

TAMILNADU TRANSMISSION CORPORATION LIMITED

ABSTRACT

TANTRANSCO – Establishment of new 230/110 kV SS at Tindivanam (Venmaniyathur in Villupuram District) with associated Transmission lines in Villupuram Operation Circle of System Operation/Chennai - Administrative approval – Accorded

TECHNICAL BRANCH

(Per.) FB TANTRANSCO Proceedings No. 30

Dated : 17.10.2026
Purataasi : 30
Parabhaava Varudam,
Thiruvalluvar Aandu : 2057

READ: Approval by Board of TANTRANSCO in its 128th Meeting held on 22.09.2026 vide Item No TR-128/52

PROCEEDINGS:

The Tamil Nadu Transmission Corporation Ltd, after careful consideration approves the following proposal:

1. Administrative approval for the establishment of new 230/110 kV SS at Tindivanam (Venmaniyathur) with 2x160 MVA, 230/110 kV Auto transformers and Associated Transmission Lines in Villupuram Operation Circle of System Operation/ Chennai at an estimated cost of Rs. 348.608 Crores Gross and Rs 332.328 Crores Nett. The detailed estimate and report are annexed to these proceedings. The phasing out year of the proposed 230 kV SS is 2027-28.
2. The expenditure is chargeable to TANTRANSCO - Funds - Capital Expenditure - Villupuram Operation Circle (System Operation/Chennai) - A/C code No: 1020500.
3. By virtue of the provisions contained in sub-section (2) (a) of section 185 of the Electricity Act, 2003, TANTRANSCO being the Transmission utility, 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 works will be taken up after ensuring necessary budget provision.

//BY ORDER OF THE BOARD//

K.SRIDHARAN
CHIEF ENGINEER/TRANSMISSION

To

The Chief Engineer/ System Operation/Chennai.

Copy to:

The Managing Director/TANTRANSCO, Chennai-2.

The Director/ Transmission Projects/ TANTRANSCO, Chennai-2.

The Director/Operation/TANTRANSCO/Chennai -2

The Director /Finance/TANTRANSCO, Chennai-2

The Director/Distribution, TNPDC, Chennai-2.

The Director/Finance, TNPDC, Chennai-2

The Secretary/TANGEDCO/Chennai -2.

The Chief Engineer/Civil Transmission/Chennai -2

The Chief Engineer/Distn/Villupuram Region

The Superintending Engineer /GCC I/ Chennai

The Superintending Engineer/Operation/ Villupuram

The Superintending Engineer/Villupuram EDC

The Chief Financial Controller/General/ TANTRANSCO, Chennai-2.

The Chief Internal Audit Officer/TANGEDCO, Chennai-2.

The Deputy Secretary, TANTRANSCO

The Superintending Engineer/Transmission -I/Chennai -2

The Superintending Engineer/Transmission IV/Chennai -2

The Superintending Engineer/Transmission 765 KV/Chennai -2

The Superintending Engineer/System Studies/Chennai -2

The Resident Audit Officer (AGO'S Unit)/Chennai -2

B.P.Section (Administrative Branch)

Stock file

//FORWARDED BY ORDER//

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17/10/2026

EXECUTIVE ENGINEER/MASTER PLAN II

Enclosure to (Per) FB TANTRANSCO Proceedings No. 30 dated : 17.10.2026

REPORT TO ACCOMPANY THE ESTIMATE

This proposal envisages of new 230/110 kV SS at Tindivanam (Venmaniyathur) with 2x160 MVA, 230/110 kV Auto transformers and associated transmission lines in Villupuram Operation Circle of System Operation/Chennai at an estimated cost of Rs. 348.608 Crores Gross and Rs 332.328 Crores Nett. (SS Cost: Rs 109.279 Crores and Associated Transmission Lines: Rs 238.546 Crores Gross, Dismantling charges of Rs 78.240 lakhs)

NEED:

At present, the areas in and around Tindivanam are being fed off Neyveli 230/110 kV SS, Villupuram 230/110 kV SS and Acharapakkam 230/110 kV SS. The peak reached on the above substations are listed below:

Sl. No.	Name of the Substation	Auto transformer capacity (in MVA)	Peak reached (in MVA)	% loading
1	Neyveli 230/110 kV SS	3x160	400	83.33 %
2	Villupuram 230/110 kV SS	2x160	251	78.44 %
3	Acharapakkam 230/110 kV SS	3x100	190	63.33 %

At present, the Auto Transformers at the above 230 kV substations are loaded more than 60% of their capacity.

The details of load relief to the following existing 230 kV SS after establishment of proposed Tindivanam 230 kV SS is as follows:

Name of the SS	Capacity	Present Maximum Load/Sustained Peak	Load expected after new SS (After load bifurcation)	Load Relief
Villupuram 230/110 KV Auto SS	320 MVA : 2x160 MVA	251 MVA	181 MVA	70 MVA
Acharapakkam 230/110 KV Auto SS	300 MVA : 3 x100 MVA	190 MVA	170 MVA	20 MVA
Neyveli 230/110 KV Auto SS	480 MVA : 3x160 MVA	400 MVA	359 MVA	41 MVA

Villupuram 230/110 KV Auto SS

Name of the existing 110 kV Feeder fed from 230 kV Villupuram SS	Name of the connected SS	Total capacity of Power transformer/ Sustained peak	% loading	Connected Load to be transferred to the proposed Tindivanam 230 kV SS
110 kV Villupuram - Thayanur feeder	Gingee 110 kV SS	2x16 MVA, 110/33 kV 1x16 MVA, 110/11 kV 2x8 MVA 33/11 kV 25.15 MVA	52.40%	Total prop: 32 MVA
110 kV Villupuram - Madurapakkam II feeder	Vanur 110 kV SS	1x16+1x10 MVA, 110/22 kV 18.47 MVA	71.04%	Total prop: 12 MVA
110 kV Villupuram - Acharapakkam II feeder	Elamangal 110 kV SS	3x16 MVA, 110/33 kV 2x8 MVA, 33/11 kV 24.32 MVA	50.67%	Total prop: 26 MVA
				Total 70 MVA

Acharapakkam 230/110 KV SS

Name of the existing 110 kV Feeder fed from 230 kV Acharapakkam SS	Name of the connected SS	Total capacity of power transformer/ Sustained peak	% loading	Sanctioned Additional Transformer	Connected Load to be transferred to the proposed Tindivanam 230 kV SS
110 kV SP Koil -Acharapakkam II feeder	Murukkery 110 kV SS	2x16 MVA, 110/33 kV 2x8 MVA, 33/11 kV 30.5 MVA	95.31%	1x16 MVA, 110/33 kV	Extg:20 MVA (Prop:16 MVA)
				Total	20 MVA

Neyveli 230/110 kV Auto SS

Name of the existing 110 kV Feeder fed from 230 kV Neyveli Auto SS	Name of the connected SS	Total capacity of power transformer/ Sustained peak	% loading	Sanctioned Additional Transformer	Connected Load to be transferred to the proposed Tindivanam 230 kV SS
110 kV Villupuram - Acharapakkam I feeder	Tindivanam 110 kV SS	2x16 MVA, 110/33 kV 2x16 MVA, 110/11 kV 46.5 MVA	72.66 %	1x16 MVA, 110/33 kV	Extg:41 MVA (Prop:16 MVA)
Total					41 MVA

Therefore, in order to give load relief to the above said existing 230 kV substations and to meet the future load growth, establishment of a new 230/110 kV SS is very much essential. In addition, establishment of 230 kV SS will facilitate operational flexibilities and alternate feeding arrangements for the existing substations so as to maintain uninterrupted supply. Hence, it is proposed to establish new 230/110 kV SS at Tindivanam area.

The above said nearby substations EHT connectivity network is detailed as per enclosed sketch.

LOAD FLOW STUDY:

The load flow study for the proposed establishment of Tindivanam 230/110 kV SS has been conducted for the network condition for the year 2027-28 condition for High RE and Low RE condition.

Load Flow study considerations:

The following considerations have been made for the Load Flow Study:

1. The sanctioned introduction of 400/230kV at Ariyalur 765/400 kV SS and its associated transmission schemes has been considered in this study.
2. The proposed Cuddalore 400 /230-110 kV SS has been considered in this study.

3. 230kV Split bus operation at Neyveli 230kV SS and 230kV Split bus operation at proposed Cuddalore 400/230-110kV SS has not been considered.
4. The sanctioned Keezhakuppam 230kV SS has been considered.
5. The proposed 3rd 1x160 MVA, 230/110kV Auto Transformer at Villupuram 230/110kV SS.
6. The upcoming substations and lines pertaining to the year period of 2027-28 have been considered in this study.

The revised load flow study has been conducted for the establishment of the Tindivanam 230 /110 kV SS for the network condition pertaining to the year period of 2027-28 for full wind & nil wind generation conditions.

Base Case: Without the proposed Tindivanam 230/110 kV SS.

Case 1: With the proposed Tindivanam 230/110 kV SS as per the field proposal as detailed below:

➤ **Auto Transformer :** 230 /110 kV , 2 x 160 MVA.

➤ **230 KV feeders**

1. LILO of Cuddalore – Veerapuram 230 kV feeder at the proposed Tindivanam 230kV SS.
2. 230 kV SC line from the existing Villupuram 230 kV SS to the proposed Tindivanam 230 kV SS.

➤ **110 KV feeders**

1. 110kV SC line to Tindivanam 110 kV SS.
2. LILO of 110kV Acharapakkam - (Elamangalam 110 kV SS) Villupuram - II feeder.
3. 110 kV SC line to Murukkery 110 kV SS.
4. 110 kV SC line to Gingee 110 kV SS .
5. 110 kV SC line to Vanur 110 kV SS .

Observations :

- 1) In Case 1, the proposed 2x160 MVA, 230/110kV Auto Transformers at the proposed Tindivanam 230/110 kV SS are observed to be loaded to 2 x 96 MW and 2 x 87 MW under Full wind and Nil wind condition respectively.
- 2) In Base case, the 3x160 MVA, 230/110kV Auto Transformers at Villupuram 230/110kV SS are observed to be loaded to 3x109 MW and 3x110 MW under Full wind and Nil wind condition respectively. In Case 1, the loading of the Auto Transformers decreases to 3x87 MW and 3x88 MW under Full wind and Nil wind condition respectively.
- 3) In Base case, the Ulunthurpet – Villupuram 230kV line have been observed to be loaded to 185 MW & 174 MW under Full wind and Nil wind condition respectively. In Case 1, the loading decreases to 167 MW & 147 MW under Full wind and Nil wind condition respectively.
- 4) In Case 1 , with the proposed LILO of Cuddalore – Veerapuram 230kV feeder at proposed Tindivanam 230kV SS, the proposed 230kV line from Cuddalore 400/230-110kV SS to the proposed Tindivanam 230 kV SS is loaded to 180 MW and 152 MW under Full wind and Nil wind condition respectively. The proposed Tindivanam - Veerapuram 230kV line is loaded to 4 MW and 21 MW under Full wind and Nil wind condition respectively.
- 5) In Case 1 , the proposed Villupuram – Tindivanam 230kV line has been observed to be loaded to around 21 MW and 4 MW under Full wind and Nil wind condition respectively.
- 6) There is a line loss saving of 1.6 MW due to the establishment of Tindivanam 230/110 kV SS.
- 7) The relief in the loading of the Auto Transformers in the 230kV substations with the proposed Tindivanam 230/110 kV SS are as follows:

Sl. No	Name of 230/110 kV SS	Relief in Auto Transformer loading (MW)	
		Full Wind	Nil Wind
1	Neyveli 230kV SS (230/110kV)	21	27
2	Villupuram 230kV SS (230/110kV)	66	66
3	Achrapakkam 230kV SS (230/110kV)	28	38

Contingency analysis :

In order to determine the adequacy of lines, another set of load flow study has been carried out in case 1 with the outage of the proposed Cuddalore – Tindivanam 230 kV under full wind condition and nil wind condition.

