

## 220kV & 132kV TRANSMISSION LINE DIVERSION at PATRATU

### BOQ CUM PRICE SCHEDULE - SUPPLY

Project : 220KV AND 132 KV T/L DIVERSION FOR PATRATU SUPER THERMAL POWER STATION EXPANSION, PHASE-I (3X800 MW) AT PATRATU.

Customer PATRATU VIDYUT UTPADAN NIGAM LIMITED

S. No.	Item / Work description	Unit	Quantity	Unit Rate	Amount (Rs)
<b>1</b>	<b>SUPPLY OF TOWER STRUCTURE, HARDWARE</b>				
<b>1.1</b>	<b>Fabrication and supply of Galvanised Steel Structures for 220kV lattice type transmission line towers including preparation of shop drawing based on structure drawings issued by BHEL, proto assembly, submission of proto-corrected drawings &amp; BOMs for approval, mass fabrication, galvanisation, inspection and supply complet as per technical specification.</b>				
a	Mild steel (Galvanized) (Weight of galvanisation shall be 610 gms/sqm)	MT	135	77762.13	104,97,888
b	HT steel (Galvanized) (Weight of galvanisation shall be 610 gms/sqm)	MT	230	91000	209,30,000
<b>1.2</b>	<b>GI structure Hardwares (Nuts, bolts, pack and spring washers, step bolts, Hangers, D-Shackles etc.)</b>	MT	14	100413	14,05,775
<b>1.3</b>	<b>Supply of MS stub setting templates made of channels,angles etc with primer and painting.</b>	MT	12	71089.63	8,53,076
<b>2</b>	<b>SUPPLY OF STRINGING MATERIALS, TOWER &amp; STRINGING ACCESSORIES &amp; EARTHING MATERIALS</b>				
<b>2.1</b>	<b>Transmission Line tower accessories as per NTPC/BHEL specification.</b>				
a	Phase plate	Nos.	135	750	1,01,250
b	Circuit plate	Nos.	45	750	33,750
c	Number plate	Nos.	16	450	7,200
d	Caution plate	Nos.	16	450	7,200
e	Anti Climbing device	Nos.	16	10000	1,60,000
f	Bird Guard	Sets	16	7500	1,20,000
<b>2.2</b>	<b>Conductor accessories as per NTPC/BHEL specification.</b>				
a	Vibration Dampers	Nos.	590	1006.49	5,93,828
b	TEE/PG connector (single zebra to single zebra)	Nos.	26	1558.52	40,522
c	TEE/PG connector (single panther to single panther)	Nos.	26	935.86	24,332
d	Flexible spacers (for twin zebra)	Nos.	70	986.97	69,088
e	Rigid spacers (for twin zebra)	Nos.	45	532.52	23,963
f	Mid span compression joint for zebra	Nos.	12	941.43	11,297
g	Mid span compression joint for panther	Nos.	12	565.05	6,781
h	Repair sleeve for zebra	Nos.	12	324.34	3,892
i	Repair sleeve for panther	Nos.	12	195.16	2,342
<b>2.3</b>	<b>GS Earth Wire accessories as per NTPC/ BHEL spec.</b>				
a	Vibration Dampers	Nos.	40	493.49	19,739
b	PG connector for earth wire	Nos.	10	139.40	1,394
c	Strain Clamp	Nos.	30	682.14	20,464
d	Suspension clamp	Nos.	2	682.14	1,364
e	Mid span compression joint	Nos.	2	389.40	779
f	Repair sleeve	Nos.	2	194.23	388
g	Cleat clamp for earth wire	Nos.	10	108.73	1,087
h	Flexible copper bond	Nos.	30	752.77	22,583
<b>2.4</b>	<b>Earthing materials for tranmission line towers as per approved drawings</b>				
a	3 m long , 40 NB pipe electrode	Nos.	16	9188.75	1,47,020
b	Counterpoise type (120 m long)	Nos.	16	4483.75	71,740
<b>2.5</b>	<b>ACSR Zebra conductor as per NTPC/BHEL specification.</b>	km	18	331258.15	59,62,647
<b>2.6</b>	<b>ACSR Panther conductor as per NTPC/BHEL specification.</b>	km	14	198754.89	27,82,568
<b>2.7</b>	<b>GS Earth wire (7/3.66mm) as per NTPC/BHEL specification.</b>	km	3	50000	1,50,000
<b>2.8</b>	<b>120kN Disc Insulator as per NTPC/BHEL specification.</b>	Nos.	3327	950	31,60,650

