

**BILL OF QUANTITIES**

**MEP WORK FOR PROPOSED OVERHAULING HANGAR AT M/s.BEML LIMITED AT KANJIKODE,PALAKKAD, KERALA.**

S. No.	Description	Unit	QTY	Remarks
<b>I.ELECTRICAL WORK</b>				
<b>1</b>	<b>PANELS</b>			
	Design, Fabrication, Supply, Erection, Testing and commissioning of Powder coated Panel fabricated out of 14 guage CRCA sheet steel in cubical compartmentallised, free standing floor mounted on a base frame, totally enclosed, extensible type dust and vermin proof, with reinforcement of suitable size angle iron, channel, T-iron or flats as required. The general construction shall confirm to IS:8623/93. Cable gland plates shall be provided on top as well as bottom of the panels with minimum 3mm thick plate. Panels shall be treated with all anti-corrosive process before painting as per specification. Panels shall be suitable for 415V, 3-Phase, Four wire, 50 Hz supply complete with earth bus and lifting hooks as required in case of large panels. Approval of GAD along with BOM shall be taken for each panel before fabrication. (All hardwares like nuts and bolts used shall be Galvanize and Zinc passivated). <b>Ingress protection shall be IP54 minimum for indoor use.</b> Complete board shall be factory fabricated and ready for installation at site. After the fabrication and before the despatching, the panel should be tested for high voltage test at 2.5 kv, insulation resistance test by 1000 v megger, polarity test. Power and			
<b>1</b>	<b>MAIN PANEL</b>			
	<b>INCOMER</b>			
	2 nos. 1250 A FP ACB (50kA) shall comply having microprocessor based programmable & variable trip setting for releases with integral protection for the following:			
	IDMTL Protection for S/C, O/C & E/f releases. With communication through RS 485 Port compatible with PLC/PC			
	U/V & O/V protection			
	with Mechanical Inter lock			
	<b>METERING &amp; INDICATION</b>			
	2 sets of phase LED indicating lamps with individual 10A toggle switch			
	2 sets of with 3 nos. 2A SP MCBs each for control circuit protection			
	6 nos. 1250/5A, CL-1 CTs, as required			
	Multifunction Meter - 2 Nos Parameters: V, A, F, PF, kW, kVA, kVAR, kWh, kVAh, kVARh, Runhours, On hours, Phase angle, Interrupts, THD, Events (High-Low, Neutral Current with RS485 Port			
	2 Sets of Breaker ON-OFF-TRIP indication Lamps			
	<b>BUS BAR:-</b>			
	1 Sets of 1250 A, TPN Aluminum bus bars with colour coded sleeves.			
	<b>OUTGOINGS</b>			
	IDMTL Protection for S/C, O/C & E/f releases, continuously variable			
	U/V & O/V protection with front drive kit for all MCCBs			
	1 no. 800 A TPN MCCB (35 kA)having microprocessor based programmable & variable trip setting for releases with integral protection			
	2 nos. 630 A TPN MCCB (35 kA)having microprocessor based programmable & variable trip setting for releases with integral protection			
	1 no. 400 A TPN MCCB (35 kA)having microprocessor based programmable & variable trip setting for releases with integral protection			
	1 no. 250 A TPN MCCB (35 kA)having microprocessor based programmable & variable trip setting for releases with integral protection			
	1 no. 200 A TPN MCCB (50 kA)having microprocessor based programmable & variable trip setting for releases with integral protection	Each	1	
<b>2</b>	<b>SSB-1 PANEL</b>			
	<b>INCOMER</b>			
	1 nos. 800 A FP MCCB (50kA) shall comply having microprocessor based programmable & variable trip setting for releases with integral protection for the following:			
	IDMTL Protection for S/C, O/C & E/f releases. With communication through RS 485 Port compatible with PLC/PC			
	U/V & O/V protection			

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<b>I.ELECTRICAL WORK</b>				
	with front drive kit			
	<b>METERING &amp; INDICATION</b>			
	1 sets of phase LED indicating lamps with individual 10A toggle switch			
	1 sets of with 3 nos. 2A SP MCBs each for control circuit protection			
	3 nos. 800/5A, CL-1 CTs, as required			
	Multifunction Meter - 1 No Parameters: V, A, F, PF, kW, kVA, kVAR, kWh, kVAh, kVARh, Runhours, On hours, Phase angle, Interrupts, THD, Events (High-Low, Neutral Current with RS485 Port			
