



Ref : CWPL/SS/ATGPH/05092017
Dated: 5/9/2017


TO
The Treasurer
Eastern University
House-26, Road -05
Dhanmondi R/A, Dhaka 1205

SUB: Revised offer for Supply and Installation of 1250 KVA Electric Substation for Academic Building, Permanent campus at Ashulia, Savar.

BILL OF QUANTITIES OF EXTERNAL ELECTRIFICATION WORKS

SL NO	DESCRIPTION OF WORKS	UNIT	QTY	RATE IN TK IN FIGURE	RATE IN TK IN WORD	AMOUNT IN TK
1.0	<p>HT (11 KV) SWITCHGEAR</p> <p>Supply of 11 KV, 3-phase, 50 Hz, indoor type, high tension switchgear complete with Vacuum/SF6 Circuit Breaker, 800 Amps hard-drawn electrolytic copper bus-bars, 1 No 0 - 15 KV range voltmeter & 1 no. ammeter of adequate range both with selector switch, 1 no. of panel heater with auto thermostat control switch, manual ON & OFF push button switch and indicators including following components (components such as LBS, HRC fuse, CT, PT, shall be manufactured & tested as per NEMA/ VDE/ IEC/ JIS/ BS Standards) assembled locally in 14 SWG sheet steel clad, dust & vermin proof, free standing, floor mounting, epoxy resin powder coat painted cabinet as per relevant IEC standards and as per accepted/approved by the Engineer.</p> <p>With withdrawable type Vacuum Circuit Breaker.</p> <p>1 Set of 11KV, 630 Amps (25KA), 3-phase, 50 Hz, trolley mounted fully withdrawable type Vacuum Circuit Breaker complete with motor operated spring charged stored energy mechanism for auto tripping at 12/24/48/110 volts D.C (without battery) .</p> <p>2 Nos. 11 KV, cast resin insulated, dry type; double pole PT having ratio 11/0. 11, burden 50VA, class 0.5 for metering & protection.</p> <p>3 Nos. 11 KV cast resin insulated, dry type, double core CT of adequate current ratio (compatible with the transformer capacity), burden 10-15 VA, first core of class 0.5 M5 for metering and second core of class 10P10 for protection.</p> <p>1 No of Triple pole solid-state microprocessor control IDMT relay with 2 elements of over current and short circuit protection and one for earth fault protection.</p> <p>1 No. 415V, 6A (10KA) TPMCB for PT secondary protection.</p> <p>Assembled by the valid ISO-9001 certified company having test certificate according to relevant IEC standards from BUET.</p>	Each	1	930,000		930,000


Engr. Md. Serajul Haque
Project Director
Permanent Campus
Eastern University


Muhammed Siddique Hossain
Treasurer
Eastern University





SL NO	DESCRIPTION OF WORKS	UNIT	QTY	RATE IN TK IN FIGURE	RATE IN TK IN WORD	AMOUNT IN TK
2.0	<p>THREE PHASE OIL TYPE TRANSFORMER</p> <p>Supply of following oil-immersed, natural air cooled, 3-phase, 50-Hz, 11KV/0.415 KV & 0.24 KV outdoor type distribution transformer of DYN11 vector group complete with two windings of high conductivity copper having percentage impedance 4 - 6.5%, basic impulse insulation level 75 KV, Dielectric strength 28 KV (for 1 min), HT & LV porcelain bushings, manual 5 position standard tap changer, conservator, thermometer, oil inlet & outlet valves, oil level indicator, dehydrating breather, lifting lugs, earthing terminals, wheel, data plate etc. in/c painting, suitable for operation at 40°C ambient temperature with maximum temperature rise 60°C, locally manufactured and tested in Bangladesh as per NEMA/VDE/IEC/BS standards.</p> <p>(a) Capacity: 1250 KVA with buchholz relay. (b) No load loss: 2000 watts (Maximum) (c) Full load loss: 15000 watts (Maximum)</p> <p>Manufactured by the valid ISO-9001 certified company having test certificate according to relevant IEC standards from BUET.</p>	Each	1.00	1550000.00		1,550,000
3.0	<p>LT SWITCH GEAR</p> <p>Supply of 415 V, 3-phase, 50 Hz, indoor type low tension switch-gear of following specification complete with voltmeter (0 - 500V) & ammeter of adequate rating both with selector switch, indicating lamps for ON - OFF and following components (components such as TPMCCBs shall be manufactured according to relevant NEMA/VDE/IEC/JIS/BS Standards and shall have type test certificate according to relevant IEC Standard) assembled locally in 14 SWG sheet steel metal clad, dust & vermin proof, free standing, floor mounting, epoxy resin powder coat painted cabinet as per relevant IEC standards and as per accepted/approved by the Engineer.</p> <p>For 1250 KVA Transformer: INCOMING : 1 Set- 415V, 2500 amp. TP & NE hard drawn electrolytic copper busbar. 1 No-415V, 2000 Amps (80KA), adjustable type TPMCCB / ACB for main control overload & instantaneous electro-magnetic short circuit release. 3 Nos. - 415V, 2000/5 ratio current transformer with suitable accuracy & burden. OUTGOING: 1 No.-415V, 1250A (65KA) adjustable type TPMCCB with instantaneous electro-magnetic short circuit release. (For PFI control). 1 No - 415V, 400A (35KA) adjustable type TPMCCB with thermal overload & instantaneous electro-magnetic short circuit release. 3 Nos. - 415V, 300/320A (35KA) adjustable type TPMCCB with thermal overload & instantaneous electro-magnetic short circuit release.</p>					

