

Supply Part :	R0- 220 kV 1Cx1200 sq. mm, 2x(3+0) Copper conductor XLPE U/G cable laying LILO from prop. 220 kV M/C cable termination tower to 220 kV Kanbha GIS from existing Ranasan Karamsad S/C line with Deer conductor (route length: 0.300 Km(U/G))		
Sr. No.	Particulars of Item	Unit	Qty.
1	Supply of 220 kV (E), 1 core, 1200 sq. mm. Aluminum /Copper conductor XLPE insulated, AL corrugated ,HDPE outer sheathed power cable AS PER TECHNICAL SPECIFICATION(Cable length shall be min. 500 mtr per drum)	Mtr.	2250
2	Earthing/Sheath bonding Cable 6.6 kV 1Cx300 sq. mm. Copper conductor,XLPE insulated cable as per technical specification	Mtr.	120
3	Supply of 1Cx300 sq mm Copper conductor, XLPE insulated , HDPE ST-7 O/Sheath Earth continuity cable connecting earth pit to earth pit (1.1 kV class)	Mtr.	600
4	Supply of 220 KV Class-SM 7KJ/KV Lightening Arrestor with required all the accessories and clamp and connectors to provide on tower end	Nos.	6
5	Supply of Joint suitable for Midpoint bonding system/ Cross bonding of screen (required for sheath voltage control) including copper casing for power cable considering <i>nos. per cable.</i>	Nos.	0
6	Supply of straight through joint including copper casing for power cable considering <i>nos. per cable.</i>	Nos.	0
7	Supply of Composite type Polymeric Premolded End Termination for power cable suitable for S/S end & on tower at appx. 50 Mtr height.	Nos.	6
8	Supply of Three phase earth Link Box with SVL	Nos.	2
9	Supply of Three phase earth Link Box without SVL	Nos.	2
10	Supply of lattice support structure for 220 kV cable system at sub-station end	Nos.	0
11	Supply of GI tower material for 220 kV M/C MDC tower,cable support,adaquate capacity Ladder,Cable Termination & LA mounting arrangement etc ., 220 kV DD Type Narrow base tower	MT	44.5
12	GI Bolts & nuts	MT	1.4
13	Fibre Optic Approach Cable (DWSM - Dual window single mode, 48F) - with installation hardware like ties / clips / cleats, conduits, HDPE ducts, supports, fittings, accessories etc).(Supply Part)	Mtr.	1360
14	AL59 conductor (61/3.50)	Km	0.18
15	SRI Insulators		
a	220kV, 90kN Suspension SRI	Nos.	0
b	220kV, 120kN Tension SRI	Nos.	24

16	Insulator hardware for AL59 conductor (61/3.50)		
a	Single Suspension	Nos.	0
b	Single Tension	Nos.	24
c	Double Suspension	Nos.	0
d	Double Tension	Nos.	0
e	P. A. Rod	Nos.	0
f	Mid Span Joint	Nos.	0
g	Vibration Damper	Nos.	24
h	Repair Sleeve	Nos.	0
17	OPGW		
a	48 Fibre (DWSM) OPGW fibre Optic cable	kM	1.1
b	Installation Hardware set * & accessories for above OPGW i.e. all cable fittings & accessories like suspension clamps, tension clamps, vibration dampers, earthing clamps, down lead clamps, in-line splice enclosures etc. including; Pigtails FC-PC type) a) Fibre Optic Approach Cable - 400 Mtrs - For 220KV S/S & 500 Mtrs - For 400KV S/S (with installation hardware like ties/ clips / cleats, conduits, ducts, supports, fittings, accessories etc). (Any variation in quantities shall be absorbed by contractor)	kM	1.1

