

REQUEST FOR QUOTATION (RFQ)
(Goods)



Empowered lives
Resilient nations

NAME & ADDRESS OF FIRM:	DATE: 21 October -2014
	REFERENCE: RFQ/2014-CHTDF13
	Electrical infrastructure renovation for Rangamati Office

Dear Sir / Madam:

We kindly request you to submit your quotation for the items as detailed in Annex 1 (Schedule of Requirements) of this RFQ. When preparing your quotation, please be guided by the form attached hereto as Annex I.

Quotations may be submitted on or before **11th November, 2014; 12:00 midnight (local time)** to
(ebidbox-ctddf.bd@undp.org); Attention: Procurement Section

Email subject line should contain the RFQ reference" RFQ/2014-CHTDF13"

It shall remain your responsibility to ensure that your quotation will reach the address above on or before the deadline. Quotations that are received by UNDP after the deadline indicated above, for whatever reason, shall not be considered for evaluation.

Please take note of the following requirements and conditions pertaining to the supply of the abovementioned good/s:

Exact Address/es of Delivery Location/s (Identify all, if multiple)	CHTDF, UNDP, Rajbari Road, Rangamati (items wise detail delivery schedule will be provided with the Purchase Order)	
Latest Expected Delivery Date and Time	<input type="checkbox"/> [indicate number] days from the issuance of the Purchase Order (PO) <input checked="" type="checkbox"/> Electrical infrastructure renovation for Rangamati Office should be completed within three (3) weeks of award notification or as agreed between the parties whichever comes earlier	
Delivery Schedule	<input type="checkbox"/> Required <input checked="" type="checkbox"/> Not Required	
Packing Requirements	Standard Packing	
Mode of Transport	<input type="checkbox"/> AIR <input type="checkbox"/> SEA	<input checked="" type="checkbox"/> LAND <input type="checkbox"/> OTHER
Preferred Currency of Quotation	<input type="checkbox"/> United States Dollars <input type="checkbox"/> Euro <input checked="" type="checkbox"/> Local Currency : BDT (Taka)	
Value Added Tax on Price Quotation	<input checked="" type="checkbox"/> Must be inclusive of VAT and other applicable indirect taxes <input type="checkbox"/> Must be exclusive of VAT and other applicable indirect taxes	
After-sales services required	<input type="checkbox"/> Warranty for minimum period <input type="checkbox"/> Technical Support <input type="checkbox"/> Provision of Service Unit when pulled out for maintenance/ repair <input type="checkbox"/> Others	
Deadline for the Submission of Quotation	11 November 2014 12:00 midnight (local time)	
All documentations, including catalogs, instructions and operating manuals, shall be in this language	<input checked="" type="checkbox"/> English <input type="checkbox"/> French <input type="checkbox"/> Spanish <input type="checkbox"/> Others	
Documents to be submitted	<input checked="" type="checkbox"/> Duly Accomplished Form as provided in Annex I, and in accordance with the specifications Annexes II and III <input checked="" type="checkbox"/> Latest Business Registration Certificate <input checked="" type="checkbox"/> Written Self-Declaration of not being included in the UN Security Council 1267/1989 list, UN Procurement Division List or other UN Ineligibility List; <input checked="" type="checkbox"/> Company profile with list of at least 3(three) clients, with contact details (Organization's name, Person's name, email and phone number), for similar services. <input checked="" type="checkbox"/> Bank information (Bank name, branch, account name and number) and financial solvency	

	<p>certificate from Bank.</p> <p><input checked="" type="checkbox"/> Proof of physical address for Company office – eg Lease agreement</p> <p><input checked="" type="checkbox"/> Provide CVs of at least 2 key personnel that will be assigned to the project;</p>
Period of Validity of Quotes starting the Submission Date	<p><input checked="" type="checkbox"/> 90 days</p> <p><input type="checkbox"/> 60 days</p> <p><input type="checkbox"/> 120 days</p> <p>In exceptional circumstances, UNDP may request the Vendor to extend the validity of the Quotation beyond what has been initially indicated in this RFQ. The Proposal shall then confirm the extension in writing, without any modification whatsoever on the Quotation.</p>
Partial Quotes	<p><input checked="" type="checkbox"/> Not permitted</p> <p><input type="checkbox"/> Partial bidding is permitted; But bidder has to quote for full quantities on any particular item. Partial quote on quantity for any item is not allowed.</p>
Quality Criteria	<p><input type="checkbox"/> Bidders are requested to submit samples for all quoted items. Specification and samples will be checked based on the sample checklist provided in Annex-1</p> <p><input checked="" type="checkbox"/> Electrical infrastructure renovation for Rangamati Office should be completed as per attached specifications Annex I- to III</p>
Payment Terms	<p><input checked="" type="checkbox"/> 100% upon completion of the work and acceptance of service/goods</p> <p><input checked="" type="checkbox"/> Final payment will be made on the basis of actual measurement upon certification from the Project in Charge/Engineer in Charge</p> <p><input type="checkbox"/> Others</p>
Liquidated Damages	1% per day on the total value of delayed delivery. In case the delay is more than 1 month the PO will be cancelled.
Evaluation Criteria	<p><input checked="" type="checkbox"/> Technical responsiveness/Full compliance to requirements and lowest price</p> <p><input checked="" type="checkbox"/> Full acceptance of the PO/Contract General Terms and Conditions</p>
UNDP will award to:	<p><input checked="" type="checkbox"/> One and only one supplier</p> <p><input type="checkbox"/> One or more Supplier</p>
Type of Contract to be Signed	<p><input checked="" type="checkbox"/> Purchase Order</p> <p><input type="checkbox"/> Long-Term Agreement</p> <p><input type="checkbox"/> Other Type/s of Contract</p>
Special conditions of Contract	<p><input checked="" type="checkbox"/> Cancellation of PO/Contract if the delivery/completion is delayed by more than 1 month</p> <p><input checked="" type="checkbox"/> Poor quality/not matched with required specification/unacceptable delivery and failure to do necessary corrections/replacements as requested by CHTDF, UNDP will result in cancellation of the PO</p>
Conditions for Release of Payment	<p>Passing Inspection</p> <p><input type="checkbox"/> Passing all Testing</p> <p><input type="checkbox"/> Completion of Training on Operation and Maintenance</p> <p><input checked="" type="checkbox"/> Written Acceptance of Goods based on full compliance with PO requirements after full delivery</p> <p><input type="checkbox"/> Others</p>
Submission Procedures	<p><input checked="" type="checkbox"/> Quotations may be submitted on or before 11 November, 2014; 12:00 midnight (local time) to (ebidbox-htdf.bd@undp.org); Attention: Procurement Section</p> <p>Email subject line should contain the RFQ reference" RFQ/2014-CHTDF13"</p> <p><input checked="" type="checkbox"/> Quotation Submission Form is attached in Annex I</p>
Eligibility Criteria	<p>1. A registered supplier of concerned authority.</p> <p>2. Compliance with the required specification</p> <p>3. Submission of all requested supporting documents</p> <p>4. Vendor must have minimum five years of experience in electrical installation work with proof of at least 1 (one) contract of 10,00,000 BDT. (provide contracts or purchase order)</p> <p>5. Team leader must have at least a BSC in electrical engineering (or related) with 3 years' experience or a diploma with at least 5 years experience</p>
Award Criteria	Contract will be awarded to the lowest offer which meets all criteria mentioned above or the offer which gives the best value for money to UNDP

Annexes to this RFQ	<input checked="" type="checkbox"/> Form for Submission of Quotation (Annex I) <input checked="" type="checkbox"/> Schedule of Items with notes and measurement (Annex II) <input checked="" type="checkbox"/> Technical specifications (Annex III) <input checked="" type="checkbox"/> General Terms and Conditions / Special Conditions (Annex IV) Non-acceptance of the terms of the General Terms and Conditions (GTC) shall be grounds for disqualification from this procurement process.
Other Information	<ul style="list-style-type: none"> A pre-bid meeting and site view will be held on Conference Room, Building no-2, CHTDF, Rangamati Office on 30 October 2014, at 12:00 noon. All interested Organizations/NGOs are requested to participate at the meeting. Maximum two (2) participants from each organization are allowed.
Contact Person for inquiries (Written inquiries only)	protul.dewan@undp.org Any delay in UNDP's response shall be not used as a reason for extending the deadline for submission, unless UNDP determines that such an extension is necessary and communicates a new deadline to the Proposers.

Goods offered shall be reviewed based on completeness and compliance of the quotation with the minimum specifications described above and any other annexes providing details of UNDP requirements.

The quotation that complies with all of the specifications, requirements and offers the lowest price, as well as all other evaluation criteria indicated, shall be selected. Any offer that does not meet the requirements shall be rejected.

Any discrepancy between the unit price and the total price (obtained by multiplying the unit price and quantity) shall be re-computed by UNDP. The unit price shall prevail and the total price shall be corrected. If the supplier does not accept the final price based on UNDP's re-computation and correction of errors, its quotation will be rejected.

After UNDP has identified the lowest price offer, UNDP reserves the right to award the contract based only on the prices of the goods in the event that the transportation cost (freight and insurance) is found to be higher than UNDP's own estimated cost if sourced from its own freight forwarder and insurance provider.

At any time during the validity of the quotation, no price variation due to escalation, inflation, fluctuation in exchange rates, or any other market factors shall be accepted by UNDP after it has received the quotation. At the time of award of Contract or Purchase Order, UNDP reserves the right to vary (increase or decrease) the quantity of services and/or goods, by up to a maximum twenty five per cent (25%) of the total offer, without any change in the unit price or other terms and conditions.

Any Purchase Order that will be issued as a result of this RFQ shall be subject to the General Terms and Conditions attached hereto. The mere act of submission of a quotation implies that the vendor accepts without question the General Terms and Conditions of UNDP herein attached as Annex 3.

UNDP is not bound to accept any quotation, nor award a contract/Purchase Order, nor be responsible for any costs associated with a Supplier's preparation and submission of a quotation, regardless of the outcome or the manner of conducting the selection process.


Please be advised that UNDP's vendor protest procedure is intended to afford an opportunity to appeal for persons or firms not awarded a purchase order or contract in a competitive procurement process. In the event that you believe you have not been fairly treated, you can find detailed information about vendor protest procedures in the following link: <http://www.undp.org/procurement/protest.shtml>.

UNDP encourages every prospective Vendor to avoid and prevent conflicts of interest, by disclosing to UNDP if you, or any of your affiliates or personnel, were involved in the preparation of the requirements, design, specifications, cost estimates, and other information used in this RFQ.

