

# **TENDER SPECIFICATION**

**No. BHE/PW/PUR/HZGG-CLE/645**

FOR

Handling at Storage Yard/ Stores, Transportation to Site, Calibration, Erection, Testing, Commissioning, Final Painting and Handing Over of Electrical and Control & Instrumentation Works of 1x350 MW Combined Cycle Power Plant comprising of HRSG, Frame 9 FA Gas Turbine, Steam Turbine and their Auxiliaries, Piping etc.

AT

**GUJARAT STATE ENERGY GENERATION LIMITED**

NEAR HAZIRA, VILLAGE MORA

POST BHATHA, SURAT HAZIRA ROAD,  
DISTT.-SURAT, PIN : 394510  
GUJARAT

**PART II - PRICE BID**



**BHARAT HEAVY ELECTRICALS LIMITED**

(A Govt. of India Undertaking)

POWER SECTOR - WESTERN REGION

345, KINGS WAY - NAGPUR 440 001

**BHARAT HEAVY ELECTRICALS LIMITED**  
(A GOVERNMENT OF INDIA UNDERTAKING)  
POWER SECTOR - WESTERN REGION  
SHREEMOHINI COMPLEX  
345, KINGS WAY - NAGPUR 440 001

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LAST DATE FOR  
TENDER SUBMISSION:

Please obtain updated information from web page  
"<http://www.bhel.com>" → Tender Notifications → View  
Corrigendums.

THESE TENDER SPECIFICATION DOCUMENTS CONTAINING **PART-I** AND **PART- II** ARE ISSUED  
TO:

M/s. ....

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PLEASE NOTE:  
THESE TENDER SPECS DOCUMENTS ARE NOT TRANSFERABLE.

For Bharat Heavy Electricals Limited

Dy. General Manager (Purchase)  
Place: Nagpur  
Date:

**BHARAT HEAVY ELECTRICALS LIMITED: PSWR: Nagpur**  
**T.S. No. BHE/PW/PUR/HZGG-CLE/645**

NAME OF THE WORK: Handling at Storage Yard/ Stores, Transportation to Site, Calibration, Erection, Testing, Commissioning, Final Painting and Handing Over of Electrical and Control & Instrumentation Works of 1x350 MW Combined Cycle Power Plant comprising of HRSG, Frame 9 FA Gas Turbine, Steam Turbine and their Auxiliaries, Piping etc. at GUJARAT STATE ENERGY GENERATION LIMITED, HAZIRA, GUJARAT

<b>Description of Work</b>	<b>TOTAL LUMP SUM AMOUNT</b>	
	<b>In Figures (in Rupees)</b>	<b>In Words (in Rupees)</b>
Scope of work as mentioned in the tender specification no. BHE/PW/PUR/HZGG-CLE/645 and the <b>BOQ attached as part of Price Bid</b>		

**Note:**

1. Amount quoted shall be considered as the total lumpsum amount for the complete BOQ as given in Part-II: Price Bid.
2. Individual item rates shall be in proportion to the weightages specified in the BOQ.
3. Refer Clause 11.6.0 of tender specification for variation in quantity.

**Date**

**Signature & Official Seal of Bidder**

BHARAT HEAVY ELECTRICALS LIMITED  
PS-WR NAGPUR  
T.S. No. BHE/PW/PUR/HZGG-CLE/645  
BILL OF QUANTITIES

JOB :Handling at Storage Yard/ Stores, Transportation to Site, Calibration, Erection, Testing, Commissioning, Final Painting and Handing Over of Electrical and Control & Instrumentation Works of 1x350 MW Combined Cycle Power Plant comprising of HRSG, Frame 9 FA Gas Turbine, Steam Turbine and their Auxiliaries, Piping etc. at GUJARAT STATE ENERGY GENERATION LIMITED, HAZIRA, GUJARAT.

SN	DESCRIPTION	TOTAL QTY.	UOM	WEIGHTAGES
<b>AA</b>	<b>PANELS</b>			
<b>A1</b>	<b>GT CONTROLS</b>			
A1.1	Mark VI Control panel with two sets of table top mounted items such as HMI station PC unit, network switch, monitor, trackball, keyboard, interconnecting cable, line driver unit, printer, modem, prefab cable, 100m long RG 62 cable etc. Panel dimension 4200x600x2320mm: 1000kg	1	Set	0.072%
<b>A2</b>	<b>STG Controls</b>			
A2.1	Control Panel (approx L750 X B800 X H2415, 400Kg) - one panel	4	Set	0.080%
A2.2	Control Panel (approx L1500 X B800 X H2415, 800 Kg) - suit of two panels	16	Set	0.390%
A2.3	Control Panel (approx L2250 X B800 X H2415, 1200 Kg) - suit of three panels	4	Set	0.145%
A2.4	Control Panel (approx L3750 X B800 X H2415, 2000 Kg) - suit of five panels	2	Set	0.096%
<b>A3</b>	<b>MMI/DAS</b>			
A3.1	Network Panel (600x800x2000)	2	No	0.040%
A3.2	SCADA Marshalling panels consist of-3 nos. Switch Control Panel RPU (750x750x2415),1 no. Back up control Panel (2300x750x2415).	1	set	0.080%
A3.3	Auxiliaries control panel(GT) 1000(L)x900(W)x2355(H) mm,and accessories like BNC Monitor and GAS Monitor etc.	1	set	0.040%
A3.4	GT/STG CO2 Fire protection panel 600 x 1200 x 300 MM , 0.1 MT and accessories	2	NO	0.144%
A3.5	Evaporative Cooling Water System	1	No	0.060%
A3.6	Water Injection VFD System Panel with accessories	1	Set	0.064%