**BOQ CUM PRICE SCHEDULE - SUPPLY**

**Customer** PATRATU VIDYUT UTPADAN NIGAM LIMITED

S. No.	Item / Work description	Unit	Quantity	Unit Rate	Amount (Rs)
2.9	90kN Disc Insulator as per NTPC/BHEL specification.	Nos.	431	950	4,09,450
2.10	Stringing Hardware as per NTPC/BHEL specification.				
a	132kV Single Tension String Insulator Hardware with all hardware accessories Suitable for Single ACSR Panther Conductor	Sets	152	4936	7,50,272
b	132kV Single Suspension Pilot String Insulator Hardware with all hardware accessories Suitable for Single ACSR Panther Conductor	Sets	26	4068	1,05,768
c	220kV Single Tension String Insulator Hardware with all hardware accessories Suitable for Single ACSR Zebra Conductor	Sets	38	15154	5,75,852
d	220kV Double Tension String Insulator Hardware with all hardware accessories Suitable for Single ACSR Zebra Conductor	Sets	13	31823	4,13,699
e	220kV Single Tension String Insulator Hardware with all hardware accessories Suitable for Twin ACSR Zebra Conductor	Sets	32	15154	4,84,928
f	220kV Single Suspension Pilot String Insulator Hardware with all hardware accessories Suitable for Twin ACSR Zebra Conductor	Sets	7	11021	77,147
3	CABLE GLANDS as per NTPC/BHEL specification.				
	Nickel Chrome - Plated brass cable glands, double compression heavy-duty type complete with necessary armour clamp & tapered washer etc for the following cables (Bidder's Scope is to supply only & ETC is covered under cable laying work) Overall Qty may vary by ±50%				
3.1	Cable Glands For Control cables				
a	5Cx2.5 sqmm Cu	Nos.	20	170	3,400
b	4Cx10 sqmm Cu	Nos.	20	200	4,000
c	10Cx2.5 sqmm Cu	Nos.	30	250	7,500
d	14Cx2.5 sqmm Cu	Nos.	20	250	5,000
e	19Cx2.5 sqmm Cu	Nos.	20	300	6,000
3.2	Cable Glands For Auxiliary Power cables				
a	2Cx6 sqmm Al	Nos.	10	170	1,700
b	4Cx6 sqmm Al	Nos.	10	170	1,700
c	4Cx16 sqmm Al	Nos.	10	200	2,000
d	3.5Cx70 sqmm Al	Nos.	6	300	1,800
4	GI conduits & accessories as per NTPC/BHEL specification.				
a	50mm diameter GI pipe with socket at one end & threaded at both ends	m	200	237	47,400
b	90 Deg. Bend for 50mm diameter GI pipe with socket at one end & threaded at both ends	Nos.	70	237	16,590
c	Tee Bend for 50mm diameter GI pipe with socket at one end & threaded at all ends	Nos.	50	237	11,850
d	Sockets for 50mm diameter GI pipe	Nos.	50	237	11,850
e	100mm diameter GI pipe with socket at one end & threaded at both ends	m	100	237	23,700
f	90 Deg. Bend for 100mm diameter GI pipe with socket at one end & threaded at both ends	Nos.	50	237	11,850
g	Tee Bend for 100mm diameter GI pipe with socket at one end & threaded at all ends	Nos.	30	237	7,110
h	Sockets for 100mm diameter GI pipe	Nos.	30	237	7,110
5	Earthing materials for switchyard as per NTPC/BHEL specification.				
a	75 x 12 mm GI Flat	m	60	348	20,880
c	50 x 6 mm GI Flat	m	30	118	3,540
b	40mm dia MS Rod	MT	1	33200	33,200
					502,79,904