Erection Part :	R0- 220 kV 1Cx1200 sq. mm, 2x(3+0) Copper conductor XLPE U/G cable laying LILO from prop. 220 kV M/C cable termination tower to 220 kV Kanbha GIS from existing Ranasan Karamsad S/C line with Deer conductor (route length: 0.300 Km(U/G))		
Sr. No.	Description	Unit	Quantity
1	Detailed survey for optimum and most feasible route and preparation of proposal with all detailing	Mtr.	300
2	Under ground laying / installation of 220 KV (E),D/C 3 12 Nos. of 1 core 1200 sq. mm. Alu. conductor XLPE insulated Power Cable (2 Nos./per phase , Single Double Circuit) in four trefoil formation with 4 nos. earth continuity cable (1 Nos./trefoil) and FOAC cable (As per Enclosed Annexure-II) (FOAC cable shall be laid in HDPE pipe - One pipe per FOAC cable) inclusive of all requisite materials (like sand, pre cast slabs, non magnetic trefoil clamps(mounted at min. 3 Mtr spacing), phase & CKT identification tag, pre warning tape, route marker, HDPE pipe etc.), supervision, testing of installation, pre-commissioning tests etc and associated civil works with open excavation in any type of soil as per specs & approved drawing. (GETCO/E/2S-489 220 KV-DC-TWIN/Cable/01, R0,Dt.18.03.2023)	Mtr.	0
3	--do-- but for Road/Nala Crossing with open excavation and laying NP4 class RCC Hume Pipe 1 no. for each trefoil and laying of cable in HDPE pipe (min. 0.6 Mpa class) 1 no. per cable in trefoil formation, FOAC cable (As per Enclosed Annexure-II) (FOAC cable shall be laid in RCC hume pipe & in HDPE pipe - One pipe per FOAC cable)as per approved drawing (GETCO/E/2S-489 220 KV-DC-TWIN/Cable/01, R0,Dt.18.03.2023)	Mtr.	0
4	--do-- but for Crossing with Trenchless digging and laying of cable in PVC/HDPE pipe (min. 0.6 Mpa class) 1 no. per cable and trefoil in HDPE pipe (min. 0.6 Mpa class) , FOAC cable (As per Enclosed Annexure-II) (FOAC cable shall be laid in HDPE pipe - One pipe per FOAC cable) as per approved drawing (GETCO/E/2S-489 220 KV-DC-TWIN/Cable/01, R0,Dt.18.03.2023)	Mtr.	0
5	Under ground laying / installation of 220 KV (E), D/C 6 Nos. of 1 core 1200 sq. mm.Copper conductor XLPE insulated Power Cable (1 Nos./per phase , Double Circuit) in Two trefoil formation with 2 nos. earth continuity cable (1 Nos./trefoil) and FOAC cable (As per Enclosed Annexure-II) (FOAC cable shall be laid in HDPE pipe - One pipe per FOAC cable) inclusive of all requisite materials (like sand, pre cast slabs, non magnetic trefoil clamps(mounted at min. 3 Mtr spacing), phase & CKT identification tag, pre warning tape, route marker, HDPE pipe etc.), supervision, testing of installation, pre-commissioning tests etc and associated civil works with open excavation in any type of soil as per specs & approved drawing.	Mtr.	50
6	--do-- but for Road/Nala Crossing with open excavation and laying NP4 class RCC Hume Pipe 1 no. for each trefoil and laying of cable in HDPE pipe (min. 0.6 Mpa class) 1 no. per cable in trefoil formation, FOAC cable (As per Enclosed Annexure-II) (FOAC cable shall be laid in NP4 class RCC hume pipe & in HDPE pipe - One pipe per FOAC cable)as per approved drawing (GETCO/E/2S-489 220 KV-DC-TWIN/Cable/01, R0,Dt.18.03.2023)	Mtr.	30
7	--do-- but for Crossing with Trenchless digging and laying of cable in PVC/HDPE pipe (min. 0.6 Mpa class) 1 no. per cable and trefoil in HDPE pipe (min. 0.6 Mpa class) , FOAC cable (As per Enclosed Annexure-II) (FOAC cable shall be laid in HDPE pipe - One pipe per FOAC cable) as per approved drawing (GETCO/E/2S-489 220 KV-DC-TWIN/Cable/01, R0,Dt.18.03.2023)	Mtr.	20

