

Part-II

Financial Bid

Section-I

Price Bid

Tender Inviting Authority: Chief General Manager/ Electrical/ KTE, IRCON International Limited

Name of Work: Conversion of LT & HT (11 & 33 kV) overhead power line crossings into underground cable lines including replacement/ relocation of associated lines & equipments to remove infringement of new diverted alignment of Beohari – Joba section in connection to Katni Singrauli Doubling Project of West Central Railway

Contract No: IRCON/2065/KSDP/Elect/BEHR-JOBA/PLC/01 Dated 21/07/2026

Name of the Bidder/ Bidding Firm / Company :					
PRICE SCHEDULE (This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevant columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only)					
NUMBER #	TEXT #	TEXT #	NUMBER	NUMBER #	TEXT #
Sl. No.	Item Description	Units	Estimated Cost in Rs.	TOTAL AMOUNT With GST and All Taxes in Rs.	TOTAL AMOUNT In Words
1	2	4	5	6	7
1	Item Description				
1.01	Conversion of LT & HT (11 & 33 kV) overhead power line crossings into underground cable lines including replacement/ relocation of associated lines & equipments to remove infringement of new diverted alignment of Beohari – Joba section in connection to Katni Singrauli Doubling Project of West Central Railway	Lumpsum	19,54,36,923.00	19,54,36,923.00	INR Nineteen Crore Fifty Four Lakh Thirty Six Thousand Nine Hundred & Twenty Three Only
Total in Figures				19,54,36,923.00	INR Nineteen Crore Fifty Four Lakh Thirty Six Thousand Nine Hundred & Twenty Three Only
Quoted Rate in Figures		Select		0.00	INR Zero Only
Quoted Rate in Words	INR Zero Only				

Name of work : Conversion of LT & HT (11 & 33 kV) overhead power line crossings into underground cable lines including replacement/ relocation of associated lines & equipments to remove infringement of new diverted alignment of Beohari – Joba section in connection to Katni Singrauli Doubling Project of West Central Railway

ANNEXURE IV(AA)
PROFORMA FOR STATEMENT OF MINOR DEVIATIONS
(Refer Clause 6. and 7. of ITT)

Name of tenderer/firm:			
The following are the particulars of minor deviations from the requirements of the Tender Document:			
Sr. no.	Clause	Deviations	Price adjustment for each deviation/s
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
Note: 1. The Tenderer shall indicate price adjustment against each deviation in Annexure IV(AA) of BOQ. This price is the price which the tenderer shall reduce from this tender price if deviation(s) is/are accepted by the Employer. 2. Where there is no deviation, please indicate 'No Deviations'. In case, Performa of deviations is left as blank, it will be construed that the tenderer has not proposed any deviations from tender documents. 3. If the tenderer proposes deviations in tender documents, and/or any other terms and conditions of the tender, other than in this Annexure, it will have no effect. 4. All deviations have been listed and priced in the financial proposal and deviations not priced will be treated as null and void and stand withdrawn.			

Section-II

**Bill of Quantity
(BOQ)**

BOQ of Power Line Crossing work (BEHR-JOBA)				
Sch. No.	Work Description	Amount	Qty	Total Amount
1	Modification of 33kV Powerline Crossing	₹ 16,24,890.68	52	₹ 8,44,94,315.56
2	Modification of 11kV Powerline Crossing	₹ 12,25,706.76	39	₹ 4,78,02,563.66
3	Modification of LT Powerline Crossing	₹ 9,11,227.57	10	₹ 91,12,275.71
4	General Services Work			₹ 3,52,54,733.33
5	Technical Consultants & Site Facilities			₹ 1,87,73,034.64
Total Amount (Incl. GST)				₹ 19,54,36,922.90

Schedule -1: Unit BOQ for Modification of 33kV Powerline Crossing

Sr. No.	Description of Item	Unit	Qty.	Rate (Rs.) (Incl. GST)		Amount (Rs.)		Total Amount (Rs.)
				Supply	Erection	Supply	Erection	
1	Supply, excavation of trench and laying of following sizes XLPE (E) insulated, armoured, aluminium conductor HT cable (a) 33 kV, 3 Core 300 sq mm	Mtr.	210	2,547.42	172.61	5,34,958.52	36,248.94	5,71,207.46
2	Supply of outdoor type, heat shrinkable, end termination kit, suitable for following cable sizes XLPE(E) insulated, armoured aluminium conductor cable and making termination, connections with overhead conductor, testing and commissioning etc (a) 3 core 33 kV 240 to 400 sq mm	Set	4	46,113.10	4,559.85	1,84,452.41	18,239.40	2,02,691.81
3	Supply and fixing double pole structure by 2 nos H-Beam, 13 mtr height 152x 152mm with all accessories include concreting	Set	2	90,252.39	10,028.14	1,80,504.77	20,056.28	2,00,561.05
4	Drilling of horizontal bore below the track/road by pushing method by means of HDD machine for laying of Pipe	Mtr.	20	-	3,351.50	-	67,030.08	67,030.08
5	Supply and laying of HDPE pipe type, of size 160 mm outer dia, Grade PN8, PE100, ISI marked (either single piece of full round or two half round split pieces set), under the Railway track/ road etc. digging of trench and back filling with excavated earth after laying of pipe and making good the damages as required.	Mtr.	30	725.89	18.23	21,776.63	546.98	22,323.60
6	Supply and erection of MS cable route marker	No	8	440.65	20.37	3,525.21	162.94	3,688.15
7	Supply and connecting of GI earth continuity wire of 6/8 SWG for providing of earth inter connection to the cable	Mtr.	50	22.52	23.59	1,126.13	1,179.26	2,305.39
8	Supply, erection of GI pipe-class 'B' ISI marked with accessories including bends etc. for support of cable with erected pole /recessing in wall /floor /passing earth strip or passing cable as required: (d) 150 mm dia	Mtr.	200	2,019.93	318.44	4,03,985.40	63,687.00	4,67,672.40
9	Co-ordination/ liasoning and chasing with State Utility Company for availing new electrical connection /augmentation of sanctioned load at stations, level crossing set including applying for load, collection of estimates for loads, modification of power line crossings, depositing payment to State Utility Company, arranging release of load & other related works, payment to be made to SEB for new connection, load augmentation, modification of power line crossings etc.shall be made by IRCON.	Each Location	1	-	11,121.60	-	11,121.60	11,121.60

Sr. No.	Description of Item	Unit	Qty.	Rate (Rs.) (Incl. GST)		Amount (Rs.)		Total Amount (Rs.)
				Supply	Erection	Supply	Erection	
10	Supplying and erection of galvanised stay set for 33 KV over head lines complete with 19/ 20 mm dia X 1.8 metres long stay rod, anchor plate of size 45 cm X 45 cm X 7.5 mm thick, thimble, stay clamps, turn buckle (20 mm X 600 mm), 7/ 4.00 mm dia G.I. stay wire and 11 KV strain insulator etc in cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) foundation including excavation and refilling etc. as required	No	4	-	4,162.59	-	16,650.35	16,650.35
11	Supplying and erection of nonlinear resistor type lightning arrestor suitable for 3 wire, 33 KV overhead lines with rated voltage 30 KV (rms) with a nominal discharge current rating of 10 KA (station class) and complete with galvanised clamping arrangement, G.I. bolts, nuts, washers etc. as required.	set	2	12,685.60	1,409.51	25,371.20	2,819.02	28,190.21
12	Supply & Erection of 33 kv HT Disc insulator with metal part completed with all accessories as required	Set	6	1,862.85	-	11,177.13	-	11,177.13
13	Supply and provision of anti-climb devices with clamps, bolts, nuts complete with all other connected materials and works.	No	4	299.21	75.01	1,196.83	300.03	1,496.86
14	Supply, laying and fixing of G.I. earth coil of 4mm dia G.I. wire having 120 turns of nearly 50mm dia. and 3 mt. long tail in existing pit duly earthed with pole etc complete as required as per specification.	No	2	310.73	-	621.47	-	621.47
15	Supplying and provision of Danger Boards in Hindi/ English/ and Regional language on enamelled steel plate with clamps, Bolts and Nuts complete with all other connected materials and works.	No	2	299.21	75.01	598.42	150.01	748.43
16	Dismantling of H-Beam and handing over to concerned authority	No.	4		1,124.54	-	4,498.16	4,498.16
17	Dismantling of erected pole/overhead conductor, GI wire, cross arm brackets, insulators, stay, luminary etc including accountal, stocking, and handing over the released materials to MPEB/railway's authorized official as instructed by the Engineer and making temporary arrangements if required.	No.	4	-	1,055.00	-	4,220.00	4,220.00
18	Earthing with 3m long, 50mm dia, G.I. pipe class 'B' earth electrode, adding the charcoal or coke and salt, providing concrete enclosure and MS cover plate with lifting arrangement etc. including connections with 4mm G.I. wire from earth electrode to switch board / electrical equipment as required.	Job	2	3,753.58	589.69	7,507.17	1,179.38	8,686.55
Total Cost for 01 no. 33kV Powerline Crossing								16,24,890.68