**220kV & 132kV TRANSMISSION LINE DIVERSION AT PATRATU**  
**BOQ CUM PRICE SCHEDULE - CIVIL**

**Project :** 220KV AND 132 KV T/L DIVERSION FOR PATRATU SUPER THERMAL POWER STATION EXPANSION, PHASE-I (3X800 MW) AT PATRATU.

**Customer** PATRATU VIDYUT UTPADAN NIGAM LIMITED

S. No.	Item / Work description	Unit	Quantity	Unit Rate	AMOUNT(Rs)
	<b>Civil Works</b>				
1	Earthwork in excavation by mechanical means (Hydraulic excavator)/manual means over areas (exceeding 30cm in depth 1.5m in width as well as 10sqm on plan) including dewatering as necessary of rain water/subsoil seepage water and disposal of excavated earth upto 100m and lift upto 4 m, disposed earth to be levelled and neatly dressed.				
1.1	All kinds of soil.	Cum	13800	125.95	1738110
1.2	Ordinary rock	Cum	200	221.05	44210
2	Filling available excavated earth (including rock) in trenches, plinth, sides of foundations, etc., in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead upto 100m and lift upto 3.5m.	Cum	12200	125.75	1534150
3	Carriage & disposal of surplus excavated earth/rock beyond initial lead by mechanical means not necessarily all the times on pucca roads, including loading, unloading, dressing of excavated material, etc., complete as per specifications -.				
3.1	Lead upto 1 km.	Cum	1500	98.34	147510
4	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work upto plinth level.				
4.1	1:3:6 (1 Cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size)	Cum	65	4522.52	293963.8
5	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement-All work up to plinth level:				
5.1	M20 Grade	Cum	1200	5570.21	6684252
5.2	M25 Grade	Cum	25	5887.43	147185.75
6	Centering and shuttering including strutting, propping, etc., and removal of form for:				
6.1	Foundations, footings, bases of columns, etc., for mass concrete.	sqm	800	184.42	147536
6.2	Columns, Pillars, Piers, Posts and Struts .	sqm	700	454.41	318087
6.3	RCC walls at all levels (any thickness).	sqm	200	369.24	73848
7	Steel reinforcement -Cold twisted bars /TMT- Fe 500/Fe500D (to be procured from NTPC approved sources)				
7.1	Supplying and Fixing including straightening, cutting and bending, binding (i/c cost of binding wire), placing in position, etc., all labour & material, complete. Reinforcement steel shall be supplied by BHEL free of cost at site. The quoted rate should be inclusive of unloaing at site , watch and ward, shifting to required loaction etc. also.	kg	100000	49.62	4962000
8	Fixing of stub angles in position with template assembling and dismantling all complete as per drawing and directions of Engr-in-Charge.(weight of stub only shall be measured for payment of this item)	kg	27000	13.4745763	363813.5593

9	Providing and fixing (all dia & length) GI foundation bolts in position with help of proper templates including supply of templates, nuts and washers all complete as per specs, drawings & directions of Engr-in-Charge. (Note: For payment purpose the weight of Template will not be considered)	kg	500	87.19	43595
10	Providing and laying non-pressure NP3 class RCC pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement: 2 fine sand) including testing of joints etc., complete.				
(a)	300mm dia. RCC pipe	RM	10	1106.74	11067.4
(b)	450mm dia. RCC pipe	RM	50	1660.11	83005.5
11	Grouting of block outs, pockets, foundations, bolts holes and underside of base plates with cement, sand aggregate ( of size 6 mm and down) grout M-30 with non-shrink additive and shall be of strength not less than M30 including placing, curing, cleaning, surface preparation, testing, etc. complete with labour, materials, equipment, handling, testing, etc. all complete as per specifications, drawings and instructions of the Engineer.	cum	10	7217.34	72173.42373
12	Demolishing RCC work manually/ by mechanical means including stacking of steel bars and disposal of unserviceable material within 50 metres lead as per direction of Engineer-in-charge.	cum	10	970.99	9709.860508
13	Dismantling and re-fixing MS rails	MT	1	18440	18440
					<b>166,92,657</b>