8	Construction of RCC D/C 4-tire (2x4-tire)- 2 tire (2x2 tire- 4 Ckt) (Cable trench /crossing with Galvanized racks & perforated cable tray(as per site requirement), Prestressed trench cover with Min 50 mm thk. with M20 grade concrete in all respect as per attached reference drawing. [Construction with supply of all items as per relevant standard, GETCO specs & reference tender drawing].Work to be executed through GETCO approved agency.	Mtr.	220
9	Under ground laying / installation of 6 nos , 220 KV (E),1 core 1200 sq. mm. Copper conductor XLPE insulated Power Cable Double Single-circuit (1 cables per phase) in two separte trefoil flat-formation with 2 nos. earth continuity cable and FOAC cable As per Telecom BOQ (FOAC cable shall be laid in HDPE pipe - One pipe per FOAC cable) inclusive of all requisite materials (like non magnetic trefoil clamps for flat formation(mounted at min. 3 mtr. spacing) , phase identification tag, pre warning tape, HDPE pipe etc.) including supervision, testing of installation, pre-commissioning tests etc. in RCC Cable trench as per approved drawing	Mtr.	220
10	Construction of RCC D/C 4-tire (2x4-tire)- 2 tire (1x2 tire- 2 Ckt) (Cable trench /crossing with Galvanized racks & perforated cable tray(as per site requirement), Prestressed trench cover with Min 50 mm thk. with M20 grade concrete in all respect as per attached reference drawing. [Construction with supply of all items as per relevant standard, GETCO specs & reference tender drawing].Work to be executed through GETCO approved agency.	Mtr.	0
11	Under ground laying / installation of 12 nos , 220 KV (E),1 core 1200 sq. mm. Cu. conductor XLPE insulated Power Cable Double Single-circuit (2 cables per phase) in two separte trefoil flat-formation with 4 nos. earth continuity cable and FOAC cable As per Telecom BOQ (FOAC cable shall be laid in HDPE pipe - One pipe per FOAC cable) inclusive of all requisite materials (like non magnetic trefoil clamps for flat formation(mounted at min. 3 mtr. spacing) , phase identification tag, pre warning tape, HDPE pipe etc.) including supervision, testing of installation, pre-commissioning tests etc. in RCC Cable trench as per approved drawing	Mtr.	0
12	Laying/dressing of 220 kV (E) 1 core 1200 sq. mm. Copper conductor XLPE insulated Power Cable for Double circuit (6 cables , 1 cables per phase) inclusive of all requisite materials (like trefoil clamps, phase identification tag, Ladder etc.), supervision, testing of installation, pre-commissioning tests etc and associated civil/mechanical works for overhead line transmission tower structure including required fabrication work for mounting of Surge Arrester & End Termination, providing & fixing of Ladder as per approved drawing and FOAC cable (As per Enclosed Annexure-II) in HDPE pipe as per instruction.Scope also includes cable protection arrangement at tower base, jumpering works on tower with supply of required clamps & connectors and required maintainnce free earth pit with GI earthing strip for LA (total 6 nos, 3 nos/ckt) & providing tower earthing as per GETCO standard practice.	Job	1
13	Installation of Joint suitable for Midpoint bonding system/ Cross bonding of screen (required for sheath voltage control) including copper casing for power cable complete in all respect including required civil works considering nos. per cable	Nos.	0
14	Installation of straight through joint including copper casing for power cable complete in all respect including required civil works considering nos. per cable.	Nos.	0
15	Installation of Composite type Polymeric Premolded End Termination for power cable complete in all respect with required fabrication on tower side , Scope also includes suitable clamp and connectors etc. complete in all respect with providing maintainance free earthing pit & GI earthing strip of each cable.	Nos.	6
16	Installation of Composite type Polymeric Premolded End Termination for power cable complete in all respect with required fabrication on lattice support structure at S/S end Scope also includes Civill work for required lattice galvanized structure, suitable clamp and connectors etc. complete in all respect, providing maintainance free earthing pit & GI earthing strip of each cable	Nos.	0
17	Installation of Three phase earth Link Box with SVL with maintainance free earthing pit & GI earthing strip including required fabrication of structure, civil work if any.	Nos.	2