Sh.

[Handwritten signature]





SL NO	DESCRIPTION OF WORKS	UNIT	QTY	RATE IN TK IN FIGURE	RATE IN TK IN WORD	AMOUNT IN TK
	<p>4 Nos. - 415V, 250A (35KA) adjustable type TPMCCB with thermal overload & instantaneous electro-magnetic short circuit release.</p> <p>2 Nos. - 415V, 200A (25KA) adjustable type TPMCCB with thermal overload & instantaneous electro-magnetic short circuit release.</p> <p>1 No. - 415V, 80A (16KA) TPMCCB with thermal overload & instantaneous electro-magnetic short circuit release.</p> <p>1 No. - 415V, 30/32A (16KA) TPMCCB with thermal overload & instantaneous electro-magnetic short circuit release.</p> <p>Assembled by the valid ISO-9001 certified company having test certificate according to relevant IEC standards from BUET.</p>	Each	1.00	1539000.00		1,539,000
4.0	<p>POWER FACTOR IMPROVEMENT PANEL</p> <p>Supply of following 415 volt, 3 phase, 50 Hz power factor improvement panel complete with TP busbars and earth block, micro processor controlled auto power factor correction relay with digital PF reading display, capacitor bank, contactor, fuse, ON indicators for every stage of capacitor bank (except directly connected one) etc. shall be manufactured & tested as per NEMA/VDE/IEC/JIS/BSS standards assembled locally in 16 SWG sheet steel clad dust & vermin proof, free standing, floor mounting, epoxy resin powder coat painted cabinet. as per relevant IEC standards and as per accepted/approved by the Engineer.</p> <p>For 1250 KVA Transformer</p> <p>PFI Capacity- 750 KVAR</p> <p>3 Nos.- 415V, 1500A hard drawn electrolytic copper busbar.</p> <p>1 No. - 415V, 5 KVAR, 50 Hz TP power capacitor bank with built in / separate discharge coil for connection directly with line through fuse.(Spare)</p> <p>1 No. - 415V, 5 KVAR, 50 Hz TP power capacitor bank with built in / separate discharge coil for connection directly with line through fuse.(Fixed)</p> <p>2 No. - 415V, 10 KVAR, 50 Hz TP power capacitor bank with built in / separate discharge coil for connection.</p> <p>2 No. - 415V, 25 KVAR, 50 Hz TP power capacitor bank with built in / separate discharge coil for connection directly with line through fuse.</p> <p>1 No. - 415V, 50 KVAR, 50 Hz TP power capacitor bank with built in / separate discharge coil for connection.</p> <p>3 No. - 415V, 75 KVAR, 50 Hz TP power capacitor bank with built in / separate discharge coil for connection.</p> <p>4 No. - 415V, 100 KVAR, 50 Hz TP power capacitor bank with built in / separate discharge coil for connection.</p> <p>1 Nos. - 415V, 12 Amps, 50 Hz auto TP magnetic contactor with AC3 duty.</p>					

Sh.

[Signature]





