

Subhead 4

Boards & Controls

Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna,Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
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4.1 SUB DISTRIBUTION BOARD (SDB)

Providing & fixing 250V, 50 Hz grade following concealed type sub-distribution board made of 18-SWG MS sheet complete with hinged type door, built-in type locking arrangement, one no. 60 A capacity bus-bar with required no. of holes thereon on insulators at both ends, copper blocks for neutral and earth terminal, SPMCBs Manufactured / Assembled and tested in accordance with IEC / VDE / NEMA / BS / JIS along with relevant BDS IEC standard having minimum breaking capacity 6 / 10-KA with thermal over current and instantaneous electromagnetic short circuit release, necessary arrangement for fixing of MCBs duly painted with powder coating with epoxy polyester resin on all surfaces of board (gray / off-white) etc. In front side there will be tempered thick fiber glass of minimum 8 mm thickness with rubber gaskets etc. with SPMCBs accepted / approved by the Engineer-in-charge.

- 4.1.1 3-Way SDB (with box size minimum 220mm x 132mmx148mm)
in-coming :1 x 20 amps (6 KA) & out-going: 3 x 5 / 10 amps SPMCB(6 KA).

Each 4,301.00 4,300.00 4,295.00 4,295.00

- 4.1.2 4-Way SDB (with box size minimum 220mmx 132mmx148mm)
in-coming : 1 x 30 amps (6 KA) & out-going :4 x 5 / 10 / 15 amps
SPMCB (6 KA) .

Each. 5,037.00 5,036.00 5,031.00 5,031.00

4.2 SINGLE PHASE DISTRIBUTION BOARD (SPDB)

Providing and fixing single phase distribution board (SPDB) [concealed / surface] having the following components and specifications: [Fig : 4.2]

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1. Steel board : Approximate size: 20"x15"x4"
 MS sheet : 18SWG with hinged type door and locking arrangement duly painted with powder coating with epoxy polyester resin on all surfaces of board (gray / off-white) etc. In front side there will be tempered thick fiber glass of minimum 8 mm thickness with rubber gaskets to observe the inside arrangement.
2. Copper bar: Approximate size: 10"x 1"x 3mm(2 nos) and 6"x 1"x 3mm, (1 no) mounted on insulator at both ends, capacity: 60-100A .
3. 1 No. DPMCB(main control) and following nos.SPMCB, DPMCB and SPMCB Manufactured / Assembled and tested in accordance with relevant BDS IEC 60898-1:2016 and IEC / VDE / NEMA / BS / JIS standard.
 Minimum breaking capacity 6/10 KA with thermal overcurrent and instantaneous electromagnetic short circuit release.
4. Loop Cable [from phase bar to SPMCB(circuit & power)]
 Size: 1C-1x2.5 sq mm (BYM) with DPMCB and SPMCBs accepted / approved by the Engineer-in-charge.

4.2.1 6-way SPDB

Incoming : 1x40A DPMCB (6 KA)

Outgoing : 6x5-10A SPMCB (6 KA)

Each.

12,829.00

12,828.00

12,823.00

12,823.00

4.2.2 8-way SPDB

Incoming : 1x50A DPMCB (10 KA)

Outgoing : 8x5-10A SPMCB-(10 KA)

Each.

14,179.00

14,177.00

14,172.00

14,172.00

4.2.3 10-way SPDB

Incoming : 1x60A/63A DPMCB (10 KA)

Outgoing : 10x5-10A SPMCB (10 KA)

Each.

16,571.00

16,570.00

16,565.00

16,565.00

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4.3 THREE PHASE DISTRIBUTION BOARD (TPDB)

Providing and fixing three phase distribution board (TPDB) [concealed / surface] having the following components and specifications: [Fig : 4.3]

1. Steel board : Approximate size 36"x30"x6"

MS sheet:18SWG with hinged type door and locking arrangement duly painted with powder coating with epoxy polyester resin on all surfaces of board (gray / off-white) etc. In front side there will be tempered thick fiber glass of minimum 8 mm thickness with rubber gaskets to observe the inside arrangement.

2. Copper bar : size 12"x1"x6 mm(4 No's) and 6"x1"x5mm(1 No) mounted on insulator at both ends. Capacity : 200-300A

3. 1 no. TPMCCB (main control) and following nos. TPMCCB for feeders. TPMCCB's are Manufactured / Assembled and tested in accordance with IEC / VDE / NEMA / BS / JIS along with relevant BDS IEC standard. Minimum breaking capacity 10-16 KA with thermal overcurrent and instantaneous electromagnetic short circuit release.

4. Loop Cable: From phase bar to TPMCCB (circuit & power)

Cable Size: As required compatible with circuit breaker with TPMCCBs accepted / approved by the Engineer-in-charge.

4.3.1 100A TPDB

Incoming : 1x100A TPMCCB (10 KA)	Each.	64,284.00	64,283.00	64,276.00	64,276.00
Outgoing: 6x10-20A TPMCCB (10 KA)					

4.3.2 150A TPDB

Incoming : 1x150A TPMCCB (16 KA)	Each.	83,917.00	83,916.00	83,909.00	83,909.00
Outgoing: 8x10-30A TPMCCB (10 KA)					

4.3.3 200A TPDB

Incoming : 1x200A TPMCCB (16 KA)	Each.	106,004.00	106,003.00	105,996.00	105,996.00
Outgoing: 10x10-30A TPMCCB (10 KA)					

(Handwritten signatures and initials follow)

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4.4	CIRCUIT BREAKER (SPMCB)					

Providing & fixing on a prepared board 250 volt grade following single pole miniature circuit breaker (SPMCBs) having minimum breaking capacity 6-KA / 10 KA with thermal over-current and instantaneous electromagnetic short circuit release provision as per BDS IEC and IEC / VDE / NEMA / BS / JIS standard.

4.4.1 SPMCBs accepted / approved by the Engineer-in-charge.

4.4.1.1 5 - 40 Amps (minimum 6 KA) MCB	Each	780.00	780.00	779.00	779.00
4.4.1.2 60/63 Amps (minimum 10 KA) MCB	Each	964.00	964.00	963.00	963.00

4.5 TPMCB

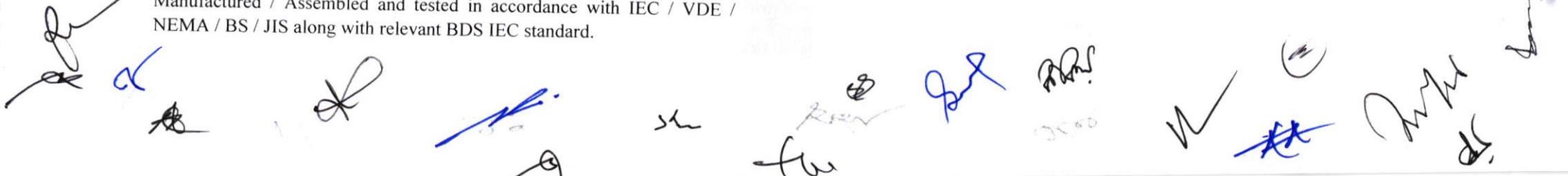
Providing & fixing on a prepared board 500 volt grade following Triple pole miniature circuit Breaker (TPMCB) having minimum breaking capacity 6-KA/ 10 KA with thermal over-current and instantaneous electromagnetic short circuit release provision as per BDS IEC and IEC / VDE / NEMA / BS / JIS standard.

4.5.1 TPMCBs accepted / approved by the Engineer-in-charge.

4.5.1.1 5 - 60 Amps.	Each	4,030.00	4,030.00	4,028.00	4,028.00
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4.6 TPMCCB

Providing & fixing on a prepared board 500 volt grade following triple-pole molded case circuit breaker (TPMCCB) with thermal over-current and instantaneous electromagnetic short circuit release provision, Manufactured / Assembled and tested in accordance with IEC / VDE / NEMA / BS / JIS along with relevant BDS IEC standard.



