

TECHNICAL SPECIFICATIONS

1. Technical Specification for Item No. 1:

(a) Technical Specification for Main Distribution Panel.

This includes design, supply at site, installation, testing & commissioning of outdoor pedestal type Main Distribution Panel, double shutter, handle with locking arrangement (Pad lock-5 lever with keys), dust, damp and vermin proof. The main distribution panel shall be fabricated from MS Sheet of 2.00 mm thick, 316 grade MS angle and MS flat of suitable size.

The main panel shall be designed as per IS norms and shall be specious for easy maintenance and frame structure shall be with MS angle of suitable size (min. 35 X 35 X 6mm) with inner sheet & inner angles & pedestal of pane made from 65 X 65 X 6mm MS angle of 316 grade with four legs of 1200 mm and shall be provided with following items.

1	400A, 4 Pole ON LOAD Change over switch	1 No.
2	100A, 4 Pole, 415V, 35KA, Panel Mounted MCCB	2 No.
3	50A, 4 Pole, 415V, 35KA, Panel Mounted MCCB	8 No.
4	Indicating Lamps, 230/240V, AC with in-built resistance	3 No.
5	Suitable size of Analog Ammeter & Volt meter with four portion selector switches	1 each
6	Indicating Lamp- Red, Green and blue, 230V AC with in-built resistance.	1 each
7	Three phase, 4 wire electronic energy meter	1 No.
8	Surface mounted light sensor time switch	1 No.
10	50A, Three phase Ait Breaker Contactor	1 No.
11	Electrolytic copper bus-bar of suitable size for phase and neutral, PVC sleeved with colour code, Danger Board tie belt MS Wall Mounted stand etc.	

All these compartments shall be mounted in the Panel by means of suitable cadmium passivated hardware. The Panel shall be complete in all respects with cable glands, lugs for incoming and outgoing cables including interconnection with PVC insulated cable single core, standard copper conductor of 650/1100V grade.

The Panel shall be erected on cement concrete platform duly plastered with tapped collar of suitable size having height of 500 mm above ground level including grouting of legs in reinforced foundation of suitable design.

The Pane shall be tested as per IS and test certificate to be submitted along with panel at site. All the components shall be panel mounted type and hardware cadmium passivated. The Main Distribution Panel shall be provided with 2 Nos. GI Terminals for earthing.

The Panel shall be manufactured from type test certificate holder having Type Test Certificate of Distribution Panel of similar or above ratings. This includes all labour & material as directed by Engineer-In-Charge.

(b) Technical Specification for Feeder Panel.

This includes design, supply at site, installation, testing & commissioning of outdoor pedestal type Feeder Pillar Panel, double shutter, handle with locking arrangement (Pad lock-5 lever with keys), dust, damp and vermin proof. The main distribution panel shall be fabricated from MS Sheet of 2.00 mm thick, 316 grade MS angle and MS flat of suitable size.

The main panel shall be designed as per IS norms and shall be specious for easy maintenance and frame structure shall be with MS angle of suitable size (min. 35 X 35 X 6mm) with inner sheet & inner angles & pedestal of pane made from 65 X 65 X 6mm MS angle of 316 grade with four legs of 1200 mm and shall be provided with following items.

1	200A, 4 Pole, 415V, 35KA, Panel Mounted MCCB	1 No.
2	50A, 4 Pole, 415V, 35KA, Panel Mounted MCCB	8 No.
3	Indicating Lamps, 230/240V, AC with in-built resistance	3 No.
4	Suitable size of Analog Ammeter & Volt meter with four portion selector switches	1 each
5	Indicating Lamp- Red, Green and blue, 230V AC with in-built resistance.	1 each
6	Three phase, 4 wire electronic energy meter	1 No.
7	Surface mounted light sensor time switch	1 No.
8	50A, Three phase Ait Breaker Contactor	1 No.
9	Analog Timer for control of street light	
11	Electrolytic copper bus-bar of suitable size for phase and neutral, PVC sleeved with colour code, Danger Board tie belt MS Wall Mounted stand etc.	

All these compartments shall be mounted in the Panel by means of suitable cadmium passivated hardware. The Panel shall be complete in all respects with cable glands, lugs for incoming and outgoing cables including interconnection with PVC insulated cable single core, standard copper conductor of 650/1100V grade.

The Panel shall be erected on cement concrete platform duly plastered with tapped collar of suitable size having height of 500 mm above ground level including grouting of legs in reinforced foundation of suitable design.

The Pane shall be tested as per IS and test certificate to be submitted along with panel at site. All the components shall be panel mounted type and hardware cadmium passivated. The Feeder Panel shall be provided with 2 Nos. GI Terminals for earthing.

The Panel shall be manufactured from type test certificate holder having Type Test Certificate of Feeder Panel of similar or above ratings. This includes all labour & material as directed by Engineer-In-Charge.