18	Installation of Three phase earth Link Box without SVL with maintainance free earthing pit & GI earthing strip including required fabrication of structure, civil work if any.	Nos.	2
17	Excavation excluding back filling, but including shoring, shuttering, dewatering, tree cutting for tower footings, etc. for		
18	(a) Normal soil either dry or wet / sandy soil	Cu.m	0
19	(b) Black cotton soil either dry or wet.	Cu.m	1054.56
20	(C) Normal Submerge/marine soil where dewatering is necessary	Cu.m	0
21	(d) Black cotton Submerge/marine soil where dewatering is necessary	Cu.m	0
22	(e) Soft Rock	Cu.m	0
23	(f) Hard Rock	Cu.m	0
24	Installation of steel reinforcement in concrete foundation including supply of MS bars, binding wire and their cutting,bending, binding & laying in position as per drawing.	MT	10.3
25	Stub-setting with prop or template including back-filling, during back filling dispose of excess soil and levelling of site is to be done as per instructions of EIC but excluding excavation and concreting etc. for all types of towers/extensions except special towers. (Weight of stub, cleat & template with Bolt & Nuts of stub & template shall be counted)	MT	6.761
26	Concreting of foundation by M15 (1:2:4) mixture including shoring, shuttering, dewatering etc. for normal tower / tower with extension up to 21 mtr. (Rates are with cement.)	Cu.m	9.8
27	Concreting of foundation by M20 (1:1.5:3) mixture including shoring, shuttering, dewatering etc. for normal tower / tower with extension up to 21 mtr. (Rates are with cement.)	Cu.m	159.78
28	Grounding of towers with Pipe Type earthing including excavation and back filling and supply of all materials like 32mm Dia heavy duty 3 mtr Long G.I pipe & 50 x 6 mm G.I flat , bolt - nuts , salt , coal/charcoal etc as per drawing.	Set	1
29	Grounding of tower with COUNTER POSE TYPE earthing including excavation and back filling and supply of all material like GSS Wire, lugs, bolt - nuts , salt , coal/charcoal etc as per drawing.	Set	1
30	Erection of super structure upto 6 meter extension including tree cutting, fixing of tower accessories, ACD/DP/NP/CIP/PP and including tack welding of bolts, cable tray, cable accessories etc.	MT	43.998
31	Fixing of Anti-climbing devices incuding supply of Barbed wire. (except special tower)		
	a) 220 KV	Loc.	2

32	Fixing of DP/NP/PP/CIP including supply of plates and supply of GI Bolt nuts & tack welding as per drawing.	Loc	2
33	Tack welding of nuts upto approx 10 mtrs height or two bottom most panel from ground level at three places on the nuts diametrically and applying zinck rich paint immediately after tack welding.	Per Bolt	1500
34	Painting of name of line , location number, colour code and telephone number on tower for information of concerned substation including supply of paints etc.		
	a) all four legs	Per Loc.	2
35	Stringing of ACSR/ AAAC 6 (Six conductors for Double circuit including laying, jointing, tensioning, clamping with armour rods, hoisting of insulator string fixing of jumpers, dampers etc. & with required tree cutting on entire length for adequate clearances / safe charging of line, as per instruction of	RKM	0.3
36	Dismantalling of ACSR/ AAAC 6 (Six conductors) and line material for Double circuit , as per instruction of EIC.(Cold Condition)	RKM	0.3
37	Complete Installation of OPGW cable (24/48 fibres) including laying, providing required hardwares, in line splices to be encased in Fibre Optic Splice Enclosures, Laying and termination of a fibre optic approach cable required to connect Overhead Fiber Optic Cable (OPGW) between the final ii in line splice enclosure on the gantry/tower and the Fibre Optec Distribution panel (FODP) to be installed within the building at both the substation ends as per technical specifications	kM	1.1
38	Link up of OPGW Cable including all related activities as per inst. Of EIC.	kM	1.1

Notes:- Laying of Two continuous Runs (no in between splicing) of Fibre Optic Approach Cable (DWSM - Dual window single mode, 24F/48F) - with installation hardware like ties / clips / cleats, conduits, HDPE ducts, supports, fittings, accessories etc) along with 132kV/220kV cable system strictly as per approved method of construction i.e MOC. Proposed FOAC cable shall be spliced to existing OPGW/FOAC cable after rearranging. Following shall be strictly followed for installation