**220kV & 132kV TRANSMISSION LINE DIVERSION AT PATRATU**  
**BOQ CUM PRICE SCHEDULE - ETC**

**Project :** 220KV AND 132 KV T/L DIVERSION FOR PATRATU SUPER THERMAL POWER STATION EXPANSION, PHASE-I (3X800 MW) AT PATRATU.  
**Customer** PATRATU VIDYUT UTPADAN NIGAM LIMITED

S. No.	Item / Work description	Unit	Quantity	Unit Rate	Amount (Rs)
<b>1</b>	<b>Erection, Testing and Commissioning (ETC) of 220/132kV Transmission Line</b>				
1.1	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 132/220 kV Double/ Multi Circuit transmission line towers	MT	365	10640.42	40,77,942
1.2	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*	16	4872.88	81,864
1.3	ETC of ACSR Panther/ 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	32	38983.05	13,09,831
1.4	ETC of GS Earth Wire 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	3	68220.34	2,14,894
1.5	ETC of OPGW on transmission line tower along with all its accessories to complete for entire route length as per NTPC/ BHEL spec.	km	3	68220.34	2,14,894
1.6	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.)				-
a	3 m long , 40 NB pipe electrode	Nos.	16	4872.88	81,864
b	Counterpoise type (120 m long)	Nos.	16	4794.92	80,555
					-
<b>2</b>	<b>Dismantling of Existing 220/132kV Transmission Line Tower/Equipments</b>				-
2.1	Dismantling of existing 132/220/400kV Transmission Line tower complete with Shield wire/OPGW associated with it.	MT	15	5320.211864	83,793
2.2	Dismantling of existing 132/220kV gantry and switchyard tower/LM structure including shield wire associated with it.	MT	50	2840.40	1,49,121
2.3	Dismantling of existing 220kV Switchyard equipment lattice type structure	MT	1	2840.40	2,982
2.4	Dismantling of existing 220kV Switchyard equipment pipe type structure	MT	1	2840.40	2,982
2.5	Dismantling of existing conductor (Bus/jumper/droppers) including stringing hardware, accessories etc.	km	2	33135.59	69,585
2.6	Dismantling of existing 220kV Post Insulators complete with terminal connectors excluding support structure	Nos.	6	945.34	5,956
2.7	Dismantling of existing 220kV, 1 Phase Surge Arrester complete with surge counter, leakage current meter, insulating base, connecting cable and terminal connectors but excluding support structure.	Nos.	6	1893.60	11,930
2.8	Dismantling of existing 220kV, 1 Ph CVT/PT complete with terminal connector, JB and associated cables excluding support structure.	Nos.	6	2367.25	14,914
2.9	Dismantling of existing 220kV, 1 phase, Wave Trap (gantry mounted) complete with terminal connectors	Nos.	4	7796.61	32,746
					-
<b>3</b>	<b>Erection, Testing and Commissioning (ETC) of 220kV Switchyard Equipment &amp; associated works</b>				-
3.1	ETC of 220kV Post Insulators complete with terminal connectors without support structure	Nos.	6	1890.68	11,911
3.2	ETC of 220kV, 1 Phase Surge Arrester complete with surge counter, leakage current meter, insulating base, connecting cable and terminal connectors.	Nos.	6	3787.20	23,859
3.3	ETC of 220kV, 1 Ph CVT complete with terminal connector without support structure.	Nos.	6	4734.49	29,827
3.4	ETC of 220kV, 1 phase, Wave Trap (gantry mounted/ pedestal mounted) complete with terminal connectors. In case of pedestal mounted Wave Trap , ETC work will include ETC of associated support BPI.	Nos.	4	15593.22	65,492
3.5	ETC of Galvanised steel Pipe/ Lattice Structures including hardwares for equipment support	Nos.	22	5680.81	1,31,227
3.6	ETC of ACSR Conductor complete with Tee/ PG connectors for droppers to equipment connections, PG clamps for busbar jumpering, Twin bundle spacers etc to complete.	km	1	66271.19	69,585

