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TAMIL NADU TRANSMISSION CORPORATION LIMITED
ABSTRACT

Electricity – Coimbatore Region – Coimbatore Operation Circle - Establishment of 400/230 kV Substation at Parali with 2 sets of 3X166.66 MVA 400/230 kV ICTs and its associated transmission lines - Administrative approval -Regarding.

Technical Branch

(Per.) FB TANTRANSCO Proceedings No. 21

Dated:05.03.2019
Maasi :21,
Thiruvalluvar Aandu 2050

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- 7 MAR 2019

READ: Item No. 12 of the minutes of the 87th Board meeting of the TANTRANSCO Ltd. held on 28.02.2019.

PROCEEDINGS:

1. The Tamil Nadu Transmission Corporation Limited hereby approves the proposal for the establishment of 400/230 kV SS at Parali and its associated transmission lines in Coimbatore Operation Circle of Coimbatore Region at an estimated cost of Rs. 429.78 Crores (Gross) & Rs.407.96 Crores (Nett) chargeable to TANTRANSCO and Rs. 90.74 Crores (Gross & Nett) chargeable to TANGEDCO. The detailed estimate and report are annexed to these proceedings.

2. The expenditure of Rs. 429.78 Crores (Gross) & Rs.407.96 Crores (Nett) is chargeable to TANTRANSCO Funds – Capital Expenditure - Coimbatore Operation circle- A/c code No:14.515 and the expenditure of Rs. 90.74 Crores (Gross & Nett) is chargeable to TANGEDCO Funds – Capital Expenditure – Kundah Pumped Storage Hydro Electric Power Project - A/c code No:14.016

3. By virtue of the provisions contained in sub-section (2) (a) of section 185 of the Electricity Act 2003, TANTRANSCO being the State Transmission utility/Transmission Licensee and successor entity of Tamil Nadu Electricity Board will exercise the powers of the Telegraph Authority under the provisions of section 164 of the Electricity Act,2003, which have already been conferred upon the Board under section 51 of the Indian Electricity Act,1910.

4. The work is to be taken up after ensuring necessary budget provision.

//BY ORDER OF THE BOARD//

R.S.USHA
CHIEF ENGINEER / PLANNING & RC

Encl.: Report and detailed Estimate

To
The Chief Engineer/ Transmission /TANTRANSCO, Chennai -2.
The Chief Engineer/ Civil Transmission/TANTRANSCO, Chennai -2.
The Chief Engineer/ Transmission Projects/TANTRANSCO, Trichy.

Copy to:
The Managing Director /TANTRANSCO, Chennai –2.
The Director/Distribution/TANGEDCO, Chennai-2.
The Director /Transmission Projects/TANTRANSCO, Chennai –2.
The Director/Generation/TANGEDCO, Chennai-2.
The Director/Projects/TANGEDCO, Chennai-2.
The Director /Operation/TANTRANSCO, Chennai –2.
The Director/ Finance/ TANTRANSCO Chennai-2.
The Director/ Finance/ TANGEDCO Chennai-2.
The Chief Engineer/ Distribution/Coimbatore Region.
The Chief Engineer/Hydro /TANGEDCO, Chennai -2.
The Chief Engineer/ P & C, Chennai-2.
The Chief Engineer/ Projects I & II, Chennai-2.
The Chief Engineer/ System Operation, Trichy.
The Superintending Engineer/ Civil/PD & Co-ordination, Chennai-2
The Superintending Engineer/ Transmission –I , II,III & IV/ TANTRANSCO, Chennai-2.
The Superintending Engineer/ GCC / Coimbatore.
The Superintending Engineer/ P&C/ Coimbatore.
The Superintending Engineer/ Operation/ Coimbatore
The Superintending Engineer/ Emerald Generation Circle/ Kundah Pumped Storage Hydro Electric Power Project/ Emerald/ Nilgiris
The Superintending Engineer/ EDC/Nilgiris
The Superintending Engineer/ Planning, Chennai-2.
The Deputy Secretary/TANTRANSCO/Secretariat Branch, Chennai-2.
The Resident Audit Officer (AGO' s Unit) Chennai-2
The BP Section (Administrative Branch) (2 copies)
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Mnda 5/3/19

Executive Engineer-I/System Studies

Endt. NO. SE/GCC/CBE/DB/F.BP/D. /2019 Dt. 08.03.2019

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Asst Exe. Engineer/ MN/Gcc/cbe
Asst. Exe. Engineer/ MONI/Gcc/cb
Deputy financial Controller/Gcc/cb.

11/3/19

SE/GCC

(Enclosure to (Per).FB.TANTRANSCO Proceeding No. 21, dated 05.03.2019)

CHARGEABLE TO TANTRANSCO

DETAILED ESTIMATE FOR ESTABLISHMENT OF 400/230KV SUB-STATION AT PARALI WITH 2 SET OF 3X166.66 MVA 400/230 KV ICTs, SPARE ICT OF 1 X166.66 MVA 400/230 KV, 1 NO 400KV 125MVAR BUS REACTOR, 2 NOS 400KV FEEDERS AND 5 NOS 230 KV FEEDERS

Sl. No.	DESCRIPTION	QTY		RATE in Lakhs	PER	AMOUNT in Lakhs
I	**CIVIL WORKS**					
1	Cost of land		Board Land			0.000
2	Control room Building,Kiosk building, Internal electrification, water supply arrangements and air conditioning for control room and kiosk building			LS		319.590
3	Gravel filling ,metal spreading and yard leveling			LS		507.087
4	Approach Road			LS		268.420
5	Cable duct and Retaining wall			LS		526.710
6	Compound wall for SS and Quarters(Elephant crossing location)			LS		232.970
7	Structure Foundation ,Plinths ,supply of towers & Foundation for Towers in yard and allied civil works			LS		2366.150
8	Solar System			LS		25.000
9	D.G.Set Room			LS		15.000
10	Q Type Quaters	60	Nos	24.870	for 2	746.100
11	R Type Quaters	4	Nos	27.020	for 2	54.040
12	S- Type for AEE/Shift & maintenance	5	Nos	36.780	for 2	91.950
13	Civil works towards strengthening of road bridges/ culverts for transporting single phase transformer			LS		15.000
	SUB-TOTAL					**5168.017**
	Total for Civil Works					**5168.000**
I I	**ELECTRICAL WORKS**					
A	**EQUIPMENTS**					
1	400KV,3150A, 63KA SF6 Breaker (with out pre insertion resistor) with Control and Switching Device(CSD)and all accessories	4	E	50.703	E	202.812
2	400KV,3150A, 63KA SF6 Breaker with pre insertion resistor, CSD and all accessories	2	E	63.638	E	127.276
3	400KV,3150A, 63KA SF6 Breaker with pre insertion resistor and all accessories	2	E	53.638	E	107.276
4	400KV, 3150A, 63KA - 5 Core Single Phase Current Transformers with JB (Ratio 3000 - 2000 -1000 / 1A)	33	E	7.190	E	237.270
5	400KV,200VA - 400 KV/ √3 /110V / √3 Capacitive Votage Transformer	12	E	3.477	E	41.724
6	400KV, 10KA, Station Type LAS	16	E	1.140	E	18.240