2. Technical Specification for Item No. 2:

This includes supply at site 1.1 KV grade, 4 core aluminum conductor, XLPE insulated armoured cable confirming to IS: 7098 (Part-I) 1985 with up to date amendments and of approved make with ISI mark. The manufacturer shall produce TYPE TEST certificate with similar size of cable, which shall not be more than 3 years old. The cable shall have marking/embossing at the interval of every meter showing its progressive length. The manufacturer's routine test certificate shall produce with supply of cable at site.

3. Technical Specification for Item No. 3:

This includes laying of cable through following type..

(a) Hard/Soft Soil:

This includes laying of single length cables up to 4.0 core x 50 Sq.mm LT armoured aluminum Conductor XLPE Cable of 1.1KV Grade (excluding supply of cable) through excavation in soft/hard soil. The trench to be excavated 0.3 Mtr. wide 0.6 Mtr. deep. The bed of 50mm of river sand shall be provided in the bottom of the excavated trench. The cable shall be laid over the bed of river sand. The cable shall be protected by providing and laying bricks both the sides lengthwise parallel to the cable & the gaps shall be filled with river sand. The cable shall be covered by keeping two bricks over the side bricks. The filling of the trench shall be done with the excavated stuff & should be watered and rammed properly to its original position. The excess excavated stuff shall be disposed off from the Site of work and spreader in low laying area as directed.

The contractor shall provide heat shrinkable straight through joint of relevant size of approved make if the laying of cable shall be more than standard drum length. This includes all labour and material as directed by Engineer-in-Charge.

(b) Road/RCC Crossing:

This includes laying of single length cable up to 4.0 core x 50 Sq.mm LT armoured aluminum Conductor XLPE Cable of 1.1KV Grade (excluding supply of cable) through road crossing in the trench to be excavated 0.3 Mtr wide 1.0 Mtr deep. by providing of 1 lengths of RCC NP2 Class pipe of 150mm diameter, in which cable shall be passed through. The excavated stuff shall be disposed off from the Site of work and spreaded in low laying area as directed. The filling of the trench shall be done with material in layers of 20 cm thickness and each layer should be watered and rammed properly and road position shall be properly re-done to its original position with all material and labour as directed by Engineer- in-charge.

(c) On wall through saddles & clamps:

This includes laying of supplied single length cable up to 4.0 core x 50 Sq.mm LT armoured aluminum Conductor XLPE Cable of 1.1KV Grade (excluding supply of cable) on existing wall/cement structure. The G.I. Saddle set with base & Clamps shall be provided of suitable size (with respect to cable outer diameter) made from G.I. flat 25 x 3 mm with G.I. Nut bolts/heavy duty screws for clamping. The base shall be fixed rigidly on wall/cement structure through cemented wooden gutties at 0.50 mtr. Intervals & the cable shall be laid on 3mm thick G.I. saddle base on wall/cement structure and clamped rigidly by G.I. screwing/bolting of clamps. The work includes with all materials and labour as directed by Engineer-in-charge.

(d) In GI Class-B Pipe:

This includes laying of single length cable up to 4.0 core x 50 Sq.mm LT armoured aluminum Conductor XLPE Cable of 1.1KV Grade (excluding supply of cable) in class-B G.I. Pipe of suitable size (with respect to cable outer diameter) on existing Wall/DP/Four Pole Structure/steel Structure/Street Light Pole with G.I. base & Clamps of suitable size made from G.I. flat 25 x 3 mm including G.I. Nut bolts of suitable size at 0.50 mtr. Intervals. The work includes with all materials and labour as directed by Engineer-in-charge

4. Technical Specification for Item No. 4:

- (a) The item includes providing & fixing concealed wiring for single phase sub-circuit from the main switch /meter /DBs / MCBs to the switchboard with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 2.5 sq. mm. for phase & neutral wire and 1.5 Sq.mm continuous stranded copper conductor wire for earth to be laid through PVC Round Pipe of size 25 mm Diameter of Medium Mechanical Strength (MMS) type and other accessories such as Tee, junction box, inspection bends, elbow etc. of approved make. The proper size of grew shall be prepared by contractor on wall/ceiling as case may be & the conduit pipe shall be laid through prepared grew and incase of new construction the pipes shall be laid during reinforcement work. After laying of pipe the grew shall be closed with mixture of cement & sand and to match with existing surface of wall/ceiling. Complete work consists of necessary wiring connections and earth linking at both the ends with all materials and labour as directed by Engineer-in-charge.
- (b) The item includes providing & fixing concealed wiring for single phase sub-circuit from the main switch /meter /DBs / MCBs to the switchboard with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 4.0 sq. mm. for phase & neutral wire and 1.5 Sq.mm continuous stranded copper conductor wire for earth to be laid through PVC Round Pipe of size 25 mm Diameter of Medium Mechanical Strength (MMS) type and other accessories such as Tee, junction box, inspection bends, elbow etc. of approved make. The proper size of grew shall be prepared by contractor on wall/ceiling as case may be & the conduit pipe shall be laid through prepared grew and incase of new construction the pipes shall be laid during reinforcement work. After laying of pipe the grew shall be closed with mixture of cement & sand and to match with existing surface of wall/ceiling. Complete work consists of necessary wiring connections and earth linking at both the ends with all materials and labour as directed by Engineer-in-charge.

