

Bill Of Quantity Cum Price Schedule

Name of Project :- 220 kV GIS for 2 X 60 MW Vyasi HEP at Vyasi, Dist Dehradun, UK

Name of work :- Erection, testing, commissioning and handing over of 220 kV GIS at Vyasi in Uttarakhand.

SL No	Description_of_Item	Quantity	UOM	Unit Rate	Total
1	<p>220kV Generator Transformer Bay Module: GIS (220kV- 50kA for 1 sec) -</p> <p>Work shall include erection / installation, testing and commissioning of 220kV GIS including LCC panels. The supervision for ETC works shall be provided by OEM/ GIS manufacturer.</p> <p>Arrangement of special tools & tackles/ plants, and testing instrument shall be done by OEM/ BHEL on returnable basis, however, general tools & tackles/ plants, and testing instrument as per anenxure-A&B shall be under contractor's scope.</p> <p>The scope includes complete installation of GIS bays, including Surge Arrester, Cable Connection Module/(s), associated Local Control Cabinet (LCC) and any other module, if applicable. Any other services required for ETC of complete GIS, walkways/ support structure, scaffolding, installation of cable trays on GIS modules, SF6 Gas treatment, handling / filling / top-up etc complete in all respect.</p> <p>Any dismantling/ rework before commissioning shall be in contractor's scope.</p> <p>Please refer notes and relevant technical specification/ drawings for additional details.</p>	2	Set	87,491.68	1,74,983.36
2	<p>220kV Station Transformer Bay Module: GIS (220kV- 50kA for 1 sec) -</p> <p>Work shall include erection / installation, testing and commissioning of 220kV GIS including LCC panels. The supervision for ETC works shall be provided by OEM/ GIS manufacturer.</p> <p>Arrangement of special tools & tackles/ plants, and testing instrument shall be done by OEM/ BHEL on returnable basis, however, general tools & tackles/ plants, and testing instrument as per anenxure-A&B shall be under contractor's scope.</p> <p>The scope includes complete installation of GIS bays, including Surge Arrester, Cable Connection Module/(s), associated Local Control Cabinet (LCC) and any other module, if applicable. Any other services required for ETC of complete GIS, walkways/ support structure, scaffolding, installation of cable trays on GIS modules, SF6 Gas treatment, handling / filling / top-up etc complete in all respect.</p> <p>Any dismantling/ rework before commissioning shall be in contractor's scope.</p> <p>Please refer notes and relevant technical specification/ drawings for additional details.</p>	1	Set	87,491.68	87,491.68
3	<p>220kV Line Feeder Bay Module: GIS (220kV- 50kA for 1 sec)</p> <p>Work shall include erection / installation, testing and commissioning of 220kV GIS including LCC panels. The supervision for ETC works shall be provided by OEM/ GIS manufacturer.</p> <p>Arrangement of special tools & tackles/ plants, and testing instrument shall be done by OEM/ BHEL on returnable basis, however, general tools & tackles/ plants, and testing instrument as per anenxure-A&B shall be under contractor's scope.</p> <p>The scope includes complete installation of GIS bays, including Surge Arrester, Cable Connection Module/(s), associated Local Control Cabinet (LCC) and any other module, if applicable. Any other services required for ETC of complete GIS, walkways/ support structure, scaffolding, installation of cable trays on GIS modules, SF6 Gas treatment, handling / filling / top-up etc complete in all respect.</p> <p>Any dismantling/ rework before commissioning shall be in contractor's scope.</p> <p>Please refer notes and relevant technical specification/ drawings for additional details.</p>	2	Set	1,00,427.27	2,00,854.54

4	<p>220kV Bus Bars: GIS (220kV- 50kA for 1 sec)</p> <p>Work shall include erection / installation, testing and commissioning of 220kV GIS including LCC panels. The supervision for ETC works shall be provided by OEM/ GIS manufacturer.</p> <p>Arrangement of special tools & tackles/ plants, and testing instrument shall be done by OEM/ BHEL on returnable basis, however, general tools & tackles/ plants, and testing instrument as per anenxure-A&B shall be under contractor's scope.</p> <p>The scope includes complete installation of GIS bays, including Surge Arrester, Cable Connection Module/(s), associated Local Control Cabinet (LCC) and any other module, if applicable. Any other services required for ETC of complete GIS, walkways/ support structure, scaffolding, installation of cable trays on GIS modules, SF6 Gas treatment, handling / filling / top-up etc complete in all respect.</p> <p>Any dismantling/ rework before commissioning shall be in contractor's scope.</p> <p>Please refer notes and relevant technical specification/ drawings for additional details.</p>	2	Set	25,672.19	51,344.38
5	<p>220kV Voltage Transformer module (for Busbars) GIS (220kV- 50kA for 1 sec) -</p> <p>Work shall include erection / installation, testing and commissioning of 220kV GIS including LCC panels. The supervision for ETC works shall be provided by OEM/ GIS manufacturer.</p> <p>Arrangement of special tools & tackles/ plants, and testing instrument shall be done by OEM/ BHEL on returnable basis, however, general tools & tackles/ plants, and testing instrument as per anenxure-A&B shall be under contractor's scope.</p> <p>The scope includes complete installation of GIS bays, including Surge Arrester, Cable Connection Module/(s), associated Local Control Cabinet (LCC) and any other module, if applicable. Any other services required for ETC of complete GIS, walkways/ support structure, scaffolding, installation of cable trays on GIS modules, SF6 Gas treatment, handling / filling / top-up etc complete in all respect.</p> <p>Any dismantling/ rework before commissioning shall be in contractor's scope.</p> <p>Please refer notes and relevant technical specification/ drawings for additional details.</p>	2	Set	44,804.21	89,608.42
6	<p>220kV Bus Coupler Bay Module: GIS (220kV- 50kA for 1 sec)</p> <p>Work shall include erection / installation, testing and commissioning of 220kV GIS including LCC panels. The supervision for ETC works shall be provided by OEM/ GIS manufacturer.</p> <p>Arrangement of special tools & tackles/ plants, and testing instrument shall be done by OEM/ BHEL on returnable basis, however, general tools & tackles/ plants, and testing instrument as per anenxure-A&B shall be under contractor's scope.</p> <p>The scope includes complete installation of GIS bays, including Surge Arrester, Cable Connection Module/(s), associated Local Control Cabinet (LCC) and any other module, if applicable. Any other services required for ETC of complete GIS, walkways/ support structure, scaffolding, installation of cable trays on GIS modules, SF6 Gas treatment, handling / filling / top-up etc complete in all respect.</p> <p>Any dismantling/ rework before commissioning shall be in contractor's scope.</p> <p>Please refer notes and relevant technical specification/ drawings for additional details.</p>	1	Set	1,03,014.39	1,03,014.39