Sl. No.	DESCRIPTION	QTY		RATE in Lakhs	PER	AMOUNT in Lakhs
7	400KV,3150A, 63KA Horizontal Center Break Disconnector with Single Earth blades. (2 nos. included for Bus CVT)(4 nos. for 1 phase spare ICT)	22	set	8.110	set	178.420
8	400KV,3150A, 63KA Horizontal Center Break Disconnector with double Earth blades.	6	set	9.330	set	55.980
9	400KV Bus Earth switch (single phase)	6	E	1.263	E	7.578
10	400KV Busbars, All Types of Power connectors, Tension Fitting Clamps, Insulators and hardwares	1	Lot	142.000	Lot	142.000
11	500KVA/11KV/0.433V Dsitribution Transformer (Energy efficient) with Structures	2	set	7.426	set	14.852
12	230KV, 2000A, 40KA SF6 Breaker with all accessories	8	E	12.572	E	100.576
13	230KV,2000A,40KA - 5 Core Single Phase Current Transformers wiyh TC & JB (Ratio 2000-1200- 800-400 / 1A)	24	nos	2.530	E	60.720
14	230KV,200VA Single Phase Potential Transformers with TC & JB	6	nos	2.640	E	15.840
15	230 KV- 10 KA Station Type LAS	22	nos	0.414	E	9.108
16	230 KV - 2000 A, 40 KA Isolator with Earthblades	5	Set	2.090	set	10.450
17	230 KV - 2000 A, 40KA Isolator without Earthblades (2 nos. included for Bus VT)(4 nos. for 1 phase spare ICT)	38	set	1.650	set	62.700
18	230 KV Capacitive Voltage Transformer with structures	15	nos	1.890	no	28.350
19	230 KV Bus Voltage Transformer with structures	6	nos	2.640	no	15.840
20	230KV Bus Earth switch (single phase)	6	E	1.263	E	7.578
21	230KV All Types of Power Connectors, Tension Fitting Clamps, Insulators and for 230KV Yard	1	Lot	37.000	Lot	37.000
22	ACSR Moose Conductor, Aluminium Tubes and GI wire for 400KV and 230KV Yards	1	Lot	100.000	Lot	100.000
23	220V, 535 AH Battery Set with Stand	2	Sets	10.950	set	21.900
24	220V,100A Float/Boost Battery charger	3	nos	3.830	E	11.490
25	220V, 300 AH Battery Set with Stand	2	Sets	8.020	set	16.040
26	220V,60A Float/Boost Battery charger	3	nos	1.490	E	4.470
27	Control Cables, LT Power Cables and Cable Trays			LS		450.000
28	Earthing and Painting			LS		200.000
29	Outdoor Illumination			LS		20.000
30	250KVA DG set with AMF,protection relay panel,accessories and shelter	2	set	25.000	set	50.000

Sl. No.	DESCRIPTION	QTY		RATE in Lakhs	PER	AMOUNT in Lakhs
31	3 KVA UPS (for emergency lighting of control room)	1	set	0.500	set	0.500
32	Visual monitoring system for monitoring complete switchyard and control room premises			30.000	LS	30.000
33	Fire alarm system for main control room building and for all the Kiosk buildings			30.000	LS	30.000
	Sub-Total					**2415.990**
B	**CONTROL AND RELAY PANEL**					
34	DC Distribution Panel for 400 kV SS	3	nos	1.707	E	5.12
35	AC Panel for 400 kV SS	3	nos	3.072	E	9.22
36	Control & protection Panel for 400KV Feeder	2	nos	11.280	E	22.559
37	400 kV Bus Bar protection Panel	2	nos	17.000	E	34.00
38	Control & protection Panel for 400KV ICT	2	sets	8.156	E	16.31
39	Control & protection Panel for 400KV single phase spare ICT	1	set	8.156	E	8.16
40	control & protection Panel for 400KV Bus reactor	1	no	8.977	E	8.98
41	control & protection Panel for 400 KV Tie Breaker	3	nos	3.385	E	10.16
42	Control & protection Panel for 230KV Feeders	3	sets	8.170	E	24.51
43	control & protection Panel for 230KV Bus Coupler	1	no	2.430	E	2.43
44	230KV Busbar Protection Panel	1	no	14.030	E	14.03
45	Control & protection Panel for 230KV Feeders (based on line differential protecetion) (for 2 Nos. Kundha PH3 feeders)(At Parali 400 KV SS end)	2	sets	6.000	E	12.00
46	Relay Panel for 230KV Feeders (based on line differential protecetion) (for 2 Nos. Kundha PH3 feeders)(At Kundha PH3 end)	2	sets	6.000	E	12.00
47	Control panel for 230 KV feeder (At Kundha PH3 end) (This has been included in the 230 Bay extension work)					
48	Marshalling Box	14	nos	0.500	E	7.000
49	Synchronising cum Islanding panel for 400 KV Bays	1	no	0.500	E	0.500
50	Synchronising cum Islanding panel for 230 KV Bays	1	no	0.500	E	0.500
51	Sub-Station Automation System(for koisk type architecture)(400 KV-9 Bays, 230 KV-8 bays and 2 bays for 1phase spare ICT totally 19 bays)	1	lot	125.160	E	125.160
52	FO Cable with HDPE pipe for connectivity of all kiosks to the SAS LAN in the control room building	2	LOT	13.250	E	26.500
53	Laying testing and commissioning of FO cable with HDPE pipe for connectivity of kiosk to SAS	2	LOT	1.488	E	2.975
	Sub-Total					**342.101**