5. Technical Specification for Item No. 5:

- (a) The item includes providing & fixing surface wiring for single phase sub-circuit from the main switch /meter /DBs / MCBs to the switchboard with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 2.5 sq. mm. for phase & neutral wire and 1.5 Sq.mm continuous stranded copper conductor wire for earth to be laid through PVC Round Pipe of size 25 mm Diameter of Medium Mechanical Strength (MMS) type/PVC casing capping/oval shape PVC conduit pipe of 25mm and other accessories such as Tee, junction box,

inspection bends, elbow etc. of approved make as directed by Engineer-in-Charge. The PVC round/oval conduit shall be fixed rigidly on wall/ceiling with suitable size heavy duty PVC saddle set with base, clamp & screw at the interval of 0.5 meter. Complete work consists of necessary wiring connections and earth linking at both the ends with all materials and labour as directed by Engineer-in-charge.

- (b) The item includes providing & fixing surface wiring for single phase sub-circuit from the main switch /meter /DBs / MCBs to the switchboard with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 4.0 sq. mm. for phase & neutral wire and 1.5 Sq.mm continuous stranded copper conductor wire for earth to be laid through PVC Round Pipe of size 25 mm Diameter of Medium Mechanical Strength (MMS) type/ PVC casing capping/oval shape PVC conduit pipe of 25mm and other accessories such as Tee, junction box, inspection bends, elbow etc. of approved make as directed by Engineer-in-Charge. The PVC round/oval conduit shall be fixed rigidly on wall/ceiling with suitable size heavy duty PVC saddle set with base, clamp & screw at the interval of 0.5 meter. Complete work consists of necessary wiring connections and earth linking at both the ends with all materials and labour as directed by Engineer-in-charge.

6. Technical Specification for Item No. 6:

The item includes providing & fixing concealed wiring for light/tube/bell point from switchboard with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 1.5 sq. mm. for phase & neutral wire and 1.0 Sq.mm continuous stranded copper conductor wire for earth to be laid through PVC Round Pipe of size 20 mm Diameter of Medium Mechanical Strength (MMS) type and other accessories such as Tee, junction box, inspection bends, elbow etc. of approved make. The proper size of grew shall be prepared by contractor on wall/ceiling as case may be & the conduit pipe shall be laid through prepared grew and incase of new construction the pipes shall be laid during reinforcement work. After laying of pipe in the grew shall be closed with mixture of cement & sand and to match with existing surface of wall/ceiling. The work also includes providing & fixing of Bell Push/Flush type SP switch 6A x 250V with ISI mark and 3 plate Ceiling Rose/Angle Holder made from polycarbonate on suitable size of PVC box with cover. The PVC box shall be embedded properly in the wall and the switches shall be fixed on cover of the embedded box. The complete work consists necessary wiring connections and earth linking at both the ends with all materials and labour as directed by Engineer-in-charge.

7. Technical Specification for Item No. 7:

The item includes providing & fixing surface wiring for light/tube/bell point from switchboard with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 1.5 sq. mm. for phase & neutral wire and 1.0 Sq.mm continuous stranded copper conductor wire for earth to be laid through PVC Round Pipe of size 20 mm Diameter of Medium Mechanical Strength (MMS) type/ PVC casing capping / oval shape PVC conduit pipe and other accessories such as Tee, junction box, inspection bends, elbow etc. of approved make as directed by Engineer-in-Charge. The PVC round/oval conduit /casing capping shall be fixed rigidly on wall/ceiling with

suitable size heavy duty PVC saddle set with base, clamp & screw at the interval of 0.5 meter. The work consists providing & fixing of Bell Push/Flush type SP switch 6A x 250V with ISI mark and 3 plate Ceiling Rose/Angle Holder made from polycarbonate on suitable size of PVC box with cover. The PVC box shall be rigidly fixed with cemented wooden gutties on the wall and the switches shall be fixed on cover of the box. The complete work consists necessary wiring connections and earth linking at both the ends with all materials and labour as directed by Engineer-in-charge.

