Sub :	Laying of 06 Nos 66kV 1CX1000 SQMM XLPE cable from 220 kV RK Puram Grid Substation to B Block Vasant Kunj grid substation, Route Length-5.150 km.

SUPPLY (PART A)

S.No.	Description	Unit	QTY	BASIC	FERIGHT	GST	UNIT LANDED	TOTAL AMOUNT
1	CBL PWR,1000MM2;1C;66KV;ARMD (DRUM RETURNBALE BASIS)	M	30900					
2	KIT,JOINTING,66KV, 1CX1000 MM2	EA	62					
3	TERM KIT HS I/D 66KV, 1CX1000 MM2 GIS, Male Part	EA	6					
4	TERM KIT HS O/D 66KV, 1CX1000 MM2	EA	6					
5	OFC (OFC Details-ITU-T G.657. A1 Single mode -36 nos. and OM-2 (50/125) Multi Mode-12 nos, 12 nos OFC per tube) including joint and termination kits	M	12360					
6	OFC Conduit (40mm, HDPE), Orange Color	M	12360					
7	Roxtec cable sealing/ MCT Brattberg (*Dia shall be suitable for cable OD*)	LS	1					
8	Electronic Ball/Ring marker at every 50 meter -Passive (*Make-- 3M/ Stanley*)	NOS	206					
9	Electronic Ball marker at every at every joint -Active (*Make-- 3M*)	NOS	62					
10	Route Tracer Cum Identifier (*make shall be same as electronic ball/ring*) Commissioning in bidder scope.	NOS	2					
11	Supply of RCC Cable Route Marker marker (66kV) as per approved drawing.	NOS	103					
12	Supply of RCC Cable Route Joint marker (66kV) as per approved drawing.	NOS	10					
13	RCC Coffin for Joint (*Dimension of each coffin shall be suitable to cover complete joint. Tender drawing is only for reference purpose, not showing actual length*)	NOS	62					
14	Supply of Sand for cable route as per BRPL specification	CUM	1440					
15	Supply of Warning tape (*Colour and Font size shall be as per BRPL Specification*)	M	10300					
16	Supply of Cable identification Tags (*Aluminium*)	EA	1030					
17	Supply of HDPE Pipe --180 MM dia PN-6 PE80	M	12900					
18	Supply of RCC Cable protection cover as per BRPL specification & drawing. (*50mm Thick; 550mm wide; 675mm length*)	EA	11444					
19	Earthing pit and Earthing	EA	16					
20	Cement concrete 1:1.5:3	CUM	144					

S.No.	Description	Unit	QTY	BASIC	FERIGHT	GST	UNIT LANDED	TOTAL AMOUNT
21	Trefoil Clamp (Dimension shall be suittable to adjust 3 Nos. 66kV 1X1000sqmm cable at every 1m-- *Aluminium*)	EA	10300					
Supply of Bay Accessories								
22	BAR FL MS 8MM 50MM 1940MM	KG	2000					
23	CKT BKR,SF6,OUTDOOR;66KV;2000A;3;31.5KA	EA	2					
24	TRAFO,CURR,1600-800A;1-1-1-1Amp;66KV	EA	6					
25	TRAFO,INST,CVT;V3/110V/V3/110V/V3;66KV	EA	6					
26	ARRESTOR,LIGHTNING,ZINC OXIDE,66KV,10KA	EA	6					
27	BAY MARSHALING BOX	EA	2					
28	CBL ELEC ARM 1.1KV PVC CU 6C 2.5MM2	M	3000					
29	CBL ELEC ARM 1.1KV PVC CU 10C 2.5MM2	M	3000					
30	PANEL,CNTRL,C&R F/LINE FEEDER 66KV	EA	2					
31	ISOLATOR,66KV,2000A,3P,W/O EARTH SWITCH	EA	4					
32	ISOLATOR,66KV,2000A,3P,W/EARTH SWITCH	EA	2					
33	FITTING,S/TENSION,BOLT,F/ACSR SNGL ZEBRA	EA	18					
34	FITTING,S/TENSION,BOLT,F/ACSR TWIN ZEBRA	EA	12					
35	CABLE INSUL DISC 11KV 120KN (Polymeric)	EA	324					
36	FITTING,S/SUSPENSION,BOLTED,F/ACSR ZEBRA	EA	12					
37	P.G.CLAMP,F/ZEBRA CONDUCTOR	EA	48					
38	T-CONNECTOR,F/ZEBRA CONDUCTOR	EA	48					
39	CONDUCTOR,ACSR,UN INSULATED,ZEBRA	M	300					
40	ANGL MTL EQ MS 75X75X6MM	MT	4					
41	ANGL MTL EQ MS 65X65X6MM	MT	4					
42	CHANNEL,MOC:MS,SIZE:100X50X6MM	MT	2					
43	WIRE BARE GI STAY 7/9 SWG	KG	200					
44	FITTING,S/SUSPEN.,BOLT,F/ACSR TWIN ZEBRA	EA	6					
45	CLAMP,TENSION,FOR 7/9SWG WIRE	EA	4					
46	Line Differential Relay including LIU and accessories for commissioning (Relay make shall be as per BRPL requirement)	EA	4					
47	SCADA and IT (**Detailed BOQ as per Annexure-A; List of signals as per Annexure-C**)	EA	1					
TOTAL (PART A)								
SERVICES (PART B)								
B	**SERVICE**							