	1 Sets of Breaker ON-OFF-TRIP indication Lamps			
	<b>BUS BAR:-</b>			
	1 Sets of 800 A, TPN Aluminum bus bars with colour coded sleeves.			
	<b>OUTGOINGS</b>			
	IDMTL Protection for S/C, O/C & E/f releases, continuously variable			
	U/V & O/V protection with front drive kit for all MCCBs			
	2 nos. 400 A TPN MCCB (35 kA)			
	3 nos. 250 A TPN MCCB (35 kA)			
	2 Nos. 200A TPN TM MCCB (25 KA)			
	1 Nos. 125A TPN TM MCCB (25 KA)	Each	1	
<b>3</b>	<b>PSB-1 PANEL</b>			
	<b>INCOMER</b>			
	1 nos. 250 A TPN MCCB (35 kA)having microprocessor based programmable & variable trip setting for releases with integral protection for the following:			
	IDMTL Protection for S/C, O/C & E/f releases. With communication through RS 485 Port compatible with PLC/PC			
	U/V & O/V protection			
	with front drive kit			
	<b>METERING &amp; INDICATION</b>			
	1 sets of phase LED indicating lamps with individual 10A toggle switch			
	1 sets of with 3 nos. 2A SP MCBs each for control circuit protection			
	3 nos. 250/5A, CL-1 CTs, as required			
	Multifunction Meter - 1 No Parameters: V, A, F, PF, kW, kVA, kVAR, kWh, kVAh, kVARh, Runhours, On hours, Phase angle, Interrupts, THD, Events (High-Low, Neutral Current with RS485 Port			
	1 Sets of Breaker ON-OFF-TRIP indication Lamps			
	<b>BUS BAR:-</b>			
	1 Sets of 250 A, TPN Aluminum bus bars with colour coded sleeves.			
	<b>OUTGOINGS</b>			
	IDMTL Protection for S/C, O/C & E/f releases, continuously variable			
	U/V & O/V protection with front drive kit for all MCCBs			
	2 Nos. 125A TPN TM MCCB (25 KA)			
	2 Nos. 100A TPN TM MCCB (25 KA)			
	4 Nos. 63A TPN TM MCCB (25 KA)			
	2 Nos. 32A DP TM MCCB (25 KA)	Each	1	
<b>4</b>	<b>LSB-1 PANEL</b>			
	<b>INCOMER</b>			
	1 nos. 200 A 4P MCCB (35 kA)having microprocessor based programmable & variable trip setting for releases with integral protection for the following:			
	IDMTL Protection for S/C, O/C & E/f releases. With communication through RS 485 Port compatible with PLC/PC			
	U/V & O/V protection			
	with front drive kit			
	<b>METERING &amp; INDICATION</b>			
	1 sets of phase LED indicating lamps with individual 10A toggle switch			
	1 sets of with 3 nos. 2A SP MCBs each for control circuit protection			
	3 nos. 200/5A, CL-1 CTs, as required			
	Multifunction Meter - 1 No Parameters: V, A, F, PF, kW, kVA, kVAR, kWh, kVAh, kVARh, Runhours, On hours, Phase angle, Interrupts, THD, Events (High-Low, Neutral Current with RS485 Port			

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S. No.	Description	Unit	QTY	Remarks
<b>I.ELECTRICAL WORK</b>				
	1 Sets of Breaker ON-OFF-TRIP indication Lamps			
	<b>BUS BAR:-</b>			
	1 Sets of 200 A, TPN Aluminum bus bars with colour coded sleeves.			
	<b>OUTGOINGS</b>			
	IDMTL Protection for S/C, O/C & E/f releases, continuously variable			
	U/V & O/V protection with front drive kit for all MCCBs			
	8 Nos. 63A TPN TM MCCB (25 KA)			
	2 Nos. 32A DP MCCB (16 KA)	Each	1	
<b>5</b>	<b>BUSBAR TRUNKING - Sandwich Type</b>			
	Supply, Installation, Testing and Commissioning of the following Indoor sandwich type BBT with 35KA TP& N Busbars, complete with Flexibles at regular intervals (4 meters) to take of thermal expansion and ventilations louvers with chicken mesh on the covers at regular intervals ( 1 meter), along with required 'L' bends, MS Supports and other associated fixing accessories as required as per the site conditions. The cost shall inclusive of earthing of BBT with 2 runs of 25x3mm Cu. flat.			
