



# Sub-Transmission & Distribution System

(33 kV and Below Systems)

Cost Data FY 2016-17

  
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**COST DATA FOR FY- 2017-18****PREFACE**

1	This Cost Data has been prepared in pursuance to regulation 13 of HPERC (Recovery of Expenditure for Supply of Electricity) Regulation, 2012, for the purpose of making initial estimate for erection of electric lines and/or electric plants and/or any other works to be executed in order to provide supply of power to applicants/consumers in cases where cost is to be recovered on actual basis.
2	Configurations and costs for Sub-Stations and Lines contained in this Cost Data comprising of rates of individual items (Equipment / Material) are merely indicative in nature. The Estimates shall however be prepared by the field units on the basis of proposed layout of the sub-station & other requirements etc. and in accordance with the relevant Standards and Rules / Regulations.
3	Cost of civil works for laying of lines, erection of sub-station and equipment has not been incorporated in this Cost Data, as these vary from place to place. The area & site specific conditions shall be taken into account while preparing the estimates.
4	Cost of land development for sub-station and laying of lines is not envisaged in this Cost Data. The estimations shall be based upon actual requirements.
5	The estimates for the works/ equipments / material not specifically covered in this Cost Data shall be prepared from available stock rates or recent purchase orders or market prices as may be accessible and proof to this effect shall be submitted to the O/o SE(RGGVY).
6	Estimates prepared by Field Units based upon specifications and other considerations using costs not available in this Cost Data <b>shall NOT</b> be subject to Audit Objections by Internal / External Audit Parties or any other Agency.
7	This Cost Data shall not be applicable in cases where prices / costs / rates are discovered or discoverable through competitive bidding as in case of Turn Key Contracts / Awards of Work Contracts.
8	The Vat / GST / Sales Tax on material / service tax on D.C. / Labour cess on material and other statutory levis shall be as per prevalent rates. The prevalent rates as on 01.04.2016 are depicted separately in this Cost Data.
9	IEEMA (Indian Electrical and Electronics Manufacturing Association) formula calculates the variation in prices for the purpose of price adjustments between start of tendering process and delivery of equipment and services and is intended for the purposes of Contractual clauses. This formula is applied to specific equipment / material and is calculated using a host of factors / indices that are distinct for different items. This formula has not been applied in this Cost Data, being not pertinent to Cost Data.
10	Escalation in the price over past years is calculated based upon WPI / inflation in those cases where costs for the financial year under consideration are not available. Rates of material not considered in previous years has been estimated based upon the contiguous items available in the Cost Data. Where items are used in the field which are not available in this Cost Data, the same shall be intimated to the O/o SE(RGGVY) by the field unit so as to enable updating of this Cost Data.
11	The Labour Rates for erection/manual carriage for the labour hired on daily wages basis in the Scheduled Tribal Areas/ Remote Area/Hard Area as notified by State Government from time to time shall be separately allowed 25 % enhancement on the prevalent daily wages rates in accordance with the Finance Department's Office Memorandum No. FIN(PR)B(7)-1/95-II dated 17.04.1998.
12	Where Purchase Orders for the Financial Year have been made available, costs of such items in this Cost Data are based on these Purchase Orders (POs) . Where Purchase Orders for the Financial Year have not been made available, costs have been based upon escalation (Esc) on the Cost Data of previous year(s). For other items, costs are based on Market Rates (MR) / Estimation (Est) / Awards. Accordingly , in order to continue to build this Cost Data in the future, discovery of new costs by the Field Units by way of POs / MR / Awards may be intimated to the office of SE(RGGVY) along with documentary proof.
13	All Technical / Engineering provision in relevant statutes in force shall be kept in mind at the time of framing estimates based on this cost data viz:- (a) The Electricity Act, 2003 (b) The Electricity Rules, 2005 (c) HPERC (Recovery of Expenditure for Supply of Electricity) Regulation, 2012 and amendments thereto. (d) CEA (Technical Standards for construction of Electrical Plans and Electrical Lines) Regulation, 2010 and amendments thereto. (e) CEA (Installation and Operation of Meters) Regulation, 2006 and amendments thereto. (f) REC Specifications and Construction Standards (g) For Civil Works - Latest HP Schedule of Rates (HPSR)
14	<b>DISCLAIMER:</b> (a) This is a broad based Cost Data for the purpose of cost estimation only and is not intended as a design substitute. The design for the construction shall be based on construction standards which shall be prepared separately at the time of Framing Estimates. The drawings given in this Cost Data are indicative and field units may make upward modification / improvements so as to include for or improve stability and safety. The Office of SE(RGGVY) shall not be liable on any account for any errors made by the Field Units as a result of this Cost Data. (b) This Cost Data covers only a limited number of configurations and costs. Configurations and Costs being innumerable, all configurations and costs as may be required on case to case basis cannot be covered under the scope of this Cost Data due to practical constraints, which may be prepared at the field level as per case requirements. The Office of SE(RGGVY) shall not be liable on any account for any errors made by the Field Units as a result of this Cost Data. In case of doubts, office of SE (RGGVY) may be consulted. (c) Estimations of costs and other components made in this Cost Data <b>shall NOT</b> be subject to Audit Objections by Internal / External Audit Parties or any other Agency.

  
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**MAIN COST DATA**  
(including optional scope of items)

Item	Type	Broad Spec	Minor Spec (opt)	Unit	Rate FY17 (Rs)	PO/ Est
Auto Voltage Booster	11 kV	11 kV, 100 A, 1-Phase Outdoor Type		No	559923	Esc
Cable	Control	2.5 mm <sup>2</sup>	PVC(1.1 kV, 2C, HR FRLS, Cu, Un-Screen)	km	43344	PO
Cable	Control	2.5 mm <sup>2</sup>	PVC(1.1 kV, 4C, HR FRLS, Cu, Un-Screen)	km	74813	PO
Cable	Control	2.5 mm <sup>2</sup>	PVC(1.1 kV, 7C, HR FRLS, Cu, Un-Screen)	km	121718	PO
Cable	Control	2.5 mm <sup>2</sup>	PVC(1.1 kV, 12C, HR FRLS, Cu, Un-Screen)	km	206625	PO
Cable	Control	2.5 mm <sup>2</sup>	PVC(1.1 kV, 19C, HR FRLS, Cu, Un-Screen)	km	317063	PO
Cable	Control	4 mm <sup>2</sup>	PVC(1.1 kV, 2C, HR FRLS, Cu, Un-Screen)	km	67331	PO
Cable	Control	4 mm <sup>2</sup>	PVC(1.1 kV, 4C, HR FRLS, Cu, Un-Screen)	km	114594	PO
Cable	Control	6 mm <sup>2</sup>	PVC(1.1 kV, 4C, HR FRLS, Cu, Screen)	km	190000	PO
Cable	Control	6 mm <sup>2</sup>	PVC(1.1 kV, 7C, HR FRLS, Cu, Screen)	km	308750	PO
Cable	LT	6 mm <sup>2</sup>	PVC(1.1 kV, 2C, Al, Outdoor)	km	10980	PO
Cable	LT	10 mm <sup>2</sup>	PVC(1.1 kV, 2C, Al, Outdoor)	km	15999	PO
Cable	LT	16 mm <sup>2</sup>	PVC(1.1 kV, 2C, Al, Outdoor)	km	26850	PO
Cable	LT	25 mm <sup>2</sup>	PVC(1.1 kV, 2C, Al, Outdoor)	km	40468	PO
Cable	LT	10 mm <sup>2</sup>	PVC(1.1kV, 4C, Cu, Armour)	km	228000	PO
Cable	LT	16 mm <sup>2</sup>	PVC(1.1kV, 3½ C, Al, Un-Armour)	km	53479	Stock
Cable	LT	25 mm <sup>2</sup>	PVC(1.1kV, 3½ C, Al, Un-Armour)	km	87532	Stock
Cable	LT	35 mm <sup>2</sup>	PVC(1.1kV, 3½ C, Al, Un-Armour)	km	96625	Stock
Cable	LT	50 mm <sup>2</sup>	PVC(1.1kV, 3½ C, Al, Un-Armour)	km	99755	Stock
Cable	LT	70 mm <sup>2</sup>	PVC(1.1kV, 3½ C, Al, Un-Armour)	km	162053	Stock
Cable	LT	95 mm <sup>2</sup>	PVC(1.1kV, 3½ C, Al, Un-Armour)	km	230384	Stock
Cable	LT	120 mm <sup>2</sup>	PVC(1.1kV, 3½ C, Al, Un-Armour)	km	291920	Stock
Cable	LT	150 mm <sup>2</sup>	PVC(1.1kV, 3½ C, Al, Un-Armour)	km	350304	Stock
Cable	LT	185 mm <sup>2</sup>	PVC(1.1kV, 3½ C, Al, Un-Armour)	km	360239	Stock
Cable	LT	240 mm <sup>2</sup>	PVC(1.1kV, 3½ C, Al, Un-Armour)	km	475000	Est
Cable	LT	300 mm <sup>2</sup>	PVC(1.1kV, 3½ C, Al, Un-Armour)	km	690244	Stock
Cable	LT	400 mm <sup>2</sup>	PVC(1.1kV, 3½ C, Al, Un-Armour)	km	881906	Stock
Cable	LT	500 mm <sup>2</sup>	PVC(1.1kV, 3½ C, Al, Un-Armour)	km	1127354	Stock
Cable	11kV Line	3 x 70 mm <sup>2</sup>	XLPE(11 kV, 3C)	km	445167	PO
Cable	11kV Line	3 x 95 mm <sup>2</sup>	XLPE(11 kV, 3C)	km	530889	PO
Cable	11kV Line	3 x 120 mm <sup>2</sup>	XLPE(11 kV, 3C)	km	598196	PO
Cable	11kV Line	3 x 150 mm <sup>2</sup>	XLPE(11 kV, 3C)	km	678172	PO
Cable	11kV Line	3 x 185 mm <sup>2</sup>	XLPE(11 kV, 3C)	km	782293	PO
Cable	11kV Line	3 x 240 mm <sup>2</sup>	XLPE(11 kV, 3C)	km	935236	PO
Cable	11kV Line	3 x 300 mm <sup>2</sup>	XLPE(11 kV, 3C)	km	1075409	PO
Cable	11kV Line	3 x 400 mm <sup>2</sup>	XLPE(11 kV, 3C)	km	1306148	PO
Cable	22kV Line	3 x 95 mm <sup>2</sup>	XLPE(22 kV, 3C)	km	775402	PO
Cable	22kV Line	3 x 185 mm <sup>2</sup>	XLPE(22 kV, 3C)	km	1075813	PO
Cable	33kV Line	3 x 120mm <sup>2</sup>	XLPE(33 kV, 3C)	km	1034906	PO
Cable	33kV Line	3 x 240 mm <sup>2</sup>	XLPE(33 kV, 3C)	km	1422239	PO
Cable	33kV Line	1 x 300 mm <sup>2</sup>	XLPE(33 kV, 1C)	km	512581	PO
Cable	33kV Line	1 x 400 mm <sup>2</sup>	XLPE(33 kV, 1C)	km	636243	PO
Cable	33kV Line	1 x 630 mm <sup>2</sup>	XLPE(33 kV, 1C)	km	854194	PO
Cable	ABC (11kV)	3 x 70+35 mm <sup>2</sup>	XLPE(11 kV, 3C + Earth)	km	429825	Esc
Cable	ABC (11kV)	3 x 70+95 mm <sup>2</sup>	XLPE(11 kV, 3C + Earth)	km	494033	Esc

  
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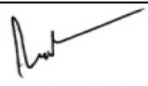
  
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**MAIN COST DATA**  
**(including optional scope of items)**

Item	Type	Broad Spec	Minor Spec (opt)	Unit	Rate FY17 (Rs)	PO/ Est
Cable	ABC (11kV)	3 x 95+75 mm <sup>2</sup>	XLPE(11 kV, 3C + Earth)	km	543268	Esc
Cable	ABC (11kV)	3 x 120+95 mm <sup>2</sup>	XLPE(11 kV, 3C + Earth)	km	637241	Esc
Cable	ABC (11kV)	3 x 35+70 mm <sup>2</sup>	XLPE(11 kV, 3C + Earth)	km	333945	Stock
Cable	ABC (11kV)	3 x 95+70+35 mm <sup>2</sup>	XLPE(11 kV, 3C + Earth)	km	510324	Stock
Cable	ABC (11kV)	3 x 70+70 mm <sup>2</sup>	XLPE(11 kV, 3C + Earth)	km	352931	Stock
Cable	ABC (LT)	3 x 50+35+35 mm <sup>2</sup>	PVC(1.1kV, 3+1 C, Al)	km	155726	Esc
Cable	ABC (LT)	3 x 35+25+16 mm <sup>2</sup>	PVC(1.1kV, 3+1 C, Al)	km	110174	Esc
Cable	ABC (LT)	3 x 120+95 mm <sup>2</sup>	PVC(1.1kV, 3+1 C, Al)	km	301894	Esc
Cable	ABC (LT)	3 x 70+50+16 mm <sup>2</sup>	PVC(1.1kV, 3+1 C, Al)	km	191127	Esc
Cable	ABC (LT)	3 x 120+70+16 mm <sup>2</sup>	PVC(1.1kV, 3+1 C, Al)	km	308410	Esc
Cable	ABC (LT)	3 x 70+50+35 mm <sup>2</sup>	PVC(1.1kV, 3+1 C, Al)	km	206315	Esc
Cable	ABC (LT)	3 x 25+25+16 mm <sup>2</sup>	PVC(1.1kV, 3+1 C, Al)	km	92728	Esc
Cable	ABC (LT)	3 x 25+35+35 mm <sup>2</sup>	PVC(1.1kV, 3+1 C, Al)	km	111863	Esc
Capacitor Bank	11 kV	Thyristor Controlled along with Series Reactor	1200 kVAr	Each	696594	Esc
Capacitor Bank	11 kV	Thyristor Controlled along with Series Reactor	1800 kVAr	Each	958993	Esc
Capacitor Bank	415V	for 25 kVA DTR	9 kVAr	Each	6262	Esc
Capacitor Bank	415V	for 63 kVA DTR	27 kVAr	Each	18787	Esc
Capacitor Bank	415V	for 100 kVA DTR	36 kVAr	Each	25050	Esc
Capacitor Bank	415V	for 250 kVA DTR	81 kVAr	Each	56362	Esc
Capacitor Bank	415V	for 400 kVA DTR	135 kVAr	Each	93937	Esc
Capacitor Bank	415V	for 630 kVA DTR	216 kVAr	Each	150299	Esc
Chemical Earth		With Back Fill Compound, Conductive gel, Cu bonded rod, Earth Pit Cap etc		kg	10000	Est
Clamps	Half	For Poles		No	138	Esc
Communication Equipment	Auto Recloser	Router, Modem, M2M Gateway, Ethernet Switch, Control Cable, Panel for meters, Battery and Battery Charger, LAN Cables, Software		LS	1000000	Est
Communication Equipment	Package Sub Station			LS	200000	Est
Communication Equipment	Cable (OFC)	ADSS	6 pair /12 core	km	65000	Est
Communication Equipment	Cable (OFC)	ADSS	12 pair /24 core	km	75000	Est
Communication Equipment	Cable (OFC)	OPGW	12 pair /24 core	km	250000	Est
Communication Equipment	VSAT			set	100000	Est
Communication Equipment	RTU	With Interface		set	1000000	Est
Communication Equipment	Satellite Phone			set	120000	Est
Communication Equipment	Radio Frequency			set	280000	Est
Communication Equipment	Terminal Equipment	With STM-1		set	2500000	Est
Conductor	ACSR	30 mm <sup>2</sup> , 6/1/2.59 (Weasel)		km	20000	PO
Conductor	ACSR	50 mm <sup>2</sup> , 6/1/3.35 (Rabbit)		km	33200	PO
Conductor	ACSR	6/1/4.10 (Raccoon)		km	50800	PO
Conductor	ACSR	100mm <sup>2</sup> , 6/7/4.72 (Dog)		km	66250	PO
Conductor	ACSR	150 mm <sup>2</sup> 30/7/2.59 (Wolf)		km	109434	PO
Conductor	ACSR	200mm <sup>2</sup> , 30/7/3.00 (Panther)		km	138790	Est
Conductor	AAAC	30 mm <sup>2</sup> , 7/2.54 (Cedar)		km	19430	PO
Conductor	AAAC	50 mm <sup>2</sup> , 7/3.30 (Hazel)		km	30400	PO
Conductor	AAAC	70mm <sup>2</sup> , 7/3.61 (Pine)		km	44480	PO
Conductor	AAAC	100mm <sup>2</sup> , 7/4.65 (Oak)		km	55500	PO
Conductor	AAAC	150mm <sup>2</sup> , 19/3.48 (Ash)		km	100000	Est
Conductor	AAAC	175mm <sup>2</sup> , 19/3.76 (Elm)		km	125000	Est
Conductor	AAC	50 mm <sup>2</sup> , 7/3.10(Ant)		km	28202	Est
Conductor	AAC	7/2.21(Gnat)		km	14394	Est
Conductor	ACSS (HTLS / Composite)	(Linnet)		km	154324	Award
Conductor	Covered Conductor	11kV	(XLPE, AAAC, 12kV, 245 Amps, 70mm <sup>2</sup> )	km	306000	Est
Conductor	Covered Conductor	11kV	(XLPE, AAAC, 12kV, 305 Amps, 99mm <sup>2</sup> )	km	408000	Est
Conductor	Covered Conductor	22kV	(XLPE, AAAC, 24kV, 245 Amps, 70mm <sup>2</sup> )	km	356000	Est
Conductor	Covered Conductor	22kV	(XLPE, AAAC, 24kV, 305 Amps, 99mm <sup>2</sup> )	km	458000	Est
Conductor	Covered Conductor	33kV	(XLPE, AAAC, 36kV, 245 Amps, 70mm <sup>2</sup> )	km	406000	Est

  
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**MAIN COST DATA**  
**(including optional scope of items)**

Item	Type	Broad Spec	Minor Spec (opt)	Unit	Rate FY17 (Rs)	PO/ Est
Conductor	Covered Conductor	33kV	(XLPE, AAAC, 36kV, 305 Amps, 99mm <sup>2</sup> )	km	508000	Est
Cross Arms	11kV	HDGI	V-shape	No	987	Est
Cross Arms	33kV	HDGI	V-shape	No	1509	Est
CT-PT Unit	33kV	PT(1 Unit, 33 kV/110 V); CT(3No, 100/1A)		Set	73994	PO
CT-PT Unit	11kV	PT(1 Unit, 11 kV/110 V); CT(3No, 100/1A)		Set	22971	PO
CT-PT Unit	22kV	PT(1 Unit, 2 kV/110 V); CT(3No, 100/1A)		Set	45000	Est
Current Transformer	33kV	1200-600/1-1-1-1-0.577A		Each	59457	PO
Current Transformer	33kV	800-400/1-1-1-1-1 A		Each	59457	PO
Current Transformer	33kV	400-200/1-1-1-1 A		Each	54752	PO
Current Transformer	33kV	400-200/1-1-1 A		Each	50047	PO
Current Transformer	33kV	600-300/1-1-1 A		Each	50047	PO
Current Transformer	33kV	300-150/1-1-1 A		Each	50047	PO
Current Transformer	22kV	300-150/1-1-1-1 A		Each	50047	PO
Current Transformer	22kV	100-50/1-1-1-1 A		Each	50000	PO
Current Transformer	33kV	400-200/5-5 A		Each	47123	Est
Current Transformer	33kV	400-200/1-1 A		Each	47123	Est
Current Transformer	33kV	Resin cast 25/5 A		Each	27649	Est
Current Transformer	33kV	Resin cast 50/5 A		Each	27649	Est
Current Transformer	33kV	Resin cast 100/5 A		Each	27649	Est
Current Transformer	11kV	Epoxy cast, Indoor, 50/5, 15VA, Class 0.5		Each	10450	Est
Current Transformer	11kV	Epoxy cast, Indoor, 25/5, 15VA, Class 0.5		Each	10450	Est
Current Transformer	11kV	Epoxy cast, Indoor, 12.5/5, 15VA, Class 0.5		Each	10890	Est
Energy Meters		LTAC Single Phase kWh Meter (ISI Marked 1-Ph, Two Wire, 5-30 A)		No	697	PO
Energy Meters		LTAC Single Phase kWh Meter (ISI Marked 1-Ph, Two Wire, 10-60 A)		No	717	PO
Energy Meters		Metal Meter Box (MMBs) (CRCA M.S. Sheet Deep Drawn for housing 1-Ph Energy meters)		No	352	PO
Danger Plate		203X200X1.6 mm		No	116	Esc
Fault Path Indicator	7kV - 69kV	Clipon Type (3 No., 25KA / 170ms, conductor dia -5 to 22mm, Op temp - -40° to +85°)		Set	33000	Est
Fitting	Packing Pieces	CI for Rail Pole 11 /13m		No	149	Est
Fitting	Packing Pieces	CI for Rail Pole 9m		No	149	Est
H.G. Fuse unit 11 kV 200 Amps				Set	7150	Est
ICTPN		32A/415V		No	1002	Est
ICTPN		63A/415V		No	2089	Est
Insulator	11 kV	Disc(Porcelain: 12kV, BS, 45 KN)		No	350	Est
Insulator	11 kV	Disc(Porcelain: 12kV, CT, 90 KN)		No	377	Stock
Insulator	11 kV	Disc(Porcelain: 12kV, CT, 45 KN)		No	330	Est
Insulator	33kV	Pin(Porcelain, 36kV, 10 KN)		No	568	Esc
Insulator	22kV	Pin(Porcelain, 24kV, 10 KN)		No	337	Stock
Insulator	11kV	Pin(Porcelain, 12kV, 5KN)		No	135	Stock
Insulator	11kV	Disc(Polymeric)	With fittings	No	240	Stock
Insulator	33kV	Disc(Polymeric)	With fittings	No	900	Est

  
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**MAIN COST DATA**  
**(including optional scope of items)**

Item	Type	Broad Spec	Minor Spec (opt)	Unit	Rate FY17 (Rs)	PO/ Est
Insulator	HT	Egg		No	28	Stock
Insulator	LT	Egg		No	18	Stock
Insulator	LT	Shackle(16KN)		No	11	Stock
Insulator	LT	Shackle(11.5KN)		No	10	Est
Insulator	LT	Pin(3.5KN)		No	7	Est
Insulator	15kV	Break(88KN)		No	130	Est
Insulator	8kV	Break(44KN)		No	110	Est
Insulator	11kV	Post		No	400	Est
Insulator	33kV	Rod		No	4600	Est
Kit Kat Fuse		200A, 415V		No	1500	Est
Kit Kat Fuse		400A, 415V		No	1900	Est
Kit Kat Fuse		100A, 415V		No	1100	Est
Kit Kat Fuse		300A, 415V		No	1700	Est
Lightning Arrestor / Surge Arrestor	11kV	Porcelain(9kV, 5KA)		Set	1400	Est
Lightning Arrestor / Surge Arrestor	11kV	Porcelain(9kV, 10KA, Station)		Set	5000	Est
Lightning Arrestor / Surge Arrestor	33kV	Porcelain(30kV, 5KA, Station)		Set	6000	Est
Lightning Arrestor / Surge Arrestor	33kV	Porcelain(30kV, 10KA, Station)		Set	14500	Est
Lightning Arrestor / Surge Arrestor	33kV	Polymeric(30kV, 10KA)		Set	10150	Est
Lightning Arrestor / Surge Arrestor	11kV	Polymeric(9kV, 10KA)		Set	3750	Est
Muff (For ST Pole)		With concrete filling		No	1549	Esc
Package Substation	11/0.4 kV	400 kVA, (Oil Type Hermetically sealed Transformer) with 11kV SF6 Insulated compact switchgear with SF6 / Vacuum Circuit Breaker as protection to transformer I.T Switchgear	Outdoor, HV: 3 WAY (2 Nos Isolators + 1 No Breaker), 630A, 21 KA; LV Incomer: 4P ACB, 1000 A, 50KA; Outgoing TPN MCCB 250/125 A, 35KA 5No	LS	2100000	Est
Package Substation	11/0.4 kV	630 kVA, (Oil Type Hermetically sealed Transformer) with 11kV SF6 Insulated compact switchgear with SF6 / Vacuum Circuit Breaker as protection to transformer I.T Switchgear	Outdoor, HV: 3 WAY (2 Nos Isolators + 1 No Breaker), 630A, 21 KA; LV Incomer: 4P ACB, 1000 A, 50KA; Outgoing TPN MCCB 250/125 A, 35KA 5No	LS	2500000	Est
Paints		Aluminium paint.		Ltr	350	Est
Paints		Red oxide paint.		Ltr	132	Est
Paints		Aircraft Gray paint.		Ltr	165	Est
Panel(Bus Coupler)	11kV	With VCB(12 kV, 1250A, 25 kA)		Each	416000	PO
Panel(Bus Coupler)	33kV	Without Circuit Breaker		Each	215000	PO
Panel(Distribution Box LT)	63 kVA DTR	With MCCB(100A, 10KA, 4P, 1No) & SFU(32A, 4No, rewirable)		No	19115	Est
Panel(Distribution Box LT)	100 kVA DTR	With MCCB(160A, 10KA, 4P, 1No) & SFU(32A, 5No, rewirable)		No	26800	Est
Panel(Distribution Box LT)	250 kVA DTR	With MCCB(400A, 36KA, 4P, 1No) & SFU(100A, 4No, rewirable)		No	71900	Est
Panel(Distribution Box LT)	400kVA DTR	With ACB(630A, 50KA, 4P, 1No) & SFU(100A, 6No, rewirable)		No	190600	Est
Panel(Distribution Box LT)	630 kVA DTR	With ACB(1000A, 50KA, 4P, 1No) & SFU(100A, 9No, rewirable)		No	230900	Est
Panel(Distribution Box LT)	6.3 kVA DTR	With MCCB(15A, 10KA, 2P) & SFU(16A, 1No, rewirable)		No	3600	Est
Panel(Distribution Box LT)	16kVA DTR	With MCCB(32A, 10KA, 2P) & SFU(16A, 2No, rewirable)		No	4200	Est
Panel(Distribution Box LT)	25 kVA DTR	With MCCB(40A, 35KA, 4P) & SFU(16A, 4No, rewirable)		No	19300	Est
Pole	Steel Tubular	8m		No	5838	PO
Pole	Steel Tubular	9m		No	8172	PO
Pole	Steel Tubular	10m		No	12007	PO
Pole	Steel Tubular	11m		No	13084	PO
Pole	Steel Tubular	13m		No	16000	Est
Pole	Rail	I Beam (19.6 Kg/m, 9m long)		No	10800	Est