S.No.	Description	Unit	QTY	BASIC	FERIGHT	GST	UNIT LANDED	TOTAL AMOUNT
1	Digging of cable trench as per specification and drawings. Rate is inclusive of digging and backfilling. Measurement shall be as per actual depth excavated. For Dense Carpeted bituminous Road.	CUM	3600					
2	Digging of cable trench as per specification and drawings. Rate is inclusive of digging and backfilling. Measurement shall be as per actual depth excavated. For Rocky Soil	CUM	2520					
3	Digging of joint pit suitable for 33/66 KV cable joint box and covering the joint box with sand and providing protection as per BRPL design. For Dense carpeted bituminous road.	CUM	324					
4	Digging of joint pit suitable for 33/66 KV cable joint box and covering the joint box with sand and providing protection as per BRPL design. For Hard Rocky Soil	CUM	216					
5	Laying, testing and commissioning of 66kV 1X1000sqmm under ground cable in trench, supply and fixing of cable identification tags (9" X 4") at every 30 Mtrs, refilling the trench and ramming the surface, including watch and ward till charging of cable (This activity includes only labour jobs) for 66 KV single core cable Running Mtr	M	30900					
6	Extra for handling of 66KV Cable from cable drum. Note:If the Drum length is more than 250Mtr.	M	30900					
7	Laying, testing and commissioning of OFC along with conduit including termination kit, patch code and all accessories required for commissioning (Jointing and termination of OFC in bidder's scope).	M	12360					
8	Laying in position specified grade of reinforced cement concrete excluding the cost of shuttering,centring,finishing and reinforcement-All work upto plinth level : 1:1.5:3 (1cement :1.5coarse sand :3graded stone agg.20mm nominal size.)	CUM	144					
9	Laying of HDPE pipe of 180mm dia.of PN6 Class PE 80 For crossing of roads by trenchless technology including required equipment, manpower & transport of equipment from one place to another.	EA	5700					
10	Crossing of roads by laying of HDPE pipe excluding supply of pipe .Laying by Pneumatic Jack Hammer Road Cutting.laying . 180 mm dia.	M	4800					

S.No.	Description	Unit	QTY	BASIC	FERIGHT	GST	UNIT LANDED	TOTAL AMOUNT
11	Laying Sand Cushioning for cable route as per BRPL specification,Sand cushion will be min 75mm below and 75mm above the cable,	CUM	1440					
12	Removal of Malba including Loading / Unloading on own vehicle.	CUM	1728					
13	Charges for providing continous steel barricade including cost of all material plant consumables transport and labour for shifting placing painting and regular maintenance. As per new specification	M	5150					
14	Installation of RCC Cable Cover (This includes only Labour jobs)	EA	11444					
15	Installation of RCC Cable Route indicating Stone at every 50m	EA	103					
16	Installation of RCC Cable Route Joint indicating Stone at every joint	EA	10					
17	Charges for carrying out Route survey and identification of underground utilities of various civic agencies before/ during execution of scheme involving cable laying work. Route length will be considered for payment. Route length will be specifically verified by DGM.	M	5150					
18	Laying of HDPE pipe for crossing small Nallas in the cable route or in the existing trenches	M	2400					
19	Supply and fixing of RCC Coffin for joint as per the specification of BRPL	EA	62					
20	Installation, testing and commissioning of active ball markers (for 66kV joint at every joint)	EA	62					
21	Installation, testing and commissioning of passive ball markers (at every 50m)	EA	206					
22	INSTALLATION OF SILING, ROXYLON: ROXTEC: FOR/CABLE SILING / MCT Brattberg	LS	1					
23	Installation of Warning Tape (This includes only Labour jobs)	EA	10300					
24	Making of st. through joints	EA	62					
25	Making of END Termination kits	EA	6					
26	Making of END Termination kits for GIS	EA	6					
27	Survey and submission of Ground penetration report for entire Route.	M	5150					
28	Installation of Trefoil Clamp	EA	10300					