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SN	DESCRIPTION	TOTAL	UOM	WEIGHTAGES
		QTY.		
A3.7	Diverter Damper control panel , 1000X2354X450 MM, 0.25 MT	1	NO	0.006%
A3.8	Guillotine Damper control panel, 1000 X 2354 X 450 MM, 0.25 MT	1	NO	0.006%
A3.9	Inlet air filter control panel 520 x 400 x900 mm., 0.25 MT	1	NO	0.020%
A3.10	Local Gauge Board for STG(2200x300x1800), 0.65 The scope of work includes removal, calibration and refixing of mounted on the local rack also.	3	No	0.108%
A3.11	Space Heater Control Panel for GTG (500x300x500)	1	No	0.060%
A3.12	Generator Instrumentation cabinet including annunciator (1230 x 1060 x 2550, 600 Kgs)	1	Nos	0.045%
A3.13	DC motor starter panels, etc (DC JOP, DC EOP, Seal oil panel), including resistance boxes. Approx weight 0.5 MT each.	1	Nos	0.040%
A3.14	Generator auxiliary monitoring panel	1	set	0.040%
A3.15	Hart Management system (HMS), Approx Unit WT. 500 kg.	1	Set	0.032%
A3.16	Vibration monitoring system for main turbine	1	Set	0.170%
A3.17	Vibration monitoring system for BFP/CEP/ACWP/CWP	1	Set	0.108%
A3.18	T& AVT Panel	1	Set	0.040%
A3.19	PA System	1	Set	0.401%
A3.20	Laboratory setup (Electrical & C&I)	1	Set	0.100%
A3.21	CRT Desk ( 2700x1000x1000mm)	1	No	0.100%
A3.22	Computer furniture for all Servers, PCs, Printers	1	Set	0.080%
A4	Generator Starting Frequency Converter system consist of LCI panels, AC reactors, DC reactors, LCI transformers, AC breaker cubicle HMI station and printers of LCI and networking interface and associated accessories	1	Set	0.725%

SN	DESCRIPTION	TOTAL QTY.	UOM	WEIGHTAGES
A5	GTG -Excitation system consist of -REG Cubicle (1150x1200x2355),FS Cubicle (1150x1200x2355),TY1& TY2 Cubicle (680x1200x2355),RTC Cubicle (1950x1450x2355)	1	Set	0.401%
A6	STG -Excitation system consist of -REG Cubicle (1150x1200x2355),FS Cubicle (1150x1200x2355),TY1& TY2 Cubicle (680x1200x2355),RTC Cubicle (1950x1450x2355)	1	Set	0.401%
A7	<b>GENERATOR, GT, ST &amp; UAT PROTECTION &amp; METERING PANELS, ETC</b>			
A 7.1	Generator Relay panel for GTG 2600(H)x1200(W)x1200(D), Wt.600Kg. Each	4	NO	0.481%
A 7.2	Generator Relay panel for STG 2600(H)x1200(W)x1200(D), Wt.600Kg. Each	4	NO	0.481%
<b>BB</b>	<b>FIELD INSTRUMENTS/DEVICES</b>			
B1	Master and Slave Clock system	1	Set	0.056%
B2	Local Instrument racks (LIR)	32	Nos	0.360%
B3	Local Instrument enclosures (LIE)	30	Nos	0.580%
B4	max Engineering / operator / storian / LAN / WAN / Shift in charge / stn in charge / gateway / interface PC / HART etc., PC/Server Station with ASCII Keyboard, Mouse & 21" Colour Monitor, individual UPS	14	No	0.140%
B5	Printers (80/132 col Dot Matrix, A3 Inkjet, A3 Laserjet, etc)	7	No	0.022%
B6	LVS (Large Video Screen) made up of 5X1 matrix. Each LVS of DLP/LCD type, Rear projection type, 67 inches diagonal size, with 1024x768 resolution non interlaced	3	set	0.120%
B7	Dust emission monitor (Installation at around 50 M in chimney)	1	Set	0.044%

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SN	DESCRIPTION	TOTAL	UOM	WEIGHTAGES
		QTY.		
B8	Air filter regulator	60	Nos	0.072%
B9	BNC Vibration Monitor Racks for GT, STG, Booster Compressor etc.	1	Nos	0.024%
B10	Turbosupervisory Instruments for measurement of Axial Shift, Vibration and Expansion measurement etc. One set consist One probe, proximity switch, Proximity switch housing, interconnecting cable and accessories and its interface with BNC Rack .	90	Set	0.550%
B11	O2 Analyser	1	nos	0.024%
B12	SWAS Sample handling system with racks & Sample conditioning panel with chiller	1	Set	0.241%
B13	Analyzer Panel including various analyzers	1	Set	0.120%
B14	Pressure/DP Transmitters electronic/smart type	73	Nos	0.146%
B15	Pressure / DP / Flow (DP type) / Level - Transmitter	144	Nos	0.290%
B16	Level Transmitter (smart type)	22	Nos	0.132%
B17	Level Transmitter (displacer type)	12	Nos	0.072%
B18	Flow Transmitters electronic/smart type	2	Nos	0.012%
B19	Pressure Gauges, DP gauges & draft gauges	164	Nos	0.300%
B20	Pressure Switches/DP Indicator cum switches/vacuum switches	85	Nos	0.171%
B21	Temperature Gauge Stem Type/Capillary type	109	Nos	0.220%
B22	Temperature element with thermowell RTD/ Thermocouple	325	Nos	0.590%
B23	Temperature switches stem/capillary type	25	Nos	0.050%
B24	Temperature Transmitter	118	Nos	0.142%
B25	Temperature Switch / Thermostat	15	Nos	0.036%
B26	Electronic Level Switch (with amplifier, etc), Capacitance or conductivity type	6	Nos	0.036%
B27	Float type Level Switch	14	Nos	0.056%