  
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**MAIN COST DATA**  
(including optional scope of items)

Item	Type	Broad Spec	Minor Spec (opt)	Unit	Rate FY17 (Rs)	PO/ Est
Pole	Rail	H Beam (37.1Kg/m, 11m)		No	25000	Est
Pole	Rail	H Beam (37.1Kg/m, 13m)		No	29550	Est
Pole	PSCC	8m		No	3003	Est
Pole	PSCC	9.5m		No	3300	Est
Pole	PSCC	7.5m		No	3995	Est
Pole	PCC	9m		No	4500	Est
Pole	PCC	10m		No	5500	Est
Pole	PCC	11m		No	6500	Est
Pole	Lattice Structure	13m		No	32000	Est
Potential Transformer		(33 kV/ $\sqrt{3}$ / 110V/ $\sqrt{3}$ - 110/ $\sqrt{3}$ - 110V)		Each	29500	PO
Reactor	33kV	33 kV, 7.2 kVAr Series		Each	142000	PO
Safety & Protective Gear	Snow Kit			No	4600	Est
Safety & Protective Gear	Safety Belt / Safety Harness	Full body Harness Type with adjustable leg and shoulder straps and scaffolding hooks	Tensile Strength (Max 24KN)	No	2000	Est
Safety & Protective Gear	Gum Boots		Industrial Grade	Pair	600	Est
Safety & Protective Gear	Hand Gloves		11kV Grade	Pair	700	Est
Safety & Protective Gear	Fire Extinguisher	ABC Type(Portable, Dry Chemical, 2 kg)		No	1100	Est
Safety & Protective Gear	Fire Extinguisher	ABC Type(Portable, Dry Chemical, 4 kg)		No	1600	Est
Safety & Protective Gear	Fire Extinguisher	ABC Type(Portable, Dry Chemical, 6 kg)		No	1950	Est
Safety & Protective Gear	Fire Extinguisher	ABC Type(Portable, Dry Chemical, 9 kg)		No	2400	Est
Safety & Protective Gear	Fire Extinguisher	ABC Type(Portable, Dry Chemical, 25 kg)		No	11000	Est
Spacer		LT Line Spacers Spiral 3- $\Phi$		No	60	Stock
Spacer		LT Line Spacers Spiral 2- $\Phi$		No	52	Stock
Steel Sections		MS Angle	50x50x6	M/T	42713	Est
Steel Sections		MS Angle	65x65x6	M/T	42533	Est
Steel Sections		MS Angle	75x75x6	M/T	42352	Est
Steel Sections		MS Angle	50x50x6	M/T	36462	Est
Steel Sections		MS Angle	65x65x6	M/T	36412	Est
Steel Sections		MS Angle	75x75x6	M/T	36362	Est
Steel Sections		MS Channel	75x40x6	M/T	42533	Est
Steel Sections		MS Channel	100x50x50	M/T	42597	Est
Steel Sections		MS Channel	125x65x6	M/T	42661	Est
Steel Sections		MS Channel	150x75x6	M/T	42789	Est
Steel Sections		MS Channel	75x40x6	M/T	36435	Est
Steel Sections		MS Channel	150x75x6	M/T	36588	Est
Switchgear	11kV	Auto Recloser(interruption: Vaccum, Insulation: Solid Dielectric, with C/R Panel and without Communication)	15.5 kV, 630 A, 12.5KA	No	551280	Esc
Switchgear	33kV	Auto Recloser(interruption: Vaccum, Insulation: SF6, With C/R Panel & Without Communication)	38 kV, 800 A, 16KA	No	700000	Est
Switchgear	33kV	VCB (36 kV, 1250A, 26.2 kA, Outdoor Type)		No	218549	PO
Switchgear	33kV	SF6(36kV, 1250A, 31.5KA, Outdoor)		No	300000	Est
Switchgear	22kV	VCB (24kV, 1250A, 26.2 KA, Outdoor)		No	190000	Est
Switchgear	22kV	SF6(24kV, 1250A, 31.5KA, Outdoor)		No	250000	Est
Switchgear	11kV	VCB(12 kV, 1250A, 25 KA, Outdoor)		No	160000	Est
Switchgear	11kV	SF6(12kV, 1250A, 31.5KA, Outdoor)		No	200000	Est
Switchgear	33kV	Isolator(2000 A with ES)		Each	100000	Est

  
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**MAIN COST DATA**  
**(including optional scope of items)**

Item	Type	Broad Spec	Minor Spec (opt)	Unit	Rate FY17 (Rs)	PO/ Est
Switchgear	33kV	Isolator(1600 A with ES)		Each	55000	Est
Switchgear	33kV	Isolator(1250 A with ES)		Each	50000	Est
Switchgear	33kV	Isolator(2000 A without ES)		Each	80000	Est
Switchgear	33kV	Isolator(1600 A without ES)		Each	50000	Est
Switchgear	33kV	Isolator(1250 A without ES)		Each	45000	Est
Switchgear	33kV	Isolator(2000 A with ES, Motorised)		Each	120000	PO
Switchgear	33kV	Isolator(1600 A with ES, Motorised)		Each	62000	PO
Switchgear	33kV	Isolator(1250 A with ES, Motorised)		Each	60000	PO
Switchgear	33kV	Isolator(2000 A without ES, Motorised)		Each	88000	PO
Switchgear	33kV	1600 A without ES, Motorised		Each	55000	PO
Switchgear	33kV	Isolator(1250 A without ES, Motorised)		Each	53000	PO
Switchgear	22kV	Isolator(630 A, 25 kA, with ES)		Each	34313	PO
Switchgear	22kV	Isolator(630 A, 25 kA, without ES)		Each	29835	PO
Switchgear	11kV	Isolator(630 A, 25 KA, with ES)		Each	24998	PO
Switchgear	11kV	Isolator(630 A, 25 KA, without ES)		Each	22490	PO
Switchgear	11kV	Sectionalizer(11kV, 400 A, 12.5KA, SF6/ Vaccum, Outdoor)	With Remote Communication	Each	344466	Esc
Switchgear	415V	FSU(100A)		No	3300	Est
Switchgear	415V	FSU(200A)		No	4650	Est
Switchgear	415V	FSU(315A)		No	7300	Est
Switchgear	415V	FSU(400A)		No	8100	Est
Switchgear	415V	FSU(63A)		No	2000	Est
SwitchGgear	11kV	GOABS(400 Amps)		Set	5704	Stock
SwitchGgear	22kV	GOABS(400 Amps)		Set	7043	Stock
Tools / Plants / Tackles	Meggar / Insulation Tester	1000V (Hand operated, 200 MΩ)		No	4650	Stock
Tools / Plants / Tackles	Meggar / Insulation Tester	2500V (Hand operated, 5000 MΩ)		No	7950	Stock
Tools / Plants / Tackles	Meggar / Insulation Tester	5000V (Hand operated, 10000 MΩ)		No	9200	Est
Tools / Plants / Tackles	Earth Tester			No	8748	Stock
Tools / Plants / Tackles	Tong Tester	Clipon Type		No	9765	Stock
Tools / Plants / Tackles	Lighting	Emergency Solar (complete fitting including pole and LED lamp (as per HIMURJA rates))		Set	15340	Est
Tools / Plants / Tackles	Earthing Rods			No	300	Est
Tools / Plants / Tackles	Pliers			No	150	Est
Tools / Plants / Tackles	Screw Driver			Set	200	Est
Tools / Plants / Tackles	Rope	25mm		Kg	100	Est
Transformer	33/11	Power(1.6 MVA)		No	2176874	Esc
Transformer	33/11	Power(3.15 MVA)		No	2760000	PO
Transformer	33/11	Power(5 MVA)		No	3500000	Est
Transformer	33/11	Power(6.3 MVA)		No	4046873	Esc
Transformer	33/11	Power(10 MVA, ONAN, with OLTC)		No	4836503	PO
Transformer	33/11	Power(10/ 12 MVA, ONAF, with OLTC)		No	5891395	Est
Transformer	11/0.4kV	DTR(25kVA, outdoor)		No	44363	PO
Transformer	11/0.4kV	DTR(63kVA, outdoor)		No	77995	PO
Transformer	11/0.4kV	DTR(100kVA, outdoor)		No	107811	PO
Transformer	11/0.4kV	DTR(250kVA, outdoor)		No	183905	PO
Transformer	11/0.4kV	DTR(400kVA, outdoor)		No	455000	PO
Transformer	11/0.4kV	DTR(400kVA, indoor)		No	470288	PO
Transformer	11/0.4kV	DTR(630kVA, outdoor)		No	663300	PO
Transformer	11/0.4kV	DTR(630kVA, indoor)		No	674125	PO
Transformer	11/0.4kV	DTR(100kVA, outdoor, Star)		No	99983	Est
Transformer	11/0.4kV	DTR(200kVA, outdoor, Star)		No	175420	Est
Transformer	11/0.4kV	6.3 kVA (CSP)		No	33636	Esc
Transformer	11/0.4kV	6.3 kVA (DRY TYPE)		No	29286	Esc
Transformer	22/0.4kV	DTR(25kVA, outdoor)		No	92000	PO

  
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**MAIN COST DATA**  
**(including optional scope of items)**

Item	Type	Broad Spec	Minor Spec (opt)	Unit	Rate FY17 (Rs)	PO/ Est
Transformer	22/0.4kV	DTR(63kVA, outdoor)		No	148000	PO
Transformer	22/0.4kV	DTR(100kVA, outdoor)		No	188278	PO
Transformer	22/0.4kV	DTR(250kVA, outdoor)		No	313013	PO
Transformer	22/0.4kV	DTR(250kVA, indoor)		No	385000	PO
Transformer	22/0.4kV	DTR(400kVA, indoor)		No	620000	PO
Transformer	22/0.4kV	DTR(630kVA, outdoor)		No	840000	PO
Transformer	22/0.4kV	DTR(100kVA, outdoor, Star)		No	99983	Est
Transformer	22/0.4kV	DTR(200kVA, outdoor, Star)		No	175420	Est
Transformer	33/0.4kV	SSTR(100kVA)		No	359731	Esc
Transformer	33/0.4kV	SSTR(250kVA)		No	403000	PO
Transformer		SSTR(250kVA)		No	476000	PO
Wire	GI	6 SWG (5 mm)	Earth, Hot Dip	MT	66000	Est
Wire	GI	8 SWG (4 mm)	Earth, Hot Dip	MT	66000	Est
Wire	GI	10 SWG (3.15 mm)	Earth, Hot Dip	MT	68026	Est
Wire	GI	7/8 SWG (7/4.00 mm)	Stay, Strand, Galvanised	MT	67000	Est
Wire	GI	7/10 SWG (7/3.15 mm)	Stay, Strand, Galvanised	MT	53711	Stock
Wire	Barbed	HDGI		MT	69000	Est

  
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**CONFIGURATION 1: (33 kV LINE)**

**Cost Data**

A) **Estimated Cost (per Km): [For 33 kV Single Circuit Line on Single Pole Structure (Delta Formation) using Conductor (Dog / 100 mm<sup>2</sup> / ACSR 6/7/4.72 and Double continuous earth wire]**

A<sup>1</sup> (Assume: Wind pressure upto 100 kg/m<sup>2</sup>; Ice / Snow Loading: Moderate ; Span (Max= 90m, Sag=1.73m; Ruling= 75m, Sag=1.20m)

Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09  
 Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	<sup>1</sup> ACSR 6/1/4.72 (100 mm <sup>2</sup> ) {Includes 3 conductor lengths for 3Φ and Additional 1% (Sag, Jumpering and wastage)}	66250	Km	3.03	200738	PO
2	<sup>2</sup> Steel Tubular Poles (11 m, Working Load > 227 kg) (with Ruling Span 75 m, 10 No. Run thro' and 3 No. Double Pole Dead End Structures)	13084	No	16	209344	PO
3	<sup>3</sup> Muffs with concrete filling	1549	No	16	24784	Esc
4	<sup>4</sup> <b>Run Thro' Structures (Δ Formation):</b> on Single Pole Structures (Adopt Ten (10) No. Run-through Structures per Km) -					
a	<b>X-Arms:</b> [MS Channel Iron (100x50x5 mm), Length:1525 mm] x 10 No. Structures	420	m	15.3	6398	Est
b	[MS Angle Iron(50x50x5 mm), Length: 2 x 950 mm] x 10 No. Structures	164	m	19	3117	Est
5	33 kV Pin Insulators (Porcelain, 36 kV, 10 kN): 3 No per single pole structure	568	No	30	17040	Esc
6	Pole top Bracket (On single Pole Structure)	150	No	8	1200	Est
7	<sup>7</sup> <b>Dead End Structures:</b> (Adopt three (3) No. per Km) on Double Pole (Prefer along road side):-					
a	Belt Set - MS Angle Iron: 65x65x5, Length:1500 mm x 2 No.	211	m	9.0	1901	Est
b	X-Bracing Set - MS Angle Iron: 50x50x5, Length [2700 mm x 2 No.]	164	m	16.2	2658	Est
c	X-Arm (Horizontal) - MS Channel Iron: 100X50x5, Length [3050 mm x 2 No.]	420	m	18.3	7678	Est
d	<sup>7d</sup> Discs insulator String sets on Dead End structures (comprising 3 No. Discs in each string: *(Porcelain, BS, 12 kV, 90 kN) including Dead End Clamps etc.) x (3 No. conductors) x (2 No. sides)	1496	Set	18	26928	Est
e	33 kV Pin Insulators (Porcelain, 36 kV, 10 kN): 3 No per double pole structure	568	No	9	5112	Esc
8	<b>Stay / Guy Arrangement</b>					
a	Stay set complete in all respect (1No. / Single Pole , 4 No. / Double Pole Structures)	771	No	22	16962	Esc
b	Stay Wire (7/4.00 mm) (9.0 kg Per Stay Set)	67	Kg	198.0	13266	Esc
9	<b>Earthing:-</b>					
a	HT Earthing set complete	2500	No	13	32500	Est
b	Earth wire (GI, 6 SWG) {Includes 2 wire lengths and Additional 1% (Sag and wastage)}@ 150 kg/km	66	Kg	303	19998	Esc
c	Eye Hook for earth wire	40	No	26	1040	Est
d	Earth Reel	21	No	26	546	Esc
e	MS Angle Iron: 50x50x5, Length: 3300 mm	164	m	42.9	7039	Est
10	Nuts and Bolts of Various Sizes (Galvanised / Coated) [Preferably 16 mm Φ or more (with flat and spring washers)]	86	Kg	75.0	6450	Esc
11	Half clamps: [On Double Pole structure: 4 No, On Single Pole structures: 1No.]	138	No	44	6072	Esc
12	Barbed wire	69	Kg	80.0	5520	Esc
13	Danger Plate (203X200X1.6 mm)	116	No	10	1160	Esc
14	Aluminium Paint	350	Ltr	10.0	3500	Est
15	<b>Add:</b> [Cost of Essential Optional Sub-Configurations Required as per Site Conditions (such as Guarding for Road Crossing, 4 pole structures for 90° spans etc not included here)] (Per Km)					X
	<b>Estimated Cost of the material</b>		X	+	620951	
16	<b>Add:</b> [Cost of Optional Miscellaneous Items (Protective Gear, T&P etc) not included here] (Per Km) (After Justification and with Approval)	1.0%	0.01X	+	6210	
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>		1.01X	+	627161	

  
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**CONFIGURATION 1: (33 kV LINE)**

**Cost Data**

**A) Estimated Cost (per Km): [For 33 kV Single Circuit Line on Single Pole Structure (Delta Formation) using Conductor (Dog / 100 mm<sup>2</sup> / ACSR 6/7/4.72 and Double continuous earth wire]**

A1 The Span / Sag shown are for Level Spans. For Non Level Spans recalculate Spans / Sags. For Areas where Ice / Snow loading are absent recalculate span / sag (In absence of data assume: Max Span= 95m, Sag =1.67m, Ruling Span= 80m, Sag= 1.19m), For Areas where there is Extreme High Ice / snow / wind loading (150kg/m<sup>2</sup>) recalculate span / sag (In absence of data assume: Max Span= 75m, Sag = 1.77 m, Ruling Span= 65m, Sag= 1.33m)

1 Higher conductor sizes / DC Line shall be preferred for feeding 33 / 11 kV Sub Stations of capacities >15MVA; Insulated conductors may be preferred when lines pass through cities / townships. AAAC conductors to be used in plain areas.

2 PCC Poles, H Beams, ST Poles of higher sizes may be used as per site conditions

3 Concrete Filling not included in earlier Cost Data; Where Muffs are not available we may opt for concreting

7 Use of additional Dead End Structures depend on Site Conditions such as large span angles, Non Level Spans, Ridge spans, River crossing spans etc . Where necessary and justified 3 or 4 pole structures shall be preferred.

7d For Lesser Discs per string, 15 KV Glass Disc Insulators may be preferred; Composite Polymeric Insulators may also be preferred but shall not be used for Snow bound areas. Discs of strength 45 kN may be used where ever feasible.

\*\* Cost Includes VAT / Sales Tax/ GST

**B) Optional Scope of Items (if Included in Estimate):** **Refer Main Cost Database**

**C) \*\* ADD: Additional Charges and Taxes (Including Overhead Charges):** **Refer Annexure 'A'**

**D) Note:** The Material / Equipment specifications shall conform to relevant IS / IEC Standards. The Construction / laying of 33KV line shall confirm to relevant REC standards and regulations 90 to 111 under Chapter V (Part-B) of CEA (Technical standard) Regulation 2010 and amendements there to.

  
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**CONFIGURATION 2: (33 kV LINE)**

**Cost Data**

A) **Estimated Cost (per Km): [For 33 kV Single Circuit (SC) Line on Double Pole (DP) Structure (Horizontal Formation); using Conductor (Dog / 100 mm<sup>2</sup> / ACSR 6/1/4.72) and Double continuous Earth wire]**

A<sup>1</sup> (Assume: Wind pressure upto 100 kg/m<sup>2</sup>; Ice / Snow Loading: Moderate ; Span (Max= 110m, Sag= 2.58m; Ruling= 90m, Sag= 1.73m;)

Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09  
 Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	<sup>1</sup> ACSR 6/1/4.72 (100mm <sup>2</sup> ) {Includes 3 conductor lengths for 3Φ and Additional 1% (Sag, Jumpering and wastage)}	66250	Km	3.03	200738	PO
2	<sup>2</sup> Steel Tubular Poles (11 m, Working Load > 227 kg) (with Ruling Span 90 m, 8 No. Run thro' and 3 No. Dead End Structures)	13084	No	22	287848	PO
3	<sup>3</sup> Muffs with concrete filling	1549	No	22	34078	Esc
4	<b>Run Thro' Structures: (Horizontal Formation) on Double Pole Structures (Adopt Eight (8) No. Run-through Structures per Km) -</b>					
a	X-Arm: [MS Channel Iron(100x50x5 mm), Length: 3050 mm] / Run Through Structure	420	m	24.40	10248	Est
b	Disc insulator String (Suspension) sets: 3 No. Discs in each string: ^^ (Porcelain, CT, 12 kV, 90 kN) including Suspension Clamps etc.) x (Single Circuit: 3 No. conductors) / Run Through structure	1387	No	24	33288	Esc
c	Belt Set - MS Angle Iron: 65x65x5, Length [1500 mm x 2 No.]	211	m	24	5064	Est
d	X-Bracing Set - MS Angle Iron: 50x50x5, Length [2700 mm x 2 No.]	164	m	43	7085	Est
5	<b><sup>5</sup> Dead End Structures (Adopt three (3) No. per Km) on Double Pole (Prefer along road side)</b>					
a	Belt Set - MS Angle Iron: 65x65x5, Length [1500 mm x 2 No.]	211	m	9	1899	Est
b	X-Bracing Set - MS Angle Iron: 50x50x5, Length [2700 mm x 2 No.]	164	m	16	2657	Est
c	X-Arm: - MS Channel Iron: 125X65x5, Length [2x3050mm / Dead Structure]	576	m	18.30	10541	Est
d	<sup>5d</sup> Disc insulator String (Strain) sets: 3 No. Discs in each string: ^^ (Porcelain, BS, 12 kV, 90 kN) including Dead End Clamps etc.) x (Single Circuit: 3 No. conductors) x (2 No. sides) / Dead Structures	1496	Set	18	26928	Est
e	33 kV Pin Insulators (Porcelain, 36 kV, 10 kN): 3 No per double pole structure	568	No	9	5112	Esc
6	<b>Stay / Guy Arrangement</b>					
a	Stay set complete in all respect (4 No. / DP Structure)	771	No	44	33924	Esc
b	Stay Wire (7/4.00 mm) (9.0 kg Per Stay Set)	67	Kg	396	26532	Esc
7	<b>Earthing</b>					
a	HT Earthing set complete	6895	No	11	75845	Est
b	Earth wire (GI, 6 SWG) {Includes 2 wire lengths and Additional 1% (Sag and wastage)}@ 150 kg/km	66	Kg	303	19998	Esc
c	Eye Hook for earth wire	40	No	22	880	Est
d	Earth Reel	21	No	22	462	Esc
e	MS Angle Iron: 50x50x5, Length [3300 mm	164	m	36.3	5953	Est
8	Half clamps: [On Double Pole structure: 4No]	138	No	88	12144	Esc
9	Nuts and Bolts of Various Sizes (Galvanised / Coated) [Preferably 16 mm Φ or more (with flat and spring washers)]	86	Kg	75	6450	Esc
10	Barbed wire	69	Kg.	80	5520	Esc
11	Danger Plate (203X200X1.6mm)	116	No	10	1160	Esc
12	Aluminium Paint	350	Ltr	10	3500	Est
13	<b>Add:</b> [Cost of Essential Optional Sub-Configurations Required as per Site Conditions (such as Guarding for Road Crossing, 4 pole structures for 90° spans etc not included here)] (Per Km)					X
	<b>Estimated Cost of the material</b>		X	+	817853	
14	<b>Add:</b> [Cost of Optional Miscellaneous Items (Protective Gear, T&P etc) not included here] (Per Km) (After Justification and with Approval)	1.0%	0.01X	+	8179	
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>		1.01X	+	826032	

  
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- CONFIGURATION 2: (33 kV LINE)** **Cost Data**
- A) **Estimated Cost (per Km): [For 33 kV Single Circuit (SC) Line on Double Pole (DP) Structure (Horizontal Formation); using Conductor (Dog / 100 mm<sup>2</sup> / ACSR 6/1/4.72) and Double continuous Earth wire]**
- A<sup>1</sup> The Span / Sag shown are for Level Spans. For Non Level Spans recalculate Spans / Sags. For Areas where Ice / Snow loading are absent recalculate span / sag (In absence of data assume: Max Span= 120m, Sag = 2.67m, Ruling Span= 100m, Sag= 1.86m), For Areas where there is Extreme High Ice / snow / wind loading (150kg/m<sup>2</sup>) recalculate span / sag (In absence of data assume: Max Span= 90m, Sag = 2.55 m, Ruling Span= 75m, Sag= 1.77m)
- <sup>1</sup> Higher conductor sizes / DC Lines shall be preferred for feeding 33 / 11 KV Sub Stations of capacities >15MVA; Insulated conductors may be preferred when lines pass through cities / townships. AAAC conductors to be used in plain areas.
- <sup>2</sup> PCC Poles, H Beams, ST Poles of higher sizes may be used as per site conditions
- <sup>3</sup> Concrete Filling not included in earlier Cost Data; Where Muffs are not available we may opt for concreting.
- <sup>5</sup> Use of additional Dead End Structures depend on Site Conditions such as large span angles, Non Level Spans, Ridge spans, River crossing spans etc . Where necessary and justified 3 or 4 pole structures shall be preferred.
- <sup>5d</sup> For Lesser Discs per string, 15 KV Glass Disc Insulators may be preferred; Composite Polymeric Insulators may also be preferred but shall not be used for Snow bound areas. Discs of strength 45 kN may be used where ever feasible.
- \*\* Cost Includes VAT / Sales Tax / GST
- B) **Optional Scope of Items (if Included in Estimate):** **Refer Main Cost Database**
- C) **\*\* ADD: Additional Charges and Taxes (Including Overhead Charges):** **Refer Annexure 'A'**
- D) **Note:** The Material / Equipment specifications shall conform to relevant IS / IEC Standards. The Construction / laying of 33KV line shall conform to relevant REC standards and regulations 90 to 111 under Chapter V (Part-B) of CEA (Technical standard) Regulation 2010 and amendments there to.