UNDP implements a zero tolerance on fraud and other proscribed practices, and is committed to identifying and addressing all such acts and practices against UNDP, as well as third parties involved in UNDP activities. UNDP expects its suppliers to adhere to the UN Supplier Code of Conduct found in this link: http://www.un.org/depts/ptd/pdf/conduct_english.pdf

Thank you and we look forward to receiving your quotation.

Sincerely yours,


Kenae Ramodimoosi
Operations Manager

Annex I:**Quotation Submission Form****FORM FOR SUBMITTING SUPPLIER'S QUOTATION***(This Form must be submitted only using the Supplier's Official Letterhead/Stationery)*

We, the undersigned, hereby accept in full the UNDP General Terms and Conditions, and hereby offer to supply the items listed below in conformity with the specification and requirements of UNDP as per RFQ Reference No. _____:

TABLE 1: Offer to Supply Goods Compliant with Technical Specifications and Requirements

Sl. No	Short description	Unit	Qty/ Unit	Unit Rate	Total amount
A. Dismantling work of the existing system :					
A1	Disconnection of Energy Meters: Liaison with PDB for dismantling and rearrangement of existing energy meter that's include all necessary services/charges and formalities as required or as per direction of EIC	Each	5		
A2	Disconnection and dismantling of Electrical DB, SDB and ESDB : Disconnection and dismantling/cleaning of DB/SDB/ESDB and other distribution related electrical equipment of existing 5 (five) buildings as per direction of EIC	Each	20		
A3	Dismantling of existing inter building Power Distribution System: Dismantling of existing inter building power distribution system including all related necessary works as per direction of Engineer in Charge	M	500		
A4	Dismantling of existing Electrical wires upto EDB/ESDB: Dismantling of existing Electrical wires upto sub distribution board and clean the surface as per direction of Engineer in Charge	M	300		
A5	Dismantling of Electrical system of Generator shed: Dismantling of existing electrical system including ESDB/ATS and other related equipment/cables of generator shed or as per direction of Engineer in Charge	Each	2		
A6	Dismantling and rearrangement of existing ATS system: Dismantling and rearrangement of existing ATS system and other related electrical equipment of existing 5 (five) buildings as per direction of EIC	Each	5		
A7	Dismantling/Disconnect of earthing/lighting system: Dismantling and rearrangement of earthing or lightning system of 5 (five) buildings including all accessories as per direction of EIC	Each	5		
A8	Other costs				
Sub Total Amount of dismantling work of existing system 'A' Tk.					
B. Electrical Works					
B1	PVC Trunking Bits: Supply & installation of PVC cable channel/trunking bit (Pran/aziz or equivalent brand) of the following sizes for enclosing the surfaced wiring cables running on columns, wall etc. including all type of necessary bends, tees of the same materials fixing saddles clamps screws etc to complete the work in all respect. & direction of the Engineer-in-charge. AS per measurement)				
B1.1	25 mm	M	150		
B1.2	37.5 mm	M	250		
B1.3	50.0 mm	M	200		

B2	Single core cable: Supply & installation of PVC insulated single core Paradise/BRB cables procured from authorized distributor or direct from the manufacturer of the following sizes including all accessories for proper connection/ termination as per appropriate standard electric rules.& direction of the Engineer-in-charge (Invoice must be submitted to UNDP before execution of the work)				
B2.1	1.5 rm BYA	M	600		
B2.2	2.5 rm BYA	M	800		
B2.3	4.0 rm BYA	M	100		
B2.4	6.0 rm BYA	M	100		
B2.5	10.0 rm BYA	M	100		
B2.6	16.0 rm BYA	M	100		
B2.7	35.0 rm BYA	M	300		
B2.8	50.0 rm BYA	M	10		
B3	ECC: Supply & installation of original earth continuity conductor made of Paradise/BRB cables procured from authorized distributor or direct from the manufacturer of the following sizes including all accessories such as copper lugs, sleeve, nuts & bolts, washer etc for proper connectivity as per appropriate standard electric rules. (Invoice must be submitted to UNDP before execution of the work)				
B3.1	1C- 1.5 re BYA	M	300		
B3.2	1C-2.5 re BYA	M	250		
B4	Light fitting /Luminaries: Supply and installation of light shade (capable of holding 2X4' lights same as current office) with luminaries of Siemens, Osram, Crescent, Shwash including all necessary accessories like ballast, starter wires, screws etc as per direction of EIC. Sample must be submitted for approval before installation.	Each	20		
B4.1	A) Luminary 2X36 W Tube lights	Each	20		
B4.2	B) Luminary 2X18 W Tube lights	Each	20		
B4.3	C) CFL 23 watt with socket and accessories	Nos	50		
B5	Socket outlet: Supply & installation of switched socket outlet (ceramic base) of MK logic plus, England (original) of the following type procured from the authorized distributor including all necessary accessories such as screw, nuts surface mounting box/ conceal box etc. with mechanism for fixing on skirt level of the wall, partition wall, column and wherever necessary as per direction of E/C				
B5.1	Twin 13/16 amp 3-pin (flat pin)	Nos	10		
B5.2	Single 13/16 amp 3-pin (flat pin)	Nos	10		
b5.3	Single 5/6 amp 2-pin (round pin)	Nos	10		
B6	Switches: Supply & installation of switched socket outlet with MK logic plus, England (original) of the following type procured from the authorized distributor including all necessary accessories such as screw, nuts surface mounting box/ conceal box etc. with mechanism for fixing on skirt level of the wall, partition wall, column and wherever necessary as per drawing & direction of E/C				
B6.1	1 Gang (1-way)	Nos	5		
B6.2	2 Gang (1-way)	Nos	5		
B6.3	3 Gang (1-way)	Nos	5		

B7	MK Box: Supply & installation of original box supplied from MK logic plus, England (no local box is allowed) procured from the authorized distributor including all necessary accessories such as screw, nuts surface mounting box/ conceal box etc. with mechanism for fixing on skirt level of the wall, partition wall, column and wherever necessary as per drawing & direction of E/C				
B7.1	Single box	Nos	10		
B7.2	Dual box	Nos	10		
B8	Single Phase Circuit Breaker: Supply and installation of single pole electrical circuit breaker of doorman/mem made in UK/EU/Japan including all necessary accessories for fitting/fixing in the distribution board as per direction of Engineer in Charge				
B8.1	6-32 A	Nos	150		
B09	Three Phase Circuit Breaker: Supply and installation of three phase MCCB electrical circuit breaker of doorman/mem made in UK/EU/Japan including all necessary accessories for fitting/fixing in the distribution board as per direction of EIC				
B9.1	163 A MCCB	Nos	10		
B9.2	63 A MCCB	Nos	10		
B9.3	40 A MCCB	Nos	10		
B10	ATS: Supply & installation of heat paint Auto transfer Switch as per BS and suitable for 40-50KVA generator power switching system including all necessary accessories such as screw, nuts surface mounting box/ conceal box etc. with mechanism for fixing on skirt level of the wall, partition wall, column and wherever necessary as per direction of E/C (all transfer switches and control modules shall be the product of the same manufacturer and all time delay shall be fully field adjustable without the use of the tools) delay transfer maximum 0 to 5 minutes.	Nos	3		
B11	EDB/ESDB: Supply & installation of factory made (Siemens, mem, ligrant or equivalent) Sub Distribution Electrical Board as per BS and minimum 12 nos single phase circuit breaker and 2 nos 63A 3phase MCCB, bus bar, grounding system including all necessary accessories such as screw, nuts surface mounting box/ conceal box etc. with mechanism for fixing on the wall, column and wherever necessary as per direction of E/C	Nos	20		
B12	DB: Supply & installation of powder coated painting Electrical Distribution Board as per BS (SWG 18 sheet) for minimum 2 nos three phase MCCB circuit breaker, bus bar, ATS system and other accessories including all necessary accessories such as screw, nuts surface mounting box/ conceal box etc. with mechanism for fixing on the wall, column and wherever necessary as per drawing & direction of E/C	Nos	5		
B13	Lightning protection system (less than 1 ohm) with sinking tube well method: Supply and installation of lightning protection system at a suitable location of the building as per BS including all necessary component/accessories such as earthing electrode, earthing led with pipe, earthing pit with slab, Testing point, Down conductor, air terminal, copper lugs, sleeve, nuts & bolts etc for proper connectivity	Job			
B13.1	Necessary arrangement for boring holes	Nos	1		
B13.2	18"X18"X18" earthing pit with 3" thick slab (mixture ratio1:2:4) with lifting arrangement	Nos	1		
B13.3	Earthing led (16.0 mm BYA green cable) up to testing point	M	10		
B13.4	Resistance testing device as per BS	Nos	1		
	16.0 mm BYA green cable as running conductor	M	80		

B13.5	16.0 mm BYA green cable as down conductor	M	30		
B13.6	3.5 feet Air terminal	Nos	5		
B14	Equipment grounding system (less than 2 ohm) with sinking tubewell method : Supply and installation of lightning protection system at a suitable location of the building as per BS including all necessary component/accessories such as earthing electrode, earthing led with pipe, earthing pit with slab, Testing point, Down conductor, copper lugs, sleeve, nuts & bolts etc for proper connectivity	Job			
B14.1	Necessary arrangement for boring holes	Nos	2		
B14.2	18"X18"X18" earthing pit with 3" thick slab (mixture ratio 1:2:4) with lifting arrangement	Nos	2		
B14.3	Earthing led (16.0 mm BYA green cable) up to testing point	M	20		
B15	Service line : Supply and installation necessary materials of 48 KW 3 phase service line (not less than 35.0 mm BYA cables) for UNDP-CHTDF Rangamati Office as per PDB standard, liaison with PDB/ BHDC (if necessary) for necessary arrangement including all type of charges/ actions as appropriate and as per direction of EIC.	Job	5		
B16	Pole: Supply and installation of 17 " dia 2" GI electrical pole with all necessary arrangement such as RCC foundation, electrical/LAN wire hanging arrangement etc as per direction of EIC	Each	5		
B17	Overhead power distribution system: Installation of over hanging underbuilding power distribution system supported by horizontal gye wire including all accessories as required or as per direction of EIC	M	500		
B18	Cable joint : Supply and installation of necessary materials including PIB tape, cable lugs for cable joint as per direction of EIC	Each	20		
B19	Rearrangement of Electrical system of Generator shed: Rearrangement of existing electrical system including ESDB/ATS and other related equipment/cables of generator shed or as per direction of Engineer in Charge	Each	2		
B20	Synthetic enamel paint: Supply and installation of enamel paint for grill, net, window grill safety grill in two coats with approved best quality and colour of synthetic enamel paint delivered from authorized local agent of the manufacturer in a sealed container, Preffetred brand Berger/Asian paint having highly water resistant, high bondibility, flexible, using specific brand thinner applied by brass/roller/spray over a coat of priming elapsing time for drying including surface cleaning from dust, oil or dirt, smoothening, finishing and polishing with sand paper and necessary tools, scaffolding, testing charges etc. all complete as per direction of EIC.	Sft	2000		
B21	5" first class brick work in cement sand (F.M. 1:2) mortar (1:4) and making bond with connected walls including necessary scaffolding, raking out joints, cleaning and soaking the bricks for at least 24 hours before use and washing of sand curing at least for 7 days including cost of water, electricity and other charges etc. all complete and accepted by the Engineer. (Cement: CEM-II/A-M).	sft	500		
B22	Cement Concrete works (CC): with minimum cement content relates to mix ratio 1:2:4 as per standard practice of Code ACI/BNBC/ASTM & cement conforming to BDS EN-197-1- CEM 1 (32.5 to 52.5 N) / ASTM-C 150 Type – I, best quality sand (50% best local and 50% Sylhet), 20 mm down well graded picked jhama brick chips conforming ASTM C-33 including breaking chips and screening, mixing in standard mixer machine, casting in forms, compacting by vibrator machine including cost of water, electricity, testing and other charges etc. all complete as accepted by the EIC.	cft	10		

