normal condition (failure limit)	55% of ultimate tensile strength
Normal condition (damage limit)	50% of ultimate tensile strength
Everyday condition	20% of ultimate tensile strength

1 The Bidder / Contractor shall determine the appropriate conductor tension under different loading conditions to maintain the minimum height of phase conductors after creep or after load at the support on standard height, from ground level for the corresponding span criteria. Min. height of bottom conductor attachment level is mentioned in the Annex under this section.

9	Vol.2 Sec.8 Tower Annex 8-4 (2) Basic Dimension of Support P8-39	As per Annex 8-4: (2) Basic Dimension of Supports, page 8-39, Volume 2 of 3. Max. base width of standard height tower at k-point "x" and Max. width of bottom cross arm waist "y" is provided in table. This width is fixed or we can increase the width. Please confirm.	The width cannot be increased. Please follow the bid document.
10	Vol.2 Sec.11 Conductors Annex 11-1 Conductor – Type and Uses P11-15	As per in Annexure 2-1-Climatic Conditions of Technical Specification the Ambient Temperature mentioned is 45 Deg. C, whereas in Annexure 11-1 -Note (iii), it is given as 40 Deg C. Please Clarify, which temperature to be considered	Please refer to the Annex 2-1 of Volume 2 of the bidding document for Every Day Temperature (30degC) and Annex 11-3 for Min. temperature (5deg C) and Max. Operating Temperature (80deg C for Conductor and 50deg C for earthwire/ OPGW).
11	Vol.2 Sec.8 Tower Annex 8-4 (1) Support Extensions P8-38	As per Technical Specification Vol -2, Annexure 8-4 (1) Support Extension of-Volume-2-Type of Extension is Body/ Leg Extension are indicated for each type of towers. Kindly confirm whether towers are to be designed with un-equal Leg Extensions. If so the max. differential height of legs may be defined.	Un-equal Leg Extensions are not applicable in this Package TL-2.
12	Vol.2 Sec.8 Tower Annex 8-1 Table 3.1 Conductor System Loading (400kV) P8-36	As per Annex 8-1, Table 3.1- Maximum Allowable Tensions have been defined for Normal Condition (Failure Limit) as 55% of UTS of conductor and Normal Condition (Damage Limit) as 50% of UTS. However, as per clause 8.2.4, Normal Condition (DL) is same as Normal Condition (FL). Hence, we understand, for sag tension calculation, we have to consider Normal Condition (Failure Limit) as 55% of UTS of conductor and ignore Normal Condition (Damage Limit) as 50% of UTS. Please confirm that our understanding is correct.	No, your understanding is not correct. Criteria provided at clause 8.2.4 are for tower design whereas criteria provided in Annex 8-1 are for conductor system limit.
13	Vol.2 Sec.8 Tower 8.3 Materials Clause 8.3.1.3 P8-20	As per Technical Specification Vol -2, Sec-8, Cl.8.3.1.3, it was mentioned that the grade of material used for tower sections confirms to grade S235JRG2 or S275JR for mild steel & S355JR for High tensile steel. However as per Clause 8.2.8 Allowable ultimate unit stress (a) Grade S355JO has been mentioned. Kindly confirm whether the material grade shall be as per the indicated standard or equivalent grade of material can also be used.	The material grade shall be as per the indicated standard only. Equivalent grade is not allowed.
14	Vol.2 Sec.8 Tower Annex 8-4 (2) Basic Dimensions of Supports P8-39	As per technical Specification – Vol.2, Annex 8-4(2) Basic Dimensions of Supports Min. height of standard height tower bottom conductor attachment point after creep or after load condition from k-point (m) is provided. The standard height obtained by using LL ASCR Finch conductor is much more than the value provided in Annex. 11.8.7(2). Kindly confirm on the standard tower height that we need to maintain.	The bidder/Contractor may need to increase the tower height to secure the electrical clearance specified in Vol 2 Sec 6, Annex 6 “Crossing of Obstacles” by using LL-ACSR.
15	Vol.2 Sec.8 Tower	As per ASCE 74-2009, wind force = F = Yw Q Kz Kzt (V50)2 G Cf A For calculation of Kzt, we require the values of K1, K2 & k3 as per formula given in ASCE 74-2009, clause 2.1.7.3 page 40 Kzt = (1+K1 K2 K3)2 . Kindly suggest the value of K1, K2, K3 to be considered from the below table from ASCE 74-2009	Values of K1, K2 & K3 are to be considered as per standard practice.