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TPMCCBs accepted / approved by the Engineer-in-charge.						
4.6.1	15 - 100 Amps. (Minimum 10-KA)	Each	7,466.00	7,466.00	7,464.00	7,464.00
4.6.2	120 - 200 Amps. (Minimum 16-KA)	Each	8,816.00	8,816.00	8,813.00	8,813.00
4.7 BUSBAR						
Providing and fixing 500 V 3-phase busbar system assembled in prelaid board with porcelain insulators. There will be equal size holes on every bar at 0.5" interval and bar to bar gap shall be 2" - 3".						
4.7.1	<u>60 - 100 Amps.</u> Copper flat bar (5 nos) : 4 nos 9" x1"x3mm and 1 no 4"x1"x4mm for earthing mounted on insulator at both ends individually.	Each	2,544.00	2,544.00	2,543.00	2,543.00
4.7.2	<u>200 - 300 Amps.</u> Copper flat bar (5 nos) : 4 nos 15"x1"x8mm and 1 no 4"x1"x8mm for earthing mounted on insulator at both ends individually.	Each	6,225.00	6,225.00	6,224.00	6,224.00
4.7.3	<u>400 - 500 Amps.</u> Copper flat bar (5 nos) : 4 nos 18"x1.5"x10mm and 1 no 4"x1.5"x10mm for earthing mounted on insulator at both ends individually.	Each	7,698.00	7,698.00	7,697.00	7,697.00
4.7.4	<u>600 - 800 Amps.</u> Copper flat bar (5 nos) : 4 nos 18"x2"x10mm and 1 no 4"x2"x10mm for earthing mounted on insulator at both ends individually.	Each	10,397.00	10,397.00	10,396.00	10,396.00
4.7.5	<u>900 - 1000 Amps.</u> Copper flat bar (5 nos) : 4 nos 20"x2"x12mm and 1 no 4"x2"x12mm for earthing mounted on insulator at both ends individually.	Each	13,833.00	13,833.00	13,832.00	13,832.00

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4.8	BUSBAR TRUNKING SYSTEM					

Supply and fixing bus bar trunking system (800 A and above) both feeder and plugging having the following specification :-

Rated operation voltage 1000V 3-phase, 5 wire .

All bus-bar trunking products and fixing (straight length, elbow, tees, flanged ends, cable tap box and circuit breaker etc.) shall be in accordance with IEC61439 ; 2012 or UL 857 and from the same manufacturer as per bus bar trunking system.

Short circuit rating : 800 A - 1000 A (40-60 KA/sec)

2500 A - 4000 A (165 -220 KA/sec)

Housing: Constructed of code gauge steel and aluminum to reduce hysteresis and eddy current losses. It shall be totally enclosed non ventilated and anticorrosive ability.

Bus bar: Hard drawn silver plated high conductivity copper of 99.9% purity.

Bus-bar insulation :Class B or class F rated polyester film. (no epoxy insulation).

Joint: Bus bar trunking joint shall be of the one-bolt type and shall be possible to remove any joint connection assembly to allow electrical isolation of bus bar trunking length.

Indoor feeder and plug-in trunking shall be hanged 3 meters horizontally and 4.88 meters vertically spacing.

Line to line voltage drop shall not exceed 4% when connected at full load. Temperature rise at any point of the bus bar trunking enclosure shall no exceed 55°C.

4.8.1 Bus bar trunking system with flange, elbow, plug in points and fixing supports.

4.8.1.1 800 A

meter 137,610.00 137,610.00 137,607.00 137,607.00

4.8.1.2 1000 A

meter 142,518.00 142,518.00 142,516.00 142,516.00

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4.8.1.3	1250 A	meter	146,199.00	146,199.00	146,197.00	146,197.00
4.8.1.4	1600 A	meter	153,561.00	153,561.00	153,559.00	153,559.00
4.8.1.5	2000 A	meter	191,600.00	191,600.00	191,597.00	191,597.00
4.8.1.6	2500 A	meter	254,179.00	254,179.00	254,177.00	254,177.00
4.8.1.7	3200 A	meter	310,624.00	310,624.00	310,621.00	310,621.00
4.8.1.8	4000 A	meter	375,657.00	375,657.00	375,655.00	375,655.00
4.8.1.9	5000 A	meter	417,377.00	417,377.00	417,374.00	417,374.00
4.8.2	Tap of box with TPMCCB of following ratings.					
4.8.2.1	16 A - 100 A	Each	34,676.00	34,676.00	34,673.00	34,673.00
4.8.2.2	125 A - 160 A	Each	39,400.00	39,400.00	39,397.00	39,397.00
4.8.2.3	200 A - 250 A	Each	42,161.00	42,161.00	42,158.00	42,158.00
4.8.2.4	400 A	Each	73,757.00	73,757.00	73,755.00	73,755.00
4.8.2.5	500 A	Each	103,206.00	103,206.00	103,204.00	103,204.00
4.8.2.6	630 A	Each	153,515.00	153,515.00	153,513.00	153,513.00
4.8.2.7	800 A	Each	252,600.00	252,600.00	252,597.00	252,597.00

4.9 BOARD

Supplying and fixing of almirah type 18 SWG metal board of depth 228mm (6") duly painted with powder coating with epoxy polyester resin on all surfaces of board (gray / off-white) having built in push type / suitable locking arrangement including metal bridges of suitable size for fixing of all electrical control devices complete with suitable anchoring arrangement in wall / column and keeping provision

for cable inlets and exits as required (only front surface of the board will be considered for measurement) accepted/approved by the Engineer-in-charge.

4.9.1 Normal board (without water tight) Per sq.m 16,939.00 16,938.00 16,933.00 16,933.00

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4.9.2	With water tight arrangement.	Per sq.m	17,553.00	17,552.00	17,547.00	17,547.00
4.9.3	With Glass Cover The front side of the boards should be covered with required size tempered thick fiber glass of minimum 8 mm thickness with rubber gaskets to observe the inside arrangement.	Per sq.m	18,780.00	18,779.00	18,774.00	18,774.00
4.9.4	Pedestal Type Providing and fixing of pedestal type 18 SWG M.S. sheet steel board for outside use with proper reinforcement by M.S. flat bars, water tight arrangement duly painted with powder coated paint over prime anticorrosive red oxide coat fitted on floor with necessary cc work, angle iron clamps / legs as per direction of the Engineer.	Per sq.m	5,605.00	5,603.00	5,598.00	5,598.00
4.9.5	G.P. Sheet Board Supplying and fixing of surface / concealed 18 SWG G.P. sheet board of 76.2 mm(3") depth(with open front) duly painted inner & outer surfaces with gray enamel paint, anchoring arrangement to be fitted in wall (only back surface of the board will be considered for measurement).	Per sq.m	6,701.00	6,701.00	6,700.00	6,700.00
4.9.6	PVC Board Supplying and fixing of surface / concealed type self-extinguishing PVC board of 76.2 mm(3") depth (with open front) duly painted inner & outer surfaces with anchoring arrangement to be fitted in wall (only back surface of the board will be considered for measurement).	Per sq.m	5,965.00	5,965.00	5,963.00	5,963.00

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4.9.7 Ebonite Sheet

Providing and fixing of 3mm.thick ebonite sheet cover including making hole / groove etc. as required.

Per sq.m

1,639.00

1,639.00

1,638.00

1,638.00

4.10 SOCKET OUTLETS

Providing & fixing 250 volt single phase 3-pin combined switch socket outlet (surface / Concealed type) Manufactured / Assembled and tested in accordance with IEC / VDE / NEMA / BS / JIS along with relevant BDS IEC standard, mounted on required size 18 SWG galvanized plain sheet board / Plastic Board (Self-extinguishing 650 degree centigrade) of 76.2 mm. (3") depth. (Manufacturer shall have certificate of standard which they follow).

4.10.1 13 / 15 / 16 / 20 Amps.

4.10.1.1 Made in ENGLAND / GERMANY / JAPAN / USA or EU countries	Each	1,066.00	1,066.00	1,066.00	1,066.00
4.10.1.2 Made in HONGKONG / MALAYSIA / SINGAPORE / S KOREA / THAILAND	Each	501.00	500.00	500.00	500.00
4.10.1.3 Assembled and made in BANGLADESH / CHINA / INDIA / TURKEY / VIETNAM	Each	384.00	383.00	383.00	383.00

4.10.2 5 - 10 Amps.

4.10.2.1 Made in ENGLAND / GERMANY / JAPAN / USA or EU countries .	Each.	912.00	911.00	911.00	911.00
4.10.2.2 Made in HONGKONG / MALAYSIA / SINGAPORE / S KOREA / THAILAND	Each.	728.00	727.00	727.00	727.00
4.10.2.3 Assembled and made in BANGLADESH / CHINA / INDIA / TURKEY / VIETNAM	Each.	323.00	322.00	322.00	322.00

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4.11 UNIVERSAL COMBINED SWITCH SOCKET OUTLET (SURFACE/CONCEALED TYPE)

Providing & fixing 250 volt single phase universal combined switch socket outlet (surface / concealed type) Manufactured/ Assembled and tested in accordance with IEC / VDE / NEMA / BS / JIS along with relevant BDS IEC standards mounted on required size 18 SWG galvanized plain sheet board / plastic board (self-extinguishing 650 degree centigrade) of 76.2 mm. (3") depth. Sample to be approved by the Engineer-in-charge. Manufacturer shall have certificate of standard which they follow.

4.11.1 13 / 15 / 16 / 20 Amps.

4.11.1.1 Made in HONGKONG / MALAYSIA / SINGAPORE / S KOREA / THAILAND

Each. 942.00 942.00 942.00 942.00

4.11.1.2 Assembled and made in BANGLADESH / CHINA / INDIA / TURKEY / VIETNAM

Each. 421.00 420.00 420.00 420.00

4.11.2 5 - 10 Amps.

