

**Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",
"North – South Interlink Package (Phase – I)" & "Thrissivaperur Line Strengthening Package" on turnkey basis.**

SL. NO.	ITEM DESCRIPTION	UNIT	BILL OF QUANTITIES - MATERIAL & SPARES																	
			Kottayam Line Package									North South Interlink Project				Thrissivaperur Line Strengthening Package			Total Qty - KLP+NSIP+TLSP	
			Project A1	Project A2	Project A3	Project A Total	Project B	Project C	Project D	Spares	Total Qty	Project A	Project B	Spare Total Qty	Total Qty	Project A	Spare A	Total Qty	Total Qty - Main+Spare	
1	2	3	4	5	6	7 = 4+5+6	8	9	10	11	12=7+8+9+10+11	13	14	15	16=13+14+15	17	18	19	20=12+16+19	
1	Towers & Tower accessories																			
1.1	Manufacturing, Testing and Supply of Lattice Type Hot Dip Galvanized Steel Towers and Stub & cleat of various types complete with all tower parts & Extensions, Templates, including bolts & nuts, step bolts, hangers, D-shackles, spring washers, Danger plate, Number plate, Phase plate, Anti Climbing Device, Bird Guard, etc. complete in all respect as per scope & Technical specifications	MT	1,350	345	110	1,805	680	375	125	-	2,985	1,100	1,340	-	2,440	1,880	-	1,880	7,305	
1.2	Manufacturing, Testing and Supply of Pipe Type Earthing set with 50NB Hot Dip GI Pipe (3000mm long), Set of flat 50x6 (5000mm long) with bolts, nuts & spring washers complete in all respect as per scope & Technical specifications	No	120	30	40	190	56	30	2	-	278	104	120	-	224	166	-	166	668	
1.3	Manufacturing, Testing and Supply of Counter poise Earthing set with following accessories Hot Dip Galvanized Steel Wire 7/3.0mm (120 m long), Legs for Counterpoise compression joints, Any other required groove clamps, connectors etc. complete in all respect as per scope & Technical specifications	No	12	3	4	19	6	3	-	-	28	10	12	-	22	17	-	17	67	
2	Conductors and Conductor Accessories																			
2.1	Manufacturing, Testing & Supply of following type of Conductors complete in all respect as per scope & technical specifications:																			
2.1.1	ACCC Drake equivalent conductor	km														138	-	138	138	
2.1.2	ACSR Panther Conductor	km	360	82	30	472	115	-	-	7	594	218	300	-	518			-	1,112	
2.1.3	ACSR Kundah - Conductor	km	-	-	-	-	-	24	-	1	25		-	-	-			-	25	
2.1.4	ACSR Zebra Conductor	km	-	-	-	-	-	24	-	2.4	26	-	-	-	-			-	26	
2.1.5	ACSR Moose Conductor	km	-	-	-	-	-	-	5	0.5	6	-	-	-	-			-	6	
2.1.6	ACSR 30/2.59mm Al 7/2.59mm steel Wolf	km														8	-	8	8	
2.2	Manufacturing, Testing & Supply of Midspan Compression joint for following type of conductor complete in all respect as per Scope and technical specification																			
2.2.1	ACSR Panther Conductor	No	375	100	35	510	150	-	-	27	687	120	151	15	286			-	973	
2.2.2	ACSR Kundah Conductor	No	-	-	-	-	-	30	-	3	33		-	3	3			-	36	
2.2.3	ACSR Zebra Conductor	No	-	-	-	-	-	30	-	3	33	-	-	-	-			-	33	
2.2.4	ACSR Moose Conductor	No	-	-	-	-	-	-	14	5	19	-	-	-	-			-	19	
2.2.5	ACSR Wolf Conductor	No														5	-	5	5	
2.2.6	ACCC Drake equivalent conductor	No														25	5	30	30	
2.3	Manufacturing, Testing & Supply of Repair Sleeve for following type of conductor complete in all respect as per Scope and technical specification																			
2.3.1	ACSR Panther Conductor	No	-	-	-	-	-	-	-	24	24	36	45	5	86			-	110	
2.3.2	ACSR Kundah Conductor	No	-	-	-	-	-	-	-	3	3		-	3	3			-	6	
2.3.3	ACSR Zebra Conductor	No	-	-	-	-	-	-	-	3	3	-	-	-	-			-	3	
2.3.4	ACSR Moose Conductor	No	-	-	-	-	-	-	-	20	20	-	-	-	-			-	20	
2.3.5	ACSR Wolf Conductor	No														5	-	5	5	

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			Project A1	Project A2	Project A3	Project A Total	Project B	Project C	Project D	Spares	Total Qty	Project A	Project B	Spare Total Qty	Total Qty	Project A	Spare A	Total Qty	Total Qty - Main+Spare
			4	5	6	7 = 4+5+6	8	9	10	11	12=7+8+9+10+11	13	14	15	16=13+14+15	17	18	19	20=12+16+19
1	2	3	4	5	6	7 = 4+5+6	8	9	10	11	12=7+8+9+10+11	13	14	15	16=13+14+15	17	18	19	20=12+16+19
2.3.6	ACCC Drake equivalent conductor	No														50	5	55	55
2.4	Manufacturing, Testing & Supply of T-Connector for following type of conductor complete in all respect as per Scope and technical specification																		
2.4.1	ACSR Panther Conductor	No	30	30	10	70	30	-	-	10	110	18	24	2	44			-	154
2.4.2	ACSR Kundah Conductor	No	-	-	-	-	-	-	-	3	3		-	2	2			-	5
2.4.3	ACSR Zebra Conductor	No	-	-	-	-	-	36	-	3	39	-	-	-	-			-	39
2.4.4	ACSR Moose Conductor	No	-	-	-	-	-	-	60	6	66	-	-	-	-			-	66
2.4.5	ACSR Wolf Conductor	No														6	-	6	6
2.4.6	ACCC Drake equivalent conductor	No														36	2	38	38
2.5	Manufacturing, Testing & Supply of Vibration Damper for following type of conductor complete in all respect as per Scope and technical specification																		
2.5.1	ACSR Panther Conductor	No	2,160	504	240	2,904	936	-	-	28	3,868	1,176	1,164	58	2,398			-	6,266
2.5.2	ACSR Kundah Conductor	No				-		168		6	174		-	126	126			-	300
2.5.3	ACSR Zebra Conductor	No	-	-	-	-	-	168	-	6	174	-	-	-	-			-	174
2.5.4	ACSR Moose Conductor	No	-	-	-	-	-	-	96	10	106	-	-	-	-			-	106
2.5.5	ACSR Wolf Conductor	No														50	-	50	50
2.5.6	ACCC Drake equivalent conductor	No														1,100	10	1,110	1,110
2.6	Manufacturing, Testing & Supply of Single Tension Hardware Fittings for following type of single conductor complete in all respect as per Scope and technical specification																		
2.6.1	ACSR Panther Conductor (110KV)	No	480	132	192	804	276	-	-	24	1,104	402	432	43	877			-	1,981
2.6.2	ACSR Kundah Conductor (220KV)	No	-	-	-	-	-	138	-	6	144		-	93	93			-	237
2.6.3	ACSR Zebra Conductor (220KV)	No	-	-	-	-	-	138	-	6	144	-	-	-	-			-	144
2.6.4	ACSR Wolf Conductor (110KV)	No														50	-	50	50
2.6.5	ACCC Drake equivalent conductor (220KV)	No														570	12	582	582
2.7	Manufacturing, Testing & Supply of Single Suspension Hardware Fittings for following type of single conductor complete in all respect as per Scope and technical specification																		
2.7.1	ACSR Panther Conductor (110KV)	No	243	54	39	336	99	-	-	15	450	150	252	14	416			-	866
2.7.2	ACSR Kundah Conductor (220KV)	No	-	-	-	-	-	51	-	3	54		-	63	63			-	117
2.7.3	ACSR Zebra Conductor (220KV)	No	-	-	-	-	-	51	-	6	57	-	-	-	-			-	57
2.7.4	Quad Bundle ACSR Moose Conductor (For 400 KV Pilot String)	No	-	-	-	-	-	-	6	1	7	-	-	-	-			-	7
2.7.5	ACSR Wolf Conductor (110KV)	No														12	-	12	12
2.8	Manufacturing, Testing & Supply of Double Suspension Hardware Fittings for following type of single conductor complete in all respect as per Scope and technical specification																		
2.8.1	ACSR Panther Conductor (110KV)	No	12	12	6	30	-	-	-	3	33	30	24	2	56			-	89
2.8.2	ACSR Kundah Conductor (220KV)	No	-	-	-	-	-	6	-	1	7			6	6			-	13
2.8.3	ACSR Zebra Conductor (220KV)	No	-	-	-	-	-	6	-	1	7	-	-	-	-			-	7
2.8.4	ACSR Wolf Conductor (110KV)	No														-	-	-	-