It has been observed that under the above contingency condition, the Villupuram 230/110kV SS serves as the primary 230kV source for the proposed Tindivanam 230kV SS and the proposed Villupuram –Tindivanam 230 kV line has been observed to be loaded to around 100 MW and 71 MW under full wind and nil wind condition respectively.

Summarizing:

Tindivanam 230/110 kV SS

Auto Transformer : 230 /110kV , 2x160 MVA.

➤ 230 KV feeders

1. LILO of Cuddalore – Veerapuram 230 kV feeder at the proposed Tindivanam 230 kV SS.
2. 230 kV SC line from the existing Villupuram 230 kV SS to the proposed Tindivanam 230 kV SS.

➤ 110 KV feeders

- i. 110 kV SC line to Tindivanam 110 kV SS.
- ii. LILO of 110 kV Acharapakkam – (Elamangalam 110 Kv SS) Villupuram-II feeder.
- iii. 110 kV SC line to Murukkery 110 kV SS.
- iv. 110 kV SC line to Gingee 110 kV SS .
- v. 110 kV SC line to Vanur 110 kV SS .

Proposed Load Transfer:

The proposed loads that will be incident after establishment of new SS as furnished from field is given below:

- i) For both High RE & Non RE scenarios the details are required for substations & line effected by this proposal is as follows

Name of the SS	Capacity	Present Maximum Load/Sustained Peak	Load expected after new SS (After load bifurcation)	Load Relief
Villupuram 230/110 KV Auto SS	320 MVA : 2x160 MVA	251 MVA	181 MVA	70 MVA
Achrapakkam 230/110 KV Auto SS	300 MVA : 3 x100 MVA	190 MVA	170 MVA	20 MVA
Neyveli 230/110 KV Auto SS	480 MVA : 3x160 MVA	400 MVA	359 MVA	41 MVA

- ii) The loading of proposed SS (New SS)

Name of the SS	Capacity	Load expected/ Anticipated Load in new SS (After load bifurcation from the existing nearby substations)	Remarks
230/110 kV Tindivanam SS at Venmaniyathur Village	320 MVA (2 x 160 MVA)	131 MVA	--

DETAILS OF AUTO TRANSFORMER CAPACITY PROPOSED:

Based on the above load flow results, it is proposed to install 2x160 MVA, 230/110 kV auto transformers in the proposed substation.

DETAILS OF WORK:

- i. Construction of Control room, 230 kV and 110 kV yard work and allied Civil work at the proposed 230/110 kV Tindivanam SS.

- ii. Erection of 2x160 MVA, 230/110 kV Auto Transformers at the proposed Tindivanam 230 kV SS with Double Bus arrangements for 230 kV and 110 kV side.
- iii. Erection of 3 Nos. of 230 kV Bays and 6 Nos. of 110 kV Bays at the proposed Tindivanam 230 kV SS.
- iv. Extension of One number new 230 kV Bay at the existing Villupuram 230 kV Auto SS.
- v. Extension of One number new 110 kV bay each at the existing Tindivanam 110 kV SS, Murukkery 110 kV SS, Kiliyanur 110 kV SS, Gingee 110 kV SS and Vanur 110 kV SS.
- vi. Erection of the following 230 KV and 110 KV associated Transmission Lines:

Sl. No.	Description of Line	Route Length (Km)
	<u>230kV Lines:</u>	
1	Erection of 230kV DC line on DC tower with Zebra conductor by making LILO @ loc No 280 of 230 KV Cuddalore – Veerapuram feeder to proposed new Tindivanam (Venmaniyathur) 230kV SS.	15.00
2	Erection of 230 kV SC line with Zebra conductor on DC / MC towers from Villupuram 230kV SS to proposed new Tindivanam 230kV SS.	
a	230 kV SC line on DC tower	44.00
b	230 kV SC line on DC Mono Pole tower	5.00
c	230 kV SC line on DC Narrow Base tower	5.00
d	230kV SC line on MC tower MC Tower consists of following feeders: 1) 230kV SC line on MC tower from Villupuram 230kV SS to proposed Venmaniyathur 230kV SS 2)110kV Venmaniyathur to Tindivanam 110kV SS 3 & 4) LILO of 110kV Villupuram - Acharapakkam DC lines	6.00

	110kV Lines:	
3	Erection of 110 kV SC line on DC tower with ACSR panther to 110/33-11 kV Gingee SS.	
a	110kV SC line on DC tower	20.00
b	110kV SC line on DC mono pole tower	5.00
c	110kV SC line on DC Narrow base tower	5.00
4	Free arm stringing of 110 kV DC line on 230kV MC tower with ACSR panther for making LILO in the existing 110 KV Villupuram – Acharapakkam II feeder (between Elamangalam and Acharapakkam). <u>Note:</u> The above 110kV DC line shall be taken up in 230kV MC tower in Sl. No. 2d, only line stringing cost added here.	6.00
5	Free arm stringing of 110 kV link line with 110 KV SC line on 230kV MC tower with ACSR panther from the proposed 230 kV Tindivanam SS upto loc.No.1 of the existing 110 kV Tindivanam spur line (Presently tied with either of the feeders through a switching arrangement @ loc.No.377). The above 110kV SC line will be taken up in 230kV MC tower in Sl. No. 2d, only line stringing cost to be added here.	6.00
6	Replacement of the existing SC line on SC tower with leopard conductor by SC line on DC tower with panther conductor from loc. 1 -26 in the 110 kV Tindivanam spur line to link to the new proposed 110kV link line from the proposed 230 kV SS.	7.00
7	Erection of 110 kV SC /DC line on DC tower with ACSR panther to the existing 110/33-11 kV Murukkery SS by tapping the existing 110KV ACPKM-VILM II feeder near ACPKM 230KV SS	
a	110KV SC line on DC tower	7.00
b	Conversion of 110 kV SC on SC tower from ACPKM 230/110KV SS to Murukkery 110KV SS into 110KV DC line on DC tower .	34.00
8	Erection of 110 kV SC line on DC tower with ACSR panther from the proposed Tindivanam 230KV SS to existing Vanur 110KV SS.	51.00

The above 230 KV and 110 KV associated Transmission Lines are proposed by erecting Narrow Base tower and Mono Pole tower at certain locations due to the following reasons:

i. Due to developments in and around Venmaniyathur 230 kV SS Site by SIPCOT, SIDCO and other private bodies, finding the right of way ROW for the incoming and outgoing EHT lines are strenuous. Considering the ROW issues and farmers agitation, provision has been given for Narrow Base tower and Mono Pole towers at very sensitive locations.

ii. In order to overcome the ROW issues in future while erection of EHT lines, it is proposed to convert the portion of the existing 110 kV Villupuram-Acharapakkam DC Corridor into 230 kV MC Corridor.

iii. The OPGW Fibre optic connectivity for 110 kV Vanur SS, 110kV Gingee SS and 110 kV Murukkery SS are already established under Reliable Communication scheme (sanctioned vide P&C LoA No.999) , hence the proposal for laying 48 F OPGW along with erection of the above power lines is not necessary.

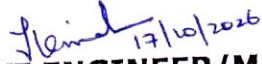
Land availability:

Poromboke land to an extent of 3.67.0 Hectares (S.F.No. 121/176) in Venmaniyathur Village of Tindivanam taluk in Villupuram District has been acquired and registered. The payment has been made towards cost of land is Rs.31,73,095/-.

The SE/GCC I/Chennai has certified that the above land is found suitable for establishing the proposed new 230/110 kV SS at Tindivanam (Venmaniyathur village) subject to the following conditions:

- i) Proposed area requires normal gravel filling as it is at 1.5 m to 2m below the existing Venmaniyathur SIDCO road
- ii) It is to be ensured that the existing Panchayat Union road inside the allotted land has to be shifted to the boundary.

The provision for the above works has been included in the Civil portion and confirmed by GCC I/Chennai wing.


EXECUTIVE ENGINEER/MASTER PLAN II

TAMILNADU TRANSMISSION CORPORATION LIMITED						
230 KV DC LINE ON DC 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 nuts etc..			
1	404.43	MT	MS tower parts	84578.00	MT	3,42,05,880.54
3	21.73	MT	Ordinary Bolts & nuts	90000.00	MT	19,55,700.00
4	1751.00	No.	90 KN Disc Insulators	376.80	No.	6,59,776.80
5	4284.00	No.	120 KN Disc Insulators	500.00	No.	21,42,000.00
			Conductor & Earth wire accessories			
6	96.00	Set	Single Suspension Fittings for ACSR Zebra	1848.50	Set	1,77,456.00
7	36.00	Set	Single suspension fittings for jumperig	1848.50	Set	66,546.00
8	288.00	Set	Single Tension fittings for ACSR Zebra	2315.47	Set	6,66,855.36
9	12.00	set	Double tension fittings	4766.58	Set	57,198.96
10	288.00	Set	Vibration Damper for ACSR Zebra	889.37	Set	2,56,138.56
11	30.00	Set	Mid span comp. joint for Zebra	584.20	Set	17,526.00
12	15.00	No.	Repair sleeve for Zebra	306.15	No.	4,592.25
13	96.00	Set	PA Rod for ZEBRA	1240.09	Set	1,19,048.64
18	60.60	KM	ACSR Zebra	389000.00	KM	2,35,73,400.00
	10.50	KM	OPGW - 48 Fibre with accessories	255397.00	KM	26,81,668.50
			Earthing Materials			
20	40.00	No.	Pipe type earthing	1613.08	No.	64,523.20
21	2.00	No.	Counter poise earthing (120m length)	3870.43	No.	7,740.86
			Tower Accessories			
22	40.00	No.	Number plate	218.76	No.	8,750.40
23	40.00	No.	Danger Board	242.95	No.	9,718.00
24	48.00	No.	Phase plate(Set of three)	252.41	No.	12,115.68
25	48.00	No.	Circuit plate	235.58	No.	11,307.84
27			TOTAL COST OF MATERIALS			6,66,97,943.59
			TOWER FOUNDATIONS			
28	16.00	No.	GR type tower	255097.00	No.	40,81,552.00
			0° to 2° Suspension tower			
29	12.00	No.	KSR type tower	278733.00	No.	33,44,796.00
			2° to 30° Medium angle tower			
30	12.00	No.	LSR type tower	595579.00	No.	71,46,948.00
			30° to 60° High angle & Dead end tower			
31			Tower protection works			5,00,000.00
32			TOTAL FOUNDATION COST			1,50,73,296.00
33			Erection charges(10% on cost of materials)			66,69,794.36
34			Transportation & Insuranc charges charges (5% on cost of materials)			33,34,897.18
36			Total amount			9,17,75,931.13
37			Contingencies 1%			9,17,759.31
38			Total			9,26,93,690.44
39			Establishment & Supervision Charges at 15.0%			1,39,04,054.00
40			Total			10,65,97,744.44
41			GST @ 18 %			1,91,87,594.00
42			Total amount including GST			12,57,85,338.44
43			Land compensation			10650519.03
44	10.00	KM	Tree/Crop compensation	1000000.00	KM	1,00,00,000.00
45			TOTAL COST PER	10.00	KM	14,64,35,857.47
46			TOTAL COST PER 1 KM			1,46,43,585.75
47			(Rounding to nearest 1000)	SAY		1,46,44,000.00
48			TOTAL COST PER KM IN LAKHS			146.44