Schedule -2: Unit BOQ for Modification of 11kV Powerline Crossing

Sr. No.	Description of Item	Unit	Qty.	Rate (Rs.) (Incl. GST)		Amount (Rs.)		Total Amount (Rs.)
				Supply	Erection	Supply	Erection	
1	Supply , excavation of trench and laying of following sizes XLPE (E) insulated, armoured, aluminium conductor HT cable (a) 11 kV, 3 Core 185 sq mm	Mtr.	190	1,824.80	107.21	3,46,712.05	20,370.09	3,67,082.14
2	Supply of outdoor type, heat shrinkable, end termination kit, suitable for following cable sizes XLPE(E) insulated, armoured aluminium conductor cable and making termination, connections with overhead conductor, testing and commissioning etc (a) 3 core 11 kV 70 to 185 sq mm	Set	4	14,702.38	2,309.40	58,809.50	9,237.62	68,047.12
3	Supply and fixing double pole structure by 2 nos H-Beam, 11 mtr height 152x 152mm with all accessories include concreting	Set	2	76,367.48	8,485.09	1,52,734.96	16,970.19	1,69,705.15
4	Drilling of horizontal bore below the track/road by pushing method by means of HDD machine for laying of Pipe	Mtr.	20	-	3,351.50	-	67,030.08	67,030.08
5	Supply and laying of HDPE pipe type, of size 125 mm outer dia, Grade PN8, PE100, ISI marked (either single piece of full round or two half round split pieces set), under the Railway track/ road etc. digging of trench and back filling with excavated earth after laying of pipe and making good the damages as required.	Mtr.	30	774.12	-	23,223.66	-	23,223.66
6	Supply and erection of MS cable route marker	No	8	440.65	20.37	3,525.21	162.94	3,688.15
7	Supply and connecting of GI earth continuity wire of 6/8 SWG for providing of earth inter connection to the cable	Mtr.	50	22.52	23.59	1,126.13	1,179.26	2,305.39
8	Supply, erection of GI pipe-class 'B' ISI marked with accessories including bends etc. for support of cable with erected pole /recessing in wall /floor /passing earth strip or passing cable as required: (d) 150 mm dia	Mtr.	200	2,019.93	318.44	4,03,985.40	63,687.00	4,67,672.40
9	Co-ordination/ liasoning and chasing with State Utility Company for availing new electrical connection /augmentation of sanctioned load at stations, level crossing set including applying for load, collection of estimates for loads, modification of power line crossings, depositing payment to State Utility Company, arranging release of load & other related works, payment to be made to SEB for new connection, load augmentation, modification of power line crossings etc.shall be made by IRCON.	Each Location	1	-	11,121.60	-	11,121.60	11,121.60

Sr. No.	Description of Item	Unit	Qty.	Rate (Rs.) (Incl. GST)		Amount (Rs.)		Total Amount (Rs.)
				Supply	Erection	Supply	Erection	
10	Supplying and erection of galvanised stay set for 11 KV over head lines complete with 19/ 20 mm dia X 1.8 metres long stay rod, anchor plate of size 45 cm X 45 cm X 7.5 mm thick, thimble, stay clamps, turn buckle (20 mm X 600 mm), 7/ 4.00 mm dia G.I. stay wire and 11 KV strain insulator etc in cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) foundation including excavation and refilling etc. as required	No	4	-	4,162.59	-	16,650.35	16,650.35
11	Supplying and erection of three piece nonlinear resistor type lightning arrestor suitable for 3 wire, 11 KV overhead lines with rated voltage 9 KV (rms) with a nominal discharge current rating of 5 KA and complete with galvanised clamping arrangement, G.I. bolts, nuts, washers etc. as required.	set	2	1,888.42	210.19	3,776.84	420.38	4,197.22
12	Supply & Erection of 11 kv HT Disc insulator with metal part completed with all accessories as required	Set	6	328.07	82.43	1,968.41	494.56	2,462.97
13	Supply and provision of anti-climb devices with clamps, bolts, nuts complete with all other connected materials and works.	No	4	299.21	75.01	1,196.83	300.03	1,496.86
14	Supply, laying and fixing of G.I. earth coil of 4mm dia G.I. wire having 120 turns of nearly 50mm dia. and 3 mt. long tail in existing pit duly earthed with pole etc complete as required as per specification.	No	2	310.73	-	621.47	-	621.47
15	Supplying and provision of Danger Boards in Hindi/ English/ and Regional language on enamelled steel plate with clamps, Bolts and Nuts complete with all other connected materials and works.	No	2	299.21	75.01	598.42	150.01	748.43
16	Dismantling of H-Beam and handing over to concerned authority	No.	6		1,124.54	-	6,747.24	6,747.24
17	Dismantling of erected pole/overhead conductor, GI wire, cross arm brackets, insulators, stay, luminary etc including accountal, stocking, and handing over the released materials to MPEB/railway's authorized official as instructed by the Engineer and making temporary arrangements if required.	No.	4	-	1,055.00	-	4,220.00	4,220.00
18	Earthing with 3m long, 50mm dia, G.I. pipe class 'B' earth electrode, adding the charcoal or coke and salt, providing concrete enclosure and MS cover plate with lifting arrangement etc. including connections with 4mm G.I. wire from earth electrode to switch board / electrical equipment as required.	Job	2	3,753.58	589.69	7,507.17	1,179.38	8,686.55
Total Cost for 01 no. 33kV Powerline Crossing								12,25,706.76

Schedule -3: Unit BOQ for Modification of LT Powerline Crossing

Sr. No.	Description of Item	Unit	Qty.	Rate (Rs.) (Incl. GST)		Amount (Rs.)		Total Amount (Rs.)
				Supply	Erection	Supply	Erection	
1	Supply, excavation of trench and laying of 1.1 KV grade LT XLPE insulated armoured, aluminium conductor cable, making good the damages, end terminations with aluminium crimping socket/ plugs, provisions of cable route markers, testing & commissioning etc. as required as per technical specifications.							
	(d) 4 Core 70 sq mm	Mtr.	95	1,057.13	43.95	1,00,427.73	4,175.54	1,04,603.27
	(e) 4 Core 120 sq mm	Mtr.	190	1,669.34	60.04	3,17,173.94	11,407.70	3,28,581.63
2	Supply and making cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for 1.1 KV XLPE/HD alum. conductor cable as required as per specification and as per accepted standard including connection testing complete for (I.D../O.D.) termination.							
	(c) 4 core 70 to 150 sq mm	Set	4	4,531.20	-	18,124.80	-	18,124.80
3	Provision for execvation of pit, Foundation casting and Supply , erection and commisioning of double pole structure by 2 nos. of RSJ pole 100x116 mm -11 Mtrs long with all associated fitting /accessories etc complete in all respect.	Set	2	62,188.29	6,909.90	1,24,376.58	13,819.81	1,38,196.38
4	Drilling of horizontal bore below the track/road by pushing method by means of HDD machine for laying of Pipe	Mtr.	20	-	3,351.50	-	67,030.08	67,030.08
5	Supply and laying of HDPE pipe type, of size 90 mm outer dia, Grade PN8, PE100, ISI marked (either single piece of full round or two half round split pieces set), under the Railway track/ road etc. digging of trench and back filling with excavated earth after laying of pipe and making good the damages as required.	Mtr.	30	410.22	-	12,306.56	-	12,306.56
6	Supply and laying of HDPE pipe type, of size 63 mm outer dia, Grade PN8, PE100, ISI marked (either single piece of full round or two half round split pieces set), under the Railway track/ road etc. digging of trench and back filling with excavated earth after laying of pipe and making good the damages as required.	Mtr.	30	207.76	-	6,232.68	-	6,232.68
7	Supply and erection of MS cable route marker	No	8	440.65	20.37	3,525.21	162.94	3,688.15
8	Supply and connecting of GI earth continuity wire of 6/8 SWG for providing of earth inter connection to the cable	Mtr.	50	22.52	23.59	1,126.13	1,179.26	2,305.39