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			4	5	6	7 = 4+5+6	8	9	10	11	12=7+8+9+10+11	13	14	15	16=13+14+15	17	18	19	20=12+16+19
1	2	3																	
2.9	Manufacturing, Testing & Supply of Double Tension Hardware Fittings for following type of single conductor complete in all respect as per Scope and technical specification																		
2.9.1	ACSR Panther Conductor (110KV)	No	48	12	48	108	36	-	-	12	156	60	24	2	86			-	242
2.9.2	ACSR Kundah Conductor (220KV)	No	-	-	-	-	-	12	-	1	13		-	10	10			-	23
2.9.3	ACSR Zebra Conductor (220KV)	No	-	-	-	-	-	12	-	3	15	-	-	-	-			-	15
2.9.4	Quad Bundle ACSR Moose Conductor (400KV)	No	-	-	-	-	-	-	36	4	40	-	-	-	-			-	40
2.9.5	ACSR Wolf Conductor (110KV)	No														-	-	-	-
2.9.6	ACCC Drake equivalent conductor (220KV)	No														36	12	48	48

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			Project A1	Project A2	Project A3	Project A Total	Project B	Project C	Project D	Spares	Total Qty	Project A	Project B	Spare Total Qty	Total Qty	Project A	Spare A	Total Qty	Total Qty - Main+Spare	
1	2	3	4	5	6	7 = 4+5+6	8	9	10	11	12=7+8+9+10+11	13	14	15	16=13+14+15	17	18	19	20=12+16+19	
2.10	Manufacturing, Testing & Supply of Preformed Armour Rod for following type of conductor complete in all respect as per Scope and technical specification																			
2.10.1	ACSR Panther Conductor	No	378	72	24	474	90	-	-	21	585	510	846	40	1,396			-	1,981	
2.10.2	ACSR Kundah Conductor	No	-	-	-	-	-	18	-	2	20	-	-	63	63			-	83	
2.10.3	ACSR Zebra Conductor	No	-	-	-	-	-	18	-	6	24	-	-	-	-			-	24	
2.10.4	ACSR wolf Conductor					-					-				-	12		12	12	
2.11	Manufacturing, Testing & Supply of Hardware set for Twin ACSR Panther Conductor for 220KV complete in all respect as per Scope and technical specification																			
2.11.1	Double tension Hardware set	No	480	132	-	612	276	-	-	24	912	462	432	43	937			-	1,849	
2.11.2	Single Suspension Hardware set	No	117	30	-	147	63	-	-	18	228	114	129	11	254			-	482	
2.11.3	V String Suspension Hardware	No	126	24	-	150	30	-	-	12	192	66	144	14	224			-	416	
2.12	Spacer Damper suitable for Twin ACSR Panther Conductor	Set	2,920	640	-	3,560	740	-	-	35	4,335	1,560	2,124	89	3,773			-	8,108	
2.13	Rigid spacer suitable for ACSR Twin Panther	set	960	240		1,200	560			10	1,770	468	516	22	1,006			-	2,776	
2.14	Spacer Damper suitable for ACSR Quad-Moose Conductor	Set	-	-	-	-	-	-	40	4	44	-	-	-	-			-	44	
2.15	Manufacturing, Testing & Supply of Hardware set for ACCC Drake equivalent Conductor including conductor accessories complete in all respect as per Scope and technical specification																			
2.15.1	V String Suspension Hardware set	Set														200	10	210	210	
2.15.2	Single Pilot Suspension Hardware set including PA rod	Set														150	12	162	162	
3	Polymeric Insulators																			
3.1	Manufacturing, Testing and Supply of Silicone Rubber Housed Long rod composite polymer Insulator of following items complete in all respect as per scope and technical specifications																			
3.1.1	110kV, 70KN	No	243	54	42	339	96	-	-	24	459	210	252	30	492	12	-	12	963	
3.1.2	110kV, 90KN	No	528	144	216	888	288	-	-	51	1,227	522	432	48	1,002	54	-	54	2,283	
3.1.3	220kV, 90KN	No	369	78	-	447	123	102	-	30	702	246	417	50	713	546	27	573	1,988	
3.1.4	220kV, 120KN	No	960	264	-	1,224	516	276	-	84	2,100	924	864	50	1,838	636	32	668	4,606	
3.1.5	400kV, 120KN	No	-	-	-	-	-	-	12	2	14	-	-	-	-			-	14	
3.1.6	400kV, 160KN	No	-	-	-	-	-	-	120	12	132	-	-	-	-			-	132	
4	OPGW & Accessories																			
4.1	Manufacturing, Testing & Supply 48 Fiber (DWSM) OPGW Cable	Km	21.4	4.9	5.3	31.6	7.2	4.2	1.0	3.6	48	12	16	1	29	23.0	-	23	100	
4.2	Manufacturing, Testing & Supply of Hardware set for 48 fibre OPGW OFC including cable fittings and all accessories (per Km rate)	Km	21.4	4.9	5.3	31.6	7.2	4.2	1.0	3.6	48	-	-	-	-			-	48	
4.3	Manufacturing, Testing & Supply of following OPGW Accessories complete in all respect as per scope and technical specifications																	-		
4.3.1	Joint Box (48 Fibre)	No	10	3	2	15	4	3	2	1	25	4	4	2	10	6	-	6	41	