8. Technical Specification for Item No. 8:

The item includes providing & fixing concealed wiring for fan point from switchboard with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 1.5 sq. mm. for phase & neutral wire and 1.0 Sq.mm continuous stranded copper conductor wire for earth to be laid through PVC Round Pipe of size 20 mm Diameter of Medium Mechanical Strength (MMS) type and other accessories such as Tee, junction box, inspection bends, elbow etc. of approved make. The proper size of grew shall be prepared by contractor on wall/ceiling as case may be & the conduit pipe shall be laid through prepared grew and incase of new construction the pipes shall be laid during reinforcement work. After laying of pipe the grew shall be closed with mixture of cement & sand and to match with existing surface of wall/ceiling. The work consists providing & fixing of Flush type SP switch 6A x 250V with ISI mark and Step cut electronic fan regulator with rotary steps & 3 plate Ceiling Rose made from polycarbonate on suitable size of PVC box with cover. The PVC box shall be embedded properly in the wall and the switches shall be fixed on cover of the embedded box. The complete work consists necessary wiring connections and earth linking at both the ends with all materials and labour as directed by Engineer-in-charge.

9. Technical Specification for Item No. 9:

The item includes providing & fixing surface wiring for fan point from switchboard with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 1.5 sq. mm. for phase & neutral wire and 1.0 Sq.mm continuous stranded copper conductor wire for earth to be laid through PVC Round Pipe of size 20 mm Diameter of Medium Mechanical Strength (MMS) type/20mm oval shape PVC conduit pipe / PVC Casing Capping and other accessories such as Tee, junction box, inspection bends, elbow etc. of approved make as directed by Engineer-in-Charge. The PVC round/oval conduit / PVC Casing Capping shall be fixed rigidly on wall/ceiling with suitable size heavy duty PVC saddle set with base, clamp & screw at the interval of 0.5 meter. The work consists providing & fixing of Flush type SP switch 6A x 250V with ISI mark and Step cut electronic fan regulator with rotary steps & 3 plate Ceiling Rose made from polycarbonate on suitable size of PVC box with cover. The PVC box shall be rigidly fixed with cemented wooden gutties on the wall and the switches shall be fixed on cover of the box. The complete work consists necessary wiring connections and earth linking at both the ends with all materials and labour as directed by Engineer-in-charge.

10. Technical Specification for Item No. 10:

(a) Full Plug Point:

The item includes providing & fixing concealed wiring for plug point with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 1.5 sq. mm. for phase & neutral wire and 1.0 Sq.mm continuous stranded copper conductor wire for earth to be laid through PVC Round Pipe of size 20 mm Diameter of Medium Mechanical Strength (MMS) type and other accessories such as Tee, junction box, inspection bends, elbow etc. of approved make. The proper size of grew shall be prepared by contractor on wall/ceiling as case may be & the conduit pipe shall be laid through prepared grew and incase of new construction the pipes shall be laid during reinforcement work. After laying of pipe the grew shall be closed with mixture of cement & sand and to match with existing surface of wall/ceiling. The work consists providing & fixing of Flush type SP switch 6A x 250V with ISI mark and 2 in 1 socket 6A x 250V made from polycarbonate on suitable size of PVC box with cover. The PVC box shall be embedded properly in the wall and the switch & Socket shall be fixed on cover of the embedded box. The complete work consists necessary wiring connections and earth linking at both the ends with all materials and labour as directed by Engineer-in-charge.

(b) Half Plug Point:

The item includes providing & fixing half point in existing switch board with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 1.5 sq. mm. for phase, neutral & earth. The work consists providing & fixing of Flush type SP switch 6A x 250V with ISI mark and 2 in 1 socket 6A x 250V made from polycarbonate on existing switchboard. The complete work consists necessary wiring connections and earth linking with all materials and labour as directed by Engineer-in-charge.

11. Technical Specification for Item No. 11:

(a) The item includes providing & fixing surface wiring for plug point with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 1.5 sq. mm. for phase & neutral wire and 1.0 Sq.mm continuous stranded copper conductor wire for earth to be laid through PVC Round Pipe of size 20 mm Diameter of Medium Mechanical Strength (MMS) type/20mm oval shape PVC conduit pipe/PVC Casing Capping and other accessories such as Tee, junction box, inspection bends, elbow etc. of approved make as directed by Engineer-in-Charge. The PVC round/oval conduit/PVC Casing Capping shall be fixed rigidly on wall/ceiling with suitable size heavy duty PVC saddle set with base, clamp & screw at the interval of 0.5 meter. The work consists providing & fixing of Flush type SP switch 6A x 250V with ISI mark and 2 in 1 socket 6A x 250V made from polycarbonate on suitable size of PVC box with cover. The PVC box shall be rigidly fixed with cemented wooden gutties on the wall and the switch & Socket shall be fixed on cover of the box. The complete work consists necessary wiring connections and earth linking at both the ends with all materials and labour as directed by Engineer-in-charge.