	1. Aluminium bus bars should be mounted on finger type of DMC/SMC. Supported on both sides. 2. min. clearance between bus bar should not less than be 40mm . 3.Each segment of bus bar trunking should be 2mtrs in length with provision to mount 3 nos of MCCB boxes. Dummy covers to be put where ever MCCB box is not put. 4.Each 2 mt segment of bus bar should be provided with mounting brackets with screws and fish plates for bus bar continuity. 5.Spare end covers to be provided for closing the BBT where ever required .desgn should be approved by site engineer/consultant before ordering. 6. The fabrication and dimentions should match as per the existing installation of the same at site.			
	400A TPN 35KA - BBT-1 & 2			
	Straight length - 70 Mtrs			
	Plug-in type Tap off boxes with 200A TPN 25KA MCCB - 1 Nos			
	Plug-in type Tap off boxes with 125A TPN 25KA MCCB - 3 Nos			
	Plug-in type Tap off boxes with 100A 4P 25KA MCCB - 6 Nos			
	Plug-in type Tap off boxes with 63A 4P 16KA MCCB - 9 Nos			
	1 No - 400A TPN 35KA MCCB as incoming control with suitable enclosure including cable adopter box and interconnections.Cable entry box shall be mounted on the side of BBT ( size of box appr.700H , 500W, 400D) Prior approval from the client / consultant's site engineer should be taken.			
	<b>BUS BAR RATING:</b>			
	One set: 400A TPN 35KA for 1 sec. Aluminium bus bars with colour coated heat shrinkable PVC sleeves with DMC/SMC bus bar supports and suitable earth bus as required.	Set	2	
<b>6</b>	<b>DISTRIBUTION BOARDS</b>			
	Supply, Installation, Testing and Commisioining of three phase, phase segregated, compartmentalised 8 way MCBDB Double door type, IP 42 powder coated comprising of "C" curve MCB's for LIGHTING DB			
	Incomer - 63A 4P MCB - 1 No			
	Phase Incomer - 63A, 30mA DP RCBO - 3Nos			
	Outgoings - 6 - 32A SP MCB - 24 Nos			
	Blank Plates - 0			
	Including all interconnections and other associated fixing accessories etc as reqd as per the site conditions.	Each	6	
<b>7</b>	Supply, Installation, Testing and Commisioining of single phase 12 way MCBDB Double door type, IP 42 powder coated comprising of "C" curve MCB's for UPS DB-OFFICE & HANGAR.			
	Incommer - 40A, 30mA DP RCBO - 1No			
	Outgoings - 6 - 25A SP MCB - 12 Nos			
	Blank Plates - 0			
	Including all interconnections and other associated fixing accessories etc as reqd as per the site conditions.	Each	3	

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S. No.	Description	Unit	QTY	Remarks
<b>I.ELECTRICAL WORK</b>				
8	Supply, Installation, Testing and Commisioining of three phase, phase segregated, compartmentalised 12 way MCBDB Double door type, IP 42 powder coated comprising of "C" curve MCB's for UPS DB - 1NO Incommer - 63A 4P MCB - 1 No Phase Incommer - 63A 100mA DP RCBO - 3Nos Outgoings - 16/32A SP MCB - 36Nos Blank Plates - 0			
	Including all interconnections and other associated fixing accessories etc as reqd as per the site conditions.	Each	1	
9	Supply, Installation, Testing and Commisioining of three phase, phase segregated, compartmentalised 8 way MCBDB Double door type, IP 42 powder coated comprising of "C" curve MCB's for POWER DB - 3NOS & AC DB-2NOS. Incommer - 63A 4P MCB - 1 No Phase Incommer - 63A 100mA DP RCBO - 3Nos Outgoings - 16/32A SP MCB - 24 Nos Blank Plates - 0			