Sl. No.	DESCRIPTION	QTY		RATE in Lakhs	PER	AMOUNT in Lakhs
C	**COMMUNICATION EQUIPMENTS**					
54	Digital Protection Coupler (8 nos. for 400kv Feeders & 10 Nos for 230 KV feeders including remote ends)	18	Nos	1.330	set	23.940
55	Optic line terminal equipments (OLTES)	4	Nos	16.852	E	67.408
56	Multiplexers with cross connectors (including remote ends)	4	No.	8.800	E	35.200
57	EPAX - for 48 subscribers and 16 Trunks	1	No	4.235	E	4.235
58	48 V/ 600 AH Battery System	2	set	2.310	set	4.620
59	48 V/ 120 A Battery Chargers	3	Nos.	1.051	E	3.153
60	Erection, supply and commissioning of OPGW cable(48 fibre) with accessories along with the 230 KV feeders from PH 3 to Parali 400KV SS.	0.5	Km	3.000	Km	1.500
61	Telephone Cable(4 pair-6 nos., each with 500 mtrs.)	3	Kms	0.180	km	0.450
62	Telephone	10	Nos	0.010	E	0.100
63	**Sub-Total**					**140.61**
64	**Cost of materials and equipments (A to C)**					**2898.70**
65	**Accessories 3%**					**86.96**
66	**Sub-Total**					**2985.66**
67	**Contingencies 1%**					**29.86**
68	**Sub-Total**					**3015.51**
69	**Labour 10%**					**301.55**
70	**Transport 5%**					**150.78**
71	**Cost of Material and Labour**					**3467.84**
D	**TRANSFORMERS & REACTOR**					
72	400/230KV, 166.66 MVA Single phase Interconnection transformer with OLTC with Nitrogen injection Fire protection system and line materials required for formation of tertiary delta and neutral bus.(one spare single phase unit is included)	7	Nos	550.00	No.	3850.00
73	125MVAR, 400KV, Three phase Reactor with Nitrogen injection Fire protection system.	1	No	530.38	No.	530.38
	Sub-Total (Cost of Material and Labour including Transformers)					**7848.22**
	Estt & Supervision Charges 15 %					**1177.23**
	Sub-Total					**9025.45**
E	**SCIENTIFIC INSTRUMENTS & OTHERS:**					
74	Fire Fighting Equipments			LS		8.00
75	Digital Multimeter (AC/DC)	2	nos	0.30	E	0.60
76	10 KV Digital insulation Tester (rechargeable	1	no	6.22	E	6.22
77	Digital Mini Clamp Meter(for mA current	1	no	0.80	E	0.80
78	Hand held Digital Clamp meter(True RMS AC/DC currents upto 2000 Amps)	1	no	1.00	E	1.00
79	Thermovision camera	1	no	6.50	E	6.50
80	Hand held Megger (1 KV with R measurement)	1	no	0.55	E	0.55
81	Circuit Breaker analysing kit with DCRM and laptop	1	no	45.00	E	45.00
82	On Line Earth Resistance Tester	1	no	4.50	E	4.50
83	Primary Injection Kit (2000 Amps continuous)	1	no	17.90	E	17.90
84	Computerised CT/ PT Analyser testing kit with Laptop Computer	1	no	25.00	E	25.00

Sl. No.	DESCRIPTION	QTY		RATE in Lakhs	PER	AMOUNT in Lakhs
85	Bit Error Meter (E1 Tester)	1	no	2.00	E	2.00
86	Optical Source meter	1	no	3.50	E	3.50
87	Optical Power Meter	1	no	2.00	E	2.00
88	Optical Splicing equipment	1	no	8.00	E	8.00
89	OTDR	1	no	8.00	E	8.00
90	Tan Delta Test kit	1	No.	35.00	E	35.00
91	SFRA testing kit	1	No.	22.00	E	22.00
92	Transformer DC Winding Resistence measuerement kit (50A DC)	1	No.	4.10	E	4.10
93	Transformer ratio testing kit	1	No.	6.50	E	6.50
94	SF6 Gas Analyser with calibrator	1	No.	25.00	E	25.00
95	Ethernet Tester	1	No.	3.00	E	3.00
96	Ferruling machine	1	No.	0.50	E	0.50
97	T & P Furnitures				LS	2.00
98	PC & Software	1	no	1.00	E	1.00
99	Spares for relay panels & SAS	1	Lot	60.00	Lot	60.00
100	Digital Fault Recorder System with PMU, Distance to fault locator	1	Dia	24.430	Dia	24.43
101	Work Station for Distance Fault Recorder	1	No.	2.000	No.	2.00
102	Installation, testing & commissioning of DFR cum PMU cum FL System	1	Dia	0.400	Dia	0.40
103	Spares for DFR cum PMU cum TWFL	1	Lot	25.00	Lot	25.00
104	Commissioning of SAS	19	bays	0.20	E	3.80
105	LED bulbs(20 W or higher) for emergency lighting of control room	1	Lot	0.5	Lot	0.50
106	ESI 4.75% on Labour charges, item no.C69					14.32
107	EPF 13.36% on Labour charges, item no.C69					40.29
108	GST 18% on labour charges, ESI & EPF, (item no.67,106 &107)					64.11
109	Labour Welfare Fund 1.0% on Erection Charges					3.02
110	**SUB-TOTAL**					**476.54**
F	**STRUCTURES**					
111	400KV Structures	1	Loc	464.33	Loc	464.330
112	230KV Structures	1	Loc	219.33	Loc	219.33
113	230 KV Tertiary Delta and Auxilary rigid bus				LS	20.00
114	**SUB-TOTAL**					**703.66**
G	**CABLE ERECTION & BAY EXTENSION WORKS**					
115	Estimate for laying of 230KV , 1X1200 Sq. mm XLPE copper cable from 400/230KV ICT LV to 230KV bus & laying of 230KV , 1X1200 Sq. mm XLPE aluminium cable from 230 KV Feeder bay to terminal towers (Annexure-A)					2468.94
116	400KV Bay Erection at 400/230KV Karamadai SS for 2 bays by one and half breaker system (Annexure-B)	1	Loc	1291.84	Loc	1291.84