B23	Reinforced cement concrete works (RCC) using wooden shutter, with minimum cement content relates to mix ratio 1:2:4 as per standard practice of Code ACI/BNBC/ASTM & cement conforming to BDS EN-197-1- CEM 1 (32.5 to 52.5 N) / ASTM-C 150 Type – I, best quality sand [50% best local and 50% Sylhet), 20 mm down well graded picked jhama brick chips conforming ASTM C-33 including breaking chips and screening, making, placing shutter in position and maintaining true to plumb, making shutter water-tight properly, placing reinforcement in position (main 12 mm and binder 10mm 60 grade) for lintel 4X12mm main and binder 10mm 8" c/c ; mixing in standard mixer machine, casting in forms, compacting by vibrator machine and curing at least for 28 days, removing centering-shuttering including cost of water, electricity, testing and other charges etc. all complete accepted by the EIC.	cft	10		
B24	Working Drawing: Prepare as built drawing based on actual work or any other modification but must be reflected on the drawin and prior approval is required before finalisation of the drawing. The awarded contractor will prepare the drawing and submit to UNDP before starting the work.	Job	1		
B25	AS Built Drawing: Prepare as built drawing based on actual work or any other modification but must be reflected on the drawin and prior approval is required before finalisation of the drawing	Job	1		
B26	Other costs				
Subtotal of Electrical works Mark "B" Tk.					
Grand Total (A+B) Taka					
In word Taka					

TABLE 2: Offer to Comply with Other Conditions and Related Requirements

Other Information pertaining to our Quotation are as follows :	Your Responses		
	<i>Yes, we will comply</i>	<i>No, we cannot comply</i>	<i>If you cannot comply, pls. indicate counter proposal</i>
Technical responsiveness/Full compliance to requirements			
Submission of all requested supporting documents			
Compliance with Eligibility criteria			
Full acceptance of the PO/Contract General Terms and Conditions			

All other information that we have not provided automatically implies our full compliance with the requirements, terms and conditions of the RFQ.

[Name and Signature of the Supplier's Authorized Person]
[Designation]
[Date]

Annex – II

SCHEDULE OF ITEMS WITH NOTES ON MEASUREMENT

Sl. No.	Description of Items
01.	<p>P.V.C. Conduit Supply & installation of PVC pipe (Lira made or approved best quality of other reputed manufacturers) size(s) as mentioned in the Bill of Quantities in brick/RCC wall/column/ ceiling floor etc at all levels complete with all accessories viz. 12 SWG G.I. pull wire, circular box/bends, sockets jointing adhesive, PVC/18 SWG G.P sheet pull/junction box with 3mm thick ebonite sheet cover etc. as required including binding the pipe with reinforcement rods with the help of 2x20 SWG G.I binding wires at 381mm intervals including tracing out the outlets after the shutterings are removed, cleaning the outlets and mending good all damages (where necessary) etc. all complete in all respect as per direction of the Engineer.</p> <p><u>Basis of Measurement :</u> The length along the mid section of pipe shall be measured for payment. All the fitting such as junction / pull box shall be included in the length of pipe.</p>
02.	<p>Single Core Cable: Supply and drawing of PVC insulated single core cable size(s) as mentioned in the Bill of Quantities with copper conductor of Eastern or approved best quality cable in pre-laid conduits and termination/ connection and wrapping the joints with PVC tape wherever necessary etc. all complete in all respect as per drawing and instruction of the Engineer.</p> <p><u>Basis of Measurement :</u> The length of Cable used in the work shall be measured for payment.</p>
03.	<p>Supply and drawing of electrolytic annealed copper earth continuity conductor in pre-laid conduit along with cable including connection to various metallic parts of the following sizes etc. all complete in all respect as per drawing and instruction of the Engineer.</p> <p><u>Basis of Measurement :</u> The length of ECC used in the work shall be measured for payment.</p>
04.	<p>Switch Board Cover: Supply fitting and fixing of 3mm thick ebonite cover plate of approved colour with edge treatment of required size shall be mounted on existing switch board with counter sunk galvanized machine screws including all other necessary accessories etc. complete in all respect as per instruction of the Engineer.</p> <p><u>Basis of Measurement :</u> The quantity of complete and accepted work measured as provided shall be paid at the unit price (SqM).</p>
05.	<p>Switch/Socket : Supply, fitting and fixing of MK switch/socket or approved best quality) with all accessories etc. all complete in all respect as per instruction of the Engineer.</p> <p><u>Basis of Measurement :</u> The fixture installed complete in all respect including consumable materials shall be considered as one unit and payment shall be made by unit.</p>
06.	<p>Distribution/Sub-Distribution/Meter/ Machine Board: Supply, fitting and installation of distribution/ Sub-distribution/Meter/Machine box for housing the required incoming/outgoing circuit breakers and bus-bars etc. The distribution box shall be made of 16 SWG galvanized steel sheet and should be of suitable dimension to accommodate circuit breakers, cut-out and bus-bars with sufficient spacing. The box shall be spray painted with grey/white synthetic enamel paint, shall have knock outs for conduits entry and exit, a copper plate earthing block must be provided inside the box. In all cases sufficient gap must be maintained between the bus-bars and the back side of box. The rate shall be inclusive of platform for fixing MCB's, copper washer, handle, system locking arrangement with lock (China or approved best quality) one door with screws and earthing block etc. all complete in all respect as per direction of the Engineer.</p> <p><u>Basis of Measurement :</u> The fixture installed complete in all respect including consumable materials shall be considered as one unit and payment shall be made by unit.</p>
07.	<p>Supply & installation of copper bus-bar (covered by ebonite sheet of 3mm thick and proper size) of the following dimension and installation in a pre-fabricated steel box, supplying with necessary insulators, nut-bolts and fixing hardware with connection arrangement for cable with sufficient gap between the bus-bar and the back side of the box, MCB/MCCB's, cut-out etc. complete in all respect as per direction of the Engineer.</p> <p><u>Basis of Measurement :</u></p>

- The fixture installed complete in all respect including consumable materials shall be considered as one unit and payment shall be made by unit.
08. Providing and fixing on a prepared board 250 volts grade following single /triple pole miniature Circuit breaker SPMCB having breaking capacity 6KA with thermal over current and instantaneous electromagnetic short circuit release all complete in all respect as per direction of the Engineer.
- Basis of Measurement :
The fixture installed complete in all respect including consumable materials shall be considered as one unit and payment shall be made by unit.
09. **Light fittings:**
- (a) Providing and fixing of single fancy bracket light fitting consisting of half round glass shade, brass holder, base plate of required size ebonite sheet of 3mm thick, oxidized or chromium plated or nickered brass bracket, necessary wiring etc. all complete in all respect (except lamp) of the following model and as per sample approved by the Engineer.
- (b) Providing and fixing of Saucer light fitting (except lamp) consisting of 250mm dia glass saucer shade with aluminum base carrier brass holder, base plate of required size ebonite sheet of 3mm thick, necessary wiring etc. all complete in all respect following the Model as per sample approved by the Engineer.
- (c) Providing and fixing of 1 x 1.22M x 40W fluorescent tube light fitting consisting of Superior quality ballast, ceiling rose, starter, holder, 18 SWG sheet steel stove enameled base necessary wiring etc. all complete in all respect of following model (except lamp) as per sample approved by the Engineer.
- (h) Providing and fixing of water tight light fitting consisting of aluminum cast body U-type glass cover with G.I wire net guard, brass holder necessary wiring etc. all complete in all respect of (except lamp) of following model as per sample approved by the Engineer.
- Basis of Measurement :
The fixture installed complete in all respect including consumable materials shall be considered as one unit and payment shall be made by unit.
10. Providing, fitting and fixing following type fluorescent/ incandescent lamp complete in all respect as per direction of the Engineer.
- Basis of Measurement :
The fixture installed complete in all respect including consumable materials shall be considered as one unit and payment shall be made by unit.
11. **Switch Board:**
Supply, fitting & fixing of 18 SWG M.S. sheet made switch board (concealed) of the following size having threaded ears at the four corners for fixing the ebonite cover plate with counter sunk galvanized machine screws etc. all complete in all respect as per direction of the Engineer.
- Basis of Measurement :
The fixture installed complete in all respect including consumable materials shall be considered as one unit and payment shall be made at unit price (SqM).
12. **Earthing System**
Earthing the electrical installation with 38mm dia G.I. pipe (Earth electrode) having 6.35mm dia holes across the dia at 305mm interval securely bonded with 2 SWG HDBC earth lead with washer, nuts, bolts etc. sunk up to undermentioned depth and protection of earth lead by 12mm dia G.I. pipe up to plinth level run at a depth of 609.6mm below G.L. up to main board to be earthed including necessary connecting copper sockets, bolts, nuts, including additional vertical run of 12mm dia G.I. pipe up to G.L from 609.6mm depth with blind socket for water pouring facility etc. complete for maintaining earth resistance within 1 ohm etc. all complete in all respect as per direction of the Engineer.
- Basis of Measurement :
- a) Measurement of shall be based on SET basis and no separate payment shall be made for G.I. bend, socket, clamp etc. including consumable materials necessary to complete the work. The rate is also inclusive of cost of boring and making holes in pipes.
- b) Measurement shall be unit number (Each) of each inspection pit installed in place.
-
13. **G.I. Pole**
Providing G.I. Pole of size(s) as mentioned in the bill of quantities made of G.I. pipe complete with sockets and reducer where required M.S. base plate and top over duly welded with the pole etc. all complete in all respect as per direction of the Engineer.
- a) Total 9144mm long with, 152mm (6") 6090mm (20'-0" at the bottom, and 101mm (4") dia 3048mm (10') at the top with 609mm (2'-0" x 2'-0") size base plate.
- b) Total 6.0M long with, 75mm dia 4.5M at the bottom, and 50mm dia 1.5M at the top with 450mmx

- 450mm size plate.
c) Total 3.0M long with, 37.5mm dia with 300mm x 300mm size base plate.