SL NO	DESCRIPTION OF WORKS	UNIT	QTY	RATE IN TK IN FIGURE	RATE IN TK IN WORD	AMOUNT IN TK
	2 Nos. - 415V, 25 Amps, 50 Hz auto TP magnetic contactor with AC3 duty. 2 Nos. - 415V, 50 Amps, 50 Hz auto TP magnetic contactor with AC3 duty. 1 Nos. - 415V, 80 Amps, 50 Hz auto TP magnetic contactor with AC3 duty. 3 Nos. - 415V, 116 Amps, 50 Hz auto TP magnetic contactor with AC3 duty. 4 Nos. - 415V, 190 Amps, 50 Hz auto TP magnetic contactor with AC3 duty. 03 Nos. - 415V, 20 Amps. HRC fuse with base. 06 Nos. - 415V, 32 Amps. HRC fuse with base. 06 Nos. - 415V, 63 Amps. HRC fuse with base. 03 Nos. - 415V, 100 Amps. HRC fuse with base. 09 Nos. - 415V, 160 Amps. HRC fuse with base. 12 Nos. - 415V, 200 Amps. HRC fuse with base. Assembled by the valid ISO-9001 certified company having test certificate according to relevant IEC standards from BUET	Each	1.00	450000.00		450,000
5.0	Lightning Arrester and Drop-out fuse.					
5.1	Supply of outdoor type 11 KV, 50 Hz, 100A, (10 KA), 75 KV BIL lightning arrester complete with mounting accessories etc. manufactured by GEM Co. Ltd, Bangladesh /ENERGYPAC or equivalent product of USA EU Countries (3 Nos. in a set).	Per set	1.00	8679.00		8,679
5.2	Supply of outdoor type 11KV, 50 Hz, 5KA (20 KA) dropout fuse complete with mounting accessories etc. manufactured by GEM Co. Ltd, Bangladesh /ENERGYPAC or equivalent product of USA /EU Countries (3 Nos. in a set).	Per set	1.00	8679.00		8,679
6.0	Supply of 11KV, 50Hz, 320A, 3-phase outdoor type disconnecting switch having 75KV BIL manufactured by GEMCO Ltd, Bangladesh /ENERGYPAC or equivalent product of USA/EU Countries.	Per/set	1.00	8679.00		8,679
7.0	Providing & fixing U-channel iron cross-arm of size 38 mm x 76 mm x 38 mm x 6.35mm. (1.5" x 3" x 1.5" x 0.25") on single pole / H-pole with the help of necessary clamps, nuts, bolts etc. including making required no. of holes on the cross-arm for fixing of drop out fuse, lightning arrester including two coats of superior quality aluminum painting over required prime coat of anti corrosive red-oxide painting complete as required & as per instruction of the Engineer-in-charge.	Per/ meter	1.00	4500.00		4,500
8.0	Installations, testing and commissioning of following 11 KV, 50 Hz. 3-phase, indoor type HT switchgear on prepared foundation with the help of necessary tools, plants, skilled labour & technician as per direction of the Engineer-in-charge.					
	With withdrawable type Vacuum Circuit breaker	Per job	1.00	8000.00		8,000
9.0	Installation, testing and commissioning of following 11 KV/.415KV transformer on prepared platform on pole / c.c. foundation with the help of necessary tools & plants. skilled labour & technician as per direction of the Engineer-in-charge.					

[Signature]

[Signature]





SL NO	DESCRIPTION OF WORKS	UNIT	QTY	RATE IN TK IN FIGURE	RATE IN TK IN WORD	AMOUNT IN TK
	1250-1600 KVA 3 phase transformer on C.C. pad	Per job	1.00	12500.00		12,500
10.0	Installation, testing and commissioning of 415V, 3-phase, 50 Hz indoor type LT switchgear/P.F.I. plant suitable for following capacity transformer on prepared c.c. foundation with the help of necessary tools & plants, skilled labour & technician as per direction of the Engineer-in-charge.					
	For 1250-1500 KVA. Transformer	Per job	1.00	12500.00		12,500
11.0	Installation of HT drop out fuse/ lightning arrester/ disconnection switch on prepared U-channel cross-arm on single / H-pole with necessary fixing materials complete as per instruction of the Engineer-in-charge.					
11.1	Drop out fuse.	set	1.00	2000.00		2,000
11.2	Lightning arrester.	set	1.00	2000.00		2,000
11.3	Disconnection switch	set	1.00	4000.00		4,000
12.0	<p>THREE PHASE GENERATOR (WITH AUTO TRANSFER SWITCH)</p> <p>Supply of 400 / 230 V, 3-phase, 50 Hz. air/water cooled, floor mounted, indoor type following continuous capacity (Prime Power) electric generating set suitable for tropicalized country complete with four stroke, 1500 rpm, diesel engine with all standard accessories, viz. 12/24 volt DC battery & auto battery charger with ammeter, radiator assembly, oil & fuel pump, auto speed governor, air cleaner, fuel & oil tank, fuel level & oil pressure gauge, RPM & hour meter, exhaust silencer, vibration isolator, mounting steel base frame etc including a safety & protection device viz. auto shut off with indicators for overload, over & under voltage high temperature, low oil pressure, over speed, low fuel level etc. coupled with brush less, self excited alternator having control panel with auto voltage regulator, voltmeter & ammeter with selector switch, frequency meter,</p> <p>TPMCCB of required rating for overload & instantaneous short circuit release, auto start & auto change over to load within 10 sec during normal power failure and auto stop & auto change over to normal supply within 5 minutes after restoration of normal power supply, indicator for 3 Phase ON-OFF - Trip etc including maintenance tools, 3 sets of detailed technical catalogues & maintenance manual. Manufactured, assembled and tested in accordance with NEMA / IEC / VDE / JIS standards (subject to satisfy standard test and approved by Engineering Firms).</p> <p>WITH ATS</p> <p>With sound attenuated acoustically treated canopy (maximum sound level: 75 dBA at 7m distance).</p>					
12.1	200 KVA					

sh

[Signature]