Sl. No.	DESCRIPTION	QTY		RATE in Lakhs	PER	AMOUNT in Lakhs
117	One Number new 230KV Bay Provision at Existing 230KV Kundha PH3 switch yard(1 #) for link with Proposed 400KV SS and another feeder will be connected in the existing 230KV PH 3- Karamadai feeder breaker.(The PH3- Karamadai feeder is proposed to convert as 400KV DC feeder)(as per cost data)	1	No.	213.98	No.	
	SUB-TOTAL					213.980
	TOTAL FOR ELECTRICAL WORKS					**3974.76**
III	**TRANSMISSION LINE ERECTION**					**14180.41**
118	Conversion of existing 230KV SC line on SC tower with Kundha conductor into 400KV Double circiut line on Double Circuit Tower with Twin HTLS(ACCC DRAKE) conductor from Kundha PH 3 (location 01 to 57) on Kundha PH3- Karamadai feeder (In Hills area all the towers were tension towers proposed)(WIND ZONE 2 TC 2 HILL area) (Annexure-C)	14	Kms	470.65	Km	6589.10
119	Conversion of existing 230KV SC line on SC tower with Kundha conductor into 400KV Double circiut line on Multi Circuit Tower with Twin HTLS(ACCC DRAKE) condutor from (location 57 to 105) on Kundha PH3- Karamadai feeder (WIND ZONE 5 TC 1 PLAIN area)(Annexure-D)	14.4	Kms	917.37	Km	13210.13
120	Erection of new 400KV DC line on MC Tower with Twin HTLS(ACCC DRAKE) conductor (from location 105 to Karamadai 400KV SS)	4.0	km	917.37	No.	3669.48
121	Erection of 230 KV DC line on DC tower with Zebra conductor for linking the existing 230KV Kundha PH 3 with Proposed 400KV Parali SS.	0.5	km	102.25	Km	51.13
122	Sub total					**23519.83**
	Total for Transmission line Erection					**23519.83**
		Or say				**23520.00**
	TOTAL FOR WORKS (I+II+III)					**42868.41**
	Add Dismantling Charges					109.10
	Total Gross					42977.51
		Or say				**42978.00**
	Less credit					**2182.00**
	Total Nett					**40796.00**

Sl. No.	DESCRIPTION	QTY	RATE in Lakhs	PER	AMOUNT in Lakhs
Part I (a) : Dismantling charges Chargeble to A/C No. 77.550					109.10

Part II : Accumulated Depreciation Charges Chargeble to A/C No. 12.500

Sl. No.	DESCRIPTION	Original cost	Full life period	Life served	Accm. Dep, axc/bx. 9
1	Dismantling of 230KV SC line with Kundha conductor from existing 230 kV Kundha PH 2 to 230 kV Kundha PH 3.	636.72	35	52	573.05
2	Dismantling of 230KV SC line with Kundha conductor between existing 230kV PH 3 to loc.105	1545.54	35	37	1390.98
3	Total				1964.03

Part III : Devolution of Old equipment to store Debit to A/C No. 22.300

	Part III: Part IV - part II	2182.00	-	1964.03	=	217.97

Part IV: Removal of old assets Chargeble to A/C No 10.542

Sl No	Description	Qty in KMs	50% of cost/E	Original cost	Original erection charges	Original centage	Original cost of asset
1	Dismantling of 230KV SC line with Kundha conductor from existing 230 kV Kundha PH 2 to 230 kV Kundha PH 3.	11.7	43.02	503.33	50.33	83.05	636.72
2	Dismantling of 230KV SC line with Kundha conductor between existing 230kV PH 3 to loc.105	28.4	43.02	1221.77	122.177	201.59	1545.54
3	Total						2182.25
							2182.00

ABSTRACT	Rs. In Lakhs	
Part I: New assets Chargeble to capital A/C No. 14.655	Gross:	42978.00
	Nett:	40796.00
Part I (a) : Dismantling charges Chargeble to A/C No. 77.550		109.10
Part II : Accumulated Depreciation Charges Chargeble to A/C No. 12.500		1964.03
Part III : devolution of Old equipment to store Debit to A/C No. 22.300		217.97
Part IV: Removal of old assets Chargeble to A/C No 10.542		2182.00

Mandar 5/3/19

Executive Engineer-1
System Studies

(Enclosure to (Per).FB.TANTRANSCO Proceeding No. 21, dated 05.03.2019)

CHARGEABLE TO TANGEDCO

DETAILED ESTIMATE FOR ESTABLISHMENT OF 400/230KV SUB-STATION AT PARALI WITH 2 SET OF 3X166.66 MVA 400/230 KV ICTs, SPARE ICT OF 1 X166.66 MVA 400/230 KV, 2 NOS 400KV FEEDERS AND 5 NOS 230 KV FEEDERS						
Sl. No.	DESCRIPTION	QTY		RATE in Lakhs	PER	AMOUNT in Lakhs
	ELECTRICAL WORKS					
I	**COMMUNICATION EQUIPMENTS**					
1	Erection, supply and commissioning of OPGW cable(48 fibre) with accessories along with the 230 KV feeders from Proposed PH 7 to PH 2 and PH 2 to Parali SS (25+12)	37.0	Kms	3.000	Km	111.000
	Sub-Total					**111.00**
	Contingencies 1%					**1.11**
	Sub-Total					**112.11**
	Labour Charges 10%					**11.21**
	Transport 5%					**5.61**
	Cost of Material and Labour					**128.93**
	Estt & Supervision Charges 15 %					**19.34**
	EPF at 13.36 % on labour					**1.50**
	ESI at 4.75 % on labour					**0.53**
	GST 18 % on labour charges, ESI and EPF					**2.38**
	Sub-Total					**152.68**
II	**TRANSMISSION LINE ERECTION**					
1	Erection of 230KV Three circiut line on Multi Circuit Tower with Zebra conductor (PH VII to PH II) (Annexure-E)	25	Kms	236.13	Km	5903.25
2	Conversion of existing 230KV SC line on SC tower with Kundha conductor into 230 KV 4 Circuit line on MC tower with Zebra conductor from PH II to Parali SS (Annexure-F)	12	Kms	251.54	Km	3018.48
	Total for Transmission line Erection					**8921.73**
	TOTAL FOR WORKS (I+II)					**9074.41**
			Or Say (in Crores)			**90.74**

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Executive Engineer-1
System Studies

(Enclosure to (Per).FB.TANTRANSCO Proceeding No. 21, dated 05.03.2019)

ANNEXURE-A

ESTIMATE FOR LAYING OF 230 KV , 1 X 1200 SQ MM XLPE COPPER CABLE FROM 400/230KV ICT LV SIDE TO 230KV BUS & AYING OF 230 KV , 1 X 1200 SQ MM XLPE ALUMINIUM CABLE FROM 230 KV FEEDER BAY TO TERMINAL TOWERS