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**BOQ CUM PRICE SCHEDULE - ETC**

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S. No.	Item / Work description	Unit	Quantity	Unit Rate	Amount (Rs)
3.7	ETC of GI Stranded Shield wire including tension clamp, PG clamp and clamping on structure for down conductor, fixing/bolting with earth strip etc to complete.	km	0.5	28405.00	14,913
3.8	ETC of Al Tube including Aluminium welding and bending to be included. (Aluminium Tube, sleeve, pins shall be supplied by BHEL)	m	200	662.71	1,39,169
3.9	ETC of 220/132kV, Tension/Suspension insulator string with double/single anchoring point with hardware set with all accessories including clamp with/ without Turn Buckle set suitable for single/ twin conductor.	Nos.	24	568.18	14,318
3.10	Cabling including laying, tagging , dressing, ferruling, Glanding, lugging, ,soldering, tapping, jointing, crimping, termination, and drilling/ cutting holes in cable gland plates- laying can be either on trays, supports, underground, buried in ground or through GI pipe over ground, through wall etc. All erection materials viz. ferrules, copper lugs, cable ties / straps, Al. tags, markers, GI / PVC wall sleeves with rubber / nylon bushes and flexible steel conduits shall be supplied by bidder. <b>Minor repair of trench is also in ETC contractor's scope.</b>				-
3.10.1	Control cables				-
a	5Cx2.5 sqmm Cu	km	1	18936.99	19,884
b	4Cx10 sqmm Cu	km	1	18936.02	19,883
c	10Cx2.5 sqmm Cu	km	1	18937.97	19,885
d	14Cx2.5 sqmm Cu	km	1	23672.46	24,856
e	19Cx2.5 sqmm Cu	km	1	23670.51	24,854
3.10.2	Auxiliary Power cables				-
a	2CX6 sqmm Al	km	1	18906.78	19,852
b	4Cx6 sqmm Al	km	1	18936.02	19,883
c	4Cx16 sqmm Al	km	1	18936.02	19,883
d	3.5Cx70 sqmm Al	km	0.5	47340.04	24,854
3.11	Laying of GI conduits at a depth of 300mm including excavation, backfilling, making holes in RCC/ brick walls and repairing of walls in trenches, cutting, threading, fixing of sockets/ bends where required etc. complete. Both ends of GI conduits shall be closed by by suitable material as per instruction of site-incharge. (Payment will be made for the as erected pipe length)				-
a	GI pipe, 50 NB	m	200	76.02	15,964
b	GI Pipe, 100 NB	m	100	94.53	9,926
3.12	Fixing of GI Pipes on Lattice/ Pipe Structure including clamping, fixing of sockets/ bends as required etc. complete. Both ends of GI Pipes shall be closed by plastering. (Payment will be made for the as erected pipe length)				-
3.12.1	50 mm dia	m	50	47.75	2,507
3.12.2	100 mm dia	m	30	66.27	2,088
					-
3.13	<b>Earthing</b> - Earthing includes earthing of all Switchyard equipment, Panels, towers, lattice structure, cable trenches, fence, electrode for LA, CVT & towers with peak using necessary Connectors for earthing flats. Earthing clamping shall be carried out by ETC contractor. GS strip including cutting, bending, welding with 40 mm dia MS rod riser/earth strip, applying zinc rich paint, clamping to structure/building wall etc. to complete. Hardware required for connecting flat on pads of structure & equipment included in scope. The Earthing of equipments shall be carried out as per approved drawings.				-
3.13.1	75 x 12 mm GI Flat	m	60	76.02	4,789
3.13.2	50 x 6 mm GI Flat	m	30	56.53	1,781
3.14	Installing of 40 mm diameter Rod Electrode without test pit/link as per Equipment Earthing drawing including following works including following works: - excavation/hammering of rod in earth - installing the rod electrode - backfilling and compaction - any other work necessary to complete the work	Nos.	12	47341.99	5,96,509
3.15	ETC of Control and Relay Panels - Supervision of testing and commissioning of relays in scope of panel supplier. Necessary manpower, support, tools, tackles and testing equipment to be in scope of ETC contractor. Panel testing excluding relay testing is in Bidder's Scope.				-
3.15.1	220kV Line Protection Panel	Nos.	4	9468.01	39,766
3.15.2	220kV Circuit Breaker Panel	Nos.	2	9468.01	19,883
3.15.3	Modification/Augmentation of Existing Control Panels	Nos.	2	25000	52,500
3.15.4	Panel/cable supporting angles/channels etc on cable trench in control room buildings/yard including vertical support for cables(including supply)	MT	0.5	61544.49	32,311
	<b>Total ETC</b>				79,08,009