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SN	DESCRIPTION	TOTAL	UOM	WEIGHTAGES
		QTY.		
B28	Flow indicator / Flow Gauge / Flow meter/Acoustic flow meter (coal)	1	Nos	0.006%
B29	Fire detectors	4	Nos	0.013%
B30	Level switches float / level probe capacitance type	58	Nos	0.151%
B31	Level Gauge	22	Nos	0.100%
B32	Soleniod valve	36	Nos	0.072%
B33	Ch-Al thermocouple	46	Nos	0.280%
B34	MTM thermocouple capillary type SS	50	Nos	0.241%
B35	Magnetis pickups / speed pick up with associated work	10	Nos	0.040%
B36	Differential transducers( LVDT)/ position transmitters	16	Nos	0.045%
B37	Position transmitters for Control Valves	3	Nos	0.008%
B38	I/P converter	60	Nos	0.108%
B39	Naphtha/gas monitor 161x361x177 with sensors	1	Nos	0.024%
B40	Hazardous gas monitors 161x361x177 mm with sensors.	1	set	0.024%
B41	Digital / bargraph indicators	10	nos	0.028%
B42	Hydrogen Purity analyser	1	nos	0.028%
B43	Electronic water level indicator along with Local & remote display unit and electrode, electrode cable etc	6	set	0.241%
B44	Electric Heater for Booster Gas Compressor	3	Nos	0.120%
<b>CC</b>	<b>Structural steel fabrication &amp; installation</b>	60	MT	2.900%
<b>DD</b>	<b>Impulse pipes, tubes, GI pipes &amp; fittings (SS/CS/AS/Copper/GI) including siphons and condensing pots wherever required.</b>			
D 1	GI pipe 1/2" NB Heavy Grade	600	mtrs	0.144%
D 2	GI pipe 1" NB Heavy Grade	200	mtrs	0.064%
D 3	ASTM A 106 Gr C 1/2" NB SCH 160	200	mtrs	0.096%
D 4	ASTM A 106 Gr C 1/2" NB SCH 80	1900	mtrs	0.800%
D 5	ASTM A 335 P22 1/2" NB SCH 160	175	mtrs	0.090%
D 6	ASTM A 106 Gr C 1" NB SCH 80	850	mtrs	0.460%

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SN	DESCRIPTION	TOTAL	UOM	WEIGHTAGES
		QTY.		
D 7	ASTM A 312 TP316 H 1/2" NB SCH 160	2000	mtrs	1.107%
D 8	ASTM A 312 TP316 H 1/2" NB SCH 40	1000	mtrs	0.542%
D 9	CS pipe 1/2" SCH 80 (21.3x3.73)	350	mtrs	0.154%
D 10	Cr-Mo pipe (21.3x3.73)	560	mtrs	0.236%
D 11	SS tube 12.7x2.1	760	mtrs	0.305%
D 12	SS pipe 60.3x2.8	35	mtrs	0.020%
D 13	SS pipe (33.4x3.4)	110	mtrs	0.050%
D 14	SS pipe (21.3x2.8)	170	mtrs	0.080%
D 15	SS pipe 1/2" SCH 80	150	mtrs	0.075%
D 16	CS pipe 1/2" SCH 40/80/160	100	mtrs	0.050%
D 17	Alloy Steel pipe 1/2" SCH 40/160	100	mtrs	0.052%
D 18	Seamless SS tube 6.35 x 0.9 mm/1/4"OD SS Tube	100	mtrs	0.040%
D 19	Seamless SS Tube 12.7 x 2.1 mm/ 1/2" OD SS Tube	100	mtrs	0.045%
<b>EE</b>	<b>TRANSFORMERS</b>			
E 1	Gas Turbine Generator transformer <b>273 MVA</b> , 230/15.75 KV, with ONAN /ONAF cooling, OLTC ,Neutral side CTs,HV/LV/HVN bushings,bushing CTs, Radiators, Cooling fans, conservators, RTC Control panel, Marshalling Panel,Piping and loose accessories. Dimensions: 15500x8000x8000mm, Shipping Weight (Gas Filled) -170MT Oil quantity -63000 Litres.	1	Nos	2.608%
E 2	Steam Turbine Generator transformer <b>153 MVA, 230/15.75 KV</b> , with ONAN /ONAF cooling, OLTC ,Neutral side CTs,HV/LV/HVN bushings,bushing CTs, Radiators, Cooling fans, conservators, RTC Control panel, Marshalling Panel,Piping and loose accessories. Dimensions: 14500x8300x7800mm, Shipping Weight (Gas Filled) -125MT Oil quantity -44830 Litres.	1	Nos	2.006%
E 3	Unit Auxiliary transformer 20 MVA,15.75/6.9 kV, ONAN Cooling and loose accessories.	2	Nos	2.006%