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			4	5	6	7 = 4+5+6	8	9	10	11	12=7+8+9+10+11	13	14	15	16=13+14+15	17	18	19	20=12+16+19
4.3.2	Self Supporting Cubicle of Size 1220X600X600 mm suitable for 96 fibre (Fibre Optic Distribution Panel (FODP))	No	2	2	1	5	2	1	1	1	10	2	2	1	5	2	-	2	17
4.3.3	Suspension Assembly for 48 Fibre OPGW - ASLH-D(S)b 48 SMF (A20SA 79-6.4)	No	-	-	-	-	-	-	-	-	-	11	24	4	39	33	3	36	75
4.3.4	Tension Assembly for 48 Fibre OPGW - ASLH-D(S)b 48 SMF (A20SA 79-6.4)	No	-	-	-	-	-	-	-	-	-	76	72	14	162	84	4	88	250
4.3.5	Dead end Assembly for 48 Fibre OPGW - ASLH-D(S)b 48 SMF (A20SA 79-6.4)	No	-	-	-	-	-	-	-	-	-	4	8	2	14	4	-	4	18
4.3.6	Tension Assembly (For Joint Box Locations) for 48 Fibre OPGW - ASLH-D(S)b 48 SMF (A20SA 79-6.4)	No	-	-	-	-	-	-	-	-	-	8	8	2	18	12	1	13	31
4.3.7	Pass through Assembly for 48 Fibre OPGW - ASLH-D(S)b 48 SMF (A20SA 79-6.4)	No	-	-	-	-	-	-	-	-	-	39	32	5	76	38	4	42	118
4.3.8	Tension Assembly at Susp. Tower (For Joint Box Locations) for 48 Fibre OPGW - ASLH-D(S)b 48 SMF (A20SA 79-6.4)	No	-	-	-	-	-	-	-	-	-	2	2	2	6	6	1	7	13
4.3.9	Vibration Damper for 48 Fibre OPGW - ASLH-D(S)b 48 SMF (A20SA 79-6.4)	No	-	-	-	-	-	-	-	-	-	98	120	16	234	166	17	183	417
4.3.10	Down Lead Clamp Assembly for 48 Fibre OPGW - ASLH-D(S)b 48 SMF (A20SA 79-6.4)	No	-	-	-	-	-	-	-	-	-	8	40	6	54	60	6	66	120
4.3.11	Flexible aluminium Bond with Y type Clamp	No	-	-	-	-	-	-	-	-	-	60	100	16	176				176
4.3.12	Fibre Optic Approach Cable- 48 Fibre	m	-	-	-	-	-	-	-	-	-	400	300	-	700				700
4.3.13	HDPE Pipe 40 mm	m	-	-	-	-	-	-	-	-	-	400	300	-	700				700
4.3.14	GI Cable Tray with clamp, B&N, suitable for Approach cable- 48 Fibre	m	-	-	-	-	-	-	-	-	-	20	20	4	44				44
4.3.15	Cable loop bracket	No	-	-	-	-	-	-	-	-	-	4	4	1	9				9
5	Earthwire & Accessories																		
5.1	Manufacturing, Testing and Supply of Earthwire & Accessories complete as per scope and technical specifications																		
5.1.1	GI Earthwire 7/9 SWG	km	0.5	0.5	0.5	1.5	0.5	0.5	0.5	0.0	3	-	-	-	-				3
5.1.2	Single Tension hardware set for 7/9 SWG Earthwire with copper bond	No	10	6	6	22	6	6	6	-	40	-	-	-	-				40
6	Miscellaneous Accessories																		
6.1	Manufacturing, Testing and Supply of Ariel Marker Balls fluroscent complete as per scope & technical specifications:	No	10	10	-	20	10	-	-	5	35	-	-	-	-				35
6.2	Manufacturing, Testing and Supply of Aviation Warning Lights solar powered complete in all respect as per scope & technical specifications:	No	10	5	-	15	5	3	-	2	25	-	-	-	-				25
7	110KV UG cable - Materials Charge																		-
7.1	110 kV UG Cable 630 sqmm XLPE Aluminium Cable Aluminim Corrugated Shathed XLPE	km										4.2			4				4
7.2	110 kV Cable end termination (Heat shrinkable type) suitable for tower cross mounting	No										14			14				14

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7.3	Supply of Single Phase Link Box without SVL with earth bond cable suitable for 110KV XLPE Cable	No										7			7				7
7.4	110kV Surge Arrestor Polymer (Silicon Rubber) with all accessories suitable for mounting in Tower	No										12			12				12
7.5	Heavy Duty Non Magnetic materials Aluminium cast cable bracket / clamp with protective sleeve inside with all fixing materials like fasteners etc. suitable for 110kV 630 sq.mm Cable	No										400			400				400
7.6	Hot Dipped GI Angle Ladder trays with all fixing materials like tray jointing angles, plates, B&N, Washers etc for mounting 110KV Cable on tower including support structure for additional fabrication on tower	MT										5			5				5
7.7	Hot Dipped GI Angle Ladder trays with all fixing materials like tray jointing angles, plates, B&N, Washers etc for laying earth strips on tower	MT										2			2				2
7.8	Hot Dipped GI strip Size 50x6mm Size	kg										1000			1,000				1,000
7.9	Synthetic warning Tape Size 300mm Wide & 1mm Thick with printing as per standard	km										1.2			1				1
8	Supply of 180m Dia HDPE pipe with coupling Collars	m										120			120				120
8.1	Optical Fibre Cable	m										600			600				600
8.2	Splice Box for OFC	No										2			2				2

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			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
1	Stub setting as per approved schedule including surveying for marking and pegging of tower locations at site, in correct alignment using template or Probe Setting in concrete foundation / rock foundation excluding excavation, concreting and back filling, removing the template after completion etc., complete in all respects as per scope & specification of work for following:													
1.1	220/220kV MC or 220/110 kV MCMV or 220kV DC towers or 400 KV MC/DC tower	each	60	14	-	25	14	1	114	49	60	109	83	306
1.2	110 kV DC towers	each	-	-	20	3	-	-	23	-	-	-		23
2	Excavation of earth pit of size 0.3 x 0.3 x 3.6 m (Two Earthing per Location) including over excavation on account of sloping the banks and necessary hire for planks for filling of charcoal, earthing of tower by means of a 50 mm dia, 3 m long pipe and a double run 7/9 S.W.G galvanised steel wire or G.1 tape including cost of charcoal but excluding cost of pipes, steel wire or copper tape with connecting lugs, nuts, etc. including measurement of tower foot resistance by standard egpt, Complete in all respects as per scope & specification of work	each	120	30	40	56	30	2	278	106	120	226	166	670
3	Counter poise earthing excavation for trench for burying the conductor 450mm below ground level, laying and connecting the conductor on to the tower legs, back filling and consolidating the soil after laying the conductor etc. Complete in all respects as per scope & specification of work	m	800	200	300	400	200		1,900	600	720	1,320	1,000	4,220
4	Erection of super structure above ground level, including erection of normal and special hill side extension members, where ever necessary, providing tower accessories like phase, danger and number plates, bird guards, anti climbing devices, etc. complete in all respects as per scope & specification for following:								-			-		
4.1	220/220kV MCMV or 220/110 kV MCMV or 220kV DC towers or 400 KV Multicircuit tower	MT	1,300	330	-	650	360	120	2,760	1,100	1,340	2,440	1,880	7,080
4.2	110 kV DC towers	MT	-	-	100	-	-		100			-		100