7	<p>220kV Gas Insulated Bus Duct- GIS (220kV- 50kA for 1 sec)</p> <p>Work shall include erection / installation, testing and commissioning of 220kV GIS including LCC panels. The supervision for ETC works shall be provided by OEM/ GIS manufacturer.</p> <p>Arrangement of special tools & tackles/ plants, and testing instrument shall be done by OEM/ BHEL on returnable basis, however, general tools & tackles/ plants, and testing instrument as per annexure-A&B shall be under contractor's scope.</p> <p>The scope includes complete installation of GIS bays, including Surge Arrester, Cable Connection Module/(s), associated Local Control Cabinet (LCC) and any other module, if applicable. Any other services required for ETC of complete GIS, walkways/ support structure, scaffolding, installation of cable trays on GIS modules, SF6 Gas treatment, handling / filling / top-up etc complete in all respect.</p> <p>Any dismantling/ rework before commissioning shall be in contractor's scope.</p> <p>Please refer notes and relevant technical specification/ drawings for additional details.</p>	575	Metre	470.39	2,70,476.14
8	<p>220kV SF6 to Air Bushing -GIS (220kV- 50kA for 1 sec) -</p> <p>Work shall include erection / installation, testing and commissioning of 220kV GIS including LCC panels. The supervision for ETC works shall be provided by OEM/ GIS manufacturer.</p> <p>Arrangement of special tools & tackles/ plants, and testing instrument shall be done by OEM/ BHEL on returnable basis, however, general tools & tackles/ plants, and testing instrument as per annexure-A&B shall be under contractor's scope.</p> <p>The scope includes complete installation of GIS bays, including Surge Arrester, Cable Connection Module/(s), associated Local Control Cabinet (LCC) and any other module, if applicable. Any other services required for ETC of complete GIS, walkways/ support structure, scaffolding, installation of cable trays on GIS modules, SF6 Gas treatment, handling / filling / top-up etc complete in all respect.</p> <p>Any dismantling/ rework before commissioning shall be in contractor's scope.</p> <p>Please refer notes and relevant technical specification/ drawings for additional details.</p>	6	nos.	5,174.25	31,045.47
9	<p>GIS (220kV- 50kA for 1 sec) - Structure work for Installation of GIS including support structure for GIS ducts, SF6 to air bushings, supports, platforms, ladders, fixing of foundation bolts/ base frame, aligning, jointing, welding, fixing of embedded parts/ support plates in floors etc., which are required for installation of GIS as per the specification.</p>	1	lot	39,688.76	39,688.76
10	<p>Making holes of required dia (M12/M16/M24) in the GIS floor/ceiling, Transformer hall floor/ceiling upto 9m or Control Room or Pothead yard, by drilling with diamond core cutter so as to make chemical anchoring. The supply of chemical anchor is in the scope of BHEL/OEM.</p>	500	Nos.	682.50	3,41,250.00

11	GIS (220kV- 50kA for 1 sec) HV Test for GIS - HV test kit shall be arranged by GIS Supplier. Test shall also be conducted by GIS supplier. All necessary support i.e. unloading, shifting, minor assembling of HV test kit, support for complete HV Test, dismantling & loading on carrier. Complete in all respect.	1	lot	1,05,840.00	1,05,840.00
12	GIS (220kV- 50kA for 1 sec) Grounding/ Earthing for GIS complete- including Gas Insulated Bus duct, LCC, SF6 to air bushing, using braided Cu wire (insulated/ non-insulated)/ earth strip (Cu/Al/GI flat). Work includes cutting, lug crimping , bolting , fixing etc. and connecting with riser/earth strip (GI/AL /Cu flat) complete in all respect. Grounding Material will be supplied by GIS Supplier /BHEL.	6	bays	5,652.64	33,915.85
13	GIS (220kV- 50kA for 1 sec) Cabling between LCC and GIS including termination, ferruling , laying, dressing, tagging etc. including arrangement of consumables etc. Cable shall be provided by GIS supplier / BHEL.	6	bays	10,348.48	62,090.88
14	220kV , 1 Ph, CVT complete with terminal connector without support structure	6	Nos.	6,308.16	37,848.99
15	3 Ph, HDB Isolator, 1600 A, 50kA for 1s, mechanically ganged motor operated complete with 9 nos. of 220kV support insulators & terminal connectors without support structure - with one earth switch mechanically ganged motor/manual operated.	2	Set	19,893.05	39,786.10
16	198 kV, 1 Phase, Gapless type Metal Oxide Surge Arrester complete with surge counter, leakage current meter, insulating base, connecting cable and terminal connectors. - High level (15 m to 20 m height from plinth) and to be mounted on Tower beam as per attached Pothead yard layout. Surge Counter to be installed at a height of 1.5 m from FGL.	6	Nos.	6,350.40	38,102.40
17	220kV, 1 phase, 1mH, 1600A, 50kA for 1s, Pedestal type Wave Trap complete with 3 nos. post insulators per WT with terminal connectors without support structure.	4	Nos.	8,467.20	33,868.80
18	220kV Post Insulators complete with terminal connectors without support structure low level (upto 6 m height from plinth)	2	Nos.	1,587.60	3,175.20
19	220kV Post Insulators complete with terminal connectors without support structure - High level (above 15 m height from plinth) and to be mounted on Tower beam as per attached Pothead yard layout.	6	Nos.	3,175.20	19,051.20
20	220 kV Double Tension string insulator (120 kN per string) with double anchoring points with 2X15 nos antifog disc with all hardware accessories including grading Ring and tension clamp suitable for Twin Moose with 250mm sub conductor spacing with turn buckle	6	Sets	1,799.28	10,795.68
21	220 kV Double Tension string insulator (120 kN per string) with double anchoring points with 2X15 nos antifog disc with all hardware accessories including grading Ring and tension clamp suitable for Twin Moose with 250mm sub conductor spacing without turn buckle	6	Sets	1,799.28	10,795.68
22	220 kV Single Suspension string insulator (120 kN) assembly with 1x15 nos antifog disc with all hardware accessories including grading Ring with Drop clamp set suitable for Twin Moose with 250 mm sub conductor spacing	6	Sets	1,587.60	9,525.60
23	220 kV Single Suspension string insulator (120 kN) assembly with 1x15 nos antifog disc with all hardware accessories including grading Ring with through type suspension clamp set suitable for Twin Moose with 250 mm sub conductor spacing	6	Sets	1,587.60	9,525.60
24	GI Stranded Shield wire including tension clamp, PG clamp and clamping on structure for down conductor, fixing/bolting with earth strip etc to complete. Supply of Shield wire in ETC Contractor scope.	600	m	124.12	74,469.15
25	Conductor complete with Tee connectors for droppers to equipment connections, PG clamps for busbar jumpering, Twin spacers etc to complete.	2	Km	69,139.75	1,38,279.49
26	415V, 3Ph, 4 wire, 200A, 40kA for 1s AC DISTRIBUTION BOARD	1	Set	64,692.16	64,692.16
27	220V, 100A, 35kA (DC) for 1s DC DISTRIBUTION BOARD	1	Set	48,519.12	48,519.12
28	48V, 200 AH VRLA Battery Bank with all accessories	1	Set	30,728.78	30,728.78
29	48V, 50A, Float and Float cum boost battery charger with integrated Distribution board	1	Set	35,257.22	35,257.22