Basis of Measurement :

The fixture installed complete in all respect including consumable materials shall be considered as one unit and payment shall be made by unit.

14 Energy Meter :

Providing and fitting fixing of 230 / 415 Volts, 50 Hz single / three phase 10-100 Ampere eclectic energy meter (KWH) with required size M.S. sheet box with glass over on prepared board complete in all respect as per direction of the Engineer.

Basis of Measurement :

The fixture installed complete in all respect including consumable materials shall be considered as one unit payment shall be made by unit.

Annex – III

TECHNICAL SPECIFICATION

A

VENDOR REQUIREMENTS

- 1.0 The vendor shall provide the working drawing before starting the work for prior approval
- 2.0 The work shall be supervised by CHTDF-UNDP. The site supervisor of the vendor shall be full time available and shall supervise the work.
- 3.0 The vendor shall provide the list of personnel those who are involved in the work.
- 4.0 The vendor shall provide the working schedule for completion of the work. The total working period is 15 days.
- 5.0 The defect and liabilities period for this project is 90 days. The security deposit is 10% of the total value of the work which will be released after the defect and liabilities is over.
- 6.0 Vendor shall clean the working area and clear the site of all debris on completion of works.
- 7.0 The sample of all the materials must be submitted for approval before installation in place.
- 8.0 All boxes and fittings shall be manufactured from un-plasticized PVC Copolymer material or other suitable non-metallic material
- 9.0 The interior of the fittings shall be free from obstruction which might cause abrasion of cables or which might interfere with the ready introduction or withdrawal of cables of the maximum size and number permitted to be enclosed by the conduit

B

SPECIFICATIONS FOR ELECTRICAL WORKS (MATERIALS AND WORKS)

1.0. SCOPE OF WORK

This chapter covers all equipment/ materials and operations in connection with internal and external electrification and similar other installation works covering buildings and related other establishments as indicated on the drawings. All works shall be completely in conformity with the Rules and Regulations as stated below.

2.0. STANDARD CODE AND REGULATIONS FOR INSTALLATION

The installation in general shall be carried out in conformity with the Electricity Rules of the Govt. of Bangladesh (Indian Electricity Act and Rules as adopted in Bangladesh) and the 14th edition of the Regulation for Electrical Equipment of Buildings of the Institute of Electrical Engineers (London), hereinafter referred as 'I.E.E. Wiring Regulations' and the British Standard Code of practice for the relevant works. But where the under noted specifications differs from these rules and standards, the specifications written hereunder shall be followed. Any special requirement of the Electrical Inspector, Govt. of Bangladesh or the Power Development Board/Dhaka Electric Supply Authority or the Telegraph and Telephone Board or any other Legally constituted Authority shall also be complied with, at Contractor's cost within the Contract Price.

3.0. GENERAL REQUIREMENTS

- 3.1 The drawings related to the works indicate only the general arrangement of the electrical installation. Details of proposed departures due to actual field condition or other cause shall be submitted to the Engineer. for approval. The Contractor shall carefully examine the drawings and shall be responsible for the proper installation of materials, fixtures and equipment in each unit as indicated without substantial alteration.

3.2 Specifications :

Materials required which are not covered by the detailed specifications shall be as recommended by the equipment manufacturer or in consistent with good practice and approved by the Engineer.

3.3 Drawings :

The drawings show the general arrangement of all circuitry, wiring, feeders, cables and race ways etc. however, where local conditions necessitate a re-arrangement shall prepare and submit for approval drawings of the proposed re-arrangement. Because of the small scale of the drawings it is not possible to indicate all offsets, fitting and accessories which may be required. The Contractor shall carefully investigate the structural and finish conditions affecting all of his works and shall arrange such works accordingly, furnishing such fittings, access traps, inspection boxes and accessories as may be required to meet such conditions. The Contractor , if necessary shall prepare a shop drawing indicating the exact location of conduits and wiring for approval of the Engineer.

3.4 Cutting and Repairing:

The work shall be carefully laid out in advance and any cutting of construction shall be done only with the written permission of the Engineer. Cutting shall be carefully done and mending good the damages to the building as a result of cutting for installation, piping, wiring for equipment etc. shall be done by skilled mistries of the trade involved, at no additional expense to the Employer.

3.5 Protection of Fixture:

Conduit and pipe opening shall be closed with caps of plugs during installation. Fixture fittings and equipment shall be adequately protected against dirt, water and chemical or mechanical injury. At the completion of the work, fixture, materials and equipment shall be thoroughly cleaned and delivered in a condition satisfactory to the Engineer.

4.0. APPROVAL AND LIST OF MATERIALS, FIXTURE AND EQUIPMENT

As soon as practicable and within 30 days after date of receipt of executed contract and before any materials fixtures or equipment are purchased, the contractor shall submit to the Engineer for approval a complete list, in triplicate, of materials, fixtures and equipment to be incorporated in the work, together with the names and addresses of the manufactures and their catalogues numbers and trade names. The contractor shall also furnish other detailed information where so directed, under the various items. No consideration will be given to partial lists submitted from time to time. Approval of materials will be based on manufactures, published ratings. Any materials fixtures and equipment listed which are not in accordance with the specification requirements may be rejected, the product of any reputable manufacturer regularly engaged in the commercial production of equipment shall not be excluded on the basis of minor differences, provided all essential requirements of this specification relative to materials capacity and performance are met. The Contractor shall furnish a statement giving a complete description of all points wherein the equipment proposed does not comply with the specifications. Failure to furnish such a statement will be in turreted to mean that the equipment meets all requirement of the specifications. Tear sheet of catalogues shall be furnished if such catalogues are not readily available to the Engineer.

5.0 AS-BUILT/RECORD DRAWINGS

5.1 As-Built/Record Drawings and Charts for Internal Electrification.

Before the installation is finally handed over to the Employer the Contractor shall prepare and submit to the Engineer for approval As-Built/Record drawings showing layout of all electrical fixtures and Boards and positions and layout of conduits and exposed wiring if any and cable runs with dimensions and full circuit details.

If the Engineer finds that the As-Built Drawings are not complete in all respects and/or they contain errors, the Contractor shall do the corrections and resubmit to the Engineer, more than once if necessary, till the Engineer can approve the As-Built Drawings.

A detailed circuit Chart shall be prepared, fitted in a durable frame and fixed in an approved position adjacent to the main distribution control gear.

The installation shall not be considered complete till the As-Built Drawings free from incompleteness and errors are submitted to and approved by the Engineer and the Charts mentioned above are fixed in a satisfactory manner.

5.2 As-Built/Record Drawings for External Electrical Works

Before the installation is finally handed over to the Employer, the Contractor shall prepare and submit to the Engineer for approval As-Built/Record drawings showing all routes and depths below ground of all electrical cables, telephone cables.

If the Engineer finds that the As-Built Drawings are not complete in all respects and/or they contain errors, the Contractor shall do the correction and resubmit to the Engineer for approval of the As-Built Drawings, more than once if necessary, till the Engineer can approve the As-Built Drawings.

The installation shall not be considered complete till the As-Built Drawings free from incompleteness and errors are prepared and submitted by the Contractor to the Engineer and the Charts mentioned above are fixed in a satisfactory manner.

Submission of As-Built/Record Drawings for all work is a pre-requisite for Contractor's claim for final payment for any work including Electrical Work.

6.0. GENERAL INSTALLATION REQUIREMENTS

6.2 Exposed Installation

6.2.1 Raceways or there wiring methods shall be exposed only :

- a. In specially assigned electric riser closets, shafts or switch board room.
- b. In mechanical equipment spaces.
- c. Where specially indicated on the drawing or otherwise with the expressed permission of the Engineer.

6.2.2 Exposed raceways of there wiring method shall be run parallel to building, walls, columns lines etc. throughout.

6.2.3 All exposed heavy conduits are to be fastened to masonry walls, floor or partitions, use of wooden plugs will not be permitted instead rowel plugs should be used. Metal saddles of approved type not more than 0.61M apart shall be used for fixing exposed conduit.

C. MATERIALS AND THEIR INSTALLATION :

1. PIPE (CONDUIT) / BATTEN WORKS

1.1. PVC Pipe (Conduit) and Accessories

The work under this item comprises supply and installation of rigid, water grade PVC Pipe and accessories concealed or exposed in/on floors, roof slabs, walls and column where necessary in accordance with the drawings. PVC Pipes shall be of standard manufacture to meet the requirement of BS 3505 : 1968 but with thickness and weight per metre relaxed as per Table - 1. Pull boxes, circular boxes, bends, sockets, elbows etc., shall be of PVC or other similar inert synthetic materials, press fitted and then sealed with PVC solvent cement or by any other standard glue as prescribed by the manufacturer. Switch Boxes, and Junction Boxes shall be made of Steel 18 SWG and galvanised. Each junction box shall have an earth block where earth continuity conductor can be connected. The circular boxes shall be of PVC material with 19mm long hub and machine screwed cover. Pull wires, to draw the copper conductors through conduits shall be 16 SWG and galvanized. The conduits to be concealed in slabs shall be installed along with G.I. Pull Wire in between top and bottom bar immediately after placement of reinforcement bar as per applicable routing shown on the drawings. Conduits shall be tied with bars by 2 x 20 SWG G.I. Wire at 610mm c/c. Conduits over false ceiling will remain exposed. All these non-concealed conduits are to be secured with concrete surface or timber frame by galvanized saddle or cleats at 381mm c/c. Concealed conduits in concrete wall or column surface shall be placed along with shuttering or form work before the concrete is poured in.