SL NO	DESCRIPTION	QUANTITY		RATE RS IN LAKHS	PER	AMOUNT RS IN LAKHS
1	230 KV, 1x1200 sqmm XLPE COPPER Cable (0.4x7) from LV of ICT to 230KV Bus bar	2.8	Kms	203.140	Km	568.79
2	230 KV, 1x1200 sqmm XLPE Aluminium Cable (0.5x5x3) from 230 KV Feeder bay to Terminal tower	7.5	Kms	90.876	Km	681.57
3	230 KV LAS	44	Nos.	0.414	E	18.22
4	230 KV LAS structure	44	Nos.	0.285	E	12.54
5	Outdoor termination kit	44	Nos.	10.63	E	467.72
6	Outdoor termination structure	44	Nos.	1.097	E	48.27
7	230 KV Single phase link box with CCPU	22	Nos.	0.615	E	13.53
8	230 KV Single phase link box without CCPU	22	Nos.	0.286	E	6.29
9	Sheath link box	22	Nos.	1.332	E	29.30
10	240 sq. mm sheath bonding cable	0.6	Km	20.330	km	12.20
11	**Sub total**					1858.43
12	Contingencies 1%					18.58
13	Labour and Transport Charges			2.0	Ls	2.00
14	Sub total					1879.01
15	Establishment and Supervision Charges 15%					281.85
16	Labour charges for laying of cable	10.3	Km	15.0	Km	154.50
17	Sub total					2315.37
18	Erection & Company supervision of terminations	44	Nos.	1.45	E	63.80
19	Transit, erection, testing & commissioning insurance @ 1%					18.584
20	ESI 4.75% on labour (4.75% on item No.16 & 4.75% on 40% of item no.13 &18)					8.589
21	EPF 13.36% on labour (13.36% on item No.16 & 13.36% on 40% of item no.13 &18)					24.158
22	GST 18.0% on labour (18% on item No.16, ESI and EPF & 18% on 40% of item no.13 &18)					38.442
23	**Total (Gross & Nett)**					**2468.94**

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(Enclosure to (Per).FB.TANTRANSCO Proceeding No. 21, dated 05.03.2019)

ANNEXURE-B

DETAILED ESTIMATE FOR 400 KV BAY EXTENSION AT 400 KV KARAMADAI SS (With I section) - For Two Bays

Rs. In lakhs

Sl No	DESCRIPTION	UNIT	QTY	RATE	TOTAL
1	420 kV, SF6 Breaker with pre insertion resistor	Nos	4	53.638	214.552
2	420 kV, CT	Nos	18	7.190	129.420
3	420 kV Isolator with double earth	Nos	4	9.330	37.320
4	420 kV Isolator with single earth	Nos	8	8.110	64.880
5	390 kV Lightning Arrester	Nos	6	1.140	6.840
6	400kv Single phase CVT	Nos	6	3.477	20.865
7	400 KV double tension fitting with disc insulator for	Nos	48	0.213	8.784
8	400 kV single suspension string Insulator	Nos	18	0.183	3.294
9	400 kV support Insulator	Nos	27	0.462	12.486
10	4" Alu. Tube bus clamp for support Insulator	Nos	27	0.033	0.891
11	Clamps, Spacers and others for 400 kV Yard		LS	5.250	5.250
12	Alu. Tube, Moose conductor for 400 kV yard		LS	10.500	10.500
13	Relay panel for 400 kV feeders	Nos	2	11.280	22.560
14	Relay panel for 400 kV tie Breaker	No	2	3.385	6.769
15	Marshalling box	Nos	4	0.300	1.200
16	Control cables & LT power cables		LS	28.941	28.941
17	Yard lighting		LS	3.473	3.473
18	Shielding & Earthing		LS	0.281	0.281
19	Augmentation of SAS, DFR with PMU, Distance to fault locator system and Protection system	Bays	4	8.000	32.000
20	DFR cum PMU cum FL System	Dia	2	24.5	24.5
21	Work station for DFL	LS		2.00	2.000
22	ADSS Cable for 400 KV feeders	Kms	3	2.500	7.500
23	Optical Line Terminal Equipments	E	2	3.641	7.282
24	Multiplexers with cross conectors (included in the main estimate)				
25	Digital Protection Coupler(8 command) (included in the main estimate)				
26	**Subtotal**				**651.590**
27	Spares 3%				19.548
28	Cost of Equipment & material				671.137
29	Erection charges at 10%				67.114
30	Transportation 5%, Insurance 1%, Central & State ST 4%.Total 10%				67.114
31	Contingencies 1 %				6.711
32	**Total**				**812.076**
33	Cost of material & Labour				812.076
34	Establishment (7.5%), T&P (1%), Loss on stock (0.25%), Audit & Accounts (1%), Maintenance during construction (1%). Total 10.75%				87.298

No	DESCRIPTION	UNIT	QTY	RATE	TOTAL
35	400 kV Structure	LS		87.400	87.400
36	Civil works for foundation, cable duct, Yard levelling, filling, lead road and foot path and fencing.	LS		208.770	208.770
37	Commissioning of SAS	Bays	4	0.2	0.80
38	Installation, testing & commissioning of DFR cum PMU cum FL	lot	1	2.000	2.00
39	Material and Labour cost for necessary 400 KV Bus bar protection modification works	LS		2.200	2.200
40	Integration of 4 Nos 400 KV Relay panels with SAS	Bays	4	8.000	32.00
41	ESI 4.75% on labour (4.75% on item No.29 & 4.75% on 40% of item no.36)				7.15
42	EPF 13.36% on labour (13.36% on item No.29 & 13.36% on 40% of item no.36)				20.12
43	GST 18.0% on labour (18% on item No.29, ESI (41) and EPF (42) & 18% on 40% of item no.36)				32.02
	Overall Cost				1291.844

Say Rs. 1291.84 Lakhs

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(Enclosure to (Per).FB.TANTRANSCO Proceeding No. 21, dated 05.03.2019)