(b) The item includes providing & fixing half point in existing switch board with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of

size 1.5 sq. mm. for phase, neutral & earth. The work consists providing & fixing of Flush type SP switch 6A x 250V with ISI mark and 2 in 1 socket 6A x 250V made from polycarbonate on existing switchboard. The complete work consists necessary wiring connections and earth linking with all materials and labour as directed by Engineer-in-charge.

12. Technical Specification for Item No. 12:

The item includes providing & fixing concealed wiring for Power point with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 4.0 sq. mm. for phase & neutral wire and 2.5 Sq.mm continuous stranded copper conductor wire for earth to be laid through PVC Round Pipe of size 25 mm Diameter of Medium Mechanical Strength (MMS) type and other accessories such as Tee, junction box, inspection bends, elbow etc. of approved make. The proper size of grew shall be prepared by contractor on wall/ceiling as case may be & the conduit pipe shall be laid through prepared grew and incase of new construction the pipes shall be laid during reinforcement work. After laying of pipe in prepared grew the grew shall be closed with mixture of cement & sand and to match with existing surface of wall/ceiling. The work consists providing & fixing of 5 in 1 combined unit suitable for 1 with switch, socket, fuse & indicator with ISI mark. The PVC box of suitable size shall be embedded properly in the wall and the combined unit shall be fixed on embedded PVC box. The complete work consists necessary wiring connections and earth linking at both the ends with all materials and labour as directed by Engineer-in-charge.

13. Technical Specification for Item No. 13:

The item includes providing & fixing surface wiring for Power point with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 4.0 sq. mm. for phase & neutral wire and 2.5 Sq.mm continuous stranded copper conductor wire for earth to be laid through PVC Round Pipe of size 25 mm Diameter of Medium Mechanical Strength (MMS) type/25mm oval shape PVC conduit pipe/PVC Casing Capping and other accessories such as Tee, junction box, inspection bends, elbow etc. of approved make as directed by Engineer-in-Charge. The PVC round/oval conduit shall be fixed rigidly on wall/ceiling with suitable size heavy duty PVC saddle set with base, clamp & screw at the interval of 0.5 meter. The work consists providing & fixing of 5 in 1 combined unit suitable for 15/16A with switch, socket, fuse & indicator with ISI mark. The PVC box of suitable size shall be rigidly fixed with cemented wooden gutties on the wall and the combined unit shall be fixed on PVC box. The complete work consists necessary wiring connections and earth linking at both the ends with all materials and labour as directed by Engineer-in-charge.

14. Technical Specification for Item No. 14:

The item includes providing & fixing concealed wiring for A.C point with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 4.0 sq. mm. for phase & neutral wire and 2.5 Sq.mm continuous stranded copper conductor wire for earth to be laid through PVC Round Pipe of size 25 mm Diameter of Medium Mechanical Strength (MMS) type and other accessories such as Tee, junction box, inspection bends, elbow etc. of approved make. The proper size of grew shall be prepared by contractor on wall/ceiling as case may be & the conduit pipe

shall be laid through prepared grew and incase of new construction the pipes shall be laid during reinforcement work. After laying of pipe, the grew shall be closed with mixture of cement & sand and to match with existing surface of wall/ceiling. The work also includes providing & fixing of 20A Socket near the AC Indoor Unit and 20A two modular Switch at 1/1.5 Mtr above ground level on in the switch board as the case may be including necessary wiring from switch to socket. The PVC box for socket & Switch of suitable size shall be embedded properly in the wall. The complete work consists necessary wiring connections and earth linking at both the ends with all materials and labour as directed by Engineer-in-charge.

15. Technical Specification for Item No. 15:

The item includes providing & fixing surface wiring for A.C point with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 4.0 sq. mm. for phase & neutral wire and 2.5 Sq.mm continuous stranded copper conductor wire for earth to be laid through PVC Round Pipe of size 25 mm Diameter of Medium Mechanical Strength (MMS) type/25mm oval shape PVC conduit pipe/ PVC Casing Capping and other accessories such as Tee, junction box, inspection bends, elbow etc. of approved make as directed by Engineer-in-Charge. The PVC round/oval conduit/PVC Casing Capping shall be fixed rigidly on wall/ceiling with suitable size heavy duty PVC saddle set with base, clamp & screw at the interval of 0.5 meter. The work also includes providing & fixing of 20A Socket near the AC Indoor Unit and 20A two modular Switch at 1/1.5 Mtr above ground level on in the switch board as the case may be including necessary wiring from switch to socket. The PVC box for socket & Switch of suitable size shall be rigidly fixed with cemented wooden gutties on the wall. The complete work consists necessary wiring connections and earth linking at both the ends with all materials and labour as directed by Engineer-in-charge.