30	VT Junction Box (on foundation/structure)	2	Nos.	2,304.02	4,608.03
31	Control and Relay Panels and SAS (At Local End) - 220kV Line Relay Panel (Approx 800mm Wide) {1Set = 2 Nos. Panel} - Relay & BCU Panels & 61850 Based Sub station Automation system complete with all accessories (Testing and commissioning of relays in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment including laying & termination of patch cords to be in scope of ETC contractor).	2	Set	12,835.75	25,671.49
32	Control and Relay Panels and SAS (At Local End) - 220kV GT Relay Panel (Approx 800mm Wide) {1Set = 1 Nos. Panel} - Relay & BCU Panels & 61850 Based Sub station Automation system complete with all accessories (Testing and commissioning of relays in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment including laying & termination of patch cords to be in scope of ETC contractor).	2	Set	6,417.87	12,835.75
33	Control and Relay Panels and SAS (At Local End) - 220kV ST Relay Panel (Approx 800mm Wide) {1Set = 1 Nos. Panel} - Relay & BCU Panels & 61850 Based Sub station Automation system complete with all accessories (Testing and commissioning of relays in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment including laying & termination of patch cords to be in scope of ETC contractor).	1	Set	6,417.87	6,417.87
34	Control and Relay Panels and SAS (At Local End) - 220kV Bus Coupler Relay Panel (Approx 800mm Wide) {1Set = 1 Nos. Panel} - Relay & BCU Panels & 61850 Based Sub station Automation system complete with all accessories (Testing and commissioning of relays in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment including laying & termination of patch cords to be in scope of ETC contractor).	1	Set	6,417.87	6,417.87
35	Control and Relay Panels and SAS (At Local End) - 220kV Busbar Relay Panel (Approx 800mm Wide) (1 Set=2 Panels) - Relay & BCU Panels & 61850 Based Sub station Automation system complete with all accessories (Testing and commissioning of relays in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment including laying & termination of patch cords to be in scope of ETC contractor).	1	Set	12,835.75	12,835.75
36	Control and Relay Panels and SAS (At Local End) - SAS Network Panel (Approx 800mm Wide) {1 Set = 1No. Panel} - Relay & BCU Panels & 61850 Based Sub station Automation system complete with all accessories (Testing and commissioning of relays in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment including laying & termination of patch cords to be in scope of ETC contractor).	1	Set	6,417.87	6,417.87
37	Control and Relay Panels and SAS (At Local End) - SAS Auxiliary BCU and BCU Panels (Approx 800mm Wide) {1 Set = 1No. Panel} - Relay & BCU Panels & 61850 Based Sub station Automation system complete with all accessories (Testing and commissioning of relays in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment including laying & termination of patch cords to be in scope of ETC contractor).	6	Set	6,417.87	38,507.24
38	Control and Relay Panels and SAS (At Local End) - SAS: Armoured Fibre Optic Cable for SAS and Busbar protection (to be laid in GI/ HDPE Pipe) (Scope - Laying of the cables in the 40mm GI/HDPE PIPE)	250	m	23.05	5,761.65
39	Control and Relay Panels and SAS (At Local End) - Operator Work Station with 24 inch LED monitor	2	Nos.	768.22	1,536.44
40	Control and Relay Panels and SAS (At Local End) - Engineering Work Station with 24 inch LED monitor	1	Nos.	768.22	768.22
41	Control and Relay Panels and SAS (At Local End) - Colour Laser Jet Printer (A3 SIZE)	1	Nos.	384.11	384.11