4.11.2.1 Made in HONGKONG / MALAYSIA / SINGAPORE / S KOREA / THAILAND

Each. 715.00 715.00 715.00 715.00

4.11.2.2 Assembled and made in BANGLADESH / CHINA / INDIA / TURKEY / VIETNAM

Each. 445.00 445.00 445.00 445.00

4.12 GANG SWITCH.

Providing & fixing 250 volts. 5 / 6 amps (minimum) concealed type following switch / switch socket Manufactured / Assembled and tested in accordance with IEC / VDE / NEMA / BS / JIS along with relevant BDS IEC standards mounted on required size 18 SWG galvanized plain sheet / PVC board (Self-extinguishing 650 Degree Centigrade) of 76.2 mm (3") depth. All electrical contacts shall be of brass / copper.

(Signature)

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4.12.1 MADE IN ENGLAND / GERMANY / JAPAN / USA or EU countries

4.12.1.1 One gang switch	Each.	574.00	574.00	574.00	574.00
4.12.1.2 Two gang switch	Each.	951.00	950.00	950.00	950.00
4.12.1.3 Three gang switch	Each.	1,458.00	1,457.00	1,457.00	1,457.00
4.12.1.4 One gang switch & one 5/10 amps. 2-pin socket combined.	Each.	1,323.00	1,322.00	1,322.00	1,322.00

4.12.2 MADE IN HONGKONG / MALAYSIA / SINGAPORE / S KOREA / THAILAND

4.12.2.1 One gang switch	Each.	218.00	218.00	218.00	218.00
4.12.2.2 Two gang switch	Each.	375.00	375.00	375.00	375.00
4.12.2.3 Three gang switch	Each.	514.00	514.00	514.00	514.00
4.12.2.4 Four gang switch	Each.	763.00	763.00	763.00	763.00
4.12.2.5 One gang switch & one 5/10 Amps. 2-pin socket combined.	Each.	512.00	511.00	511.00	511.00
4.12.2.6 20 AMP DP Switch	Each.	930.00	929.00	929.00	929.00

4.12.3 ASSEMBLED AND MADE IN BANGLADESH / CHINA / INDIA / TURKEY / VIETNAM

4.12.3.1	One gang switch	Each.	151.00	150.00	150.00	150.00
4.12.3.2	Two gang switch	Each.	200.00	199.00	199.00	199.00
4.12.3.3	Three gang switch	Each.	243.00	242.00	242.00	242.00
4.12.3.4	Four gang switch	Each.	323.00	322.00	322.00	322.00
4.12.3.5	One gang DP switch with Neon and earth	Each.	432.00	431.00	431.00	431.00
4.12.3.6	One gang switch & one 5/10 Amps. 2-pin socket combined.	Each.	323.00	322.00	322.00	322.00

4.13 GANG TYPE FAN REGULATOR

4.13.1 Made in ENGLAND / GERMANY / JAPAN / USA or EU countries . Each. 1,525.00 1,525.00 1,525.00 1,525.00
4.13.2 Made in HONGKONG / MALAYSIA / SINGAPORE / S KOREA / THAILAND Each. 1,187.00 1,186.00 1,186.00 1,186.00

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4.13.3	Assembled and made in BANGLADESH / CHINA / INDIA / TURKEY / VIETNAM	Each.	593.00	592.00	592.00	592.00
4.14	<u>GANG TYPE CALLING BELL PUSH</u>					
4.14.1	Made in ENGLAND / GERMANY / JAPAN / USA or EU countries .	Each.	998.00	997.00	997.00	997.00
4.14.2	Made in MALAYSIA / THAILAND / SINGAPORE / HONGKONG / S.KOREA	Each.	482.00	482.00	482.00	482.00
4.14.3	Assembled and made in BANGLADESH / CHINA / VIETNAM / INDIA / TURKEY	Each.	200.00	199.00	199.00	199.00
4.15	<u>GANG TYPE TELEPHONE/TV SOCKET</u>					
4.15.1	Made in ENGLAND / GERMANY / JAPAN / USA or EU countries .	Each.	1,418.00	1,418.00	1,418.00	1,418.00
4.15.2	Made in HONGKONG / MALAYSIA / SINGAPORE / S KOREA / THAILAND	Each.	609.00	608.00	608.00	608.00
4.15.3	Assembled and made in BANGLADESH / CHINA / INDIA / TURKEY / VIETNAM	Each.	267.00	267.00	267.00	267.00
4.16	<u>DATA/ INTERNET SOCKET</u>					
4.16.1	Made in Malaysia / Thailand / Singapore / Hongkong or equivalent Country	Each.	1,096.00	1,095.00	1,095.00	1,095.00
4.16.2	Assembled and Made in Bangladesh / Made in China	Each.	402.00	402.00	402.00	402.00
4.17	<u>CALL BELL</u>					
4.17.1	Providing & fixing ding dong 250 V grade call bell on prepared board including required length of PVC twin flexible cord etc. complete.	Each.	758.00	758.00	758.00	758.00
4.17.2	Providing & fixing 250V, 50 Hz grade remote control call bell complete (foreign made).	Each.	912.00	911.00	911.00	911.00

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4.18 CHANGE OVER SWITCH

Providing & fixing of 18 SWG metal clad 500 volt 3 phase two way manual change-over switch of following capacity complete with moving & fixed copper contacts, copper buses, brass nuts and bolts, 3mm thick ebonite sheet separators insulators, operating handle etc. complete including necessary hammer painting on enclosure.

4.18.1	60 -100 Amps. rating.	Each.	4,055.00	4,054.00	4,049.00	4,049.00
4.18.2	100-300 Amps. rating.	Each.	6,755.00	6,754.00	6,749.00	6,749.00
4.18.3	400-600 Amps. rating.	Each.	12,890.00	12,889.00	12,884.00	12,884.00
4.18.4	800-1000 Amps. rating.	Each.	14,853.00	14,852.00	14,847.00	14,847.00

4.19 EARTHING

Earthing the electrical installation with 40 mm (1.5") dia G.I. pipe (earth electrode) having 6.35 mm. dia hole across the pipe at 305 mm. interval securely bonded by soldering with 2 nos. of No-2 SWG HDBC earth leads (at the top of the electrode) with its protection by 20 mm. (3/4") dia G.I. pipe up-to plinth level run at a depth of 609.6 mm (2 ft) below G.L up-to main board to be earthed including necessary connecting copper sockets, bolts, nuts, etc. complete for maintaining earth resistance within 1 ohm.

[Fig : 4.19]

4.19.1	Depth of bottom of main electrode at 6858 mm. (22.5 ft) from GL & length of electrode 6096 mm. (20 ft).	Per Set.	24,786.00	24,786.00	24,786.00	24,786.00
4.19.2	Depth of bottom of main electrode at 12954 mm. (42.5 ft) from GL & length of electrode 12192 mm. (40 ft).	Per Set.	29,449.00	29,449.00	29,449.00	29,449.00
4.19.3	Depth of bottom of main electrode at 19050 mm. (62.5 ft) from GL & length of electrode 18288 mm. (60 ft).	Per Set.	34,971.00	34,971.00	34,971.00	34,971.00
4.19.4	Depth of bottom of main electrode at 25146 mm. (82.5 ft) from GL & length of electrode 24384 mm. (80 ft).	Per Set.	41,106.00	41,106.00	41,106.00	41,106.00

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Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna,Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
4.19.5	Depth of bottom of main electrode at 31242 mm. (102.5 ft) from GL & length of electrode 30480 mm. (100 ft).	Per Set.	45,401.00	45,401.00	45,401.00	45,401.00
4.19.6	Depth of bottom of main electrode at 37338 mm. (122.5 ft) from GL & length of electrode 36576 mm. (120 ft).	Per Set.	51,536.00	51,536.00	51,536.00	51,536.00
4.20	Construction of earthing inspection pit inside measurement 600 mm x 600 mm with 250 mm thick brick in cement mortar (1:4) with 100mm thick RCC top slab (1:2:4) with 1% re-enforcement 450 mm dia water sealed CI man-hole cover with locking arrangement including necessary earth works, site filling and one brick flat soling 75 mm thick (1:3:6) base concrete for making inlet channel & 12mm thick (1:2) cement plaster with neat finishing etc. all complete up to a depth of .75 meter.	Each	7,362.00	7,362.00	7,362.00	7,362.00
4.21	<u>LIGHTNING ARRESTER</u>					
4.21.1	<u>LIGHTNING ARRESTER (Up to 6-storied building)</u>					
	Providing & fixing 25.4 mm (1") dia 457 mm (1.5 ft) long solid copper rod with 6.6 mm thick 150 mm x 150 mm copper made base with sharp end top, fixed on the top of 2.0"(2.5 - 3 mm thick) dia 10' long GI pole by necessary accessories . The pole shall fixed on parapet wall with necessary CC work and other accessories for arresting lightning as per plan (enclosed) and as per direction of the Engineer. [Fig : 4.21]	Per Set.	7,568.00	7,567.00	7,562.00	7,562.00
4.21.2	Providing & drawing no-2 HDBC wire through 12.7 mm. (½") dia G.I. pipe including fitting, fixing the G.I. pipe in wall or column complete as required.	Per meter	1,133.00	1,133.00	1,132.00	1,132.00
4.22	<u>LIGHTNING ARRESTER</u>					
4.22.1	(Above 6-storied building) (Item no : 4.22.1 - 4.22.9)					
	Supply, installation, testing and commissioning early streamer Emission Air Terminal (ESEAT)/ Collection Volume Method (CVM) as per IEEE 998-2012 or equivalent product having the following technical specification -					

Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna,Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
(i)	Withstand Peak Lightning Current : 100 KA					
(ii)	Weather condition of work : Material of lightning Air Terminal should be able to work in any environmental condition. So, material of Air Terminal should be stainless steel.					
(iii)	Dimension of the air terminal : Minimum length : 220 mm 25mm dia solid rod at the bottom of the Air Terminal having M20 male thread to fix on mast.					
(iv)	Certified advance Time : Maximum 60 μ second with a current peak higher than 100 KA.					
(v)	Material of the Air Terminal : Stainless steel					
(vi)	Weight : 2.25 – 4.00 kg.					
(vii)	Radius of protection : 90 – 100 meter at 5 meter height from the plan.					
(viii)	Product certification and standards: System should compliant to UL-96 (lightning protection component) (standard of safety)					
(ix)	Manufactured / Assembled and made in : USA / FRANCE / AUSTRALIA or EU countries.	Each	310,443.00	310,443.00	310,443.00	310,443.00
4.22.2	Supply and installation of insulated Air Terminal mast of the following specification - Made of stainless steel (Type : 316) Length : 2300 mm Dia : 30mm The mast shall be fixed on the top of the GI tower with SS nuts bolts, clamps as per sample approved by the Engineer-in-charge.	Each	17,884.00	17,884.00	17,884.00	17,884.00

Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna,Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
4.22.3	Supply and installation of lightning event counter of the following technical specification - Register capacity : 0-999 mechanical counting without external power supply (LCD display) The down conductor shall pass the hole of the counter and the same shall be fixed vertically at any point.	Each	49,389.00	49,389.00	49,389.00	49,389.00
4.22.4	Supply and installation of earth test box with the following arrangement inside it. Test Joint : (79mm x 50mm x 20mm) made of copper. 30mm x 2mm and dia 8mm, line coupling made of copper.	Each	1,503.00	1,503.00	1,503.00	1,503.00
4.22.5	Supply and drawing of copper made down conductor having dia 12.7 mm or copper strip (30mmx2mm) with fixing holder on vertical and horizontal surface. The fixing shall have 40mm to 50mm length or height and will be placed 3 nos per meter as per direction and sample approved by the Engineer-in-charge .	meter	2,261.00	2,261.00	2,261.00	2,261.00
4.22.6	Construction of GI tower with the following specification - GI Pole: Dia 3", Length: 15' (L-10', D-3"; L-5', D- 2") duly painted with powder coating with epoxy polyester resin . There will be minimum three Guy-wire for erection of the pole properly. The base of the pole and guy will be installed by CC on the roof-top and the size will be as required to hold the pole at any circumstances.	Each	13,252.00	13,252.00	13,252.00	13,252.00
4.22.7	Construction of earthing (2 nos.) for the lightning arrester as per instruction and enclosed diagram (Fig : 4.21) and as per direction of the Engineer in the following way-					
(i)	Soil digging : Size – 3000mmx400mmx400mm (2 nos.)					

Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna,Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
(ii)	Construction of pit by brick and RCC slab on it. On the top of the slab there will be a hole and a pit cover made by cast iron will be fixed on it.					
(iii)	Size of the pit : (600mmx600mmx600mm) (2 nos.)					
(iv)	Copper plate : (300mmx150mmx15mm) (2 nos.) Copper plate will be fixed with the electrode (copper rod or copper strip) by necessary fixing materials made of copper.					
(v)	Copper electrode (12.7mm dia copper rod or copper strip (30mmx2mm) Length of the copper rod or strip : minimum 3000mm (10+10) = 20 meter.					
(vi)	Ground enhancing materials (40 + 40) = 80 kg. (2 Nos. of earthing is considered 1 set)	job	153,381.00	153,381.00	153,381.00	153,381.00
4.22.8	Surge protection device (SPD) for protection of over-head line connected to LT line. Capacity : 50 KA 4-pole with wiring and SPD box. Made in GERMANY / AUSTRALIA / SPAIN or product of EU countries.	Set.	54,297.00	54,297.00	54,297.00	54,297.00
4.22.9	Supply and installation of Aviation light fittings with LED Lamp, day light sensor, wiring by 1C-2x1.5 sq.mm cable (NYY) with ECC as per instruction and sample approved by the Engineer-in-charge. The Aviation Light fitting shall be fixed on GI pipe (GI Bracket) with necessary fixing materials shown in the fig - 4.22, below the Air Terminal.	Each	10,829.00	10,829.00	10,829.00	10,829.00

Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna,Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
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4.23 CABLE KITS

Supply & fixing of heat shrink joint kit complete with DIN ferrules, cable preparation kits at the point of jointing of cables for 11 KV 3-core PVC insulated & PVC sheathed armored / non-armored cables of the following sizes:- (Made in GERMANY / JAPAN / USA / UK / FRANCE / JAPAN / ITALY / SWEDEN / SWITZERLAND accepted/approved by the Engineer-in-charge)

4.23.1	3 x 35 mm ²	Per kit	17,630.00	17,628.00	17,623.00	17,623.00
4.23.2	3 x 50 mm ²	Per kit	18,611.00	18,610.00	18,605.00	18,605.00
4.23.3	3 x 70 mm ²	Per kit	19,838.00	19,837.00	19,832.00	19,832.00
4.23.4	3 x 95 mm ²	Per kit	20,697.00	20,696.00	20,691.00	20,691.00
4.23.5	3 x 120 mm ²	Per kit	21,924.00	21,923.00	21,918.00	21,918.00
4.23.6	3 x 150 mm ²	Per kit	23,029.00	23,027.00	23,022.00	23,022.00
4.23.7	3 x 185 mm ²	Per kit	24,378.00	24,377.00	24,372.00	24,372.00
4.23.8	3 x 240 mm ²	Per kit	28,060.00	28,058.00	28,053.00	28,053.00

4.24 HEAT SHRINK TERMINATION KIT

Supply & fixing of heat shrink termination kit out-door / in-door use complete with DIN lugs earth connection hardware & cable preparation kit (In-door & outdoor) at the point of cable termination for 11 KV 3-core PVC insulated & PVC sheathed & armored / non-armored cable of the following sizes (Made in GERMANY / USA / UK / FRANCE / JAPAN / ITALY / SWEDEN / SWITZERLAND or equivalent accepted / approved by the Engineer-in-charge.)

4.24.1 FOR INDOOR USE

4.24.1.1	3 x 35 mm ²	Per kit	7,200.00	7,198.00	7,194.00	7,194.00
4.24.1.2	3 x 50 mm ²	Per kit	7,813.00	7,812.00	7,807.00	7,807.00

Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna, Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
4.24.1.3	3 x 70 mm ²	Per kit	8,304.00	8,303.00	8,298.00	8,298.00
4.24.1.4	3 x 95 mm ²	Per kit	8,672.00	8,671.00	8,666.00	8,666.00
4.24.1.5	3 x 120 mm ²	Per kit	9,286.00	9,284.00	9,280.00	9,280.00
4.24.1.6	3 x 150 mm ²	Per kit	9,777.00	9,775.00	9,770.00	9,770.00
4.24.1.7	3 x 185 mm ²	Per kit	10,267.00	10,266.00	10,261.00	10,261.00
4.24.1.8	3 x 240 mm ²	Per kit	10,881.00	10,880.00	10,875.00	10,875.00

4.24.2 FOR OUTDOOR USE

4.24.2.1	3 x 35 mm ²	Per kit	10,206.00	10,205.00	10,200.00	10,200.00
4.24.2.2	3 x 50 mm ²	Per kit	10,390.00	10,389.00	10,384.00	10,384.00
4.24.2.3	3 x 70 mm ²	Per kit	10,758.00	10,757.00	10,752.00	10,752.00
4.24.2.4	3 x 95 mm ²	Per kit	10,881.00	10,880.00	10,875.00	10,875.00
4.24.2.5	3 x 120 mm ²	Per kit	11,004.00	11,002.00	10,997.00	10,997.00
4.24.2.6	3 x 150 mm ²	Per kit	11,372.00	11,370.00	11,366.00	11,366.00
4.24.2.7	3 x 185 mm ²	Per kit	11,985.00	11,984.00	11,979.00	11,979.00
4.24.2.8	3 x 240 mm ²	Per kit	13,335.00	13,334.00	13,329.00	13,329.00

4.25 Supplying and fitting of heat shrink joint kit complete with DIN ferrules & G.I armored case at the point of jointing of cables for 4-core / 1000 V grade PVC insulated & sheathed armored / non-armored cable of the following sizes Made in GERMANY / JAPAN / USA / UK / FRANCE / JAPAN / ITALY / SWEDEN / SWITZERLAND or accepted / approved by the Engineer-in-charge.