Any change in routing necessitated because of job condition shall have prior approval of the Engineer. All such changes shall be marked on the plans as field records. Conduits in brick wall shall be installed during construction of wall. No chiselling in masonry wall shall be allowed without prior approval.

PVC Pipes shall be bent either by using a hot box bending or by using flame. In any event bending radii shall be 6 times pipe size but 152mm minimum. The pipe bore in the bent portion shall remain truly circular and without reduction in diameter.

The conduit run shall be continuous throughout its length and kept straight as far as possible. It shall have either horizontal or vertical run but shall never run at an angle. Routing of conduits in between walls at right angle shall not be allowed.

All conduit run shall be kept at least 152mm clear of all service pipes. Where necessary it shall be rerouted or set out to maintain the specified separation. If there arise any difficulty in fulfilling the above condition, it shall be brought to the notice of the Engineer for solution/decision.

In installing the conduits particular care shall be taken in cutting them to the proper lengths so that the ends will fit exactly in to the outlet boxes. After installation the open end shall be carefully plugged to prevent intrusion of plaster, dust, moisture etc.

No inspection bends shall be used. At points where inspection is normally required steel boxes shall be used, in 18 SWG sheet fabricated by welding and galvanised.

All conduits along with accessories required for complete installation shall be furnished and installed in a best workmanship manner.

Measurement for payment shall be in linear metre of conduits installed in place for vertical or horizontal run as measured from the as-built drawings.

The amount of completed and accepted work measured as provided shall be paid for at the contract price, per running metre which payment shall constitute full compensation for furnishing all materials equipment, tools and labour including storage, transportation, cutting, painting and supply of conduits and all accessories, preparing as built drawings and providing all incidentals and consumable necessary to complete this item of work.

1.2.1 Metal conduits shall conform to B.S. 4568 Part-1 & Part-2, or B.S. 31:1940, and shall be in 18 SWG (minimum) thick, either solid drawn or formed round and then welded. In the latter case, the bore shall be free from any burs. The conduits shall be black enamelled or galvanized. The steel shall be such that when bends are formed, the conduit should not break, crack or be deformed. Appropriate sample shall be submitted prior to installation of conduit.

1.2.2 G.I. pipes

The Galvanised Iron pipes to be used in the work shall conform to ASTM A 120-83 Standard, welded or seamless. The diameter of pipes mentioned in the Schedule of Item are nominal diameters. The pipes shall be coated with Zinc inside and outside by hot dip process and the Zinc used for the coating shall be any grade of Zinc conforming to the ASTM B-6. The weight of coating shall not be less than 550gm per square metre. Each length of the pipe shall be tested at the mill to the Hydrostatic Test pressure and Test pressure shall be 84 kg/cm².

1.2.3 G.I. Bends

No inspection bends shall be used. At points where inspection is normally required steel boxes shall be used, in minimum 18 SWG sheet fabricated by welding and galvanised.

Long radius preformed bends of same material and of required angle (22.5°, 45°, 60° and 90°) shall be used.

G.I. conduit may be bent to required angle other than above only after obtaining express approval of the Engineer.

The inside edges of all openings through which cables are intended to pass shall be smoothly rounded to prevent damage to the cables

1.2.4 Junction box, Pull box, Circular box and Switch box

Junction Box and Switch Box shall be of minimum 18 SWG sheet steel and galvanised. Circular boxes, Pull Boxes and fittings shall be manufactured from unplasticized PVC copolymer material or other suitable non-metallic material. The fittings shall be homogenous and non-porous and shall be so designed and constructed as to have adequate mechanical strength and be able to withstand such rough uses as may be expected during and after installations. The inside and outside surfaces of the fittings shall be smooth, clean and uniform and free from projections and other defects.

The interior of the fittings shall be free from obstruction which might cause abrasion of cables or which might interfere with the ready introduction or withdrawal of cables of the maximum size and number permitted to be enclosed by the conduit.

The inside edges of all openings, through which cables are intended to pass, shall be smoothly rounded in order to prevent damage to the cable.

The minimum thickness of the Pull Boxes and Circular Boxes shall be 1.5 mm.

All Switch Boxes shall have copper earth block 10 x 10 x 10mm in size with $\phi 5$ drilled hole and $\phi 3$ machine screws tapped for 1 thread per mm.

1.2.5 Conduit termination and fittings

At the end of a run, the conduit/G.I. pipe must terminate in a metal box, galvanised. When a conduit is terminated in a metal box (circular boxes excepted), a smooth bore brass/PVC bush or ring bush shall be used along with 2 brass

1.2.6 G.I. pipe in floor

All G.I. Pipes (conduit) shall be installed having a slope of 1:100 towards the floor mounted pull box or cable duct so that condensate or leakage water drains out easily to the pull box or cable duct. For runs of more than one conduit in the same floor the direction of slopes of different conduits should be decided in such a systematic manner as to ensure a uniform drain out of the leakage. All socket joints shall be made watertight. No U-bend in floor shall be installed. All G.I. pipe and accessories shall be painted as specified in General Notes, General - Painting for G.I. pipe below ground.

1.3 Conduit Installation

1.3.1 Cutting of conduits shall be done with a hacksaw in a neat manner without damage to the conduits.

1.3.2 The ends of all conduits shall be carefully reamed out free from burrs before installation and after threading.

1.3.3 The ends of all conduit entering box, outlet box, cabinet etc. shall be provided with two brass lock nuts and male/female brass bushing of required size for 31mm dia conduits and larger ones, installed bushing shall be used.

1.3.4 if bushing are of fully insulated type, an additional lock nut shall be used inside the junction box and cabinet before installing the bushing.

1.3.5 Conduits entering main distribution feeder pull boxes shall be provided with insulated bushing regardless of sizes.

1.3.6 Care shall be taken to see that all conduits run from a permanent and continuous ground return back to the service ground connection point. Conduits used on system which are entirely isolated from the light and other distribution system shall be electrically continuous and grounded in an approved manner.

1.3.7 Where conduits terminate at equipment or location where a ground bus is provided, such as main switch boards (or pull boxes), sub-station transformer vaults etc. grounding bushings shall be provided for each conduits. such bushing shall be bounded to the ground bus by a 8 SWG dia (Min.) wire.

1.3.8 Conduits exposed or embedded crossing building expansion or construction joints shall be furnished with approved brass expansion fittings and shall be provided flexible grounding bonds by passing the fittings.

- 1.3.9 Wherever exterior underground conduits enter the building through sleeves or openings in walls they shall be securely and permanently plugged by means of approved sealing compound.
- 1.3.10 During installation of conduits all unfinished runs and also termination in pull boxes, cabinets etc. shall be capped in an approved manner. Caps in cabinets etc. shall be left in place until building is ready for installation of conductor. Paper or wood plugs shall be used for this purposes.
- 1.3.11 The conduits system shall be self-ventilating type and drainage outlet shall be provided at points in the installation where condensed moisture might cool, as per standard practice of the electrical trade.

1.4 Joints

- 1.4.1 Conduits shall be coupled by means of running threads. Threadless coupling shall not be permitted. All joints shall be made up tight.
- 1.4.2 Where it is impossible to turn the conduit in coupling section together a Brick stone type coupling shall be used.
- 1.4.3 Where conduit is to be embedded in concrete, threads shall be coated prior to coupling or making up with red leads.

2. CABLE WORKS

2.1(a) Single core cable and conductors

Single core low voltage cables and conductors shall be as per B.S. 6004, or B.S. 6346, or equivalent VDE specifications of copper conductor and PVC insulated conductors shall have 600/1000 volt grade of PVC insulation cables. All sizes over 2.5 mm² shall be stranded. The cable lugs shall be of copper. Flexible cables shall be as per B.S. 600A unless otherwise specified.

2.2 **Cable in Conduits (G.I./PVC Conduit)**

Generally, single core cable (non-sheathed) are to be installed in conduits. The conduit sizes shall be as specified in the drawings. It shall be ensured that cables are not scratched/damaged during pulling. For long lengths over 10m, pull boxes shall be used even if not indicated in the drawings. Cable shall not be drawn round more than two 90° bends (or their equivalent) between drawing-in-boxes, and no single bend shall be less than 90°. No cable pulling lubricant other than powdered soap stones shall be used and that after obtaining approval of the Engineer.

2.2.2 **Cable termination and joints**

No termination or joints of cables shall be allowed except at switch boxes. Termination of cables upto 2.5mm² shall be done by making a hook at the end, and for higher sizes, brass cable terminals shall be used. Tee-off joints in the cable to lighting point, switches etc. shall not be made. Looping in system of wiring shall be followed and the joints shall be made in the switch boards only. All PVC cables shall be terminated using brass cable glands of proper size.

2.2.3.1 **Installation of wires and cables**

- a) The maximum number of conductors in any conduit shall be as per drawing conforming with the regulations of I.E.E. No joints in the conductor will be made throughout the installation and looping system shall be followed.
- b) The conductor shall be tested for continuity and insulation before energizing and conform to the standard laid down by the local Engineering Authority and Institution of Electrical Engineer (England).
- c) Generally, single core cable (non-sheathed) are to be installed in metal conduits. The conduits sizes shall be as specified in the drawings. It must be ensured that the cables are not damaged during pulling. For long lengths, pull boxes must be used even if not indicated in the drawing Cables shall not be drawn round more than two 90° bend between drawing-in-boxes and any single bend must not be less than 90°
- d) The cable up to 0.0258cm² shall be solid conductor and therefore, jointing are to be done through porcelain connector and the connection shall be wound with PIB tape before placing in the boxes. Termination of cable termination must be used. Tee-off joints in the cable to light point, switches etc. should not be made Looping in system of wiring is to be

followed for recessed and surface wiring and the joints are to be made in the switch boards only. Ass 3 to 4 core PVC cable shall be terminated using brass cable glands of proper size.

2.3 Connection to switches

The phase wire shall be connected to the switches and the neutral wire shall be kept solid in all switch connections.

2.4 Cable colour

Cables used shall have colour as stated below :

Two wire single phase a.c. system

Red, white or blue for phase line or switch wire, black for neutral and green for earth when flexible cords are used.

Three wire two phase a.c. system

Red for one phase.

Black for common return.

White for other phase.

Three or four wire three phase a.c. system

Red for first phase

White for second phase

Blue for third phase

Black for neutral

Two wire d.c. system

Red for positive or switch wire

Black for negative.