42	Control and Relay Panels and SAS (At Local End) - Colour Laser Jet Printer (A4 SIZE)	1	Nos.	384.11	384.11
43	Control and Relay Panels and SAS (At Local End) - Dot Matrix printer	1	Nos.	384.11	384.11
44	Control and Relay Panels and SAS (At Local End) - Inverter with Battery Backup	2	Nos.	3,841.10	7,682.21
45	Control and Relay Panels and SAS (At Local End) - Laptop with relay parameterisation software	1	Nos.	384.11	384.11
46	Control and Relay Panels and SAS (At Local End) - GPS receiver with 100mm TDU complete in all respects including antenna, all cables, processing equipment etc.	1	Nos.	2,304.66	2,304.66
47	Control and Relay Panels and SAS (At Local End) - Handling & installation of furniture required for OWS, printer, chairs etc.	1	Lot	2,304.66	2,304.66
48	PLCC Equipments (at Local End Station) - Coupling device (Phase to Phase; 1 set = 1 No. LMU Box)- (Testing and commissioning of PLCC Equipments in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment and including shifting/ loading/ unloading of equipments to remote end to be in scope of ETC contractor).	2	Set	10,800.71	21,601.42
49	PLCC Equipments (at Remote End Station) - Coupling device (Phase to Phase; 1 set = 1 No. LMU Box)- (Testing and commissioning of PLCC Equipments in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment and including shifting/ loading/ unloading of equipments to remote end to be in scope of ETC contractor).	2	Set	16,201.06	32,402.13
50	PLCC Equipments (at Local End Station) - HF Cable - (Testing and commissioning of PLCC Equipments in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment and including shifting/ loading/ unloading of equipments to remote end to be in scope of ETC contractor).	750	m	10.45	7,839.72
51	PLCC Equipments (at Remote End Station) - HF Cable - (Testing and commissioning of PLCC Equipments in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment and including shifting/ loading/ unloading of equipments to remote end to be in scope of ETC contractor).	750	m	15.68	11,759.58
52	PLCC Equipments (at Local End Station) - Analog PLCC Panels - (Testing and commissioning of PLCC Equipments in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment and including shifting/ loading/ unloading of equipments to remote end to be in scope of ETC contractor).	2	Nos.	10,800.71	21,601.42
53	PLCC Equipments (at Remote End Station) - Analog PLCC Panels - (Testing and commissioning of PLCC Equipments in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment and including shifting/ loading/ unloading of equipments to remote end to be in scope of ETC contractor).	2	Nos.	16,201.06	32,402.13
54	PLCC Equipments (at Local End Station) - Analog Protection Coupler - (Testing and commissioning of PLCC Equipments in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment and including shifting/ loading/ unloading of equipments to remote end to be in scope of ETC contractor).	4	Nos.	6,060.40	24,241.59
55	PLCC Equipments (at Remote End Station) - Analog Protection Coupler - (Testing and commissioning of PLCC Equipments in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment and including shifting/ loading/ unloading of equipments to remote end to be in scope of ETC contractor).	4	Nos.	9,090.60	36,362.39

56	PLCC Equipments (at Local End Station) - 4 Wire telephone instrument along with wires - (Testing and commissioning of PLCC Equipments in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment and including shifting/ loading/ unloading of equipments to remote end to be in scope of ETC contractor).	4	Nos.	104.49	417.96
57	PLCC Equipments (at Remote End Station) - 4 Wire telephone instrument along with wires - (Testing and commissioning of PLCC Equipments in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment and including shifting/ loading/ unloading of equipments to remote end to be in scope of ETC contractor).	4	Nos.	156.73	626.94
58	PLCC Equipments (at Local End Station) - 5 Pair telephone cable, armoured, 0.5 mm dia, annealed copper conductor and petroleum jelly filled with polyethene outer jackets- (Testing and commissioning of PLCC Equipments in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment and including shifting/ loading/ unloading of equipments to remote end to be in scope of ETC contractor).	750	m	10.45	7,839.72
59	PLCC Equipments (at Remote End Station) - 5 Pair telephone cable, armoured, 0.5 mm dia, annealed copper conductor and petroleum jelly filled with polyethene outer jackets- (Testing and commissioning of PLCC Equipments in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment and including shifting/ loading/ unloading of equipments to remote end to be in scope of ETC contractor).	750	m	15.68	11,759.58
60	PLCC Equipments (at Local End Station) - 2 Pair telephone cable, armoured, 0.5 mm dia, annealed copper conductor and petroleum jelly filled with polyethene outer jackets - (Testing and commissioning of PLCC Equipments in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment and including shifting/ loading/ unloading of equipments to remote end to be in scope of ETC contractor).	500	m	10.45	5,226.48
61	PLCC Equipments (at Remote End Station) - 2 Pair telephone cable, armoured, 0.5 mm dia, annealed copper conductor and petroleum jelly filled with polyethene outer jackets - (Testing and commissioning of PLCC Equipments in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment and including shifting/ loading/ unloading of equipments to remote end to be in scope of ETC contractor).	500	m	15.68	7,839.72
62	PLCC Equipments (at Local End Station) - EPABX (24/8) with 2 wire Telephone sets, Cables and accessories - (Testing and commissioning of PLCC Equipments in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment and including shifting/ loading/ unloading of equipments to remote end to be in scope of ETC contractor).	1	Set	5,224.65	5,224.65
63	PLCC Equipments (at Local End Station) - 2 wire Telephone sets with connecting Cables and accessories - (Testing and commissioning of PLCC Equipments in scope of panel supplier. Necessary manpower support, tools, tackles and testing equipment and including shifting/ loading/ unloading of equipments to remote end to be in scope of ETC contractor).	10	Nos.	104.49	1,044.89
64	PLCC Equipments (at Local End Station) - Testing and Maintenance equipment (Print Test kit)	1	Nos.	1,050.00	1,050.00
65	PLCC Equipments (at Remote End Station) - Testing and Maintenance equipment (Print Test kit)	1	Nos.	2,100.00	2,100.00
66	LT Cabling 4C x 4 sq mm HR-PVC/Copper, Unarmoured Control Cables including laying, tagging, dressing, ferruling, Glanding, lugging, soldering, tapping, jointing, crimping, termination, and drilling/ cutting holes in cable gland plates- laying can be either on trays, supports, underground, buried in ground or through GI/PVC/HDPE pipe over / under ground, through wall, on structure/LM etc. All erection materials viz. ferrules, copper lugs, cable ties / straps, Al. tags, markers, GI / PVC wall sleeves with rubber / nylon bushes and flexible steel conduits shall be supplied by bidder. Glands shall be quoted separately.	7000	m	14.26	99,833.58