S.No.	Description	Unit	QTY	BASIC	FERIGHT	GST	UNIT LANDED	TOTAL AMOUNT
29	Fabrication of MS structure as well as galvanised for different equipment like isolator, C.T.'s, P.T.'s, CVT, LA's etc, cable supporting structure including supply of nuts and bolts, consumables , welding electrode, hacksaw blades etc. excluding supply of steel.	MT	12					
30	Erection of MS as well as galvanised structure for different equipment like isolator, C.T.'s, P.T.'s, CVT, LA's , ISO etc, cable supporting structure, 33kV/66 kV GI gantry structure , Tower Structure i/c consumables , welding electrode ,tack welding & hacksaw blades etc.	MT	10					
31	Painting of any M.S.Structure with one coat of Red oxide and two coats of AL.paint ISI marked including supply of paint by contractor.	Kg	12000					
32	Mounting of 66KV,1x1000sq.mm.XLPE cable with cable end box on the steel structure and fixing it with suitable wooden cleats (wooden cleats shall be supplied by contractor) i/c.its jumpering with the isolator as required.	EA	12					
33	Charges for Hi pot test - Testing equipment to be provided by the contractor. For 66 KV cables	EA	4					
34	Digging of earth pit upto depth of 10 ft. inrocky/ semi rocky as per feasibility at site of embedding 600 x600mm earth plate with M.S Flate 50 x8 mm running the same through 3/4 " dia G.I. grouting pipe. Earth Plate to be covered by charcoal 200kg. And 10	EA	16					
35	Making of civil goomitties around GI earthpipe as per standard design of BSES. Supply of necessary bricks, cement, badarpur, sand, C1 cover of size 1'x1' and providing the same at the top of goomitties.	EA	16					
36	Excavation of trench below the ultimate good earth level in following type of soil including refilling after laying of eath mat riser, fixing of earth electrodes welding etc. **For Semi rocky/rocky soil with providing of good earth**	CUM	90					
37	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .**For 10CX2.5 sqmm, Cu**	M	3000					

S.No.	Description	Unit	QTY	BASIC	FERIGHT	GST	UNIT LANDED	TOTAL AMOUNT
38	Laying, dressing, megger and contnuity test of PVC, armoured control and auxilary power cables in excavated trench/cable trays .**For 6/5CX2.5 sqmm, Cu**	M	3000					
39	Erection of double compression gland including termination **For 10CX2.5 sqmm, Cu**	EA	60					
40	Erection of double compression gland including termination **For 6CX2.5 sqmm, Cu**	EA	60					
41	Supply of Glands 10X2.5MM	EA	60					
42	Supply of Glands 6X2.5MM	EA	60					
43	Laying of MS flat in the excavated trench including risers, equipment earthing, overlapping of MS flat at the joints by twice of its width and welding of over lapping and cross joints including supply of electrodes, red oxide/bitumin compound , paint etc and Laying of GI earth strip for equipment earthing, along the wall, trench, cable trays etc including fabrication of supports/cleats and fixing with wall bolts, welding works, painting of earth strip and riser with red oxide paint/bitumin compound and final. For 40 mm dia MS Rod	M	833					
44	Erection testing and commissioning of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.**For 66 kV isolator without earth switch including testing and commissioning**	EA	4					
45	Erection testing and commissioning of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.**For 66 kV isolator with one earth switch including testing and commissioning**	EA	2					
46	Erection testing and commissioning of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.**For 66 kV LA's with/without surge counter including testing and commissioning**	EA	6					

S.No.	Description	Unit	QTY	BASIC	FERIGHT	GST	UNIT LANDED	TOTAL AMOUNT
47	Erection testing and commissioning of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.**For 66 kV CT, any ratio including testing and commissioning**	EA	6					
48	Erection testing and commissioning of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.**For Bay Terminal/Marshalling Kiosk**	EA	2					
49	Erection testing and commissioning of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.**For Control and relay panel forTransformer line Bus coupler Erection testing and commisioning 66 kV C & R panel- (*BSES approved make shall be taken*)**	EA	2					
50	Erection testing and commissioning of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.**For 66 kV SF6 circuit breaker with mechanism and structure including testing and commissioning**	EA	2					
51	Erection of electrical equipment Including supply of T & P, all consumable items such as welding rods, hacksaw blades etc and minor modification in support structure for fixing as required.**For 66 kV CVT**	EA	6					