For two wire final sub-circuits, whether a.c. or d.c. supplying lighting or power circuits, the neutral or "middle" wire shall always be black, and the phase or outer wire (no matter which phase it is connected to) shall always be red. For lighting, the red wire shall always feed the switch, and a red wire shall always be used from the switch to the light.

2.6. Cable in G.I. or R.C pipes in Road and Drain crossing

G.I. pipes/R.C. pipes whatever is applicable and as directed by the Engineer shall be provided for all road and drain crossing. These pipes shall be laid direct in the ground without any sand bed, sand layer, brick or cable covers.

Cables shall laid out of or laid into the ground through G.I. pipe of suitable size as decided by the Engineer. The length of the pipes over the ground shall not be less than 1.2m and no extra cost shall be paid for such pipes. The exposed end of the pipes shall be sealed using PVC or wooden plugs.

2.7. Cable works

2.7.1 Cable Boxes

2.7.1.1 All types of cable and boxes shall be of cast iron and shall comply with latest Bangladesh Government Specification and as per drawing. All other accessories shall be approved type and design and shall be approved by the Engineer.

2.7.1.2 The excavation shall be 1.06M deep and 0.46M wide. The bed surface shall be free from any point sharp materials, Breadth of the trench shall be increased by 0.61M on a joint point.

2.8 Crossing road, pavement, culvert etc.

In crossing road or pavement, a hume pipe of suitable size shall be provided in the trench shall be covered with pre-cast slabs or blocks of sufficient strength to withstand the load over them.

2.9 Joint Cable

- 2.9.1 While laying the cable it shall be so arranged that cables to be jointed overlap each other by about 0.46M to provide ample length for jointing. Metal serving and armouring shall be removed from both cable to conform to the dimension of the box. The lead sheath (if there by any) is than to be cut off from both cables to box dimension. The belt paper shall be removed to within 25mm of the lead sheathing at each and exposing the insulated core. The insulation shall be removed to the required length. All points shall be sweathed, wiped clean and properly insulated.
- 2.9.2 At least 25mm clearance shall be allowed between the center of each pair or joints. A wad of impregnated tape shall be provided between each core and in tee joints, the armouring shall be properly bound and the box shall be replaced in the filling holes. Necessary tapping up shall be carried out after the compound has cooled.
- 2.9.3 Cables are to be terminated with the cable glands or end box as the case may be with the cable lugs of appropriate size and ratings.
- 2.9.4 Markers shall be provided along the cable routes at each turning point of the trench.
- 2.9.5 Markers shall be made of 3.125mm thick M.S. sheet welded to M.S. angle as shown in the drawing or shall be made of cast iron.

3. EARTH CONTINUITY CONDUCTOR WORKS

The Conductor shall be electrolytic copper of 100% conductivity at 20°C (68° F) (International Annealed Copper standard) with weight resistivity of 0.15328 ohm-gram per sq.m. at 20°C (68° F) and density of 8,890 kg/m³ for meeting the requirements of B.S. 636 : 1969 or its metric adoption.

The earth continuity conductor and earthing lead shall run in accordance with the drawings and direction, and all metal fittings shall be earthed with earth continuity conductors. All the earth continuity conductors from the various circuits, sockets, etc. shall be connected to the earthing block located near the DB/SDB. The earth continuity conductors shall be of sizes as stated in the drawings. All DB/SDB/SB shall be interconnected with earth continuity conductors. The earth continuity conductors shall be drawn along with the cables and no joint shall be allowed from earthing block to the respective earth point. Light and fan points, excepts where indicated other-wise, shall not be earthed.

4. LIGHT FITTINGS AND FIXTURES

The light fittings shall be constructed as per schedule, and shall comply with the relevant requirements of applicable B.S. including B.S. 4533.

The chokes, if applicable, shall comply with the requirements of B.S. 2818, and shall be Thorn, or of equivalent quality and shall have appropriate power factor correction capacitor (250V 3.5MF for 20W and 40W tubes, 5MF for 65W tubes, and 7MF for 80W tubes if used with Thorn chokes : for other chokes of approved best quality, the improved p.f. shall not be less than 0.90).

The starters for fluorescent lights shall be 91W lamp type and shall have built in radio interference suppressor capacitor.

All incandescent light fittings, except where specifically stated other wise, shall have un-switched brass holders for BS 22/25/26 lamp caps complying with B.S. 52 : 1963.

Fixtures near combustible materials shall be so constructed or installed, or equipped with shades or guards that combustible materials shall not be subjected to temperature in excess of 90°c.

Appropriate samples of light fittings with chokes and starters shall be submitted prior to installation.

The light fittings shall be installed in accordance with the applicable fittings layout drawings.

All pendant fittings shall be supported from brass ceiling base plate with at least 9.52mm screw-hub.

The location of outlets shown on diagrammatic wiring plans shall be considered as approximate and it shall be incumbent upon the Contractor, before installation of outlet boxes, to study all pertinent drawings and obtain precise information from the architectural schedule, scale drawings, large scale and full size details of finished rooms and approved shop drawings of other trades. It shall be understood that any outlets may be relocated at a distance not

exceeding 4.57m from the location shown in the drawings. In centering outlets, due allowance shall be made for overhead piping ducts, window and door trim, variations in thickness of furring, plastering etc. as erected, regardless of whatever is shown on small scale drawings. Outlets incorrectly located shall be properly relocated at the Contractor's own cost.

5. DISTRIBUTION BOARD/SUB-DISTRIBUTION BOARD

5.1 DB/SDB Boxes

The DB/SDB Double door boxes shall be as per schedule and shall be safety dead front fixed type having circuit breakers and shall be designed for operation on a 240/415V, 50 Hz, 3 phase, 4 wire system. The panels shall have the phases clearly marked and where required shall have solid neutral buses. The panels shall be constructed with 16 SWG mild steel sheets as per schedule and shall comply with relevant requirements of applicable B.S. including: B.S. 4649, where applicable with standard concentric knockout of required size all around. The Boards shall be painted as per General Notes, General, Painting. The colour of paint shall be as decided by the Engineer. The panels shall be mounted directly on frames. The door is to be provided with flush lock and handle. All doors are to be keyed alike. All hinges shall be concealed.

5.2 Bus-Bar

Bus-Bar shall be of the laminated type, constructed of hard rolled copper each part being finished fitted and bolted together using electroplated steel bolts for assembling. Bus-Bars shall be constructed on the basis of 1.24 Amp per sq.m. cross section metal bars which shall have same width as outside lugs.

O Spacing

The minimum distance bars, metal parts, bus-bar, etc. shall not be less than what is specified below :

Opposite polarity where mounted in the same surface	Opposite polarity where held free in air	Live parts to ground
Not over 250V 31.75mm	19.05mm	12.7mm
Not over 600V 50.80mm	25.40mm	

- 5.3 Conductors and bus-bars shall be located as to be free from physical damage and shall be held firmly in place. The arrangement of bus-bars and conductors shall be such as to avoid overheating due to inductive effects.

The Board shall be installed in accordance with applicable layout drawings. Minimum height to bottom of the Boards from the floor level shall be 610mm maximum height of any circuit breaker/switch shall be 1.83m from the floor level.

The location of DB/SDB shown on diagrammatic wiring plans shall be considered as approximate and it shall be incumbent upon the Contractor, before installation of DB/SDB to study all pertinent drawings and obtain precise information from the architectural schedule, scale drawings large scale and full size details of finished rooms and approved shop drawings of other trades. It shall be understood that DB/SDB may be located at a distance not exceeding 40cm from the location shown on the drawings. In centering DB/SDB due allowance shall be made for piping, ducts, window and door trim, variations in thickness of furring, plastering etc. as erected, regardless of whatever is shown on small scale drawings, DB/SDB located incorrectly shall be properly relocated at Contractor's own cost.

5.4 Meter Board

All meters and cut outs are of ratings given in schedule fixed in 16 SWG sheet steel box with locking arrangement The box must be hammer painted. The materials shall be submitted to the Authority/Engineer..

6. MCB/MCCB

The MCB/MCCB shall be quick-make, quick-break type, and shall have inverse time limit characteristics with instantaneous magnetic trip elements functioning on overloads over the normal operating range. All circuit breakers shall be 'trip-free'. Ratings and frame sizes of breakers shall be in accordance with schedule. All lugs must be of the solderless mechanical type. The MCB must comply with B.S. 3871 : Part-1 (1965) category M4 (5A-60A). Rated voltage 240/415V A.C. 50 Hz, interrupting capacity 4000 amp, capable of providing overload and short circuit protection,

through thermal magnetic trip actions respectively : temperature rating, 40°C tropicalized (moisture-fungus corrosion treated), with contacts of silver alloy : terminal capability upto 70 mm² wire.

The breakers shall be designed manufactured and tested in accordance with B.S. 3871 part-2 or equivalent having the following short circuit rating with overload and short circuit protection with thermal and magnetic tripping action and temperature rating 40° C, tropicalized (moisture fungus corrosion treated) termination capability upto the requirement :

5A	to	60A	SP	4KA	SYM at 230V A.C.
5A			TP	5KA	SYM at 480V A.C.
10A	to	70A	TP	10KA	SYM at 480V A.C.
80A	to	100A	TP	14KA	SYM at 480V A.C.
200A	to	300A	TP	30KA	SYM at 480V A.C.
400A	to	500A	TP	42KA	SYM at 480V A.C.
600A	to	1200A	TP	85KA	SYM at 480V A.C.

7. SWITCH WORKS

The flushed snap plate/grid switches shall be vertical single pole (1-way/2-way) 5A A.C. architrave rocker operated switches white in colour, to B.S. 3676: 1963, complying with the test requirements for inductive, fluorescent or resistive loads specified, and satisfy the best requirements for three types in fluorescent lamp circuit, upto the ratings of these switches as set out in B.S. 3676 amendment 3, 1969. The switches shall have minimum clearance of 3mm between the contacts, and a similar minimum creepage distance. Flush dimmer switch/Fan speed controller white in colour to BS5518: 1977 & BS800 : 1977 or relevant IEC standard complying with test requirement for induction or resistive load specified. All contacts shall be faced with pure silver/silver-cadmium oxide alloy. The switch operating member shall pivot independently of the rocker, making the speed of 'make and break' independent of the speed at which the rocker is operated. Terminal capability : minimum 2 x 2.5 mm² conductors for each. Appropriate samples shall be submitted prior to installation of switches.

Switches shall be installed on switch board or otherwise as per drawings.