- Two to Three rings of extra loop length shall be kept buried underground at foot of both end termination tower after laying FOAC cable with 132kV/220kV cable as per MOC.
- Each run of FOAC cable length remaining outside the ground level shall be at least two times the height of each termination tower at both end and it should be brought upto third cross arm of termination tower through HDPE pipes properly tied with tower.
- Length of FOAC cable (i.e Approximately tower height) after bringing the FOAC cable above third cross shall be managed in rings by properly fixing clamp arrangement to hold up on end termination tower. Also, each run of FOAC cable shall be terminated at individual joint box on each termination tower.
- After laying FOAC cable, each length shall be tested for end to end test using power meter and OTDR. Test Report provided in GETCO technical specification shall be duly sealed and signed with date, name & designation of testing person, executing contractor and witnessing officer one each from telecom as well as TR/Const. nominated from respective EE(Telecom) and EE(TR)/EE(const.) respectively.

Considerations: R0- 220 kV 1Cx1200 sq. mm, 2(3+0) Copper conductor XLPE U/G cable laying LILO from prop. 220 kV M/C cable termination tower to 220 kV Kanbha GIS from existing Ranasan Karamsad S/C line with Deer conductor (route length: 0.300 Km(U/G))

1	As per inputs received from field office vide ref. no. (3) &(5) , as per submitted google image drg. route length for LILO Kanbha GIS end from Prop. Cable term tower MDC - 375 mtr is considered
2	220 kV S/C Ranasan- Karamsad O/H line with Deer conductor, hence to match current carrying capacity , 220 kV 1Cx1200 sq. mm Copper conductor XLPE cable , single cable per phase (total 2 ckt of 3+0 each) is considered.
3	BOQ prepared considering following total length for 220 kV, 1Cx1200 Sq. mm Copper conductor XLPE cable with 2x(3+0) modality .
	From MDC tower to 220 kV Kanbha GIS end: 300 RMtr. +50 Mtr. (220 kV MDC+0) + 20 Mtr extra length for loop at both end +5 mtr height for GIS sealing end , hence total single cable route length - 375 mtr.
5	As per SS Layout of Kanbha GIS ,required length of 2x2 tier (4 ckt) RCC cable trench at Kanbha GIS is 220 mtr. against 320 mtr proposed from field office , hence balance 100 mtr is bifurcated as Open exc(50 mtr)+ By RCC hume pipe(30 mtr)+Trench less (20 mtr.)
6	As per SS layout , at Kanbha GIS end ,seperate 2nos. Of 2x2 tier RCC cable trench are considered , hence in this BOQ, cable trench for 4 ckt. is considered, inwhich 2 cks laied for this line & 2 ckt for future use.
7	At Kanbha GIS end , supply & erection of plug in type GIS termination are already considered in scope of SS EPC BOQ . Hence not a part of this BOQ. However, required cordination with S/S EPC contractor for interfacing of cable sealing end with GIS module for successful charging of Cable line is in scope of cable laying agency.
8	As per submitted GA Drg vide ref. L. no. (5), 220 kV D/C DD+0 type Narrow base tower proposed by field office adjacent to 220 kV Prop. MDC+0 tower.
9	Scope of supply & erection, foundation of 1 nos of ,220 KV cable termination tower MDC+0 and 1 no. of 220 kV Narrow base TT DD+0 90 ' (Torrent design) are considered in scope of UGC agency.
10	As confirmed by DE Const S/dn, type of soil for foundation of both towers are DBC
11	On Existing MDC tower, modification for installation of 2 nos of Cable termination & 2 no. of LA on same side Cross arm (on 2, 4, 6 at one end) are required , all modifications are in scope of UGC cable agency.
12	Stringing/ De stringing of existing line is not a part of this BOQ
13	Existing line is with Deer conductor. Proposed DD+0 NB tower lying on existing line corridor , hence same conductor to be utilized for stringing.However, in case of additional requirement of conductor for jumpering work, AL59 (eq. wt to Zebra) conductor is considered . H/W & Accessories are also considered suitable for AL59 (eq. wt to Zebra) conductor.