4.25.1	4 x 35 mm ²	Per kit	3,396.00	3,395.00	3,390.00	3,390.00
4.25.2	4 x 50 mm ²	Per kit	3,825.00	3,824.00	3,819.00	3,819.00
4.25.3	4 x 70 mm ²	Per kit	4,439.00	4,438.00	4,433.00	4,433.00
4.25.4	4 x 95 mm ²	Per kit	4,868.00	4,867.00	4,862.00	4,862.00
4.25.5	4 x 120 mm ²	Per kit	5,605.00	5,603.00	5,598.00	5,598.00

Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna,Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
4.25.6	4 x 150 mm ²	Per kit	5,850.00	5,849.00	5,844.00	5,844.00
4.25.7	4 x 185 mm ²	Per kit	6,341.00	6,340.00	6,335.00	6,335.00
4.25.8	4 x 240 mm ²	Per kit	6,832.00	6,830.00	6,825.00	6,825.00

4.26 HEAT SHIRNK SELF - AMALGAMATING TAPE

Supplying and fixing of **heat shrink self-amalgamating tape** of the following sizes for bus-bar of both HT switch-gear (11 KV) & LT switch-gear / PFI, transformer terminals as protection against flash-over.

4.26.1	Width 25 mm thickness 1 mm	Per meter	604.00	604.00	604.00	604.00
4.26.2	Width 50 mm thickness 1 mm	Per meter	844.00	844.00	844.00	844.00
4.26.3	Width 75 mm thickness 1 mm	Per meter	1,120.00	1,120.00	1,120.00	1,120.00
4.26.4	Width 100 mm thickness 1 mm	Per meter	1,365.00	1,365.00	1,365.00	1,365.00

4.27 VOLTMETER

4.27.1	Providing and fixing voltmeter of range 0-500 volt as per sample approved by the Engineer-in-charge-in-charge (Origin: JAPAN / CHINA or accepted / approved by the Engineer-in-charge.)	Each	782.00	782.00	782.00	782.00
4.27.2	Providing and fixing 500 volt grade 4-way selector switch for voltmeter as per sample approved by the Engineer-in-charge-in-charge (Origin: JAPAN / CHINA or accepted / approved by the Engineer-in-charge.)	Each	537.00	537.00	537.00	537.00

4.28 AMMETER

Providing and fixing 500 volt grade Ammeter of following range and as per sample approved by the Engineer-in-charge-in-charge (Origin: JAPAN / CHINA or accepted / approved by the Engineer-in-charge.)

Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna,Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
4.28.1	0 - 50 amps.	Each	721.00	721.00	721.00	721.00
4.28.2	0-100 amps with Current Transformer (C.T) of ratio 100/5	Each	856.00	856.00	856.00	856.00
4.28.3	0-200 amps with Current Transformer (C.T) of ratio 200/5	Each	1,089.00	1,089.00	1,089.00	1,089.00
4.28.4	0-300 amps with Current Transformer (C.T) of ratio 300/5	Each	1,120.00	1,120.00	1,120.00	1,120.00
4.28.5	0-400 amps with Current Transformer (C.T) of ratio 400/5	Each	1,150.00	1,150.00	1,150.00	1,150.00
4.28.6	0-600 amps with Current Transformer (C.T) of ratio 600/5	Each	1,163.00	1,163.00	1,163.00	1,163.00
4.28.7	0-800 amps with Current Transformer (C.T) of ratio 800/5	Each	1,187.00	1,187.00	1,187.00	1,187.00
4.28.8	0-1000 amps with Current Transformer (C.T) of ratio 1000/5	Each	1,212.00	1,212.00	1,212.00	1,212.00
4.28.9	Providing and fixing 500 volt grade 3-way ammeter selector switch as per sample approved by the Engineer-in-charge-in-charge (Origin: JAPAN / CHINA or accepted / approved by the Engineer-in-charge.)	Each	512.00	512.00	512.00	512.00

4.29 MAGNETIC CONTACTORS

Supply & fixing 415 / 400/ 380 V magnetic contactors for AC3 duty having control circuit voltage 380-415V / 220-240V, 50Hz. SIEMENS / SCHNEIDER / TELEMECANIQUE / ABB / DORMAN SMITH / VITZRO as per International Standard or equivalent brand accepted / approved by the Engineer-in-charge of the following ratings .

4.29.1	12A (Ith 27A) magnetic contactor	Each	3,068.00	3,068.00	3,068.00	3,068.00
4.29.2	25A (Ith 45A) magnetic contactor	Each	4,417.00	4,417.00	4,417.00	4,417.00
4.29.3	32A (Ith 55A) magnetic contactor	Each	9,571.00	9,571.00	9,571.00	9,571.00
4.29.4	38A (Ith 60A) magnetic contactor	Each	14,111.00	14,111.00	14,111.00	14,111.00
4.29.5	65A (Ith 115A) magnetic contactor	Each	23,437.00	23,437.00	23,437.00	23,437.00
4.29.6	80A (Ith 125A) magnetic contactor	Each	29,449.00	29,449.00	29,449.00	29,449.00
4.29.7	95A (Ith 145A) magnetic contactor	Each	34,357.00	34,357.00	34,357.00	34,357.00
4.29.8	115A (Ith 200A) magnetic contactor	Each	49,082.00	49,082.00	49,082.00	49,082.00
4.29.9	150A (Ith 250A) magnetic contactor	Each	61,352.00	61,352.00	61,352.00	61,352.00

Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna,Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
4.29.10	185A (Ith 275A) magnetic contactor	Each	73,623.00	73,623.00	73,623.00	73,623.00
4.29.11	225A (Ith 315A) magnetic contactor	Each	85,893.00	85,893.00	85,893.00	85,893.00
4.29.12	265A (Ith 350A) magnetic contactor	Each	98,164.00	98,164.00	98,164.00	98,164.00
4.29.13	330A (Ith 400A) magnetic contactor	Each	104,299.00	104,299.00	104,299.00	104,299.00
4.29.14	400A (Ith 500A) magnetic contactor	Each	110,434.00	110,434.00	110,434.00	110,434.00
4.29.15	500A (Ith 500A) magnetic contactor	Each	128,840.00	128,840.00	128,840.00	128,840.00

4.30 THERMAL OVERLOAD RELAY

Supply & fixing 415 / 400 / 380 V, 50 Hz thermal overload relay suitable for use with magnetic contactors accepted/approved by the Engineer-in-charge of the following ratings .

4.30.1	0.40-8.50A	Each	1,693.00	1,693.00	1,693.00	1,693.00
4.30.2	9-13A	Each	2,331.00	2,331.00	2,331.00	2,331.00
4.30.3	7.5-14 A	Each	2,454.00	2,454.00	2,454.00	2,454.00
4.30.4	13-32A	Each	2,945.00	2,945.00	2,945.00	2,945.00
4.30.5	18-42A	Each	3,436.00	3,436.00	3,436.00	3,436.00
4.30.6	28-40A	Each	4,663.00	4,663.00	4,663.00	4,663.00
4.30.7	34-50A	Each	5,890.00	5,890.00	5,890.00	5,890.00
4.30.8	36-100A	Each	7,240.00	7,240.00	7,240.00	7,240.00
4.30.9	60-80A	Each	9,203.00	9,203.00	9,203.00	9,203.00
4.30.10	90-110A	Each	12,270.00	12,270.00	12,270.00	12,270.00
4.30.11	115-500A	Each	18,406.00	18,406.00	18,406.00	18,406.00
4.30.12	300-500A	Each	24,541.00	24,541.00	24,541.00	24,541.00
4.30.13	250-800A	Each	34,971.00	34,971.00	34,971.00	34,971.00

4.31 11 KV HRC FUSE

Supply & fixing 11 KV HRC fuse of the following ratings .

4.31.1	40 A (3 nos in 1 set)	Set	5,890.00	5,890.00	5,890.00	5,890.00
4.31.2	50 A (3 nos in 1 set)	Set	7,240.00	7,240.00	7,240.00	7,240.00
4.31.3	63 A (3 nos in 1 set)	Set	8,344.00	8,344.00	8,344.00	8,344.00
4.31.4	100 A (3 nos in 1 set)	Set	9,203.00	9,203.00	9,203.00	9,203.00

Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna,Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
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4.32 CUT-OUT

Supply & fixing 500 volt grade rewire able fuse link porcelain carrier cutout (foreign made) on prepared board of the following ratings .