8. SWITCH BOARD/DIMMER/FAN SPEED CONTROLLER BOARD WORKS

Switch boards and/or fan dimmer boards shall be as per schedule and shall have plate switches and/or fan dimmer. Switch boards shall have copper earthing block of appropriate size.

The switch boards and fan dimmer boards shall be installed on wall at a height of 1372mm from the floor if not specified otherwise, and at locations shown in applicable layout drawings.

The phase wire shall be connected to the switches and the neutral wire shall be kept solid in all switch connections. The earth continuity conductor (ECC) shall be connected to the earth point inside the switch board. The approved size galvanised steel boxes shall be installed at the time of construction of the wall to avoid chasing in wall.

The location of board shown in diagrammatic wiring plans shall be considered as approximate and it shall be incumbent upon the Contractor, before installation of switch board/regulator board boxes, to study all pertinent drawings and obtain precise information from the architectural schedules, scale drawings, large scale and full size details of finished rooms and approved shop drawings of other trades. It shall be understood that any outlet may be relocated at a distance not exceeding 4.5M from the location shown in the drawings. In earthing outlets, due allowance shall be made for piping, ducts, window and door trim, variations in thickness of furring, plastering, etc. as erected, regardless of whatever is shown on small scale drawings. Switch boards, and other boards located incorrectly shall be properly relocated at Contractor's own cost.

9. EBONITE/ACRYLIC/FORMICA SHEET

(i) Ebonite Sheet

Paper impregnated and press fitted soaked with insulating oil from the Ebonite sheet to be used for switch board, DB/SDB cover. It is a Electrical insulating material and have heat insistent quality. Available in market in Down, Deep brown and bitter chokolate colour leaving different thickness. For switch board 3mm thick sheet will serve the purpose.

- (ii) Acrylic Sheet
Polyvinyl base plastic sheet is available in market in trade name of Acrylic sheet. It can also be used for switch board cover. It is got no insulating on heat resisting quality but available in different thickness and different colour. For switch board 3mm thick sheet with same the purpose and beauty.
- (iii) Formica Sheet
The Formica sheet shall be 3mm thick of approved colour shall be installed on switch board on otherwise mentioned. It has got heat resisting quality.

10. SWITCH SOCKET - OUTLETS

All switch socket outlets, except the shaver sockets, shall be round pin type, white in colour, conforming to B.S. 5733:1979 or relevant IEC Standard. All mouldings shall be made from aminoplastic urea moulding powers to B.S. 1322: 1950 and shall possess high scratch resisting qualities. These shall be supplied with counter sunk cadmium plate fixing screws and mounted in 18 SWG galvanised sheet steel shall be painted as per General Notes, General, -Painting, having brass earth point as per drawings and direction.

The socket/MCB/MCCB shall be installed on wall with lower end of the face plates at height and locations shown in applicable layout drawings.

The fixing of the units on the outlets boxes shall be by means of flat head cadmium plated screws. The flat head of the screw shall be sunk in the plates so as to finish flush with the surface of the cover. The mounting heights of the outlets shall be as shown in the drawings. The earth wire shall be connected to earth point of the boxes of the 3rd pole of the 3-pin sockets, 2-pin socket outlets are for television, shavers, calculator etc.

11. EARTHING DEVICE

- (i) Earth electrode
The pipe earthing electrode shall be buried below ground level, as per schedule by tube-well sinking method. The earthing lead from the DB to the main earthing electrode shall be installed in G.I. pipe of specified diameter. The terminal connected to the earthing electrode shall use a copper clamp of 203x38x6.35mm size for making the connection.
 - a) Pipe Electrode (where applicable)
The earthing inspection pit shall be constructed as per schedule and direction. The pit shall have well formed regular sides. Curing for the R.C., shall be for 4 weeks, and for C.C., brick work and plaster shall be 2 weeks.
- (ii) Earthing Lead
Earthing lead shall consist of copper conductor as per schedule. All terminal lugs shall be of solderless mechanical type of tinned copper and nut-bolts of brass.

The earthing leads from the earth electrode shall be connected to the brass bar of test point. A double run of specified tinned copper conductor shall be brought out as earth lead for the earth electrode through G.I. pipe from the electrode and connected to the brass bar. There shall no joint in the copper earth lead. All earthing lead shall follow the shortest and most direct route to earth electrodes and sharp bends and joints shall be avoided. The earthing leads shall be connected to the earth electrode as per drawings. The joints shall be made mechanically strong and electrically continuous with minimum of resistance.

Earthing lead shall consist of copper conductor as per specification given in Art 2.03a. All terminal lugs shall be of copper and nut-bolts of brass.
- (iii) Earthing Block
The earthing block shall be of solid electrolytic copper, cast and machined, of size as per schedule having at least 10mm dia drilled, holes for accommodating the terminals of the earth continuity conductor. Requisite number of brass nuts and bolts shall also be provided.
- (iv) Earth Inspection Pit
Bricks used shall be 1st class. Only approved best quality cement shall be used. Jhama brick khoa for R.C.C. cover shall be 25mm down graded (upto 6mm) and shall be washed clean before casting, 8mm dia M.S. rod @ 25mm c/c, with two 9.5mm dia, M.S. hook (of 50mm diameter) shall be provided in the cover slab.

(v) Earth Loop Resistance

The maximum earth loop resistance from any point in the installation including earthing lead to the earthing electrode shall not exceed the resistance specified in the schedule, or that indicated by the Engineer. The Contractor shall ensure that the leads are efficiently bonded to all metal works other than the current carrying parts, so that the above resistance level is not exceeded. It will be the duty of the Contractor to provide earth tester for test of installation in presence of the authorised representative of the Engineer, and submit earth test report to the Engineer for approval.

12. LIGHTNING PROTECTION

12.1 Air-Terminals

Air-terminals shall be of copper of grade required for commercial electrical work, generally designated as being of 98 percent conductivity when annealed. The size and shape of the air-terminal shall be as per drawings and schedule.

Air-terminals shall be clamped with the building as per drawings and in manner that there is no possibility of overturning. Where necessary, additional braces, permanently and rigidly attached with the building, shall be used. On mortar and brick work, all holes shall be made with proper tools, such as a Rawl bits, and shall be made in brick rather than in the mortar joint.

All air-terminals shall be installed in a manner to bring the tip not less than 300mm above the object to be protected.

12.2 Roof Conductor

Roof conductors shall be made of copper of grade as specified in Art. 12.

Roof conductors shall be continuous and without any joint between terminations. All terminations shall be permanent, both electrically and mechanically. Where jointing in a conductor is absolutely unavoidable it shall be made after express consent of the Engineer. The joint shall be mechanically strong and well made and provide adequate electrical conductivity, which shall be secured by a contact area not less than double the conducting cross-sectional area of the conductor.

No bend in the conductor shall have a radius of less than 200mm and the angle of any turn shall not be less than 90°. All conductor runs shall preserve a downward or horizontal course.

The conductor shall be securely attached to the building by means of fasteners at intervals not exceeding 1.2m, and shall be embedded under roof finish or concealed in plaster. Fasteners shall have cross section not less than 14 SWG and shall be made of copper.

12.3 Down Conductor

The down conductor shall be continuous and shall be installed as indicated in the schedule.

12.4 Test Point

The test point shall be made as per schedule and drawings. The brass bar assembly shall be well-formed and shall be without filling. The conductor terminals shall be provided with tinned copper lugs of size as detailed in the drawings.

The test point shall be installed during construction of the building wall and made flush with the outside walls finish.

Copper lugs shall be press-fitted with the conductor terminals with crimping tools, or shall use cast brass lug-block with brass nuts. The lug shall be bolted with the brass-bar by means of brass nuts and bolts.

14. Danger Plate

14.1. The danger plate shall be displayed in each pole with red pattering on white back ground. The lettering shall be in English and Bengali stating " DANGER", "CAUTION" and " PRESSURE".

14.2. The size of the plate will be 250mm x 150mm x 3.175mm of M.S. plate and the size of letter will be 38mm in height.

14.3. Non - Climbing Device

- 14.4 Non - climbing device of flat iron bar welded with ring from spike as per drawing shall be in each pole.
- 14.5 Barbed wire device may also be used covering 50mm space of the pole as per direction of the EMPLOYER/CONSULTANT.

15. Fluorescent, Mercury Lamps, etc

- 15.1 All discharge lamp (fluorescent, mercury, etc.) lighting fixtures furnished as part of the electrical work shall conform to the following and the fittings shall be suitable to operate on the main particulars of which are given below.
 - a. Number of Phase - Single phase
 - b. Voltage - 230 Volts \pm 5%
 - c. Frequency - 50c/s.
 - d. Type - Alternating current.
- 15.2 The fluorescent lamp shall be high power factor operation, tubular in shape for general lighting service.
- 15.3 The colour shall be day light.
- 15.4 Ballast and capacitor shall be rigidly mounted to the inside of the top of the fixture housing with ballast surface and housing in complete contact for efficient conduction of ballast heat, Ballast mounting shall be permanently affixed to the housing.
- 15.5 The diffusers shall be glare free, moulded out of 3.175mm thick opal materials of uniform density and sturdy construction. The diffusers shall be quick detachable type and shall be supplied as asked for in the schedule of quantities.

16 Contractors, Equipment and Materials Acceptance

The contractor shall comply with the following in order to obtain approval for the use of contractor's equipment and materials.

The contractor shall submit a list which includes:

- (a) A list of the manufacturers of equipment of materials proposed for the contract works.

Each item of equipment shall be a standard catalogue product of an established, reputable, approved manufacturer. All similar equipment shall be of the same manufacturer, type, class and finish, unless otherwise specified.

Where manufacturer's catalogue numbers of types are specified or shown on the drawings they are generally intended to be used as a guide and are not included to take precedence over the basic duty and performance specified or shown. In all cases verify the duty with the particular characteristics of the equipment offered for approval.

Where no alternative materials are noted in this specification or on the drawings and where the words "equal", "approved equal" or "as approved" etc. do not appear, the text make specified must be supplied and installed.

Generally, single core cable (non-sheathed) is to be installed in conduits/channel. It must be ensured that cables are not scratched damaged during pulling.

The cables up to 2.5mm² sizes shall be solid conductor and, therefore, jointing of these cables is to be done through porcelain connector and the connector shall be wound with PIB tape before placing

All cables used must maintain the colour code i.e. Red, Yellow and Blue for Phase, Black for neutral, Green for earth and others as per general rules of electrical cabling system.