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Package			Thrivivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
5	Stringing of conductors using Tension Puller Machine including attaching Polymer V type Tension/Suspension insulator strings with arcing horns or rings on to the cross arms, clamping conductor to the insulator strings using suspension clamps with armour rods, tension clamps, jumpering at tension points with pilot suspension insulators, wherever necessary, jointing of conductor and pilot wire, wherever necessary, installation of vibration dampers, including dismantling of 33kV or LT lines & re-stringing, wherever required, complete in all respects as per scope & specification of work for the following:								-			-		
5.1	Six line Single and Six line Double ACSR Panther conductor for 110 kV/220kV Multi circuit	Km	19.60	2.85	-	5.70	-		29	11.73	14	26		55
5.2	Six line Double ACSR Panther conductor for 220kV/110kV Multi circuit	Km		1.60		1.02			3			-		3
5.3	Six line Single ACSR Panther conductor for 110 kV Double circuit	Km	-	-	4.85	-	-		5		2	2		7
5.4	Six line ACSR Kundah conductors for 220 KV Multicircuit	km	-	-	-	-	3.84		4			-		4
5.5	Six line ACSR Zebra conductor for 220kV Multi circuit	Km	-	-	-	-	3.84		4			-		4
5.6	Six line ACSR Quad-Moose conductor for 400kV Multi circuit	km						0.11	1			-		1
5.7	Six line ACSR Wolf conductor for 220kV/110kV Multi circuit	km							-			-	1.50	1.50
5.8	Six line ACCC Drake equivalent conductor for 220kV/110kV Multi circuit	km							-			-	23	23
5.9	Stringing of one no. 7/9 SWG stranded steel GI earth wire	km	0.5	0.5	0.5	0.5	0.5	0.5	3			-		3
6	Tension stringing using tension puller machine as per standard of 24/48 pair Optical Ground Wire (OPGW ASLH-D(S)b 24 SMF) including fixing of hardware accessories, fittings including cable fittings and accessories, etc, Pre-installation test (Drum Test), Post installation tes, Splicing and link test (End to End Test) and providing suitable back stays at the time of stringing, complete in all respects as per scope & specification of work	km	21.60	5.10	4.85	7.35	4.18	1.00	45	12	16	28	23	96

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Package			Thrissivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
7	Dismantling of conductors including detaching insulator strings with arcing horns or rings from the tower cross arms, disconnecting the jumpering at tension points, detaching of vibration dampers, providing suitable back stays at the time of dismantling, etc. complete in all respects as per scope & technical specifications of following types:								-			-		
7.1	6 line ACSR DOG / Copper conductors	km	-	-	2.5	5.4	-	-	8			-		8
7.2	3 line ACSR DOG / copper conductors	km	19.4	2.4	2.3	-	-	-	25			-		25
7.3	3 line ACSR WOLF/Tiger/Mink conductors	km							-			-	22	22
7.4	6 line ACSR WOLF/Tiger conductors	km	-	1.96	-	-	-	-	2	12	-	12	1.5	16
7.5	6 line ACSR Kundah conductors	km	-	-	-	-	2.4		3			-		3
7.6	Dismantling as per standard of ACSR Quad-Moose conductors	km						0.3	1			-		1.0
7.7	24/48 pair Optical Ground Wire (OPGW ASLH-D(S)b 24 SMF) including hardware, cable fittings and accessories, etc.	km						0.3	1			-		1.0
8	Dismantling one no. 7/9/10 or 7/3.66/3.15 mm stranded steel earth wire from the existing 220kV DC / 110kV SC /66kV DC towers including detaching the tension clamps and suspension clamps, jumpers at tension points, earth bonds, protective trestles and providing suitable back stays complete in all respects as per scope & technical specifications.	km	19.4	4.4	4.8	5.4	2.4		37	12	-	12	25	74
9	Dismantling of tower superstructure above ground level including dismantling of tower accessories like phase, danger and number plates, bird guards, anticlimbing devices etc	MT	235	80	70	105	60		550	245	-	245	150	945
10	Clearing grass and removal of the rubbish upto a distance of 50m outside the periphery of the area cleared less than 1m. Complete in all respects as per scope & specification of work & technical specifications.													
10.1	Height of more than 1m above ground level	sqm	359.00	87.00	253.50	39.00	177.45		916	-	-	-		916
10.2	Less than 1m above ground level	sqm	1,014.0	237.0	338.0	101.0	236.6		1,927	-	-	-		1,927
11	Felling trees of girth(measured at aheight of 1m above ground level) including cutting of trunks and branches removing the roots and stacking of serviceable material and disposal of unserviceable material. Complete in all respects as per scope & specification of work & technical specifications.													
11.1	Beyond 30cm girth upto and including 60cm girth	Each	400	50	100	400	300		1,250	100	100	200	75	1,525

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Package			Thrivivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
11.2	Beyond 60cm girth upto and including 120cm girth	Each	600	100	50	600	500		1,850	100	100	200	75	2,125
11.3	Beyond 120cm girth upto and including 240cm girth	Each	300	100	50	200	500		1,150	100	50	150	75	1,375
11.4	Above 240cm girth	Each	150	50	20	100	200		520	100	50	150	75	745
12	Detailed Survey of the route along the alignment fixed by KSEBL, preparation of the longitudinal profiles of the route showing all site details of the terrain for the full corridor of the line route, plotting of tower locations with details of types and extensions to towers, preparation of tower schedule, sag and tension calculations of conductors, preparation and supply of one copy of the approved sag template on transparent acrylic plastic sheet after completion of all the stub setting works, two paper print copies and one tracing cloth copy of the approved profile drawing and route map with the final tower locations marked, complete in all respects as per scope & technical specifications.	km	2	0.4	-	2	1		6	-	17	17		23.00
13	Arranging scaffolding on either sides of the Main road as per the directions of KSEBL officers complete in all respects as per scope & technical specifications.	Loc	24	6	10	20	10	10	80	20	100	120	75	275
14	Labour Charges for Fixing ariel marker balls for very long spans including transportation charges etc complete as directed by depts/officers. Complete in all respects as per scope & specification of work & technical specifications.	Each	10	10	-	10	-		30	-	-	-		30
15	Labour Charges for providing Aviation Warning lights at top of specified towers including fixing all accessories such as solar panels, batteries and transportation charges etc. Complete as directed by depts/officers. Complete in all respects as per scope & specification of work & technical specifications.	Each	10	5	-	5	3		23			-		23
16	Painting towers with synthetic enamel paint of approved brand and manufacture on new tower (as per IS 5613) complete in all respects as per scope & technical specifications.	sqm	400	400	-	400	100		1,300			-		1,300

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Package			Thrivivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
17	Design, Proto Fabrication, Assembly and Type Testing (non-destructive type) of new towers including design of tower foundation, complete in all respects as per scope & specification of work & technical specifications.													
17.1	400KV Multi Circuit tower	Each	-	-	-	-	-	1	1			-		1
17.2	400KV Double Circuit tower	Each	-	-	-	-	-	1	1			-		1
17.3	220 Multi Circuit special tower	Each	-	-	-	1	-	-	1			-		1
18	Installation of Emergency Restoration System (ERS) Work in existing 220 KV Double circuit Line Route (ERS Equipment will be supplied by KSEB) complete in all respects as per scope & technical specifications.	Km	-	-	-	-	2.7		3			-		3
19	Soil test, wherever found neccessary for asertaining type of foundation including taking pits/bore holes, collecting soil samples and testing at approved laboratories as per relevant IS codes, including cost of testing, all labour and transportation charges etc. as directed by KSEB Officers complete in all respects as per scope & technical specifications of following types: Except in river/lake								-			-		
19.1	Soil test in all kinds of soil except rock	metre	190	40	130	90	30		480	200	300	500	200	1,180
19.2	Soil test in ordinary rock	metre	40	10	30	20	10		110	200	150	350	100	560
19.3	Soil test in hard rock	metre	20	10	20	10	10		70	50	150	200	100	370
20	Soil test, wherever found neccessary for asertaining type of foundation including taking pits/bore holes, collecting soil samples and testing at approved laboratories as per relevant IS codes, including cost of testing, all labour and transportation charges etc. as directed by KSEB Officers complete in all respects as per scope & technical specifications of following types: In river/lake													
20.1	Soil test in all kinds of soil except rock	metre		50					50			-		50
20.2	Soil test in ordinary rock	metre		10					10			-		10
20.3	Soil test in hard rock	metre		5					5			-		5