Sr. No.	Description of Item	Unit	Qty.	Rate (Rs.) (Incl. GST)		Amount (Rs.)		Total Amount (Rs.)
				Supply	Erection	Supply	Erection	
9	Supply, erection of GI pipe-class 'B' ISI marked with accessories including bends etc. for support of cable with erected pole /recessing in wall /floor /passing earth strip or passing cable as required:							
	(c) 80 mm dia	Mtr.	180	881.31	137.23	1,58,636.21	24,701.63	1,83,337.83
10	Co-ordination/ liasoning and chasing with State Utility Company for availing new electrical connection /augmentation of sanctioned load at stations, level crossing set including applying for load, collection of estimates for loads, modification of power line crossings, depositing payment to State Utility Company, arranging release of load & other related works, payment to be made to SEB for new connection, load augmentation, modification of power line crossings etc.shall be made by IRCON.	Each Location	1	-	11,121.60	-	11,121.60	11,121.60
11	Supply and Erection of stay set with CC foundation in ratio 1:3:6, stay rod, stay tightner, stay insulator, GI wire 7/8 SWG, thimble and other fixing accessories as required.	No	4	-	2,678.93	-	10,715.71	10,715.71
12	Supply & Erection of Disc insulator with metal part completed with all accessories as required	Set	6	328.07	82.43	1,968.41	494.56	2,462.97
13	Supply and provision of anti-climb devices with clamps, bolts, nuts complete with all other connected materials and works.	No	4	299.21	75.01	1,196.83	300.03	1,496.86
14	Supply, laying and fixing of G.I. earth coil of 4mm dia G.I. wire having 120 turns of nearly 50mm dia. and 3 mt. long tail in existing pit duly earthed with pole etc complete as required as per specification.	No	2	310.73	-	621.47	-	621.47
15	Supplying and provision of Danger Boards in Hindi/ English/ and Regional language on enamelled steel plate with clamps, Bolts and Nuts complete with all other connected materials and works.	No	2	299.21	75.01	598.42	150.01	748.43
16	Dismantling of H-Beam and handing over to concerned authority	No.	6		1,124.54	-	6,747.24	6,747.24
17	Dismantling of erected pole/overhead conductor, GI wire, cross arm brackets, insulators, stay, luminary etc including accountal, stocking, and handing over the released materials to MPEB/railway's authorized official as instructed by the Engineer and making temporary arrangements if required.	No.	4	-	1,055.00	-	4,220.00	4,220.00
18	Earthing with 3m long, 50mm dia, G.I. pipe class 'B' earth electrode, adding the charcoal or coke and salt, providing concrete enclosure and MS cover plate with lifting arrangement etc. including connections with 4mm G.I. wire from earth electrode to switch board / electrical equipment as required.	Job	2	3,753.58	589.69	7,507.17	1,179.38	8,686.55
Total Cost for 01 no. 33kV Powerline Crossing								9,11,227.57

Schedule -4: General Services Work

Sr. No.	Description of Items	Unit	BOQ Qty	Rate (Rs.) (Incl. GST)		Amount		
				Supply	Erection	Supply	Erection	Total
1	Supply and erection of all types of galvanised steel structures, small parts steel etc.	MT	15.0	1,45,487.60	3,389.02	21,82,314.00	50,835.30	22,33,149.30
2	Supply of cable joint kit,suitable for 2 core LT 70 sqmm to 150 sqmm XLPE(E) insulated aluminium conductor cable and testing and commissioning etc.	Nos	50	4,080.16	453.36	2,04,008.00	22,668.00	2,26,676.00
3	Supply, erection, testing & commissioning of 63Amp Changeover switch enclosure complete in all respect	Nos	15	5,670.76	1,417.69	85,061.40	21,265.35	1,06,326.75
4	Supply, excavation of trench and laying of 1.1 KV grade LT XLPE insulated armoured, aluminium conductor cable, making good the damages, end terminations with aluminium crimping socket/ plugs, provisions of cable route markers, testing & commissioning etc. as required as per technical specifications.					-	-	
(a)	2 Core 70 sq.mm	Meter	1000	717.27	43.95	7,17,270.00	43,950.00	7,61,220.00
(b)	4 Core 16 sq.mm	Meter	4000	469.60	26.80	18,78,400.00	1,07,200.00	19,85,600.00
(c)	4.0 Core 35 sq.mm	Meter	1000	662.58	26.80	6,62,580.00	26,800.00	6,89,380.00
(f)	4.0 Core 300 sq.mm	Meter	300	3,785.76	110.43	11,35,728.00	33,129.00	11,68,857.00
(g)	2 Core 150 sq.mm	Meter	500	844.89	33.79	4,22,445.00	16,895.00	4,39,340.00
(h)	4.0 Core 25 sq.mm	Meter	2000	407.66	-	8,15,320.00	-	8,15,320.00
(i)	4.0 Core 185 sq.mm	Meter	1500	2,292.61	48.29	34,38,915.00	72,435.00	35,11,350.00
5	Supply of outdoor type, heat shrinkable, stright through jointing kit, suitable for following cable sizes XLPE(E) insulated, armoured aluminium conductor cable and making termination, connections with overhead conductor, testing and commissioning etc			-	-	-	-	
(a)	3 core 11 kV 120 to 185 sq mm	Set	5	25,470.30	-	1,27,351.50	-	1,27,351.50
(b)	3 core 33 kV 300 sq mm	Set	10	56,343.82	-	5,63,438.20	-	5,63,438.20
6	Supply and making cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for 1.1 KV XLPE/HD alum. conductor cable as required as per specification and as per accepted standard including connection testing complete for (I.D../O.D.) termination.				-	-	-	-
(a)	4 core 4 to 16 sq mm	Set	10	3,550.62	-	35,506.20	-	35,506.20
(b)	4 core 25 to 50 sq mm	Set	20	4,338.86	-	86,777.20	-	86,777.20
(d)	4 core 185 to 300 sq mm	Set	10	7,468.22	-	74,682.20	-	74,682.20
7	Supply and making cable straight joint with heat shrinkable jointing kit complete with all accessories including lugs suitable for 1.1 KV XLPE/HD alum. conductor cable as required as per specification and as per accepted standard including connection testing complete for (I.D../O.D.) termination.				-	-	-	-
(a)	4 core 10 to 16 sq mm	Set	20	2,349.38	-	46,987.60	-	46,987.60
(b)	4 core 25 to 50 sq mm	Set	20	2,955.90	-	59,118.00	-	59,118.00
(c)	4 core 70 to 150 sq mm	Set	10	4,124.10	-	41,241.00	-	41,241.00
(d)	4 core 185 to 240 sq mm	Set	10	6,869.96	-	68,699.60	-	68,699.60
(e)	4 core 300 to 400 sq mm	Set	10	7,665.28	-	76,652.80	-	76,652.80

Sr. No.	Description of Items	Unit	BOQ Qty	Rate (Rs.) (Incl. GST)		Amount		
				Supply	Erection	Supply	Erection	Total
8	Supply, installation, testing and commissioning of 11 KV/ 440 V , 50 HZ , out door type, Delta/Star connected, copper wound, DYn11, ONAN cooled, power distribution transformer (outdoor type) conforming to IS:1180 (Energy Efficiency level shall not be less than-II), complete with all accessories and first filling of oil as required.					-	-	
(i)	100 KVA	No	5	3,45,270.34	62,135.29	17,26,351.70	3,10,676.45	20,37,028.15
(ii)	250KVA	No	2	7,48,576.08	1,00,615.76	14,97,152.16	2,01,231.52	16,98,383.68
(iii)	Extra for construction of foundation for transformer installation/ Panels / others etc as required. (M-10 Grade for casting & M-15 for Muffing & grouting etc.)	CUM	200	6,573.34	1,859.10	13,14,668.00	3,71,820.00	16,86,488.00
9	Supply, erection of GI pipe-class 'B' ISI marked with accessories including bends etc. for support of cable with erected pole /recessing in wall /floor /passing earth strip or passing cable as required:							
(a)	32 mm dia	Mtr.	1000	349.68	56.08	3,49,680.00	56,080.00	4,05,760.00
(b)	50 mm dia	Mtr	1500	538.82	84.67	8,08,230.00	1,27,005.00	9,35,235.00
10	Supply, erection, testing & commissioning of 3 pole, 11 kV, 400 amps, gang operated switch complete with drop out fuses etc. as required.	No	5	40,139.09	7,345.29	2,00,695.45	36,726.45	2,37,421.90
11	Excavation of pit , foundation casting and supply & erection of RSJ Pole/Strut 100x116mm - 11Mtrs long with all associated fitting /accessories etc complete in all respect.	Nos.	20	31,094.14	3,455.36	6,21,882.80	69,107.20	6,90,990.00
12	Supply and fixing double pole structure by 2 nos H-Beam, 15 mtr height 152x 152mm with all accessories include concreting	Set	10	1,06,229.14	11,803.46	10,62,291.40	1,18,034.60	11,80,326.00
13	Supply & fixing single pole 1no H-Beam 15 Mtr 152 x152 mm with all accessories include concreting	Set	20	53,114.57	5,901.72	10,62,291.40	1,18,034.40	11,80,325.80
14	Supply & fixing single pole 1no H-Beam 11Mtr 152 x152 mm with all accessories include concreting	Set	30	38,183.74	4,242.55	11,45,512.20	1,27,276.50	12,72,788.70
15	Supply & fixing single pole 1no H-Beam 13Mtr 152 x152 mm with all accessories include concreting	Set	50	45,125.78	5,014.06	22,56,289.00	2,50,703.00	25,06,992.00
16	Supply & fixing of H-beam only (Without accessories), including concreting, for pole or stud - 13 mtr (152x152mm)	Nos	20	39,069.80	3,400.76	7,81,396.00	68,015.20	8,49,411.20
17	Supply & fixing of H-beam only (Without accessories), including concreting, for pole or stud - 11 mtr (152x152mm)	Nos	40	34,363.96	3,171.84	13,74,558.40	1,26,873.60	15,01,432.00
18	Supply, laying and fixing of G.I. earth coil of 4mm dia GI wire having 120 turns of nearly 50mm dia and 3Mtr long tail in existing pit duly earthed with pole etc complete as required as per specification.	Nos.	150	310.73	-	46,609.50	-	46,609.50
19	Supply & erection of overhead mains with AAAC conductor of following size							
(a)	Size-7/3.15 , Rabbit (50 Sqmm)	Mtrs	3000	86.55	8.24	2,59,650.00	24,720.00	2,84,370.00
(b)	Size-7/3.81, Raccon (80 Sqmm)	Mtrs	3000	127.76	12.37	3,83,280.00	37,110.00	4,20,390.00
(c)	Size-7/4.26, Dog (100 Sqmm)	Mtrs	1500	140.13	16.49	2,10,195.00	24,735.00	2,34,930.00