S.No.	Description	Unit	QTY	BASIC	FERIGHT	GST	UNIT LANDED	TOTAL AMOUNT
52	Stringing of **ACSR ZEBRA Conductor** , Earthwire, Insulator & Hardware Fittings i.e.Single Tension String Insulator fittings with single tension clamp for single ZEBRA conductor ,Single Tension String Insulator fittings with double tension clamp for twin ZEBRA conductor ,Double Tension String Insulator fittings with single tension clamp for single ZEBRA conductor,Single Suspension String Insulator fittings with single drop/tension clamp for single ZEBRA conductor ,Single Suspension String Insulator fittings with double drop/tension clamp for twin ZEBRA conductor ,Single Suspension String Insulator fittings with single suspension clamp for single ZEBRA conductor ,Single Suspension String Insulator fittings with double suspension clamp for twin ZEBRA conductor ,Bolted type 'T' Connector suitable for single ZEBRA conductor,Vibration Damper for ZEBRA Conductor,Repair Sleeve for ZEBRA,Mid span compression joint for ZEBRA,Rigid Type Spacers for twin ZEBRA,Tension Clamp for 7/3.15 earthwire,Vibration damper for Earthwire,7/3.15 GSS earthwire,	KM	0.3					
53	Installation, testing and commissioning of Line Differential Relay including LIU and accessories for commissioning (Relay make shall be as per BRPL requirement)	EA	4					
54	Installation, testing and commssioning of SCADA and IT accessories (***As per Annexure B***)	EA	1					
	TOTAL (PART B)							
	GRAND TOTAL (SUPPLY + SERVICE)							
	Annexure-A							

S.NO	MAT DESC	UOM	QTY
	Annexure-A		
1	CRD,CPU,COMM PORT EXTN MDL CARD,CPU,TYPE - COMMUNICATION PORT EXTENSION MODULE SPECIFICATION: 2xETH, 6 x SR.PORTS PORT:2 ETH & 6 RS232-RS-485 SELECTABLE SR.PORTS PROTOCOLS SUPPORTED – IEC 870-5-101/103/104, MODBUS, IEC 61850-8-1,IEC-104 MASTER/SLAVE (***Make--SYNERGY SYSTEMS SOLUTION - E70-CXM-001***)	NOS	1
2	RCK,19IN 4U,HIGH RCK (***Make--SYNERGY SYSTEMS SOLUTION - E70-CXM-001***)	NOS	1
3	CRD,32-CH SGL ENDED DIGTL I/P INPUT VOLTAGE:48VOLTS DC SPECIAL FEATURE:BUILT IN ISOLATION AND SURGE PROTECTION (***Make--SYNERGY SYSTEMS SOLUTION - E70-CXM-001***)	NOS	1
4	CRD,CPU,16CHNL POTENTIAL FREE O/P TYPE:DIGITAL OUTPUT CARD (***Make-SYNERGY SYSTEMS SOLUTION - E70-CXM-001***)	NOS	1
5	CRD, CPU,PWR SPPLY MDL SPECIFICATION:I/P 48-24 VOLT DC, O/P:5VDC SPECIAL FEATURE : OVER CURRENT & REVERSE POLORITY PROT. (***Make--SYNERGY SYSTEMS SOLUTION - E70-CXM-001***)	NOS	1
6	CRD,CPU,IO SCNR MDL (***Make--SYNERGY SYSTEMS SOLUTION - E70-CXM-001***)	NOS	1
7	SUPPLY OF 61850 COMPAITABLE INDUSTRIAL STANDARD ETHERNET SWITCH SPECIFICATIONS: 8 PORTS - COPPER/FIBER PORTS FOR RELAY/RTU COMMUNICATIONS. PS1:48 VOLTS DC & PS2:220 VOLTS DC (***Make-- KYLAND,RUGGEDCOM***)	NOS	1
8	16 CORE, 1.5 SQMM,MULTI STRAINED COPPER CABLE,ARM FRLS 1.1KV HRPVC APPLICATION:DIGITAL SIGNAL FEED BACK (***BSES approved makes***)	M	150
9	2 CORE, 2.5 SQMM, MULTI STRAINED COPPER CABLE,ARM FRLS 1.1KV HRPVC APPLICATION::AUXILARY SUPPLY (***BSES approved makes***)	M	100
10	ARMORED RS485,TWISTED PAIR,22 GAUGE BELDEN 8761 OR EQUIVALENT (***Make-- BELDEN***)	M	100
11	PVC CONDUIT PIPE	M	50
12	METAL/PLASTIC GLANDS (1,1/2INCH,3/4INCHES) (***Make-- COMEX***)	M	10
13	ARMORED 4 PAIR, CAT5/CAT6 UTP CABLE (***Make-- D-Link***)	M	100
14	3PH,4 WIRE 1/5A, AUXILIRY SUPPLY 220 V DC, ACC.CLASS 0.5% WITH MODBUS (***Make-- Rishabh-3440***)	NOS	2
15	Router;Fortigate 30E 3G4G	NOS	2