	Including all interconnections and other associated fixing accessories etc as reqd as per the site conditions.	Each	5	
10	Supply, Installation, Testing and Commisioining of three phase & single phase Industrial type MCB DB with socket control box IP 42 powder coated comprising of "C" curve MCB's for the location of Pillars. Incommer - 63A, 4P MCB - 1No With Sutable size of RYBN Copper Bus bars. Outgoings - 32A 100mA 4P RCBO with 5 pin Industrial PVC socket - 2Nos Outgoings - 16A 100mA DP RCBO with 3 pin Industrial PVC socket - 2Nos Blank Plates - 0			
	Including all interconnections and other associated fixing accessories etc as reqd as per the site conditions.	Each	14	
11	Supply, Installation, Testing and Commisioining of 8Way VTPN DB - three phase & single phase Industrial type MCB with socket control box IP 42 powder coated comprising of "C" curve MCB's for Roofing Shater Incommer - 63A, 4P MCCB - 1No Outgoings - 10A 3P MCB - 4 Nos Outgoings - 6 to 32A MCB - 12Nos Blank Plates - 0			
	Including all interconnections and other associated fixing accessories etc as reqd as per the site conditions.	Each	2	
<b>I</b>	<b>CABLE SUPPLY AND LAYING</b>			
12	XLPE insulated, armoured heavy duty electric cable with copper conductor, 1100 volts grade, cross-sectional area 2.5 sq. mm - 4 core	Meter	150	
13	XLPE insulated, armoured heavy duty electric cable with copper conductor, 1100 volts grade, cross-sectional area 2.5 sq. mm - 3 core in	Meter	450	
14	XLPE insulated, armoured heavy duty electric cable with copper conductor, 1100 volts grade, cross-sectional area 4 sq. mm - 4 core	Meter	150	
15	XLPE insulated, armoured heavy duty electric cable with copper conductor, 1100 volts grade, cross-sectional area 4 sq. mm - 3 core in	Meter	450	
16	XLPE insulated, armoured heavy duty electric cable with copper conductor, 1100 volts grade, cross-sectional area 10 sq. mm - 4 core	Meter	325	
17	XLPE insulated, armoured heavy duty electric cable with copper conductor, 1100 volts grade, cross-sectional area 16 sq. mm - 4 core	Meter	330	
18	XLPE insulated, armoured heavy duty electric cable with copper conductor, 1100 volts grade, cross-sectional area 50 sq. mm - 4 core	Meter	90	
19	XLPE insulated, armoured heavy duty electric cable with aluminium conductor, 1100 volts grade, cross-sectional area 25 sq. mm - 3.5 core	Meter	480	

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S. No.	Description	Unit	QTY	Remarks
<b>I.ELECTRICAL WORK</b>				
20	XLPE insulated, armoured heavy duty electric cable with aluminium conductor, 1100 volts grade, cross-sectional area 95 sq. mm - 3.5 core	Meter	150	
21	XLPE insulated, armoured heavy duty electric cable with aluminium conductor, 1100 volts grade, cross-sectional area 120 sq. mm - 3.5 core	Meter	70	
22	XLPE insulated, armoured heavy duty electric cable with aluminium conductor, 1100 volts grade, cross-sectional area 150 sq. mm - 3.5 core	Meter	50	
23	XLPE insulated, armoured heavy duty electric cable with aluminium conductor, 1100 volts grade, cross-sectional area 300 sq. mm - 3.5 core	Meter	200	
24	XLPE insulated, armoured heavy duty electric cable with aluminium conductor, 1100 volts grade, cross-sectional area 400 sq. mm - 3.5 core	Meter	880	
<b>II CABLE END TERMINATION</b>				
	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.			