Sr. No.	Description of Items	Unit	BOQ Qty	Rate (Rs.) (Incl. GST)		Amount		
				Supply	Erection	Supply	Erection	Total
20	Supplying & drawing/laying of PVC insulated XLPE aerial bunch power cable conductor H2/H4 grade aluminium solid/stranded conforming to IS-7098 Part-II, Alu. alloy messenger of approved make in air with necessary material as per specification of required size as mentioned below – 11 kV Grade Aerial Bunch Cable:							
(a)	3x95 + 1x80 Sqmm	Mtrs	1000	1,105.28	110.53	11,05,280.00	1,10,530.00	12,15,810.00
(b)	3x70 + 1x70 Sqmm	Mtrs	1000	1,000.39	100.04	10,00,390.00	1,00,040.00	11,00,430.00
21	Supplying & drawing/laying of PVC insulated XLPE aerial bunch power cable conductor H2/H4 grade aluminium solid/stranded conforming to IS-142551995, alu. alloy insulated messenger 1100 volts grade cable of approved make in air with necessary material as per specification of required size as mentioned below: 3x95 sq.mm, 1x16 (st. light), 1x50 (insulated neutral messenger)	Mtr	1000	763.46		7,63,460.00	-	7,63,460.00
22	Supplying, drawing and testing of XLPE insulated covered aluminium conductor of approved make, stringing, making off complete with binding at existing insulator, jointing, jumpering, tearing off, connecting etc. as required and clearing of obstacles (if any) etc. with necessary material as per specification of required size as mentioned below – 99 Sqmm XLPE 33kV Grade	Mtrs	1000		781.19		7,81,190.00	7,81,190.00
23	Supply and fixing of 3 no of 11KV HT pin insulators with metal parts complete with all accessories etc	Set	100	175.57	43.69	17,557.00	4,369.00	21,926.00
24	Supply & Erection of 33 kv HT pin insulator with metal part completed with all accessories as required	Set	100	535.78	-	53,578.00	-	53,578.00
25	Demolishing cement concrete manually/ by mechanical means including disposal of material within 50 meters lead as per direction of engineer in charge. Nominal concrete 1:3:6 or richer mix (including equivalent design mix)	Cum	100	-	2,326.64	-	2,32,664.00	2,32,664.00
26	Demolishing R.C.C. work manually/ by mechanical means including stacking of steel bars and disposal of unserviceable material within 50 meters lead as per direction of Engineer - in - charge.	Cum	50	-	3,394.26	-	1,69,713.00	1,69,713.00
27	Extra for cutting reinforcement bars manually/ by mechanical means in R.C.C. or R.B. work (Payment shall be made on the cross-sectional area of R.C.C. or R.B. work) as per direction of Engineer-in-charge.	Sq. mtr	50	-	1,096.49	-	54,824.50	54,824.50
28	Loading/ Unloading, transportation and handing over of all type of materials etc. (Other than contractor material)	MT-KM	2000		83.70	-	1,67,400.00	1,67,400.00
29	Dismantling of sub-station equipments such as transformers, DG Set, HT & LT Panels, cables etc at site including transporting, stocking and handing over to Electrical department as instructed by the Engineer and making temporary arrangements if required.	Job.	5		26,821.99		1,34,109.95	1,34,109.95
30	Shifting, erection, & commissioning of 25/63/100/200/315/500 KVA (11/0.433 KV) distribution transformer on existing structure including Bi-metallic clamp, ACSR/AAAC Conductor i/c colour code sleeve, for connection from H.T. Line to transformer as required as per specification.	Each	10		12,798.28		1,27,982.80	1,27,982.80
31	Dismantling/ de-erection of 25/63/100/200/315/500 KVA (33/11/0.433 KV) or similar distribution transformer from an existing structure and handing over the released materials to MPEB/railway's authorized official as instructed by the Engineer and making temporary arrangements if required.	Each	30		2,559.66		76,789.80	76,789.80
32	Supplying and making cable route marker with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) of size 60 cm X 60 cm at the bottom and 50 cm X 50 cm at the top with a thickness of 10cm including inscription duly engraved as required.	Each	100		683.00		68,300.00	68,300.00
	Total							3,52,54,733.33

Schedule -5						
Technical Consultants & Site Facilities						
BOQ Item No.	Description	Unit	Personnel/ Qty required	Months	BOQ rate	Total Amount (In Rs)
A	Technical Consultant					
1	Resident Engineer	Man - months	1	18	1,68,223.13	₹ 30,28,016.34
2	Electrical Expert	Man - months	2	18	1,06,129.00	₹ 38,20,644.00
3	Supervisor electrical	Man - months	4	18	80,927.02	₹ 58,26,745.44
Total (a)						₹ 1,26,75,405.78
B	Site Facilities					
1(a)	Providing road vehicles for the use of Engineer/ Employer Tata Sumo, Bolero, Scorpio, or similar SUV upto 3000KM in one month and extra will be payable as per 1(c)	Vehicle Month	4	18	58,070.03	₹ 41,81,042.16
1(b)	Providing road vehicle for the use of Employer/ Project Head Innova, Scorpio or Similar SUV upto 3000KM in one month and extra will be payable as per 1(c)	Vehicle Month	1	18	96,388.15	₹ 17,34,986.70
1(c)	Extra for running and maintenance of every running KM over and above 3000KM	KM	10000		18.16	₹ 1,81,600.00
Total (a)						₹ 60,97,628.86
Grand Total (A+B)						₹ 1,87,73,034.64

SECTION - III
EXPLANATORY NOTES

Explanatory notes for various items of work in Electrical General Services Schedule are given below. This shall be read in conjunction with specifications given in tender/latest standards/Guidelines /Rules/Instructions/Codes/Technical specification issued by RDSO/ Railway Board/ CORE/Zonal Railway/RVNL/Other statutory body like BIS, Electricity act 2003, CEA rules/regulations/safety measures, CERC rules, National Grid Code etc.

1. Explanatory notes for various items of work in Electrical General Services Schedule are given below:
 - i. All electrical works should comply with Indian Electricity Act 2003 and Rules framed there under.
 - ii. All electrical installations shall conform to the relevant Indian Standard and shall be carried out as per the relevant safety Code of Practices and guidance for Safety Procedures in Electrical Works as per IS:5216/Pt I & II/1982.
 - iii. All minor items viz. hardware items, foundation bolts, termination lugs for electrical connections etc. as required and necessary for proper working of the equipment shall be deemed to have been included in the Bill of Quantities, whether such items are specifically mentioned or not.
 - iv. The various items to be supplied/provided/erected should be as per the list of approved suppliers included in Technical Specifications/ list followed by concerned zonal Railway. Items not appearing in the approved list shall be procured from good quality sources in line with best industries practices and shall be either ISI marked or conforming to latest IS (if any). Before procurement, vendor approval shall be obtained from the Employer.
 - v. Good workmanship and total compliance with safety and other statutory rules and regulations, shall invariably be observed by the Contractor.
2. The descriptions of all items are self explanatory. These Explanatory Notes are supplementary to the BOQ description.

3. DRAWINGS

- 3.1 The contractor shall prepare drawings in Auto Cad for all LT/HT installations, indicating proposed works and shall obtain approval of Engineer prior to taking up the work. Such drawings shall be prepared in coordination with all other agencies executing works at the same site and a maximum of 6(Six) copies as are required by IRCON with one tracing on RTF paper.
- 3.2 After commissioning, these drawings shall be duly updated as per erection work at site and submitted in six copies and one tracing in RTF paper, as Completion Drawings, along with a soft copy to the Employer.
- 3.3 Where the contractor proposes to use an item of equipment, other than that specified or detailed on the drawings, which requires any re-design of the structure, partitions, foundation, piping, wiring or any other part of the mechanical, electrical or architectural layouts, he shall inform the Engineer well in advance and obtain his approval. Delays resulting from such redesign shall be On Contractor's account. He shall also submit all related information as may be required for approval of such redesign, to the Engineer.
- 3.4 Where the work of the Contractor has to be executed in close proximity to or will interfere with work of other agencies, the Contractor shall work out space/time adjustments in coordination with other agencies. If the contractor installs his work before coordinating with other agencies, so as to cause any interference with their work, he shall make the necessary changes without extra cost to the owners of the installation.