67	LT Cabling 2C x 2.5 sq mm HR-PVC/Copper, Unarmoured Control Cables including laying, tagging , dressing, ferruling, Glanding, lugging ,soldering, tapping, jointing, crimping, termination, and drilling/ cutting holes in cable gland plates- laying can be either on trays, supports, underground, buried in ground or through GI/PVC/HDPE pipe over / under ground, through wall , on structure/LM etc. All erection materials viz. ferrules, copper lugs, cable ties / straps, Al. tags, markers, GI / PVC wall sleeves with rubber / nylon bushes and flexible steel conduits shall be supplied by bidder. Glands shall be quoted separately.	500	m	13.88	6,939.93
68	LT Cabling 5C x 2.5 sq mm HR-PVC/Copper, Unarmoured Control Cables including laying, tagging , dressing, ferruling, Glanding, lugging ,soldering, tapping, jointing, crimping, termination, and drilling/ cutting holes in cable gland plates- laying can be either on trays, supports, underground, buried in ground or through GI/PVC/HDPE pipe over / under ground, through wall , on structure/LM etc. All erection materials viz. ferrules, copper lugs, cable ties / straps, Al. tags, markers, GI / PVC wall sleeves with rubber / nylon bushes and flexible steel conduits shall be supplied by bidder. Glands shall be quoted separately.	8000	m	13.88	1,11,038.94
69	LT Cabling 7C x 2.5 sq mm HR-PVC/Copper, Unarmoured Control Cables including laying, tagging , dressing, ferruling, Glanding, lugging ,soldering, tapping, jointing, crimping, termination, and drilling/ cutting holes in cable gland plates- laying can be either on trays, supports, underground, buried in ground or through GI/PVC/HDPE pipe over / under ground, through wall , on structure/LM etc. All erection materials viz. ferrules, copper lugs, cable ties / straps, Al. tags, markers, GI / PVC wall sleeves with rubber / nylon bushes and flexible steel conduits shall be supplied by bidder. Glands shall be quoted separately.	2500	m	14.86	37,158.27
70	LT Cabling 12C x 2.5 sq mm HR-PVC/Copper, Unarmoured Control Cables including laying, tagging , dressing, ferruling, Glanding, lugging ,soldering, tapping, jointing, crimping, termination, and drilling/ cutting holes in cable gland plates- laying can be either on trays, supports, underground, buried in ground or through GI/PVC/HDPE pipe over / under ground, through wall , on structure/LM etc. All erection materials viz. ferrules, copper lugs, cable ties / straps, Al. tags, markers, GI / PVC wall sleeves with rubber / nylon bushes and flexible steel conduits shall be supplied by bidder. Glands shall be quoted separately.	4000	m	19.83	79,300.78
71	LT Cabling 19C x 2.5 sq mm HR-PVC/Copper, Unarmoured Control Cables including laying, tagging , dressing, ferruling, Glanding, lugging ,soldering, tapping, jointing, crimping, termination, and drilling/ cutting holes in cable gland plates- laying can be either on trays, supports, underground, buried in ground or through GI/PVC/HDPE pipe over / under ground, through wall , on structure/LM etc. All erection materials viz. ferrules, copper lugs, cable ties / straps, Al. tags, markers, GI / PVC wall sleeves with rubber / nylon bushes and flexible steel conduits shall be supplied by bidder. Glands shall be quoted separately.	6500	m	21.80	1,41,721.10
72	LT Cabling 1C x 150 sq mm HR-PVC/Aluminium, Armoured Auxiliary Power Cables including laying, tagging , dressing, ferruling, Glanding, lugging ,soldering, tapping, jointing, crimping, termination, and drilling/ cutting holes in cable gland plates- laying can be either on trays, supports, underground, buried in ground or through GI/PVC/HDPE pipe over / under ground, through wall , on structure/LM etc. All erection materials viz. ferrules, copper lugs, cable ties / straps, Al. tags, markers, GI / PVC wall sleeves with rubber / nylon bushes and flexible steel conduits shall be supplied by bidder. Glands shall be quoted separately.	500	m	49.93	24,965.88
73	LT Cabling 3.5C x 70 sq mm HR-PVC/Aluminium, Armoured Auxiliary Power Cables including laying, tagging , dressing, ferruling, Glanding, lugging ,soldering, tapping, jointing, crimping, termination, and drilling/ cutting holes in cable gland plates- laying can be either on trays, supports, underground, buried in ground or through GI/PVC/HDPE pipe over / under ground, through wall , on structure/LM etc. All erection materials viz. ferrules, copper lugs, cable ties / straps, Al. tags, markers, GI / PVC wall sleeves with rubber / nylon bushes and flexible steel conduits shall be supplied by bidder. Glands shall be quoted separately.	1000	m	28.74	28,743.17