25	3C X 2.5 sq. mm	Each	9	
26	3C X 4 sq. mm	Each	36	
27	4C X 2.5 sq. mm	Each	12	
28	4C X 4 sq. mm	Each	6	
29	3.5 X 25 sq. mm (28mm)	Each	64	
30	3.5 X 95 sq. mm (45mm)	Each	4	
31	3.5 X 120 sq. mm (45mm)	Each	2	
32	3.5 X 150 sq. mm (50mm)	Each	4	
33	3.5 X 300 sq. mm (70mm)	Each	4	
34	3.5 X 400 sq. mm (82mm)	Each	16	
35	4 X 10 sq. mm (25mm)	Each	12	
36	4 X 16 sq. mm (28mm)	Each	12	
37	4 X 50 sq. mm (35mm)	Each	2	
<b>III LIGHT &amp; FAN FIXTURES</b>				
38	Supply and fixing LED lights fitting 1x 20W, 220V,AC decorative box type with driver, holder including LED tube light connecting up with three core flexible copper conductor cable of suitable size from ceiling rose complete.	Each	36	
39	Supply and fixing LED lights fitting 1x 40W, 220V, AC decorative box type with driver, holder including LED tube light connecting up with three core flexible copper conductor cable of suitable size from ceiling rose complete.	Each	41	
40	Supply and fixing LED light fitting mirror type with high out put diffuser 2 feet, 10 watt 220 V AC decorative type with driver holder and LED lamp including connecting up with three core flexible copper conductor cable of suitable size complete.	Each	10	
41	Supply and fixing round shape 13 watt 220 volts AC recessed type with high efficiency PMMA diffuser soft glare free light complete with drivers, holders, LED lamp suitable for roof ceiling including connecting up with three core flexible copper conductor cable of suitable size complete.	Each	6	
42	S&F LED light fitting 1x9W/1X10Wbulkhead luminaires including LED light driver holder connecting up with three core flexible copper conductor cable of suitable size.	Each	7	
43	Supply and fixing of Highbay Luminaire closed version with anodized aluminium narrow beam and wide beam reflector. Comprised of Housing (HPK),Reflector (HPK reflector) & Glass Cover (ZPK).luminiare including providing of 1 no. 200W HPI complete.	Each	36	
44	Supply and fixing of Highbay Luminaire closed version with anodized aluminium narrow beam and wide beam reflector. Comprised of Housing (HPK),Reflector (HPK reflector) & Glass Cover (ZPK).luminiare including providing of 1 no. 100W HPI complete.	Each	6	
45	Supply and fixing of wall mounted Street Light 70Watts LED IP65 fitting with 40mm GI pipe 1X1 Meter with accessories.	Each	20	

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S. No.	Description	Unit	QTY	Remarks
<b>I.ELECTRICAL WORK</b>				
46	Supply and fixing ceiling fans complete with blades, down rods, electronic regulator and accessories, 230 V, 1400mm sweep with Min air delivery 245 CFM with service value 6.00 BEE. Five star rated with brushless direct current motor (BLDC)	Each	22	
47	Supply and fixing of Wall mounted metal blade - 400mm fan , 1440 RPM , with all accessories	Each	6	
48	Supply and fixing of Wall mounted PVC blade - 400mm fan , 2000 RPM , with all accessories	Each	26	
49	Supply and fix exhaust fan, steel body AC single Phase. 230V of size 300m sweep with, blades, and frame and louvers	Each	11	
50	Supply and fix exhaust fan made of sturdy Engineering plastic complete with louvers shutter, voltage 230V, 50 Hz, RPM 1200, Copper winding of sweep 300m	Each	3	
51	Supply and fix exhaust fan made of sturdy Engineering plastic complete with louvers shutter, voltage 230V, 50 Hz, RPM 1200, Copper winding of sweep 300m with ductable as per Site Condition	Each	1	
<b>IV POWER /LIGHTING WIRING</b>				
	Wiring for circuit / submain wiring along with earth wire with the following sizes of FR PVC insulated copper conductor, single core cable in surface/ recessed Steel conduit as required.			
52	2 X 2.5 sq. mm + 1 X 1.5 sq. mm earth wire	Meter	200	
53	2 X 4 sq. mm + 1 X 2.5 sq. mm earth wire	Meter	400	
	Wiring for Highbay lighting along with earth wire the following sizes of FRLS insulated copper flexible cable in surface/ recessed Steel conduit as required.			
54	3C X2.5 sq. mm FRLS Flexible Copper Cable with MS conduit	Meter	900	
55	3C X1.5 sq. mm FRLS Flexible Copper Cable with MS conduit	Meter	400	
	Wiring for circuit / submain wiring along with earth wire with the following sizes of FR PVC insulated copper conductor, single core cable in surface/ recessed medium class PVC conduit as required.			