TAMILNADU TRANSMISSION CORPORATION LIMITED						
110 KV SC line on MC towers with Panther conductor.(Free arm stringing)						
Sl. No.	QTY	Unit	DESCRIPTION	Rate in Rs.	Per	Amount in Rs.
1	686.00	No.	90 KN Disc Insulators	376.80	No.	2,58,484.80
2	1029.00	No.	120 KN Disc Insulators	500.00	No.	5,14,500.00
3			Conductor & Earth wire accessories			
	60.00	Set	Single Suspension fittings for ACSR Panther	1074.42	Set	64,465.20
4	36.00	Set	Suspension fitting for jumper	1074.42	Set	38,679.12
5	120.00	Set	Single Tension fittings for ACSR Panther	1292.40	Set	1,55,088.00
6	6.00	Set	Double Tension Fittings for Panther	3678.60	Set	22,071.60
7	120.00	Set	Vibration Damper for Panther	490.22	Set	58,826.40
8	15.00	Set	Mid span comp.joint for ACSR Panther	438.87	Set	6,583.05
9	10.00	Set	Repair sleeve for ACSR Panther	235.42	Set	2,354.20
10	60.00	Set	PA rod for Panther	590.98	Set	35,458.80
11	30.30	KM	ACSR PANTHER conductors 1.0% sag	211517.23	KM	64,08,972.07
12			TOTAL COST OF MATERIALS			75,65,483.24
13			Erection charges(10% on cost of materials)			7,56,548.32
14			Transportation & Insurance charges (5% on cost of materials)			3,78,274.16
15			Total amount			87,00,305.72
16			Contingencies 1%			87,003.06
17			Total			87,87,308.78
18			Establishment & Supervision Charges at 15.0%			13,18,096.00
19			Total			1,01,05,404.78
20			GST @ 18 %			18,18,972.86
21			Total amount including GST			1,19,24,377.64
22			Land compensation			7437469.11
23	10.00	KM	Tree/Crop compensation	1000000.00	KM	1,00,00,000.00
24			TOTAL COST PER	10.00	KM	2,93,61,846.75
25			TOTAL COST PER 1 KM			29,36,184.67
26			(Rounding to nearest 1000)	SAY		29,37,000.00
27			TOTAL COST PER KM IN LAKHS			29.37

TAMILNADU TRANSMISSION CORPORATION LIMITED						
110 KV DC line on DC Towers with Panther 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 nuts etc.,			
a	256.09	MT	a) MS 100%	84578.00	MT	2,16,59,580.02
b	16.18	MT	b) Ordinary Bolts & nuts	90000.00	MT	14,56,200.00
2	1111.00	No.	90 KN Disc Insulators	376.80	No.	4,18,624.80
3	2057.00	No.	120 KN Disc Insulators	500.00	No.	10,28,500.00
			Conductor & Earth wire accessories			
4	120.00	Set	Single Suspension fittings for ACSR Panther	1074.42	Set	1,28,930.40
5	36.00	Set	Sus.fittings for Jumper	1074.42	Set	38,679.12
6	240.00	Set	Single Tension fittings for ACSR Panther	1292.40	Set	3,10,176.00
7	12.00	Set	Double Tension Fittings for Panther	3678.60	Set	44,143.20
8	240.00	Set	Vibration Damper for Panther	490.22	Set	1,17,652.80
9	30.00	Set	Mid span comp.joint for ACSR Panther	438.87	Set	13,166.10
10	10.00	Set	Repair sleeve for ACSR Panther	235.42	Set	2,354.20
11	120.00	Set	PA Rod for Panther	590.98	Set	70,917.60
16	60.60	KM	ACSR PANTHER conductors 1.0% sag	211517.23	KM	1,28,17,944.14
			Earthing materials			
18	40.00	No.	Pipe type earthing	1613.08	No.	64,523.20
19	2.00	No.	Counter poise earthing (120m length)	3870.43	No.	7,740.86
			Tower Accessories			
20	40.00	No.	Number plate	218.76	No.	8,750.40
21	40.00	No.	Danger Board	242.95	No.	9,718.00
22	40.00	No.	Phase plate(Set of three)	252.41	No.	10,096.40
23	40.00	No.	Circuit plate	235.58	No.	9,423.20
24			Total Cost of materials			3,82,17,120.44
			TOWER FOUNDATIONS			
25	20.00	No.	GC type tower	103802.00	No.	20,76,040.00
26	8.00	No.	0° to 2° Suspension tower	257543.00	No.	20,60,344.00
27	12.00	No.	HC type tower	343984.00	No.	41,27,808.00
			2° to 30° Medium angle tower			
			KC type tower			
			30° to 60° High angle & Dead end tower			
28			Tower protection works			5,00,000.00
29			Total Cost of Foundations			87,64,192.00
30			Erection charges(10% on cost of materials)			38,21,712.04
			Transportation & Insurance charges (5% on cost of materials)			19,10,856.02
31			Total amount			5,27,13,880.50
16			Contingencies 1%			5,27,138.81
17			Total			5,32,41,019.31
18			Establishment & Supervision Charges at 15.0%			79,86,153.00
19			Total			6,12,27,172.31
20			GST @ 18 %			1,10,20,891.02
21			Total amount including GST			7,22,48,063.32
22			Land compensation			7437469.11
23	10.00	KM	Tree/Crop compensation	1000000.00	KM	1,00,00,000.00
24			TOTAL COST PER	10.00	KM	8,96,85,532.43
25			TOTAL COST PER 1 KM			89,68,553.24
26			(Rounding to nearest 1000)	SAY		89,69,000.00
27			TOTAL COST PER KM IN LAKHS			89.69
* The OPGW Fibre optic connectivity for 110 kV Vanur SS, 110kV Gingee SS and 110 kV Murukkery SS are already established under Reliable Communication scheme (sanctioned vide P&C LoA No.999), hence the proposal for laying 48 F OPGW along with erection is not included in the estimate.						

110 KV SC line on SC towers with Panther conductor						
Sl. No.	QTY	Unit	DESCRIPTION	Rate in Rs.	Per	Amount in Rs.
1			Galvanised steel tower materials with extension part wherever necessary, and bolts and nuts etc			
a	119.93	MT	b) MS 100%	84,578.00	MT	1,01,43,439.54
b	7.93	MT	c) Ordinary Bolts & nuts	90,000.00	MT	7,13,700.00
2	600	No.	90 KN Disc Insulators	376.80	No.	2,26,080.00
3	1029	No.	120 KN Disc Insulators	500.00	No.	5,14,500.00
			Conductor & Earth wire accessories			
4	60	Set	Single Suspension fittings for ACSR Panther	1,074.42	Set	64,465.20
5	12	Set	Suspension fitting for jumper	1,074.42	Set	12,893.04
6	120	Set	Single Tension fittings for ACSR Panther	1,292.40	Set	1,55,088.00
7	6	Set	Double Tension Fittings for Panther	3,678.60	Set	22,071.60
8	120	Set	Vibration Damper for Panther	490.22	Set	58,826.40
9	15	Set	Mid span comp.joint for ACSR Panther	438.87	Set	6,583.05
10	10	Set	Repair sleeve for ACSR Panther	235.42	Set	2,354.20
11	60	Set	PA rod for Panther	590.98	Set	35,458.80
12	30.3	KM	ACSR PANTHER conductors 1.0% sag	2,11,517.23	KM	64,08,972.07
13	10.5	KM	OPGW - 48 Fibre with accessories	2,55,397.00	KM	26,81,668.50
			Earthing materials			
14	40	No.	Pipe type earthing	1,613.08	No.	64,523.20
15	2	No.	Counter poise earthing (120m length)	3,870.43	No.	7,740.86
			Tower Accessories			
16	40	No.	Number plate	218.76	No.	8,750.40
17	40	No.	Danger Board	242.95	No.	9,718.00
18	20	No.	Phase plate(Set of three)	252.41	No.	5,048.20
19	20	No.	Circuit plate	235.58	No.	4,711.60
			TOTAL COST OF MATERIALS			2,11,46,592.66
			TOWER FOUNDATIONS			
20	20	No.	GCR type tower	1,03,802.00	No.	20,76,040.00
			0° to 2° Suspension tower			
21	8	No.	HCR type tower	2,57,543.00	No.	20,60,344.00
			2° to 30° Medium angle tower			
22	12	No.	KC type tower	3,43,984.00	No.	41,27,808.00
			30° to 60° High angle & Dead end tower			
23			Tower protection works			5,00,000.00
			COST OF FOUNDATION			87,64,192.00
24			Erection charges(10% on cost of materials)			21,14,659.27
25			Transportation & Insurance charges (5% on cost of materials)			10,57,329.63
			Total amount			3,30,82,773.56
26			Contingencies (1% on materials, foundation & erection charges)			3,30,827.74
			Total			3,34,13,601.29
27			Establishment & Supervision Charges at 15.0%			50,12,040.19
			Total			3,84,25,641.49
28			GST at 18%			69,16,615.47
			Total			4,53,42,256.96
30	10	KM	Tree/Crop compensation	10,00,000.00	KM	1,00,00,000.00
31	10	KM	Land compensation			74,37,469.00
			Total cost per 10 Kms			6,27,79,725.96
32			TOTAL COST PER 1 KM			62,77,972.60
			(Rounding to nearest 1000)	SAY		62,78,000.00
			TOTAL COST PER 1 KM IN LAKHS			62.78

TAMILNADU TRANSMISSION CORPORATION LIMITED						
230 KV SC line on DC towers with Zebra conductor						
Sl. No.	Quantity		DESCRIPTION	Rate in Rs.	Per	Amount in Rs.
1			Galvanised steel tower materials with extension part wherever necessary, and bolts and nuts etc..			
a	404.43	MT	MS tower parts	84578.00	MT	3,42,06,049.70
b	21.30	MT	Ordinary Bolts & nuts	90000.00	MT	19,16,820.00
3	1114.00	No.	90 KN Disc Insulators	376.80	No.	4,19,755.20
4	2228.00	No.	120 KN Disc Insulators	500.00	No.	11,14,000.00
5			Conductor & Earth wire accessories			
6	48.00	Set	Single Suspension Fittings for ACSR Zebra	1848.50	Set	88,728.00
7	144.00	Set	Single Tension fittings for ACSR Zebra	2315.47	Set	3,33,427.68
8	6.00	set	Double tension fittings	4766.58	Set	28,599.48
9	144.00	Set	Vibration Damper for ACSR Zebra	889.37	Set	1,28,069.28
10	30.00	Set	Mid span comp. joint for Zebra	584.20	Set	17,526.00
11	30.00	No.	Repair sleeve for Zebra	306.15	No.	9,184.50
12	54.00	Set	PA Rod for ZEBRA	1240.09	Set	66,964.86
18	30.30	KM	ACSR Zebra	389000.00	KM	1,17,86,700.00
	10.50	KM	OPGW - 48 Fibre with accessories	255397.00	KM	26,81,668.50
			Earthing Materials			
20	35.00	No.	Pipe type earthing	1613.08	No.	56,457.80
21	2.00	No.	Counter poise earthing (120m length)	3870.43	No.	7,740.86
			Tower Accessories			
22	37.00	No.	Number plate	218.76	No.	8,094.12
23	37.00	No.	Danger Board	242.95	No.	8,989.15
24	37.00	No.	Phase plate(Set of three)	252.41	No.	9,339.17
25	37.00	No.	Circuit plate	235.58	No.	8,716.46
27			TOTAL COST OF MATERIALS			5,28,96,830.76
			TOWER FOUNDATIONS			
28	18.00	No.	GR type tower	255097.00	No.	45,91,746.00
			0° to 2° Suspension tower			
29	10.00	No.	KSR type tower	278733.00	No.	27,87,330.00
			2° to 30° Medium angle tower			
30	9.00	No.	LSR type tower	595579.00	No.	53,60,211.00
			30° to 60° High angle & Dead end tower			
31			Tower protection works			5,00,000.00
32			TOTAL FOUNDATION COST			1,32,39,287.00
33			Erection charges(10% on cost of materials)			52,89,683.08
34			Transportation & Insuranc charges charges (5% on cost of materials)			26,44,841.54
35			Total amount			7,40,70,642.37
36			Contingencies 1%			7,40,706.42
37			Total			7,48,11,348.79
38			Establishment & Supervision Charges at 15.0%			1,12,21,702.00
39			Total			8,60,33,050.79
40			GST @ 18 %			1,54,85,949.14
41			Total amount including GST			10,15,18,999.94
42			Land compensation			10650519.03
43	10.00	KM	Tree/Crop compensation	1000000.00	KM	1,00,00,000.00
44			TOTAL COST PER	10.00	KM	12,21,69,518.97
45			TOTAL COST PER 1 KM			1,22,16,951.90
46			(Rounding to nearest 1000)	SAY		1,22,17,000.00
47			TOTAL COST PER KM IN LAKHS			122.17