ANNEXURE-C

TAMILNADU TRANSMISSION CORPORATION LIMITED

COST DATA FOR 400 KV DC LINE ON DC TOWERS (WIND ZONE 2 TC 2) WITH TWIN HTLS(ACCC DRAKE) CONDUCTOR

Sl. No.	Quantity	Unit	Description	Rate in Rs.	Per	Amount in Rs.
1			Galvanised steel tower materials with extension part wherever necessary, and bolts and nutsetc.,			
			12945 MT			
	421.515	MT	a) HT Steel	69000	MT	29084535.00
	490.035	MT	b) MS	65000	MT	31852275.00
	27.57	MT	c) Ordinary Bolts & nuts	90000	MT	2481300.00
	0	MT	d)Anti-theft bolts and nuts	90000	MT	0.00
2	1690	No.	120 KN Disc Insulators	491.3	No.	830297.00
3	17626	No.	160 KN Disc Insulators	867	No.	15281742.00
			Conductor & Earth wire accessories			
4	0	Set	Double I suspension string for Twin HTLS(ACCC DRAKE)	21099	Set	0.00
5	72	Set	Double I suspension pilot string with counter weight	21099	Set	1519128.00
6	360	Set	Double Tension string	13359	Set	4809240.00
7	1273	Set	Bundle spacer for Twin HTLS(ACCC DRAKE)	1413.55	Set	1799449.15
8	720	Set	Vibration Damper for Twin HTLS(ACCC DRAKE)	1768	Set	1272960.00
9	540	Set	Rigid Spacer for conductor HTLS(ACCC DRAKE) 3 Nos. per jumper	849.15	Set	458541.00
10	60	Set	Midspan compression joint for HTLS(ACCC DRAKE)	87486	Set	5249160.00
11	30	No.	Repair sleeve for HTLS(ACCC DRAKE)	4776	No.	143280.00
12	0	Set	Suspension clamp for Earth wire 7/3.66mm	845	Set	0.00
13	60	Set	Tension Clamp for Earth wire 7/3.66mm	845.0649	Set	50703.89
14	5	Set	Midspan compression joint for GS Earth wire 7/3.66mm	352.75	Set	1763.75
15	120	No.	Vibration Damper for Earth wire 7/3.66mm	640.05	Set	76806.00
16	60	No.	Flexible copper bond for earthing	935.00	No.	56100.00
17	121.8	KM	HTLS(ACCC DRAKE) conductors 1.5% sag	1154500	KM	140618100.00
18	10.1	KM	GI EARTH WIRE 7/3.66mm 1.0% sag	52331	KM	528543.10
19	10.5	KM	OFC ground wire with accessories	229705	KM	2411902.50
			Earthing Materials			
20	24	No.	Pipe type earthing	2235	No.	53640.00
21	6	No.	Counter poise earthing (120m length)	9484	No.	56904.00
22			Tower Accessories			
23	30	No.	Number plate	299	No.	8970.00
24	30	No.	Danger Board	362	No.	10860.00
25	60	No.	Phase plate(Set of three)	319	No.	19140.00
26	60	No.	Circuit plate	306	No.	18360.00
27	30	No.	Anti-climbing devices	14292	No.	428760.00
28			TOTAL COST OF MATERIALS			239122460.39

Sl. No.	Quantity	Unit	Description	Rate in Rs.	Per	Amount in Rs.
			TOWER FOUNDATIONS			
29	0	No.	DA type tower			
			0° to 2° Suspension tower	346813	No.	0.00
30	9	No.	DB type tower			
			2° to 15° Light angle tower	951392.00	No.	8562528.00
31	9	No.	DC type tower			
			15° to 30° Medium angle tower	1215639.00	No.	10940751.00
32	12	No.	DD type tower			
			30° to 60° High angle & Dead end tower	2070233.00	No.	24842796.00
33			Tower protection works 15% on foundation			6651911.25
34			TOTAL COST ON FOUNDATION			50997986.25
35			Total Cost of materials & FOUNDATION			290120446.64
36			Erection charges(10% on item 28)			23912246.04
37	10	KM	Tree/Crop compensation	2000000	KM	20000000.00
38			Total amount			334032692.68
39			Labour Welfare Fund 1.0% on Foundation & Erection Charges			749102.32
40			Transportation & Insurance charges (5% on Item 28)			11956123.02
41			Contingencies 1% on Foundation Erection and Materials			3459888.16
42			Total Cost of Materials, Foundation and Erection charges but excluding LWF			349448703.86
43			Establishment & Supervision Charges at 15.0% on item 42			52417305.58
44			Total Cost of Materials, Foundation and Erection charges including LWF			350197806.18
45			TOTAL COST PER	10	KM	402615111.76
46			EPF at 13.36 % on labour portion (on item 36 & 40% of item 34)			5920008.46
47			ESI at 4.75 % on labour portion (on item 36 & 40% of item 34)			2104793.43
48			GST @ 18% on total cost of materials & Foundation, erection charges, ESI and EPF			57970349.02
49			Land compensation			2038660.00
50			TOTAL COST PER	10	KM	470648922.67
51			TOTAL COST PER 1 KM			47064892.27
			(Rounding to nearest 1000)	SAY		47065000.00
			COST PER KM IN LAKHS			470.65

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(Enclosure to (Per).FB.TANTRANSCO Proceeding No. 21, dated 05.03.2019)

ANNEXURE-D

TAMILNADU TRANSMISSION CORPORATION LIMITED

COST DATA FOR 400 KV DC LINE ON MC TOWERS (WIND ZONE 5 TC 1) WITH TWIN HTLS(ACCC DRAKE) CONDUCTOR

Sl. No.	Quantity	Unit	Description	Rate in Rs.	Per	Amount in Rs.
1			Galvanised steel tower materials with extension part wherever necessary, and bolts and nutsetc..			
			12945	MT		
	2267.54	MT	a) HT Steel	69000	MT	156460260.00
	752.67	MT	b) MS	65000	MT	48923550.00
	118.41	MT	c) Ordinary Bolts & nuts	90000	MT	10656900.00
	0	MT	d)Anti-theft bolts and nuts	90000	MT	0.00
2	3097	No.	120 KN Disc Insulators	491.3	No.	1521556.10
3	9988	No.	160 KN Disc Insulators	867	No.	8659596.00
			Conductor & Earth wire accessories			
4	78	Set	Double I suspension string for Twin HTLS(ACCC DRAKE)	21099	Set	1645722.00
5	54	Set	Double I suspension pilot string with counter weight	21099	Set	1139346.00
6	204	Set	Double Tension string	13359	Set	2725236.00
7	1273	Set	Bundle spacer for Twin HTLS(ACCC DRAKE)	1413.55	Set	1799449.15
8	408	Set	Vibration Damper for Twin HTLS(ACCC DRAKE)	1768	Set	721344.00
9	306	Set	Rigid Spacer for conductor HTLS(ACCC DRAKE) 3 Nos. per jumper	849.15	Set	259839.90
10	60	Set	Midspan compression joint for HTLS(ACCC DRAKE)	87486	Set	5249160.00
11	30	No.	Repair sleeve for HTLS(ACCC DRAKE)	4776	No.	143280.00
12	13	Set	Suspension clamp for Earth wire 7/3.66mm	845	Set	10985.00
13	34	Set	Tension Clamp for Earth wire 7/3.66mm	845.0649	Set	28732.21
14	5	Set	Midspan compression joint for GS Earth wire 7/3.66mm	352.75	Set	1763.75
15	68	No.	Vibration Damper for Earth wire 7/3.66mm	640.05	Set	43523.40
16	47	No.	Flexible copper bond for earthing	935.00	No.	43945.00
17	121.8	KM	HTLS(ACCC DRAKE) conductors 1.5% s	1154500	KM	140618100.00
18	10.1	KM	GI EARTH WIRE 7/3.66mm 1.0% sag	52331	KM	528543.10
19	10.5	KM	OFC ground wire with accessories	229705	KM	2411902.50
			Earthing Materials			
20	23	No.	Pipe type earthing	2235	No.	51405.00
21	7	No.	Counter poise earthing (120m length)	9484	No.	66388.00
22			Tower Accessories			
23	30	No.	Number plate	299	No.	8970.00
24	30	No.	Danger Board	362	No.	10860.00
25	60	No.	Phase plate(Set of three)	319	No.	19140.00
26	60	No.	Circuit plate	306	No.	18360.00
27	30	No.	Anti-climbing devices	14292	No.	428760.00
28			TOTAL COST OF MATERIALS			384196617.11