ATS, ESDB, AVR and other electrical equipment shall be installed as per instruction of engineer in charge.

The vendor shall maintain the liaison with BPDB (if necessary).

Before the installation is finally handed over to CHTDF-UNDP the vendor shall prepare and submit the as built drawing to CHTDF-UNDP for approval.

As-Built/Record drawings showing layout of all electrical/LAN fixtures and Boards and positions and layout of conduits and exposed wiring if any and cable runs with dimensions and full circuit details.

The installation shall not be considered complete till the As-Built Drawings free from incompleteness and errors

Before the installation is finally handed over to CHTDF-UNDP, the vendor shall balance the load in a possible manner and submit for approval.

Annex IV:

General Terms and Conditions

1. ACCEPTANCE OF THE PURCHASE ORDER

This Purchase Order may only be accepted by the Supplier's signing and returning an acknowledgement copy of it or by timely delivery of the goods in accordance with the terms of this Purchase Order, as herein specified. Acceptance of this Purchase Order shall effect a contract between the Parties under which the rights and obligations of the Parties shall be governed solely by the terms and conditions of this Purchase Order, including these General Conditions. No additional or inconsistent provisions proposed by the Supplier shall bind UNDP unless agreed to in writing by a duly authorized official of UNDP.

2. PAYMENT

2.1 UNDP shall, on fulfillment of the Delivery Terms, unless otherwise provided in this Purchase Order, make payment within 30 days of receipt of the Supplier's invoice for the goods and copies of the shipping documents specified in this Purchase Order.

2.2 Payment against the invoice referred to above will reflect any discount shown under the payment terms of this Purchase Order, provided payment is made within the period required by such payment terms.

2.3 Unless authorized by UNDP, the Supplier shall submit one invoice in respect of this Purchase Order, and such invoice must indicate the Purchase Order's identification number.

2.4 The prices shown in this Purchase Order may not be increased except by express written agreement of UNDP.

3. TAX EXEMPTION

3.1 Section 7 of the Convention on the Privileges and Immunities of the United Nations provides, inter alia, that the United Nations, including its subsidiary organs, is exempt from all direct taxes, except charges for utilities services, and is exempt from customs duties and charges of a similar nature in respect of articles imported or exported for its official use. In the event any governmental authority refuses to recognize UNDP's exemption from such taxes, duties or charges, the Supplier shall immediately consult with UNDP to determine a mutually acceptable procedure.

3.2 Accordingly, the Supplier authorizes UNDP to deduct from the Supplier's invoice any amount representing such taxes, duties or charges, unless the Supplier has consulted with UNDP before the payment thereof and UNDP has, in each instance, specifically authorized the Supplier to pay such taxes, duties or charges under protest. In that event, the Supplier shall provide UNDP with written evidence that payment of such taxes, duties or charges has been made and appropriately authorized.

4. RISK OF LOSS

Risk of loss, damage to or destruction of the goods shall be governed in accordance with Incoterms 2010, unless otherwise agreed upon by the Parties on the front side of this Purchase Order.

5. EXPORT LICENCES

Notwithstanding any INCOTERM 2010 used in this Purchase Order, the Supplier shall obtain any export licences required for the goods.

6. FITNESS OF GOODS/PACKAGING

The Supplier warrants that the goods, including packaging, conform to the specifications for the goods ordered under this Purchase Order and are fit for the purposes for which such goods are ordinarily used and for purposes expressly made known to the Supplier by UNDP, and are free from defects in workmanship and materials. The Supplier also warrants that the goods are contained or packaged adequately to protect the goods.

7. INSPECTION

7.1 UNDP shall have a reasonable time after delivery of the goods to inspect them and to reject and refuse acceptance of goods not conforming to this Purchase Order; payment for goods pursuant to this Purchase Order shall not be deemed an acceptance of the goods.

7.2 Inspection prior to shipment does not relieve the Supplier from any of its contractual obligations.

8. INTELLECTUAL PROPERTY INFRINGEMENT

The Supplier warrants that the use or supply by UNDP of the goods sold under this Purchase Order does not infringe any patent, design, trade-name or trade-mark. In addition, the Supplier shall, pursuant to this warranty, indemnify, defend and hold UNDP and the United Nations harmless from any actions or claims brought against UNDP or the United Nations pertaining to the alleged infringement of a patent, design, trade-name or trade-mark arising in connection with the goods sold under this Purchase Order.

9. RIGHTS OF UNDP

In case of failure by the Supplier to fulfil its obligations under the terms and conditions of this Purchase Order, including but not limited to failure to obtain necessary export licences, or to make delivery of all or part of the goods by the agreed delivery date or dates, UNDP may, after giving the Supplier reasonable notice to perform and without prejudice to any other rights or remedies, exercise one or more of the following rights:

- 9.1 Procure all or part of the goods from other sources, in which event UNDP may hold the Supplier responsible for any excess cost occasioned thereby.
- 9.2 Refuse to accept delivery of all or part of the goods.
- 9.3 Cancel this Purchase Order without any liability for termination charges or any other liability of any kind of UNDP.

10. LATE DELIVERY

Without limiting any other rights or obligations of the parties hereunder, if the Supplier will be unable to deliver the goods by the delivery date(s) stipulated in this Purchase Order, the Supplier shall (i) immediately consult with UNDP to determine the most expeditious means for delivering the goods and (ii) use an expedited means of delivery, at the Supplier's cost (unless the delay is due to Force Majeure), if reasonably so requested by UNDP.

11. ASSIGNMENT AND INSOLVENCY

- 11.1. The Supplier shall not, except after obtaining the written consent of UNDP, assign, transfer, pledge or make other disposition of this Purchase Order, or any part thereof, or any of the Supplier's rights or obligations under this Purchase Order.
- 11.2. Should the Supplier become insolvent or should control of the Supplier change by virtue of insolvency, UNDP may, without prejudice to any other rights or remedies, immediately terminate this Purchase Order by giving the Supplier written notice of termination.

12. USE OF UNDP OR UNITED NATIONS NAME OR EMBLEM

The Supplier shall not use the name, emblem or official seal of UNDP or the United Nations for any purpose.

13. PROHIBITION ON ADVERTISING

The Supplier shall not advertise or otherwise make public that it is furnishing goods or services to UNDP without specific permission of UNDP in each instance.

14. CHILD LABOUR

The Supplier represents and warrants that neither it nor any of its affiliates is engaged in any practice inconsistent with the rights set forth in the Convention on the Rights of the Child, including Article 32 thereof, which, inter alia, requires that a child shall be protected from performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development.

Any breach of this representation and warranty shall entitle UNDP to terminate this Purchase Order immediately upon notice to the Supplier, without any liability for termination charges or any other liability of any kind of UNDP.

15. MINES

The Supplier represents and warrants that neither it nor any of its affiliates is actively and directly engaged in patent activities, development, assembly, production, trade or manufacture of mines or in such activities in respect of components primarily utilized in the manufacture of Mines. The term "Mines" means those devices defined in Article 2, Paragraphs 1, 4 and 5 of Protocol II annexed to the Convention on Prohibitions and Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects of 1980.

Any breach of this representation and warranty shall entitle UNDP to terminate this Purchase Order immediately upon notice to the Supplier, without any liability for termination charges or any other liability of any kind of UNDP.

16. SETTLEMENT OF DISPUTES

16.1 Amicable Settlement. The Parties shall use their best efforts to settle amicably any dispute, controversy or claim arising out of, or relating to this Purchase Order or the breach, termination or invalidity thereof. Where the Parties wish to seek such an amicable settlement through conciliation, the conciliation shall take place in accordance with the UNCITRAL Conciliation Rules then obtaining, or according to such other procedure as may be agreed between the Parties.

16.2 Arbitration. Unless, any such dispute, controversy or claim between the Parties arising out of or relating to this Purchase Order or the breach, termination or invalidity thereof is settled amicably under the preceding paragraph of this Section within sixty (60) days after receipt by one Party of the other Party's request for such amicable settlement, such dispute, controversy or claim shall be referred by either Party to arbitration in accordance with the UNCITRAL Arbitration Rules then obtaining, including its provisions on applicable law. The arbitral tribunal shall have no authority to award punitive damages. The Parties shall be bound by any arbitration award rendered as a result of such arbitration as the final adjudication of any such controversy, claim or dispute.

17. PRIVILEGES AND IMMUNITIES

Nothing in or related to these General Terms and Conditions or this Purchase Order shall be deemed a waiver of any of the privileges and immunities of the United Nations, including its subsidiary organs.

18. SEXUAL EXPLOITATION:

18.1 The Contractor shall take all appropriate measures to prevent sexual exploitation or abuse of anyone by it or by any of its employees or any other persons who may be engaged by the Contractor to perform any services under the Contract. For these purposes, sexual activity with any person less than eighteen years of age, regardless of any laws relating to consent, shall constitute the sexual exploitation and abuse of such person. In addition, the Contractor shall refrain from, and shall take all appropriate measures to prohibit its employees or other persons engaged by it from, exchanging any money, goods, services, offers of employment or other things of value, for sexual favors or activities, or from engaging in any sexual activities that are exploitive or degrading to any person. The Contractor acknowledges and agrees that the provisions hereof constitute an essential term of the Contract and that any breach of this representation and warranty shall entitle UNDP to terminate the Contract immediately upon notice to the Contractor, without any liability for termination charges or any other liability of any kind.

18.2 UNDP shall not apply the foregoing standard relating to age in any case in which the Contractor's personnel or any other person who may be engaged by the Contractor to perform any services under the Contract is married to the person less than the age of eighteen years with whom sexual activity has occurred and in which such marriage is recognized as valid under the laws of the country of citizenship of such Contractor's personnel or such other person who may be engaged by the Contractor to perform any services under the Contract.

19.0 OFFICIALS NOT TO BENEFIT:

The Contractor warrants that no official of UNDP or the United Nations has received or will be offered by the Contractor any direct or indirect benefit arising from this Contract or the award thereof. The Contractor agrees that breach of this provision is a breach of an essential term of this Contract.

20. AUTHORITY TO MODIFY:

Pursuant to the Financial Regulations and Rules of UNDP, only the UNDP Authorized Official possess the authority to agree on behalf of UNDP to any modification of or change in this Agreement, to a waiver of any of its provisions or to any additional contractual relationship of any kind with the Contractor. Accordingly, no modification or change in this Contract shall be valid and enforceable against UNDP unless provided by an amendment to this Agreement signed by the Contractor and jointly by the UNDP Authorized Official.