TAMILNADU TRANSMISSION CORPORATION LIMITED						
230 KV SC LINE ON DC MONO POLE TOWERS WITH ZEBRA CONDUCTOR.						
Sl. No.	QTY	UNIT	DESCRIPTION	Rate in Rs.	Per	Amount in Rs.
1			Galvanised steel tower materials with extension part wherever necessary and bolts and nuts etc.,			
a	664.00	MT	Mono Pole steel st.	202725.00	MT	134609400.00
b	24.00	MT	Ordinary Bolts & nuts	90000.00	MT	2160000.00
2	2228	No.	90 KN Disc Insulators	376.80	No.	839510.40
3	2228	No.	120 KN Disc Insulators	500.00	No.	1114000.00
			Conductor & Earth wire accessories			
4	132	Set	Single Suspension fittings for ACSR Zebra	1848.50	Set	244002.00
5	36	Set	Single Suspension fitting for Jumpering	1848.50	Set	66546.00
6	144	Set	Single Tension fittings for ACSR Zebra	2315.47	Set	333427.68
7	6	Set	Double Tension Fittings for Zebra	4766.58	Set	28599.48
8	144	Set	Vibration Damper for Zebra	889.37	Set	128069.28
9	3	Set	Mid span comp.joint for ACSR ZEBRA	584.20	Set	1752.60
10	3	Set	Repair sleeve for ACSR ZEBRA	306.15	No.	918.45
11	132	Set	PA rod for ZEBRA	1240.09	No.	163691.88
12	30.30	KM	ACSR Zebra conductors 1.0% sag	389000.00	KM	11786700.00
	10.50	KM	OPGW - 48 Fibre with accessories	255397.00	KM	26,81,668.50
			Earthing materials			
14	68	No.	Pipe type earthing	1613.08	No.	109689.44
15	2	No.	Counter poise earthing(120m length)	3870.43	No.	7740.86
			Tower Accessories			0.00
16	68	No.	Number plate	218.76	No.	14875.68
17	68	No.	Danger Board	242.95	No.	16520.60
18	48	No.	Phase plate(Set of three)	252.41	No.	12115.68
19	48	No.	Circuit plate	235.58	No.	11307.84
			TOTAL COST OF MATERIALS			154330536.37
21			TOWER FOUNDATIONS			
22	44	No.	PA type tower 0° to 2° Suspension tower	1096406.55	No.	48241888.20
23	12	No.	PC type tower 15° to 30° Medium angle tower	1827344.25	No.	21928131.00
24	12	No.	PD type tower 30° to 60° Angle tower	2101445.89	No.	25217350.65
25			Tower protection works			500000.00
26			COST OF FOUNDATION WORKS			95887369.85
27			Total Cost of materials & Foundation			250217906.22
28			Erection charges(10% on cost of materials)			15433053.64
29			Transportation & Insuranc charges (5% on cost of materials)			7716526.82
30			Total amount			273367486.68
31			Contingencies 1%			2733674.87
32			Total			276101161.54
33			Establishment & Supervision Charges at 15%			41415174.23
34			Total			317516335.77
35			GST @ 18 %			57152940.44
36			Total amount including GST			374669276.21
37			Land compensation			12050519.03
38	10	KM	Tree/Crop compensation	1000000.00	KM	10000000.00
39			TOTAL COST PER	10.00	KM	396719795.24
40			TOTAL COST PER 1 KM			3,96,71,979.52
41			(Rounding to nearest 1000)	SAY		3,96,72,000.00
42			Total Cost per KM in LAKHS			396.72

TAMILNADU TRANSMISSION CORPORATION LIMITED						
230 KV SC LINE ON DC NARROW BASE TOWERS WITH ZEBRA CONDUCTOR.						
Sl. No.	QTY	UNIT	DESCRIPTION	Rate in Rs.	Per	Amount in Rs.
1			Galvanised steel tower materials with extension part wherever necessary and bolts and nuts etc.,			
a	118.03	MT	a. MS 100%	84578.00	MT	9982741.34
b	265.73	MT	b. HT steel	91650.00	MT	24354154.50
2	17.084	MT	c. Ordinary Bolts & nuts	90000.00	No.	1537560.00
3	995.00	No.	90 KN Disc Insulators	376.80	No.	374916.00
4	4,370.00	No.	120 KN Disc Insulators	500.00	No.	2185000.00
			Conductor & Earth wire accessories			
5	0	Set	Single Suspension fittings for ACSR Zebra	1848.50	Set	0.00
6	75	Set	Single Suspension fitting for Jumpering	1848.50	Set	138637.50
7	300	Set	Single Tension fittings for ACSR Zebra	2315.47	Set	694641.00
8	12	Set	Double Tension Fittings for Zebra	4766.58	Set	57198.96
9	300	Set	Vibration Damper for Zebra	889.37	Set	266811.00
10	15	Set	Mid span comp.joint for ACSR ZEBRA	584.20	Set	8763.00
11	15	Set	Repair sleeve for ACSR ZEBRA	306.15	No.	4592.25
12	0	Set	PA rod for ZEBRA	1240.09	No.	0.00
	30.3	KM	ACSR Zebra conductors 1.0% sag	389000.00	KM	11786700.00
	10.5	KM	OPGW - 48 Fibre with accessories	255397.00	KM	26,81,668.50
			Earthing materials			
14	50	No.	Pipe type earthing	1613.08	No.	80654.00
15	2	No.	Counter poise earthing(120m length)	3870.43	No.	7740.86
			Tower Accessories			
16	50	No.	Number plate	218.76	No.	10938.00
17	50	No.	Danger Board	242.95	No.	12147.50
18	100	No.	Phase plate(Set of three)	252.41	No.	25241.00
19	100	No.	Circuit plate	235.58	No.	23558.00
			TOTAL COST ON MATERIALS			54233663.41

TAMILNADU TRANSMISSION CORPORATION LIMITED						
230 KV SC LINE ON DC NARROW BASE TOWERS WITH ZEBRA CONDUCTOR.						
Sl. No.	QTY	UNIT	DESCRIPTION	Rate in Rs.	Per	Amount in Rs.
21			TOWER FOUNDATIONS			
	0	No.	DA type tower 0° to 2°	9,48,284.41	No.	0.00
22			Suspension tower - 60% of DD type			
	25	No.	DC type tower 2° to 30°	11,06,331.82	No.	27658295.43
23			Medium angle tower - 70% of DD type			
	25	No.	DD type tower - 100%	15,80,474.02	No.	39511850.61
24						
25			Tower protection works			5,00,000.00
26			COST OF FOUNDATION WORKS			67670146.04
27			Total Cost of materials & Foundation			121903809.45
28			Erection charges(10% on cost of materials)			5423366.34
29			Transportation & Insurance charges (5% on cost of materials)			2711683.17
30			Total amount			130038858.96
31			Contingencies 1%			1300388.59
32			Total			131339247.55
33			Establishment & Supervision Charges at 15.0%			19700887.13
34			Total			151040134.69
35			GST @ 18 %			27187224.24
36			Total amount including GST			178227358.93
37			Land compensation			10650519.03
38	10	KM	Tree/Crop compensation	1000000.00	KM	10000000.00
39			TOTAL COST PER	10.00	KM	198877877.96
40			TOTAL COST PER 1 KM			1,98,87,787.80
41			(Rounding to nearest 1000)	SAY		1,98,88,000.00
42			Total Cost per KM in LAKHS			198.88

TAMILNADU TRANSMISSION CORPORATION LIMITED						
COST DATA FOR 230 KV 1 CIRCUITS LINE ON MC TOWERS WITH ZEBRA CONDUCTOR						
Sl. No.	QTY	UNIT	DESCRIPTION	Rate in Rs.	Per	Amount in Rs.
1			Galvanised steel tower materials with extension part wherever necessary and bolts and nuts etc.,			
a	669.88	MT	MS tower parts	84578.00	MT	56657110.64
b	210.65	MT	HT Tower parts	91650.00	MT	19306072.50
2	25.62	MT	Ordinary Bolts & nuts	90000.00	No.	2305980.00
3	1,592.00	No.	90 KN Disc Insulators	376.80	No.	599865.60
4	2,142.00	No.	120 KN Disc Insulators	500.00	No.	1071000.00
			Conductor & Earth wire accessories			
5	48.00	Set	Single Suspension fittings for ACSR Zebra	1848.50	Set	88728.00
6	36.00	Set	Single Suspension fitting for Jumpering	1848.50	Set	66546.00
7	144.00	Set	Single Tension fittings for ACSR Zebra	2315.47	Set	333427.68
8	6.00	Set	Double Tension Fittings for Zebra	4766.58	Set	28599.48
9	144.00	Set	Vibration Damper for Zebra	889.37	Set	128069.28
10	30.00	Set	Mid span comp.joint for ACSR ZEBRA	584.20	Set	17526.00
11	15.00	Set	Repair sleeve for ACSR ZEBRA	306.15	No.	4592.25
12	48.00	Set	PA rod for ZEBRA	1240.09	No.	59524.32
13	30.30	KM	ACSR Zebra conductors 1.0% sag	389000.00	KM	11786700.00
	10.5	KM	OPGW - 48 Fibre with accessories	255397.00	KM	26,81,668.50
			Earthing materials			
14	40	No.	Pipe type earthing	1613.08	No.	64523.20
15	2	No.	Counter poise earthing(120m length)	3870.43	No.	7740.86
			Tower Accessories			
16	40	No.	Number plate	218.76	No.	8750.40
17	40	No.	Danger Board	242.95	No.	9718.00
18	96	No.	Phase plate(Set of three)	252.41	No.	24231.36
19	96	No.	Circuit plate	235.58	No.	22615.68
20			TOTAL COST ON MATERIALS			95272989.75
21			TOWER FOUNDATIONS			
22	16	No.	MA type tower	5,82,686.00	No.	9322976.00
			0° to 2° Suspension tower			
23	12	No.	MC type tower	15,67,131.00	No.	18805572.00
			2° to 30° Medium angle tower			
24	12	No.	MD type tower	18,44,659.00	No.	22135908.00
			30° to 60° High angle & Dead end tower			
25			Tower protection works			50,00,000.00
26			COST OF FOUNDATION WORKS			55264456.00
27			Total Cost of materials & Foundation			150537445.75
28			Erection charges(10% on cost of materials)			9527298.98
29			Transportation & Insurance charges (5% on cost of materials)			4763649.49
30			Total amount			164828394.21
31			Contingencies 1%			1648283.94
32			Total			166476678.15
33			Establishment & Supervision Charges at 15.0%			24971501.72
34			Total			191448179.88
35			GST @ 18 %			34460672.38
36			Total amount including GST			225908852.26
37			Land compensation			10650519.03
38	10	KM	Tree/Crop compensation	1000000.00	KM	10000000.00
39			TOTAL COST PER	10.00	KM	246559371.29
40			TOTAL COST PER 1 KM			2,46,55,937.13
41			(Rounding to nearest 1000)	SAY		2,46,56,000.00
42			Total Cost per KM in LAKHS			246.56