Sl. No.	Quantity	Unit	Description	Rate in Rs.	Per	Amount in Rs.
			TOWER FOUNDATIONS			
29	13	No.	QA type tower 0° to 2° Suspension tower	2797156.5	No.	36363034.50
30	4	No.	QB type tower 2° to 15° Light angle tower	5408742.00	No.	21634968.00
31	4	No.	QC type tower 15° to 30° Medium angle tower	7030791.00	No.	28123164.00
32	9	No.	QD type tower 30° to 60° High angle & Dead end tower	10215581.00	No.	91940229.00
33			Tower protection works 15% on foundation			26709209.33
34			TOTAL COST ON FOUNDATION			204770604.83
35			Total Cost of materials & FOUNDATION			588967221.93
36			Erection charges(10% on item 28)			38419661.71
37	10	KM	Tree/Crop compensation	2000000	KM	20000000.00
38			Total amount (items 35 to 37)			647386883.64
39			Labour Welfare Fund 1.0% on Foundation & Erection Charges			2431902.67
40			Transportation & Insurance charges (5% on Item 28)			19209830.86
41			Contingencies 1% on Foundation Erection and Materials			6665967.14
42			Total Cost of Materials, Foundation and Erection charges but excluding LWF(items 41,40 & 38)			673262681.64
43			Establishment & Supervision Charges at 15.0% on item 42			100989402.25
44			Total Cost of Materials, Foundation and Erection charges including LWF (items 42 &39)			675694584.31
45			TOTAL COST PER	10	KM	776683986.55
46			EPF at 13.36 % on labour portion (on item 36 & 40% of item 34)			16075807.93
47			ESI at 4.75 % on labour portion (on item 36 & 40% of item 34)			5715575.42
48			GST @ 18% on total cost of materials & Foundation, erection charges, ESI and EPF			116852088.06
49			Land compensation			2038660.00
50			TOTAL COST PER (items 45 to 49)	10	KM	917366117.96
51			TOTAL COST PER 1 KM			91736611.80
			(Rounding to nearest 1000)	SAY		91737000.00
			COST PER KM IN LAKHS			917.37

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(Enclosure to (Per).FB.TANTRANSCO Proceeding No. 21, dated 05.03.2019)

ANNEXURE-E

TAMILNADU TRANSMISSION CORPORATION LIMITED

COST DATA FOR 230 KV 3 CIRCUITS LINE ON MULTI CIRCUIT TOWERS WITH ZEBRA CONDUCTOR

Sl. No.	Quantity		DESCRIPTION	Rate in Rs.	Per	Amount in Rs.
			Galvanised steel tower materials with extension part wherever necessary, and bolts and nutsetc.,			
1	669.88	MT	MS tower parts	65000.00	MT	43542200.00
2	210.65		HT Tower parts	69000.00	MT	14534850.00
3	24.508	MT	Ordinary Bolts & nuts	90000.00	MT	2205720.00
4	3342	No.	90 KN Disc Insulators	549.95	No.	1837932.90
5	6426	No.	120 KN Disc Insulators	633.25	No.	4069264.50
			Conductor & Earth wire accessories			
6	144	Set	Single Suspension Fittings for ACSR Zebra	1747.00	Set	251568.00
7	54	Set	Single suspension fittings for jumperig	1747.00	Set	94338.00
8	432	Set	Single Tension fittings for ACSR Zebra	2001.75	Set	864756.00
9	18	set	Double tension fittings	3570.00	Set	64260.00
10	432	Set	Vibration Damper for ACSR Zebra	917.15	Set	396208.80
11	45	Set	Mid span comp. joint for Zebra	803.00	Set	36135.00
12	24	No.	Repair sleeve for Zebra	388.00	No.	9312.00
13	144	Set	PA Rod for ZEBRA	1876.00	Set	270144.00
14	16	Set	Suspension clamp for Earth wire 7/3.55mm	463.25	Set	7412.00
15	48	Set	Tension Clamp for Earth wire 7/3.55mm	458.15	Set	21991.20
16	5	Set	Midspan compression joint for GS Earth wire 7/3.55mm	192.10	Set	960.50
17	64	No.	Flexible Al. Earth bond	196.35	No.	12566.40
18	90.9	KM	ACSR Zebra	240006.00	KM	21816545.40
19	10.15	KM	GI Earth wire 7/3.55mm	49344.00	KM	500841.60
			Earthing Materials			
20	40	No.	Pipe type earthing	2235.00	No.	89400.00
21	2	No.	Counter poise earthing (120m length)	9484.00	No.	18968.00
			Tower Accessories			
22	40	No.	Number plate	299.00	No.	11960.00
23	40	No.	Danger Board	362.00	No.	14480.00
24	96	No.	Phase plate(Set of three)	319.00	No.	30624.00
25	96	No.	Circuit plate	306.00	No.	29376.00
26	40	No.	Anti-climbing devices	14292.00	No.	571680.00
27			TOTAL COST OF MATERIALS			91303494.30