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Package			Thrivivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
21	Excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, in specified lifts, including disposal of surplus excavated soil as directed, within a lead of 50m including pumping out water from all sources wherever necessary, complete in all respects as per scope & technical specifications in:													
21.1	All kinds of soil excluding rock								-			-		
21.1.1	Depth not exceeding 1.5 m.	cum	66	66	528	174	66		900			-		900
21.1.2	Depth exceeding 1.5 m but not exceeding 3 m.	cum	22	22	176	58	22		300			-		300
21.1.3	Depth exceeding 3 m but not exceeding 4.5 m.	cum	22	22	176	58	22		300			-		300
21.2	Ordinary rock								-			-		-
21.2.1	Depth not exceeding 1.5 m.	cum	1	2	71	3	1		79			-		79
21.2.2	Depth exceeding 1.5 m but not exceeding 3 m.	cum	3	6	213	9	3		235			-		235
21.2.3	Depth exceeding 3 m but not exceeding 4.5 m.	cum	7	12	426	17	7		469			-		469
21.3	Hard rock (requiring blasting)								-			-		-
21.3.1	Depth not exceeding 1.5 m.	cum	1	2	4	1	1		9			-		9
21.3.2	Depth exceeding 1.5 m but not exceeding 3 m.	cum	2	6	12	4	2		26			-		26
21.3.3	Depth exceeding 3 m but not exceeding 4.5 m.	cum	3	12	24	9	3		51			-		51
21.4	Hard rock (blasting prohibited)								-			-		-
21.4.1	Depth not exceeding 1.5 m.	cum	1	1	18	1	1		22			-		22
21.4.2	Depth exceeding 1.5 m but not exceeding 3 m.	cum	3	3	54	3	3		66			-		66
21.4.3	Depth exceeding 3 m but not exceeding 4.5 m.	cum	6	6	108	6	6		132			-		132
22	Excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30cm in depth. 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50m and in specified lift, disposed earth to be levelled and neatly dressed including pumping out water from all sources wherever necessary. complete in all respects as per scope & technical specifications in:													
22.1	All kinds of soil excluding rock								-			-		-
22.1.1	Depth not exceeding 1.5 m.	cum	3,699	480	1,020	4,920	1,680	540	12,339	12,000	4,194	16,194	10,700	39,233
22.1.2	Depth exceeding 1.5 m but not exceeding 3 m.	cum	1,233	160	340	1,640	560	180	4,113	1,745	607	2,352	3,019	9,484
22.1.3	Depth exceeding 3 m but not exceeding 4.5 m.	cum	1,233	160	340	1,640	560	180	4,113	1,000	500	1,500	1,000	6,613
22.2	Ordinary rock								-			-		-
22.2.1	Depth not exceeding 1.5 m.	cum	492	10	134	650	220	70	1,576	300	200	500	2,130	4,206
22.2.2	Depth exceeding 1.5 m but not exceeding 3 m.	cum	1,476	30	402	1,950	660	210	4,728	163	56	219	218	5,165
22.2.3	Depth exceeding 3 m but not exceeding 4.5 m.	cum	2,952	60	804	3,900	1,320	420	9,456	150	25	175	100	9,731
22.3	Hard rock (requiring blasting)								-			-		-
22.3.1	Depth not exceeding 1.5 m.	cum	13	1	4	17	6	2	43			-		43

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Package			Thrivivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
22.3.2	Depth exceeding 1.5 m but not exceeding 3 m.	cum	36	1	10	51	18	6	122			-		122
22.3.3	Depth exceeding 3 m but not exceeding 4.5 m.	cum	73	2	20	102	36	12	245			-		245
22.4	Hard rock (blasting prohibited)								-			-		-
22.4.1	Depth not exceeding 1.5 m.	cum	121	4	34	170	60	20	409	200	200	400	2,130	2,939
22.4.2	Depth exceeding 1.5 m but not exceeding 3 m.	cum	365	12	102	510	180	60	1,229			-		1,229
22.4.3	Depth exceeding 3 m but not exceeding 4.5 m.	cum	729	24	204	1,020	360	120	2,457			-		2,457
23	Earth work in excavation in soil (Under water) by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed, in or under water and/or liquid mud, including pumping out water as required, complete in all respects as per scope & technical specifications:													
23.1	Normal kinds of soil								-			-		
23.1.1	Depth not exceeding 1.5 m.	cum	1,086	99	306	1,500	294	108	3,393			-		3,393
23.1.2	Depth exceeding 1.5 m but not exceeding 3 m	cum	362	33	102	500	98	36	1,131			-		1,131
23.1.3	Depth exceeding 3 m but not exceeding 4.5 m.	cum	362	33	102	500	98	36	1,131			-		1,131
23.2	Ordinary rock								-			-		-
23.2.1	Depth not exceeding 1.5 m.	cum	19	3	6	30	6	2	66			-		66
23.2.2	Depth exceeding 1.5 m but not exceeding 3 m	cum	57	11	18	90	18	6	200			-		200
23.2.3	Depth exceeding 3 m but not exceeding 4.5 m.	cum	114	21	36	180	36	12	399			-		399
23.3	Hard rock (blasting prohibited)								-			-		-
23.3.1	Depth not exceeding 1.5 m.	cum	10	2	3	20	3	1	39			-		39
23.3.2	Depth exceeding 1.5 m but not exceeding 3 m	cum	30	6	9	60	9	3	117			-		117
23.3.3	Depth exceeding 3 m but not exceeding 4.5 m.	cum	60	12	18	120	18	6	234			-		234
24	Excavation in hard rock using non explosive agent (Chemical) without resorting to the use of conventional explosive materials etc in all lifts and conveying and depositing the excavated rock etc. at places with in a distance of 50m including pumping out water from all sources wherever necessary as directed by KSEB Engineer complete as per scope & technical specifications in:	cum	65	5	65	105	35	35	310	1,100	20	1,120	425	1,855
25	Close timbering in trenches including strutting, shoring and packing cavities (wherever required) complete. (Measurements to be taken of the face area timbered) complete in all respects as per scope & technical specifications:													-
25.1	Depth not exceeding 1.5 m.	sqm	630	70	170	700	270	60	1,900	3,240	4,000	7,240	5,500	14,640
25.2	Depth exceeding 1.5 m but not exceeding 3 m.	sqm	400	20	150	700	270	60	1,600	1,800	4,000	5,800	5,500	12,900
25.3	Depth exceeding 3 m but not exceeding 4.5 m.	sqm	140	20	10	300	90	30	590	700	900	1,600	1,500	3,690