  
Assistant Engineer

  
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14/58

  
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**A) CONFIGURATION 3: (33 kV LINE) Cost Data**

**Estimated Cost (per Km): [For 33 kV Double Circuit (DC) Line on Double Pole (DP) Structure (Vertical Formation); using Conductor: (Dog : 100mm<sup>2</sup> : ACSR 6/1/4.72) and Double continuous Earth wire]**

<sup>A1</sup> (Assume: Wind pressure upto 100 kg/m<sup>2</sup>; Ice / Snow Loading: Moderate ; Span (Max= 100m, Sag= 2.13m; Ruling= 80m, Sag= 1.36m)

Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09  
 Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	<sup>1</sup> ACSR 6/1/4.72 (100mm <sup>2</sup> ) {Includes 3 conductor lengths for 3Φ and Additional 1% (Sag, Jumpering and wastage)}	66250	Km	6.06	401475	PO
2	<sup>2</sup> Steel Tubular Poles (13 m, Working Load > 227 kg) (with Ruling Span 80 m, 10 No. Run thro' and 3 No. Dead End Structures)	16000	No	26	416000	Est
3	<sup>3</sup> Muffs with concrete filling	1549	No	26	40274	Esc
4	<sup>4</sup> Run-through Structures (Vertical Formation) on Double Pole Structures (Adopt Ten (10) No. Run-through Structures per Km) -					
a	X-Arm: [MS Channel Iron(100x50x5 mm), Length: 3050 mm] x 3 No (for two circuits ;Left and Right) / Run Through Structure	420	m	91.5	38430	Est
b	33 kV Pin Insulators (Porcelain, 36 kV, 10 kN): Upper Circuit: 3 No. conductors) / Run Through Structure	568	No	60	34080	Esc
c	Belt Set - MS Angle Iron: 65x65x5, Length [1500 mm x 2 No.]	211	m	30	6336	Est
d	X-Bracing Set - MS Angle Iron: 50x50x5, Length [2700mm x 2 No.]	164	m	54	8860	Est
5	<sup>5</sup> <sup>AA</sup> Dead End Structures (Adopt three (3) No. per Km) on Double Pole (Prefer along road side)					
a	Belt Set - MS Angle Iron: 65x65x5, Length [1500 mm x 2 No.]	211	m	9	1901	Est
b	X-Bracing Set - MS Angle Iron: 50x50x5, Length [2700 mm x 2 No.]	164	m	16	2658	Est
c	X-Arm (Horizontal) - MS Channel Iron: 125X65x5, Length [2x1525 mm / Dead Structure]	420	m	9.15	3843	Est
d	<sup>5d</sup> <sup>A</sup> Discs insulator String (Strain) sets: 3 No. Discs in each string: <sup>AA</sup> (Porcelain, BS, 12 kV, 90 kN) including Dead End Clamps etc.) x (Left and Right Circuits: 6 No. conductors) x (2 No. sides) /Dead Structures	1496	Set	36	53856	Est
e	33 kV Pin Insulators (Porcelain, 36 kV, 10 kN): Left and Right Circuits: 6 No. conductors) / Dead End Structure	568	No	18	10224	Esc
6	<b>Stay / Guy Arrangement</b>					
a	Stay set complete in all respect (4No. / DP Structure)	771	No	52	40092	Esc
b	Stay Wire (7/4.00 mm) (9.0 kg Per Stay Set)	67	Kg	468	31356	Esc
7	<b>Earthing</b>					
a	HT Earthing set complete	6895	No	13	89635	Est
b	Earth wire (GI, 6 SWG) {Includes 2 wire lengths and Additional 1% (Sag and wastage)}@ 150 kg/km	66	kg	303	19998	Esc
c	Eye Hook for earth wire	40	No	26	1040	Est
d	Earth Reel	21	No	26	546	Esc
e	MS Angle Iron: 50x50x5, Length: 3300 mm	164	m	42.9	7036	Est
8	Half clamps: [On Double Pole structure: 4No]	138	No	104	14352	Esc
9	Nuts and Bolts of Various Sizes (Galvanised / Coated) [Preferably 16 mm Φ or more (with flat and spring washers)]	86	Kg	75	6450	Esc
10	Barbed wire	69	Kg.	80	5520	Esc
11	Danger Plate (203X200X1.6mm)	116	No	10	1160	Esc
12	Aluminium Paint	350	Ltr	10	3500	Est
13	<b>Add:</b> [Cost of Optional Items Required as per Site Conditions (such as Guarding for Road Crossing, 4 pole structures for 90° spans etc not included here)] (Per Km)					X
	<b>Estimated Cost of the material</b>		X	+	1238621	
14	<b>Add:</b> [Cost of Optional Miscellaneous Items (Protective Gear, T&P etc) not included here] (Per Km) (After Justification and with Approval)	1.0%	0.01X	+	12386	
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>		1.01X	+	1251007	

  
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A) **CONFIGURATION 3: (33 kV LINE)** **Cost Data**  
**Estimated Cost (per Km): [For 33 kV Double Circuit (DC) Line on Double Pole (DP) Structure (Vertical Formation); using Conductor: (Dog : 100mm<sup>2</sup> : ACSR 6/1/4.72) and Double continuous Earth wire]**

<sup>A1</sup> The Span / Sag shown are for Level Spans. For Non Level Spans recalculate Spans / Sags. For Areas where Ice / Snow loading are absent recalculate span / sag (In absence of data assume: Max Span= 107m, Sag = 2.1m, Ruling Span= 90m, Sag= 1.5m), For Areas where there is Extreme High Ice / snow / wind loading (150kg/m<sup>2</sup>) recalculate span / sag (In absence of data assume: Max Span= 77m, Sag = 1.87 m, Ruling Span= 65m, Sag= 1.33m)

<sup>1</sup> Higher conductor sizes shall be preferred for feeding 33 / 11 KV Sub Stations of capacities >15MVA; Insulated conductors may be preferred when lines pass through cities / townships. AAAC conductors to be used in plain areas.

<sup>2</sup> Lattice Structure, PCC Poles or H Beam may be used as per site conditions for longer span lengths.

<sup>3</sup> Concrete Filling not included in earlier Cost Data; Where Muffs are not available we may opt for concreting.

<sup>5</sup> Use of additional Dead End Structures depend on Site Conditions such as large span angles, Non Level Spans, Ridge spans, River crossing spans etc . Where necessary and justified 3 or 4 pole structures shall be preferred.

<sup>5d</sup> For Lesser Discs per string, 15 KV Glass Disc Insulators may be preferred; Composite Polymeric Insulators may also be preferred but shall not be used for Snow bound areas. Discs of strength 45 kN may be used where ever feasible.

\*\* Cost Includes VAT / Sales Tax / GST

B) **Optional Scope of Items (if Included in Estimate):** **Refer Main Cost Database**

C) **\*\* ADD: Additional Charges and Taxes (Including Overhead Charges):** **Refer Annure 'A'**

D) **Note:** The Material / Equipment specifications shall conform to relevant IS / IEC Standards. The Construction / laying of 33KV line shall confirm to relevant REC standards and regulations 90 to 111 under Chapter V (Part-B) of CEA (Technical standard) Regulation 2010 and amendements there to.

  
Assistant Engineer

  
Sr. Executive Engineer

  
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**A) CONFIGURATION 4: (11 kV LINE) Cost Data**

**Estimated Cost (per Km): [For 11 kV Single Circuit (SC) Line on Single Pole (SP) Structure (Delta Formation): using Conductor: (Dog : 100mm<sup>2</sup> : ACSR 6/1/4.72) and Single continuous Earth wire]**

<sup>A1</sup> (Assume: Wind pressure upto 100 kg/m<sup>2</sup>; Ice / Snow Loading: Moderate ; Span (Max= 110m, Sag=2.58m; Ruling= 90m, Sag=1.73m)

Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09  
 Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74

S. No.	Description	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	<sup>1</sup> ACSR 6/1/4.72 (100mm <sup>2</sup> ) {Includes 3 conductor lengths for 3Φ and Additional 1% (Sag, Jumpering and wastage)}	66250	km	3.03	200738	PO
2	<sup>2</sup> Run Thro' Structures (Δ Formation): Steel Tubular Poles (11 m, Working Load > 227 kgf/m <sup>2</sup> ) (with Ruling Span 90 m, 8 No. Run thro' and 3 No. Double Pole Dead End Structures)	13084	No	14	183176	PO
3	<sup>3</sup> Muffs with concrete filling	1549	No	14	21686	Esc
4	Cross Arm: [Channel Iron (100x50x5 mm), Length (1070) mm x 8 structure	420	m	8.56	3595	Est
5	Angle Iron (50x50x5 mm), Length (2x750) mm x 8 structures	164	m	12	1968	Est
6	Pole Top Bracket	150	No	10	1500	Est
7	11 kV Pin Insulators (Porcelain, 12 kV, 10 KN): 3 No per pole structure	135	No	24	3240	PO
8	<sup>8</sup> <b>Dead End Structures:</b> (Adopt three (3) No. per Km) on Double Pole (Prefer along road side)					
a	Belt Set - MS Angle Iron: 50x50x5, Length [1500 mm x 2 No.]	164	m	9	1476	Est
b	X-Bracing Set - MS Angle Iron: 50x50x5, Length [2125 mm x 2 No.]	164	m	12.75	2091	Est
c	X-Arm (Horizontal) - MS Channel Iron: 100X50x5, Length [(1070x2)/mm x 2 No.]	420	m	12.84	5393	Est
d	<sup>8d</sup> Discs insulator sets on Dead End structures (comprising 1 No. Disc: ** (Porcelain, BS, 12 kV, 90 kN) including Dead End Clamps etc.) x (3 No. conductors) x (2 No. sides)	1082	Set	18	19476	Est
e	11 kV Pin Insulators (Porcelain, 12 kV, 10 KN): 3 No per double pole structure	135	No	9	1215	PO
9	<b>HT Stay / Guy Arrangement</b>					
a	Stay set complete in all respect (1No. / Single Pole , 4 No. / Double Pole Structures)	771	No	20	15420	Esc
b	Stay Wire (7/3.15 mm) (6.0 kg Per Stay Set)	61	kg	120	7320	Esc
10	<b>Earthing</b>					
a	HT Earthing set complete	2500	Nos	11	27500	Est
b	Single Continuous Earth wire (GI, 8 SWG) {alongwith 1 wire lengths for avg. one road crossing @ 20 m and Additional 1% (Sag and wastage)} @ 0.102 kg/m	66	kg	105.08	6935	Esc
c	Cross Lacings (GI, 8 SWG) [ 2.2 m x 9 Nos @ 2 m spacing] {0.102 kg/m}	66	kg	2.02	133	Esc
d	Eye Hook for earth wire	25	Nos	4	100	Est
e	Earth Wire Clamp	200	Nos	13	2600	Est
f	MS Angle Iron: 50x50x5, Length : 2210 mm for Road crossing	164	m	4.42	725	Est
11	Danger Plate (250X200X1.6 mm)	116	No	10	1160	Esc
12	Nuts and Bolts of Various Sizes (Galvanised / Coated) [Preferably 16 mm Φ or more (with flat and spring washers)]	86	Kg	35	3010	Esc
13	Barbed Wire	69	Kg	30	2070	Esc
14	Aluminium Paint	350	Ltr	16	5600	MR
15	Pole Clamps (M.S. Flat 50X6 mm)	59	No	56	3304	Esc
	<b>Add:</b> [Cost of Essential Optional Sub-Configurations Required as per Site Conditions (such as Guarding for Road Crossing, 4 pole structures for 90° spans etc not included here)] (Per Km)					X
	<b>Estimated Cost of Material</b>			X +	521431	
	<b>Add:</b> [Cost of Optional Miscellaneous Items (Protective Gear, T&P etc) not included here] (Per Km) (After Justification and with Approval)	1.0%	0.01X +		5214	
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>		1.01X +		526645	

<sup>A1</sup> The Span / Sag shown are for Level Spans. For Non Level Spans recalculate Spans / Sags. For Areas where Ice / Snow loading are absent recalculate span / sag (In absence of data assume: Max Span= 115m, Sag =2.45m, Ruling Span= 100m, Sag= 1.86m), For Areas where there is Extreme High Ice / snow / wind loading (150kg/m<sup>2</sup>) recalculate span / sag (In absence of data assume: Max Span= 90m, Sag = 2.55 m, Ruling Span= 75m, Sag= 1.77m)

<sup>1</sup> Higher conductor sizes / DC Line shall be preferred for feeding 11/0.4 KV Sub Stations of capacities >400 KVA; Insulated conductors may be preferred when lines pass through cities / townships. AAAC conductors to be used in plain areas.


  
 Assistant Engineer

  
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- A) **CONFIGURATION 4: (11 kV LINE)** **Cost Data**  
Estimated Cost (per Km): [For 11 kV Single Circuit (SC) Line on Single Pole (SP) Structure (Delta Formation); using Conductor: (Dog : 100mm<sup>2</sup> : ACSR 6/1/4.72) and Single continuous Earth wire]  
<sup>2</sup> PCC Poles, H Beams, ST Poles of higher sizes may be used as per site conditions. 9 m Poles may be used in places other than across or along streets.  
<sup>3</sup> Concrete Filling not included in earlier Cost Data; Where Muffs are not available we may opt for concreting  
<sup>8</sup> Use of additional Dead End Structures depend on Site Conditions such as large span angles, Non Level Spans, Ridge spans, River crossing spans etc . Where necessary and justified 3 or 4 pole structures shall be preferred.  
<sup>8d</sup> For Lesser Discs per string, 15 KV Glass Disc Insulators may be preferred; Composite Polymeric Insulators may also be preferred but shall not be used for Snow bound areas. Discs of strength 45 kN may be used where ever feasible.  
 \*\* Cost Includes VAT / Sales Tax/ GST
- B) **Optional Scope of Items (if Included in Estimate):** **Refer Main Cost Database**
- C) **\*\* ADD: Additional Charges and Taxes (Including Overhead Charges):** **Refer Annexure 'A'**
- D) **Note:** The Material / Equipment specifications shall conform to relevant IS / IEC Standards. The Construction / laying of 33KV line shall confirm to relevant REC standards and regulations 90 to 111 under Chapter V (Part-B) of CEA (Technical standard) Regulation 2010 and amendments there to.

  
 Assistant Engineer

  
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**CONFIGURATION 5: (11 KV LINE)**

**Cost Data**

**B) Estimated Cost (per Km): [For 11 kV Double Circuit (DC) Line on Double Pole (DP) Structure ( Vertical Formation); using Conductor (Dog / 100 mm<sup>2</sup> / ACSR 6/1/4.72) and Single continuous Earth wire]**

A1 (Assume: Wind pressure upto 100 kg/m<sup>2</sup>; Ice / Snow Loading: Moderate ; Span (Max= 100m, Sag= 2.13m; Ruling= 80m, Sag= 1.36m)

Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09  
 Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74

S. No.	Description	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	<sup>1</sup> ACSR 6/1/4.72 (100 mm <sup>2</sup> ) {Includes 3 conductor lengths for 3Φ and Additional 1% (Sag, Jumpering and wastage)}	66250	km	6.06	401475	PO
2	<sup>2</sup> Steel Tubular Poles (11 m, Working Load > 227 kgf/m <sup>2</sup> ) (with Ruling Span 80 m, 10 No. Run thro' and 3 No. Dead End Structures)	13084	No	26	340184	PO
3	<sup>3</sup> Muffs with concrete filling	1549	No	26	40274	Esc
4	Belt Set - MS Angle Iron: 50x50x5, Length [1500 mm x 2 No.]	164	m	39	6396	Est
5	X-Bracing Set - MS Angle Iron: 50x50x5, Length [2125 mm x 2 No.]	164	m	55	9061	Est
6	X-Arm (Horizontal) - MS Channel Iron: 100X50x5, Length [1070x2 mm x ((10*3)+(3*2*3) ) No.]	420	m	103	43142	Est
7	<sup>7</sup> Discs insulator sets on Dead End structures (comprising 1 No. Disc: ^^ (Porcelain, BS, 12 kV, 90 kN) including Dead End Clamps etc.) x (3 No. conductors) x (2 No. sides)	1082	Set	18	19476	Est
8	11 kV Pin Insulators (Porcelain, 12 kV, 10 kN): 6 No per structure	135	No	78	10530	PO
9	<b>HT Stay / Guy Arrangement</b>				0	
a	Stay set complete in all respect (4 No. / Structure)	771	No	52	40092	Esc
b	Stay Wire (7/3.15 mm) (6.0 kg Per Stay Set)	61	kg	312	19032	Esc
10	<b>Earthing</b>					
a	HT Earthing set complete	2500	No	13	32500	Est
b	Single Continuous Earth wire (GI, 8 SWG) {alongwith 1 wire lengths for avg. one road crossing @ 20 m and Additional 1% (Sag and wastage)}@ 0.102 kg/m	66	kg	105.08	6935	Esc
c	Cross Lacings (GI, 8 SWG) [ 2.2 m x 9 Nos @ 2 m spacing] {0.102 kg/m}	66	kg	2.02	133	Esc
d	Eye Hook for earth wire	25	No	4	100	Est
e	Earth Wire Clamp	200	No	13	2600	Est
f	MS Angle Iron: 50x50x5, Length : 2210 mm for Road crossing	164	No	4.42	725	Est
11	Danger Plate (250X200X1.6 mm)	116	No	13	1508	Esc
12	Nuts and Bolts of Various Sizes (Galvanised / Coated) [Preferably 16 mm Φ or more (with flat and spring washers)]	86	Kg	70	6020	Esc
13	Barbed Wire	69	Kg	50	3450	Esc
14	Aluminium Paint	350	Ltr	26	9100	MR
15	Pole Clamps (M.S. Flat 50X8 mm)	59	No	260	15340	Esc
	<b>Add:</b> [Cost of Essential Optional Sub-Configurations Required as per Site Conditions (such as Guarding for Road Crossing, 4 pole structures for 90° spans etc not included here)] (Per Km)				X	
	<b>Estimated Cost of Material</b>		X	+	1008074	
	<b>Add:</b> [Cost of Optional Miscellaneous Items (Protective Gear, T&P etc) not included here] (Per Km) (After Justification and with Approval)	1.0%	0.01X	+	10081	
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>		1.01X	+	1018155	

A1 The Span / Sag shown are for Level Spans. For Non Level Spans recalculate Spans / Sags. For Areas where Ice / Snow loading are absent recalculate span / sag (In absence of data assume: Max Span= 100m, Sag =1.87m, Ruling Span= 80m, Sag= 1.19m), For Areas where there is Extreme High Ice / snow / wind loading (150kg/m<sup>2</sup>) recalculate span / sag (In absence of data assume: Max Span= 80m, Sag = 2.1 m, Ruling Span= 60m, Sag= 1.13m).

1 Higher conductor sizes / DC Line shall be preferred for feeding 11/0.4 KV Sub Stations of capacities >400KVA; Insulated conductors may be preferred when lines pass through cities / townships. AAAC conductors to be used in plain areas.

2 PCC Poles, H Beams, ST Poles of higher sizes may be used as per site conditions

3 Concrete Filling not included in earlier Cost Data; Where Muffs are not available we may opt for concreting

7 Use of additional Dead End Structures depend on Site Conditions such as large span angles, Non Level Spans, Ridge spans, River crossing spans etc . Where necessary and justified 3 or 4 pole structures shall be preferred.

7 For Lesser Discs per string, 15 KV Glass Disc Insulators may be preferred; Composite Polymeric Insulators may also be preferred but shall not be used for Snow bound areas. Discs of strength 45 kN may be used where ever feasible.

\*\* Cost Includes VAT / Sales Tax / GST

**B) Optional Scope of Items (if Included in Estimate):** Refer Main Cost Database

**C) \*\* ADD: Additional Charges and Taxes (Including Overhead Charges):** Refer Annexure 'A'

**D) Note:** The Material / Equipment specifications shall conform to relevant IS / IEC Standards. The Construction / laying of 33KV line shall confirm to relevant REC standards and regulations 90 to 111 under Chapter V (Part-B) of CEA (Technical standard) Regulation 2010 and amendments there to.

  
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19/58

  
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**CONFIGURATION 6: (11 kV LINE with AB Cable)**

**Cost Data**

**A) Estimated Cost (per Km): [For 11 kV Line on Single Pole (SP) Structure; using AB Cable (3x70+95 mm<sup>2</sup>) x 2 Cables]**

A<sup>1</sup> (Assume: Wind pressure upto 100 kg/m<sup>2</sup>; Ice / Snow Loading: Moderate ; Span (Max= 48m, Sag= 1.69m; Ruling= 30 m, Sag= 0.66m)

Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09  
 Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74

S. No.	Description	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	11 kV AB Cable [Size: (3x70+95 mm <sup>2</sup> ) x 2 Cables (additional 1% sagging & wastage)]	494033	km	2.02	997947	Esc
2	<sup>2</sup> Steel Tubular Poles (9 m, Working Load > 200 kgf/m <sup>2</sup> ) (with Ruling Span 35 m)	8172	No	33	269676	PO
3	<sup>3</sup> Muffs with concrete filling	1549	No	33	51117	Esc
4	Stay Set Complete	771	No	33	25443	Esc
5	Stay Wire (7/3.15 mm) (6.0 kg Per Stay Set)	61	Kg	198	12078	Esc
6	Anchoring Assembly for HT	302	No	17	5134	Esc
7	Suspension Assembly for HT	240	No	16	3840	Esc
8	Facade Hooks for HT	79	No	33	2607	Esc
	<b>Add:</b> [Cost of Essential Optional Sub-Configurations Required as per Site Conditions (such as Guarding for Road Crossing, 4 pole structures for 90° spans etc not included here)] (Per Km)				X	
	<b>Estimated Cost of Material</b>			X	+	1367842
	<b>Add:</b> [Cost of Optional Miscellaneous Items (Protective Gear, T&P etc) not included here] (Per Km) (After Justification and with Approval)	1.0%	0.01X		+	13678
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>			1.01X	+	1381520

A<sup>1</sup> The Span / Sag shown are for Level Spans. For Non Level Spans recalculate Spans / Sags. For Areas where Ice / Snow loading are absent recalculate span / sag (In absence of data assume: Max Span= 52m, Sag =1.76m, Ruling Span= 40m, Sag= 1.04m). For Areas where there is Extreme High Ice / snow / wind loading (150kg/m<sup>2</sup>) recalculate span / sag (In absence of data assume: Max Span= 44m, Sag = 1.71 m, Ruling Span= 25m, Sag= 0.55m)


<sup>2</sup> PCC Poles, H Beams, ST Poles of higher sizes may be used as per site conditions

<sup>3</sup> Concrete Filling not included in earlier Cost Data; Where Muffs are not available we may opt for concreting

\*\* Cost Includes VAT / Sales Tax / GST

- B) **Optional Scope of Items (if Included in Estimate):** Refer Main Cost Database
- C) **\*\* ADD: Additional Charges and Taxes (Including Overhead Charges):** Refer Annexure 'A'
- D) **Note:** The Material / Equipment specifications shall conform to relevant IS / IEC Standards. The Construction / laying of 33KV line shall conform to relevant REC standards and regulations 90 to 111 under Chapter V (Part-B) of CEA (Technical standard) Regulation 2010 and amendments there to.