56	2 X 2.5 sq. mm + 1 X 1.5 sq. mm earth wire	Meter	1280	
57	2 X 4 sq. mm + 1 X 2.5 sq. mm earth wire	Meter	3380	
<b>POINT WIRING WITH COPPER CONDUCTOR CABLES</b>				
58	One Light Point or one fan point controlled by one switch with cables 1.5 sq. mm size PVC single core, sheathed cable Materials and Labour in stove enamelled Steel Conduit	Point	14	
59	One Light Point or one fan point controlled by one switch with cables 1.5 sq. mm size PVC single core, sheathed cable Materials and Labour in PVC Conduit	Point	240	
<b>VI MODULAR SWITCH &amp; SOCKETS</b>				
	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular			
60	5/6 amps switch	Each	164	
61	3 pin 5/6 amp socket outlet	Each	211	
62	Supplying and fixing two module stepped type electronic fan regulator on the existing modular plate switch box including connections but excluding modular plate etc. as required.	Each	22	
63	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 5/6 & 15/16 A modular socket outlet and 15/16 A modular switch, connections etc. as required.	Each	85	
64	Supplying and fixing 32 A, 240 V, SPN Industrial type socket outlet, with 2 pole and earth, metal enclosed plug top along with 32 A "C" curve, SP, MCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and	Each	3	
	Supplying and fixing following size/ modules, GI box along with modular base & cover plate for modular switches in recess etc. as required.			
65	1 or 2 Module (75mm X 75mm)	Each	168	
66	3 Module (100mmX75mm)	Each	70	
67	8 Module (125mmX125mm)	Each	47	
<b>VII MCCBs / MCBs / ISOLATORS / STARTERS etc.</b>				

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<b>I.ELECTRICAL WORK</b>				
	Supply, installation, testing and commissioning of the following MCCBs / MCBs / ISOLATORS / STARTERS of type-II coordination etc.in manufacturer's sheet steel enclosures, IP 20 Protection, fixed on the wall including all interconnections and accessories as required as per the site conditions.			
68	630A TP+N 35KA MCCB with adjustable relay setting, Padlock arrangement and Rotary handle Mechanism.	Each	1	
69	250A TP+N 25KA MCCB with adjustable relay setting, Padlock arrangement and Rotary handle Mechanism.	Each	1	
70	200A TP+N 25KA MCCB with adjustable relay setting, Padlock arrangement and Rotary handle Mechanism.	Each	4	
71	125A TP+N 25KA MCCB with adjustable relay setting, Padlock arrangement and Rotary handle Mechanism.	Each	2	
72	63A TP+N 16KA MCCB with adjustable relay setting, Padlock arrangement and Rotary handle Mechanism.	Each	8	
<b>VIII LIGHTNING ARRESTOR</b>				
	Supply of lightning arrestor enchanching type designed to attract lightning from a predetermined volume and to safety convey the lightning current to the earth and complaint UL-96 (Under writers labouratories-96) and complete with following principle components. (the lightning arrestor			
73	<b>Air Termination</b> Supply of Air termination shall be non-corroding and centre earthed finials shall be 300mm in cross section and be made of electric grade non ferrous material. Terminal shall be manufactured of anodised Aluminium.	Each	1	
74	<b>Air Termination supports</b> The Air termination support shall be consists of 2m of insulating fibreglass cylindrical tube wall thickness is 4mm. The support shall be bolted to other mast materials with guy wires used.	Each	1	
75	Cable for Conductor Connectivity. Supply, laying , termination, testing and commissioing of 1C 70 Sq.mm. YY from Lightning arrestor to earth pits	Meter	45	
76	<b>Performance recording equipments</b> Supply of lightning event counter shall have electronically controlled which activates one registration of 1500 A - 8/20 micro second peak current. The operating temperature range is 40 c to 50 c.	Each	1	
77	<b>Earth Pit</b> Supply of lightning arrestor standard earth pit comprising of 4nos. Of copper bonded ground rod 5/8" x 4 feet long copper earth electrode buried not more that 70mm deep and electrically connected to the centre earth electrode whcih is securely clamped to the down conductor with necessary lower termination kit, copper radial earth tape (50mm x 0.5mm) earth rod clamp earth gel 10Kg kit, etc., as required and provide the convenient trench to connect the 4 copper bonded ground rods. Grouding systems should be complet to UL-96.	Each	2	
<b>IX CABLE MANAGEMENT</b>				
	Supply and Installation of 3mm GI ladder type cable trays including tees,right angle bends,etc., including all fixing accessories etc., of the following sizes as required as per the site conditions. Suitable Ms angle iron support to be provided for every 1 mtr.(Cross C channel to be provided for every 300mm). Note: Dimensional variations of +/- 5mm (tolerance) in height and width may be permitted in the approved makes.			