16. Technical Specification for Item No. 16:

The item includes providing & fixing concealed wiring for plug point for computers (With 3nos. 2 in 1 socket 6A x 250V & 3 nos. Flush type SP switch 6A x 250V) with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 2.5 sq. mm. for phase & neutral wire and 1.5 Sq.mm continuous stranded copper conductor wire for earth to be laid through PVC Round Pipe of size 20 mm Diameter of Medium Mechanical Strength (MMS) type and other accessories such as Tee, junction box, inspection bends, elbow etc. of approved make. The proper size of grew shall be prepared by contractor on wall/ceiling as case may be & the conduit pipe shall be laid through prepared grew and incase of new construction the pipes shall be laid during reinforcement work. After laying of pipe, the grew shall be closed with mixture of cement & sand and to match with existing surface of wall/ceiling. The work consists providing & fixing of 3 nos. Flush type SP switch 6A x 250V with ISI mark and 3 nos. 2 in 1 socket 6A x 250V made from polycarbonate on suitable size of PVC box with cover. The PVC box shall be embedded properly in the wall and the switches & Sockets shall be fixed on cover of the embedded box. The complete work consists necessary wiring connections and earth linking at both the ends with all materials and labour as directed by Engineer-in-charge.

17. Technical Specification for Item No. 17:

The item includes providing & fixing surface wiring for plug point for computers (With 3nos. 2 in 1 socket 6A x 250V & 3 nos. Flush type SP switch 6A x 250V) with Flame Retardant, 1100 Voltage grade, single core stranded copper conductor wire of size 2.5 sq. mm. for phase & neutral wire and 1.5 Sq.mm continuous stranded copper conductor wire for earth to be laid through PVC Round Pipe of size 20 mm Diameter of Medium Mechanical Strength (MMS) type/20mm oval shape PVC conduit pipe / PVC Casing Capping and other accessories such as Tee, junction box, inspection bends, elbow etc. of approved make as directed by Engineer-in-Charge. The PVC round/oval conduit /Casing capping shall be fixed rigidly on wall/ceiling with suitable size heavy duty PVC saddle set with base, clamp & screw at the interval of 0.5 meter. The work consists providing & fixing of 3 nos. Flush type SP switch 6A x 250V with ISI mark and 3 nos. 2 in 1 socket 6A x 250V made from polycarbonate on suitable size of PVC box with cover. The PVC box shall be rigidly fixed with cemented wooden gutties on the wall and the switches & Sockets shall be fixed on cover of the box. The complete work consists necessary wiring connections and earth linking at both the ends with all materials and labour as directed by Engineer-in-charge.

18. Technical Specification for Item No. 18:

(a) Supply: This includes supply at site 6 way double door SPN DB with IP42 degree of protection. TH DB shall be made from special grade of CRCA sheet and powder coated. The DB shall be fitted with Bus Bar, DIN Rail and neutral link. Along with each DB box, the following MCBs & ELCB shall be supplied and accordingly calculate the quantity. The rates shall be including the cost of MCBs & RCCB supplied along with DB.

S/N	Description for 1 Box	Qty. for each DB
1	MCB (C-Curve), 6-10 Amp.	3
2	MCB (C-Curve), 32 Amp.	1
3	RCCB, 30 AMP	1

(b) Fixing: This includes fixing and commissioning of supplied double door DB on wall / structure as directed. The DB shall be fixed rigidly on wall through suitable size of nut bolts / anchor fasteners / cemented wooden gutties as directed. This includes necessary wiring, connections & earth linking with all material and labour as directed by Engineer-in-Charge.

19. Technical Specification for Item No. 19:

(a) Supply: This includes supply at site 4 ft LED Tube light fixture of 20-22 Watt. The tube light shall be operating on single phase 230V, 50Hz AC supply. It shall be with white light and shall be have the facility of clamping the tube rod on fixed clip (on the wall) The LED rod shall be fluctuation proof and shall provide with in-built driver.

(b) Fixing: This includes fixing and commissioning of supplied 4ft LED 20-22 Watt tube light fixture on wall/ceiling at suitable height on cemented wooden gutties as directed and connection with 3 core flexible copper cable from nearest source of supply/ceiling rose & necessary connection with all material and labour as directed by Engineer-in-Charge.

20. Technical Specification for Item No. 20:

(a) Supply: This includes supply of 1200 mm sweep ceiling fan fitted with heavy duty grease filled double ball bearing that ensures noiseless performance and long lasting smoother life of fan suitable upto 250V AC supply. The Fan blades aerodynamically balanced to ensure maximum air delivery at lower power consumption & the blades shall be made of 'heavy gauge' aluminum sheet so as to retain the blade's angle over a longer period. The Fan motor made of superior grade copper wire and impregnated in special varnish for long life operation. The motor shall be totally enclosed and low-loss-silicon steel stampings ensure minimum power consumption with high optimum output. The Fan coated with a special anticorrosive enamel paint that makes them rust free and ensures a classic appearance and longer life. The supplied fan conforming to ISI specifications. The fan shall be supplied all accessories such as down rod 30/60/120cm long, PVC Bobbin, Stainless Steel Nut Bolt with cotter pin, capacitor etc. of approved make and as per IS specification as directed by Engineer-in-charge.