  
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**CONFIGURATION 7: (3Φ LT LINE)**

**Cost Data**

A) <sup>A</sup> **Estimated Cost (per Km): [For 3Φ LT Line on Single Pole (SP) Structure (Vertical Formation); using Conductor (Dog / 100 mm<sup>2</sup> / ACSR 6/1/4.72) and Single continuous Earth wire]**

A<sup>1</sup> (Assume: Wind pressure upto 100 kg/m<sup>2</sup>; Ice / Snow Loading: Moderate ; Span (Max= 70 m, Sag= 2.13m; Ruling= 60m, Sag= 1.36m)

**Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09**  
**Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74**

S. No	Description	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1 a	<sup>1</sup> ACSR 6/1/4.72 (100mm <sup>2</sup> ) {Includes 3 conductor lengths for 3Φ and Additional 1% (Sag, Jumpering and wastage)}	66250	km	3.03	200738	PO
b	ACSR 6/1/3.35 (50mm <sup>2</sup> ) { Neutral conductor including 1% (Sag, Jumpering and wastage)}	33200	km	1.01	33532	PO
2	<sup>2</sup> PCC Poles (9 m, Working Load > 180 kgf/m <sup>2</sup> ) (with Ruling Span 60 m)	4500	No	17	76500	Est
3	<sup>3</sup> Muffs with concrete filling (1800 mm)	1302	No	17	22134	Esc
4	Shackle Insulator (16 kN)	11	No	68	748	Esc
5	D-Iron (U- Clamps)	55	No	68	3740	Esc
6	Earth Knob	10	No	17	170	Esc
7	LT Stay Set	635	No	12	7620	Esc
8	Stay Wire (7/3.15 mm) (6.0 kg Per Stay Set)	61	Kg	72	4392	Esc
9	Kit Kat I.C.	125	No	12	1500	Esc
10	<sup>10</sup> Earthing Set complete	585	No	6	3510	Esc
11	Earth wire (GI, 8 SWG) {Additional 1% (Sag and wastage)} @ 0.102 kg/m	66	Kg	103	6799	Esc
12	Spool Tie	23	No	68	1564	Esc
13	Nuts and Bolts of Various Sizes (Galvanised / Coated) [Preferably 16 mm Φ or more (with flat and spring washers)]	86	Kg	25	2150	Esc
14	Aluminium Paint	350	Ltr	16	5600	Est
15	Spiral PVC Spacer	57	No	30	1710	Esc
	<b>Add:</b> [Cost of Essential Optional Sub-Configurations Required as per Site Conditions (such as Guarding for Road Crossing, Dead End Structures not included here)] (Per Km)				X	
	<b>Estimated Cost of Material</b>		X	+	372407	
	<b>Add:</b> [Cost of Optional Miscellaneous Items (Protective Gear, T&P etc) not included here] (Per Km) (After Justification and with Approval)	1.0%	0.01X	+	3724	
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>		1.01X	+	376131	

A Horizontal Formation may be adopted where necessary

<sup>1</sup> It is desirable that the length of LT feeders do not increase beyond 500m from the feeding DTR. Higher conductor sizes / DC Line shall be preferred when feeding from 400KVA or higher DTR or feeding areas greater than 400m from the DTR; AB Cables may be preferred when lines pass through cities / townships. AAAC conductors to be used in plain areas.

<sup>2</sup> I Beams, ST Poles of higher sizes may be used as per site conditions.

<sup>3</sup> Concrete Filling not included in earlier Cost Data; Where Muffs are not available we may opt for concreting

\*\* Cost Includes VAT / Sales Tax / GST

B) **Optional Scope of Items (if Included in Estimate): Refer Main Cost Database**

C) **\*\* ADD: Additional Charges and Taxes (Including Overhead Charges): Refer Annexure 'A'**

D) **Note:** The Material / Equipment specifications shall conform to relevant IS / IEC Standards. The Construction / laying of 33KV line shall conform to relevant REC standards and regulations 90 to 111 under Chapter V (Part-B) of CEA (Technical standard) Regulation 2010 and amendments there to.

  
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## Optional Configurations

S.N.	Item	Qty	Unit	Rate Rs	Cost	PO/ Est/ Esc
<b>1</b>	<b>Material for surveying and stacking of 1 km Line</b>					
a	Wooden pegs	12	No.	27	324	Esc
b	Stone Pillar/ RCC Pillars	7	No.	1246	8722	Esc
<b>2</b>	<b>LT Guarding for Road Crossing @ 10 m (As per REC Std B-1)</b>					
a	Cross Arm: [Channel Iron (75x40x6/5* mm), Length (1200+20%) mm x 2 structure	2.4	m	182	446	Est
b	Cross Lacings (GI, 8 SWG) [ 1.2 m x 5 Nos @ 2 m spacing] {0.102 kg/m}	0.6	kg	66	40	Esc
c	LT Pin Insulator	8.0	No	50	400	Est
d	Earth Knob	2.0	No	10	20	Esc
e	Spool Insulator	5.0	No	10	50	Est
f	Pole Top Bracket	2.0	No	150	300	Est
g	Pole Clamps (M.S. Flat 50X8 mm)	2.0	No	59	118	Esc
<b>3</b>	<b>33 KV // 11 KV Line Guarding</b>					
	<b>Material for guarding of one road crossing point</b>					
a	PCC poles 8 mtr. Long	2	No	1952	3904	Esc
b	Stay set	2	No	771	1542	Esc
c	Stay Wire 7/3.15 mm ( @ 6.0 kg Per Stay Set)	12	kg	67	804	Esc
d	Earthing set	2	No	6895	13790	Est
e	Catenary wire	15	m	66	990	Esc
f	Cross Arm ( 2 Nos of Angle iron 2240x65x65x6/5* mm) @ 5.80Kg/m	4.48	m	211	945.28	Est
g	Half clamps	2	No	138	276	Esc
<b>4</b>	<b>Material cost of 11 kV, 4 Pole Structure for installation of Auto Voltage Booster/ Auto Line Sectionliser</b>					
1	Steel tubular pole 9 m long	4	No	8172	32688	PO
2	Cross Arm: [Channel Iron (100x50x6/5* mm), (Length 2400 mm)					
I	For line & four pole structure =6 nos.					
II	For G.O. switch & G.O. fuse unit =4 nos.					
III	For foundation of Auto Voltage Booster =6 nos.					
	Total = 16 nos.	38.4	m	420	16128	Est
3	Half Clamps with nuts & bolts	14	No	138	1932	Esc
4	Full Clamps with nuts & bolts	8	No	220	1760	Esc
5	11 kV Strain Insulator complete with fittings	6	No	1081	6486	Esc
6	11 kV Pin Insulators (Porcelain, 12 kV, 10KN)	6	No	135	810	PO
7	Stay Set complete	5	Set	771	3855	Esc
8	Earthing set complete	3	Set	2500	7500	Est
9	Danger plate	2	No	116	232	Esc
10	Barbed wire	10	Kg	69	690	Esc
11	Set of jumpers with PG clamps (each of 3 nos.)	2	Set	378	756	Esc
<b>4</b>	<b>Material Cost of Double Pole Structure on 11 kV line for installation of Auto Voltage Booster/ Auto Line Sectionalizer</b>					
1	Steel Tubular poles 9 mtr long	2	No.	8172	16344	PO
2	Cross Arm: [Channel Iron (100x50x6/5* mm), (Length 2400 mm)	9.6	m	420	4032	Est
3	Knee Bracing: [Angle Iron (50x50x6/5* mm), (Length 2x750 mm )	1.5	m	164	246	Est
4	Channel Iron (100x50x6/5* mm), (Length 2x 980 mm)	1.96	m	420	823.2	Est
5	11 kV Strain Insulators complete with fittings	6	No.	1081	6486	Esc
6	Stay set complete with guy trip	5	Set	771	3855	Esc
7	Earthing Set complete	2	Set	2500	5000	Est
8	Danger plate	2	No.	116	232	Esc
9	Barbed wire	8	Kg	69	552	Esc
10	MS Half clamps with nuts & bolts	2	No.	138	276	Esc
11	MS Full clamps with nuts & bolts	6	No.	220	1320	Esc
12	Set of Jumpers with PG clamps( each set of 3 no.)	2	Set	378	756	Esc

  
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**CONFIGURATION 8: (Distribution Substation 11/0.4 kV)****Cost Data****A) <sup>A</sup> Estimated Cost for 25 KVA, 11/0.4 kV Pole Mounted Distribution Substation**

Cost Escalation in FY16 over Cost Data for FY15 (%)	=	2.09
Cost Escalation in FY17 over Cost Data for FY16 (%)	=	3.74

Sr.	Description	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	<sup>1</sup> Distribution Transformer (Ordinary), 11/0.4 kV, 25 KVA	44363	No	1	44363	PO
2	Steel Tubular Poles (9 m, Working Load > 200 kgf/m <sup>2</sup> )	8172	No	2	16344	PO
3	<sup>3</sup> Muffs with concrete filling	1549	No	2	3098	Esc
4	X-Arm: [Channel Iron (100x50x5 mm), Length : 2800 mm X 4 Nos]	420	m	11.2	4704	Est
5	X-Arm: [Channel Iron (75x40x5 mm), Length : 2800 mm X 4 Nos] for supporting DO fuse unit & GO switch	212	m	5.6	1187	Est
6	X-Arm [Channel Iron (100x50x5 mm), Length : 460 mm x 2 Nos for supporting Main Channel of Transformer]	420	m	0.92	386	Est
7	MS Angle Iron (50X50x5 mm), Length: 2800 mm x(1 Nos for LA's + 2 No. for Dist Panel Box)	164	m	8.4	1378	Est
8	<b>Transformer Belting &amp; Knee Bracing</b>					
a	MS Angle Iron (50X50x5 mm), Length : 2800 mm x 4 Nos	164	m	11.2	1837	Est
b	MS Angle Iron (35X35x5 mm), Length : 460 mm x 2 Nos	146	m	0.92	134	Est
9	<sup>9</sup> GO AB Switch Unit (11kV, 400A, 25 KA )	5704	Set.	1	5704	PO
10	D.O Fuse Unit	1903	Set.	1	1903	Esc
11	<sup>11</sup> Surge Arrester, 9 kV Station Class (Porcelain Type)	848	No	3	2544	Est
12	Discs insulator sets (comprising 1 No. Disc: <sup>^^</sup> (Porcelain, BS, 12 kV, 90 kN) including Dead End Clamps etc.)	1082	Set.	3	3246	Est
13	Stay set complete	771	Set.	4	3084	Esc
14	Stay Wire (7/3.15 mm) (6.0 kg Per Stay Set)	61	Kg.	24	1464	Esc
15	Pipe Earthing Set	2969	Set.	3	8907	Esc
16	LT Distribution Panel Box with MCCB(40A, 25 kA, 4P) and SFU(16A, 4No, rewirable)	19300	Set.	1	19300	Est
17	Half Clamp (M.S. Flat 50X6 mm)	67	No.	22	1474	Esc
18	Nuts and Bolts of Various Sizes (Galvanised / Coated) [Preferably 16 mm Φ or more (with flat and spring washers)]	86	Kg.	25	2150	Esc
19	Aluminium Thimble	36	No	16	576	Esc
20	Aluminium Thimble	295	No	4	1180	PO
21	Lead-Tin Solder (60:40)	952	Kg.	0.75	714	Esc
22	Solder Flux	114	Tin	1	114	Esc
23	Danger Plate	116	No	1	116	Esc
24	Barbed Wire	69	Kg.	15	1035	Esc
25	LT Cable (3.5 Core) 35 mm <sup>2</sup>	112	m	15	1680	Esc
26	Energy Meter (3-Phase, 4-Wire) DLMS compliant 50 A CT Type for 25KVA Transformer	11014	No	1	11014	Esc
27	Aluminium Paint.	350	Ltr	4	1400	Est
28	LT Switched Capacitors 9- KVA for 25 KVA (rate per KVA)	696	No	9	6264	Esc
	<b>Add:</b> [Cost of Essential Optional Sub-Configurations Required as per Site Conditions				X	
	<b>Estimated Cost of Material</b>		X	+	147300	
	<b>Add:</b> [Cost of Optional Miscellaneous Items (Protective Gear, T&P etc) not included here] (After Justification and with Approval)	2.5%	0.025X	+	3683	
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>		1.025X	+	150983	

A Pole Mounted Sub Stations shall be used upto 100 KVA transformer rating. Sub Stations of capacities > 100 KVA shall be floor mounted - civil platform / bed based.

<sup>1</sup> For Transformer Ratings > 25KVA, the allied structure and equipment specifications shall be worked out accordingly

<sup>3</sup> Concrete Filling not included in earlier Cost Data; Where Muffs are not available we may opt for concreting

<sup>9</sup> Isolators may be preferred

<sup>11</sup> Polymeric Lightening Arrestors may be used except in snow bound areas

\*\* Cost Includes VAT / Sales Tax / GST

**B) Optional Scope of Items (if Included in Estimate):****Refer Main Cost Database****C) \*\* ADD: Additional Charges and Taxes (Including Overhead Charges):****Refer Annexure 'A'****D) Note:** The Material / Equipment specifications shall conform to relevant IS / IEC Standards. The Construction / laying of 33KV line shall conform to relevant REC standards and regulations 47 to 73 under Chapter IV (Part-B) of CEA (Technical standard) Regulation 2010 and amendments there to.

  
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**CONFIGURATION 9: (Distribution Substation 22/0.4 kV)**

**Cost Data**

**A) <sup>A</sup> Estimated Cost for 25 KVA, 22/0.4 kV Pole Mounted Distribution Substation**

Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09  
 Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74

S. No.	Description	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	<sup>1</sup> Distribution Transformer (Ordinary), 22/0.4 kV, 25 KVA	92000	No	1	92000	PO
2	Steel Tubular Poles (9 m, Working Load > 200 kgf/m <sup>2</sup> )	8172	No	2	16344	PO
3	<sup>3</sup> Muffs with concrete filling	1549	No	2	3098	Esc
4	X-Arm: [Channel Iron (100x50x5 mm), Length : 2800 mm X 4 Nos	420	m	11	4704	Est
5	X-Arm: [Channel Iron (75x40x5 mm), Length : 2800 mm X 4 Nos] for supporting DO fuse unit & GO switch	212	m	6	1187	Est
6	X-Arm [Channel Iron (100x50x5 mm), Length : 460 mm x 2 Nos for supporting Main Channel of Transformer	420	Kg.	7.34	3083	Est
7	MS Angle Iron (50X50x5 mm), Length : 2800 mm x (1 Nos for LA's + 2 No. for Dist Panel Box)	164	m	8.40	1378	Est
8	<b>Transformer Belting &amp; Knee Bracing</b>					
a	MS Angle Iron (50X50x5 mm), Length : 2800 mm x 4 Nos	164	m	11.2	1837	Est
b	MS Angle Iron (35X35x5 mm), Length: 460 mm x 2 Nos	146	m	0.9	134	Est
9	G.O Switch Unit (22 kV, 400A, 25 kA )	7043	Set.	1	7043	PO
10	D.O Fuse Unit	3732	Set.	1	3732	Esc
11	<sup>11</sup> Surge Arrester, 18 kV Station Class (Porcelain Type)	932	No	3	2796	Esc
12	Discs insulator sets (comprising 2 No. Disc: <sup>^</sup> (Porcelain, BS, 12 kV, 90 kN) including Dead End Clamps etc.)	1289	Set.	3	3867	Est
13	Stay set complete	771	Set.	4	3084	Esc
14	Stay Wire (7/3.15 mm) (6.0 kg Per Stay Set)	61	Kg.	12	732	Esc
15	Pipe Earthing Set	2969	Set.	3	8907	Esc
16	LT Distribution Panel Box with MCCB(40A, 25 kA, 4P) and SFU(16A, 4No, rewirable)	19300	Set.	1	19300	Est
17	Half Clamp (M.S. Flat 50X6 mm)	67	No.	22	1474	Esc
18	Nuts and Bolts of Various Sizes (Galvanised / Coated) [Preferably 16 mm Φ or more (with flat and spring washers)]	86	Kg.	25	2150	Esc
19	Aluminium Thimble	36	No	16	576	Esc
20	Aluminium Thimble	295	No	4	1180	PO
21	Lead-Tin Solder (60:40)	952	Kg.	0.75	714	Esc
22	Solder Flux	114	Tin	1	114	Esc
23	Danger Plate	116	No	1	116	Esc
24	Barbed Wire	69	Kg.	15	1035	Esc
25	LT Cable (3.5 Core) 35 mm <sup>2</sup>	112	Mtr	15	1680	Esc
26	Energy Meter (3-Phase, 4-Wire) DLMS compliant 50 A CT Type for 25 KVA Transformer	11014	No	1	11014	Esc
27	Aluminium Paint.	350	Ltr	4	1400	Est
28	LT Switched Capacitors 9- KVAR for 25 KVA (rate per KVAR)	696	No	9	6264	Esc
	<b>Add: [Cost of Essential Optional Sub-Configurations Required as per Site Conditions</b>				X	
	<b>Estimated Cost of Material</b>		X	+	<b>200943</b>	
	<b>Add: [Cost of Optional Miscellaneous Items (Protective Gear, T&amp;P etc) not included here] (After Justification and with Approval)</b>	<b>2.5%</b>	<b>0.025X</b>	+	<b>5024</b>	
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>		<b>1.025X</b>	+	<b>205967</b>	

A Pole Mounted Sub Stations shall be used upto 100 KVA transformer rating. Sub Stations of capacities > 100 KVA shall be floor mounted - civil platform / bed based.

<sup>1</sup> For Transformer Ratings > 25KVA, the allied structure and equipment specifications shall be worked out accordingly

<sup>3</sup> Concrete Filling not included in earlier Cost Data; Where Muffs are not available we may opt for concreting

\*\* Cost Includes VAT / Sales Tax / GST

<sup>11</sup> Polymeric Lightning Arrestors may be used except in snow bound areas

**B) Optional Scope of Items (if Included in Estimate):**

**Refer Main Cost Database**

**C) \*\* ADD: Additional Charges and Taxes (Including Overhead Charges):**

**Refer Annexure 'A'**

**D) Note:** The Material / Equipment specifications shall conform to relevant IS / IEC Standards. The Construction / laying of 33KV line shall conform to relevant REC standards and regulations 47 to 73 under Chapter IV (Part-B) of CEA (Technical standard) Regulation 2010 and amendments there to.

  
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**CONFIGURATION 10: (Distribution Substation 11/0.4 kV)**

**Cost Data**

**A) <sup>A</sup> Estimated Cost for 400 KVA, 11/0.4 kV Outdoor Type Distribution Substation**

Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09  
 Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74

Sr.	Description	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	<sup>1</sup> Distribution Transformer (Outdoor Type) , 11/0.4 kV, 400 KVA	457505	No	1	457505	PO
2	Steel Tubular Poles (9 m, Working Load > 200 kgf/m <sup>2</sup> )	8172	No	2	16344	PO
3	<sup>3</sup> Muffs with concrete filling	1549	No	2	3098	Esc
4	X-Arm: [Channel Iron (100x50x5 mm), Length : 2800 mm x 2 Nos	420	m	5.6	2352	Est
5	X-Arm: [Channel Iron (75x40x5 mm), Length : 2800 mm x 4 Nos] for supporting DO fuse unit & GO switch	212	m	11.2	2374	Est
6	MS Angle Iron (50X50x5 mm), Length : 2800 mm x 1 Nos for LA's	164	m	2.8	459	Est
7	Transformer Bed [Civil Work (As per HPSR)]	25000	Job	1	25000	Est
8	G.O Switch Unit (11kV, 400A, 25 kA )	5704	Set.	1	5704	PO
9	D.O Fuse Unit	1903	Set.	1	1903	Esc
10	<sup>10</sup> Surge Arrester, 9 kV Station Class (Porcelain Type)	848	No	3	2544	Est
11	Discs insulator sets (comprising 1 No. Disc: ^^ (Porcelain, BS, 12 kV, 90 kN) including Dead End Clamps etc.)	1082	Set	3	3246	Est
12	Stay set complete	771	Set.	2	1542	Esc
13	Stay Wire (7/3.15 mm) (6.0 kg Per Stay Set)	61	Kg	20	1220	Esc
14	Pipe Earthing Set	2969	Set	3	8907	Esc
15	LT Distribution Panel Box with ACB(630A,50 kA, 4P, 1 No) and SFU(100A, 6 No, rewirable)	190600	Set	1	190600	Est
16	Half Clamp (M.S. Flat 50x5 mm)	67	No	14	938	Esc
17	Nuts and Bolts of Various Sizes (Galvanised / Coated) [Preferably 16 mm Φ or more (with flat and spring washers)]	86	Kg	25	2150	Esc
18	Aluminium Thimble	36	No	16	576	Esc
19	Aluminium Thimble	295	No	4	1180	PO
20	Lead-Tin Solder (60:40)	952	Kg.	0.75	714	Esc
21	Solder Flux	114	Tin	1	114	Esc
22	Danger Plate	116	No	1	116	Esc
23	Chain Link Fencing, Angle Iron, Gate etc. for transformer fencing	20000	Job	1	20000	Est
24	LT Cable (3.5 Core) 400 mm <sup>2</sup> x 2 incoming	882	m	14	12348	PO
25	LT Cable (3.5 Core) 70 mm <sup>2</sup> x 6 outgoing feeder	162	m	90	14580	PO
26	Energy Meter (3-Phase, 4-Wire) DLMS compliant 400 A CT Type for 400 KVA Transformer	10309	No	1	10309	Esc
27	Aluminium Paint	350	Ltr	4	1400	Est
	<b>Add:</b> [Cost of Essential Optional Sub-Configurations Required as per Site Conditions				X	
	<b>Estimated Cost of Material</b>		X	+	787224	
	<b>Add:</b> [Cost of Optional Miscellaneous Items (Protective Gear, T&P etc) not included here] (After Justification and with Approval)	2.5%	0.025X	+	19681	
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>		1.025X	+	806904	

A Sub Stations of capacities > 100 KVA shall be floor mounted - civil platform / bed based.

<sup>1</sup> For Transformer Ratings other than 400 KVA, the allied structure and equipment specifications shall be worked out accordingly

<sup>3</sup> Concrete Filling not included in earlier Cost Data; Where Muffs are not available we may opt for concreting

\*\* Cost Includes VAT / Sales Tax / GST

<sup>10</sup> Polymeric Lightning Arrestors may be used except in snow bound areas

**B) Optional Scope of Items (if Included in Estimate):**

**Refer Main Cost Database**

**C) \*\* ADD: Additional Charges and Taxes (Including Overhead Charges):**

**Refer Annexure 'A'**

**D) Note:** The Material / Equipment specifications shall conform to relevant IS / IEC Standards. The Construction / laying of 33KV line shall confirm to relevant REC standards and regulations 47 to 73 under Chapter IV (Part-B) of CEA (Technical standard) Regulation 2010 and amendments there to.

  
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**CONFIGURATION 11: (Distribution Substation 11/0.23 kV)****Cost Data****A) Estimated Cost for 6.3 KVA, 11/0.23 kV, 1-Ø Distribution Substation**

Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09  
 Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74

Sr. No.	Description	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	1-Ø Distribution Transformer (Ordinary), 11/0.23 kV, 6.3 kVA	22920	No	1	22920	Esc
2	Steel Tubular Poles (9 m, Working Load > 200 kgf/m <sup>2</sup> )	8172	No	1	8172	PO
3	<sup>3</sup> Muffs with concrete filling	1549	No	1	1549	Esc
4	X Arm [Channel Iron : (100X50x5 mm), Length : 1500 mm]	420	m	2	630	Est
5	X Arm [Channel Iron : (100X50x5 mm), Length : 1500 mm] for GO Switch	420	m	2	630	Est
6	Bracing Set - MS Angle Iron: 50x50x5, Length : [750 mm x 2 No.]	164	m	2	246	Est
7	Double pole G.O Switch Unit (11kV, 400A, 25 kA )	5704	No	1	5704	PO
8	<sup>8</sup> Surge Arrester, 9 kV Station Class (Porcelain Type)	848	No	2	1696	Est
9	Discs insulator sets (comprising 1 No. Disc: ^^ (Porcelain, BS, 12 kV, 90 kN) including Dead End Clamps etc.)	1082	Set	2	2164	Est
10	Stay set complete	771	Set.	2	1542	Esc
11	Stay Wire (7/3.15 mm) (6.0 kg Per Stay Set)	61	Kg	12	732	Esc
12	Nuts and Bolts of Various Sizes (Galvanised / Coated) [Preferably 16 mm Φ or more (with flat and spring washers)]	86	Kg	15	1290	Esc
13	Pipe Earthing Set	2969	Set	3	8907	Esc
14	Aluminium Thimble	295	No	6	1770	PO
15	Lead-Tin Solder (60:40)	952	Kg.	0.5	476	Esc
16	Solder Flux	114	Tin	0.5	57	Esc
17	Danger Plate	116	No	1	116	Esc
18	Energy Meter (1-Phase) DLMS compliant 10-60 A CT Type	795	No	2	1590	Esc
19	Aluminium Paint.	350	Ltr	2	700	Est
20	PVC Cable T/C 16 mm <sup>2</sup>	268	Mt.	10	2680	Est
21	Barbed Wire	69	Kg.	4	276	Esc
22	LT Distribution Panel Box with MCCB(40A, 25 kA, DP) and SFU(16A, 4No, rewirable)	3600	No	1	3600	Est
	<b>Add:</b> [Cost of Essential Optional Sub-Configurations Required as per Site Conditions				X	
	<b>Estimated Cost of Material</b>		X	+	67447	
	<b>Add:</b> [Cost of Optional Miscellaneous Items (Protective Gear, T&P etc) not included here] (After Justification and with Approval)	2.5%	0.025X	+	1686	
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>		1.025X	+	69133	

\*\* Cost Includes VAT / Sales Tax / GST

<sup>3</sup> Concrete Filling not included in earlier Cost Data; Where Muffs are not available we may opt for concreting

<sup>8</sup> Polymeric Lightening Arrestors may be used except in snow bound areas

**B) Optional Scope of Items (if Included in Estimate):** Refer Main Cost Database

**C) \*\* ADD: Additional Charges and Taxes (Including Overhead Charges):** Refer Annexure 'A'

**D) Note:** The Material / Equipment specifications shall conform to relevant IS / IEC Standards. The Construction / laying of 33KV line shall conform to relevant REC standards and regulations 47 to 73 under Chapter IV (Part-B) of CEA (Technical standard) Regulation 2010 and amendments there to.