74	LT Cabling 3.5C x 35 sq mm HR-PVC/Aluminium, Armoured Auxiliary Power Cables including laying, tagging , dressing, ferruling, Glanding, lugging ,soldering, tapping, jointing, crimping, termination, and drilling/ cutting holes in cable gland plates- laying can be either on trays, supports, underground, buried in ground or through GI/PVC/HDPE pipe over / under ground, through wall , on structure/LM etc. All erection materials viz. ferrules, copper lugs, cable ties / straps, Al. tags, markers, GI / PVC wall sleeves with rubber / nylon bushes and flexible steel conduits shall be supplied by bidder. Glands shall be quoted separately.	1100	m	19.83	21,807.71
75	LT Cabling 4C x 16 sq mm HR-PVC/Aluminium, Armoured Auxiliary Power Cables including laying, tagging , dressing, ferruling, Glanding, lugging ,soldering, tapping, jointing, crimping, termination, and drilling/ cutting holes in cable gland plates- laying can be either on trays, supports, underground, buried in ground or through GI/PVC/HDPE pipe over / under ground, through wall , on structure/LM etc. All erection materials viz. ferrules, copper lugs, cable ties / straps, Al. tags, markers, GI / PVC wall sleeves with rubber / nylon bushes and flexible steel conduits shall be supplied by bidder. Glands shall be quoted separately.	4500	m	16.64	74,875.19
76	LT Cabling 4C x 6 sq mm HR-PVC/Copper, Unarmoured Auxiliary Power Cables including laying, tagging , dressing, ferruling, Glanding, lugging ,soldering, tapping, jointing, crimping, termination, and drilling/ cutting holes in cable gland plates- laying can be either on trays, supports, underground, buried in ground or through GI/PVC/HDPE pipe over / under ground, through wall , on structure/LM etc. All erection materials viz. ferrules, copper lugs, cable ties / straps, Al. tags, markers, GI / PVC wall sleeves with rubber / nylon bushes and flexible steel conduits shall be supplied by bidder. Glands shall be quoted separately.	3000	m	15.45	46,351.31
77	Supply of CABLE GLANDS - Cable glands shall be double compression type nickel plated (coating thickness not less than 10 microns) brass cable glands complete with necessary armour clamp and tapered washer, etc. for all power and control cables to provide dust and weather proof terminations. Cable glands shall match with the sizes of different HT/LT/Control cables. The cable glands shall conform to BIS: 6121. They shall comprise of heavy duty brass casting, machine finished and nickel plated, to avoid corrosion and oxidation. Rubber components used in cable glands shall be neoprene and of tested quality. Cable glands shall be of approved make.- - 4C x 4 sq mm PVC/Copper, Armoured Control Cables	300	Nos.	300.46	90,138.86
78	Supply of CABLE GLANDS - Cable glands shall be double compression type nickel plated (coating thickness not less than 10 microns) brass cable glands complete with necessary armour clamp and tapered washer, etc. for all power and control cables to provide dust and weather proof terminations. Cable glands shall match with the sizes of different HT/LT/Control cables. The cable glands shall conform to BIS: 6121. They shall comprise of heavy duty brass casting, machine finished and nickel plated, to avoid corrosion and oxidation. Rubber components used in cable glands shall be neoprene and of tested quality. Cable glands shall be of approved make.- - 2C x 2.5 sq mm PVC/Copper, Armoured Control Cables	50	Nos.	198.23	9,911.48
79	Supply of CABLE GLANDS - Cable glands shall be double compression type nickel plated (coating thickness not less than 10 microns) brass cable glands complete with necessary armour clamp and tapered washer, etc. for all power and control cables to provide dust and weather proof terminations. Cable glands shall match with the sizes of different HT/LT/Control cables. The cable glands shall conform to BIS: 6121. They shall comprise of heavy duty brass casting, machine finished and nickel plated, to avoid corrosion and oxidation. Rubber components used in cable glands shall be neoprene and of tested quality. Cable glands shall be of approved make.- - 5C x 2.5 sq mm PVC/Copper, Armoured Control Cables	250	Nos.	198.23	49,557.41

80	Supply of CABLE GLANDS - Cable glands shall be double compression type nickel plated (coating thickness not less than 10 microns) brass cable glands complete with necessary armour clamp and tapered washer, etc. for all power and control cables to provide dust and weather proof terminations. Cable glands shall match with the sizes of different HT/LT/Control cables. The cable glands shall conform to BIS: 6121. They shall comprise of heavy duty brass casting, machine finished and nickel plated, to avoid corrosion and oxidation. Rubber components used in cable glands shall be neoprene and of tested quality. Cable glands shall be of approved make. - 7C x 2.5 sq mm PVC/Copper, Armoured Control Cables	120	Nos.	267.60	32,112.46
81	Supply of CABLE GLANDS - Cable glands shall be double compression type nickel plated (coating thickness not less than 10 microns) brass cable glands complete with necessary armour clamp and tapered washer, etc. for all power and control cables to provide dust and weather proof terminations. Cable glands shall match with the sizes of different HT/LT/Control cables. The cable glands shall conform to BIS: 6121. They shall comprise of heavy duty brass casting, machine finished and nickel plated, to avoid corrosion and oxidation. Rubber components used in cable glands shall be neoprene and of tested quality. Cable glands shall be of approved make. - 12C x 2.5 sq mm PVC/Copper, Armoured Control Cables	200	Nos.	297.27	59,454.18
82	Supply of CABLE GLANDS - Cable glands shall be double compression type nickel plated (coating thickness not less than 10 microns) brass cable glands complete with necessary armour clamp and tapered washer, etc. for all power and control cables to provide dust and weather proof terminations. Cable glands shall match with the sizes of different HT/LT/Control cables. The cable glands shall conform to BIS: 6121. They shall comprise of heavy duty brass casting, machine finished and nickel plated, to avoid corrosion and oxidation. Rubber components used in cable glands shall be neoprene and of tested quality. Cable glands shall be of approved make. - 19C x 2.5 sq mm PVC/Copper, Armoured Control Cables -	250	Nos.	321.86	80,463.94
83	Supply of CABLE GLANDS - 1C x 150 sq mm PVC/Aluminium, Armoured Auxiliary Power Cables- Cable glands shall be double compression type nickel plated (coating thickness not less than 10 microns) brass cable glands complete with necessary armour clamp and tapered washer, etc. for all power and control cables to provide dust and weather proof terminations. Cable glands shall match with the sizes of different HT/LT/Control cables. The cable glands shall conform to BIS: 6121. They shall comprise of heavy duty brass casting, machine finished and nickel plated, to avoid corrosion and oxidation. Rubber components used in cable glands shall be neoprene and of tested quality. Cable glands shall be of approved make.-	20	Nos.	645.81	12,916.11
84	Supply of CABLE GLANDS -- 3.5C x 70 sq mm PVC/Aluminium, Armoured Auxiliary Power Cables- Cable glands shall be double compression type nickel plated (coating thickness not less than 10 microns) brass cable glands complete with necessary armour clamp and tapered washer, etc. for all power and control cables to provide dust and weather proof terminations. Cable glands shall match with the sizes of different HT/LT/Control cables. The cable glands shall conform to BIS: 6121. They shall comprise of heavy duty brass casting, machine finished and nickel plated, to avoid corrosion and oxidation. Rubber components used in cable glands shall be neoprene and of tested quality. Cable glands shall be of approved make.	50	Nos.	396.45	19,822.40
85	Supply of CABLE GLANDS - - 3.5C x 35 sq mm PVC/Aluminium, Armoured Auxiliary Power Cables - Cable glands shall be double compression type nickel plated (coating thickness not less than 10 microns) brass cable glands complete with necessary armour clamp and tapered washer, etc. for all power and control cables to provide dust and weather proof terminations. Cable glands shall match with the sizes of different HT/LT/Control cables. The cable glands shall conform to BIS: 6121. They shall comprise of heavy duty brass casting, machine finished and nickel plated, to avoid corrosion and oxidation. Rubber components used in cable glands shall be neoprene and of tested quality. Cable glands shall be of approved make.	50	Nos.	346.89	17,344.67