SL NO	DESCRIPTION OF WORKS	UNIT	QTY	RATE IN TK IN FIGURE	RATE IN TK IN WORD	AMOUNT IN TK
	The generating set shall be assembled & tested in USA/Japan/EU countries. The major components like engine, alternator, ATS, canopy shall also be manufactured and tested in USA/ Japan/ EU Countries & accepted/approved by the Engineer.	Each	1.00	2650000.00		2,650,000
12.2	300 KVA The generating set shall be assembled & tested in USA/Japan/EU countries. The major components like engine, alternator, ATS, canopy shall also be manufactured and tested in USA/ Japan/ EU Countries & accepted/approved by the Engineer.	Each	1.00	3725000.00		3,725,000
13.0	Installation, testing & commissioning of following electric generator on prepared cc pad with the help of necessary T & P, skilled labour, technician, Engineer including 2 hrs / 5 day trial run operation by skilled operator with supply of necessary fuel & lubricant as per manufacturers instruction manual and in accordance with relevant IEC/NEMA/VDE/JIS standards so that vibration transfer rate to foundation shall be almost zero.					
	200 KVA – 300 KVA manual/auto/auto with soundproof acoustically treated canopy generating set.	Each	2.00	200000.00		400,000
14.0	Providing & laying of following sizes LT PVC insulated sheathed & armoured cable (NYFGbY)/ HT (11KV) PVC insulated, sheathed, screened & armoured cable (NYSEYFGbY)/HT (11KV) armoured XLPE Cable: All electrical contacts shall be of brass/copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC/BDS/ BS/ VDE standards and as per detailed specification mentioned in Annexure-A. The work shall be carried out as per direction/approval/acceptance of the Engineer. In kutcha ground by cutting 45.70 cm width x 91.40 cm depth trench with necessary brick or tile protection and mending the damages good by refilling trench with proper compaction. In pucca floor through required size of PVC pipe cutting trench of necessary size and mending good the damages with one layer 1st class flat brick soling, 75 mm thick (1:2:4) cc work with neat cement finishing etc. In pucca ground/road through required size of PVC pipe by cutting 45.70cm width x 91.40 cm depth trench mending good the damages by earth refilling with proper compaction providing 50 mm thick compacted premix bituminous carpeting over one layer of 1st class flat brick soling and 75 mm thick compacted water bound macadam of khoa of brick. With HT (11KV) Cables (NYSEYFGbY) manufactured by Paradise / BRB or any other company(s) having valid test certificate from Internationally accredited Laboratory accepted/approved by the Engineer. 3C x 185 sq.mm cable In kutcha ground	Per meter	55.00	18000.00		990,000





SL NO	DESCRIPTION OF WORKS	UNIT	QTY	RATE IN TK IN FIGURE	RATE IN TK IN WORD	AMOUNT IN TK
15.0	Surface conduit wiring with the following PVC insulated and sheathed stranded cable (NYY)/ XLPE insulated and PVC sheathed stranded cable(2XY) & PVC insulated green/white coloured ECC wire (BYA) through PVC conduit of reputed manufacturer complete with fixing materials, other accessories etc. as required including mending the damages good. All electrical contacts shall be of brass/copper connected through connector or soldering (no twisting shall be allowed) and cables shall be manufactured and tested according to relevant IEC/BDS/BS/VDE standards and as per detailed specification mentioned in Annexure-A. The work shall be carried out as per direction/approval/acceptance of the Engineer. Cables manufactured by Paradise / BRB or any other company(s) having valid test certificate from Internationally accredited Laboratory accepted/approved by the Engineer.					
15.1	1C-4x240sq.mm (NYY/2XY) with 120 sq.mm (BYA) ECC wire through PVC pipe of minimum inner dia 125 mm having wall thickness of 3 mm	per meter	50.00	10500.00		525,000
15.2	1C-4x400sq.mm (NYY/2XY) with 185 sq.mm (BYA) ECC wire through PVC pipe of minimum inner dia 125 mm having wall thickness of 3 mm	per meter	25.00	17000.00		425,000
15.3	1C-4x630sq.mm (NYY) with 300 sq.mm (BYA) ECC wire through PVC pipe of minimum inner dia 200 mm having wall thickness of 3 mm. Cables manufactured by Paradise / BRB or any other company(s) having valid test certificate from Internationally accredited Laboratory accepted/approved by the Engineer.	per meter	20.00	28500.00		570,000
16.0	GI POLE Providing following GI pole fabricated with GI pipe complete with GI sockets, M.S. base plate, top cover, necessary welding as required:-					
16.1	Total 12192 mm (40'-0") long having 152.4 mm (150mm) dia(3.4mm) thickness 9144 mm (30') at the bottom, and 101.60 mm (100 mm) dia (3.4mm) thickness 3048 mm (10') at the top with 609 mm x 609 mm x 6.35 mm (2'-0" x 2'-0" x 0'-0. 25") size steel base plate.	set	2.00	60000.00		120,000
16.2	Erection of following tubular pole upto 1828.80 mm (6') depth by placing the pole base on one layer of Ist. class brick flat soling over 76.2 mm (3") sand bedding and making 1:2:4 C.C. work around the pole 304.8 mm (1'-0") below GL & 304.8 mm(1' ft) above GL, 12.5 mm (1/2") thick cement plaster with neat cement finishing over concrete surface including proper curing, excavation & refilling and ramming the loose soil etc. as required.					
	12192 mm (40') long MS/GI /Spun P.C pole with 457 mm x 457 mm (1.5'x1.5') cc work	Each	2.00	20000.00		40,000
17.0	Palli Biddut Connection fee, Application fee, Jamanat (meter security), REB meter fitting cost, Materials for meter fixing, etc. all complete	Job	1.00	3707865.00		3,707,865