(b) Fixing: This includes fixing & commissioning of supplied ceiling fan with all accessories in existing hook including necessary wiring and connection from nearest point / Ceiling rose through PVC flexible copper conductor wire and earth linking etc. with all material and labour as directed by Engineer-in-charge.

21. Technical Specification for Item No. 21:

(a) Supply: This includes supply of exhaust fan of size 225mm with capacitor start and run type motor, continuously rated, totally enclosed fitted with heavy duty grease filled double ball bearing that ensures noiseless performance and long lasting smoother life of fan suitable for single phase 220/250 Volts A.C. 50HZ. The impeller shall be used in an Exhaust Fan is of the propeller type & both hub and impeller shall be dynamically balanced, frames and arms mounted on rubber bushings, to avoid vibrations.

(b) Fixing: This includes fixing & commissioning of supplied exhaust on existing exhaust hole so that discharge of exhaust air can be done easily. However if exhaust hole is not provided, it is to be done by contractor. The grouting of the fan is to be done by suitable size of anchor fastener bolts, and by providing metallic mesh/louvers as directed to other side so that birds can be restricted in the passage. This includes connections with 3 core flexible copper cable from nearest source of supply & necessary connections & earth linking with all material and labour and as directed by Engineer-In-Charge.

22. Technical Specification for Item No. 22:

(a) Supply: This includes supply of energy efficient LED 10 Watt, cool white, surface mounted bulk head light fixture of approved make and as desired by Engineer In Charge.

(b) Fixing: This includes fixing and commissioning of supplied LED 10 Watt bulk head light fixture on wall/ceiling at suitable height on cemented wooden gutties as

directed and connection with 3 core flexible copper cable from nearest source of supply & necessary connections & earth linking with all material and labour and as directed by Engineer-In-Charge.

23. Technical Specification for Item No. 23:

(a) Supply: This includes supply of energy efficient LED 60 Watt, Street Light Fixture. The fixture shall be of 100Lm/W delivered, Pressure die cast housing with toughened glass, the fixture shall have secondary optics for better light distribution. Driver protection against lightening, over voltage, short circuit. Excess to driver shall be from top. The fixture shall be IP 66. Impact protection shall be IK07.

(b) Fixing: This includes fixing and commissioning of supplied LED 10 Watt bulk head light fixture on wall/ceiling at suitable height on cemented wooden gutties as directed and connection with 3 core flexible copper cable from nearest source of supply & necessary connections & earth linking with all material and labour and as directed by Engineer-In-Charge.

24. Technical Specification for Item No. 24:

(a) Supply: This item includes supply of Tamper proof, Shock proof and Rust proof SMC (Sheet Moulding Compound) Junction box with side hinged door and shall be supplied with 5 nos. connectors suitable for 16A x 230 Volts.

The Junction box shall be in single piece without any joints having concealed hinges, mounting screws fitted from inside, Metal hardware for wire seal, light weight and adequate.

The size of SMC Junction Box shall be of inside dimension 140 mm x 140 mm x 95 mm.

(b) Fixing: This includes fixing of supplied Shock proof and Rust proof SMC (Sheet Moulding Compound) Junction box on wall / structure/Pole as directed. The Junction Box shall be fixed rigidly on wall through suitable size of nut bolts/anchor fasteners/cemented wooden gutties and in case of pole it shall be fixed through suitable size of G.I. clamp at least 2mm. thick as directed. This includes with all material, labour tools & tackles including necessary wiring & connections with earth linking as directed by Engineer-In-charge

25. Technical Specification for Item No. 25:

(a) Supply: This includes supply of (a) 8 Way, (b) 12 way & (c) 16 way double door SPN DB with IP42 degree of protection. The DB shall be made from special grade of CRCA sheet and powder coated. The DB shall be fitted with Busbar, DIN Rail and neutral link. The rates shall be excluding the cost of MCB.

(b) Fixing: This includes fixing & commissioning of supplied double door SPN DB on wall / structure as directed. The DB shall be fixed rigidly on wall through suitable size of nut bolts/anchor fasteners/cemented wooden gutties as directed. This includes necessary wiring, connections & earth linking with all material, labour tools & tackles as directed by Engineer-In-charge.

26. Technical Specification for Item No. 26:

(a) Supply: This includes supply of following MCBs as per the requirements.