  
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**CONFIGURATION 12: (Service Connections)**

**Cost Data**

**A) Estimated Cost of 1-Ø Domestic Service Connection**

Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09  
 Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74

S. No.	Description	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	Pole Clamp	83	No	1	83	Esc
2	T/C PVC 10 mm <sup>2</sup>	16	m	4	64	Esc
3	T/C PVC 6 mm <sup>2</sup>	11	m	20	220	Esc
4	G.I Wire 8 SWG	66	Kg	2	132	Esc
5	Link Clip 80x8 mm	25	Pkt	1	25	Esc
6	Black Tape	5	m	1	5	Esc
7	Guy G.I. Wire with Clamp	17	No	1	17	Esc
8	RAG Bolt (16X105) mm	24	No	2	48	Esc
9	RAG Bolt (16X150) mm	28	No	3	84	Esc
10	Anchor Hook	21	No	2	42	Esc
11	Meter Box	376	No	1	376	Esc
12	Kit Kat Fuse Unit 16 A, 240 V	50	No	1	50	Est
13	GI Bolt for Earth Terminal (12X75) mm	15	No	3	45	Esc
14	Polycarbonate seal	16	No	3	48	Esc
15	1-Ø Energy Meter (5-30A/10-40A)	773	No	1	773	Esc
16	T-Connector	28	No	2	56	Esc
	<b>Add: Cost of Essential Optional Sub-Configurations Required as per Site Conditions</b>					X
	<b>Estimated Cost of Material</b>		X	+	<b>2068</b>	
	<b>Add: [Cost of Optional Miscellaneous Items (Protective Gear, T&amp;P etc) not included here] (After Justification and with Approval)</b>	<b>2.5%</b>	<b>0.025X</b>	+	<b>52</b>	
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>		<b>1.025X</b>	+	<b>2120</b>	

**Estimated Cost of 3-Ø Commercial Service Connection**

S. No.	Description	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	Pole Clamp	83	No	1	83	Esc
2	T/C PVC 10 mm <sup>2</sup>	16	m	4	64	Esc
3	4 Core PVC Cable 16 mm <sup>2</sup> for 3 Phase (Commercial)		m	20	1420	Esc
4	G.I Wire 8 SWG	66	Kg	2	132	Esc
5	Link Clip 80x8 mm	25	Pkt	1	25	Esc
6	Black Tape	5	m	1	5	Esc
7	Guy G.I. Wire with Clamp	17	No	1	17	Esc
8	RAG Bolt (16X105) mm	24	No	2	48	Esc
9	RAG Bolt (16X150) mm	28	No	3	84	Esc
10	Anchor Hook	21	No	2	42	Esc
11	Meter Box	376	No	1	376	Esc
12	Kit Kat Fuse Unit 32 A, 415 V	125	No	1	125	Esc
13	GI Bolt for Earth Terminal (12X75) mm	15	No	3	45	Esc
14	Polycarbonate seal	16	No	3	48	Esc
15	3 Phase 4 wire energy Meter (10-60A)		No	1	3838	Esc
16	T-Connector	28	No	2	56	Esc
	<b>Add: Cost of Essential Optional Sub-Configurations Required as per Site Conditions</b>					X
	<b>Estimated Cost of Material</b>		X	+	<b>6408</b>	
	<b>Add: [Cost of Optional Miscellaneous Items (Protective Gear, T&amp;P etc) not included here] (After Justification and with Approval)</b>	<b>2.5%</b>	<b>0.025X</b>	+	<b>160</b>	
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>		<b>1.025X</b>	+	<b>6568</b>	

\*\* Cost Includes VAT / Sales Tax / GST

**B) Optional Scope of Items (if Included in Estimate):** Refer Main Cost Database

**C) \*\* ADD: Additional Charges and Taxes (Including Overhead Charges):** Refer Annexure 'A'

**D) NOTE:-**

a) The Material / Equipment specifications shall conform to relevant IS / IEC Standards. The Construction / laying of 33KV line shall conform to relevant REC standards and regulations 90 to 111 under Chapter V (Part-B) of CEA (Technical standard) Regulation 2010 and amendments there to.

b) This is broad based Cost Data for cost estimation only and is not intended as a Design substitute. The Design for the construction shall be based on construction standards which shall be prepared separately at the time of Framing Estimates. The drawings given in the cost data are indicative and field units may make upward modification / improvements so as to include for or improve stability and safety.

c) Estimate for GSC should be prepared as per site requirement as well as on need basis.

d) Earthing of wiring should be mandatory.

  
 Assistant Engineer

  
 Sr. Executive Engineer

  
 Superintending Engineer

**CONFIGURATION 13: (Service Connections)**

**Cost Data**

**A) Estimated Cost of 1-Ø Industrial/ Agricultural Connection upto 20 kW**

Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09  
 Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74

S. No.	Description	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	Pole Clamp	83	No	1	83	Esc
2	T/C PVC Cable 25 mm <sup>2</sup>	41	Mtr	30	1230	PO
3	G.I. Wire 8 SWG	66	Kg	3	198	Esc
4	A.I (50X50x6/5") mm Length 2m	164	Kg	2	328	Est
5	Eye Bolt (16X300) mm	32	No	1	32	Esc
6	Eye Hook/G.I. Wire Guy	17	No	1	17	Esc
7	RAG Bolt (16X225) mm	30	No	4	120	Esc
8	RAG Bolt (16X150) mm	28	No	4	112	Esc
9	Meter Box	578	No	1	578	Esc
10	Kit Kat Fuse Unit 32 A, 240 V	70	No	1	70	Est
11	G.I Bolt for Earth terminal (12X75) mm	15	No	1	15	Esc
12	T-Connector	28	No	4	112	Esc
13	Black Tape	5	Roll	1	5	Esc
14	Link Clip	25	Pkt	2	50	Esc
15	Polycarbonate seal	16	No	6	96	Esc
16	Crimping Thimble	10	No	6	60	Esc
17	1-Ø 2 wire Static Energy Meter 5-20 A	773	No	1	773	Esc
	<b>Add:</b> [Cost of Essential Optional Sub-Configurations Required as per Site Conditions					X
	<b>Estimated Cost of Material</b>			X	+	3879
	<b>Add:</b> [Cost of Optional Miscellaneous Items (Protective Gear, T&P etc) not included here](After Justification and with Approval)	2.5%	0.025X		+	97
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>		1.025X		+	3976

**Estimated Cost of 3-Ø Industrial/ Agricultural Connection upto 20 kW**

S. No.	Description	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	Pole Clamp	83	No	1	83	Esc
2	3.5 Core PVC Cable 25 mm <sup>2</sup> for 3 Phase	60	m	30	1800	Esc
3	G.I. Wire 8 SWG	66	Kg	3	198	Esc
4	A.I (50X50x5) mm Length 2m	164	Kg	2	328	Est
5	Eye Bolt (16X300) mm	32	No	1	32	Esc
6	Eye Hook/G.I. Wire Guy	17	No	1	17	Esc
7	RAG Bolt (16X225) mm	30	No	4	120	Esc
8	RAG Bolt (16X150) mm	28	No	4	112	Esc
9	Meter Box	578	No	1	578	Esc
10	Kit Kat Fuse Unit 63 A, 415 V	220	No	1	220	Est
11	G.I Bolt for Earth terminal (12X75) mm	15	No	1	15	Esc
12	T-Connector	28	No	4	112	Esc
13	Black Tape	5	Roll	1	5	Esc
14	Link Clip	25	Pkt	2	50	Esc
15	Polycarbonate seal	16	No	6	96	Esc
16	Crimping Thimble	10	No	6	60	Esc
17	3 Phase 4 wire static energy Meter (10-60A)	3838	No	1	3838	Esc
	<b>Add:</b> Cost of Essential Optional Sub-Configurations Required as per Site Conditions					X
	<b>Estimated Cost of Material</b>			X	+	7664
	<b>Add:</b> [Cost of Optional Miscellaneous Items (Protective Gear, T&P etc) not included here] (After Justification and with Approval)	2.5%	0.025X		+	192
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>		1.025X		+	7856

\*\* Cost Includes VAT / Sales Tax / GST


**B) Optional Scope of Items (if Included in Estimate):** Refer Main Cost Database

**C) \*\* ADD: Additional Charges and Taxes (Including Overhead Charges):** Refer Annure 'A'

**D) NOTE:**

- The Material / Equipment specifications shall conform to relevant IS / IEC Standards. The Construction / laying of 33KV line shall confirm to relevant REC standards and regulations 90 to 111 under Chapter V (Part-B) of CEA (Technical standard) Regulation 2010 and amendments there to.
- This is broad based Cost Data for cost estimation only and is not intended as a Design substitute. The Design for the construction shall be based on construction standards which shall be prepared separately at the time of Framing Estimates. The drawings given in the cost data are indicative and field units may make upward modification / improvements so as to include for or improve stability and safety.
- Estimate for GSC should be prepared as per site requirement as well as on need basis.
- Earth leakage circle breaker is required to be checked by the JE Concerned as the same has been provided in the wiring by the consumer.
- Earthing of wiring should be mandatory.

  
Assistant Engineer

  
Sr. Executive Engineer  
28/58

  
Superintending Engineer

**CONFIGURATION 14: (Service Connections)**

**Cost Data**

**A) Estimated Cost of 3-Ø Industrial/ Agricultural Connection ≤ 50KW**

Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09  
 Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74

S. NO.	Description	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	Pole Clamp	83	No	1	83	Esc
2	3.5 Core PVC Cable 95 mm <sup>2</sup>	186	Mtr	20	3720	Esc
3	G.I Wire 8 SWG	66	Kg	2	132	Esc
4	T-Connector	28	No	4	112	Esc
5	A.I (50x50x5) mm	249	Mtr	2	498	Esc
6	Eye Bolt (16x300) mm	32	No	1	32	Esc
7	Eye Hook with G.I Wire Guy	17	No	1	17	Esc
8	RAG Bolt (16x225) mm	30	No	4	120	Esc
9	RAG Bolt (16x150) mm	28	No	4	112	Esc
10	L.T Switch 200A	3806	No	1	3806	Esc
11	Black Tape	5	Roll	1	5	Esc
12	Polycarbonate seal	16	No	6	96	Esc
13	3-Ø, 4-Wire Trivector Meter with 200/5A CT. with meter box	13499	No	1	13499	Esc
14	Crimping Thimbles	10	No	6	60	Esc
15	G.I. Bolt for earth Terminal (12x75) mm	15	No	1	15	Esc
	<b>Add: [Cost of Essential Optional Sub-Configurations Required as per Site Conditions]</b>					X
	<b>Estimated Cost of Material</b>		X	+	22307	
	<b>Add: [Cost of Optional Miscellaneous Items (Protective Gear, T&amp;P etc) not included here](After Justification and with Approval)</b>	2.5%	0.025X	+	558	
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>		1.025X	+	22865	

\*\* Cost Includes VAT / Sales Tax

**B) Optional Scope of Items (if Included in Estimate):**


Refer Main Cost Database

**C) \*\* ADD: Additional Charges and Taxes (Including Overhead Charges):**

Refer Annexure 'A'

<b>D) NOTE:</b>
a) The Material / Equipment specifications shall conform to relevant IS / IEC Standards. The Construction / laying of 33KV line shall conform to relevant REC standards and regulations 90 to 111 under Chapter V (Part-B) of CEA (Technical standard) Regulation 2010 and amendments there to.
b) This is broad based Cost Data for cost estimation only and is not intended as a Design substitute. The Design for the construction shall be based on construction standards which shall be prepared separately at the time of Framing Estimates. The drawings given in the cost data are indicative and field units may make upward modification / improvements so as to include for or improve stability and safety.
c) Estimate for GSC should be prepared as per site requirement as well as on need basis.
d) Earth leakage circle breaker is required to be checked by the JE Concerned as the same has been provided in the wiring by the consumer.
e) Any connection above <b>50 kW</b> should be on HT.
f) Earthing of wiring should be mandatory.

  
 Assistant Engineer

  
 Sr. Executive Engineer  
 29/58

  
 Superintending Engineer

**CONFIGURATION 15: (Street Light Point on Existing Pole)**

**Cost Data**

**A) <sup>A</sup> Estimated Cost of Street Light Point on Existing Pole)**

Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09  
 Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74

S. No.	Description	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	<sup>1</sup> AAAC 20 mm <sup>2</sup>	12	m	60	720	Esc
2	Pipe Bend, Clamps, nuts & Bolts, Shackle Insulator, D Clamp etc	800	LS	1	800	Est
3	Twin Core PVC Cable 1.5 mm <sup>2</sup>	7	m	2	14	Est
4	Photo Switches (Static Switch)	400	No	1	400	Est
5	<sup>5</sup> LED Fitting Complete (18 W)	1250	Set	1	1250	Est
	<b>Add:</b> [Cost of Essential Optional Sub-Configurations Required as per requirement]				X	
	<b>Estimated Cost of Material</b>		X	+	3184	
	<b>Add:</b> [Cost of Optional Miscellaneous Items not included here] (After Justification and with Approval)	2.5%	0.025X	+	80	
	<b>TOTAL ESTIMATED COST of MATERIAL **</b>		1.025X	+	3264	

<sup>A</sup> The Cost shall be deposited by the Agency / Local Body

<sup>1</sup> Cost is based on Ruling Span

<sup>5</sup> LED fittings of higher ratings may be included in Estimates with justification (such as based on area to be illuminated) only under special circumstances and after prior approval of higher office

\* Based on availability

\*\* Cost Includes VAT / Sales Tax

**B) Optional Scope of Items (if Included in Estimate):**

**Refer Main Cost Database**


**C) \*\* ADD: Additional Charges and Taxes (Including Overhead Charges):**

**Refer Annexure 'A'**

**D) NOTE:**

- a) The Material / Equipment specifications shall conform to relevant IS / IEC Standards. The Construction / laying of 33KV line shall confirm to relevant REC standards and regulations 90 to 111 under Chapter V (Part-B) of CEA (Technical standard) Regulation 2010 and amendments there to.
- b) This is broad based Cost Data for cost estimation only and is not intended as a Design substitute. The Design for the construction shall be based on construction standards which shall be prepared separately at the time of Framing Estimates. The drawings given in the cost data are indicative and field units may make upward modification / improvements so as to include for or improve stability and safety.
- c) Estimate for GSC should be prepared as per site requirement as well as on need basis.
- d) Earth leakage circle breaker is required to be checked by the JE Concerned as the same has been provided in the wiring by the consumer.
- e) Earthing of wiring should be mandatory.

  
**Assistant Engineer**

  
**Sr. Executive Engineer**  
 30/58

  
**Superintending Engineer**

**Configuration 16 (33/ 11 kV, 3.15 MVA - Single)****Cost Data****A) Estimated Cost of 33/11 kV, 3.15 MVA Substation (with Single Power Transformer)**

(With Single 33 kV Incomer Bus / Bay, Single 11 kV Bus from Transformer, Single 11 kV Outgoing feeder)

Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09  
 Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74

S.N.	Description of item	Rate	Unit	Qty	Cost (Rs/ Km) (Man)	CD Basis (PO/ Esc / Est/ MR)
<b>1</b>	<b>Transformer(s)</b>					
a	<sup>a</sup> <b>Power Transformer</b> (3.15 MVA, 33/11 kV, ONAN, OLTC, Outdoor)	2760000	No.	1	2760000	PO
b	<sup>b</sup> <b>Sub Station Transformer</b> (100 kVA, 33/0.4 kV)	359731	No.	1	359731	Esc
<b>2</b>	<b>33 kV Switchgear &amp; Allied Equipment: with 01 No., 33 kV Incomer</b>					
a	33 kV <b>Control and Relay (CR) Panel</b> (with Numeric Differential Relay, IEC 61850)	354604	Set	1	354604	PO
b	33 kV <b>Control and Relay (CR) Panel</b> (33 kV Incomer Bus) [Numeric Relay, IEC 61850]	325028	Set	1	325028	PO
c	33 kV <b>VCB</b> (36 kV, 1250A, 26.2 kA, Outdoor Type)	218549	Set	2	437098	PO
d	33 kV <b>Isolator</b> (800 A, 25kA, with Earth Switch)	102616	Set	1	102616	PO
e	33 kV <b>Isolator</b> (800 A, 25kA, without Earth Switch)	76026	Set	2	152052	PO
f	33 kV <b>LA /Surge Arrester</b> (30 kV, 10KA, Station class, ZnO, Porcelain)	6700	No.	6	40200	PO
g	33 kV <b>Current Transformer</b> (33 kV, 1Φ, Multi Ratio Multi Core, Outdoor) (1 No. per Φ)	59457	No.	6	356742	PO
h	33 kV <b>Potential Transformer</b> (33 kV/110 V, 1Φ, Multi-Core, Outdoor), (1No. per Φ)	29500	No.	3	88500	PO
i	33 kV <b>Drop Out Fuse Unit</b> (33 kV, Expulsion)	11424	Set	1	11424	Esc
<b>3</b>	<b>11 kV Switchgear and Allied equipment: 01 No. incomer Bus</b>					
a	11 kV incomer Bus: <b>Control and Relay (CR) Panel with VCB</b> (12 kV, 1250 A, 25KA) [Numeric Relay, IEC 61850]	505000	Set	1	505000	PO
b	11 kV Incomer Bus: <b>Potential Transformer</b> (11 kV/110V, 3Φ, Indoor)	10000	Set	1	10000	Est
c	11 kV <b>LA/ Surge Arrester</b> (9 KV, Station Class, ZnO, Porcelain, Outdoor)	848	No.	3	2544	PO
d	11 kV <b>Cable</b> (11 kV, 400 mm <sup>2</sup> , XLPE, Three Core, Armoured) {Transformer to 11 kV Bus} {50m+ Spare- 50m}	1306	m	100	130600	PO
e	11 kV <b>Cable Termination Kit</b> (400 mm <sup>2</sup> , Outdoor)	1800	No.	3	5400	Est
f	11 kV <b>Cable Termination Kit</b> (400 mm <sup>2</sup> , Indoor)	1536	No.	3	4608	Est
<b>4</b>	<sup>4</sup> <b>11 kV Switchgear and Allied equipment: Single (1 No.) Outgoing Feeder</b>					
a	11 kV Outgoing Feeder: <b>Control and Relay (CR) Panel with VCB</b> (12 kV, 1250 A, 25KA) including CT	395000	Set	1	395000	PO
b	11 kV Incomer Bus: <b>Potential Transformer</b> (11 kV/110V, 3Φ, Indoor)	10000	No.	1	10000	Est
c	11 kV <b>Isolator</b> (12 kV, 630 A, 25 kA, without Earth Switch, Outdoor)	22490	Set	1	22490	PO
d	11 kV <b>LA/ Surge Arrester</b> (9 kV, Station Class, ZnO, Porcelain, Outdoor)	848	No.	3	2544	PO
e	11 kV <b>Cable</b> (11 kV, 185 mm <sup>2</sup> , XLPE, Three Core, Armoured) {Busbar VCB to Isolator} {50m+ Spare- 50m}	782	mtr	100	78200	PO
f	11 kV <b>Cable Termination Kit</b> (185 mm <sup>2</sup> , Outdoor)	1800	No.	1	1800	PO
g	11 kV <b>Cable Termination Kit</b> (185 mm <sup>2</sup> , Indoor)	1536	No.	1	1536	PO
<b>5</b>	<b>LT Cable (1.1 kV, 3.5 Core, 70 mm2)</b> {from Station Tfr}	162	mtr	100	16200	PO
<b>6</b>	<b>CAPACITOR BANK:-</b> (REC Spec. 19/1981)					
a	<sup>6a</sup> <b>Capacitor Bank</b> (3-Φ, 50 Hz, 1200 KVAR) [ IS:2834 ]	696594	No	1	696594	Esc
b	<b>Automatic Capacitor Switch</b> (12 kV, 1250 A, 25 kA) [REC Spec. 20/1981]	200000	No	1	200000	Est

  
Assistant Engineer

  
Sr. Executive Engineer

  
Superintending Engineer

**Configuration 16 (33/ 11 kV, 3.15 MVA - Single)**

**Cost Data**

A) **Estimated Cost of 33/11 kV, 3.15 MVA Substation (with Single Power Transformer)**  
 (With Single 33 kV Incomer Bus / Bay, Single 11 kV Bus from Transformer, Single 11 kV Outgoing feeder)

<b>7</b>	<b>GENERAL EQUIPMENT:-</b>					
a	<b>Battery Bank with Battery Charger</b> (15 No x 2V Cell, Lead Acid, 30 V, 100 AH)	120248	No.	1	120248	Esc
b	<b>Distribution Panel</b> (30V, DC)	47567	No.	1	47567	PO
c	<b>Distribution Panel</b> (415 V, AC)	611520	No.	1	611520	Esc
<b>8</b>	<b>TELECOMMUNICATION FACILITIES</b>					
a	SCADA	2591500	Set	1	2591500	Award rate
b	ADSS OFC (6 Pair / 12 Core)					
c	Routers / Switches etc					
<b>9</b>	<b>SUPERSTRUCTURE &amp; BUSBAR</b>					
a	33 kV super structure & busbar	513880	job	1	513880	Est
b	11 kV super structure & busbar per feeder	39818	job	1	39818	Est
<b>10</b>	<b>EARTHING</b> (33 kV Sub-Station)	236830	job	1	236830	Est
<b>11</b>	<b>Yard &amp; Colony Fencing</b>	426651	job	1	426651	Est
<b>12</b>	<b>LIGHTING</b>					
a	<b>Yard Lighting</b>	67157	job	1	67157	Est
b	<b>Lighting Emergency</b> (3 No LED Bulbs with holders / wire)	1000	No	1	1000	Est
<b>13</b>	Control and LT power cables	103350	job	1	103350	Est
<b>14</b>	<b>Add: [Cost of Essential Optional Sub-Configurations</b>					Y
	<b>Estimated Cost of the material / Equipment</b>		Y	+	<b>11830032</b>	
<b>15</b>	<b>Add: [Cost of Optional Miscellaneous Items (Protective Gear, T&amp;P, Safety Provisions, Safety Equip etc) not included here] (After Justification and with Approval)</b>	5%	0.05Y	+	<b>591502</b>	
	<b>TOTAL ESTIMATED COST of MATERIAL / EQUIPMENT **</b>		<b>0.05Y</b>	<b>+</b>	<b>12421533</b>	
<b>16</b>	<b>CIVIL WORKS</b>					
a	<b>Transformer Foundation</b>	36640	job	1	36640	Est
b	<b>Trenches</b>	338061	job	1	338061	Est
c	<b>Baffle wall (As per HPSR)</b>					Z
d	<b>Oil Sump</b>	50000	job	1	50000	Est
	<b>TOTAL ESTIMATED COST of CIVIL WORKS **</b>		<b>Z</b>	<b>+</b>	<b>424701</b>	
	<b>TOTAL ESTIMATED COST of SUB STATION **</b>		<b>0.05Y + Z</b>	<b>+</b>	<b>12846235</b>	

\*\* Cost Includes VAT / Sales Tax

<sup>a</sup> For transformers of capacity more than 10 MVA, ONFA Tfrs / Nitrogen Injection system to be considered.

<sup>b</sup> Provision of oil pit should be kept under transformers to collect oil spills.

<sup>4</sup> The number of outgoing feeders along with allied equipment shall be as per requirement and resultant cost shall be multiple of this number.

<sup>6a</sup> Refer REC Specifications 19/1981 (Capacitor Bank at 33/11 kV Sub-Station), 20/1981 (11 kV Circuit Breakers for Controlling Capacitors) & 35/1984 (Pole Mounted Switched Capacitors)

B) **Optional Scope of Items (if Included in Estimate):** **Refer Main Cost Database**

C) **\*\* ADD: Additional Charges and Taxes (Including Overhead Charges):** **Refer Annexure 'A'**

**NOTE:**

D1) The Material / Equipment specifications shall conform to relevant IS / IEC Standards. The Construction / laying of 33KV line shall conform to relevant REC standards and regulations 47 to 73 under Chapter IV (Part-B) of CEA (Technical standard) Regulation 2010 and amendments there to.

D2) The cost of Additional 33 kV Bay and associated Terminal Equipment at EHV end should be taken from EHV Cost Data.