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Package			Thrivivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
26	Open timbering in trenches including strutting and shoring complete (measurements to be taken of the face area timbered). Complete in all respects as per scope & specification of work & technical specifications.								-			-		-
26.1	Depth not exceeding 1.5 m.	sqm	630	70	170	700	270	60	1,900	1,800	500	2,300	1,900	6,100
26.2	Depth exceeding 1.5 m but not exceeding 3 m	sqm	400	20	150	700	270	60	1,600	1,800	500	2,300	1,900	5,800
26.3	Depth exceeding 3 m but not exceeding 4.5 m.	sqm	140	10	10	300	90	30	580	501	200	701	500	1,781
27	Pumping out water caused by springs, tidal or river seepage, broken water mains or drains and the like. Complete in all respects as per scope & specification of work & technical specifications.	kilo litre	300	2,600	500	1,000	400	30	4,830	27,946	10,000	37,946	19,000	61,776
28	Providing and laying in position plain/reinforced cement concrete of specified grade excluding the cost of centering and shuttering up to plinth level complete in all respects including dewatering wherever necessary as per scope & specification of work & technical specifications.								-			-		
28.1	1:3:6 (1 Cement : 3 coarse sand (zone-III): 6 graded stone/aggregate 40 mm nominal size) (Note :- Cement content considered in this item is @ 220 kg/cum. Excess/less cement used as per design mix is payable/recoverable separately)	cum	280	40	40	300	110	20	790			-		790
28.2	1:3:6 (1 Cement : 3 coarse sand (zone-III): 6 graded stone/aggregate 20 mm nominal size) (Note :- Cement content considered in this item is @ 220 kg/cum. Excess/less cement used as per design mix is payable/recoverable separately)	cum							-	410	400	810	400	1,210
28.3	1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size) with cement content of 400 kg/m3 (Note :- Excess/less cement used as per design mix is payable/recoverable separately) except for river/lake locations inclusive of dewatering wherever required etc complete in all respects as per scope & technical specifications.	cum	485	30	35	500	300	78	1,428	800	2,000	2,800	1,200	5,428

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

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			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
28.4	Providing and laying in position machine batched and machine mixed design mix of specified grade concrete for reinforced cement concrete work, using cement content as per approved design mix, including pumping of concrete to site of laying but excluding the cost of centering, shuttering, finishing and reinforcement, including admixtures in recommended proportions as per IS: 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability including dewatering wherever required as per direction of KSEB coming in various locations except river/lake , complete in all respects as per scope & technical specifications.Engineer-in-charge."(Note :- Cement content considered in this item is @ 330 kg/cum."Excess/ less cement used as per design mix is payable/recoverable separately).	cum	485	30	15	700	150	40	1,420	2,460	6,000	8,460	3,500	13,380
28.5	Providing and laying in position ready mixed specified grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work, including pumping of R.M.C. from transit mixer to site of laying and with necessary arrangements to keep the pipes, excluding the cost of centering, shuttering finishing and reinforcement, including cost of admixtures in recommended proportions as per IS : 9103 to accelerate/ retard setting of concrete,improve workability without impairing strength and durability, dewatering wherever required as per direction of KSEB coming in various locations except river/lake , complete in all respects as per scope & technical specifications.(Note :- Cement content considered in this item is @ 330 kg/cum. Excess/less cement used as per design mix is payable/recoverable separately)	cum	8,940	2,850	35	515	310	80	12,730	349	700	1,049	672	14,451

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Package			Thrivivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
29	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete at all levels with Thermo-Mechanically Treated bars complete in all respects as per scope & technical specifications.	kg	6,30,971.57	2,83,866.97	8,127.98	1,45,087.15	61,059.68	19,481.46	11,48,595	1,30,000	2,80,000	4,10,000	3,04,000	18,62,595
30	Centering and shuttering including strutting, propping etc. and removal following complete in all respects as per scope & technical specifications:								-			-		-
30.1	For foundations, footings, bases for columns	sqm	4,850	1,080	830	2,300	1,140	30	10,230	5,510	9,000	14,510	11,000	35,740
30.2	For columns, piers, abutments, pillars, posts and struts	sqm	390	100	520	700	380	20	2,110	2,000	2,000	4,000	3,000	9,110
31	Random rubble masonry with hard stone including levelling up with cement concrete 1:6:12 (1 cement : 6 coarse sand : 12 graded stone aggregate 20mm nominal size) with cement mortar 1:6 (1 cement : 6 coarse sand) complete in all respects as per scope & technical specifications								-			-		-
31.1	In foundation and plinth	cum	450	110	480	580	270	70	1,960	200	300	500		2,460
31.2	In superstructure above plinth level and upto floor five level	cum	190	60	190	230	110	25	805	500	300	800		1,605
32	12 mm cement plaster of mix 1:4 (1 cement: 4 fine sand)	sqm	270	190	300	400	190	30	1,380	200	200	400		1,780
33	Flush/ Ruled pointing on stone work with cement mortar 1:3 (1 cement : 3 fine sand)	sqm	300	110	650	880	220	30	2,190	800	886	1,686		3,876
34	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and in all lifts complete in all respects as per scope & technical specifications.	cum	7,750	500	2,700	10,600	3,900	1,150	26,600	11,400	3,900	15,300	23,000	64,900
35	Supplying and Filling good quality earth brought from out side in the revetment and pits of towers in layers for consolidation including stacking for measurements watering, ramming, etc, complete as directed complete in all respects as per scope & technical specifications.	cum	2,000	200	400	1,320	300	70	4,290	-	1,600	1,600	1,600	7,490

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

BILL OF QUANTITIES - LABOUR														
SL. NO.	ITEM DESCRIPTION	UNIT	Kottayam Line Package							North South Interlink Package			Thrivivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
36	Demolishing stone rubble masonry In cement mortar manually/by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50 metres lead as per direction of KSEB engineer complete in all respects as per scope & technical specifications.	cum	90	100	50	200	20	8	468	-	-	-		468
37	Demolishing R.C.C. work manually/ by mechanical means including stacking of steel bars and disposal of unserviceable material within 50 metres lead as per direction of KSEB	cum	90	50	25	100	20	8	293			-		293
38	Construction of earthen ring bunds for bailing out water for excavation works for revetment with coconut cadjan and bamboos etc complete in all respects as per scope & technical specifications (provisional qty)								-			-		-
38.1	Bunds up to 0.5m height, 1m bottom width and 0.5m top width	Rm	250	250	100	150	50	25	825	-	1,050	1,050	400.00	2,275
38.2	Bunds beyond 0.5m height, to 1m height, 1.5m bottom width and 0.5m top width.	Rm	150	150	50	100	50	25	525	-	1,050	1,050	-	1,575
39	Boring and installation bored cast-in-situ reinforced cement concrete piles of specified grade of specified diameter and length below the pile cap, to carry a safe working load not less than specified, excluding the cost of steel reinforcement and cost of concrete but including the cost of boring with bentonite solution and temporary casing of appropriate length for setting out and removal of same and the length of the pile to be embedded in the pile cap etc. by percussion drilling using Direct mud circulation (DMC) or Bailer and chisel technique by tripod and mechanical Winch Machine all complete, including removal of excavated earth with all its lifts and leads (length of pile for payment shall be measured up to bottom of pile cap). Note: Truck Mounted rotary/TMR/Tubewell boring machine shall not be used . For all diameters of pile including charges for structural design of piles and pile cap, all costs towards shifting , making ring bunds, access bunds, dewatering etc complete except for piles in river/lake as per the direction of KSEBL Engineer complete in all respects as per scope & technical specifications.	m	2,500	800	-	-	-		3,300		10,800	10,800	1,000	15,100

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Package			Thrivivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
40	Hire charges for providing floating platform required for piling, concreting etc (Pontoon in steel work using 2 Nos. x 12.00 x 5.55x1.75 meter size one for providing machineries and the other for handling materials for form work etc, fabricating and hoisting in position with MS plate 6mm thick for bottom and sides, 10mm for top and stiffening both ways with 65mm x 65mm x 6mm Ms angle at 50cm c/c supporting over by ISMB - 150 200mm & 3 Nos., 6m long MS pipe is used for supporting the pontoon. 1 meter dia circular barrels having length 6.40 meter and 5.00 meter each is used on either side and 3.75 meter long is used in front side) or of equivalent size and approved materials. Necessary charges are included for sot and hire charges of anchorages, pontoon, mobilization charges including painting with iron primer etc. complete for piling works in river/lake as per the directions of the departmental officers at site	/metre of pile length	-	730	-	-	-	-	730			-		730
41	Fabricating, casing pipe of specified diameter with specified thick MS plate used for cast in situ pile including cost and conveyance of all materials, all related charges for fixing anchorages etc with all leads and lifts etc. complete for piles in river/lake according to the specification and as directed by the departmental officers complete in all respects as per scope & technical specifications.	Kg	-	28,550	-	-	-	-	28,550			-		28,550
42	Conveying pre fabricated, casing pipe of specified diameter with specified thick MS plate used for cast in situ pile and erecting at site in lines and levels and driven down into a required depth including cost and conveyance of all materials, all related charges for anchoring etc with all leads and lifts etc.complete for piles in river/lake as directed by the departmental officers, complete in all respects as per scope & technical specifications.	metre	-	190	-	-	-	-	190			-		190