**(ANNEXURE-II)**

**TRANSMISSION BUSINESS GROUP  
(SUB- CONTRACTS MANAGEMENT)  
TBG – NOIDA**

**PRICE SCHEDULE FORMAT**

**SUB: RECEIPT OF EQUIPMENT/ MATERIAL AT SITE, UNLOADING, INSPECTION, VERIFICATION, STORAGE, UP-KEEPING DURING STORAGE, ERECTION, TESTING, COMMISSIONING AND HANDING OVER OF 765KV/400KV SUBSTATION AT ARIYALUR IN VILLUPURAM REGION IN TAMILNADU.**

- (a) I/ We hereby agree to execute the above work at ----- % (in figure) ----- (in words) above/ Below/At Par the rates of items given in BOQ (Annexure-I) of subject tender.

**NOTE:**

1. In this annexure the tenderer shall quote a percentage above or below or at par the rates shown in the BOQ (Annexure-I). The percentage quoted shall be clearly written both in words and figures In case of discrepancy in rates in figure and words, the minimum will be taken into account by BHEL.
2. The quoted percentage will apply to the individual items of BOQ (Annexure-I).

Date:

Place

Signature of tenderer

Name & Designation of authorized person(s) with seal

**ANNEXURE-III**

**SUMMARY OF PRICES FOR EXECUTION AND HANDING OVER OF SUPPLY, CIVIL AND ETC WORKS OF 220KV AND 132 KV T/L DIVERSION FOR PATRATU SUPER THERMAL POWER STATION EXPANSION, PHASE-I (3X800 MW) AT PATRATU**

**Tender Spec. No. TBSM/PATRATUR/ TL-DIVERSION/TENDER/01, Date: 25.04.2018**

<b>Sl No.</b>	<b>Description</b>	<b>Amount (Rs.)</b>
<b>1</b>	<b>Total Amount- Supply Part (Annexure-I)</b>	502,79,904.00
<b>2</b>	<b>Total Amount- Civil Part (Annexure-II)</b>	166,92,657.00
<b>3</b>	<b>Total Amount- Erection/ Services Part (Annexure-III)</b>	79,08,009.00
<b>4</b>	<b>Total Amount for Supply, Civil, ETC (Annexure-I, Annexure - II and Annexure III)</b>	748,80,570.00
<b>5</b>	Value of percentage above/below/at par (As indicated in Price Schedule Format, <b>Annexure-II</b> ) applicable to the total amount mentioned at sl. no. 1 above.	.....% above/below/ at par
<b>6</b>	<b>Total amount after consideration of percentage above/below/ at par.</b>	
<b>7</b>	<b>Total Cost in Rs. (1+2+3)</b>	