TAMILNADU TRANSMISSION CORPORATION LIMITED						
110 KV SC line on DC towers with Panther conductor.						
Sl. No.	Quantity		DESCRIPTION	Rate in Rs.	Per	Amount in Rs.
1			Galvanised steel tower materials with extension part wherever necessary, and bolts and nuts etc..			
a	256.09	MT	b) MS 100%	84,578.00	MT	2,16,59,580.02
b	15.86	MT	c) Ordinary Bolts & nuts	90,000.00	MT	14,27,400.00
3	686.00	No.	90 KN Disc Insulators	376.80	No.	2,58,484.80
4	1,029.00	No.	120 KN Disc Insulators	500.00	No.	5,14,500.00
5			Conductor & Earth wire accessories			
6	60.00	Set	Single Suspension fittings for ACSR Panther	1074.42	Set	64,465.20
7	36.00	Set	Suspension fitting for jumper	1074.42	Set	38,679.12
8	120.00	Set	Single Tension fittings for ACSR Panther	1292.40	Set	1,55,088.00
9	6.00	Set	Double Tension Fittings for Panther	3678.60	Set	22,071.60
10	120.00	Set	Vibration Damper for Panther	490.22	Set	58,826.40
11	15.00	Set	Mid span comp.joint for ACSR Panther	438.87	Set	6,583.05
12	10.00	Set	Repair sleeve for ACSR Panther	235.42	Set	2,354.20
18	60.00	Set	PA rod for Panther	590.98	Set	35,458.80
	30.30	KM	ACSR PANTHER conductors 1.0% sag	211517.23	KM	64,08,972.07
			Earthing Materials			
20	40.00	No.	Pipe type earthing	1613.08	No.	64,523.20
21	2.00	No.	Counter poise earthing (120m length)	3870.43	No.	7,740.86
			Tower Accessories			
22	40.00	No.	Number plate	218.76	No.	8,750.40
23	40.00	No.	Danger Board	242.95	No.	9,718.00
24	20.00	No.	Phase plate(Set of three)	252.41	No.	5,048.20
25	20.00	No.	Circuit plate	235.58	No.	4,711.60
27			TOTAL COST OF MATERIALS			3,07,52,955.52
			TOWER FOUNDATIONS			
28	20.00	No.	GC type tower	103802.00	No.	20,76,040.00
			0° to 2° Suspension tower			
29	8.00	No.	HC type tower	257543.00	No.	20,60,344.00
			2° to 30° Medium angle tower			
30	12.00	No.	KC type tower	343984.00	No.	41,27,808.00
			30° to 60° High angle & Dead end tower			
31			Tower protection works			5,00,000.00
32			TOTAL FOUNDATION COST			87,64,192.00
33			Erection charges(10% on cost of materials)			30,75,295.55
34			Transportation & Insuranc charges charges (5% on cost of materials)			15,37,647.78
35	10.50	KM	* Supply, Erection, testing and commissioning of OPGW 48 fibres with accessories per Km			
36			Total amount			4,41,30,090.85
37			Contingencies 1%			4,41,300.91
38			Total			4,45,71,391.76
39			Establishment & Supervision Charges at 15.0%			66,85,709.00
40			Total			5,12,57,100.76
41			GST @ 18 %			92,26,278.14
42			Total amount including GST			6,04,83,378.89
43			Land compensation			74,37,469.11
44	10.00	KM	Tree/Crop compensation	1000000.00	KM	1,00,00,000.00
45			TOTAL COST PER	10.00	KM	7,79,20,848.00
46			TOTAL COST PER 1 KM			77,92,084.80
47			(Rounding to nearest 1000)	SAY		77,93,000.00
48			TOTAL COST PER KM IN LAKHS			77.93

*** The OPGW Fibre optic connectivity for 110 kV Vanur SS, 110kV Gingee SS and 110 kV Murukkery SS are already established under Reliable Communication scheme (sanctioned vide P&C LoA No.999), hence the proposal for laying 48 F OPGW along with erection is not included in the estimate.**

TAMILNADU TRANSMISSION CORPORATION LIMITED						
110 KV SC LINE ON DC MONO POLE TOWERS WITH PANTHER CONDUCTOR.						
Sl. No.	QTY	UNIT	DESCRIPTION	Rate in Rs.	Per	Amount in Rs.
1			Galvanised steel tower materials with extension part wherever necessary, and bolts and nutsetc..			
a	360.90	MT	a. MS Plate GI coated	202725.00	MT	7,31,63,452.50
b	39.70	MT	b. Ordinary Bolts & nuts	90000.00	MT	35,73,000.00
2	4456.00	No.	90 KN Disc Insulator	376.80	No.	16,79,020.80
3	1944.00	No.	120 KN Disc Insulator	500.00	No.	9,72,000.00
			Conductor & Earth wire accessories			
4	300.00	Set	Single Suspension fittings for ACSR Panther	1074.42	Set	3,22,326.00
5	36.00	Set	Single Suspension fitting for Jumping	1074.42	Set	38,679.12
6	120.00	Set	Single Tension fittings for ACSR Panther	1292.40	Set	1,55,088.00
7	120.00	Set	Vibration Damper for Panther	490.22	Set	58,826.40
8	30.00	Set	Mid span comp.joint for ACSR Panther	438.87	Set	13,166.10
9	30.00	Set	Repair sleeve for ACSR Panther	235.42	No.	7,062.60
10	300.00	Set	PA rod for Panther	590.98	No.	1,77,294.00
11	30.30	KM	ACSR Panther conductors 1.0% sag	211517.23	KM	64,08,972.07
			Earthing materials			
12	68.00	No.	Pipe type earthing	1613.08	No.	1,09,689.44
13	2.00	No.	Counter poise earthing (120m length)	3870.43	No.	7,740.86
			Tower Accessories			
14	70.00	No.	Number plate	218.76	No.	15,313.20
15	70.00	No.	Danger Board	242.95	No.	17,006.50
16	40.00	No.	Phase plate(Set of three)	252.41	No.	10,096.40
17	40.00	No.	Circuit plate	235.58	No.	9,423.20
18			TOTAL COST ON MATERIALS			8,67,38,157.19
			TOWER FOUNDATIONS			
19	50.00	No.	A type - 0° to 2° Suspension tower - 60% of D type	462710.55	No.	2,31,35,527.50
20	8.00	No.	C type - 15° to 30° Medium angle tower - 80% of D type	616947.40	No.	49,35,579.20
21	12.00	No.	D type - 30° to 60° High angle & Dead end tower - 130% of rate adopted as per the financial year 22-23	771184.25	No.	92,54,211.00
22			Tower protection works			5,00,000.00
23			COST OF FOUNDATION WORKS			3,78,25,317.70
24			Total Cost of materials & Foundation (adding Item 18 & 23)			12,45,63,474.89
25			Erection charges(10% on item 19)			86,73,815.72
34			Transportation & Insurance charges charges (5% on cost of materials)			43,36,907.86
35	10.50	KM	* Supply, Erection, testing and commissioning of OPGW 48 fibres with accessories per Km			
36			Total amount			13,75,74,198.47
37			Contingencies 1%			13,75,741.98
38			Total			13,89,49,940.45
39			Establishment & Supervision Charges at 15.0%			2,08,42,491.00
40			Total			15,97,92,431.45
41			GST @ 18 %			2,87,62,637.66
42			Total amount including GST			18,85,55,069.11
43			Land compensation			9437469.11
44	10.00	KM	Tree/Crop compensation	1000000.00	KM	1,00,00,000.00
45			TOTAL COST PER	10.00	KM	20,79,92,538.22
46			TOTAL COST PER 1 KM			2,07,99,253.82
47			(Rounding to nearest 1000)	SAY		2,08,00,000.00
48			TOTAL COST PER KM IN LAKHS			208.00

* The OPGW Fibre optic connectivity for 110 kV Vanur SS, 110kV Gingee SS and 110 kV Murukkery SS are already established under Reliable Communication scheme (sanctioned vide P&C LoA No.999), hence the proposal for laying 48 F OPGW along with erection is not included in the estimate.

*** The OPGW Fibre optic connectivity for 110 kV Vanur SS, 110kV Gingee SS and 110 kV Murukkery SS are already established under Reliable Communication scheme (sanctioned vide P&C LoA No.999), hence the proposal for laying 48 F OPGW along with erection is not included in the estimate.**

TAMILNADU TRANSMISSION CORPORATION LIMITED						
110 KV DC line on DC Towers with Panther conductor (Free arm stringing)						
Sl. No.	Quantity		DESCRIPTION	Rate in Rs.	Per	Amount in Rs.
1	1111.00	No.	90 KN Disc Insulators	376.80	No.	4,18,624.80
2	2057.00	No.	120 KN Disc Insulators	500.00	No.	10,28,500.00
3			Conductor & Earth wire accessories			
4	120.00	Set	Single Suspension fittings for ACSR Panther	1074.42	Set	1,28,930.40
5	36.00	Set	Sus.fittings for Jumper	1074.42	Set	38,679.12
6	240.00	Set	Single Tension fittings for ACSR Panther	1292.40	Set	3,10,176.00
7	12.00	Set	Double Tension Fittings for Panther	3678.60	Set	44,143.20
8	240.00	Set	Vibration Damper for Panther	490.22	Set	1,17,652.80
9	30.00	Set	Mid span comp.joint for ACSR Panther	438.87	Set	13,166.10
10	10.00	Set	Repair sleeve for ACSR Panther	235.42	Set	2,354.20
11	120.00	Set	PA Rod for Panther	590.98	Set	70,917.60
12	60.60	KM	ACSR PANTHER conductors 1.0% sag	211517.23	KM	1,28,17,944.14
13			Total Cost of materials			1,49,91,088.36
14			Erection charges(10% on cost of materials)			14,99,108.84
15			Transportation & Insurance charges (5% on cost of materials)			7,49,554.42
16			Total amount			1,72,39,751.61
17			Contingencies 1%			1,72,397.52
18			Total			1,74,12,149.13
19			Establishment & Supervision Charges at 15.0%			26,11,822.00
20			Total			2,00,23,971.13
21			GST @ 18 %			36,04,314.80
22			Total amount including GST			2,36,28,285.93
23			Land compensation			7437469.11
24	10.00	KM	Tree/Crop compensation	1000000.00	KM	1,00,00,000.00
25			TOTAL COST PER	10.00	KM	4,10,65,755.04
26			TOTAL COST PER 1 KM			41,06,575.50
27			(Rounding to nearest 1000)	SAY		41,07,000.00
28			TOTAL COST PER KM IN LAKHS			41.07