Sl. No.	Quantity		DESCRIPTION	Rate in Rs.	Per	Amount in Rs.
			TOWER FOUNDATIONS **(Hills MA Tower erection not Feasible)**			
28	0	No.	MA type tower 0° to 2° Suspension tower	404930.15	No.	0.00
29	25	No.	MC type tower 2° to 30° Medium angle tower	1082689.34	No.	27067233.50
30	15	No.	MD type tower 30° to 60° High angle & Dead end tower	1288654.93	No.	19329823.92
31			Tower protection works			10000000.00
32			TOTAL FOUNDATION COST			56397057.42
33			Total Cost of materials & Foundation (adding Item 27 & 32)			147700551.72
34			Erection charges(10% on item 27)			9130349.43
35	10	KM	Tree/Crop compensation	1000000.00	KM	10000000.00
36			Total amount			166830901.15
37			Labour Welfare Fund 1.0% on Foundation & Erection Charges			655274.07
38			Transportation & Insurance charges (5% on Item27)			4565174.72
39			Contingencies 1% (on items38,35,34 & 33)			1713960.76
40			Total Cost of materials & Foundation and Erection, transportation, contingencies but excluding LWF (item 36+38+39)			173110036.62
41			Establishment & Supervision Charges at 15.0% on item 40			25966505.00
42			Total Cost of materials, foundation & erection charges including Estt. And supervision charges, & LWF (item 41+40+37)	10	KM	199731815.69
43			EPF at 13.36 % on labour portion (on item 34 & 40% of item 32)			4233673.43
44			ESI at 4.75 % on labour portion (on item 34 & 40% of item 32)			1505235.69
45			GST 18 % on total cost of materials & Foundation, erection charges, ESI and EPF			29262565.85
46			Land compensation			1393670.00
47			TOTAL COST PER	10	KM	236126960.66
48			TOTAL COST PER 1 KM			23612696.07
49			(Rounding to nearest 1000)	SAY		23613000.00
50			TOTAL COST PER KM IN LAKHS			236.13

Note :- Entire lines comes through forest area, all the towers were used in the lines are tension towers (MD) only(the estimate prepared by using tension towers(MD) instead of suspension towers(MC))

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(Enclosure to (Per).FB.TANTRANSCO Proceeding No. 21, dated 05.03.2019)

ANNEXURE-F

TAMILNADU TRANSMISSION CORPORATION LIMITED

COST DATA FOR 230 KV 4 CIRCUITS LINE ON MULTI CIRCUIT TOWERS WITH ZEBRA CONDUCTOR

Sl. No.	Quantity		DESCRIPTION	Rate in Rs.	Per	Amount in Rs.
			Galvanised steel tower materials with extension part wherever necessary, and bolts and nutsetc.,			
1	669.88	MT	MS tower parts	65000.00	MT	43542200.00
2	210.65		HT Tower parts	69000.00	MT	14534850.00
3	24.508	MT	Ordinary Bolts & nuts	90000.00	MT	2205720.00
4	4456	No.	90 KN Disc Insulators	549.95	No.	2450577.20
5	8568	No.	120 KN Disc Insulators	633.25	No.	5425686.00
			Conductor & Earth wire accessories			
6	192	Set	Single Suspension Fittings for ACSR Zebra	1747.00	Set	335424.00
7	72	Set	Single suspension fittings for jumperig	1747.00	Set	125784.00
8	576	Set	Single Tension fittings for ACSR Zebra	2001.75	Set	1153008.00
9	24	set	Double tension fittings	3570.00	Set	85680.00
10	576	Set	Vibration Damper for ACSR Zebra	917.15	Set	528278.40
11	60	Set	Mid span comp. joint for Zebra	803.00	Set	48180.00
12	30	No.	Repair sleeve for Zebra	388.00	No.	11640.00
13	192	Set	PA Rod for ZEBRA	1876.00	Set	360192.00
14	16	Set	Suspension clamp for Earth wire 7/3.55mm	463.25	Set	7412.00
15	48	Set	Tension Clamp for Earth wire 7/3.55mm	458.15	Set	21991.20
16	5	Set	Midspan compression joint for GS Earth wire 7/3.55mm	192.10	Set	960.50
17	64	No.	Flexible Al. Earth bond	196.35	No.	12566.40
18	121.2	KM	ACSR Zebra	240006.00	KM	29088727.20
19	10.15	KM	GI Earth wire 7/3.55mm	49344.00	KM	500841.60
			Earthing Materials			
20	40	No.	Pipe type earthing	2235.00	No.	89400.00
21	2	No.	Counter poise earthing (120m length)	9484.00	No.	18968.00
			Tower Accessories			0.00
22	40	No.	Number plate	299.00	No.	11960.00
23	40	No.	Danger Board	362.00	No.	14480.00
24	96	No.	Phase plate(Set of three)	319.00	No.	30624.00
25	96	No.	Circuit plate	306.00	No.	29376.00
26	40	No.	Anti-climbing devices	14292.00	No.	571680.00
27			TOTAL COST OF MATERIALS			101206206.50

Sl. No.	Quantity		DESCRIPTION	Rate in Rs.	Per	Amount in Rs.
			TOWER FOUNDATIONS (Hills MA Tower erection not Feasible)			
28	0	No.	MA type tower			
			0° to 2° Suspension tower	404930.15	No.	0.00
29	25	No.	MC type tower			
			2° to 30° Medium angle tower	1082689.34	No.	27067233.50
30	15	No.	MD type tower	1288654.93	No.	19329823.92
			30° to 60° High angle & Dead end tower			
31			Tower protection works			
32			TOTAL FOUNDATION COST			10000000.00
33			Total Cost of materials & Foundation			56397057.42
			(adding Item 27 & 32)			157603263.92
34			Erection charges(10% on item 27)			
35	10	KM	Tree/Crop compensation			10120620.65
36			Total amount	1000000.00	KM	10000000.00
37			Labour Welfare Fund 1.0% on Foundation & Erection Charges			177723884.57
38			Transportation & Insurance charges (5% on Item27)			665176.78
39			Contingencies 1% (on items38,35,34 & 33)			5060310.33
40			Total Cost of materials & Foundation and Erection, transportation, contingencies but excluding LWF (item 36+38+39)			1827841.95
41			Establishment & Supervision Charges at 15.0% on item 40			184612036.84
42			Total Cost of materials, foundation & erection charges including Estt. And supervision charges & LWF (item 41+40+37)			27691806.00
43			EPF at 13.36 % on labour portion (on item 34 & 40% of item 32)	10	KM	212969019.62
44			ESI at 4.75 % on labour portion (on item 34 & 40% of item 32)			4365973.67
45			GST 18 % on total cost of materials & Foundation, erection charges, ESI and EPF			1552273.57
46			Land compensation			31255583.73
47			TOTAL COST PER			1393670.00
48			TOTAL COST PER 1 KM	10	KM	251536520.59
49			(Rounding to nearest 1000)			25153652.06
50			TOTAL COST PER KM IN LAKHS	SAY		25154000.00
						251.54

Note :- Entire lines comes through forest area, all the towers were used in the lines are tension towers (MD) only(the estimate prepared by using tension towers(MD) instead of suspension towers(MC))

Mhuda 5/3/19

Executive Engineer-1
System Studies