Sh.





SL NO	DESCRIPTION OF WORKS	UNIT	QTY	RATE IN TK IN FIGURE	RATE IN TK IN WORD	AMOUNT IN TK
18.0	Miscellaneous charges for connection including all fittings and accessories. Such as cable jointing kit, CT,PT etc. necessary connection in/c permission for road cutting from the concern authority contractor shall be responsible for communication with owner and all other agency in time shall submit application form and complete all other formalities on be half of owner till the substation is commissioned and handed over to the owner.	Job	1.00	510000.00		510,000
19.0	Supply and fixing of copper made sockets/ferules for following size cables(Need to be shown Voltage rating)					
19.1	120 sq.mm	No.	4.00	138.87		555
19.2	185 sq.mm	No.	12.00	201.00		2,412
19.3	240 sq.mm	No.	24.00	436.00		10,464
19.4	300 sq.mm	No.	2.00	448.00		896
19.5	400 sq.mm	No.	16.00	504.00		8,064
19.6	630 sq.mm	No.	8.00	729.00		5,832
20.0	Supplying and fixing of heat shrink self-amalgamating tape of the following sixes for bus-bar of both HT switch-gear (11 KV) & LT switch-gear/PFL, transformer terminals as protection against flash-over					
20.1	i) Width 25mm thickness 1 mm.	Meter	10.00	231.00		2,310
20.2	ui) Width 75mm thickness 1 mm.	Meter	2.00	289.00		578
21.0	Supply & fixing of heat shrink termination kit out-door/ in-door use complete with DIN lugs earth connection hardware & cable preparation kit (In-door & outdoor) at the point of cable termination for 11 KV 3-core PVC insulated & PVC sheathed & armoured/ non-armoured cable of the following sizes (Made in GERMANY/ USA/UK/ FRANCE/ JAPAN/ITALY/ SWEDEN/ SWITZERLAND or equivalent accepted/ approved by the Engineer.					
21.1	For in-door Use 3 x 185 mm ²	Kit	1.00	4050.00		4,050
21.2	For out-door Use 3 x 185 mm ²	Kit	1.00	4050.00		4,050
22.0	Earthing the electrical installation with 40 mm. (1.5") dia G.I. pipe (Earth electrode) having 6.35 mm. dia hole across the pipe at 305 mm. interval securely bonded by soldering with 2 nos. of No2 SWG HDBC earth leads with its protection by 20 mm. (3/4") dia G.I. pipe up-to plinth level run at a depth of 609.6 mm. (2 ft.) below G.L. up-to main board to be earthed including necessary connecting copper sockets, bolts, nuts, etc. complete for maintaining earth resistance within 1 ohm.					