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SN	DESCRIPTION	TOTAL QTY.	UOM	WEIGHTAGES
E 4	6.6/0.433 KV 2.0 MVA Station service transformer and accessories	2	Nos	0.641%
E 5	6.6/0.433 KV 1.6 MVA Station service transformer and accessories	4	Nos	1.280%
E 6	6.6/0.433 KV 1.0 MVA Station service transformer and accessories	2	Nos	0.641%
<b>FF</b>	<b>ISOLATED PHASE GENERATOR BUSDUCT OF GTG/STG AND TAP OFF BUS DUCT TO UATs COMPROSING OF THE FOLLOWING</b>			
F 1	Isolated phase bus duct with Alumunium conductor and aluminium enclosure,with cubicle housing NGTs, CTs,PTs, LA and SPs, from generator terminal to generator circuit breaker. The tap- off bus duct form main bus duct to the UAT. Providing canopy over open bus duct area Including structural steel support, hot air blower skid along with acessories etc. Approximate single phase length 155mts weigth 19 MT, Weight of support structure ; 6 MT . Detail scope of work as specified in tender specification and appendix	2	set	0.401%
<b>GG</b>	<b>NON SEGREGATED LV 415 VOLT BUSDUCTS / NEUTRAL GROUNDING TRANSFORMER / NEUTRAL GROUNDING RESISTANCE</b> Transportation of material from Stores/ storage yard to erection site, Erection, Assembly, Testing & Commissioning of NSP BUS DUCTS for interconnection between service transformer and LT MCC.			
G 1	LT Busduct, 3000/2500/1600 A 415V, Non-Phase segregated form LV terminals of oil filled LT transformer to switchgear.	10	Set	0.561%
G 2	6.6 KV NGR, 9.96 OHM, 400 A	2	nos.	0.080%

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SN	DESCRIPTION	TOTAL QTY.	UOM	WEIGHTAGES
<b>HH</b>	<b>GENERATOR CIRCUIT BREAKER</b>			
H 1	GT Circuit Breaker for Gas Turbine ,Isolated Phase set of three single phase breaker pole assembly along with hydraulic control unit ,beam/floor mounted with mounting brackets, supports and control panel etc. Dimension 4000x3000x2500, approximate weight: 7 MT	1	Set	0.401%
<b>II</b>	<b>AVIATION LAMP AND LIGHTNING ARRESTOR PACKAGE COMPRISING OF</b> Four numbers of Aviation Lamp assembly, Lightning arrestor, Approximately 100 mts of GI conduits, two numbers of JB's, Switch fuse units and its accessories	1	sets	0.200%
<b>JJ</b>	<b>HT SWITCHGEARS</b>			
J 1	<b>6.6 KV Unit Switchboard 1CA &amp; 1CB : consists of 36 panels.</b> Dimension of <b>EACH PANEL</b> is approx 2692(h) x 2355(d) x 820(w) mm and Approx Weight 1500Kg. per Panel.	1	set	1.404%
<b>KK</b>	<b>LT SWITCHGEARS</b>			
K 1	415 V, 2500 A GTG PMCC-1DA. Approx. dimension 2430(H) X 1444(D) X X16800(W) mm, & WT. 17425 kg.	1	Nos.	0.250%
K 2	415 V, 1600 A STG PMCC-1DBApprox. dimension 2430(H) X 1444(D) X 18400(W) mm, & WT. 19275 kg.	1	Nos.	0.280%
K 3	415 V, 400 A ST PMCC-1KA/1KB. Approx. dimension 2430(H) X 1444(D) X 10400(W) mm, & WT. 10025kg.	1	Nos.	0.208%
K 4	415 V, 250 A HRSG MCC-1HA/2HA. Approx. dimension 2430(H) X 1444(D) X8000(W) mm, & WT. 7250kg.	1	Nos.	0.160%
K 5	415, 3000A STATION SERVICE SWGR-0DA. Approx. dimension 2430(H) X 1444(D) X 8000(W) mm, & WT. 8650 kg.	1	Nos.	0.160%

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		QTY.		
K 6	415, 3000A COOLING WATER SYSTEM PMCC-0DB. Approx. dimension 2430(H) X 1444(D) X 15200(W) mm, & WT. 17175 kg.	1	Nos.	0.240%
K 7	415, 630A AC VENT. MCC-0SA/0SC. Approx. dimension 2430(H) X 1444(D) X 10400(W) mm, & WT. 10025 kg.	1	Nos.	0.210%
K 8	415, 400A MISC. MCC -0SB/0SD. Approx. dimension 2430(H) X 1444(D) X 10400(W) mm, & WT. 10025 kg.	1	Nos.	0.210%
K 9	415, 400A CHLORINATION PLANT MCC-0WA. Approx. dimension 2430(H) X 1444(D) X 8000(W) mm, & WT. 7250 kg.	1	Nos.	0.160%
K 10	415, 630A RWPH MCC-0WB. Approx. dimension 2430(H) X 1444(D) X 8800(W) mm, & WT. 9375 kg.	1	Nos.	0.168%
K 11	415, 1000A EMERGENCY SWITCHGEAR-0EA. Approx. dimension 2430(H) X 1444(D) X 6400(W) mm, & WT. 7400 kg.	1	Nos.	0.140%
K 12	220 STATION DCDB- 0FA. Approx. dimension 2430(H) X 144(D) X X8800(W) mm, & WT. 7325 kg.	1	Nos.	0.168%
K 13	125V GT DCDB-1 -1FA/2FA. Approx. dimension 2430(H) X 144(D) X 4800(W) mm, & WT. 2700 kg.	1	Nos.	0.112%
K 14	125V GT DCDB-2 -1FA/2FA. Approx. dimension 2430(H) X 144(D) X 2400(W) mm, & WT. 1350 kg.	1	Nos.	0.112%
K 15	415V GT MCC ( 16000x1250x2430, 20 MT)	1	set	0.130%