(I) 40A, 415/440V, 4P (TPN) MCB

- (II) 40A, 415/440V, 3P (TP) MCB
- (III) 6 -32 A 230/250V DP MCB
- (IV) 6 -32 A 230/250V SP MCB

The MCBs shall be of DIN Rail mounted 'C' Series with 10kA Breaking Capacity. The supplied MCB shall be conform to relevant IS.

- (b) Fixing:** This includes fixing & commissioning of supplied SP/DP/TP/TPN MCB in existing SPN double door DB on wall / structure. The MCB shall be fixed on DIN Rail provided in existing DB. This includes necessary 1 ϕ / 3 ϕ wiring, connections, distribution & earth linking of DB with all material, labour tools & tackles as directed by Engineer-In-charge.

27. Technical Specification for Item No. 27:

- (a) Supply:** This includes supply of "OFF LOAD" four pole Change over switch suitable for 32A x 415 Volt & conforms to relevant IS. The unit shall be provided in powder coated sheet steel enclosure. The current carrying parts shall be bright tin plated, fully shrouded live terminals & suitable for accommodating aluminum/copper conductor cable or bus bar termination. The neoprene rubber gasket shall be provided to avoid dust entry & the mechanism shall be suitable for quick make/break operation with handle and mechanically interlocking arrangement to prevent switching ON when cover in open position. The enclosure shall be fitted with removable top & bottom plates with knockouts for entry of cables.
- (b) Fixing:** This includes fixing & commissioning of supplied changeover switch unit 32A x 415 Volt four Pole on wall / structure as directed. The switch shall be fixed rigidly on wall through suitable size of nut bolts/anchor fasteners/cemented wooden gutties as directed. This includes necessary wiring, connections & earth linking with all material, labour tools & tackles as directed by Engineer-In-charge.

28. Technical Specification for Item No. 28:

This includes Supply and preparation of earth station with chemical treated back filled compound corrosion protection by hot dip 25-30mm dia. Pipe-In-Pipe GI type 2 Mtr. Depth, maintenance free including all accessories. This also includes necessary masonry work for preparing of earth pit.

29. Technical Specification for Item No. 29:

- (a)** This includes preparation of earth station with G.I. Earth plate 600mm x 600mm. x 10mm. thickness and shall be buried in such a way that its top edge is at a depth of not less than 1.5 Meter from the surface of ground. It shall have a G.I pipe (Class-B) for watering of size 20mm dia. buried vertically and adjacent to plate electrode and other end shall be provided with funnel. The two runs of G.I. flat of size 50mm x 6mm thick shall be clamped near funnel and to be taken from main earth plate. The value of earth pit shall be less than 5 Ω .

A cement concrete (ratio 1:4:8) chamber of at least 30 cm x 30 cm shall be provided just below the surface of ground over the funnel for watering and having RCC/CI cover of suitable size as directed. The pit shall be filled with alternative layer of 15cm each of charcoal and salt. This also includes removal of extra-excavated earth from the site. The work shall be carried out to entire

satisfaction of Engineer-in-charge. This work includes all labour and material as directed by Engineer-in-charge.

- (b)** This includes preparation of earth station with Copper Earth plate 600mm x 600mm. x 3mm. thickness and shall be buried in such a way that its top edge is at a depth of not less than 1.5 Meter from the surface of ground. It shall have a G.I pipe (Class-B) for watering of size 20mm dia. buried vertically and adjacent to plate electrode and other end shall be provided with funnel. The two runs of copper flat of size 50mm x 6mm thick shall be clamped near funnel and to be taken from main earth plate. The value of earth pit shall be less than 5Ω.

A cement concrete (ratio 1:4:8) chamber of at least 30 cm x 30 cm shall be provided just below the surface of ground over the funnel for watering and having RCC/CI cover of suitable size as directed. The pit shall be filled with alternative layer of 15cm each of charcoal and salt. This also includes removal of extra-excavated earth from the site. This work includes all labour and material as directed by Engineer-in-charge.

30. Technical Specification for Item No. 30:

- (a) Supply:** This includes supply at site of G.I strip of size 25x3 mm. G.I. Strip shall be hot dip galvanized with minimum 80 Micron uniform coating.

- (b) Laying & Connecting:** This includes laying & connecting of G.I. Strip from earth station/existing earthing system to equipment/ Main DBs or as per site requirement. The work includes all material & labour required shall done as directed by Engineer-in-charge.

31. Technical Specification for Item No. 31:

This includes supply at site, laying, fixing and connecting of G.I wire of size 8 SWG from earth station/existing earthing system to Junction Boxes/Distribution Boards/lighting accessories etc. as directed. The 8 SWG earth wire shall be passed through conduit pipe.

**Executive Engineer (E)
Deendayal Port Trust**