SL NO	DESCRIPTION OF WORKS	UNIT	QTY	RATE IN TK IN FIGURE	RATE IN TK IN WORD	AMOUNT IN TK
	Depth of bottom of main electrode at 37338 mm. (122.5 ft) from GL & length of electrode 36576 mm. (120 ft).	Set	6.00	46292.00		277,752
23.0	Construction of Earthing inspection pit inside measurement 600mm x 600mm with 250mm thick brick in cement mortar (1:4) with 100mm thick RCC top slab (1:2:4) with 1% re-inforcement 450 mm dia water sealed CI man-hole cover with locking arrangement including necessary earth works, site filling and one brick flat soling 75mm thick (1:3:6) base concrete of remaking inlet channel & 12mm thick (1:2) cement plaster with neat finishing etc. all complete up to a depth of .75 meter.	No.	6.00	11573.00		69,438
24.0	Exhaust fan Providing and fixing of following axial flow A.C capacitor type wall mounted exhaust fan complete with blade , steel frame standard wall louver shutter , PVC insulated connecting wire etc complete as required including cutting wall and mending good the damages as per direction of the engineer					
	12" Exhaust fan plastic body(Foreign made accepted /approved by the engineer)	No.	3.00	3399.00		10,197
25.0	ONGRID SOLAR-PANEL SYSTEM Supplying, installation, testing & commissioning Solar Power System (On Grid / Grid Tie) with required quantities of Mono/Poly crystalline silicon Solar PV Modules, inverter, Energy meter, etc as per following standards, specifications and certification. The system will be able to produce power for supplying to grid with required compatible solar cables (DC Cables) and all necessary accessories to complete the installation providing one year free operation & maintenance of the system. Solar System shall have to comply following specification: A: Solar PV Module/Panel i) The manufacturing, installation, testing and commissioning of Solar PV Module/Panel shall be in conformity with the requirement of IEC 61215, IEC 61730 Standards. ii) Solar panels shall be installed pointing to the right direction to capture most of the solar energy to transform it into electricity with the facility to be adjusted from the horizontal to 12 degree in Summer and to 35 degree in winter. For fixed panel mounting system, the panels shall have the capability to be tilted (23.5 ± 2) degree with horizontal (according to the latitude of the location) and be facing the south in Bangladesh. iii) The average efficiency of PV module shall be greater than 14%.					

ser





SL NO	DESCRIPTION OF WORKS	UNIT	QTY	RATE IN TK IN FIGURE	RATE IN TK IN WORD	AMOUNT IN TK
	<p>iv) The complete PV module shall be diode protected at junction box to protect reverse current.</p> <p>v) The main combiner box shall have built-in Lightning & Surge Protective Device to ensure the whole system in working condition even in thunderstorm. Fuse with disconnection switch shall be installed. PV module and the combiner box shall completely be water proof according to IP 65.</p> <p>B : Inverter The inverter shall be suitable for using on grid/ grid tie solar panel. The inverter shall have following features:</p> <p>i) True sine wave inverter.</p> <p>ii) MPPT: Must required</p> <p>iii) AC Grid voltage $230 \pm 5\%$ (single phase)/ $415v \pm 5\%$ (Three phase) AC</p> <p>iv) AC grid frequency 50 ± 4 Hz</p> <p>v) Power factor (Cosϕ) = 1</p> <p>vi) Operating temperature range: 0°C- 50°C</p> <p>vii) Relative humidity: 0- 95%, Non- condensing</p> <p>viii) Total harmonic distortion <3%</p> <p>ix) Efficiency : 95% minimum</p> <p>x) Noise <50 dB at 1m distance</p> <p>xi) Internal power consumption: <1 W for 1 KWp inverter</p> <p>xii) Communication port :RS 485/RS 232. Shall have the option to be incorporated with remote monitoring system</p> <p>xiii). Protection : According to IP65</p> <p>xiv) Shall have lightning induced current by Surge Protective Device of adequate rating both in DC and AC side in parallel at the entry and exit terminal of the inverter.</p> <p>Shall also have overload and over current protection from both DC and AC side.</p> <p>xv) The inverter shall be tested in accordance with the requirement of relevant IEC standards.</p> <p>C: Energy Meter: Supplying and installation of Energy Meters with following features:</p> <p>i. Single phase/Three phase (as per requirement)</p> <p>ii. Shall be able to measure and record the amount of solar energy provided by the system.</p> <p>D: General guidelines/ Criteria</p> <p>i. The bidder shall examine the site before the design of solar system & its components</p> <p>ii. The bidder shall have facilities for installing, testing & commissioning of solar Panel.</p> <p>iii. Adequate space & height shall be provided in the rows of panels for easy air flow to avoid excessive heat generation in the panel and to provide access for rain water drainage and damage from dirty water. Minimum air gap between two panel shall be 25 mm.</p>					

Sy

[Handwritten signature]