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		QTY.		
K 16	125V DCDB (9680x567x2430, 6 MT)	1	Nos.	0.115%
<b>LL</b>	<b>DC AND UPS SYSTEM</b>			
L 1	125 V DC System for Main contains 125 V DC Batteries #1&2(wt. 2500 kg each), Dual FCBC charger # 1 (wt 540 kg), DCDB(wt. 6000 kg).	1	set	0.240%
L 2	125 V DC System for EOP contains 125 V DC Battery EOP#2 (wt. 1500 kg each), Dual FCBC charger # 2(wt 300 kg), DCDB(wt. 2800 kg).	1	set	0.240%
L 3	220 V DC System consisting chargers, battery bank of 170 CELLS, 220V Ni-Cd, high discharge battery of min 840AH rating 1.14 ECV of 10 hrs discharge rate with all accessories & MS racks with anti-corrosive paint .	2	set	0.601%
L 4	90 KVA, UPS system with ACDB (1,2) Battery Banks.	1	set	0.300%
<b>MM</b>	<b>Power &amp; Control Cables (Laying, glanding, dressing, clamping, termination &amp; testing etc.)</b>			
<b>M 1</b>	<b>HT Cable</b>			
M 1.1	1 corex630 sqmm, 11KV(UE) XLPE	450	Mtrs	0.045%
<b>M 2</b>	<b>LT POWER CABLE (Aluminium)</b>			
M 2.1	3c x10 sqmm - Al.	2000	meters	0.096%
M 2.2	3c x 25 sqmm -Al.	4000	meters	0.260%
M 2.3	3c x 50 sqmm -Al.	3000	meters	0.204%
M 2.4	3c x 95 sqmm -Al.	3000	meters	0.228%
M 2.5	3C x185 sqmm - Al.	2000	meters	0.168%
M 2.6	3.5C x 25 sqmm -Al.	13000	meters	0.900%
M 2.7	3.5C x 50 sqmm -Al.	23000	meters	1.661%
M 2.8	3.5C x 95 sqmm -Al.	3000	meters	0.240%
M 2.9	3.5C x 185 sqmm -Al.	2000	meters	0.176%
M 2.10	1C x 25 sqmm -Al	4000	meters	0.144%
M 2.11	1C x 70 sqmm -Al	3000	meters	0.132%
M 2.12	1C x 120 sqmm -Al	1000	meters	0.060%

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		QTY.		
M 2.13	1C x 400 sqmm -Al	3000	meters	0.240%
M 2.14	1C x 630 sqmm -Al	44000	meters	4.413%
M 2.15	1C x 500 sqmm -Al	1000	meters	0.088%
<b>M 3</b>	<b>POWER CABLES (Copper)</b>			
M 3.1	2Cx2.5sqmm	14000	meters	0.620%
M 3.2	3Cx2.5sqmm	26000	meters	1.251%
M 3.3	1Cx25sqmm	3000	meters	0.144%
M 3.4	1Cx70sqmm	3000	meters	0.180%
M 3.5	1Cx630sqmm	1000	meters	0.140%
M 3.6	2C x 50 sqmm	1000	meters	0.088%
M 3.7	3Cx16sqmm	3000	meters	0.180%
M 3.8	3C X 35 sq. mm	4250	meters	0.375%
M 3.9	3C X 95 sq. mm	600	meters	0.060%
M 3.10	3C X 150 sq. mm	1500	meters	0.168%
M 3.11	3C X 240 sq. mm	1500	meters	0.180%
<b>M 4</b>	<b>CONTROL CABLES (PVC FRLS)</b>			
M 4.1	4Px 0.5 sq.mm- Cu.	40000	meters	1.604%
M 4.2	8Px 0.5 sq.mm- Cu.	67000	meters	3.226%
M 4.3	12Px 0.5 sq.mm- Cu.	7000	meters	0.421%
M 4.4	20Px 0.5 sq.mm- Cu.	4000	meters	0.256%
M 4.5	2Px 0.5 sq.mm- Cu.	30000	meters	1.083%
M 4.6	19C x 1.5 sqmm Cu.	4000	meters	0.288%
M 4.7	12C x 1.5sqmm Cu.	10000	meters	0.641%
M 4.8	7c x 1.5 sqmm Cu.	5000	meters	0.300%
M 4.9	5C X 1.5 sqmm- Cu.	20000	meters	1.123%
M 4.10	3C X 1.5 sq. mm- Cu.	10000	meters	0.485%
M 4.11	2C X 1.5 sqmm- Cu.	10000	meters	0.480%
M 4.12	5Cx2.5sqmm- Cu.	25000	meters	1.504%
M 4.13	24C X 2.5 SQ. MM	2000	meters	0.176%
M 4.14	19C X 2.5 SQ. MM	3000	meters	0.240%
M 4.15	12C X2.5 SQ. MM	2500	meters	0.170%