  
Assistant Engineer

  
Sr. Executive Engineer

  
Superintending Engineer



**33 KV Super Structure and Bus-bar for 33/11 kV or 33/22 KV S/Stn.**


Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09  
 Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
<b>A.</b>	<b>SUPER STRUCTURE</b>					
	(i) R.S. Joists, size 10,000x225x150 mm 12 supports i.e. (12x10x33.9)=4068 kg say 4.07 MT	43000	MT	4.07	175010	Est
	(ii) R.S. Joists, size 4200x225x150 mm supports for lightening arrester differential CT's (6x33.9x4.2) =854 kg say .854 MT	43000	MT	0.854	36722	Est
	(iii) Foundation of R.S. joists supports	5565	job	18	100167	Est
	(iv) M.S. channel iron 125x65 mm, X-arm @13.1 kg/m At 5% wastage for bus-bar,isolators,LA's,transformer etc.					
	(a) 9150 mm long =9 no. I.e. 1098.14 kg					
	(b) 4725 mm long =14 no. I.e. 882.11 kg					
	(c) 750 mm long =2 no. I.e. 20.00 kg					
	<b>Total</b> = 9.15*9+4.73*14+0.75*2=150 m	420	m	150.07	63029	Est
	(v) Add 5 % workshop charges on item A (iv) above		%	5	3151	
	(vi) M.S. angle iron 65x65 X-arm @ 5.8 kg/m & 5% wastage for body supports belt of station transformer	211	m	12.00	2534	Est
	(vii) Add 5% w/shop charge on item A(vi) above		%	5	127	
	(viii) Nuts & Bolts with Washers off sizes	86	Kg	60	5160	Esc
	<b>S/Total (A) :-</b>				<b>385901</b>	
<b>B.</b>	<b>BUS-BAR</b>					
	(i) 3 disc insulators tension string complete with fitting	1494	No.	51	76194	Esc
	(ii) ACSR conductor 200 mm <sup>2</sup> at 10 % wastage (8x4.5+1x3.5)x3x1.1=130.35 say 130 m	139	m	130	18070	PO
	For jumpers at 2 m average					
	25 sets I.e. 2x3x25x1.1=165 m	139	m	165	22935	PO
	(iii) Tee connections	232	No.	24	5568	Esc
	(iv) PG clamps	124	No.	42	5208	Esc
	<b>S/Total (B) :-</b>				<b>127975</b>	
	<b>Total (A+B) :-</b>				<b>513876</b>	
					<b>513880</b>	

**11 kV Super Structure & Busbar for 33/11 kV Sub-Station.**

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
<b>A</b>	<b>SUPPORTS</b>					
	(a) Steel tubular pole 10 m long for 4 nos. out going Feeder	12007	No.	4	48028	PO
	(b) RCC muffs & concreting thereof for 4 nos. out going Feeder	1549	No.	4	6196	Esc
	<b>S/Total (A) :-</b>				<b>54224</b>	
<b>B</b>	<b>CROSS ARMS</b>					
	(a) 3.75 m long M.S. channel iron 100X50X5 mm 9.56 kg/m Cross arms for Sub-Station With 4 nos. out going Feeder	420	m	113	47199	Est
	(b) 3.75 long M.S. angle iron 50X50X5 mm 4.5 kg/m Cross arms for Sub-Station With 4 nos. out going Feeder	164	No.	16	2625	Est
	(c) M.S. half clamps with nuts & bolts for S/Stn with 4 nos. out going Feeder	223	No.	48	10704	Esc
	<b>S/Total (B) :-</b>				<b>60529</b>	
<b>C</b>	<b>BUS-BAR</b>					
	(i) Single insulators tension string for S/Stn with 4 nos. out going Feeder	1081	No.	6	6486	Esc
	(ii) ACSR 200 mm <sup>2</sup> Conductor for 4 nos. out going Feeder for:-					
	(a) Bus-bars	139	m	23	3197	PO
	(b) Jumpers & 6 sets of jumpers at 2.5 m Average	139	m	180	25020	PO
	(iii) 11 kV Pin Insulators (Porcelain, 12 kV, 10KN): for 4 nos feeder	135	No.	14	1890	PO
	(iv) Clamps for 4 nos. out going Feeder	220	No.	36	7920	Esc
	<b>S/Total (C) :-</b>				<b>44513</b>	
	<b>Total (A+B+C):-</b>				<b>159266</b>	
	<b>Say Rs.</b>				<b>159270</b>	
	<b>Cost of 11 kV Super Structure &amp; Bus Bar per Feeder</b>				<b>39818</b>	

  
 Assistant Engineer

  
 Sr. Executive Engineer  
 33/58

  
 Superintending Engineer

**Foundation of R.S. joists**

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	(a) Round 12 mm dia = $0.925 \times 2 \times 4 + 0.625 \times 2 \times 4 + 0.4 \times 2 \times 4 + 1.927 \times 4 \times 3 = 44.804$ m Adding 10 % wastage = 49.28 m or 43.61 kg					
	(b) Round 8 mm dia = $2 \times 8 \times 0.8 + 2 \times 4 \times 0.46 + 2 \times 4 \times 0.23 + 2 \times 4 \times 0.1 = 17.52$ m after adding 10% wastage = 19.2 m Or 7.52 kg					
	Total (a+b) = 51.13 Kg	43	kg	51	2199	MR
2	(a) M.S. plate 225x160x10mm for top & bottom of R.S. joists supports i.e. $2 \times 2.84 = 5.68$ kg	43	kg	5.68	244	MR
	(b) Angle iron 50x50x6mm supports at the bottom $2 \times 0.15 = 0.3$ m	164	m	0.3	49	Est
3	M.S. 16 mm dia foundation bolts with washers and nuts etc.	86	No.	4	344	Esc
4	R.C.C. 1:2:4 = $(1.155 \times 0.96 \times 0.08) + 2(0.4 \times 0.35 \times 0.325) + 2(0.35 \times 0.208 \times 0.205) + 2(0.8 \times 0.11 \times 0.095) + 2(1.72 \times 0.205 \times 0.065) + 2(0.517 \times 0.05 \times 0.045) = 0.091 + 0.091 + 0.04 + 0.017 + 0.046 + 0.002 = 0.287$	9508	m <sup>3</sup>	0.287	2729	Esc
	<b>Total :-</b>				<b>5565</b>	

**Estimated Cost for Earthing of 33/11 kV or 33/22 kV Sub-Station with Indoor Type Switchgear**

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	Cost of Material for Earth Mat laying	174265	No	1	174265	Est
2	Earthing of 33 kV yard & equipment & 22 kV or 11kV panels M.S. flat 50x6 mm, wt. 2.4 kg/m At 5% wastage:- (a) For 3 no. Transformer earthing at 3 points (body & neutral) at 10 m Each (3x3x10) 1.05=94.5 m (b) For 3 sets of LA's at 20 mtr each 3x20x2x1.05=126 m (c) For 4 nos. 33 kV super structure at 20 mtr each 4x2x20x1.05 =168 m (d) For 2 nos. VCB & CT body earthing at 10 m Each (2x10)2x1.05 (e) For earthing of 22 kV or 11kV super structure 80 mtr each (f) For earthing of 22 kV or 11kV super structure 15 mtr each 2x15x1.05 =31.5 m Total (a+b+c+d+e+f) =542 m, 1300 kg =1.3 MT	43000	MT	1.3	55900	Est
3	Welding of risers and corrosion protection @ 5% of Sr. No.2		%	5	2795	
4	GI wire no. 6 SWG for screening etc.	66	kg	25	1650	Esc
5	Eye block for screening	74	No	30	2220	Esc
6	Turnbuckle for Screening	150	No.	30	4500	Est
	<b>Total :-</b>				<b>236830</b>	

**Schedule of cost and material Earthing Electrode (pipe type) (refer REC Construction Std. J-2)**

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	G.I. Pipe 50 mm dia with holes of 16 mm dia at 150 mm from centre to centre for 2 m Distance from bottom.	1024	No	3	3072	Esc
2	Workshop charges 5 % on item no. 1		%	5	154	
3	M.S. plates 150x150x6 mm for two connection	43	Kg	1.13	49	Est
4	50x6 mm M.S. flat connection with the mat to mat	43	Kg	4.8	206	Est
5	Nuts & bolts galvanized 16 mm dia, 50 mm long	86	Kg	0.5	43	Esc
6	Chequered plate cover 500x500x6mm i.e. 11.8 kg	90	Kg	11.8	1062	Esc
	<b>Total :-</b>				<b>4586</b>	

  
Assistant Engineer

  
Sr. Executive Engineer

  
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**Schedule of cost & material for layout of Earthmat at 33/11 kV or 33/22 kV Sub-Station**

Cost Escalation in FY16 over Cost Data for FY15 (%) = 2.09  
 Cost Escalation in FY17 over Cost Data for FY16 (%) = 3.74

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	M.S. flat 50x6 mm for ground mat including 5% wastage & weighing 2.4 kg/m (37x10+27x5)x1.05=1060.5 m or 2545.2 kg say 2.55 MT	43000	MT	2.55	109650	Est
2	Earthing pipe electrode	4586	No.	12	55027	Est
3	20 mm round, 3 m Long & weighing 2.47 kg/m 4 no. electrode 4x3x2.47 =29.64 kg, say 30 kg	43	Kg	30	1290	Est
4	Welding etc. of points @ 5% on above items		%	5	8298	
<b>Total :-</b>					<b>174265</b>	

**Extension Earthing of Equipments for 33 kV out going feeder**

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	M.S. flat 50x6 mm weighting 2.4 kg/ m at 10% wastage for:- (a) Each set of LA's at 20 mtr each 20x2x1.1=44 m (b) Structure at 20 m each 20x2x1.1= 44 m (c) 1 no. VCB & set of CT's body earthing at 10 m each 2x10x2x1.1 =44 m Total a+b+c =132 m or 317 kg say 0.317 MT	43000	MT	0.317	13631	Est
	(d) Welding of riser and corrosion protection @ 5% of above		%	5	682	
2	G.I. Wire no. 6 SWG for screening	66	kg	10	660	Esc
3	Eye block for screening	74	No.	6	444	Esc
<b>Total :-</b>					<b>15417</b>	

**Schedule of cost of yard lighting for 33/11 kV or 33/22 kV Sub-Station or 22 kV control point**

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	8 m, Steel Tubular poles for yard lighting	5838	No.	5	29190	PO
2	18 W LED Lamp complete with fittings	1250	No.	10	12500	Est
3	Post Erection for gate	1118	No.	4	4472	Esc
4	Clamps for GI pipe bracket	138	No.	20	2760	Esc
5	Underground cable 16 mm <sup>2</sup> for yard lighting	76	m	220	16720	Esc
6	PVC cable size 6 mm <sup>2</sup> for connecting LED lamp supply	11	m	75	825	Esc
7	Junction box	69	No.	10	690	Esc
<b>Total :-</b>					<b>67157</b>	

**Super structure for 33 kV bay for 1 no. out going feeder for each 33 kV VCB, 33 kV super structure and busbar controlled tapping for each outgoing 33kV feeder from existing 33 kV line**

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
<b>A. SUPER STRUCTURE</b>						
1	R.S. Joists, size 10,000x225x150=746kg say 0.75 MT 37.3 kg/mt 2 no. supports i.e.(2x10x37.3) MT	43000	MT	0.75	32250	Est
2	Foundation of R.S. Joists supports	5565	job	2	11130	Est
3	(a) M.S. channel iron 125x65x6mm, X-arm @ 12.1 kg/m At 5% wastage for bus-bar,isolators,LA's,transformer etc. (i) 4650 mm long =7 no. i.e. 447.73 kg (ii) 3725 mm long =2 no. i.e. 102.47 kg Total =9 no. i.e. 550.20 = 0.55 MT	420	m	42	17640	Est
	(b) Add 5 % workshop charges on item 3 (a) above		%	5	882	
4	Nuts and Bolts of Various Sizes (Galvanised / Coated) (with flat and spring washers)	86	Kg	25	2150	Esc
<b>S/Total (Y) :-</b>					<b>64052</b>	
<b>B. BUS-BAR</b>						
	(i) 3 disc insulators tension string complete	1496	No.	6	8976	Est
	(ii) 3 disc suspension tension string complete	1389	No.	3	4167	Est
	(iii) ACSR conductor 200 mm <sup>2</sup> at 10 % wastage:- (a) for busbar 3.5x3x1.1 =11.55 m (b) For jumpers at 2 m average 9 sets i.e. 2x3x9x1.1=59.4 m Total (a+b) =70.95 m Say 71 m	139	m	71	9869	PO
C.	PG clamps	124	No.	21	2604	Esc
<b>S/Total (Z) :-</b>					<b>25616</b>	
<b>Total (Y+Z) :-</b>					<b>89668</b>	

  
 Assistant Engineer

  
 Sr. Executive Engineer

  
 Superintending Engineer

**Estimated Cost of Control cable for 33/11 kV or 33/22 kV Sub-Station using 22 kV indoor type switchgear.**

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	2x2.5 mm <sup>2</sup> control cable	54	m	605	32670	Esc
2	4x2.5 mm <sup>2</sup> control cable	94	m	300	28200	Esc
3	12x2.5 mm <sup>2</sup> control cable	258	m	125	32250	Esc
4	3.5 core 95 mm <sup>2</sup> aluminium cable suitable for 415 V, AC	186	m	55	10230	Esc
<b>Total :-</b>					<b>103350</b>	

**Schedule of cost & material for 33kV yard and Colony fencing of 33/11 kV or 33/22 kV Sub-Station**

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
<b>A) Expended metal fencing around switchyard</b>						
1	M.S. angle iron 65x65x6 mm, 3 m long supports 0.6 m bent outwards at top & to contain 3 strands of barbed wire 0.4 m Sagged and concreted in ground and 2 m Vertical Supports required at every 2 m for 127 m Periphery for gauge fencing of switchyard 64 nos.	211	m	230	48658	Est
2	Expended metal at 10 % wastage 1.1x127x2=279.4 (say 280 m <sup>2</sup> )	993	m <sup>2</sup>	280	278040	Esc
3	G.I. Wire no. 6 SWG 6 strand all along the periphery to hold the metal 10% wastage i.e. 1.1x127x6=833.2 m @ 0.150 kg/m=125.73 kg or 0.126 MT	66	kg	125	8249	Esc
4	Angle iron stays with eye hooks etc. for 20% of supports	1378	set	13	17914	Esc
5	Cement etc. for concreting of supports & angle iron stays	387	bag	90	34830	Esc
6	Barbed wire 3 strands of 127 m at 10% wastage 1.1x3x127=419 m =84 kg	69	kg	84	5796	Esc
<b>S/Total (A)</b>					<b>393487</b>	
<b>B) Gate at colony &amp; switchyard entrance</b>						
1	Gate cost of masonry	2206	No.	3	6618	Esc
2	M.S. angle iron 65x65x6 mm <sup>2</sup> gates, 1.5x2.5 m Each grill works 2 no. i.e. 2x1.5x2.5 = 7.5 m <sup>2</sup>	804	m <sup>2</sup>	7.5	6030	Esc
3	Wicket gate	3934	No.	1	3934	Esc
					<b>16582</b>	
<b>Cost of 2 no. gates :-</b>					<b>33164</b>	
<b>Total (A+B) :-</b>					<b>426651</b>	

**Foundation of each of 33/11 kV or 33/22 kV Transformer (for 4.4 kg/ cm<sup>2</sup> soil bearing capacity) (refer 33kV Sub-station standard layout)**

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	PCC 1:4:8= 3.8X1.8X0.25=1.026 m <sup>3</sup>	2915	m <sup>3</sup>	1.026	2991	Esc
2	RCC 1:2:4=(3.5X1.5X0.2)-2(1.4X0.325X0.175)-(1.4X0.39 X0.175)+2(0.68X0.35X0.175)=0.837	9508	m <sup>3</sup>	0.837	7958	Esc
3	M.S. round 12 mm dia 230 mm center to center at 18% wastage (21x1.5+ 3.5x7x2) +(0.68x7x6x7x0.2)1.1=81.31 say 80 m Or 72.9 kg, say 73 kg	43	kg	73	3139	Est
4	M.S. rails 133.8 kg/m 2 no. 1.8 m In length 2x1.5x133.8=401.4 say 402 kg	43	kg	402	17286	Est
5	M.S angle iron slapper 75x75x8 mm, 2 nos. of 1.75 m length 1.75x2x8.9= 31.15 kg say 31.2 kg	43	kg	31.2	1342	Est
6	M.S. angle iron 65x65x6 mm supports along the M.S. rails 2x1.5x7.7=23.1 kg	43	kg	23.1	993	Est
7	GI drain pipe 100 mm dia 2 m long	1141	m	2	2282	Esc
8	Stoppers for Transformer wheels & horing of M.S. rails & angle iron with stoppers.	649	Job	1	649	Esc
<b>Total :-</b>					<b>36640</b>	

**Foundation of each of 33 kV or 22 kV CB (outdoor type) - [33kV Sub-station Standard layout]**

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	RCC 1:2:4 (2.3x1.75x0.05)+(2.2x1.65x0.5)=2.016 m <sup>3</sup>	9508	m <sup>3</sup>	2.016	19168	Esc
2	M.S. round 12 mm dia at 10% wastage 1.1(10x1.65+8x2.2+5x4x0.6)=48.51 m =43.17 kg say 44	43	kg	44	1892	Est
<b>Total :-</b>					<b>21060</b>	

  
Assistant Engineer

  
Sr. Executive Engineer

  
Superintending Engineer

**Schedule of cost of construction of 1 m of Open Brick Trench with cover**

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	PCC 1:5:10=(1.13x0.075x1)=0.085 m <sup>3</sup>	3210	m <sup>3</sup>	0.085	273	Esc
2	PCC 1:2:4=(0.075x0.25x1)+(0.025x0.25x1)+0.5(22/7x0.05x0.05)=0.021 m <sup>3</sup>	5230	m <sup>3</sup>	0.021	110	Esc
3	RCC 1:2:4 =2(0.09x0.24x1)+(0.04x0.5x1)+0.043+0.025 =0.068 m <sup>3</sup>	8379	m <sup>3</sup>	0.068	570	Esc
4	Brick Masonary 1:6=2(0.24x0.6x1)+(0.25x0.05x1)=0.301 m <sup>3</sup>	4286	m <sup>3</sup>	0.301	1290	Esc
5	10 mm cement plaster in cement mortar 1:4(22/7x0.05x1)+(0.25x1)=0.085 m <sup>2</sup>	89	m <sup>2</sup>	0.085	8	Esc
6	M.S. round 6 mm dia for at 10% wastage = 1.1(8x0.73+6x1) =13.02 mtr =2.9 kg	43	kg	2.9	125	Est
7	Angle iron 40x40x6 mm at 10% wastage= 0.49x3= 1.47 mtr. Or 5.15 kg	43	kg	5.15	221	Est
<b>Total :-</b>					<b>2596</b>	

**Schedule of Cost of Construction of One Meter of Open Concrete Trench with Cover**

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	PCC 1:5:10=(0.98x0.075x1)=0.074 m <sup>3</sup>	3210	m <sup>3</sup>	0.074	238	Esc
2	PCC 1:2:4=2(0.025x0.175x1)+0.5(0.05x0.175x1)=0.018	5230	m <sup>3</sup>	0.018	94	Esc
3	RCC 1:2:4 =2(0.09x0.24x1)+(0.05x0.35x1)= 0.061	9508	m <sup>3</sup>	0.061	580	Esc
4	Brick Masonary 1:6=2(0.24x0.21x1)=0.101 m <sup>3</sup>	4286	m <sup>3</sup>	0.101	433	Esc
5	10 mm cement plaster in cement mortar 1:4=(0.152+0.152)x1=0.864 m <sup>2</sup>	89	m <sup>2</sup>	0.364	32.396	Esc
6	M.S. round 6 mm dia for at 10% wastage = 1.1(8x0.59+6x1) =11.792 mtr =2.64 kg	43	kg	2.64	113.52	Est
7	Angle iron 40x40x6 mm, 8.3 mm long =2.01 kg	43	kg	2.01	86	Est
<b>Total :-</b>					<b>1577</b>	

**Cost of Trenches in 33/11 kV or 33/22 kV Sub-Station**

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
1	Construction of Open Brick of Trench in the yard and control room	2596	m	91.4	237297.5	Est
2	Construction of Open Concrete of Trench in the yard and control room	1577	m	63.9	100763.9	Est
<b>Total :-</b>					<b>338061</b>	

**Switch Room & Control Room Building of 33/11kV or 33/22 kV Sub-Station or 33 kV Control Point**

S.N.	Description of item	Rate	Unit	Qty	Cost (in Rs) / Km	CD Basis (PO/ Esc / Est/ MR)
<b>A) Manned Sub-Station</b>						
1	Sub-Station Building/ Control Room of 120 m <sup>2</sup> Covered Area	20372	m <sup>2</sup>	120	2444640	Esc
2	Cost of Land (May vary from place to place)	283	m <sup>2</sup>	7000	1981000	Esc
3	Electrical installation & Water supply service connection @5% on Sr. No. A(1)		%	5	122232	
<b>Total :-</b>					<b>4547872</b>	
<b>B) Un-Manned Sub-Station</b>						
1	Sub-Station Building/ Control Room of 80 m <sup>2</sup> Covered Area	20372	m <sup>2</sup>	80	1629760	Esc
2	Cost of Land (May vary from place to place)	283	m <sup>2</sup>	7000	1981000	Esc
3	Electrical installation & Water supply service connection @5% on Sr. No. B(1)		%	5	81488	
<b>Total :-</b>					<b>3692248</b>	

  
Assistant Engineer

  
Sr. Executive Engineer

  
Superintending Engineer


## LABOUR COST PER DAY

S.No.	DESCRIPTION	No. of Days
1	Total Working Days in a Year	240
2	Total Working Days in a Month	20

A Details of Labour Cost Per Day					
S.No	Description	Pay per day	Pay per day	Pay per day	Pay per day
		Foreman	Line man	AL/man	T/mate
1	Pay Band	PB-3	PB-2	PB-1	PB-1
2	Total Pay per month :-	66618	41153	24917	24352
3	Pay per day Rs.	3331	2058	1246	1218
<b>Say Rs.</b>		<b>3330</b>	<b>2060</b>	<b>1250</b>	<b>1220</b>

B Per Day Working Wages for Beldar					
1	Daily wages (Rs.)	=	200		
2	Total working day in a year	=	256		
<b>Actual wages of Beldar per day</b>		=	285.16		
<b>Say Rs.</b>		=	<b>285</b>		

  
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38/58

  
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**Erection/ Labour charges**

S.No.	Description	Amount (in Rs.)			
		PCC Poles (S/C)	S/T Poles (S/C)	40% S/T+ 60 % PCC Poles (S/C)	S/T Poles (D/C)
1	Total Erection/ Labour charges for construction of 1 km of 33 kV line on 11 M long Double Pole Structure with ACSR 6/1/4.72 mm Conductor with continuous earth wire	383240	387740	383492	474420

**Erection charges for New 33/11 kV Sub-Station**

S. No.	Description	Amount (Rs)
2	Erection charges for New 33/11 kV Sub-Station (with indoor 11 kV System)	5209596

**Erection Charges for Outdoor Yard for one 11 kV feeders**

S. No.	Description	Amount (Rs)
3	Erection Charges for 11 kV Yard (Outdoor) for 4 feeders	328170
4	Erection Charges for Yard of Single 11 kV feeder = 350550/ 4 =	82042.5
	<b>Say Rs.</b>	<b>82040</b>

Therefore, Total Erection Charges for 33/11 kV Sub-Station = **5291636**  
(=5541836+87640)

**Say Rs= 5291600**


**Erection Charges for Terminal Equipment & Allied Material for each of 33 kV out going Feeder**

S. No.	Description	Amount for 33/11 kV S/Stn	
		PT's already installed	PT's not installed
5	Total Erection Charges for Terminal Equipment & Allied Material for each of 33 kV out going Feeder	310745	322505
	<b>Say Rs.</b>	<b>310745</b>	<b>322505</b>

**Erection Charges for 11 kV Auto voltage Booster/Sectionalizer/ Auto recloser**

S. No.	Description	Amount	Amount
		11 kV auto voltage booster	11 kV line sectionalizer/ Auto recloser
6	Total Erection Charges for 11 kV Auto voltage Booster/Sectionalizer/ Auto recloser	105656	80181
	<b>Say Rs.</b>	<b>105660</b>	<b>80180</b>

  
Assistant Engineer

  
Sr. Executive Engineer  
39/58

  
Superintending Engineer

## ERECTION CHARGES PER KM FOR 11 KV AND 22 KV H.T. LINE

S. NO	DESCRIPTION	PCC POLES	STEEL POLES
		AMOUNT (Rs)	AMOUNT (Rs)
1	Erection Charges per km for 11 kV and 22 kV H.T. Line with :-		
	(i) ACSR/AAAC 30 mm <sup>2</sup> AL EQ.	164037	164043
	(ii) ACSR/AAAC 50 mm <sup>2</sup> AL EQ.	175224	175230
	(iii) ACSR/AAAC 80/100 mm <sup>2</sup> AL EQ.	213745.5	213752

## ERECTION CHARGES PER KM FOR 3-Ø L.T. LINE

S. No.	DESCRIPTION	PCC POLES	STEEL POLES
		AMOUNT (Rs.)	AMOUNT (Rs.)
2	Erection Charges per km for 3 phase L.T. Line with :-		
	(i) ACSR/AAAC 30 mm <sup>2</sup> AL EQ.	99948	96140
	(ii) ACSR/AAAC 50 mm <sup>2</sup> AL EQ.	114864	111056
	(iii) ACSR/AAAC 80/100 mm <sup>2</sup> AL EQ.	166226	162418


## ERECTION CHARGES PER KM FOR 2-Ø L.T. LINE

S. No.	DESCRIPTION	PCC POLES	STEEL POLES
		AMOUNT (Rs.)	AMOUNT (Rs.)
3	Erection Charges per km for 2 phase L.T. Line with :-		
	(i) ACSR/AAAC 30 mm <sup>2</sup> AL EQ.	90460	86652
	(ii) ACSR/AAAC 50 mm <sup>2</sup> AL EQ.	101647	97839
	(iii) ACSR/AAAC 80/100 mm <sup>2</sup> AL EQ.	140168.5	136361

## ERECTION CHARGES PER KM FOR 1-Ø L.T. LINE

S. NO	DESCRIPTION	PCC POLES	STEEL POLES
		AMOUNT (Rs.)	AMOUNT (Rs.)
4	Erection Charges per km for Single phase L.T. Line with :-		
	(i) ACSR/AAAC 30 mm <sup>2</sup> AL EQ.	71081	67511
	(ii) ACSR/AAAC 50 mm <sup>2</sup> AL EQ.	78539	74969
	(iii) ACSR/AAAC 80/100 mm <sup>2</sup> AL EQ.	104220	100650