4.32.1	15 Amps. Rating	Each	37.00	37.00	37.00	37.00
4.32.2	30 Amps. Rating	Each	74.00	74.00	74.00	74.00
4.32.3	60 Amps. Rating	Each	147.00	147.00	147.00	147.00
4.32.4	100 Amps. Rating	Each	221.00	221.00	221.00	221.00
4.32.5	200 Amps. Rating	Each	429.00	429.00	429.00	429.00

4.33 GALVANIZED CABLE TRAY

Supply, fitting and fixing galvanized cable tray made of 18 SWG (1.2 mm) MS Sheet evenly perforated with 7 mm width Capsule hole punch with self Hanging Facility at top, joint clamp, including fabricating cost of electricity, tools and plants, workshop charges, carriage of the same, cutting groves in the RCC or brick work, mending good the damages with CC (1:2:4), etc. complete for all floors accepted by the engineer.

4.33.1	100x50 mm without cover	Meter	1,411.00	1,411.00	1,411.00	1,411.00
4.33.2	200x50 mm without cover	Meter	1,749.00	1,749.00	1,749.00	1,749.00
4.33.3	300x100 mm without cover	Meter	2,331.00	2,331.00	2,331.00	2,331.00
4.33.4	500x100 mm without cover	Meter	2,896.00	2,896.00	2,896.00	2,896.00

Item No.	Description of Items	Unit	Unit Rate in Dhaka & Mymensingh Zone (Tk)	Unit Rate in Chattogram & Sylhet Zone (Tk)	Unit Rate in Khulna,Barishal & Gopalganj (Tk)	Unit Rate in Rajshahi & Rangpur (Tk)
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4.34 GALVANIZED CABLE LADDERS

Supply, fitting and fixing of Galvanized cable ladders made of 14 SWG (2 mm) MS Sheet with rungs spaced of 300 mm centers, 100x25mm side rail with multiple formation to protect from torsion and bending with full loading capacity with self-Hanging Facility at top and bottom, joint clamp, including fabricating cost of electricity, tools and plants, workshop charges, carriage of the same, cutting groves in the RCC or brick work, mending good the damages with CC (1:2:4), etc. complete for all floors accepted by the engineer.

4.34.1	300x100 mm	Meter	4,295.00	4,295.00	4,295.00	4,295.00
4.34.2	400x100 mm	Meter	4,908.00	4,908.00	4,908.00	4,908.00
4.34.3	600x100 mm	Meter	6,013.00	6,013.00	6,013.00	6,013.00
4.34.4	900x100 mm	Meter	7,608.00	7,608.00	7,608.00	7,608.00

ANNEXURE- 4

BUSBAR TRUNKING SYSTEM :

The low impedance prefabricated sand witch type main bus bar trunking system shall conform to IEC 439/1-2, tested Seismic standard shall be suitable for use in installation conforming to IEC 364.

The low impedance prefabricated sand witch type main bus bar trunking system shall conform to IEC 439/1-2, tested seismic standard shall be suitable for use in installation conforming to IEC 364.

SPECIFICATION OF BBT SYSTEM :

1 Standard : IEC 439-1 & 2, KEMA certificate	
2 Housing	: 2-piece aluminum (no duration till 55 °C)
3 Maximum ambient temperature	: 40 Deg.C
4 Degree of protection	: IP54
5 Color	: Approved color
6 Rated insulation voltage	: Maximum 600 V.A.C.
7 Frequency	: 50 Hz.
8 Rated current at 40 deg.C	: As per schedule
9 Minimum rated surge capacity (KA)(t=0.1s)	: To be quoted by the bidder.
10 Inherent short circuit capacity (KA) (t=0.1s)	: To be quoted by the bidder.
11 Rated short time with-stand current(KA) (t= 1 sec)	: To be quoted by the bidder. Mylar from Du-point or epoxy insulated Class B 130 °C.
12 Bus bar materials	: Aluminum and all conductors tinned and
13 Bus bar cross section	: To be mentioned by the bidder
14 Special features	: Single bolt clamping.
15 Others	: Drawings to be submitted for the proposed BBT system with detailed information, dimension, list of materials as per site requirement.

Tap-off units must be designed in such a way so that the tap-off units can be fitted or removed while the system i.e. the main bus bar trunking is energized.

Circuit breakers in the Tap-off units shall be of quick make, quick break, trip-free indicating type having adjustable thermal over-current and adjustable instantaneous electro-magnetic short circuit release having the rated interrupting capacity.

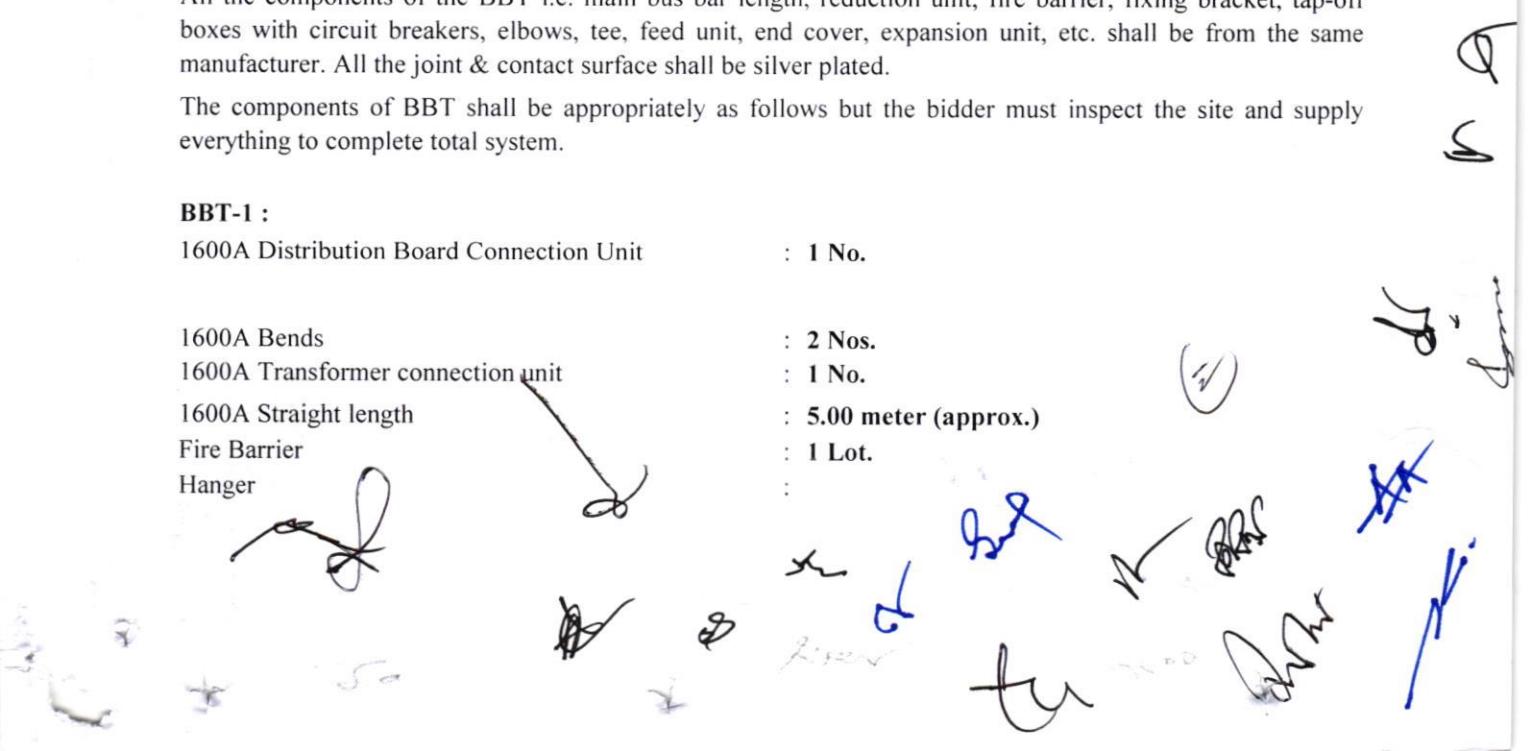
All the components of the BBT i.e. main bus bar length, reduction unit, fire barrier, fixing bracket, tap-off boxes with circuit breakers, elbows, tee, feed unit, end cover, expansion unit, etc. shall be from the same manufacturer. All the joint & contact surface shall be silver plated.

The components of BBT shall be appropriately as follows but the bidder must inspect the site and supply everything to complete total system.

BBT-1 :

1600A Distribution Board Connection Unit : 1 No.

1600A Bends	: 2 Nos.
1600A Transformer connection unit	: 1 No.
1600A Straight length	: 5.00 meter (approx.)
Fire Barrier	: 1 Lot.
Hanger	:



BBT-2 :

1600A Distribution Board Connection Unit	: 1 No.
1600A Bends	: 4 Nos.
1600A Straight length	: 40.00 meter (approx.)
Fire Barrier	: 1 Lot.
Hanger/floor support	: 2 Lot.
Tap-off boxes with 200A TP (50KA)	: 7 Nos.
Tap-off boxes with 160A TP (50KA)	: 1 No.
MCCB	: 1 No.
End Cap	: 1 No.