NOTE - Following particular requirements shall be followed for wiring works:

- 1) No conduit shall be of size less than 20 mm.
- 2) Occupancy of wiring cable in conduit shall not exceed 45% of the capacity of conduit.
- 3) Switch boxes shall be of galvanized sheet metal of suitable sizes from approved sources.
- 4) Separate conduit shall be laid for each circuit/sub main/main wiring.
- 5) Water cooler/AC Points and other such inductive loads shall be controlled with "C" series MCBs.
- 6) Neutral cable shall be brought into each switch box.
- 7) Earth cable shall be brought into each switch box.
- 8) Fan point wiring shall include supply & fixing of fan box.
- 9) Approx.150 mm long wiring cable shall be kept loose in switch box/SDB/DB etc.
- 10) Conduits laid in sheds shall be clamped with the shed structure with clamps made from GI strips of 25x1.6mm and spaced at about 1000mm interval, fixed with 8mm dia bolts with nuts.
- 11) Brass screw and cup washers shall be used for fixing sheets on the front of switch box.
- 12) All the wiring work shall be in conformity with IS732/1989 (Latest Version) CODE OF PRACTICE FOR ELECTRICAL WIRING INSTALLATIONS & IS 4648/1968 (Latest Version) Guide for Electrical Wiring in Residential Buildings.
- 13) The equipments which are available with ISI mark in Indian market, they shall be supplied having ISI mark only whether specifically mentioned in BOQ & its explanatory notes or not.
- 14) All the energy consuming equipments which are available in Indian market with energy star rating issued by BEE, shall be supplied with minimum 3 star energy rating only, whether specifically mentioned in BOQ & its explanatory notes or not
- 15) Equivalent LED fitting and lamp (as approved by Engineer) may be used in place of other type of lighting fixtures with lamp for better life and energy efficiency.

Explanatory Notes for Items under Schedule-1

Item No. 1

Supply, excavation of trench and laying of following sizes XLPE (E) insulated, armoured, aluminium conductor HT cable

The item price includes the cost of supply of cable conforming to IS:7098/Pt.II/85 and all other materials including bricks, sand and cement. The item price also includes laying of cable, miscellaneous works such as digging of trench, provision of suitable clamps as per site requirements and testing & commissioning. Price covers laying of cable in all type of pipes, horizontally or vertically, underground, on wall or in air or under the Railway track/road wherever required. It also includes coordination for arranging shut down from state Electricity authorities and returning/transporting of released materials to state electricity authorities.

In substation area, laying of cable includes construction of suitable trench. Trench shall be filled with dry sand up to 300 mm above cable after laying. 'U' frame shall be manufactured with MS angle 50x50x6mm & grouted vertical in floor for holding cable on transformer and HT panel end. Cable shall be held vertical with clamps of MS flat 50x6mm at two places on frame on transformer and panel side. Painting of U' frames and clamps shall be done with approved shade paint. The cable shall be laid as per RVNL's technical specifications.

The cost of GI/RCC/HDPE pipe and cable route markers is payable under separate BOQ items.

Note: Make of cable shall be on the approved list of manufacturers issued by RDSO/CORE/Railway/RVNL/MPPKVVCL.

Item No. 2

Supply of outdoor type, heat shrinkable, end termination kit, suitable for following cable sizes XLPE(E) insulated, armoured aluminium conductor cable and making termination, connections with overhead conductor, testing and commissioning etc

The item price includes labour & cost of all materials including cost of 33KV/11KV outdoor type, heat shrinkable end termination kit, making termination and connecting to the overhead lines.

Item No. 3

Supply and fixing double pole structure by 2 nos H-Beam, 13 mtr height 152x 152mm with all accessories include concreting.

The item price includes labour & cost of all materials including cost of fabrication & erection of 13 meters long 02 Nos 'H' beam fabricated from I section MS Beam ISHB 152mm x 152mm (weight not less than 37.1 kg/meter, Tolerance as per Relevant IS permitted). The 'H' poles shall be fabricated as directed by Engineer and drawings shall be made by contractor and get it approved from concerned authorities before taking up the work.

The item price includes cross bracing of M.S. angle size 65x65x6mm (Total length of different pieces should be greater than 0.3 meter from length of pole), channel cross arms, V cross arms, cross bracing angles of required quantity, clamps, bolts,

nuts etc. as required including erection, casting of foundation, muffing etc. with M15 grade concrete. The contractor shall have to erect the 'H' pole structure, terminate and connect the existing/new HT line and commission completely in all respect.

Above items are for guidelines purpose. The entire work has to be done in coordination and as per standards of concerned State Electricity Board/Railway/IRCON as decided by engineer.

Item No. 4

Drilling of horizontal bore below the track/road by pushing method by means of HDD machine for laying of Pipe

The price includes Drilling of horizontal bore below the track/ road by pushing method by means of HDD machine for laying of Pipe. Prior to start of excavation works under track/road, proper permission shall be obtained from the concerned authorities.

Item No. 5

Supply and laying of HDPE pipe DWC/Split DWC type, of size 160 mm outer dia, Grade PN8, PE100, ISI marked (either single piece of full round or two half round split pieces set), under the Railway track/ road etc. digging of trench and back filling with excavated earth after laying of pipe and making good the damages as required.

The item price includes labour & cost of all materials including cost of HDPE pipe as per IS:4984-1995 (or latest) (PN-8/PE-100, with minimum wall thickness of 9.6 mm), conforming IS:4984-1995 (or latest), digging of trench, joining & laying of pipe and back filling of trench with excavated earth etc.

Prior to start of excavation works under track/road, proper permission shall be obtained from the concerned authorities.

Item No. 6

Supply and erection of MS cable route marker

The item price includes labour & cost of all materials including cost of cable route markers of size not less than 200x150x3mm thick M. S. Plate and welded to MS rod of min 12 mm dia or MS flat of min 40x3 mm thick including bending and fixing with the cable.

Item No. 7

Supply and connecting of GI earth continuity wire of 6/8 SWG for providing of earth inter connection to the cable

The price shall cover supply, shaping and erection of 8 SWG G.I wire per meter used for earthing of control panels, LT, AC and DC distribution boards, battery chargers, etc. at substation control rooms, site or required locations. The requirement of fencing panel earthing to the nearest fencing upright shall also be included and paid for under this item.

Item No. 8

Supply, erection of GI pipe-class 'B' ISI marked with accessories including bends etc. for support of cable with erected pole /recessing in wall /floor /passing earth strip or passing cable as required:

The item price includes labour & cost of G.I. Pipe class 'B', ISI marked with bends, accessories, jointing, laying, pulling etc. complete; for support of cable with erected pole /recessing in wall /floor /passing earth strip or passing under road/ track as required at site or as directed by engineer. Prior to start of excavation works under track/road, proper permission shall be obtained from the concerned authorities.

Item No. 9

Co-ordination/ liasoning and chasing with State Utility Company for availing new electrical connection/ augmentation of sanctioned load at stations, level crossings etc. including applying for load, collection of estimates for loads, modification of power line crossings, arranging payment from IRCON, depositing payment to State Utility Company, arranging release of load & other related works, payment to be made to SEB for new connection, load augmentation, modification of power line crossings etc. shall be made by IRCON.

Note: payment to be made to SEB for new connection, load augmentation, supervision charges, deposits, modification of power line crossings etc. will be made by IRCON. Wherever it is required, contractor may also have to process these payments directly to SEB as advised by IRCON, on showing of documentary evidence/ payment receipts, the same amount will be reimbursed by IRCON.

Item No. 10

Supplying and erection of galvanised stay set for 11 /33 KV over head lines complete with 19/ 20 mm dia X 1.8 metres long stay rod, anchor plate of size 45 cm X 45 cm X 7.5 mm thick, thimble, stay clamps, turn buckle (20 mm X 600 mm), 7/ 4.00 mm dia G.I. stay wire and 11 KV strain insulator etc in cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) foundation including excavation and refilling etc. as required

Item No. 11

Supplying and erection of nonlinear resistor type lightning arrestor suitable for 3 wire, 33 KV overhead lines with rated voltage 30 KV (rms) with a nominal discharge current rating of 10 KA (station class) and complete with galvanised clamping arrangement, G.I. bolts, nuts, washers etc. as required.

Item No. 12

Supply & Erection of 33 kv HT Disc insulator with metal part completed with all accessories as required

The item price includes labour & cost of all materials for set of 33 KV porcelain Disc insulators complete with galvanized iron hardware, terminations with required connections etc.

Item No. 13

Supply and provision of anti-climb devices with clamps, bolts, nuts complete with all other connected materials and works.

The price includes supply and provision of anti-climb devices with channels, barbed wire, clamps, bolts, nuts complete with all other connected materials and works as required and as decided by engineer.

Item No. 14

Supply, laying and fixing of G.I. earth coil of 4mm dia G.I. wire having 120 turns of nearly 50mm dia. and 3 mt. long tail in existing pit duly earthed with pole etc complete as required as per specification.

Item No. 15

Supply and provision of Danger Boards in Hindi / English / and Regional language on enamelled steel plate with clamps, Bolts and Nuts complete with all other connected materials and works.

The price includes Supply and provision of Danger Boards in Hindi/ English/ and Regional language on enameled steel plate with clamps, Bolts and Nuts complete with all other connected materials and works as required and as decided by Engineer.

Item No. 16

Dismantling of H-Beam and handing over to concerned authority

The item price includes cost of labour/ machinery for dismantling of erected & grouted H-beam including breaking of concreting & retrieving of H-beam at site including stocking, transporting and handing over released H-beam to concerned official (MPEB/Railway) as instructed and if required making temporary arrangements as per instructions of the engineer.