86	Supply of CABLE GLANDS - - 4C x 16 sq mm PVC/Aluminium, Armoured Auxiliary Power Cables - Cable glands shall be double compression type nickel plated (coating thickness not less than 10 microns) brass cable glands complete with necessary armour clamp and tapered washer, etc. for all power and control cables to provide dust and weather proof terminations. Cable glands shall match with the sizes of different HT/LT/Control cables. The cable glands shall conform to BIS: 6121. They shall comprise of heavy duty brass casting, machine finished and nickel plated, to avoid corrosion and oxidation. Rubber components used in cable glands shall be neoprene and of tested quality. Cable glands shall be of approved make.	150	Nos.	300.46	45,069.43
87	Supply of CABLE GLANDS - - 4C x 6 sq mm PVC/Aluminium, Armoured Auxiliary Power Cables - Cable glands shall be double compression type nickel plated (coating thickness not less than 10 microns) brass cable glands complete with necessary armour clamp and tapered washer, etc. for all power and control cables to provide dust and weather proof terminations. Cable glands shall match with the sizes of different HT/LT/Control cables. The cable glands shall conform to BIS: 6121. They shall comprise of heavy duty brass casting, machine finished and nickel plated, to avoid corrosion and oxidation. Rubber components used in cable glands shall be neoprene and of tested quality. Cable glands shall be of approved make.	150	Nos.	300.46	45,069.43
88	Laying of Cable trays: including bends, tees, elbow, reducers, stiffeners coupler plates, bolting to racks, structure etc. to complete. Scope of minor fabrication is also involved. 100 to 150 mm wide, 2.5 M long Perforated type	100	Meter	51.08	5,107.54
89	Laying of Cable trays: including bends, tees, elbow, reducers, stiffeners coupler plates, bolting to racks, structure etc. to complete. Scope of minor fabrication is also involved. 100 to 750 mm wide, 2.5 M long Ladder type	350	Meter	41.35	14,471.86
90	Laying of Cable trays: including bends, tees, elbow, reducers, stiffeners coupler plates, bolting to racks, structure etc. to complete. Scope of minor fabrication is also involved. 100 to 750 mm wide, 2.5 M long Perforated type	650	Meter	51.08	33,198.98
91	Hanger and Rack assembly work includes welding/anchoring, as applicable of galvanised steel racks on inserts of ceiling/ floor in switchyard / control room/ GIS Building. Hanger and Rack assembly will be of 2/3/4 tier. At 9 m height in transformer floor ceiling as per drawing enclosed. Supply of the Anchor bolts shall be in scope of ETC contractor and shall be of reputed make duly approved by Site incharge. Any fabrication and modification/painting work required shall be in ETC contractor scope.	0.20	MT	25,082.18	5,016.44
92	Hanger and Rack assembly work includes welding/anchoring, as applicable of galvanised steel racks on inserts of ceiling/ floor in switchyard / control room/ GIS Building. Hanger and Rack assembly will be of 2/3/4 tier. Upto 5 m height in other floors as per drawing enclosed. Supply of the Anchor bolts shall be in scope of ETC contractor and shall be of reputed make duly approved by Site incharge. Any fabrication and modification/painting work required shall be in ETC contractor scope.	3.80	MT	25,082.18	95,312.30
93	Supply and Laying of GI conduits alongwith flexible conduit on cable racks/ at a depth of 300mm including excavation, backfilling, making and repairing of walls in trenches, cutting, threading, fixing of sockets/ bends where required etc. complete. Both ends of GI conduits shall be closed by plastering. (Payment will be made for the as erected pipe length) GI pipe, 50 NB	200	m	567.50	1,13,500.14
94	Supply and Laying of GI conduits alongwith flexible conduit on cable racks/ at a depth of 300mm including excavation, backfilling, making and repairing of walls in trenches, cutting, threading, fixing of sockets/ bends where required etc. complete. Both ends of GI conduits shall be closed by plastering. (Payment will be made for the as erected pipe length) GI Pipe, 100 NB	100	m	1,283.85	1,28,384.63
95	Supply and Laying of PVC pipes on cable racks/ at a depth of 300mm including excavation, backfilling, making and repairing of walls in trenches, cutting, threading, fixing of sockets/ bends where required etc. complete. Both ends of PVC conduits shall be closed by plastering. (Payment will be made for the as erected pipe length) PVC pipe, 50 NB	300	m	168.88	50,663.84
96	Supply and Laying of PVC pipes on cable racks/ at a depth of 300mm including excavation, backfilling, making and repairing of walls in trenches, cutting, threading, fixing of sockets/ bends where required etc. complete. Both ends of PVC conduits shall be closed by plastering. (Payment will be made for the as erected pipe length) PVC Pipe, 100 NB	300	m	341.13	1,02,339.61