  
Assistant Engineer

  
Sr. Executive Engineer  
40/58

  
Superintending Engineer




Abstract for Manual Carriage

Sr. No.	Description	F/MAN @ Rs.			L/MAN @ Rs.			ALM @ Rs.			T/Mate@ Rs.			Beldar @ Rs.			TOTAL	
		NO	DAYS	WAGES	NO	DAYS	WAGES	NO.	DAYS	WAGES	NO.	DAYS	WAGES	NO.	DAYS	WAGES	WAGES	
Manual carriage of material for 1 km of 33 kV line assuming avg lead distance of 1 km from road head																		
1	Steel poles 11 M long	--	--	--	--	--	--	--	--	--	1	6	7320	9	6	15390.00	22710.00	
2	PCC poles	--	--	--	--	--	--	--	--	--	1	9	10980	14	9	35910.00	46890.00	
3	M.S. cross arms, bracing sets insulators nuts & bolts Etc.	--	--	--	--	--	--	--	--	--	1	1	1220	11	1	3135.00	4355.00	
4	Stay set complete with stay wire	--	--	--	--	--	--	--	--	--	--	--	0	5	0.75	1068.75	1068.75	
5 (i)	ACSR 6/1/ 4.72 mm conductor	--	--	--	--	--	--	--	--	--	1	1	1220	9	1	2565.00	3785.00	
(ii)	AAAC 7/4.26 mm conductor	--	--	--	--	--	--	--	--	--	1	1	1220	7	1	1995.00	3215.00	
6	GI wire 6 SWG	--	--	--	--	--	--	--	--	--	--	--	0	2	1.5	855.00	855.00	
	Total for S/T Pole (ACSR 6/1/4.72)	--	--	--	--	--	--	--	--	--	--	--	9760	--	--	23013.75	32773.75	
	(AAAC 7/4.26)	--	--	--	--	--	--	--	--	--	--	--	9760	--	--	22443.75	32203.75	
	or PCC poles (ACSR 6/1/4.72)	--	--	--	--	--	--	--	--	--	--	--	13420	--	--	43533.75	56953.75	
	(AAAC 7/4.26)	--	--	--	--	--	--	--	--	--	--	--	13420	--	--	42963.75	56383.75	
	Manual carriage for 1 km line with PCC poles	=		ACSR 6/ 1/4.09=	=		AAAC 7/4.26 mm =											
		Rs		56953.75			56383.75											
	Say Rs			56950			56380											
	Manual carriage for 1 km line with S/T poles	=		32773.75			32203.75											
	Say Rs.			32770			32200											

Detailed analysis of Labour Rates for 33 kV line

SR. No.	Description	F/MAN @ Rs.			L/MAN @ Rs.			ALM @ Rs.			T/Mate@ Rs.			Beldar @ Rs.			Total	
		NO	DAYS	WAGES	NO	DAYS	WAGES	NO.	DAYS	WAGES	NO.	DAYS	WAGES	NO.	DAYS	WAGES	S/C	D/C
SUB HEAD-'A'																		
1A)	Surveying & Stacking (33 kV line per km)	--	--	21645	--	--	35020	--	--	0	--	--	0	--	--	14535.00	71200.00	71200.00
SUB HEAD-'B'																		
1B)	Erection of double PCC pole structure															Say Rs.	71200.00	71200.00
	Total :-			2497.5			1030			1406.25			3660			2921.25	11515.00	14526.25
															Say Rs.	11520.00	14530.00	
SUB HEAD-'C'																		
1C)	Erection of double S/T pole structure (As per head "B" for PCC (9.75 M))	--	0.75	2497.5	--	0.5	1030	--	--	1406.25	--	--	3660	--	--	2921.25	11515	
	Total :-			2497.5			1030			1406.25			4270			3491.25	12695.00	12695.00
															Say Rs.	12700.00	12700.00	
SUB HEAD-'D'																		
1D)	Erection of double PCC pole structure (Dead End)																	
	Total :-			3330			1545			1718.75			3965			2956.88	13515.63	13515.63
															Say Rs.	13520.00	13520.00	
SUB HEAD-'E'																		
1E)	Erection of double pole S/T poles (Dead End) structure (dead end 9.75 M long)																	
	Total :-			3330.00			1545			1718.75			4575			3526.88	14695.63	14695.63
															Say Rs.	14700.00	14700.00	
SUB HEAD-'F'																		
1F)	Earthing of 33 kV line																	
	Total :-			0			1030			625			305			2422.50	4382.50	4382.50
															Say Rs.	4380.00	4380.00	

  
Assistant Engineer

  
Sr. Executive Engineer  
41/58


  
Superintending Engineer

SR. No.	Description	F/MAN @ Rs.		3330	L/MAN @ Rs.		2060	ALM @ Rs.		1250	T/Mate@ Rs.		1220	Beldar @ Rs.		285	Total	
		NO	DAYS	WAGES	NO	DAYS	WAGES	NO.	DAYS	WAGES	NO.	DAYS	WAGES	NO.	DAYS	WAGES	S/C	D/C
	<b>SUB HEAD-'G'</b>																	
1G)	Erection of stay set of 33 kV lines																	
	Total :-			587.25			515			0			762.5			570.00	2434.75	2434.75
																	2430.00	2430.00
	<b>SUB HEAD-'H'</b>																	
1H)	Fixing of jumpers (1 set) for 33 kV line	1	0.25	341.5	1	0.25	220.75	1	0.25	162	--	--	0	1	0.25	39.00	763.25	1526.5
																	760.00	1520.00
	<b>SUB HEAD-'I'</b>																	
1I)	Stringing of 1 km of line (33 kV)																	
1	GI wire																	
	Total :-	2	0.5	1665	3	1.75	3605	6	1.75	4375	4	0.5	1220	10	0.5	712.50	11577.50	11577.50
																	11580.00	11580.00
2	100 mm <sup>2</sup> 33 kV (SC) line																	
	Total ACSR 6/1/4.72 mm	--	--	4162.5	--	--	7210	--	--	4375.00	--	--	3660.00	--	--	5130.00	24537.50	24537.50
																	24540.00	24540.00
	Total AAAC 7/4.26 mm	--	--	4162.5	--	--	7210	--	--	4375.00	--	--	3660.00	--	--	1923.75	23682.50	23682.50
																	23680.00	23680.00
	<b>SUB HEAD-'J'</b>																	
1J)	Road path stream etc.																	
	Total :-			0			2111.5			1281.25			2602.67			3325.00	9320.42	9320.42
																	9320.00	9320.00

Detailed analysis of Labour Charges for 33/11 KV Sub-Station

SR. No.	Description	F/MAN @ Rs.		3330	L/MAN @ Rs.		2060	ALM @ Rs.		1250	T/Mate@ Rs.		1220	Beldar @ Rs.		285	Total	
		NO	DAYS	WAGES	NO	DAYS	WAGES	NO.	DAYS	WAGES	NO.	DAYS	WAGES	NO.	DAYS	WAGES		
2A)	Laying of earth material rods & pipe																	
	Total :-	--	--	14985	--	--	24720	--	--	6250	--	--	25620	--	--	67830.00	139405.00	139410.00
2B)	Erection of R.S. joists 10000x225x150 mm																	
	Total :-			1665			0			625			1220			1923.75	5433.75	5434.00
																	1795	1795
2C)	Erection of each cross arms of various sizes including drilling of pole & fixing clamps etc.	1	0.25	832.5	1	0.25	515	--	--	0	1	0.25	305	2	0.25	142.5	142.5	1795
																		1800
2D)	Foundation of VCB																	
	Total :-			6660			2060			2500			2745			1923.75	15888.75	15889.00
																		15889.00
2E)	Foundation of transformer																	
	Total :-			3330			2060			1250			2440			6270.00	15350.00	15350.00
2F)	Laying of trenches (per Mtrs.)																	
	Total :-			1665			1030			0			610			997.50	4302.50	4300.00
																		4680.00
2G)	Erection of 1 set of Bus bar	1	0.66667	2220	--	--	0	1	0.667	833.333	2	0.666667	1626.67	--	--	0.00	4680.00	4680.00
																		18410.00
2H)	Installation of isolator	2	0.875	5827.5	4	0.875	7210	4	0.875	4375	--	--	0	4	0.875	997.50	18410.00	18410.00
																		2478.75
2I)	Installation of Lightning Arrestors	1	0.375	1248.75	1	0.375	772.5	--	--	0	1	0.375	457.5	--	--	0.00	2478.75	2480.00
																		3922.50
2J)	Installation of PT's	1	0.375	1248.75	2	0.375	1545	--	--	0	2	0.375	915	2	0.375	213.75	3922.50	3920.00
																		7747.50
2K)	Installation of D.O. fuse unit	1	0.75	2497.5	1	0.75	1545	2	0.75	1875	2	0.75	1830	--	--	0.00	7747.50	7750.00
																		7750.00


  
Assistant Engineer

  
Sr. Executive Engineer  
42/58

  
Superintending Engineer

SR. No.	Description	F/MAN @ Rs.		3330		L/MAN @ Rs.		2060		ALM @ Rs.		1250		T/Mate@ Rs.		1220		Beldar @ Rs.		285		Total
		NO	DAYS	WAGES	NO	DAYS	WAGES	NO.	DAYS	WAGES	NO.	DAYS	WAGES	NO.	DAYS	WAGES	NO.	DAYS	WAGES			
2L)	Installation & commissioning of power transformer (1 no. including dehydration)	3	5	49950	3	5	30900	3	5	18750	3	5	18300	18	1	5130.00						123030.00
																Say Rs.						123030.00
2M)	Installation of S/Stn transformer	3	4	39960	3	4	24720	3	4	15000	3	4	14640	12	0.5	1710.00						96030.00
																Say Rs.						96030.00
2N)	Installation of VCB with CT 11 kV, voltage booster, 11 kV line sectionalizer	3	2	19980	3	2	12360	3	2	7500	3	2	7320	6	2	3420.00						50580.00
																Say Rs.						50580.00
2O)	Erection of 1 set of jumper inclu. PG clamps	1	0.25	832.5	1	0.25	515	1	0.25	312.5	1	0.25	305	--	--	0.00						1965.00
																Say Rs.						1970.00
2P)	Connection set	1	0.25	832.5	1	0.25	515	1	0.25	312.5	1	0.25	305	--	--	0.00						1965.00
																Say Rs.						1970.00
2Q)	Installation of 11 kV incoming panel	3	5	49950	3	5	30900	3	6	22500	--	--	0	6	1	1710.00						105060.00
																Say Rs.						105060.00
2R)	Laying of control cable	2	3	19980	2	3	12360	2	3	7500	2	3	7320	--	--	0.00						47160.00
																Say Rs.						47160.00
2S)	Installation of 11 kV out going feeder panel or bus coupler	3	5	49950	3	5	30900	3	6	22500	--	--	0	6	1	1710						105060
																Say Rs.						105060.00
2T)	Laying of power cable (per no. of 50 m)																					
	Total :-			2497.5			1545			0			0			3420.00						7462.50
																Say Rs.						7460.00
2U)	Connecting the cable ends to Heat Shrinkable Terminal Kit	2	0.75	4995	2	0.75	3090	--	--	0	2	0.75	1830	--	--	0.00						9915.00
																Say Rs.						9920.00
2V)	Installation of Substation Auxiliaries																					
	Total :-			79920			49440			30000			610			5557.50						165527.50
																Say Rs.						165530.00
2W)	Yard lighting	3	0.875	8741.25	3	0.875	5407.5	3	0.875	3281.25	3	0.875	3202.5	18	0.25	1282.50						21915.00
																Say Rs.						21920.00
2X)	Erection of yard fencing (1 m)																					
	Total :-			0			2575			2187.5			0			1140.00						5902.50

  
Assistant Engineer

  
Sr. Executive Engineer  
43/58

  
Superintending Engineer

Detailed analysis of Labour Rates for 11 kV & below lines

S. NO	DESCRIPTION	F/MAN @ Rs.			L/MAN @ Rs.			ALM @ Rs.			T/Mate@ Rs.			Beldar @ Rs.			TOTAL WAGES
		NO	DAYS	WAGES	NO	DAYS	WAGES	NO.	DAYS	WAGES	NO.	DAYS	WAGES	NO.	DAYS	WAGES	
	<b>SUB HEAD-'A'</b>																
3A)	ERECTION OF 11 kV LINE																
1)	ERECTION OF PCC POLES																
	TOTAL						875.50						762.50			1347	
																SAY Rs. 3891	
2)	ERECTION OF STEEL TUBLAR POLES																
	TOTAL:-						875.50						884.50			1147	
																SAY Rs. 3813	
3)	PCC POLE DOUBLE STRUCTRE																
	TOTAL:-						1184.50						1708.00			2423	
																SAY Rs. 7065	
4)	S/T POLE DOUBLE STRUCTURE																
	TOTAL						3244.50						3538.00			2386.88	
																SAY Rs. 7483.13	
5)	EARTHING																
	TOTAL						257.50						156.25			356.25	
																SAY Rs. 770.00	
6)	STAY SET (HT)																
	TOTAL						515.00						312.50			598.50	
																SAY Rs. 1426.00	
7)	FIXING OF JUMPER				1	1/12	171.67		2	1/12	208.33	-	-	-	-	380.00	
																SAY Rs. 380.00	
	<b>SUB HEAD - 'B'</b>																
3B)	SAGGING OF CONDUCTOR																
1)	1KM, SINGLE GI WIRE ACSR/AAAC 20 MM <sup>2</sup>																
	TOTAL						1545.00						1220.00			712.50	
																SAY Rs. 5040.00	
2)	1KM SINGLE ACSR/AAAC 30MM <sup>2</sup>																
	TOTAL						2060.00						1982.50			1425.00	
																SAY Rs. 7968.00	
3)	1KM SINGLE ACSR/ AAAC 50MM <sup>2</sup>																
	TOTAL						2446.25						2897.50			3384.38	
																SAY Rs. 11696.88	
4)	1KM SINGLE ACSR/ AAAC 80/100MM <sup>2</sup>																
	TOTAL															24537.50	

*Hin*  
Assistant Engineer

*Ant*  
Sr. Executive Engineer  
44/58

*R. K. Pathania*  
Superintending Engineer



S. NO	DESCRIPTION	F/MAN @ Rs.		3330		L/MAN @ Rs.		2060		ALM @ Rs.		1250		T/Mate@ Rs.		1220		Beldar @ Rs.		285		TOTAL WAGES	
		NO	DAYS	WAGES	NO	DAYS	WAGES	NO.	DAYS	WAGES	NO.	DAYS	WAGES	NO.	DAYS	WAGES	NO.	DAYS	WAGES	WAGES			
3H)	<b>SUB HEAD - 'H'</b>																						
1)	MANUAL CARRIAGE OF MATERIAL FOR 1KM LEAD LINE CONSIDERING AVERAGE DISTANCE FROM ROAD TO SITE OF WORK 1KM:-																						
2)	<b>1-Ø LT LINE</b>																						
	(i) WITH STEEL POLES																					9500.00	14786.67
																						SAY Rs.	14787.00
	(ii) WITH PCC POLES																					18620.00	26346.67
																						SAY Rs.	26347.00
3)	<b>2-Ø LT LINE</b>																						
	(i) WITH STEEL POLES																					9785.00	15071.67
																						SAY Rs.	15072.00
	(ii) WITH PCC POLES																					18905.00	26631.67
																						SAY Rs.	26632.00
4)	<b>3-Ø LT LINE</b>																						
	(i) WITH STEEL POLES																					5286.67	10070.00
																						SAY Rs.	15357.00
	(ii) WITH PCC POLES																					7726.67	19190.00
																						SAY Rs.	26917.00
3I)	<b>SUB HEAD - 'I'</b>																						
1)	MANUAL CARRIAGE OF POLE MOUNTED DISTRIBUTION SUB STN. AVERAGE DISTANCE 1 KM																						
	(i) 25 KVA																					686.67	416.67
																						2135.00	4987.50
																						SAY Rs.	8225.83
	(ii) 63 KVA																					1030.00	625.00
																						2338.33	5510.00
																						SAY Rs.	9503.33
	(iii) 100 KVA																					1545.00	937.50
																						2643.33	6293.75
																						SAY Rs.	11419.58
	(iv) 250 KVA																					2060.00	1250.00
																						2948.33	7077.50
																						SAY Rs.	13335.83
																						SAY Rs.	13336.00
3J)	<b>SUB HEAD - 'J'</b>																						
1)	DISMANTLING CHARGES FOR 1KM OF 11 KV LINE PER CONDUCTOR WITH GI WIRE 8 SWG, 6 SWG & Cu 8 SWG & 6 SWG WIRE ACSR 6/1/2.11 & 6/1/2.36 MM																						
	TOTAL																					1562.50	1220.00
																						712.50	3495.00
																						SAY Rs.	3495.00
2)	DISMANTLING CHARGES FOR 1KM OF 11 KV LINE PER CONDUCTOR ACSR 6/1/2.59 & ACSR 6/1/3.35																						
	TOTAL																					1875.00	2440.00
																						890.63	5205.63
																						SAY Rs.	5206.00

*Hiw*  
Assistant Engineer

*[Signature]*  
Sr. Executive Engineer  
46/58

*R.k. Pathania*  
Superintending Engineer

**Abstract of Transportation Charges for 33 kV Systems**

S.No.	Description	Unit	Road Tpt	Manual Tpt	Unloading & Stacking of material		Total
<b>1</b>	<b>33 kV line material for:-</b>						
<b>a</b>	<b>Conductor size ACSR 6/1/4.72mm</b>						
(i)	On PCC poles	Km	20060	56950	--	--	77010
(ii)	On Steel tubular poles	Km	20060	32770	--	--	52830
(iii)	On 60% PCC & 40% S/T poles	Km	20060	47280	--	--	67340
<b>b</b>	<b>Conductor size AAAC 7/ 4.26mm</b>						
(i)	On PCC poles	Km	20060	56380	--	--	76440
(ii)	On steel tubular poles	Km	20060	32200	--	--	52260
(iii)	On 60% PCC & 40% S/T poles	Km	20060	46710	--	--	66770
<b>2</b>	<b>(i) Material for 33/11 kV Sub-Station</b>	No.	<b>376200</b>	--	<b>530x30=</b>	<b>15900</b>	<b>392100</b>
	<b>(ii) Material for 33/11 kV Terminal Equipment</b>	No.	<b>35570</b>	--	<b>530x3=</b>	<b>1590</b>	<b>37160</b>
	<b>(iii) Material for 11 kV auto Voltage Booster/ Sectionalizer/ Auto reclosure</b>	No.	<b>13680</b>	--	<b>530x1=</b>	<b>530</b>	<b>14210</b>

**Average Distance from Divisional Store to Site of Work**

Sr. No.	Name of Sub-Station	Store	Site	Distance from Div Store (km)		Remarks
				Sub/Stn	Site	
1	Chauntra	Joginder Nagar	Bassi	15	5+20 (line length)	
2	Chowari	Dalhousie	Lahru	45	40+5 (line length)	
3	Sandole	Sarkaghat	Jaisinghpur	40	35+7 (line length)	
		<b>Total :-</b>		100	80+32 (line length)	

Average distance of Sub-Station From Divisional store =  $100/3=33.33$  Say = **33 Km**  
Average distance for carriage of 1 km of 33 kV line material =  $32/3 = 10.66$  Say = **11 Km**  
Average distance for carriage of Terminal Equipment =  $80/3= 26.66$  Say = **27 Km**


**Transportation Charges for 33 kV line and 33/11 kV Sub-Station**

**Average distance of divisional store to central stores (Km) 77**  
**Average out turn of departmental truck in Rs. Per Km 57**

**Transportation charges for 1 km of 33 kV line material:-**

- Average distance of divisional store to central stores (Km) 77
- Average lead distance from Divisional store to site of work (Km) 11
- Line material of 1 km of 33 kV line length requires  
2 trip of truck, so total journey of truck =  $(77+11) \times 2 \times 2$  352
- Average out turn of Departmental truck in Rs. Per Km 57
- Transportation charges for items of 33 kV Line material 20064**  
Say Rs. = **20060**

  
Assistant Engineer

  
Sr. Executive Engineer  
47/58

  
Superintending Engineer

**Transportation charges for 33/11 kV Sub-Station (Manned):-**

1	Average distance of central store to Divisional store (Km)	77
2	Average lead distance from Divisional store to site of work in Kms	33
3	Carriage of material for 1 no. 33/11 kV Sub-Station requires 30 trips of truck, therefore total journey of truck (30x2(77+33))	6600
4	<b>Transportation Charges for 1no. 33/11kV Sub-Station material</b>	<b>376200</b>
	<b>Say Rs</b>	<b>376200</b>

**Transportation charges for 33/11 kV Sub-Station (Un-Manned):-**

1	Average distance of central store to Divisional store (Km)	77
2	Average lead distance from Divisional store to site of work in Kms	33
3	Carriage of material for 1 no. 33/11 kV Sub-Station requires 30 trips of truck, therefore total journey of truck (30x2(77+33))	6600
	<b>Transportation Charges for 1no. 33/11kV Sub-Station material</b>	<b>376200</b>
	<b>Say Rs</b>	<b>376200</b>

**Transportation Charges for Terminal Equipment and 11 kV auto Voltage Booster/  
Line Sectionalizer/ Auto Recloser**


**Transportation charges for Terminal Equipment :-**

1	Average distance from central store to Divisional store (km)	77
2	Average lead distance from Divisional store to site of work	27
3	Total Journey of truck for 1 no. Terminal Equipment (3 trips)	624
4	Average out turn of truck	57
	<b>Transportation charges for 1 set Terminal Equipment</b>	<b>35568</b>
	<b>Say Rs.=</b>	<b>35570</b>

**Transportation charges for 11 kV auto voltage booster/11 kV line sectionalizer/ 11kV Auto Recloser**

1	Average distance from Central store to Divisional store (KM)	77
2	Average lead distance from Divisional store to 33/11 kV Sub-Station site	33
3	Average lead distance from 33/11 kV, Sub-Station to site of installation of 11 kV Auto Voltage Booster/ 11 kV Line Sectionalizer/11kV Auto Recloser (km)	10
4	Total journey of truck (1 trip)	240
5	Average out turn of truck	57
	<b>Transportation charges for 1 no. 11kV Auto Voltage Booster / 11 kV Sectionalizer/11kV Auto Recloser</b>	<b>13680</b>
	<b>Say Rs</b>	<b>13680</b>

  
Assistant Engineer

  
Sr. Executive Engineer  
48/58

  
Superintending Engineer



## TRANSPORTATION CHARGES (in Rs.) FOR 11 kV AND BELOW SYSTEMS

S. NO.	Description	1 KM 11 kV Line		Distribution Substation				L.T.Line					
		PCC Pole	STEEL Pole	25 KVA	63 KVA	100 KVA	250 KVA	3-Phase		2-Phase		1-Phase	
								PCC Pole	STEEL Pole	PCC Pole	STEEL Pole	PCC Pole	STEEL Pole
1	Road Transportation by Truck from Central Store to Site of work	12200	12200	12200	12200	12200	12200	12200	12200	12200	12200	12200	12200
2	Manual Carriage from Road to Site of work	33580	19170	8226	9503	11420	13336	26917	15357	26632	15072	26347	14787
	<b>Total (Rs)</b>	<b>45780</b>	<b>31370</b>	<b>20426</b>	<b>21703</b>	<b>23620</b>	<b>25536</b>	<b>39117</b>	<b>27557</b>	<b>38832</b>	<b>27272</b>	<b>38547</b>	<b>26987</b>

S.No.	Description	
1	Average distance of Divisional store to Central Store (in km)	77
2	Average lead distance assumed from divisional store to site of work (in km)	30
3	Total Distance for one trip from Central Store to Site of work (in km)	214
4	Average out turn Rate (in Rs)	57
5	Transportation charges per trip for material from Central Store to Site of Work (in Rs)	12198
	<b>Say (Rs):</b>	<b>12200</b>

  
Assistant Engineer

  
Sr. Executive Engineer  
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**Annexure 'A'****Other Charges (including Overhead Charges) & Taxes**

a)	Transportation charges on Total cost of material	
b)	Erection charges on Total cost of material	
c)	Contingency charges on Total cost of material	3%
d)	Labour cess on Total cost of material+ (Contingency + Erection + Transportation) Charges	1%
e)	Deptt. Charges on Total cost of material + (Contingency + Erection + Transportation) Charges	11%
f)	Service Tax including Swachh Bharat cess @ 0.5% and Krishi Kalyan Cess @ 0.5% on Deptt. Charges	15%

**RATINGS & SPECIFICATIONS**

(A) The REC schematic diagrams attached in the end are intended to give a description of BoQ. The specifications there in may vary from those adopted in the Cost Data.