SL NO	DESCRIPTION OF WORKS	UNIT	QTY	RATE IN TK IN FIGURE	RATE IN TK IN WORD	AMOUNT IN TK
	<p>iv. All frames of the PV module, combiner box, charge controller, inverter, lightning air terminal, building earth electrode, etc, shall be equipotent bonded and earthed, by one or more conversional and/or chemical electrode system with soil conductivity enhancing material. The earth resistance must be less than 1 Ohm. For large installation above 10kW solar system, several down conductor with more than 4 earth electrodes (minimum 3 meter apart) or two earth electrodes (minimum 5 meter apart) connected by equipotent bonding conductor running at the periphery of the building shall be installed as per related standard and code of practice.</p> <p>v. The solar Panel mounting shall be of galvanized iron or equivalent to ensure rust protection of the installation. All nut bolts shall be of stainless steel (SS) or galvanized mild steel (MS) materials.</p> <p>vi. After successful completion, testing & commissioning of the whole system the contractor shall have to train nominated person(s) of the user for a period of at least seven (07) days.</p> <p>vii. After completion of whole system and before handing over the system to the concerned authority, the contractor must have to provide minimum 30 days' satisfactory operation for performance evaluation.</p> <p>viii. Technical Specification with catalogue of PV module, Inverter must be submitted with technical offer.</p> <p>ix. Only PWD approved cable shall be used for wiring.</p> <p>E: Certificate Requirement</p> <p>i. Certification from internationally accredited authorities like TUV/DNV/KEMA and CE/UL listed/marked as well.</p> <p>ii. The bidder shall have to submit minimum 15 years warranty certificate for continuous electricity generation of solar panel from its manufacturer.</p>	Per KWp	5.00	80000.00		400,000
TOTAL PRICE (INCLUDING VAT & AIT)=						19,000,000

Iftekhar Karim
Iftekhar Karim
 Chief Operating Officer
 CROSS WORLD POWER LTD

Engr. Md. Saifur Haque
Engr. Md. Saifur Haque
 Project Director
 Permanent Campus
 Eastern University

Muhammed Siddique Hossain
Muhammed Siddique Hossain
 Treasurer
 Eastern University





কট

৯৯০৭৮৯৯

Contract Agreement

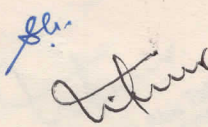
THIS AGREEMENT made the 10th September 2017 between **EASTERN UNIVERSITY**, House 26, Road 5, Dhanmondi, Dhaka-1205 (hereinafter called "the First Party") of the one part and **CROSS WORLD POWER LTD.** Plot 1/B, Road 90, Gulshan 2, Dhaka 1212, Bangladesh (hereinafter called "the Second Party") of the other part:

WHEREAS the Procuring Entity invited Quotations for **supply and installation of 1250 KVA Electric Sub-Station for academic building , permanent campus at Ashulia, Savar, Dhaka (Phase-IV)** and has accepted a Quotations by the Contractor for the execution of those works in the sum of Taka **Tk.1,90,00,000.00 (Taka One crore ninety lac)** (hereinafter called "the Contract Price")

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the General Conditions of Contract hereafter referred to.
2. The documents forming the Contract shall be interpreted in the following order of priority:
 - (a) the signed Contract Agreement
 - (b) the Notification of Award
 - (c) the completed Quotations
 - (d) the Particular Conditions of Contract
 - (e) the General Conditions of Contract
 - (f) the Particular & Technical Specifications
 - (g) the General Specifications
 - (h) the Drawings
 - (i) the priced Bill of Quantities
3. In consideration of the payments to be made by the First Party to the Second Party as hereinafter mentioned, the Contractor hereby covenants with the Procuring Entity to execute and complete the works and to remedy any defects therein in conformity in all respects with the provisions of the Contract.

Contd. P/2


Muhammad Siddique Hossain
Treasurer
Eastern University



“দেশপ্রেমের শপথ নিন, দুর্নীতিকে বিদায় দিন”



কট ৯৯০৭৮৮৮

Page - 2

4. The First Party hereby covenants to pay the Second Party in consideration of the execution and completion of the works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

SCOPE OF WORK:

The Works to be executed, completed and maintained shall be as specified in the Bill of Quantities, the General, Particular and Technical Specifications and the Drawings.

Unless otherwise stipulated in the Contract, the Works shall include all such items not specifically mentioned in the Contract but that can be reasonably referred from the Contract as being required for completion of the Works as if such items are expressly mentioned in the Contract.

COMPLETION TIME:

Total completion time for this project is 4(Four)month from the date of Commencement.

PAYMENT MODE:

First Party shall make the payment to the Second Party as per Bill of Quantities containing Priced items for the construction of the work to be done by The Second Party within 14 (Fourteen) days of submission of bill.

RETENTION MONEY:

10 (Ten percent) of Running bill as well as final bill shall be deducted as a retention money which shall be refunded to the contractor after expiry of defect liability period.

LIQUIDATED DAMAGE

The Second Party shall be liable to pay liquidated damages @0.10% (zero point one zero) of the Contract amount for each day of delay if they fail to complete the work as per intended time of completion with a maximum of 10% of Contract Amount to be paid to First Party within 15 (fifteen) days of completion of the work but before receiving the final payment from the First Party. Alternatively the First Party holds the option to adjust the delay charges from the due amounts of the bill.