97	Supply and Fixing of GI Pipes 50NB dia on Lattice/ Pipe Stucture including clamping, fixing of sockets/ bends as required etc. complete. Both ends of GI Pipes shall be closed by plastering. (Payment will be made for the as erected pipe length).	50	m	567.50	28,375.04
98	Supply and Fixing of GI Pipes 100NB dia on Lattice/ Pipe Stucture including clamping, fixing of sockets/ bends as required etc. complete. Both ends of GI Pipes shall be closed by plastering. (Payment will be made for the as erected pipe length).	50	m	1,283.85	64,192.31
99	The Fire proof sealing / fire stop system / fire protection coating system required to prevent spreading of fire from one place to other place (or one zone to other zone) through the openings in wall / floor, cables laid in trays / racks and openings below Electrical Switchgear / MCC / Distribution boards /Cabinets / Panels, etc. Customer approval to be taken for vendor	10	sq.m	2,309.25	23,092.46
100	Supply & fixing of Panel Supporting Angles / Channel etc on cable trench/ panel cut-outs in Control Room / GIS Hall	2	MT	63,684.94	1,27,369.87
101	Supply and fixing of hooks for erection of GIS ducts below GIS floor with chemical anchor. Length of the hooks shall be 100mm below the slab with 1 Ton (minimum) load bearing capacity. To be carried out as per attached CWR drawing. The supply of the chemical anchor is also in the scope of bidder.	20	Nos.	3,412.50	68,250.00
102	Structural Steel Work welded in built up sections like angles, channels & framed work etc including providing , cutting, hoisting, fixing in position with all complete - Galvanised steel lattice Structures including hardwares for equipment support	75	MT	4,816.73	3,61,254.94
103	Providing holes of following dia. In GI Structural Member like Angle & Plate (Ir-respective of size and thickness) for Erection of Tower, Beam & Equipment Support Structure: 13.5mm Dia hole for fixing of M12 Bolt- Quantity	10	Nos.	49.42	494.22
104	Providing holes of following dia. In GI Structural Member like Angle & Plate (Ir-respective of size and thickness) for Erection of Tower, Beam & Equipment Support Structure:17.5mm Dia hole for fixing of M16 Bolt- Quantity	10	Nos.	49.42	494.22
105	Providing holes of following dia. In GI Structural Member like Angle & Plate (Ir-respective of size and thickness) for Erection of Tower, Beam & Equipment Support Structure: 22mm dia hole for fixing of Stringing Hardware	10	Nos.	49.42	494.22
106	Providing holes of following dia. In GI Structural Member like Angle & Plate (Ir-respective of size and thickness) for Erection of Tower, Beam & Equipment Support Structure:28mm dia hole for fixing of Stringing Hardware	10	Nos.	49.42	494.22
107	Earthing works- 75 x 12 mm GI Flat - The earthing includes laying of earthmat grid in GIS floor and provide risers at locations specified in attached drawing, earthing of all switchyard equipment, towers, structure, cable trenches, fence, pipe electrode for LA, CVT, neutral of transformer & at interconnections of other grids, Control room equipments using necessary connectors for earthing flats. Earthing clamping shall be carried out by ETC contractor. GS strip including cutting, bending, welding with 40 mm dia MS rod riser/earth strip, applying zinc rich paint, clamping to structure/building wall etc. to complete. Hardware required for connecting flat on pads of structure & equipment included in scope. The Earthing of equipments shall be carried out as per equipment earthing drg	15	MT	14,700.00	2,20,500.00
108	Earthing works - 50 x 6 mm GI Flat- The earthing includes earthing of all switchyard equipment, towers, pipe structure, cable trenches, fence, pipe electrode for LA, CVT, neutral of transformer & at interconnections of other grids, Control room equipments using necessary connectors for earthing flats. Earthing clamping shall be carried out by ETC contractor. GS strip including cutting, bending, welding with 40 mm dia MS rod riser/earth strip, applying zinc rich paint, clamping to structure/building wall etc. to complete. Hardware required for connecting flat on pads of structure & equipment included in scope. The Earthing of equipments shall be carried out as per equipment earthing drg	3	MT	14,700.00	44,100.00

109	Supply and Laying of 40 mm dia MS Rods at a depth of 600 mm measured from the top of Finished Ground Level and bringing out risers just below gravel level near the equipment foundations as per requirement including following works: - excavation of trenches - laying of MS rod - welding of rods (refer Drg No. C/ENG/STD/EARTHINGS/09, SH-2&3 Rev 00 for Welding details of rods) - backfilling of soil for bringing out pig tail risers of 40 dia MS rod (approximately 1000) for equipments. Risers shall be raised from the earthmat (at 600 mm depth) to 150 mm above ground level to the nearest point of the equipment. This shall include all cutting, bending, welding, fixing, application of zinc rich paint on cutting surface, etc to the main earthmesh. - any other work necessary to complete the laying of earthmat (40 mm dia MS rod will be supplied by BHEL)	2	MT	21,375.37	42,750.73
110	Unloading, storage & handing over of Essential/ Mandatory spares to Customer as per Annexure-spares (attached alongwith the tender document)	1	Lot	94,342.73	94,342.73
111	Supply & Mounting of Phase Color Discs, Danger Plate and Identification Plates for bays & Equipments as per IS:2551; 1982 & IS:5; 1978.	1	Lot	1,19,971.78	1,19,971.78
112	Supply of Equipment Fixing Hardware as per specification TB-XXX-618-002a -Bolts, Washers and Spring Washers. Size as per actual requirement	50	kg	96.55	4,827.55
113	INSULATION MAT: The scope covers supply and laying of insulating mats of "class A" conforming to IS: 15652-2006. These insulating mats shall be laid in front of all floor mounted AC and DC switchboards and control & relay panels located in control room building/ Switchyard panel room / GIS LCC Panel e.t.c.refer scope note for details	60	Sq Meter	1,851.31	1,11,078.78
114	Watch & ward of stored / erected material at project site and storage area or any other locations as per instruction of site in charge. (round the clock security by authorised service agency consisting of armed guard)	24	per post per month	60,648.90	14,55,573.60
				Total	70,13,219.75

Note :- Following are the part of this BOQ , Bidders may please go through the following before quoting the Price Bid.

- 1) Scope Note-1, Doc. No. ETC-BOQ/GIS/NOTE.1 Rev.0
- 2) Scope Note-2, Doc. No. ETC-BOQ/GIS/NOTE.2 Rev.0
- 3) All other drawings/ Documents attached with the tender documents