TAMILNADU TRANSMISSION CORPORATION LIMITED						
110 KV SC line on MC towers with Panther conductor.(Free arm stringing)						
Sl. No.	QTY	Unit	DESCRIPTION	Rate in Rs.	Per	Amount in Rs.
1	686.00	No.	90 KN Disc Insulators	376.80	No.	2,58,484.80
2	1029.00	No.	120 KN Disc Insulators	500.00	No.	5,14,500.00
3			Conductor & Earth wire accessories			
	60.00	Set	Single Suspension fittings for ACSR Panther	1074.42	Set	64,465.20
4	36.00	Set	Suspension fitting for jumper	1074.42	Set	38,679.12
5	120.00	Set	Single Tension fittings for ACSR Panther	1292.40	Set	1,55,088.00
6	6.00	Set	Double Tension Fittings for Panther	3678.60	Set	22,071.60
7	120.00	Set	Vibration Damper for Panther	490.22	Set	58,826.40
8	15.00	Set	Mid span comp.joint for ACSR Panther	438.87	Set	6,583.05
9	10.00	Set	Repair sleeve for ACSR Panther	235.42	Set	2,354.20
10	60.00	Set	PA rod for Panther	590.98	Set	35,458.80
11	30.30	KM	ACSR PANTHER conductors 1.0% sag	211517.23	KM	64,08,972.07
12			TOTAL COST OF MATERIALS			75,65,483.24
13			Erection charges(10% on cost of materials)			7,56,548.32
14			Transportation & Insurance charges (5% on cost of materials)			3,78,274.16
15			Total amount			87,00,305.72
16			Contingencies 1%			87,003.06
17			Total			87,87,308.78
18			Establishment & Supervision Charges at 15.0%			13,18,096.00
19			Total			1,01,05,404.78
20			GST @ 18 %			18,18,972.86
21			Total amount including GST			1,19,24,377.64
22			Land compensation			7437469.11
23	10.00	KM	Tree/Crop compensation	1000000.00	KM	1,00,00,000.00
24			TOTAL COST PER	10.00	KM	2,93,61,846.75
25			TOTAL COST PER 1 KM			29,36,184.67
26			(Rounding to nearest 1000)	SAY		29,37,000.00
27			TOTAL COST PER KM IN LAKHS			29.37

TAMILNADU TRANSMISSION CORPORATION LIMITED						
110 KV DC line on DC Towers with Panther 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 nuts etc.,			
a	256.09	MT	a) MS 100%	84578.00	MT	2,16,59,580.02
b	16.18	MT	b) Ordinary Bolts & nuts	90000.00	MT	14,56,200.00
2	1111.00	No.	90 KN Disc Insulators	376.80	No.	4,18,624.80
3	2057.00	No.	120 KN Disc Insulators	500.00	No.	10,28,500.00
			Conductor & Earth wire accessories			
4	120.00	Set	Single Suspension fittings for ACSR Panther	1074.42	Set	1,28,930.40
5	36.00	Set	Sus.fittings for Jumper	1074.42	Set	38,679.12
6	240.00	Set	Single Tension fittings for ACSR Panther	1292.40	Set	3,10,176.00
7	12.00	Set	Double Tension Fittings for Panther	3678.60	Set	44,143.20
8	240.00	Set	Vibration Damper for Panther	490.22	Set	1,17,652.80
9	30.00	Set	Mid span comp.joint for ACSR Panther	438.87	Set	13,166.10
10	10.00	Set	Repair sleeve for ACSR Panther	235.42	Set	2,354.20
11	120.00	Set	PA Rod for Panther	590.98	Set	70,917.60
16	60.60	KM	ACSR PANTHER conductors 1.0% sag	211517.23	KM	1,28,17,944.14
			Earthing materials			
18	40.00	No.	Pipe type earthing	1613.08	No.	64,523.20
19	2.00	No.	Counter poise earthing (120m length)	3870.43	No.	7,740.86
			Tower Accessories			
20	40.00	No.	Number plate	218.76	No.	8,750.40
21	40.00	No.	Danger Board	242.95	No.	9,718.00
22	40.00	No.	Phase plate(Set of three)	252.41	No.	10,096.40
23	40.00	No.	Circuit plate	235.58	No.	9,423.20
24			Total Cost of materials			3,82,17,120.44
			TOWER FOUNDATIONS			
25	20.00	No.	GC type tower	103802.00	No.	20,76,040.00
26	8.00	No.	0° to 2° Suspension tower	257543.00	No.	20,60,344.00
27	12.00	No.	HC type tower	343984.00	No.	41,27,808.00
			2° to 30° Medium angle tower			
			KC type tower			
			30° to 60° High angle & Dead end tower			
28			Tower protection works			5,00,000.00
29			Total Cost of Foundations			87,64,192.00
30			Erection charges(10% on cost of materials)			38,21,712.04
			Transportation & Insurance charges (5% on cost of materials)			19,10,856.02
31			Total amount			5,27,13,880.50
16			Contingencies 1%			5,27,138.81
17			Total			5,32,41,019.31
18			Establishment & Supervision Charges at 15.0%			79,86,153.00
19			Total			6,12,27,172.31
20			GST @ 18 %			1,10,20,891.02
21			Total amount including GST			7,22,48,063.32
22			Land compensation			7437469.11
23	10.00	KM	Tree/Crop compensation	1000000.00	KM	1,00,00,000.00
24			TOTAL COST PER	10.00	KM	8,96,85,532.43
25			TOTAL COST PER 1 KM			89,68,553.24
26			(Rounding to nearest 1000)	SAY		89,69,000.00
27			TOTAL COST PER KM IN LAKHS			89.69

*** The OPGW Fibre optic connectivity for 110 kV Vanur SS, 110kV Gingee SS and 110 kV Murukkery SS are already established under Reliable Communication scheme (sanctioned vide P&C LoA No.999), hence the proposal for laying 48 F OPGW along with erection is not included in the estimate.**

110 KV SC line on SC towers with Panther conductor						
Sl. No.	QTY	Unit	DESCRIPTION	Rate in Rs.	Per	Amount in Rs.
1			Galvanised steel tower materials with extension part wherever necessary, and bolts and nuts etc			
a	119.93	MT	b) MS 100%	84,578.00	MT	1,01,43,439.54
b	7.93	MT	c) Ordinary Bolts & nuts	90,000.00	MT	7,13,700.00
2	600	No.	90 KN Disc Insulators	376.80	No.	2,26,080.00
3	1029	No.	120 KN Disc Insulators	500.00	No.	5,14,500.00
			Conductor & Earth wire accessories			
4	60	Set	Single Suspension fittings for ACSR Panther	1,074.42	Set	64,465.20
5	12	Set	Suspension fitting for jumper	1,074.42	Set	12,893.04
6	120	Set	Single Tension fittings for ACSR Panther	1,292.40	Set	1,55,088.00
7	6	Set	Double Tension Fittings for Panther	3,678.60	Set	22,071.60
8	120	Set	Vibration Damper for Panther	490.22	Set	58,826.40
9	15	Set	Mid span comp.joint for ACSR Panther	438.87	Set	6,583.05
10	10	Set	Repair sleeve for ACSR Panther	235.42	Set	2,354.20
11	60	Set	PA rod for Panther	590.98	Set	35,458.80
12	30.3	KM	ACSR PANTHER conductors 1.0% sag	2,11,517.23	KM	64,08,972.07
13	10.5	KM	OPGW - 48 Fibre with accessories	2,55,397.00	KM	26,81,668.50
			Earthing materials			
14	40	No.	Pipe type earthing	1,613.08	No.	64,523.20
15	2	No.	Counter poise earthing (120m length)	3,870.43	No.	7,740.86
			Tower Accessories			
16	40	No.	Number plate	218.76	No.	8,750.40
17	40	No.	Danger Board	242.95	No.	9,718.00
18	20	No.	Phase plate(Set of three)	252.41	No.	5,048.20
19	20	No.	Circuit plate	235.58	No.	4,711.60
			TOTAL COST OF MATERIALS			2,11,46,592.66
			TOWER FOUNDATIONS			
20	20	No.	GCR type tower	1,03,802.00	No.	20,76,040.00
			0° to 2° Suspension tower			
21	8	No.	HCR type tower	2,57,543.00	No.	20,60,344.00
			2° to 30° Medium angle tower			
22	12	No.	KC type tower	3,43,984.00	No.	41,27,808.00
			30° to 60° High angle & Dead end tower			
23			Tower protection works			5,00,000.00
			COST OF FOUNDATION			87,64,192.00
24			Erection charges(10% on cost of materials)			21,14,659.27
25			Transportation & Insurance charges (5% on cost of materials)			10,57,329.63
			Total amount			3,30,82,773.56
26			Contingencies (1% on materials, foundation & erection charges)			3,30,827.74
			Total			3,34,13,601.29
27			Establishment & Supervision Charges at 15.0%			50,12,040.19
			Total			3,84,25,641.49
28			GST at 18%			69,16,615.47
			Total			4,53,42,256.96
30	10	KM	Tree/Crop compensation	10,00,000.00	KM	1,00,00,000.00
31	10	KM	Land compensation			74,37,469.00
			Total cost per 10 Kms			6,27,79,725.96
32			TOTAL COST PER 1 KM			62,77,972.60
			(Rounding to nearest 1000)	SAY		62,78,000.00
			TOTAL COST PER 1 KM IN LAKHS			62.78

Detailed estimate for establishment of 230/110 kV SS at Tindivanam (Venmaniyathur in Villupuram District) with 2x160 MVA, 230/110 kV Auto transformers and associated transmission lines in Villupuram Operation Circle (System Operation/Chennai)

	Part I: Cost of new asset			Rs. in Lakhs		
Sl. No	Description	QTY		RATE	PER	AMOUNT
I	<u>CIVIL WORKS</u>					
1	Land cost (actuals)					31.731
2	Construction of control room building with electrification, compound wall, foundation for plinths and structures, supply of vaious towers and lattice supports, lightning mast, cable duct, bore well, road, drain, oil sump and allied civil works					2203.985
3	Total (including Contingencies @1%,Establishment & Supervision charges @15% & GST @18%,LWF)					3021.945
4	Total (inclusive of all charges)					3053.676
II	<u>ELECTRICAL WORKS</u>					
1	230 kV SF6 Breaker (Fdr-3, HV-2, BC-1)	6	Nos	13.341	E	80.046
2	230 kV AB switch with Earth	3	Nos	4.004	E	12.012
3	230 kV AB switch without Earth	24	Nos	3.073	E	73.752
4	230 kV CT	18	Nos	3.399	E	61.182
5	230 kV PT with JB (Bus 2,feeder-3)	15	Nos	3.151	E	47.265
6	230 kV LAS (auto tr-2,feeder-3)	15	Nos	0.494	E	7.410
7	110 kV SF6 Breaker (Fdr-6,LV-2,BC-1)	9	Nos	6.090	E	54.810
8	110 kV AB switch with Earth	6	Nos	2.020	E	12.120
9	110 kV AB switch without Earth	36	Nos	1.570	E	56.520
10	110 kV CT	27	Nos	1.977	E	53.379
11	110 kV Bus PT	6	Nos	1.383	E	8.298
12	110 kV LAS	24	Nos	0.288	E	6.912
13	110 kV Line VT (feeder-6) (single core)	6	Nos	1.383	E	8.298
14	220 V , 300 AH Battery set	2	No	8.640	E	17.280
15	220 V DC Battery charger	3	set	6.014	E	18.042
16	DC inter lock box (FRP)	7	Each	0.506	Each	3.542
17	AC Junction box (FRP)	10	Each	0.506	Each	5.060
18	AC Panel for 230KV SS	2	Each	1.218	Each	2.436
19	220V,DC Distribution panel	2	Each	0.870	Each	1.740
20	Insulators,Bus bar,Conductors, Alu.Power connector & etc			50.000	LS	50.000

