

ANNEXURE-III					
BILL OF QUANTITY					
DESIGN, SUPPLY, CIVIL WORK AND ETC OF 220KV TRANSMISSION LINE & TOWERS (DOUBLE CIRCUIT)- ERECTION/ SERVICES PART					
Project	North Karanpura Super Thermal Power Project (3x660MW)				
Customer	NTPC Ltd.				
Doc No.	TB-316-369-031TL, Rev-02				
S. No.	Item / Work description	Unit	Quantity	Unit Rate	Amount (Rs.)
1	Survey				
1.1	Preliminary Survey: Conducting reconnaissance/walkover & preliminary survey using GPS & topo sheets for three alternative routes, suggesting the best optimum route, identifying/fixing point for crossings such as river, railway, power line, telecom, road forest, fixing of angle points & submission of preliminary survey report all complete as per project specific specification & directions of BHEL including its approval from BHEL/Customer.	Km	12		
1.2	Detailed Survey: Detailed survey including modification in preliminary route alignment, adjustment in section details to achieve better average span, profiling, collecting actual field data along the selected route (enumeration of salient land features like crossing of rivers, nalla, road, railway lines, other transmission / distribution line, nearby habitations, forest land, proximity to airport, etc.), tower spotting & providing tower schedule with detailed land schedule (Plot No/Khata No, etc) for each tower location, estimation of tower quantities with extension and special tower requirement, sag template, marking on Khasra map, tree enumeration, etc. & submission of detailed survey report, all complete as per project specific specification & directions of BHEL including its approval from BHEL/Customer.	Km	12		
1.3	Check survey: Survey for route alignment during civil works & ETC stage. Peg markings to be done as per NTPC.	km	12		
2	Geo-Technical Investigation & Soil Resistivity Measurements				
2.1	Conducting detailed soil investigation at various tower locations and at other locations as per instruction of BHEL/Customer including mobilization of necessary equipment, providing necessary engineering supervision and technical personnel, carrying out field investigation and tests, laboratory tests, analysis and interpretation of data and results and working out tentative quantity of foundation work, preparations for the type of foundations and the safe bearing capacity for different sizes of foundations, different foundation strata for the various locations along the transmission lines all complete, submission of report as per project specific specification & directions of BHEL including its approval from BHEL/Customer. (per borehole)	Nos.	20		
2.2	Performing soil resistivity along the route for each tower location and working out tentative quantity of earthing material all complete as per project specific specification & directions of BHEL including its approval from BHEL/Customer.	Nos.	8		
3	Transmission Line System Design				
3.1	Design of Transmission Line system including preparation of design basis report, BOM, Sag tension calculations, Erection key Diagram, stringing chart and relevant drawing/document for 220kV Double circuit Transmission lines as per NTPC/BHEL specification.	Lot	1		
4	Erection, Testing and Commissioning (ETC)				
4.1	Erection of various type of tower angles, tower parts and tower body / leg (equal & unequal) extensions (complete) including bolts and nuts, step bolts, hangers, D-Shackles, stubs & cleats etc., including tack welding and supply and application of zinc rich paint (excluding tower accessories) for both Tension and Suspension type towers for 220 kV Double Circuit Transmission Line	MT	810		
4.2	Installation of tower accessories for all towers (phase plate, caution plate, number plate, circuit plate, anti-climbing device, bird guard, aviation signal etc) as per NTPC/ BHEL specification	Set*	45		
4.3	ETC of ACSR Zebra Conductor complete with stringing hardware, disc insulators, Clamps (tension, suspension, cleat, PG etc), Preformed armour rod, Vibration dampers, Mid span compression joint, Repair sleeves, rigid & flexible spacers etc. to complete for entire route length as per NTPC/ BHEL spec. (Stringing hardware & disc insulators shall be free issue items)	km	144		
4.4	ETC of GS Earth Wire (7/3.15mm) on transmission line tower with Vibrations dampers, Clamps (Tension Clamps, suspension clamp, cleat clamp, PG clamp etc), flexible copper bond, Mid span compression joint, Repair sleeves etc to complete for entire route length as per NTPC/ BHEL spec.	km	12		
4.5	ETC of OPGW on transmission line tower along with all its accessories to complete for entire route length as per NTPC/ BHEL spec.	km	12		

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4.6	Complete earthing of all towers as per approved drawings (Scope includes complete work including testing to show that the tower resistance meets the acceptable limits.)				
4.6.1	3 m long , 40 NB pipe electrode	Nos.	45		
4.6.2	Counterpoise type (120 m long)	Nos.	10		
	Total Amount (Rs.)				
Notes:-					
1	‘*’ – One (1) Set means items for one (1) no. complete tension/ suspension tower.				
2	ETC of OPGW (including accessories) shall be done by the contractor under the supervision of Original Equipment Manufacturer (OEM).				
3	The quantities mentioned in the BOQ are tentative and Quantity of any item may vary upto any extent but the overall contract value may vary by +- 30%.				
4	Any material/services required for successful completion of the project but not covered in the BOQ shall be deemed to be included in the scope of contractor without any cost implications to BHEL. The bidder is advised to visit North Karanpura site before submission of bid.				
5	Make of items and their sources to be supplied/used under this contract shall be subject to acceptance by customer/BHEL at contract stage.				
6	Handling, storage, transportation, loading, unloading, shifting etc. of all materials to required locations shall be in the scope of the bidder.				
7	Bidder may note that owner (NTPC/BHEL) shall not pay any compensation for any loss or damage to the properties during work of execution of transmission line job or for tree cutting due to bidder's work.				
8	MS welding - apply red lead paint then aluminium paint then bitumen after welding.				
9	GI welding - apply 2 coats of cold galvanising anti corrosive paint after welding.				
10	10% welding joints in earthing shall be tested for dye penetration test.				
11	Quoted rates are deemed to be inclusive of miscellaneous works, viz.. erection of clamps and connectors, phase colour discs etc.				
12	Right of way is not in Bidder scope, but tree cutting (if any) is in the scope of bidder. Please refer special conditions of contract and customer technical specification				
13	All associated items, though specifically not mentioned but required for safe and satisfactory execution and commissioning of transmission line will also be treated as included and same shall be supplied & ETC to be done at no extra cost to BHEL/ NTPC.				
14	Complete earthing of all towers shall be as per approved drawings (Scope includes complete work including testing to show that the tower resistance meets the acceptable limits.)				
15	For scope of supply items in contractor scope following should be followed . (1)The approval of makes shall be obtained from BHEL/Customer . (2)Drawings and MQP shall be submitted for approval in line with specification and relevant IS. (3) Quality -Inspection & dispatch clearance shall be given by BHEL/Customer.				