SN	DESCRIPTION	TOTAL	UOM	WEIGHTAGES
		QTY.		
M 4.16	7C X 2.5 SQ MM	3000	meters	0.180%
M 4.17	3C X 2.5 SQ. MM	4000	meters	0.192%
<b>M 5</b>	<b>SIGNAL CABLE</b>			
M 5.1	24PX 1.5 SQ. MM	3000	meters	0.168%
M 5.2	10PX 1.5 SQ. MM	2000	meters	0.096%
M 5.3	4PX 1.5 SQ. MM	1500	meters	0.075%
M 5.4	2PX 1.5 SQ. MM	2000	meters	0.090%
M 5.5	6P/12P x 0.5 sq mm	3000	meters	0.150%
M 5.6	6T X 1.5 SQ. MM	3000	meters	0.132%
M 5.7	2T X 1.5 SQ. MM	2500	meters	0.100%
<b>M 6</b>	<b>Compensating Cable</b>			
M 6.1	18P X 1.5 SQ.MM (T/C)	2000	meters	0.112%
M 6.2	9P X 1.5 SQ.MM (T/C)	1500	meters	0.060%
M 6.3	2P X 1.5 SQ.MM (T/C)	2500	meters	0.100%
M 6.4	Thermocouple Extension cable, - 1 pair x 16 AWG	2000	meters	0.080%
M 6.5	Thermocouple Extension cable, - 8 pair x 18 AWG	1500	meters	0.066%
M 6.6	Compensating cable 2P x 0.5 sqmm type Tx/Sx/Kx unarmoured/armoured	5000	meters	0.220%
M 6.7	Compensating cable 4P x 1.3 sqmm type Tx/Sx/Kx unarmoured/armoured	22000	meters	1.060%
M 6.8	Compensating cable 6P x 1.3 sqmm type Tx/Sx/Kx unarmoured/armoured	1000	meters	0.052%
M 6.9	Laying, etc of Optical fibre cables on cable trays, conduits etc (termination supervision by other agency) with minor civil works	1000	meters	0.056%
M 6.10	Network UTP Cables (special termination using UTP connectors involved)	4000	meters	0.192%
<b>NN</b>	<b>CABLE TERMINATION KIT</b>			
<b>N 1</b>	<b>6.35/11 kV Indoor Termination Kits for 6.35/11 kV, XLPE insulated, Armoured, Aluminium cable</b>			
N 1.1	1CX500 sq.mm	25	nos	0.250%
N 1.2	3CX185 sq.mm	33	nos	0.264%

SN	DESCRIPTION	TOTAL QTY.	UOM	WEIGHTAGES
<b>OO</b>	<b>CABLE TRAYS (with coupler plates, fastners, clamps and fixing hardwares) AND ACCESSORIES</b>			
O 1	600mm Ladder type tray	10000	M	3.009%
O 2	450mm Ladder type tray	1000	M	0.240%
O 3	300mm Ladder type tray	500	M	0.100%
O 4	150mm Ladder type tray	1000	M	0.180%
O 5	600mm Perforated type tray	3500	M	0.702%
O 6	450mm Perforated type tray	300	M	0.054%
O 7	300mm Perforated type tray	200	M	0.032%
O 8	150mm Perforated type tray	500	M	0.076%
O 9	100mm Perforated type tray	2125	M	0.300%
O 10	50mm Perforated type tray	2500	M	0.320%
<b>PP</b>	<b>PRE FABRICATED CABLE TRAYS ACCESSORIES</b>			
<b>P 1</b>	<b>HORIZONTAL TEE/BEND WITH COUPLER PLATES FOR LADDER TYPE CABLE TRAYS</b>			
P 1.1	600mm Ladder Horizontal bend	80	nos	0.040%
P 1.2	450/300/150mm Ladder Horizontal bend	28	nos	0.012%
P 1.3	600mm Ladder tee	60	nos	0.030%
P 1.4	450/300/150mm Ladder tee	40	nos	0.018%
<b>P 2</b>	<b>VERTICAL ELBOW -UP/DOWN WITH COUPLER PLATES FOR LADDER TYPE CABLE TRAYS</b>			
P 2.1	600mm Ladder Vertical Up/Down	40	nos	0.020%
P 2.2	450/300mm Ladder Vertical Up/Down	16	nos	0.008%
<b>P 3</b>	<b>HORIZONTAL TEE/BEND WITH COUPLER PLATES FOR PERFORATED TYPE CABLE TRAYS</b>			
P 3.1	600/450/300/150mm Perforated Horizontal bend	42	nos	0.009%
P 3.2	600/450/300/150mm Perforated Horizontal tee	20	nos	0.004%

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SN	DESCRIPTION	TOTAL QTY.	UOM	WEIGHTAGES
<b>P 4</b>	VERTICAL ELBOW -UP/DOWN WITH COUPLER PLATES FOR PERFORATED TYPE CABLE TRAYS			
P 4.1	600/450/300mm Perforated Vertical Up/Down	20	nos	0.010%
<b>P 5</b>	HORIZONTAL CROSS WITH COUPLER PLATES FOR LADDER TYPE CABLE TRAYS			
P 5.1	600/450/300/150mm Ladder type cross	34	nos	0.039%
<b>P 6</b>	HORIZONTAL CROSS WITH COUPLER PLATES FOR PERFORATED TYPE CABLE TRAYS			
P 6.1	600mm Perforated type cross	10	nos	0.013%
P 6.2	450/300mm Perforated type cross	9	nos	0.008%
<b>P 7</b>	REDUCER WITH COUPLER PLATE			
P 7.1	600-450/300mm Ladder type reducers	20	nos	0.007%
P 7.2	450-300mm Ladder type reducers	10	nos	0.003%
P 7.3	300-150mm Ladder type reducers	5	nos	0.001%
P 7.4	600-450/300mm Perforated type reducers	10	nos	0.003%
<b>P 8</b>	<b>FLEXIBLE CABLE TRAY SUPPORT</b>			
P 8.1	Base plate for double support channel	2500	nos	0.501%
P 8.2	Base plate for single support channel	600	nos	0.108%
P 8.3	Double support channel	1000	M	0.402%
P 8.4	Single support channel	7000	M	2.527%
P 8.5	Canti lever arm (C/A) – 600 mm	13500	nos.	2.980%
P 8.6	Canti lever arm (C/A) – 450 mm	1300	nos.	0.239%
P 8.7	Canti lever arm (C/A) – 300 mm	700	nos.	0.117%
P 8.8	Canti lever arm (C/A) – 150 mm	1500	nos.	0.210%
<b>QQ</b>	<b>JUNCTION BOXES/LOCAL PB BOX/POWER DISTRIBUTION BOX</b>			
Q 1	Junction boxes upto 48 way	114	Nos.	0.285%
Q 2	Junction boxes above 48 way	24	Nos.	0.065%
<b>RR</b>	<b>EARTHING MATERIALS (Civil works for</b>			
R 1	65 x 10 GS Flat	12000	meters	2.888%
R 2	25 x 6 GS Flat	2500	meters	0.351%