Item No. 17

Dismantling of erected pole/overhead conductor, GI wire, cross arm brackets, insulators, stay, luminary etc including accountal, stocking, and handing over the released materials to MPEB/railway's authorized official as instructed by the Engineer and making temporary arrangements if required

The item price includes cost of labour for dismantling of erected pole and its associated overhead conductor, GI wire, cross arms brackets, insulators, Stay, luminary etc as are at site including stocking, transporting and handing over released material to concerned official as instructed and if required making temporary arrangements as per instructions of the engineer.

Item No. 18

Earthing with 3 meter long, 50 mm dia, G.I. pipe class 'B' earth electrode, adding the charcoal or coke and salt, providing concrete enclosure and MS cover plate with lifting arrangement etc. including connections with 4 mm G.I. wire from earth electrode to switch board / electrical equipment as required.

The item price includes labour & cost of all materials including cost of GI pipe, concrete enclosure, MS cover plate with lifting handle, charcoal/coke and salt, etc.

Earthing shall be in conformity to IS 3043/1987 (Latest Version) and as per approved drawing. Excavation shall be done complying with Code of Safety as per IS 3764/1992(Latest Version). Earth resistance shall not be greater than 5 ohm in normal soil and 8 ohm in rocky area.

<u>Explanatory Notes for Items under Schedule-2</u>
<u>Item No. 1 & 2:</u> Same as Schedule-1
<u>Item No. 3</u> Supply and fixing double pole structure by 2 nos H-Beam, 11 mtr height 152x 152mm with all accessories include concreting. Same as Schedule-1, Item no. 3; with 2 nos. H-Beam of 11 mtr
<u>Item No. 4:</u> Same as Schedule-1
<u>Item No. 5</u> Supply and laying of HDPE pipe DWC/Split DWC type, of size 125 mm outer dia, Grade PN8, PE100, ISI marked (either single piece of full round or two half round split pieces set), under the Railway track/ road etc. digging of trench and back filling with excavated earth after laying of pipe and making good the damages as required. Same as Schedule-1, Item no. 5; with 125mm HDPE pipe
<u>Item No. 6, 7, 8, 9 & 10:</u> Same as Schedule-1
<u>Item No. 11</u> Supplying and erection of nonlinear resistor type lightning arrestor suitable for 3 wire, 11 KV overhead lines with rated voltage 9 KV (rms) with a nominal discharge current rating of 5 KA (station class) and complete with galvanised clamping arrangement, G.I. bolts, nuts, washers etc. as required.
<u>Item No. 12</u> Supply & Erection of 11 kV HT Disc insulator with metal part completed with all accessories as required The item price includes labour & cost of all materials for set of 11 KV porcelain Disc insulators complete with galvanized iron hardware, terminations with required connections etc.
<u>Item No. 13, 14, 15, 16, 17, 18:</u> Same as Schedule-1

Explanatory Notes for Items under Schedule-3

Item No. 1

Supply, excavation of trench and laying of 1.1 KV grade LT XLPE insulated armoured, aluminium conductor cable, making good the damages, end terminations with aluminium crimping socket/ plugs, provisions of cable route markers, testing & commissioning etc. as required as per technical specifications.

The item price includes labour & cost of all material including cost of LT XLPE cable conforming to IS:7098/Pt I (latest version), bricks, sand, cement, termination lugs/crimping socket, including fixing. Inscription on the plate shall be as specified in RVNL tech. spec. Cable markers shall be provided as instructed by Engineer at not more than 50 m interval and at locations where cable route is changing or cable joint provided.

In substation area, laying of cable includes construction of suitable trench. Trench shall be filled with dry sand up to 300mm above the cable after it is laid. 'U' frame shall be manufactured with MS angle 50x50x6mm & grouted vertical in floor for holding cable on transformer end. Cable shall be held vertical with clamps of MS flat 50x6mm at two places on frame on transformer and panel side. Painting of U' frame and clamps shall be done with approved shade paint. Cables shall be terminated with LT panel & on the transformer side with aluminium crimping sockets & tested and commissioned as required.

The price covers laying of cable in all Cables in all types of piping, horizontally & vertically, underground on wall, in air or under the Rly track or Road wherever required. Cables on vertical wall shall be fixed with clamps of MS flat 50x6 mm with all fixing accessories. The cable shall be laid as per RVNL's technical specifications.

The cost of GI/RCC/HDPE pipe and cable route markers is payable under separate BOQ items.

Note: Make of cable shall be on the approved list of manufacturers issued by RDSO/CORE/Railway/RVNL/MPPKVVCL.

Item No. 2

Supply and making cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for 1.1 KV XLPE/HD alum. conductor cable as required as per specification and as per accepted standard including connection testing complete for (I.D../O.D.) termination.

This price includes supply, installation, labour, Testing and commissioning cost of all materials including cost of LT outdoor type, heat shrinkable end termination kit, making termination and connecting to the overhead lines/ cables/ lugs/ panels as required at site.

Item No. 3

Provision for excavation of pit, Foundation casting and Supply , erection and commissioning of double pole structure by 2 nos. of RSJ pole 100x116 mm - 11 Mtrs long with all associated fitting /accessories etc. complete in all respect.

The item price includes provision for excavation of pit, Foundation casting and Supply , erection and commissioning of double pole structure by 2 nos. of RSJ pole 100x116 mm -11 Mtrs long with all associated fitting including cross bracing angles, clamps, bolts, nuts, cross arms /accessories including insulators etc complete in all respect. The entire work has to be done in coordination and as per standards of concerned State Electricity Board/ Railway.

Item No. 4: Same as Schedule-1

Item No. 5 & 6

Supply and laying of HDPE pipe DWC/Split DWC type, of size 90/ 63 mm outer dia, Grade PN8, PE100, ISI marked (either single piece of full round or two half round split pieces set), under the Railway track/ road etc. digging of trench and back filling with excavated earth after laying of pipe and making good the damages as required.

Same as Schedule-1, Item no. 5; with 90/63 mm HDPE pipe

Item No. 7, 8, 9 & 10: Same as Schedule-1 Item no. 6, 7, 8, 9

Item No. 11

Supply and Erection of stay set with CC foundation in ratio 1:3:6, stay rod, stay tightner, stay insulator, GI wire 7/8 SWG, thimble and other fixing accessories as required.

Including cement concrete 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) foundation including excavation and refilling etc. as required

Item No. 12

Supply & Erection of Disc insulator with metal part completed with all accessories as required

The item price includes supplying and erection including labour & cost of all materials for set of LT porcelain/ ceramic/ composite Disc insulators complete with galvanized iron hardware, metal parts, terminations with required connections and accessories etc. for complete work as required.

Item No. 13, 14, 15, 16, 17, 18: Same as Schedule-1

Explanatory Notes for Items under Schedule-4

Item No. 1

Supply and erection of all types of galvanised steel structures, small parts steel etc.

The price shall cover the cost of supply, pit cleaning, erection, alignment and setting before grouting of individual traction masts/portals and main masts of switching stations/ TSS including those for head spans of traction mast as per follows:-

- i. Rolled mild steel beam (BFB) 152 mm x 152 mm (37.1 Kg/m), designated SC-150, Table 3.1 of IS: 808/1989.
- ii. Rolled Mild Steel Joist (RSJ) 203 mm x 152 mm (52.0 Kg/m), designated WB-200, Table 2.2 of IS: 808/1989.
- iii. All types of B-Series traction mast, Bridge mast, Emergency mast, double/fabricated 'S' series masts/Dwarf masts of various structures & TTC masts along with Booms.
- iv. N, O, R, G, P, BFB type and special portals.
- v. Gantries, including tower / steel tower / steel work for feeders for traction sub-station, drop arms, standard super masts and suspension brackets for feeders and return conductors and other special type structures which are not mentioned.

The details of drawings of important galvanized steel structured are as under-

Description	Drawing No.	Mod
T-150, for LT Supply Transformer	ETI/PSI/037	Mod-C or latest

The price shall also include the supply and erection of small parts steel (SPS) which are not covered under the various other items of work.

The price shall also include the cost of steel, fabrication, galvanization and supply at site for erection.

The price shall also cover the cost of assembly of boom components of TTC/portals & any special structures across the track, not covered under this item and erection of the same. The prices shall also include supply and erection of galvanized bolts, nuts washers etc. wherever required as per approved designs and drawings.

The structures shall be fabricated and galvanized from steel conforming to IS: 2062/ 2011 {Gr E 250 (Fe 410W) Quality-A} or latest, dimensions conforming to IS-808/1989 or latest, Zinc conforming to IS: 209/1997 or latest) and galvanization confirming to RDSO specification No. ETI/OHE/13 (4/84) with A&C slips 1 to 4 or latest.

The price shall cover cost of erection, alignment and setting before grouting,

wherever required, gantries, including tower / steel tower / steel work for feeders for traction sub-station, drop arms, standard super masts and suspension brackets for feeders and return conductors. Dwarf masts of stub masts for anchoring, complete with anchor plates drilled and welded in position multiple cantilevers cross arm, chairs, adopters, backing angles for bracket assemblies and all other small part steel works, the erection of which is carried out by the contractor irrespective of whether they are supplied by purchaser/contractor.