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Package			Thrissivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
43	Boring and installation of cast-in-situ reinforced cement concrete piles of specified grade of specified diameter and length below the pile cap, to carry a safe working load not less than specified, excluding the cost of steel reinforcement and cost of concrete but including the cost of boring with bentonite solution and the length of the pile to be embedded in the pile cap etc. by percussion drilling using Direct mud circulation (DMC) or Bailer and chisel technique by tripod and mechanical Winch Machine all complete, including removal of excavated earth with all its lifts and leads and disposal of earth as per local regulations for Piles coming in river/lake(away from water bodies) (length of pile for payment shall be measured up to bottom of pile cap). Note: Truck Mounted rotary/TMR/Tubewell boring machine shall not be used. For all diameters of pile including charges for structural design of piles and pile cap, all costs towards shifting, making ring bunds, access bunds, dewatering etc complete as per the direction of KSEBL Engineer complete in all respects as per scope & technical specifications.	metre	-	730	-	-	-	-	730			-		730
44	Conveyance to site and Driving precast vertical specified grade R.C.C. Piles (Guard piles) excluding cost of cement concrete and Reinforcement complete as per Drawing and & Technical Specification Size of pile - as specified in river/lake. For all diameters / size of pile including charges for structural design of piles, all costs towards shifting, driving, jointing wherever required, etc complete as per the direction of KSEBL Engineer complete in all respects as per scope & technical specifications.	metre	-	270	-	-	-	-	270			-		270

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Package			Thrivivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
45	Providing and laying in position ready mixed specified grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads, having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work, including pumping of R.M.C. from transit mixer to site of laying and with necessary floating arrangements to keep the pipes floating , excluding the cost of centering, shuttering finishing and reinforcement, including cost of admixtures in recommended proportions as per IS : 9103 to accelerate/ retard setting of concrete,improve workability without impairing strength and durability as per direction of KSEB for Piles and pile cap coming in river/lake, complete in all respects as per scope & technical specifications.(Note :- Cement content considered in this item is @ 400 kg/cum. Excess/less cement used as per design mix is payable/recoverable separately)	cum	-	695	-	-	-	-	695			-		695
46	Add for using extra cement in the items of design mix over and above the specified cement content therein.(This rate will be used for making deductions in case of usage of lesser cement content as directed)	quintal	6,258	1,995	7	100	60	16	8,436	517	5,000	5,517	3,000	16,953
47	Boring with hydraulic piling rigs with power units, and installing cast in situ single under reamed piles of specified diameter and length below pile cap in cement concrete, to carry a safe working load not less than specified, excluding the cost of steel reinforcement and concrete but including the cost of boring with bentonite solution and the length of the pile to be embedded in pile cap etc. (Length of pile for payment shall be measured upto to the bottom of pile cap) For all diameters of pile including charges for structural design of piles,all costs towards shifting , making ring bunds, access bunds, dewatering etc complete as per the direction of KSEBL Engineer complete in all respects as per scope & technical specifications.	m	240	-	-	-	-	-	240			-		240

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Package			Thrivivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
48	Extra for providing additional bulb in under reamed piles.	each	24	-	-	-	-		24			-		24
49	Vertical load testing of piles in accordance with IS 2911 (Part IV) including installation of loading platform by Kentledge/Anchor piles method and preparation of pile head or construction of test cap and dismantling of test cap after test etc. complete as per specification & the direction of Engineer in-charge for Single pile of various tone capacities. Initial test (Test Load 2.5 times the Safe capacity) except for river/lake locations Note: 1. Initial and Routine Load Test shall not be carried out by Dynamic method of testing. Note: 2. Testing agency shall submit the design of loading platform for KSEB approval complete in all respects as per scope & technical specifications:								-			-		-
49.1	Initial test Single pile upto 50 MT Safe capacity	per test	1	-	-	-	-		1			-		1
49.2	Initial test Single pile above 50 MT and upto 100 MT Safe capacity	per test	1	-	-	-	-		1			-		1
49.3	Single pile upto 50 MT Safe capacity, Routine test (Test Load 1.5 times the Safe capacity)	per test	2	1	-	-	-		3			-		3
49.4	Single pile above 50 MT and upto 100 tonne Safe capacity, Routine test (Test Load 1.5 times the Safe capacity)	per test	2	1	-	-	-		3			-		3
50	Integrity testing of Pile using Low Strain/ Sonic Integrity Test/ Sonic Echo Test method in accordance with IS 14893 including surface preparation of pile top by removing soil, mud, dust & chipping lean concrete lumps etc. and use of computerised equipment and high skill trained personal for conducting the test & submission of results, all complete at all locations as per direction of Engineer-in-charge.	per test	10	3					13			-		13
51	High-Strain Dynamic Testing of pile using method in accordance with ASTM D 4945 including surface preparation of pile top by removing soil, mud, dust & chipping lean concrete lumps etc. and use of computerised equipment and high skill trained personal for conducting the test & submission of results, except in river/lake all complete as per direction of Engineer-in-charge.	per test	2	1					3			-		3

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Package			Thrivivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
52	High-Strain Dynamic Testing of pile using method in accordance with ASTM D 4945 including surface preparation of pile top by removing soil, mud, dust & chipping lean concrete lumps etc. and use of computerised equipment and high skill trained personal for conducting the test & submission of results, in river/lake all complete as per direction of Engineer-in-charge.	per test	-	1					1			-		1
53	Boring holes of dia 100mm or nearest size dia on hard rock where anchoring is found necessary to accommodate anchor bars/stubs including hire charges of machinery, T&P, pilot vehicle to carry other materials, grouting charges etc. Complete in all respects as per scope & technical specifications	m	80	-	80	80	20		260	1,065	50	1,115		1,375
54	Transport of dismantled materials such as tower , extensions, conductor, earthwire, insulators, hardware etc. Including loading and unloading charges (for an average distance of 25km)	MT	350	100.0	85	130	80	10	755	-	-	-	-	755
55	Supplying , stacking, handling and spreading River sand for sand bedding and sand covering over the 110kV cable in cable trench	Cub.metre							-	270		270		270
56	Transportation of 1C x 630 q.mm XLPE 110kV Cable including loading and unloading from the storage location to work site without any damage to the cable including making it ready for laying/erection works	Drum							-	9		9		9