16	Rack 12U	NOS	2
17	Switch; CISCO 2960XTSL	NOS	2
Annexure-B			
1	IED/BCU/MFM Integration over IEC 61850/IEC 103/MODBUS with Supplied RTU Note - Mapping, Configuration and extraction of ICD files comes under vendor scope.	PANEL'S	2
2	IEC 61850 Switches Installation ,Testing & Commissioning with RTU	NOS	1
3	Testing and Commissioning of new supplied RTU to Control Center over IEC-104 protocol. Note - Integration of existing RTU through Master/Slave concept comes under vender scope.	NOS	1
4	Cable Laying & Tagging & Termination With White Sleeve for 16 Core/2 Core/CAT06/RS485 Cable's Note - RS485/CAT06 Cable Punching/Crimping comes under vendor Scope.	M	300
5	Cable Glanding and termination with Lugs and Ferrules in C&R & RTU Marshalling panel. Note - Purchase of necessary Lugs & White Sleeve Ferrules Comes Under Vendor Scope for all cable terminations.	M	10
6	Miscellaneous work if any for SCADA Integration	LOT	1

Annexure-C

List of Signals for SCADA

S.No.	Signals - 33 & 66KV Incomers/Out Going	Digital Input/AI soft through	Signal Type
1	Breaker ON	√	DPI
2	Breaker OFF		
3	Front Bus (89A) ISO ON(In-Case of O/D)	√	DPI
4	Front Bus (89A) ISO OFF (In-Case of O/D)		
5	Rear Bus (89B) ISO ON (In-Case of O/D)	√	DPI
6	Rear Bus (89B) ISO OFF (In-Case of O/D)		
7	LINE ISO (89L) ON (In-Case of O/D)	√	DPI
8	LINE ISO (89L) OFF (In-Case of O/D)		
9	Earth Switch (89LE) -1 ON (In-Case of O/D)	√	DPI
10	Earth Switch (89LE) -1 OFF (In-Case of O/D)		
11	Earth Switch (89LE) - 2 ON (In-Case of O/D)	√	DPI
12	Earth Switch (89LE) - 2 OFF (In-Case of O/D)		
13	Breaker in service (In-case of I/D BKR)	√	SPI
14	Breaker in Test (In-case of I/D BKR)	√	SPI
15	Trip coil Ckt Healthy - 1 & 2	√	SPI
16	Spring Charge	√	SPI
17	Master trip(86) Operated	√	SPI
18	SF6 Pressure Low & SF6 Lock Out	√	SPI
19	VT fuse Fail	√	SPI
20	Panel DC Fail		SPI
21	L/R Switch in Local	√	DPI
22	L/R Switch in Remote	√	
23	LBB Operated	√	SPI
24	Relay Int Fault.		SPI
25	Over Current Operated (All stages)	√	SPI

26	Earth Fault Operated (All stages)	√	SPI
27	DIFF.Prot Operated	√	SPI
28	DIST.Ptot Operated	√	SPI
29	BKR CLS COMMAND		DCO
30	BKR OPN COMMAND		
31	Front Bus (89A) ISO OPNCOMMAND (In-Case of O/D)		DCO
32	Front Bus (89A) ISO CLS COMMAND (In-Case of O/D)		
33	Rear Bus (89B) ISO CLS COMMAND (In-Case of O/D)		DCO
34	Rear Bus (89B) ISO OPN COMMAND (In-Case of O/D)		
35	LINE ISO (89L) OPN COMMAND (In-Case of O/D)		DCO
36	LINE ISO (89L) CLS COMMAND (In-Case of O/D)		
37	Master Trip(86) relay reset from Remote		SCO
38	3Phase R,Y,B -Current&Voltage,Active&Reactive Power,PowerFactor,Max.Demand,Neu.Current etc	√	AI/MV
39	Fault current and phase indication of faulty phase viz. R,Y,B, Earth, Unbalance(O/C & E/F Relay).Fault voltage and phase indication of faulty phase viz. R,Y,B (Voltage Protection Relay). Fault Differential and Bias current in Line and Transformer Differential Relay ,Fault distance (in Distance Relay) ,Disturbance Records, If Any Fault Graphs for Remote diagnosis purpose	√	AI
40	Total Signals - BCPU & RTU	29 DI + Analog ,	
41	Essential Spare in BCPU,BCU	6 DI	