The price shall also include the cost of repairing of platform shelters in case the shelter is dismantled/removed/damaged during the course of erection of a mast / portal at platforms. For standard fabricated steel work for which RDSO'S approved drawings are available, the weight of steel work as specified in RDSO'S drawings shall be considered for payment. However, in case the unit sectional weight of any member indicated in RDSO's drawing is not in conformity with the unit sectional weight as per the latest IS specification, the weight of the fabricated steel work shall be calculated on the basis of latest IS specification and the same will be considered for payment. For the non-standard fabricated steel work, the calculated weight to be considered for payment under this item shall be included in the relevant drawing based on, latest IS sectional weight at the time of submitting the designs for approval of the Employer.

Note:

- i. The prices for the items shall also include the cost of stenciling of location number on masts/portal uprights in the manner as directed by the Purchaser.
- ii. The price shall also include straightening of masts/portals uprights wherever approved by the purchaser and cutting of mast/portals/upright to suit the site condition.
- iii. The payment shall be made on the basis of the final lengths/weight of the structures, in case the same are cut or modified as indicated above before erection.
- iv. For the purpose of payment against items, weight of structures or fabricated steel work will be calculated according to the weight of black steel given in section books for the lengths of various members shown in the approved drawings duly issued by CPM/GGM/GM. There will be no addition for increased weight due to galvanizing or painting or weld material or reduction for holes or skew cuts.
- v. The rates against item shall be applicable to the erection of small part steel work which are not covered under the various other items of work.
- vi. In case of difference between actual weight and weight as specified in RDSO drawings or calculated weights (for structures whose weights are not available as per RDSO drawings), payment shall be made as per least of these weights.

Item No. 2

Supply of cable joint kit, suitable for 2 core LT 70 sqmm to 150 sqmm XLPE(E) insulated aluminium conductor cable and testing and commissioning etc.

This price includes supply, installation, Testing and commissioning cost of heat shrinkable straight through cable joint kit suitable for 2x70 Sqmm to 2x150 sqmm XLPE(E) insulated aluminium conductor cables.

Item No. 3

Supply, erection, testing & commissioning of 63Amp Changeover switch enclosure complete in all respect

Item No. 4

Supply, excavation of trench and laying of 1.1 KV grade LT XLPE insulated armoured, aluminium conductor cable, making good the damages, end terminations with aluminium crimping socket/ plugs, provisions of cable route markers, testing & commissioning etc. as required as per technical specifications.

The item price includes labour & cost of all material including cost of LT XLPE cable conforming to IS:7098/Pt I (latest version), bricks, sand, cement, termination lugs/crimping socket, including fixing. Inscription on the plate shall be as specified in RVNL tech. spec. Cable markers shall be provided as instructed by Engineer at not more than 50 m interval and at locations where cable route is changing or cable joint provided.

In substation area, laying of cable includes construction of suitable trench. Trench shall be filled with dry sand up to 300mm above the cable after it is laid. 'U' frame shall be manufactured with MS angle 50x50x6mm & grouted vertical in floor for holding cable on transformer end. Cable shall be held vertical with clamps of MS flat 50x6mm at two places on frame on transformer and panel side. Painting of U' frame and clamps shall be done with approved shade paint. Cables shall be terminated with LT panel & on the transformer side with aluminium crimping sockets & tested and commissioned as required.

The price covers laying of cable in all Cables in all types of piping, horizontally & vertically, underground on wall, in air or under the Rly track or Road wherever required.

Cables on vertical wall shall be fixed with clamps of MS flat 50x6 mm with all fixing accessories.

Rates for RCC/G.I./HDPE pipe are payable separately under relevant BOQ item. Rates for cable route markers (MS or RFID type) are payable separately under relevant BOQ item.

Note: Make of cable shall be on the approved list of manufacturers issued by RDSO/CORE/Railway/RVNL/MPPKVVCL.

Item No. 5

Supply of outdoor type, heat shrinkable, straight through jointing kit, suitable for following cable sizes XLPE(E) insulated, armoured aluminium conductor cable and making termination, connections with overhead conductor, testing and commissioning etc

The item price includes labour & cost of all materials including cost of 33KV/11KV outdoor type, heat shrinkable end termination kit, making termination and connecting to the overhead lines.

Item No. 6

Supply and making cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for 1.1 KV XLPE/HD alum. conductor cable as required as per specification and as per accepted standard including connection testing complete for (I.D../O.D.) termination.

This price includes supply, installation, labour, Testing and commissioning cost of all materials including cost of LT outdoor type, heat shrinkable end termination kit, making termination and connecting to the overhead lines/ cables/ lugs/ panels as required at site.

Item No. 7

Supply and making cable straight joint with heat shrinkable jointing kit complete with all accessories including lugs suitable for 1.1 KV XLPE/HD alum. conductor cable as required as per specification and as per accepted standard including connection testing complete for (I.D../O.D.) termination.

This price includes supply, installation, labour, Testing and commissioning cost of all materials including cost of LT outdoor type, heat shrinkable straight through jointing kit, making joint and connecting to the existing cable/ cables/ lugs/ panels as required at site.

Item No. 8

Supply, installation, testing and commissioning of 11 KV/ 440 V , 50 HZ , out door type, Delta/Star connected, copper wound, DYn11, ONAN cooled, power distribution transformer (outdoor type) conforming to IS:1180 (Energy Efficiency level shall not be less than-II), complete with all accessories and first filling of oil as required.

The item price includes labour & cost of all materials including cost of Transformer, erection testing and commissioning as per standard code of practice as per IS 1180/2014 or latest with energy efficiency level not less than II.

Extra payment shall be made for construction of foundation for transformer, providing fencing enclosure and Iron Gate (if directed by the employer).

Requirements shall be as per details given here under :-

(a) Foundation

M10 grade cement concrete foundation shall be constructed with 20 mm coarse aggregate The size of foundation shall be as per approved drawing based on size of transformer but shall not be less than 2 x1.5 mt (Length x breadth) and 600mm above ground level duly plastered and finished surface. Curing shall be done as per code applicable. Excavation shall be done complying with Code of Safety as per IS 3764/1992(Latest Version).

(b) Fencing

Fabrication of enclosure for housing transformer shall be made in rectangular formation as required with M.S. Angle iron 50x50x8mm spaced at about 2 meters and 12 SWG GI wire mesh GI wire shall be cut according to size and welded with the angle frame. MS strip not less than 15x3mm size shall be provided and welded above GI wire along the angle frame to hold the GI wire mesh. Height of enclosure shall be 2 meter above ground level. The portion of MS angle to be grouted in

foundation shall be 500mm.

The fencing panels shall be erected on foundation constructed of size 200mmx200mmx500mm deep with cement, & concrete of M10 grade.

(c) Iron Gate

Iron gate shall be fabricated with 50mm x 50mm x 8mm MS angle iron frame with iron grill etc. as approved. The size of the gate shall be 2mt (height) x 3.5mt (width) and fabricated in two parts of 1.75 m each. Gate shall be provided with sliding Lockable bolt with Pad lock.

Gate shall be fixed on channels of size not less than 100x50mm, weighing 7.90 Kg per meter with bolts & Nuts and welded. Channels shall be erected on foundation constructed of size 300mmx300mmx500mm deep with cement, concrete M10 grade

Complete enclosure including Gate and angles (except galvanized portion) shall be painted with approved shade enamel paint over two coats of red oxide primer.

Installation shall be as per IS 10028 (Pt. II/1981) Latest Version.

Drawing of the enclosure with Iron Gate etc. shall be got approved from the Engineer.

Note: Make of transformer shall be on the approved list of manufacturers issued by RDSO/CORE/Railway/RVNL/MPPKVCL.

Item No. 9

Supply, erection of GI pipe-class 'B' ISI marked with accessories including bends etc. for support of cable with erected pole /recessing in wall /floor /passing earth strip or passing cable as required:

The item price includes labour & cost of G.I. Pipe class 'B', ISI marked with bends, accessories, jointing, laying, pulling etc. complete; for support of cable with erected pole /recessing in wall /floor /passing earth strip or passing under road/ track as required at site or as directed by engineer. Prior to start of excavation works under track/road, proper permission shall be obtained from the concerned authorities.

Item No. 10

Supply, erection, testing & commissioning of 3 pole, 11 kV, 400 amps, gang operated switch complete with drop out fuses etc. as required.

The item price includes labour & cost of all materials including cost of 3 poles 11 KV, 400amps. Gang Operated Switch complete with drop out fuses, operation system, clamps, connections with ACSR conductor, sleeves, etc. as required. All the materials used for manufacturing Gang Operated Switch shall conform to IS-2544, IS-5340 (Part-III) and IS-9921 (Part I to V).

Item No. 11

Excavation of pit , foundation casting and supply & erection of RSJ Pole/Strut 100x116mm - 11Mtrs long with all associated fitting /accessories etc complete in all respect.

The item price includes provision for excavation of pit ,Foundation casting and Supply , erection and commissioning of single of RSJ pole 100x116 mm -11 Mtrs long with all associated fitting /accessories including insulators etc complete in all respect. The entire work has to be done in coordination and as per standards of concerned State Electricity Board/ Railway.

Item No. 12

Supply and fixing double pole structure by 2 nos H-Beam, 15 mtr height 152x 152mm with all accessories include concreting.