Detailed estimate for establishment of 230/110 kV SS at Tindivanam (Venmaniyathur in Villupuram District) with 2x160 MVA, 230/110 kV Auto transformers and associated transmission lines in Villupuram Operation Circle (System Operation/Chennai)

	Part I: Cost of new asset			Rs. in Lakhs		
Sl. No	Description	QTY		RATE	PER	AMOUNT
21	CONTROL AND RELAY PANELS					
a	Control and Protection panels for 230/110KV Auto Transformers with BCU (Both HV & LV)	2	Each	12.603	Each	25.206
b	Control and Protection panels for 230KV feeders with BCU	3	Each	8.715	Each	26.145
c	Control and Protection panels for 110KV feeders with BCU	6	Each	11.737	Each	70.422
d	Control and Protection panel for 230KV Bus coupler Breaker with BCU	1	Each	9.318	Each	9.318
e	Control and Protection panel for 110KV Bus coupler Breaker with BCU	1	Each	4.272	Each	4.272
f	230KV Bus bar protection relay panel - Equipped with 15 Circuits	1	Each	16.555	Each	16.555
g	110KV Bus bar protection relay panel - Equipped with 21 circuits	1	Each	12.342	Each	12.342
h	Synchronising cum Islanding panel for 230KV Bays (SAS)	1	Each	34.320	Each	34.320
i	Synchronising cum Islanding panel for 110KV Bays (SAS)	1	Each	34.320	Each	34.320
22	Sub station Automation System	1	No	105.950	No	105.950
23	Essential Spares for SAS	1	LS	36.350	LS	36.350
24	Installation, Testing and Commissioning of SAS including existing and future bays of the 230/110kv sub-station	1	Bay	3.000	LS	3.000
25	PMU with associated materials - For 230kv Buses and 2No Feeder bays - (2 circuits per PMU)	2	Each	39.000	Each	78.000
26	Installation, Testing and Commissioning of PMU of the 230/110kv sub-station			3.000	LS	3.000
27	Visual Monitoring System with work station and all inclusive of necessary asociated materials such as PTZ camera,Fixed camera, Ethernet switch , workstation, cables etc.			20.000	LS	20.000
28	Supply and Erection of Solar Panels on roof top of Control room				LS	13.500
29	UPS (3KVA) along with LED bulb for emergency lighting of control room				LS	0.500
30	Earthing,painting,yard lighting incl LLM,etc.				LS	100.000
31	Control cables of assorted size				LS	25.000
32	Auxiliary panel & Interconnecting cables				LS	10.000

Detailed estimate for establishment of 230/110 kV SS at Tindivanam (Venmaniyathur in Villupuram District) with 2x160 MVA, 230/110 kV Auto transformers and associated transmission lines in Villupuram Operation Circle (System Operation/Chennai)

	Part I: Cost of new asset			Rs. in Lakhs		
Sl. No	Description	QTY		RATE	PER	AMOUNT
33	250 KVA DG Set Complete Set with all accessories & AMF Panel	1	No	17.980	E	17.980
34	250 KVA, 11 kV/433 V station transformer with structure materials complete	2	Nos.	8.941	E	17.882
35	Fire Protection Alarm system and Fire fighting Equipments				LS	11.500
36	Scientific & Testing Instruments (As per P&C Requirement Annexure I)					346.468
37	T & P and furniture,computer,software & its accessories				LS	10.000
III	COMMUNICATION EQUIPMENTS (As per Annexure - II)					241.932
38	Cost of materials					1854.066
39	Contingencies 1%					18.541
40	Sub total					1872.606
41	Labour and Transport @ 15%					280.891
42	Sub total for material and labour (A)					2153.497
43	160 MVA, 230/110 kV Auto Transformer with OLTC	2	Nos	1325.375	E	2650.750
44	Labour and Transport for Transformer	2	loc	20.000	E	40.000
45	Auto transformer rail tracks	2	loc	2.000	E	4.000
46	Earthing of Auto Transformer	2	loc	0.550	E	1.100
47	Sub total for material and labour (B)					2695.850
48	Sub total (A)+(B)					4849.347
49	Establishment and Supervision Charges @ 15%					727.402
50	Sub total					5576.750
51	GST @ 18%					1003.815
52	Sub total					6580.565
53	Substation total (Electrical & Civil)					9634.241
54	Extension of 110 kV Bay at existing Gingee 110 kV SS, Tindivanam 110 kV SS, Murukkery 110 kV SS,Killiyannur 110 kV SS,Vanur 110kV SS (As per Annexure III)	5	Nos.	123.524	E	617.621
55	Extension of new 230KV Bay extension at the existing Villupuram 230KV SS.(As per Annexure V)	1	No.	676.122	E	676.122
56	Total Substation work incl bay extension Works					10927.983

Detailed estimate for establishment of 230/110 kV SS at Tindivanam (Venmaniyathur in Villupuram District) with 2x160 MVA, 230/110 kV Auto transformers and associated transmission lines in Villupuram Operation Circle (System Operation/Chennai)

	Part I: Cost of new asset		Rs. in Lakhs		
Sl. No	Description	QTY	RATE	PER	AMOUNT
IV	ASSOCIATED TRANSMISSION LINE AS PER ANNEXURE VI				23854.590
57	Total cost of Substation and associated Transmission lines				34782.573
58	Dismantling charges for Line materials				78.240
59	Gross				34860.813
60	Less credit				1628.042
61	Nett				33232.771

Part I (a):Dismantling charges = 78.240 lakhs

Part II: Accumulated Depreciation

Sl.No	Name of the item	Original cost	Total life	Life served	Accum.depre. 0.9x(CI.3x CI.5/ CI.4)
1	110 KV SC LINE: Tindivanam Spur line from Switching arrangement to Tindivanam 110 KV SS	277.96	35	35	250.163
2	110 KV SC LINE: Acharapakkam to Murukerry 110 KV SS	1350.08	35	35	1215.076
	Total				1465.238

Part III: Devolution of old equipment

Part IV - Part II = 1628.042 - 1465.238 = **162.804**

Part IV: Removal of old asset

Sl.No	Name of the item	Qty in kms	Original Cost **	Original Erection Charges 10%	Original Centages 15%	Original Cost of Asset
1	110 KV SC LINE: Tindivanam Spur line from Switching arrangement to Tindivanam 110 KV SS (7*62.78*50%)	7	219.730	21.973	36.255	277.958
2	110 KV SC LINE: Acharapakkam to Murukerry 110 KV SS (34*62.78*50%)	34	1067.260	106.726	176.098	1350.084
	Total					1628.042

** As rate for 110 KV SC line on SC tower with Leopard conductor is not available,50 % of the present rate for 110 KV SC line on SC tower with Panther conductor as per SoR 2025-26 and updated CCC report has been adopted

ABSTRACT

Rs IN LAKHS

Part I: Cost of new asset chargeable to	GROSS 34860.813
	NETT 33232.771
Part I(A): Dismantling charges chargeable to	78.240
Part II: Accumulated depreciation chargeable to	1465.238
Part III: Devolution of old equipment	162.804
Part IV: Removal of old asset chargeable to	1628.042

Sd/-

SUPERINTENDING ENGINEER/TRANSMISSION I

ANNEXURE I

Scientific & Testing equipments (As per P&C Requirement)					
Sl. No	Description	QTY	PER	RATE in Rs	AMOUNT in Rs
1	Digital True RMS Multimeter	3	No.	97558.12	292674.36
2	Digital Leakage Current Clamp Meter (3mA –60A)	1	No.	95525.65	95525.65
3	Hand held Digital Clamp Meter (True RMS AC/DC currents upto 2000 A)	1	No.	98574.35	98574.35
4	Hand held Megger (1KV with R Measurement) (Rechargeable battery operated)	1	No.	90000.00	90000.00
5	Digital Insulation Tester 5kV	1	No.	204854.69	204854.69
6	Digital Insulation Tester 10kV	1	No.	1050782.20	1050782.20
7	Three phase test system for comprehensive Power Transformer Testing Kit	1	No.	8250000.00	8250000.00
8	Computerised Numerical Relay test kit	1	No.	5975434.55	5975434.55
9	Computerised CT/PT Analyser Testing Kit with laptop computer	1	No.	2611112.47	2611112.47
10	Phase Sequence Meter	1	No.	62000.00	62000.00
11	Optical Time Domain Reflecto Meter (500km)	1	No.	163912.49	163912.49
12	Optical Splicing Kit	1	No.	329971.42	329971.42
13	Optical Source	1	No.	242736.95	242736.95
14	Optical Power Meter	1	No.	79259.63	79259.63
15	Ferruling Machine	1	No.	569089.01	569089.01
16	CB 3 Pole Timer	1	No.	1646293.19	1646293.19
17	Circuit Breaker Analyzer Multi break kit with DCRM and laptop computer	1	No.	7926596.86	7926596.86
18	CRM Kit with 200A rating	1	No.	1605643.98	1605643.98
19	Digital Level Meter cum Oscillator	1	No.	1500000.00	1500000.00
20	Digital Earth Resistance Clamp Meter	1	No.	158787.35	158787.35
21	SF6 Gas leakage Detector Hand Held	1	No.	48368.96	48368.96
22	Transformer Oil BDV Kit Megger OTS – 100AF	1	No.	898000.00	898000.00
23	CB due Point measurement	1	No.	447141.36	447141.36
24	Modern Tool Box Set with Hand Drill Machine	2	No.	150000.00	300000.00
					34646759.470
					346.468
				OR SAY Rs	346.468 Lakhs

ANNEXURE II

Communication equipments (As per P&C Requirement)					
Sl.No	Description	QTY	Rs. in Lakhs		
			PER	RATE	AMOUNT
1	48 Fibre OFC cable with splicing box, HDPE pipe and FODP panel	1.5	2.357	KM	3.54
2	Fibre Optic Distribution Panel with provision for connecting 96 fibre including supply of pig tails and couplers	3	1.970	Nos	5.91
3	Digital Protection coupler including remote end SS (Venmaniathur - 4, Cuddalore - 2, Veerapuram - 2)	8	7.500	Nos	60.00
4	Cabinet for Digital Protection coupler including remote SS (Venmaniathur - 1, Cuddalore - 1, Veerapuram - 1)	3	2.286	Nos	6.86
5	Fibre Optic terminal equipments (MPLS-TP) at Venmaniathur 230kV SS	1	35.596	Nos	35.60
6	HW & SW augmentation of Existing FOTE/New MPLS-TP FOTE in Cuddalore and Veerapuram	2	35.030	Nos	70.06
7	Self survival stand alone VoIP Gateway and assoicated materials for Voice communication Venmaniathur - 1, Cuddalore - 1, Veerapuram - 1)	3	0.500	Nos	1.50
8	Ethernet switche(s)	3	1.008	Nos	3.02
9	Supply of VOIP Telephones wire CAT6 shieided Cable, and associated accessories	3	0.086	Nos	0.26
14	Telephone cable 0.6mm/ 4pair/KM	7	0.567	KM	3.97
18	48 V / 250 AH Battery Set	2	1.753	Nos	3.51
19	48 V / 80 A Battery Chargers	3	1.528	Nos	4.58
10	Supply of Mandatory Spares and tools for FOTE equipment as per specification	1	35.030	Nos	35.03
11	Supply of Mandatory Spares and tools for DTPC equipment as per specification	1	7.500	Nos	7.50
12	Supply of Mandatory Spares and tools for VOIP Gateway equipment as per specification	1	0.600	Nos	0.60
					241.932