SN	DESCRIPTION	TOTAL	UOM	WEIGHTAGES
		QTY.		
R 3	25 x 3 GS Flat	2000	meters	0.200%
R 4	20 mm dia. 1000 mm long GS rod	80	meters	0.025%
R 5	8 SWG Solid GI wire	2000	meters	0.080%
<b>SS</b>	<b>ILLUMINATION PACKAGE (LIGHTING SYSTEM)</b>			
<b>S 1</b>	<b>LIGHTING DISTRIBUTION BOARD</b>			
S 1.1	AC LDB type LDB-H (12)	1	nos	0.026%
S 1.2	100kVA transformer for housing in AC LDB type LDB-H (12)	1	nos	0.010%
S 1.3	AC LDB type LDB-H (8)	1	nos	0.027%
S 1.4	50kVA transformer for housing in AC LDB type LDB-H (8)	1	nos	0.010%
S 1.5	Emergency LDB type LDB-H (8)	2	nos	0.048%
<b>S 2</b>	<b>LIGHTING PANEL</b>			
S 2.1	AC normal / Emergency indoor type LP / A (6)with timer	5	nos	0.017%
S 2.2	AC normal (Decorative) type LP-A (6)	2	nos	0.006%
S 2.3	AC normal / Emergency indoor type LP / A (12)with timer	25	nos	0.085%
S 2.4	AC normal / Emergency outdoor type LP / A (12)with timer	6	nos	0.028%
S 2.5	AC normal (Decorative) type LP-A (12)	4	nos	0.013%
S 2.6	AC normal / Emergency indoor type LP / A (18)with timer	20	nos	0.076%
S 2.7	AC normal / Emergency outdoor type LP / A (18)with timer	10	nos	0.056%
S 2.8	DC indoor type LP - D (6)	8	nos	0.027%
S 2.9	DC outdoor type LP - D (6)	4	nos	0.019%
S 2.10	Street lighting type LP - S (6)	2	nos	0.017%
<b>S 3</b>	<b>LIGHTING FIXTURES AND LAMPS (Dimensions and weight as per Bajaj Catalogue)</b>			
S 3.1	Luminaires Type FC02 :	25	nos	0.015%
S 3.2	Luminaires Type FC06 :	600	nos	0.361%
S 3.3	Luminaires Type FC26 :	100	nos	0.060%
S 3.4	Luminaires Type FC81 :	125	nos	0.075%
S 3.5	Luminaires Type FC32 :	80	nos	0.048%

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		QTY.		
S 3.6	Luminares Type TB 22 :	50	nos	0.008%
S 3.7	Luminares Type TX04 :	30	nos	0.007%
S 3.8	Luminares Type TW 41 :	50	nos	0.015%
S 3.9	Luminares Type SF 63 : WITH CACG BOX	30	nos	0.054%
S 3.10	Luminares Type SF 64 : WITH CACG BOX	10	nos	0.018%
S 3.11	Luminares Type SF 66 :WITH CACG BOX	10	nos	0.019%
S 3.12	Luminares Type SB11 :	50	nos	0.060%
S 3.13	Luminares Type SB01 :	20	nos	0.024%
S 3.14	Luminares Type SB02 :	50	nos	0.072%
S 3.15	Luminares Type SB03 :	150	nos	0.216%
S 3.16	Luminares Type SS62 :	40	nos	0.028%
S 3.17	Luminares Type SS63 :	40	nos	0.028%
S 3.18	Luminares Type SW 41 :(with integral CG box)	500	nos	0.361%
S 3.19	Luminares Type SW 42 : (with integral CG box)	100	nos	0.072%
S 3.20	Luminares Type MW92 :	50	nos	0.040%
S 3.21	Luminares Type MW96 :	20	nos	0.016%
S 3.22	Dichroic spot light fixture	20	nos	0.004%
S 3.23	28W T5 fluorescent tube	1860	nos	1.716%
S 3.24	100W Incandescent lamp	100	nos	0.092%
S 3.25	100W Comptalux lamp	30	nos	0.027%
S 3.26	70 W HPSV lamp (SON-E)	500	nos	0.461%
S 3.27	150 W HPSV lamp (SON-E)	150	nos	0.140%
S 3.28	150 W HPSV lamp (SON-T)	40	nos	0.036%
S 3.29	250 W HPSV lamp (SON-E)	80	nos	0.073%
S 3.30	250 W HPSV lamp (SON-T)	40	nos	0.036%
S 3.31	400 W HPSV lamp (SON-E)	180	nos	0.166%
S 3.32	125 W HPMV lamp	70	nos	0.064%
S 3.33	12V, 50W Dichroic lamp	20	nos	0.019%