The item price includes labour & cost of all materials including cost of fabrication & erection of 15 meters long 02 Nos 'H' beam fabricated from I section MS Beam ISHB 152mm x 152mm (weight not less than 37.1 kg/meter, Tolerance as per Relevant IS permitted). The 'H' poles shall be fabricated as directed by Engineer and drawings shall be made by contractor and get it approved from concerned authorities before taking up the work.

The item price includes cross bracing of M.S. angle size 65x65x6mm (Total length of different pieces should be greater than 0.3 meter from length of pole), channel cross arms, V cross arms, cross bracing angles of required quantity, clamps, bolts, nuts etc. as required including erection, casting of foundation (M10), muffing etc. with M15 grade concrete. The contractor shall have to erect the 'H' pole structure, terminate and connect the existing/new HT line and commission completely in all respect.

Above items are for guidelines purpose. The entire work has to be done in coordination and as per standards of concerned State Electricity Board/Railway/IRCON as decided by engineer.

Item No. 13

Supply & fixing single pole 1no H-Beam 15 Mtr 152 x152 mm with all accessories include concreting.

The item price includes labour & cost of all materials including cost of fabrication & erection of 15 meters long 'H' pole fabricated from I section MS Beam ISHB 152mm x 152mm (weight not less than 37.1 kg/meter, Tolerance as per Relevant IS permitted). The 'H' poles shall be fabricated as directed by Engineer and drawing shall be made by contractor and get it approved from concerned authorities before taking up the work.

The item price includes V cross arms & clamps, bolts, nuts etc. including erection, casting of foundation (M10), muffing etc. with M15 grade concrete. The contractor shall have to erect the 'H' pole structure, terminate and connect the existing/new HT line and commission complete in all respect.

Above items are for guidelines purpose. The entire work has to be done in coordination and as per standards of concerned State Electricity Board/Railway/IRCON as decided by engineer.

Item No. 14

Supply & fixing single pole 1no H-Beam 11Mtr 152 x152 mm with all accessories include concreting

Same as per item no. 13, with 1no. of H-Beam of 11 Mtr.

Item No. 15

Supply & fixing single pole 1no H-Beam 13Mtr 152 x152 mm with all accessories include concreting

Same as per item no. 13, with 1no. of H-Beam of 13 Mtr.

Item No. 16

Supply & fixing of H-beam only (Without accessories), including concreting, for pole or stud - 13 mtr (152x152mm)

The item price includes labour & cost of all materials including cost of fabrication & erection of 13 meters long 'H' pole fabricated from I section MS Beam ISHB 152mm x 152mm (weight not less than 37.1 kg/meter, Tolerance as per Relevant IS permitted). The 'H' poles shall be fabricated as directed by Engineer and drawing shall be made by contractor and get it approved from concerned authorities before taking up the work.

The item price includes erection, casting of foundation (M10), muffing etc. with M15 grade concrete. This item may be operated for supply & erection of H-beam only (without accessories) or for supply & erection of stud. Stud should only be provided and billed whenever provision of Stay is not feasible at site.

Above items are for guidelines purpose. The entire work has to be done in coordination and as per standards of concerned State Electricity Board/Railway/IRCON as decided by engineer.

Item No. 17

Supply & fixing of H-beam only (Without accessories), including concreting, for pole or stud - 11 mtr (152x152mm)

Same as per item no. 16, with 1no. of H-Beam of 11 Mtr.

Item No. 18

Supply, laying and fixing of G.I. earth coil of 4mm dia GI wire having 120 turns of nearly 50mm dia and 3 Mtr long tail in existing pit duly earthed with pole etc complete as required as per specification.

Item No. 19

Supply & erection of overhead mains with AAAC conductor of following size

The price includes Supply, erection, testing and commissioning of overhead mains with AAAC conductor of required size including Jumpering, accessories and connections etc. complete for commissioning of work as required.

Note: Make of conductor shall be on the approved list of manufacturers issued by RDSO/CORE/Railway/RVNL/MPPKVVCL.

Item No. 20

**Supplying & drawing/laying of PVC insulated XLPE aerial bunch power cable conductor H2/H4 grade aluminium solid/stranded conforming to IS-7098 Part-II, Alu. alloy messenger of approved make in air with necessary material as per specification of required size as mentioned below –
11 kV Grade Aerial Bunch Cable:**

The price includes Supply, erection, testing and commissioning of overhead mains with AB Cable conductor of required size including jumpering, accessories and connections etc. complete for commissioning of work as required.

Note: Make of cable shall be on the approved list of manufacturers issued by RDSO/CORE/Railway/RVNL/MPPKVVCL.

Item No. 21

Supplying & drawing/laying of PVC insulated XLPE aerial bunch power cable conductor H2/H4 grade aluminium solid/stranded conforming to IS-142551995, alu. alloy insulated messenger 1100 volts grade cable of approved make in air with necessary material as per specification of required size as mentioned below:

3x95 sq.mm, 1x16 (st. light), 1x50 (insulated neutral messenger)

The price includes Supply, erection, testing and commissioning of overhead mains with AB Cable conductor of required size including jumpering, accessories and connections etc. complete for commissioning of work as required.

Note: Make of cable shall be on the approved list of manufacturers issued by RDSO/CORE/Railway/RVNL/MPPKVVCL.

Item No. 22

Supplying, drawing and testing of XLPE insulated covered aluminium conductor of approved make, stringing, making off complete with binding at existing insulator, jointing, jumpering, tearing off, connecting etc. as required and clearing of obstacles (if any) etc. with necessary material as per specification of required size as mentioned below –

99 Sqmm XLPE 33kV Grade

The price includes Supply, erection, testing and commissioning of overhead mains with covered conductor of approved GTP/ specifications of required size including jointing, Jumpering, accessories and connections etc. as required for complete work in all respect.

Note: Make of conductor shall be on the approved list of manufacturers issued by RDSO/CORE/Railway/RVNL/MPPKVVCL.

Item No. 23

Supply and fixing of 3 no of 11KV HT pin insulators with metal parts complete with all accessories etc.

The price includes Supply and fixing of 3 no of 11KV HT pin insulators with metal parts complete with all accessories including hardware etc.

Item No. 24

Supply & Erection of 33 kV HT pin insulator with metal part completed with all accessories as required

The item price includes labour & cost of all materials for set of 33 KV porcelain Pin insulators complete with galvanized iron hardware, terminations with required connections etc.

Item No. 25, 26 & 27

As per RDSO/IR-USSOR/ CPWD/ DSR latest specifications.

Item No. 28

Loading/ Unloading, transportation and handing over of all type of materials etc. (Other than contractor material)

The price shall cover loading/unloading and transportation charges to (from) site/depot and handing over of material (if required) for all type of steel structures,

poles, copper/ aluminium conductors, SPS, CBs, BMs, ATs, PTs, CTs, LAs and other electrical equipments etc. into/from BFR/ trailer/ truck etc, **other than contractor's material**, or handing over of released material to specified location as instructed by the engineer.

Item No. 29

Dismantling of sub-station equipments such as transformers, DG Set, HT & LT Panels, cables etc at site including transporting, stocking and handing over to Electrical department as instructed by the Engineer and making temporary arrangements if required.

Dismantling of Sub Station Equipments including Transformers, DG Sets, HT & LT Panels, cables, etc as are at site including stocking , transporting and handing over to concerned official as instructed. Prior to dismantling of work, it shall be ensured that the temporary power supply to the feeders shall be arranged to meet the requirements as per instructions of the engineer.

Item No. 30

Shifting, erection, & commissioning of 25/63/100/200/315/500 KVA (11/0.433 KV) distribution transformer on existing structure including Bi-metallic clamp, ACSR/AAAC Conductor i/c colour code sleeve, for connection from H.T. Line to transformer as required as per specification.

The item price includes shifting, erection & commissioning of required ratings of distribution transformer from one place/ structure to another place/ structure including all required associated accessories and mounting arrangement, conductors/ cables, sleeves, lugs etc. with connection to LT/HT line at new place/ site/ structure in complete respect for commissioning of work. Oil top-up if required to be done before commissioning of transformer shall also be done and included under this item.

Note: Transportation of long distance may be claimed separately under item no. 28

Item No. 31

Dismantling/ de-erection of 25/63/100/200/315/500 KVA (33/11/0.433 KV) or similar distribution transformer from an existing structure and handing over the released materials to MPEB/railway's authorized official as instructed by the Engineer and making temporary arrangements if required.

The item price includes dismantling/ de-erection & de-commissioning of required ratings of distribution transformer from given place/ site/ structure including de-mounting all required associated accessories and mounting arrangement, conductors/ cables, sleeves, lugs etc. in complete respect for de-commissioning of work and handing over of the released materials to concerned authority as instructed by engineer including making temporary arrangements if required.

Note: Transportation of long distance may be claimed separately under item no. 28

Item No. 32

Supplying and making cable route marker with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) of size 60 cm X 60 cm at the bottom and 50 cm X 50 cm at the top with a thickness of 10cm including inscription duly engraved as required.

<u>Explanatory Notes for Items under</u> <u>Schedule-5 (Technical Consultants & Site Facilities)</u>

Refer Section-VII (Provision of Technical Consultancy and Road Vehicles)