Contd. P/3

Signature
Engr. Mirza Abu Taher
B.Sc. Engg (Civil) FIEB
Senior Engineer (Civil)
Road Architects

Signature
Muhammed Siddique Hossain
Treasurer
Eastern University



“দেশপ্রেমের শপথ নিন, দুর্নীতিকে বিদায় দিন”



কট ৯৯০৭৮৮৯

Page - 3

That if the First Party fails to maintain the Payment schedule on time, it shall lose the right to take an action against the Second Party for any reasonable delay in Completion of the work.

However, any unintentional delay from Supplier's end caused by factors such as Force majeure, natural calamities, incomplete Civil Infrastructure etc. by first party will be excluded during calculation of any Liquidated Damage, if any.

INCOME TAX & VAT:

The First Party shall deduct income tax and vat from all bills/ payments as per prevailing rules.

The Second Party shall be entirely responsible for all Taxes, stamp duties license fees, vat, income Tax and other such levies imposed on all materials other than those mentioned in the priced BOQ of the Second Party.

SAFETY, SECURITY AND PROTECTION OF THE ENVIRONMENT:

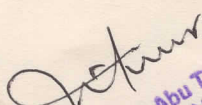
The Contractor shall throughout the execution and completion of the Works and the remedying of any defects therein:


- take all reasonable steps to safeguard the health and safety of all workers working on the Site and other persons entitled to be on it, and to keep the Site in an orderly state;
- provide and maintain at the Contractor's own cost all lights, guards, fencing, warning signs and watching for the protection of the Works or for the safety on-site; and
- take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of the Contractors methods of operation.

INSURANCE

The Contractor shall provide, in the joint names of the Procuring Entity and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles specified in the PCC for the following events which are due to the Contractor's risks:

Contd. P/4


Engr. Mirza Abu Taher
B.Sc. Engg. (Civil) FIEB
Senior Engineer (Civil)
Riddhi Architects


Muhammed Siddique Hossain
Treasurer
Eastern University



“দেশপ্রেমের শপথ নিন, দুর্নীতিকে বিদায় দিন”

- (a) loss of or damage to the Works, Plant, and Materials;
- (b) loss of or damage to Equipment;
- (c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and
- (d) personal injury or death.

The Contractor shall deliver policies and certificates of insurance to the Project Manager, for the Project Manager's approval, before the Start Date. All such insurances shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

If the Contractor does not provide any of the policies and certificates required, the Procuring Entity may effect the insurance which the Contractor should have provided and recover the premiums the Procuring Entity has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.

Alterations to the terms of insurance shall not be made without the approval of the Project Manager. Both parties shall comply with conditions of the insurance policies.

ARBITRATION:

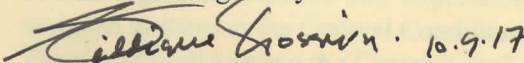
That In the First Party of any disagreement or dispute with regard to the interpretation of the terms of this Deed of Agreement, such disagreement or dispute shall be resolved amicably, failing which such matter shall be referred to for arbitration by two Arbitrators, of whom one shall be appointed by each of the parties, and an Umpire to be appointed by the two Arbitrators. In case of their failure to agree on resolution, the decision of the Umpire shall be final and binding upon the parties.

UTILITY CHARGES

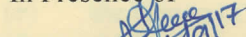
The Second Party shall pay the electricity charges, water charges, sewer service charges and other charges which may become a lien on the working premises.

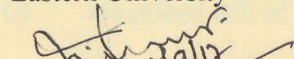
IN WITNESS where of the parties hereto have caused this agreement to be executed in accordance with the laws of Bangladesh on the day, month and year first written above.

For the Procuring Entity


Muhammed Siddique Hossain
National ID No-19554817915000002
Treasurer
Eastern University

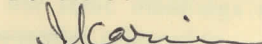
In Presence of

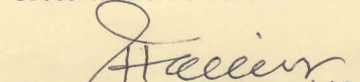

Engr. Md. Serajul Haque
Project Director
Eastern University

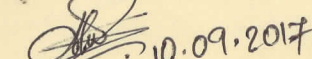

Engr. Mirza Abu Taher
Riddhi Architect

Engr. Mirza Abu Taher
B.Sc. Engg. (Civil) FIEB
Senior Engineer (Civil)
Riddhi Architects

For the Contractor


Iftekhar Karim 10/09/2017
National ID No-2693016086450
Chief Operating Officer
Cross World Power Ltd


Md. Abdul Hai Haroon
General Manager,
Cross World Power Ltd


Sabbir Ahmed
Ass. General Manager, Project Sales
Cross World Power Ltd