**1 PCC Poles sizes/working load**

a)	8 Mtr.	180kg
b)	9 Mtr.	200kg
c)	9.75 Mtr.	300kg

**2 Steel Tubular poles sizes / working load**

a)	8 Mtr.	148kg
b)	9 Mtr.	200kg
c)	10 Mtr.	300kg
d)	11 Mtr.	300kg

3	Three phase DTRs	11KV		22KV	
		LT current	HT current	LT current	HT current
a)	25KVA	32.8	1.31	32.8	0.66
b)	50KVA	65.61	2.62	65.61	1.31
c)	63KVA	82.67	3.31	82.67	1.65
d)	100KVA	131.22	5.25	131.22	2.62
e)	250KVA	328.05	13.12	328.05	6.56
f)	400 KVA	524.88	21	524.88	10.5
g)	630 KVA	826.68	33.07	826.68	16.53

(B) Conductors sizes ( ACSR / AAAC/ AAC) & Rating tables are as per British standards. Use of special conductors of type 'Covered' / 'HTLS' may be done under special circumstances with technical justification where the operating conditions are of extreme nature such as heavy wind / snow loading etc.


(C) System Designs on which Estimates are prepared, shall capture load growth for the next 15 years based on maximum demand recorded in the last 5 years.

**(D) Preferable Standard Conductor Sizes / Current Rating**

Type of conductor	Code Name	mm2 Sizes	Standard dia	Current rating
ACSR	Wesel	30	6/1/2.59	146
	Rabbit	50	6/1/3.35	297
	Horse	70	12/7/2.79	241
	Dog	100	6/7/4.72	312
	Wof	150	30/7/2.59	406
	Luynx	175	30/7/2.59	445
	Panther	200	30/7/3.0	486
AAAC	Cedar	30	7/2.54	145
	Hazel	50	7/3.30	201
	Oak	100	7/4.65	307
	Ash	150	19/3.43	398
	Elar	175	19/3.76	438
	Upas	300	37/3.53	610

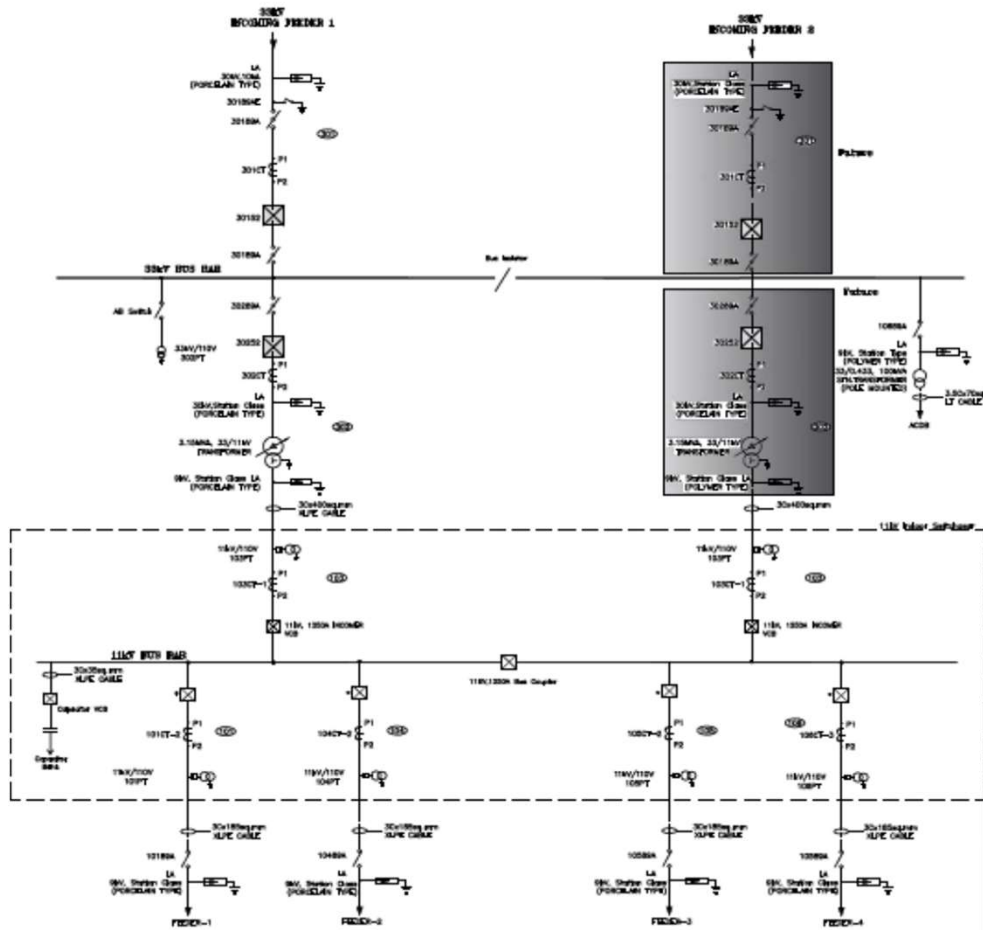
Intermediate sizes shall be adopted only under special conditions.

  
Assistant Engineer

  
Sr. Executive Engineer  
50/58

  
Superintending Engineer

**Annexure 'B'**  
REC Construction Standard  
Gen-42A



**BILL OF QUANTITY - 33KV**

SL. NO.	ITEM DESCRIPTION	SYMBOL	QTY
1.	3.15MVA, 33/11KV TRANSFORMER		1 NO.
2.	33KV, 1250A, O/D VACUUM CIRCUIT BREAKER		2 SETS
304	33KV, 300V DC NRM EARTH SWITCH		1 SET
305	33KV, 300V DC NRM/IT EARTH SWITCH		2 SETS
4.	CT RATIO 300-400/5A		6 NOS.
5.	33KV/11KV, POTENTIAL TRANSFORMER		2 NOS.
6.	33KV/11KV, CLASS SURGE ARRESTER (PORCELAIN TYPE)		2 SETS
7.	33KV/11KV, 1000VA, FERRON TRANSFORMER		1 NO.

**BILL OF QUANTITY - 11KV**

SL. NO.	ITEM DESCRIPTION	SYMBOL	QTY
104	11KV, 1250A FERRON VCB & Bus Coupler		2 SETS
105	11KV, 1250A OUTGOING VCB		4 SETS
5.	11KV, 300V, CLASS SURGE ARRESTER (PORCELAIN TYPE)		4 SETS
3.	11KV, 300V, BLENDED TYPE SAHD OPERATED EO		4 SETS
4.	11KV/11KV, POTENTIAL TRANSFORMER		16 NOS.
5.	CAPACITOR BANK VCB		1 SETS

**LEGEND:-**

- ▶ 11KV, 1250A OUTGOING VCB
- CT-1 300-400/5-5A
- CT-2 200-400/5-5A
- CT-3 100-50/5-5A

This SLD is for reference. P&ID/Utilities may suitable adopt a chg. as per site requirement.

**FOR TENDER PURPOSE ONLY**

**Rural Electrification Corporation Ltd.**

PROJECT: RGGVY XII Plan Projects

TITLE: Single Line Diagram of 1x3.15MVA (Type-A) 33/11KV Substation with Indoor 11kV Switchgear

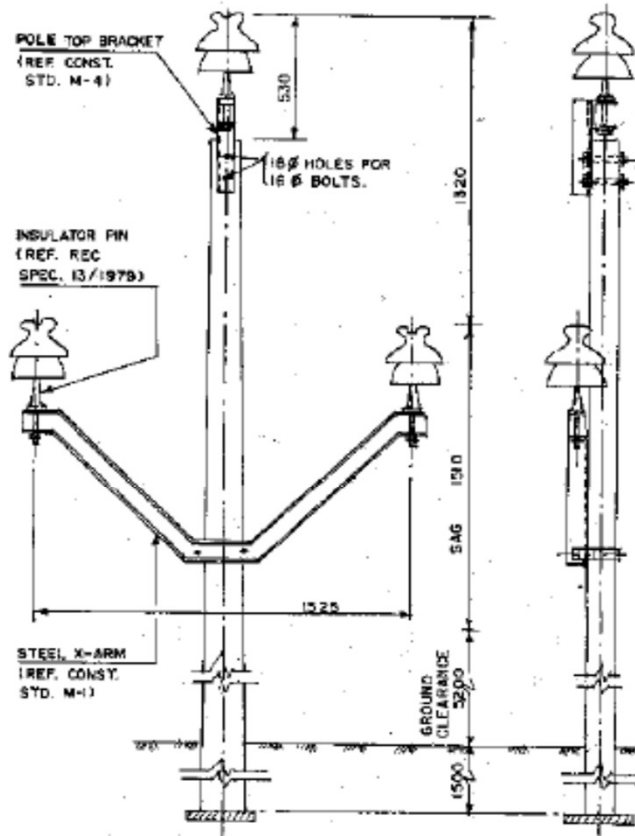
*Him*  
Assistant Engineer

*[Signature]*  
Sr. Executive Engineer

*R. K. Pathania*  
Superintending Engineer

Annexure 'B'

**R E C**  
**CONSTRUCTION STANDARD**  
**M - 3**



**BILL OF MATERIAL**

9-DM SUPPORT	1
POLE TOP BRACKET	1
V- CROSS ARM	1
(MS CHANNEL-100X50X6-4)	
BACK CLAMP	1
BOLTS 16mm	4
33 KV PIN INSULATOR	3
33 KV PINS	5
EARTHING COMPLETE	1

TANGENT LOCATION  
MAX. SPAN 125 M  
(CROSS COUNTRY)

ALL DIMENSIONS ARE IN mm.

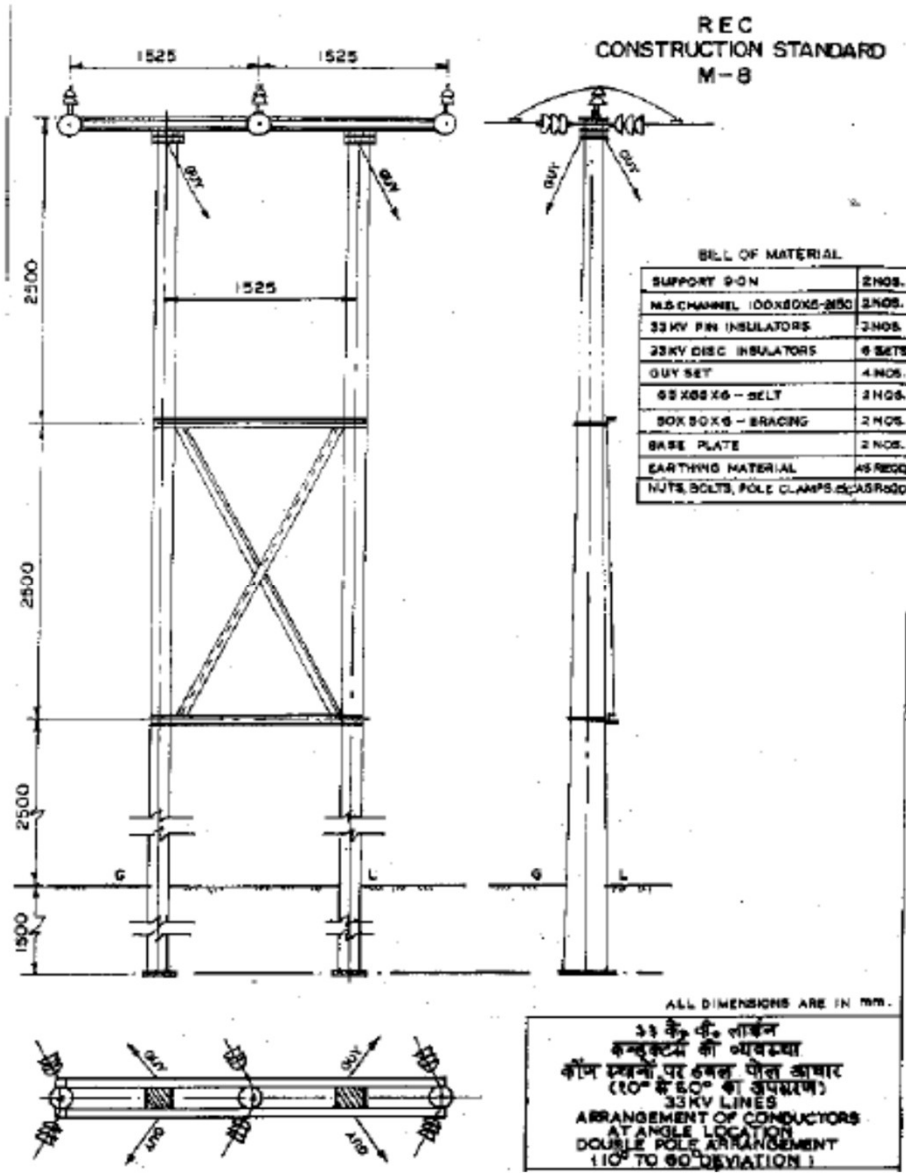
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**कन्डक्टर रचना एवं अन्तराल**  
**33KV LINE**  
**CONDUCTOR FORMATION**  
**AND CLEARANCES**

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Assistant Engineer

*[Signature]*  
Sr. Executive Engineer  
52/58

*[Signature]*  
Superintending Engineer

**Annexure 'B'**



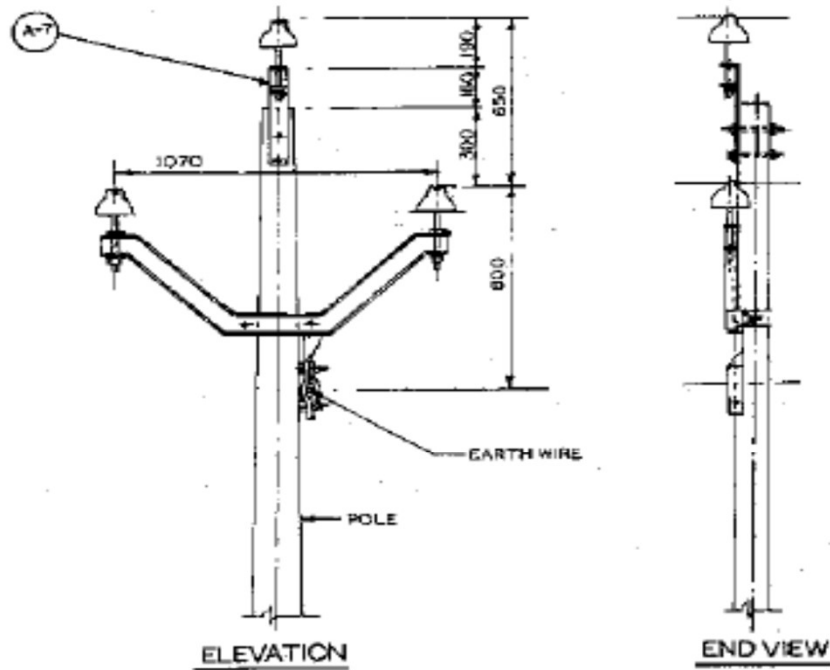
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Assistant Engineer

*[Signature]*  
Sr. Executive Engineer  
53/58

*R. K. Pathania*  
Superintending Engineer

Annexure 'B'

REC  
CONSTRUCTION STANDARD  
A-3



TANGENT LOCATION  
MAXIMUM SPAN-107 METRES

ALL DIMENSIONS ARE IN mm.

NOTE:- 11KV-CONSTRUCTION WITHOUT CONTINUOUS  
EARTH WIRE VIDE A-2 IS PREFERRED.

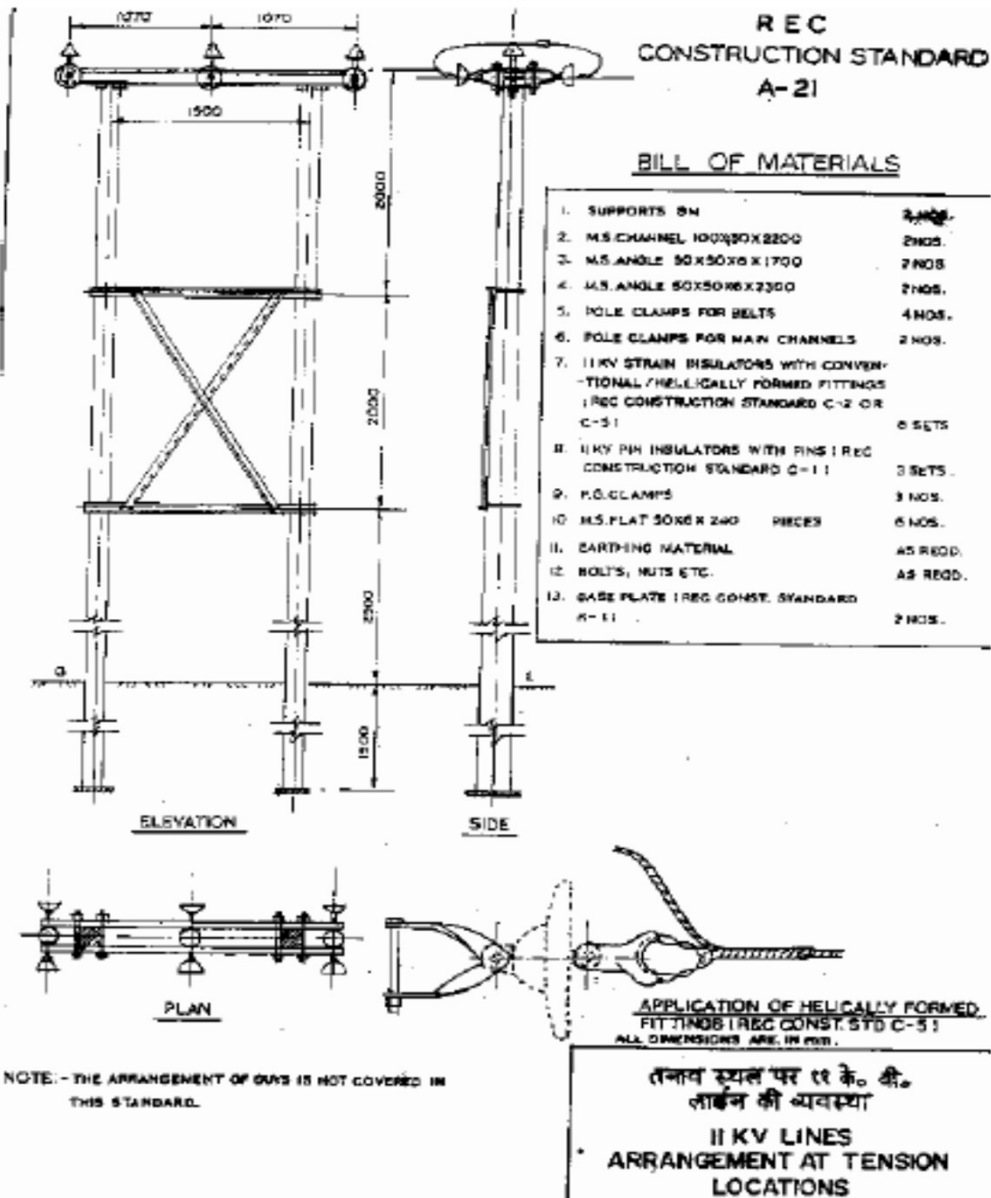
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भू तार सहित कन्डक्टर रचना व अन्तराल  
11 KV LINES  
CONDUCTOR FORMATION AND  
CLEARANCES  
WITH EARTH WIRE

*[Signature]*  
Assistant Engineer

*[Signature]*  
Sr. Executive Engineer  
54/58

*[Signature]*  
Superintending Engineer

**Annexure 'B'**



*Hin*  
Assistant Engineer

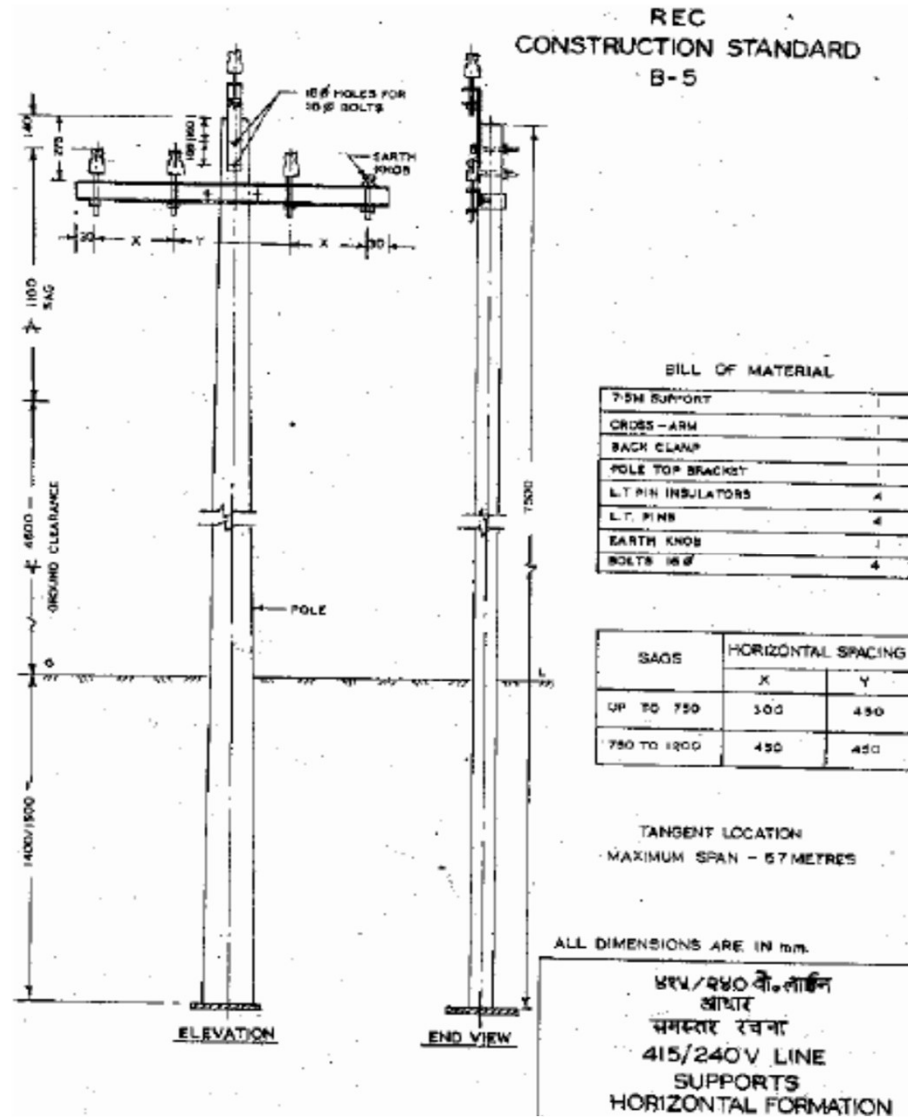
*[Signature]*  
Sr. Executive Engineer  
55/58

*R. K. Pathania*  
Superintending Engineer





**Annexure 'B'**



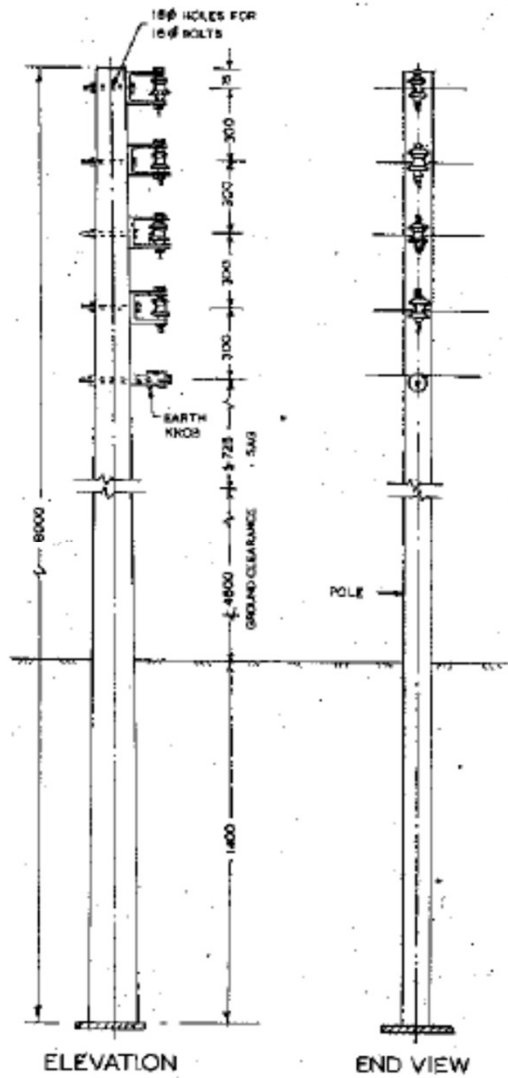
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Assistant Engineer

*[Signature]*  
Sr. Executive Engineer  
57/58

*R. K. Pathania*  
Superintending Engineer

**Annexure 'B'**

REC  
CONSTRUCTION STANDARD  
B-5



BILL OF MATERIAL

BM SUPPORT	1
U-CLAMPS	4
SHACKLE INSULATORS	4
EARTH KNOB	1
BOLTS 16 $\phi$	5

TANGENT LOCATION  
MAXIMUM SPAN - 67 METRES  
ALL DIMENSIONS ARE IN mm

४१५/२५० वी. लाईन  
आधार  
खड़ी रचना  
415/240V LINES  
SUPPORTS  
VERTICAL FORMATION

*[Signature]*  
Assistant Engineer

*[Signature]*  
Sr. Executive Engineer  
58/58

*[Signature]*  
Superintending Engineer