Annexure III

DETAILED ESTIMATE FOR 110 KV BAY EXTENSION

Rs. In lakhs

SI No	DESCRIPTION	UNIT	QTY	RATE	TOTAL
I	CIVIL WORKS				
1	Providing concrete for structure and equipment plinths for 110 KV bay extension at existing 110 KV SS			39.801	39.801
2	Total (including Contingencies @1%,Establishment & Supervision charges @15% & GST @18%,LWF)				54.550
3	Total Civil works(inclusive of all charges)				54.550
II	ELECTRICAL WORKS				
1	110 kV AB switch 2000 A without earth	Nos.	1	1.570	1.570
2	110 kV AB switch 2000 A with earth	Nos	1	2.020	2.020
3	110 kV SF6 Breaker 40 kA	Nos	1	6.090	6.090
4	110 kV CTs (Single Phase)	Nos	3	1.977	5.931
5	110 KV Control and Protection panel for Feeder	Nos	1	2.137	2.137
6	110 kV Line VT (single core)	Nos	3	1.383	4.149
7	110 kV LAS	Nos	3	0.288	0.864
8	Structure	Nos	LS	15.000	15.000
9	Control cables		LS	2.000	2.000
10	Bus bar, Insulators, hardware		LS	2.000	2.000
11	Earthing,Yard lighting		LS	2.000	2.000
12	Sub total				43.761
13	Contingencies 1 %				0.438
14	Cost of materials and equipments				44.199
15	Labour and transport 15%				6.630
16	Sub total				50.828
17	Establishment and Supervision Charges @ 15%				7.624
18	Sub total				58.453
19	GST @ 18%				10.521
	Total Electrical works				68.974

GRAND TOTAL(Electrical + Civil)

123.524

ANNEXURE - V

Detailed Estimate for 230 KV Bay Extension					
SI No	DESCRIPTION	QTY	UNIT	RATE	TOTAL
I	CIVIL WORKS				Rs. In lakhs
1	Providing foundation for equipment plinths and fabrication and supply of lattice structure and allied civil works			401.333	401.333
2	Total (including Contingencies @1%,Establishment & Supervision charges @15% & GST @18%,)				550.055
3	Total Civil works(inclusive of all charges)				550.055
II	ELECTRICAL WORKS				
1	230 KV SF6 Breaker	No	1	13.341	13.341
2	230 KV CTs	Nos	3	3.399	10.197
3	230 KV AB Switch with earth blade	No	1	4.004	4.004
4	230 KV AB Switch without earth blade	Nos	4	3.073	12.292
5	230 KV LAS	Nos	3	0.494	1.482
6	230 KV Line PT	Nos	3	3.151	9.453
7	Control & Protection Panel for 230 KV feeder with SAS	No	1	8.715	8.715
8	Control Cables	LS	1	6.000	6.000
9	Bus bar, Insulators, hardwares	LS	1	10.000	10.000
10	Earthing	LS	1	4.500	4.500
11	Sub Total				79.984
12	Contingencies 1 %				0.800
13	Cost of materials and equipments				80.784
14	Labour and transport 15%				12.118
15	Sub total				92.901
16	Establishment and Supervision Charges @ 15%				13.935
17	Sub total				106.837
18	GST @ 18%				19.231
19	Total Electrical works				126.067
20	GRAND TOTAL(Electrical + Civil)				676.122

ANNEXURE - VI

Detailed estimate for establishment of 230/110 kV SS at Tindivanam (Venmaniathur in Villupuram District) with 2x160 MVA, 230/110 kV Auto transformers and associated transmission lines in Villupuram Operation Circle (System Operation/Chennai)

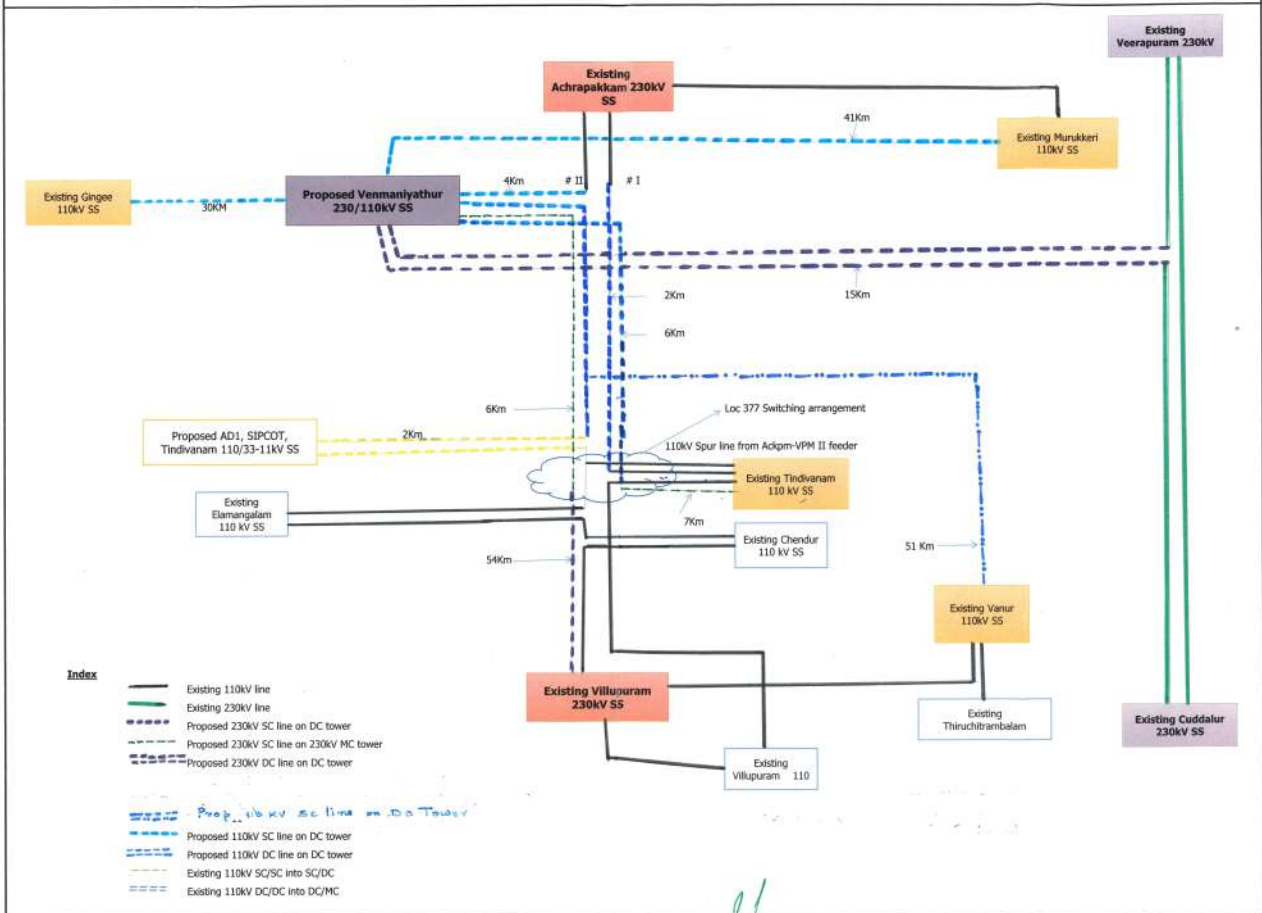
Operation Circle (System Operation/ Chennai)						
Sl. No	Description	QTY		RATE	PER	AMOUNT
ASSOCIATED TRANSMISSION LINES (Rs. in Lakhs)						
1	Erection of 230kV DC line on DC tower with Zebra conductor by making LILO @ loc No 280 of 230 KV Cuddalore – Veerapuram feeder to proposed new Tindivanam (Venmaniathur) 230kV SS.	15	Kms	146.440	Kms	2196.600
2	Erection of 230 kV SC line with Zebra conductor on DC / MC towers from Villupuram 230kV SS to proposed new Tindivanam 230kV SS.					
a	230 kV SC line on DC tower	44	Kms	122.170	Kms	5375.480
b	230 kV SC line on DC Mono Pole tower	5	Kms	396.720	Kms	1983.600
c	230 kV SC line on DC Narrow Base tower	5	Kms	198.880	Kms	994.400
d	230kV SC line on MC tower	6	Kms	246.560	Kms	1479.360
	110kV Lines:					
3	Erection of 110 kV SC line on DC tower with ACSR panther to 110/33-11 kV Gingee SS.					
a	110kV SC line on DC tower	20	Kms	77.930	Kms	1558.600
b	110kV SC line on DC mono pole tower	5	Kms	208.000	Kms	1040.000
c	110kV SC line on DC Narrow base tower	5	Kms	137.800	Kms	689.000
4	Free arm stringing of 110 kV DC line on 230kV MC tower with ACSR panther for making LILO in the existing 110 KV Villupuram – Acharapakkam II feeder (between Elamangalam and Acharapakkam). Note: The above 110kV DC line shall be taken up in 230kV MC tower in Sl. No. 2d, only line stringing cost added here.	6	Kms	41.070	Kms	246.420

Detailed estimate for establishment of 230/110 kV SS at Tindivanam (Venmaniathur in Villupuram District) with 2x160 MVA, 230/110 kV Auto transformers and associated transmission lines in Villupuram Operation Circle (System Operation/Chennai)

Sl. No	Description	QTY		RATE	PER	AMOUNT
ASSOCIATED TRANSMISSION LINES (Rs. in Lakhs)						
5	Free arm stringing of 110 kV link line with 110 KV SC line on 230kV MC tower with ACSR panther from the proposed 230 kV Tindivanam SS upto loc.No.1 of the existing 110 kV Tindivanam spur line (Presently tied with either of the feeders through a switching arrangement @ loc.No.377). Note: The above 110kV SC line will be taken up in 230kV MC tower in Sl. No. 2d, only line stringing cost to be added here.	6	Kms	29.370	Kms	176.220
6	Replacement of the existing SC line on SC tower with leopard conductor by SC line on DC tower with panther conductor from loc. 1 -26 in the 110 kV Tindivanam spur line to link to the new proposed 110kV link line from the proposed 230 kV SS.	7	Kms	77.930	Kms	545.510
7	Erection of 110 kV SC /DC line on DC tower with ACSR panther to the existing 110/33-11 kV Murukkery SS by tapping the existing 110KV ACPKM-VILM II feeder near ACPKM 230KV SS					
a	110KV SC line on DC tower	7	Kms	77.930	Kms	545.510
b	Conversion of 110 kV SC on SC tower from ACPKM 230/110KV SS to Murukkery 110KV SS into 110KV DC line on DC tower .	34	Kms	89.690	Kms	3049.460
8	Erection of 110 kV SC line on DC tower with ACSR panther from the proposed Tindivanam 230KV SS to existing Vanur 110KV SS.	51	Kms	77.930	Kms	3974.430
	TOTAL					23854.590

**Sd/-
SUPERINTENDING ENGINEER/TRANSMISSION I**

Sketch showing the lines associated with "ESTABLISHMENT OF NEW TINDIVANAM 230/110 KV SS AT VENMANIYATHUR VILLAGE WITH 2X160 MVA, 230/110 KV AUTO TRANSFORMERS"



Executive Engineer
TLC/Poonamallee