SN	DESCRIPTION	TOTAL QTY.	UOM	WEIGHTAGES
<b>S 4</b>	<b>Switch boxes for individual control of circuits</b>			
S 4.1	Type SWB1	70	nos	0.009%
S 4.2	Type SWB2	25	nos	0.006%
S 4.3	Type SWB3	10	nos	0.005%
<b>S 5</b>	<b>Junction boxes</b>			
S 5.1	Type JB-F	2000	nos	0.361%
S 5.2	Type JB-FE	150	nos	0.027%
S 5.3	Type JB-S	80	nos	0.035%
<b>S 6</b>	<b>Receptacles</b>			
S 6.1	Type RA	250	nos	0.132%
S 6.2	Type RA(Flame proof)	5	nos	0.005%
S 6.3	Type RB	100	nos	0.028%
S 6.4	Type RC	20	nos	0.024%
<b>S 7</b>	<b>Celling fans with electronic regulators</b>			
S 7.1	1200mm sweep	5	nos	0.002%
S 7.2	1400mm sweep	5	nos	0.002%
<b>S 8</b>	<b>Emergency lighting Units</b>			
S 8.1	With Ni-Cd battery and 2 X 10W fluorescent	25	nos	0.014%
<b>S 9</b>	<b>Poles [Swaged,Steel tubular poles]</b>			
S 9.1	Type PS 1 (410SP51 as per IS -2713)	40	nos	0.304%
S 9.2	Type PS 2 (410SP67 as per IS -2713)	40	nos	0.353%
S 9.3	Type PF 1 (410SP51 as per IS -2713)	10	nos	0.076%
S 9.4	Type Pf 2 (410SP51 as per IS -2713)	15	nos	0.114%
<b>S 10</b>	<b>Flexible Wires-1.1 KV, PVC Insulated, Single Core Copper Conductor Flexible Wires</b>			
S 10.1	1 x 2.5 mm <sup>2</sup> Cu PVC [Red/Yellow/Blue/Black/Gray]	60000	M	0.168%
S 10.2	1 x 4 mm <sup>2</sup> Cu PVC [Red/Yellow/Blue/Black/Gray]	15000	M	0.042%
<b>S 11</b>	<b>GL wire, flat &amp; Ms rod</b>			
S 11.1	12 SWG GI wire	50000	M	0.140%
S 11.2	25 X 6 mm GI flat	500	M	0.024%

SN	DESCRIPTION	TOTAL	UOM	WEIGHTAGES
		QTY.		
S 11.3	50 X 6 mm GI flat	1000	M	0.084%
<b>S 12</b>	<b>Hot Dip Galvanised Rigid Steel Conduits (Heavy Duty)</b>			
S 12.1	20 mm dia GI conduit, 1.6 mm thick	30000	M	2.290%
S 12.2	25 mm dia GI conduit, 1.6 mm thick	10000	M	0.802%
S 12.3	40 mm dia GI conduit, 2 mm thick	2000	M	0.192%
S 12.4	50 mm dia GI conduit, 2 mm thick	1000	M	0.108%
S 12.5	20 mm dia GI conduit with epoxy coating, 1.6 mm thick	2000	M	0.153%
S 12.6	25 mm dia GI conduit with epoxy coating, 1.6 mm thick	2000	M	0.160%
<b>S 13</b>	<b>Flexible electro galvanised MS, conduit PVC coated</b>			
S 13.1	20 mm dia flexible electro galvanised conduit, 1.6 mm thick	7000	M	0.337%
<b>S 14</b>	<b>Hume pipe</b>			
S 14.1	Hume pipe 100 mm dia	500	M	0.140%
<b>S 15</b>	<b>Lighting Mast with mounting arrangement for lighting fixture &amp; required accessories</b>			
S 15.1	Lighting mast with height 30 meters (GI, polygonal shape, raiselower arrangement with electrical winch, mounting arrangement for fittings etc.)	3	nos	0.385%
<b>S 16</b>	<b>24V supply module &amp; lamp unit complete with all accessories</b>			
S 16.1	Fix type 24 V supply modules	5	nos	0.020%
S 16.2	5A, 2AV industrial type sockets	15	nos	0.003%
<b>S 17</b>	<b>Cable laying</b>			
S 17.1	a). Armored cables to be laid on trays & trenches			
S 17.1.1	i) 3.5C X 50 mm <sup>2</sup> Al	10000	M	0.682%
S 17.1.2	ii) 3.5C X 25 mm <sup>2</sup> Al	5000	M	0.320%
S 17.1.3	iii) 2C X 25 mm <sup>2</sup> Al	2000	M	0.096%
S 17.1.4	ii) 3C X 4 mm <sup>2</sup> Cu	20000	M	0.962%

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SN	DESCRIPTION	TOTAL QTY.	UOM	WEIGHTAGES
S 17.2	b). Armoured cables to be buried underground including civil works and supply of bricks/sands/cement etc.			
S 17.2.1	i) 3.5C X 50 mm <sup>2</sup> Al	3000	M	0.938%
S 17.2.2	ii) 3.5C X 25 mm <sup>2</sup> Al	10000	M	3.089%
S 17.2.3	iii) 2C X 25 mm <sup>2</sup> Al	1000	M	0.232%
S 17.2.4	ii) 3C X 4 mm <sup>2</sup> Cu	2000	M	0.481%
<b>TT</b>	<b>COMMISSIONING SERVICES</b>			
T 1	Electric Actuators	12	Nos	0.050%
T 2	Pneumatic Control Valves/Temperature Actuated Control Valve,Regulating Dampers.	7	Nos	0.030%
T 3	Pneumatic ON/OFF Valves,ON/OFF Solenoid Valves etc.	25	Nos	0.100%
T 4	Limit Switches	30	Nos	0.054%
T 5	Control valves	49	Nos	0.158%
T 6	ERV Controller	4	Nos	0.073%
T 7	Local Push Button Station (Type A/B/C/D)	120	Nos.	0.264%
T 8	Generator system testing as per clause no.4.8 A of technical bid	2	Set	0.280%
T 9	Testing and commissioning of 6.6 KV and 2.4 KV HT motors including dryout	13	Nos	0.260%
T 10	Testing and commissioning of 415 V LT motors including dry out	60	Nos	1.205%
<b>Total</b>				<b>100.000%</b>