BBT-3 :

600A Distribution Board Connection Unit	: 1 No.
600A Bends	: 4 Nos.
600A Straight length	: 43.60 meter (approx.)
Fire Barrier	: 1 Lot.
Hanger/floor support	: 1 Lot.
Tap-off boxes with 160A TP (50KA)	: 1 No.
Tap-off boxes with 63A TP (50KA) MCCB	: 7 Nos.
500A End Cap	: 1 No.

INSTALLATION:

The BBT system shall be fixed on floor ceiling and walls with all necessary, cutting and breaking, cleaning and mending the same including cement/sand plastering and painting clamps, nuts, bolts as per the installation drawing of the manufacturer after getting approval from the owner / consultants. The contractor shall supply all materials required for complete installation of the BBT system.

EARTH RESISTANCE TEST

- 1) Earth resistance tests shall be made on the system, separating and reconnecting each earth connection.
- 2) The electrical resistance of the earth continuity conductor together with the resistance of the earthing lead measured from the connection with the earth electrode to any other position in the completed installation shall not exceed 1 ohm.
- 3) Where more than one earthing sets are installed, the earth resistance between two sets shall be measured by means of resistance bridge instrument. The earth resistance between two sets shall not exceed 1 ohm.

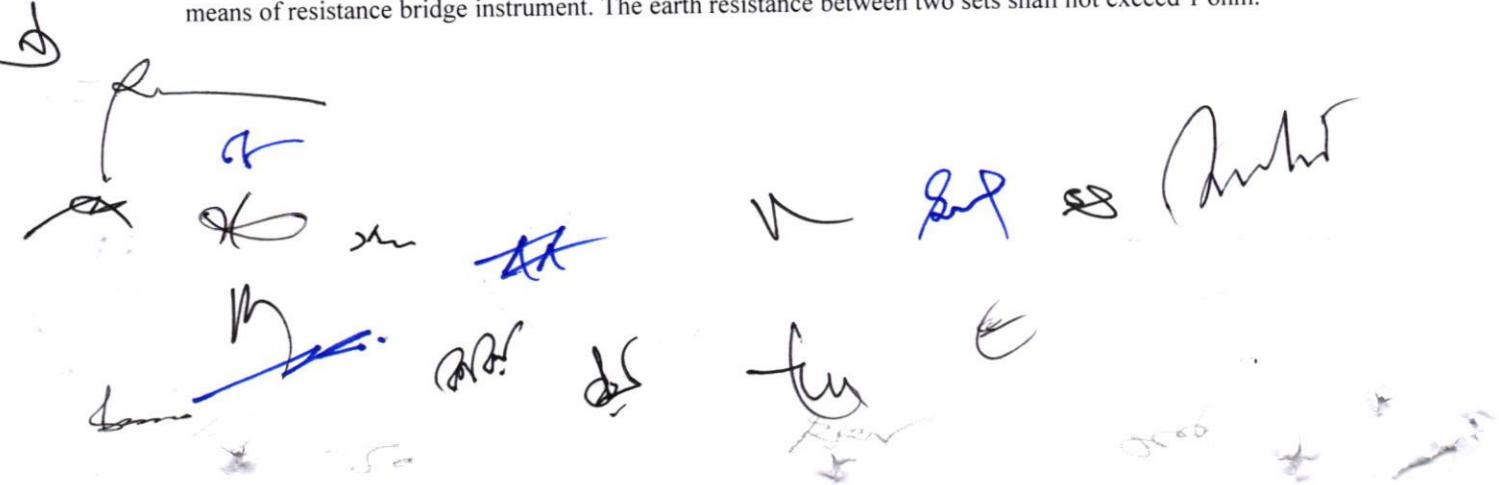
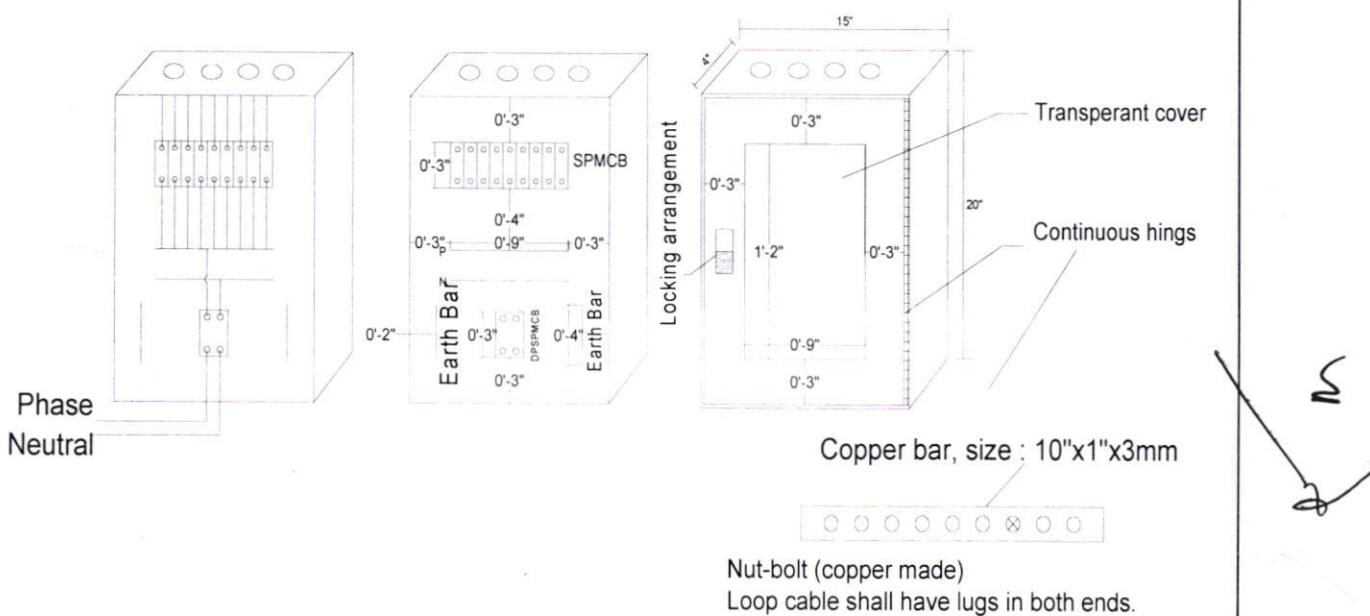


TABLE 4.1 : MINIMUM NUMBER OF SOCKET OUTLET

Minimum number of 13 A sockets outlets

Location	Number of switch socket outlets
Bed Room	2
Living Room	3
Drawing Room	3
Dining Room	1
Toaster/Snack Toaster	1
Kitchen Room	1
Bathroom	0
Verandah	1
For refrigerator	1
For air conditioner	One for each room

SINGLE PHASE DISTRIBUTION BOARD (SPDB)**Fig : 4.2**

THREE PHASE DISTRIBUTION BOARD (TPDB)

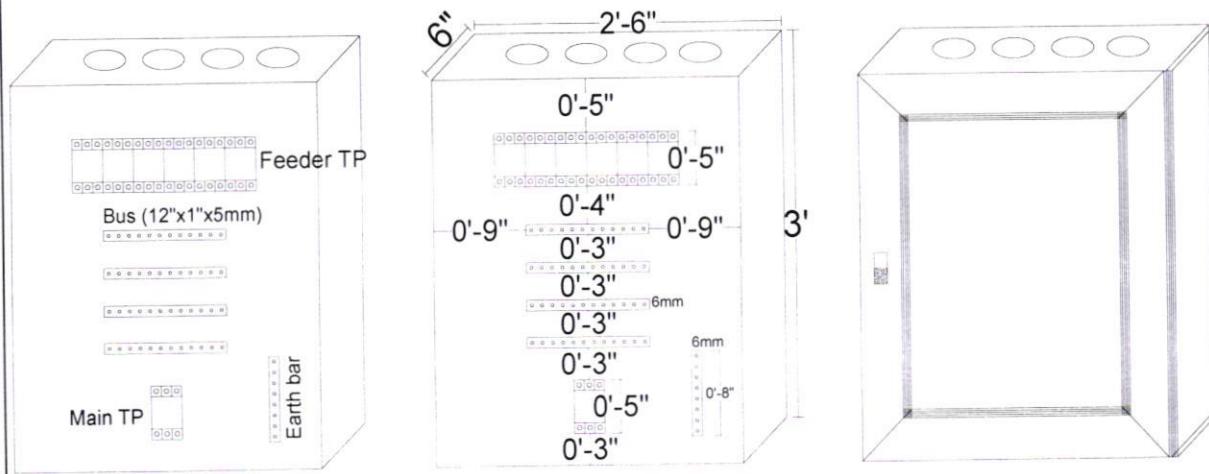


Fig : 4.3

A large area of the page is covered with numerous handwritten signatures and markings, appearing to be a signature over a large area or a series of initials. These markings are written in black ink and some are highlighted with blue ink.