		WEATHER-RELATED LOADS 39  **Topographic Multipliers for Exposure C** H/L_h | K_1 Multiplier: 2-D Ridge, 2-D Escarp., 3-D Axisym. Hill | x/L_h | K_2 Multiplier: 2-D Escarp., All Other Cases | z/L_h | K_3 Multiplier: 2-D Ridge, 2-D Escarp., 3-D Axisym. Hill 0.20 | 0.29 | 0.17 | 0.21 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 0.25 | 0.36 | 0.21 | 0.26 | 0.50 | 0.88 | 0.67 | 0.10 | 0.74 | 0.78 | 0.67 0.30 | 0.43 | 0.26 | 0.32 | 1.00 | 0.75 | 0.33 | 0.20 | 0.55 | 0.61 | 0.45 0.35 | 0.51 | 0.30 | 0.37 | 1.50 | 0.63 | 0.00 | 0.30 | 0.41 | 0.47 | 0.30 0.40 | 0.58 | 0.34 | 0.42 | 2.00 | 0.50 | 0.00 | 0.40 | 0.30 | 0.37 | 0.20 0.45 | 0.65 | 0.38 | 0.47 | 2.50 | 0.38 | 0.00 | 0.50 | 0.22 | 0.29 | 0.14 0.50 | 0.72 | 0.43 | 0.53 | 3.00 | 0.25 | 0.00 | 0.60 | 0.17 | 0.22 | 0.09 3.50 | 0.13 | 0.00 | 0.70 | 0.12 | 0.17 | 0.06 4.00 | 0.00 | 0.00 | 0.80 | 0.09 | 0.14 | 0.04 0.90 | 0.07 | 0.11 | 0.03 1.00 | 0.05 | 0.08 | 0.02 1.50 | 0.01 | 0.02 | 0.00 2.00 | 0.00 | 0.00 | 0.00	
16	Vol.2 Sec.9 Insulators 9.6 Quality Control Clause 9.6.2 P9-6	Refer Section 9, Clause – 9.6.2 1) Type Test for Insulators- We understand that, if the insulator is offered from the approved vendor M/s NGK Japan, then no type tests on Insulator unit to be performed during execution of the contract. Please confirm if the understanding is correct. In case the type tests on Insulator units are mandatorily to be performed, please do clarify specifically the tests that are required to be performed among the list provided in the bidding document. We understand that if the required tests on a particular rating of insulator is already been conducted in laboratory as mentioned in bid document, then the same rating insulators need not to be type tested during execution of contract. Please confirm if our understanding is correct. Also, if all the applicable type tests are successfully performed on the highest rating insulator unit i.e 400 KN then we understand that the Type test if required for the lower rating insulator shall be waived off. Please confirm if the understanding is correct. 2) Type Test for Insulators Sets- It is mentioned in this clause that Type tests for all type of insulator sets (except low duty sets) shall be comprising of cap and pin insulator units being completed with all appropriate same fittings including insulator protective fittings manufactured by the same manufacturer. The tests of the insulator sets shall be undertaken in accordance with the requirements of IEC 60383-2, to determine the;	1) If the insulator is offered from a manufacturer whose name is included in the list of the bidding document, then the type tests are not required to perform during execution stage. If the insulator is offered from a manufacturer whose name is not included in the list of the bidding document, then the type tests reports shall be submitted as per bid requirement along with the technical bid proposal. Regarding 400kN insulator, your understanding is not correct.