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Pacakge			Thrissivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
57	Uncoiling and laying of 110kV XLPE Cable - 3 run for each circuit in separate trefoil formation in cable trenches and tying together with high quality cable ties at an interval of 1m as per the drawing along the excavated trenches and sand bed formed, looping of the cables through various types of pipes already laid including all charges for handling, uncoiling and paving of cables in trenches using standard cable installation equipments after providing all necessary precautions to be followed as per IS specifications without damaging the existin pipe lines, cables, water lines etc. and rectifying the damges occured, if any to the existing insallations, providing aluminium sheet identification tags 150x50mm size and 1mm think embeded with the mark showing the 'Feeder Name , Phase at every 3m interval of each cable circuit, stacking the ballance cable bits safely etc. complete.	Mtr							-	1,100		1,100		1,100
58	Uncoiling and laying of 110kV XLPE Cable - 1 run in horizontal formation as per drawing along the already exavated trenches and tying together with high quality cable ties at an interval of 1m as per the drawing along the excavated trenches and sand bed formed, looping of the cables through various types of pipes already laid including all charges for handling, uncoiling and paving of cables in trenches using standard cable installation equipments after providing all necessary precautions to be followed as per IS specifications without damaging the existin pipe lines, cables, water lines etc. and rectifying the damges occured, if any to the existing insallations, providing aluminium sheet identification tags 150x50mm size and 1mm think embeded with the mark showing the 'Feeder Name , Phase at every 3m interval of each cable circuit, stacking the ballance cable bits safely etc. complete.	metre							-	900		900		900

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Package			Thrivivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
59	Laying 180mm dia HDPE pipe with coupling collars for 630 sq.mm 110KV UG cable as per drawing in the existing trench for the road crossing, tower bottom /yard structure etc. for protection of the open cables as per the direction of the department	metre							-	120		120		120
60	Lifting of 1 Core 630 sq.mm XLPE 110kV Cable, which was laid on the ground, to the tower top by using pulley, rope etc and giving necessary fixing arrangement and conneciton as per the direction of the department	Nos							-	12		12		12
61	Clamping of 1 core 630 sq.mm cable with supporting structure / cable tray/ ladder using heay duty non-magnetic materials Aluminium cast cable bracket / clamp set at an interval of 750mm, providing suitable holes in the plates, racket, structure, fixing the same the bracket / structure etc. complete	Nos							-	400		400		400
62	Carrying out the outdoor end cable termination work in tower/yard struchure for 1 Core 630 sq.mm XLPE 110kV cable including earth bonding , all charges for the termination of cables as per standard specifications, assisting the termination works, cutting the cable, supplying all the tools and plants and other accessories and all other sundry expenditures etc. as per the directions of the departmental officers at site	No							-	14		14		14
63	Casting, curing and stacking 40x50 cm RCC protection slabs having the thickness 7.5cm at centre and 5cm sides (6mm bars, 70mm c/c bothways marking CAUTION 110KV' in storage yard, transporting and placing the slab above sand cushion bed including all the charges for charged for materilas, labour for casting slabs, curing, stacking, loading and unloading from stock yard upto a distance of 1km (average), placing, fixing stables as per drawing and direction of the deparment	No							-	2,200		2,200		2,200

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Package			Thrivivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
64	Filling available excavated earth (excluding rock) in trenches, plinth, sides of the foundation etc. in layers not exceeding 20cm in depth, consolidating each deposited earth by ramming and watering, lead up to 50m and lift up to 1.5m as per the direction of the department	Cub. Metre							-	701		701		701
65	Laying synthetic warning tape of size 300mm wide and 1mm thick with printing of danger' 110KV CABLE, KSEBL (FEEDER NAME) in black letters of size 200mmx5mm and laying in the cable trench during back filling as directed by the department	Metre							-	1,100		1,100		1,100
66	Providing CC BLOCK 400x250x100mm route marker / joint marker as per standard specifications and drawing at locations as directed by the department including all charges for fixing using cement concrete 1:3:6 using 20mm broken stone, finishing the surface and embedding the letters at top " 110KV CABLE / 110KV CABLE JOINT / FEEDER NAME" etc. as directed by department	No							-	12		12		12
67	Erection of hot dipped GI angles cable support and termination structure at yard, cable and Earth Strip ladder trays on 110KV tower as per the drawing	MT							-	7		7		7
68	Earthing with hot dipped GI pipe 4.5 m long, 40mm dia including accessories and providing masonry enclosure with cover plate having locking arrangement and watering pipes etc. with charcoal/coak required as per the direction of the department	Set							-	6		6		6
69	Laying hot dipped GI strip of 50x6 mm size through GI Cable ladders on outdoor open busbar supports in the 110kV tower including cleaning and neatly bending of strips, cutting and clamping, bolting and connecting to earth pit bus by welding or bolt and nuts, removing of earth in the tower footing and burying the earth strip to the required depth as per the direction of the department	Meter							-	400		400		400

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of "Kottayam Line Package (KLP)",

SL. NO.	ITEM DESCRIPTION	BILL OF QUANTITIES - LABOUR												
		UNIT	Kottayam Line Package							North South Interlink Package			Thrivivaperur Line Strengthening Package	Total Qty - KLP+NSIP+TLSP
			Project A1	Project A2	Project A3	Project B	Project C	Project D	Total Qty	Project A	Project B	Total Qty	Project A	
1	2	3	4	5	6	7	8	9	10=4 to 9	11	12	13=11+12	14	15=10+13+14
70	Fixing of 110kV polymer (Silcon Rubber) type Surge Arrestor on the 110KV tower cross arm after opening of crates at the place of storage leading to site carefully keeping and lines and levels as per the department	No							-	12		12		12
71	Fabricating, supplying and fixing danger Board along the cable route as per the drawing cindluing all charges for supplying and fixing 600x500mm sign board using aluminium composite panel sheet mounted on MS angles 60x60x6mm at a hight of 2.75 metre (including the cost of fittings) embeded in cement concrete block 30x30x45cm of CC 1:2:6 using 20mm brocken stone and all form work, painting both sides of the board and angle iron with tow coats of synttic enamel paint over a primer coat and lettering 2.5 to 4cm etc. complete as per the directions of the department	No							-	12		12		12
72	Cement solid / hollow block of size 300x200x150 mm work in cement mortal 1: 6 for foundation and basement including the cost of all materials, conveyance and labour charges etc complete as per specification	Cub. Metre							-	25		25		25
73	Supplying , stacking, handling and spreading 20mm brocken stone for required thickness min 10cm alying to levels as per the drawing and specifications	Cub. Metre							-	25		25		25
74	Erection of 110kV cable termination set on the already erected tower after opening of cates at the place of storage leading to the site carefully keeping lines and levels as per the direction for department	No							-	14		14		14

ANNEXURE - B

Construction/Up-gradation of 220/110kV line using Narrow base MCMV Towers of “Kottayam Line Package (KLP)”, “North – South Interlink Package (Phase – I)” & “Thrissivaperur Line Strengthening Package” on turnkey basis.

Bill of Quantities for Dismantled items

SI No	Item	KLP Qty	NSIP Qty	TSLP Qty	Total Qty	Unit	Minimum reserve Rate	Total Price (excl. Taxes)
1	Cost of Dismantled ACSR conductor	48.00	52.00	17.00	117.00	MT	84000	₹ 98,28,000.00
2	Cost of Dismantled Copper conductor	7.00			7.00	MT	315000	₹ 22,05,000.00
3	Cost of Dismantled 7/9 or 7/10 stranded Galvanized steel earthwire	11.50	4.00	8.00	23.50	MT	14000	₹ 3,29,000.00
4	Cost of Dismantled Insulators and accessories, power conductor accessories, Earth conductor accessories etc.	20.00	5.00	5.00	30.00	MT	5000	₹ 1,50,000.00
5	Cost of Dismantled Galvanized Tower parts -Scrap iron	550.00	265.00	150.00	965.00	MT	14000	₹ 1,35,10,000.00
	Total Amount							₹ 2,60,22,000.00