EARTHING ARRANGEMENT

To different equipment
(HDBC, 2 SGW)



Copper Bar on Plinth wall Insulator

Building

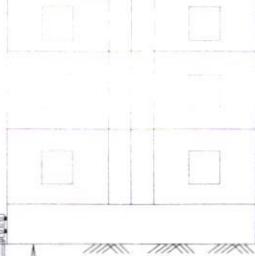
Pit (Brick wall, RCC Slab)
(Pit Size : 600mm x 600mm)

PL

GL

HDBC Wire 2 nos. (Size : 2 SWG Each)
(Through 20 mm GI Pipe)

Pit Cover at GL



GI Mesh
GI Socket (T)

Pit

GI Bend

Distance from Electrode to Plinth (As Required)

20mm Dia GI Pipe for protection of HDBC

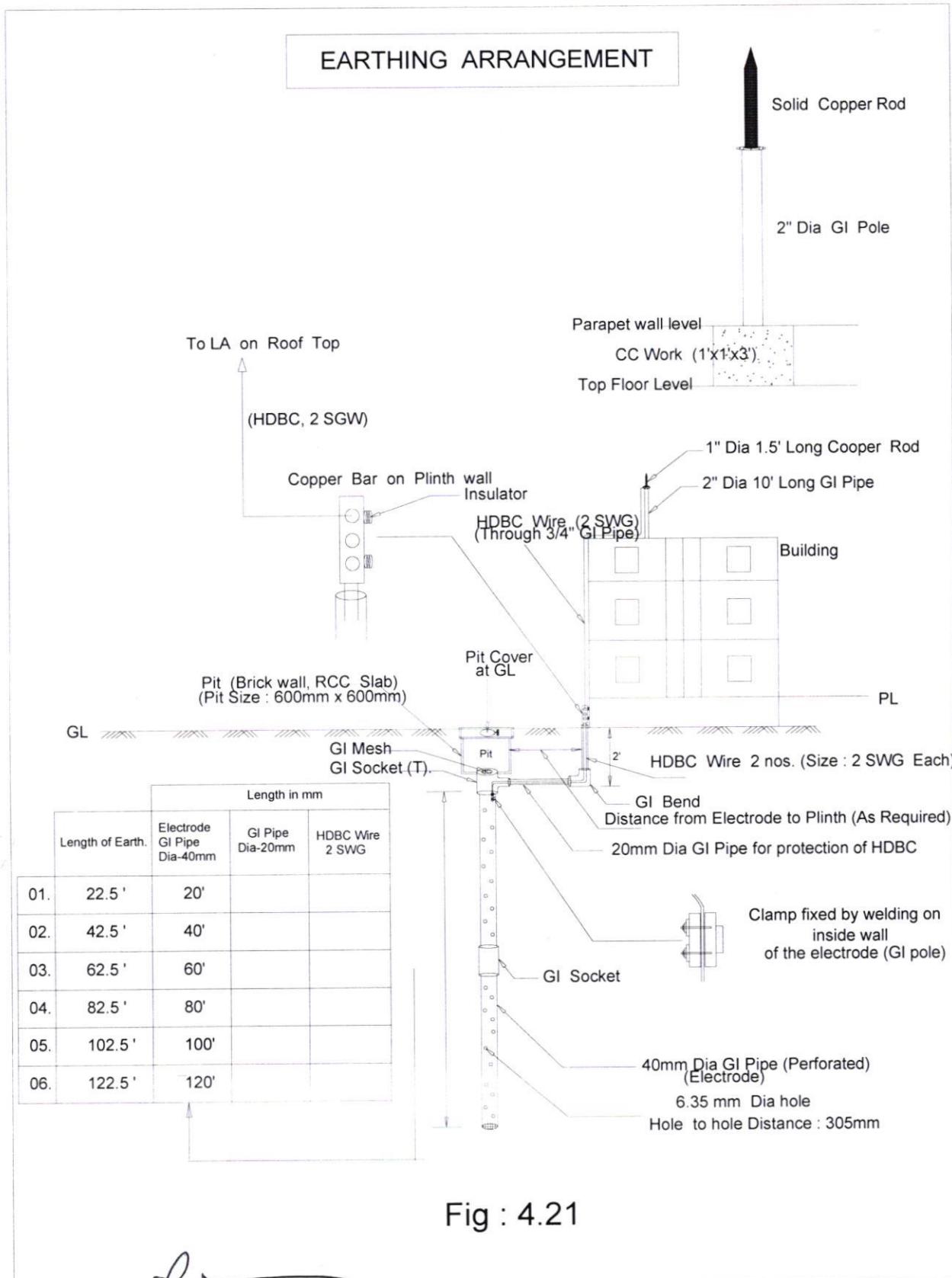
Clamp fixed by welding on the
inside wall of the electrode
(GI pole)

40mm Dia GI Pipe (Perforated)
(Electrode)

6.35 mm Dia hole
Hole to hole Distance : 305mm

Length of Earth.	Length in mm		
	Electrode GI Pipe Dia-40mm	GI Pipe Dia-20mm	HDBC Wire 2 SWG
01. 22.5 '	20'		
02. 42.5 '	40'		
03. 62.5 '	60'		
04. 82.5 '	80'		
05. 102.5 '	100'		
06. 122.5 '	120'		

Fig : 4.19



LIGHTNING ARRESTER INSTALLATION PLAN

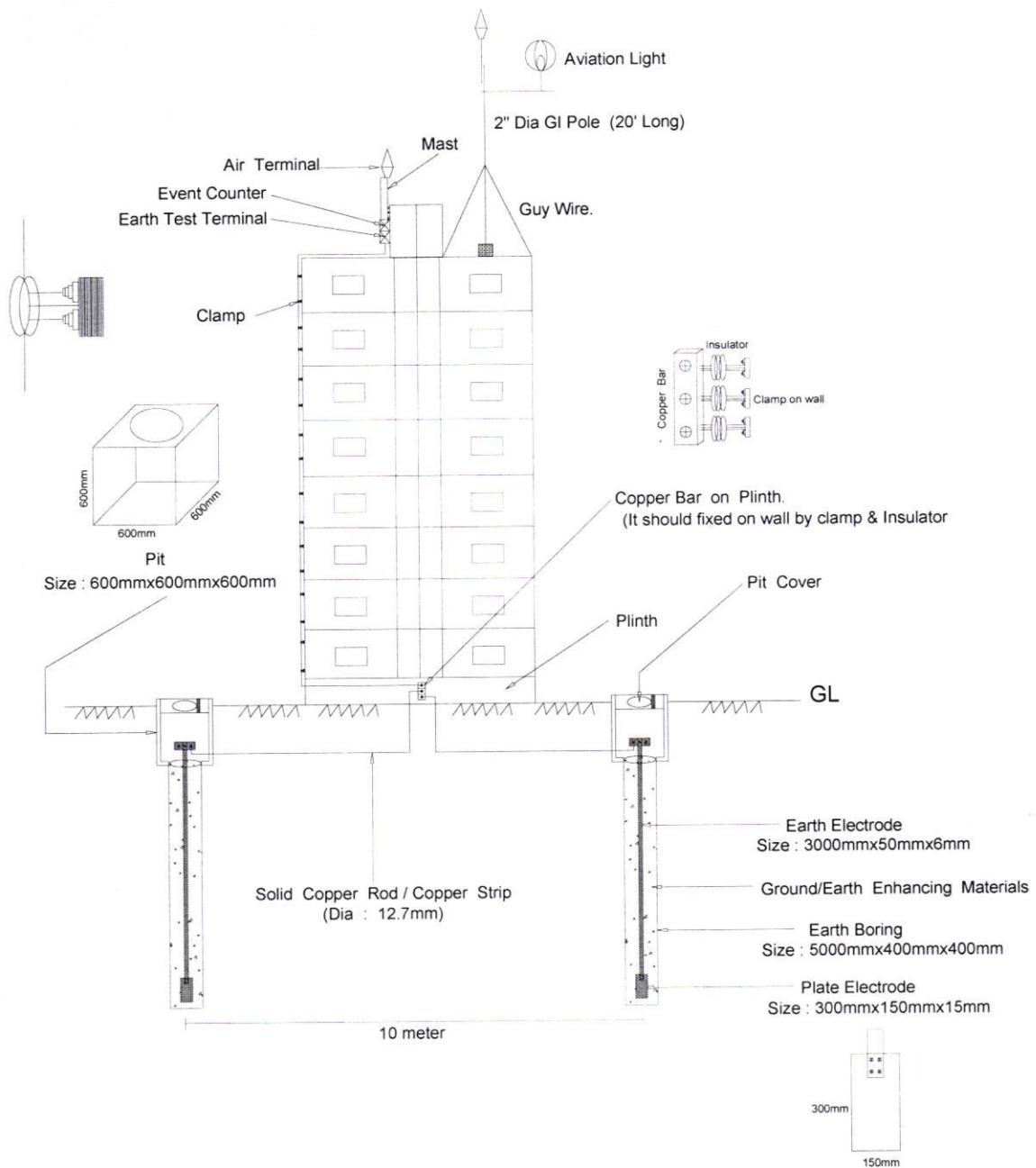


Fig : 4.22