		a. dry lightning impulse withstand voltage, b. wet switching impulse withstand voltage and the power frequency withstand voltage as appropriate. Following type tests shall also be performed as per the procedure mentioned in this specification: c. Radio Interference & Corona test d. Power Arc Test If the type tests for river crossing tension insulator sets are not available as offered combination of insulator & fitting manufacturer with proposed design, the tests shall be performed in laboratories mentioned in Clause 9.6.2 (i) during execution stage in presence of Employer's Engineers. Cost of such test and witness shall deem to be included in the Contract Price. From the above we have the following clarifications i. Do we need to perform the required types tests on all the insulators set applicable for overland portion if the test reports of required combination of Insulators & Hardware Fitting Manufacturers are not available. Pls clarify. ii. In case the Type Test Reports of a Higher Rating (e.g 300 KN) Insulators Set for the offered combination is available, will it be considered for waiving off the same test to be performed on lower rating (210 & 160 KN) insulators sets	2).i If the type tests for insulator sets are not available as offered combination of insulator & fitting manufacturer (except low duty set and pilot suspension with proposed design during execution stage, the tests shall be performed in laboratories mentioned in Clause 9.6.2 (i) during execution stage in presence of Employer's Engineers. Please refer to Addendum No. 1 in this regard. 2).ii No. Please refer to amended Clause 9.6.2 (ii) in this regard.
17	Vol.2 Sec.14 Optical Fiber Cable & Fittings 14.7 Quality Control Clause 14.7.2.1 P14-6	Refer Section 14, Clause – 14.7.2.1 "Type Test" where list of type tests has been specified. We understand that if type tests mentioned in subject clause are already been conducted by reputed inspection laboratory then OPGW & Its Fittings need not to be type tested during execution of the contract. Please confirm if our understanding is correct	Type test reports of similar type OPGW shall be submitted during bidding stage as per bid requirement. However, if the offered OPGW is already type tested then further type test is not required but if the offered OPGW is not yet type tested then the type tests are required to be performed during execution stage.
18	Vol. 2 Sec.8 Tower	Are Unequal Cross arm projections for Angle tower and terminal tower types allowed?	Unequal Cross arm projects is allowed. However, minimum phase spacing of angle towers (X) shall be as per the following formula: X = Phase spacing of Suspension Tower / Cos (θ/2) Where, θ = Tower's maximum angle of deviation.
19	Vol 2 Sec.8 Tower	Can we use neck before waist level as per the picture below-	Bend point (change in slope) must be within the suspension string length for suspension tower and within the length of jumper sag for tension tower.

		 :K	Bend point shall be only one which may be below / at bottom cross arm level.
20	Vol.2 Sec.11 Conductors Annex- 11-3 Portion Conductor System Loading P11-18	Page 11-18 Vol-2 of the Bidding Document **Sagging limits of earthwire:** Sagging limits of earthwire as a percentage of conductor sag: % — n.a. — Max 90 — Max 90 Conductor temperature: °C — 80 — 50 — 50 When Bidder calculate the sagging limit of earth wire as per the criteria of specification the maximum tension of ACSR Dorking conductor is about 70% of UTS. It does not satisfy the conductor system loading which is defined by 55% of UTS in Annex 8-1 Vol.2 We understand that the earth wire system loading, or the sagging limit would be changed along with the phase conductor sag and it will affect tower design. So, it is requested that PGCB should re-evaluate the maximum tension limit for EW/OPGW.	Please consider 70% of UTS in this regards.
21	Vol.2 Sec.8 Tower	Do we have to select ASCE-10 for redundant member checking in PLS TOWER as per the pic below-  	Redundant member check method shall be as per ASCE-10.
22	Vol.2 Sec.8. Tower Annex 8-9 (3) Spatial Distance P8-43	In the tender document volume-2 Chapter 8 Annexure 8.9(3) where it is mentioned that Vertical Spacing is As per drawing. However, in the given sample drawing of tower there is no data furnished for the clearance requirement for 400 which must be considered by the bidder while designing their towers. Based on our past experience in the country, We understand that the minimum clearance between phase conductor and earth wire peak for 400kV tower shall be 8m. Kindly confirm whether the subject assumption is correct.	Minimum vertical spacing between phase conductor and earthwire shall be 8.0m for 400kV transmission line. Please refer to Addendum No.1 in this regard.

VOLUME-3			
1	Vol.3 Sec.IV Bidding Form Schedule B Price Schedule	Refer Price Schedule No. 1 item A2.1.8 & A2.1.9 :- where both Vibration and Spacer Dampers have been aksed for in the bid,. However, in case the spacer dampers itself fulfills the Vibration Damping requirement of the conductor, then we understand that the bidder need not to supply the Vibration damper separately. Pls confirm if the understanding is correct.	The understanding is correct.
2	Vol.3 Sec.IV Bidding Form Schedule B Price Schedule	Refer Price Schedule No. 1 item A4.3.4 a) & b) : - Where “400kN triple tension insulator fittings set for quad A3/S3A 560 sqmm conductor – disc only & 400kN triple tension insulator fittings set for quad A3/S3A 560 sqmm conductor – hardware fittings only”, we understand that there no river crossing towers under the scope of this tender. Kindly clarify.	The understanding is correct. Please refer to Addendum-1 in this regard.