78	a) 600x 70mm Cable Tray	Meter	260	
79	b) 300x70mm Cable Tray	Meter	260	
80	c) 150x70mm Cable Tray	Meter	260	
	Supply and finxing of GI Perforated cable trays including tees,right angle bends,etc., including all fixing accessories etc., of the following sizes as required as per the site conditions. Suitable Ms angle iron support to be provided for every 1 mtr.			
81	a.600 x 70 x 2mm	Meter	100	
82	b.300 x 50 x 2mm	Meter	100	

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<b>I.ELECTRICAL WORK</b>				
83	c.150 x 50 x 2mm	Meter	100	
<b>X</b>	<b>EARTHING ARRANGEMENTS</b>			
84	Supply, Installation, testing and commissioning of 3 mtr long 80 mm dia 'B' class GI earth electrode with 600 x 600 x 3mm copper plate, funnel clamps bus etc including excavation refilling with sand / charcoal / salt combinations complete as required including 600mm x 600mm SFRC cover and all associated civil works like construction of Chamber and rough plastering etc as required as per the site condition and as per the KSEB norms.	Set	9	
85	Supply and Fixing of 25 x 3mm copper flats including necessary civil / excavation works wherever required..	Meter	50	
86	Supply and Fixing of 25 x 6mm copper flats including necessary civil / excavation works wherever required..	Meter	50	
87	Supply and Fixing of 50 x 6mm GI flats including necessary civil / excavation works wherever required..	Meter	450	
88	Supply and Fixing of 25 x 3mm GI flats including necessary civil / excavation works wherever required..	Meter	400	
<b>XI</b>	<b>Safety equipments:</b>			
89	Rubber mat (6mm Thick, 2mtrs x 1.0 Mtr).	Each	10	
90	1 kv hand Gloves.	Pairs	2	
91	First Aid Box	Each	2	
92	First Aid Chart	Each	2	
93	433V Danger Board 6"x4"	Each	6	
94	Danger Labels 3"x2"	Each	10	
<b>XII</b>	<b>Miscellaneous Items:</b>			
95	Supply, Fabrication and Erection of M.S. Material for ladder type cable trays additional supports, additional supports for cables, SB, DB's supports, iron embeded in the wall, steel structure in open Area painted with two coats of primer and two coats of enamel paint.	Tonnes	4.5	
96	Excavating the ground for a Depth of 1.2 Mtrs and width 1.00 Mtrs for laying the Cables.	Cu.Mtrs	45	
97	Supply and filling the excavated trench with sand before and after laying cable.	Cu.Mtrs	45	
98	Supply and Laying 600 mm X 75 mm X 1000 mm RCC Truff above the cable.	Meter	45	
99	Supplying and Laying of 25mm FRPVC Conduits	Meter	600	
100	Supplying and Laying of 32mm FRPVC Conduits	Meter	600	
101	Supplying and Laying of 25mm MS Conduits	Meter	100	
102	Supplying and Laying of 32mm MS Conduits	Meter	100	
103	Supplying and Laying of 25mm Metal hose	Meter	100	
104	Supplying and Laying of 50mm Metal hose	Meter	100	
<b>XIII</b>	<b>UPS</b>			
105	Supply, Installation, Testing and Commissioning of 10 KVA 3Phase input 3Phase Output Online Double conversion UPS with isolation transformer and 30 Min full load battery back-up along with SMF Exide/Amaron batteries, interconnection cables with battery stand and other associated accessories as required as per the site conditions.	Each	1	
106	Supply, Installation, Testing and Commissioning of 5 KVA 1P input 1P Output Online Double conversion UPS with isolation transformer and 30 Min back-up along with SMF Exide/Amaron batteries, interconnection cables with battery stand and other associated accessories as required as per the site conditions..	Each	1	
107	Supply, Installation, Testing and Commissioning of 3 KVA 1P input 1P Output Online Double conversion UPS with isolation transformer and 30 Min back-up along with SMF Exide/Amaron batteries, interconnection cables with battery stand and other associated accessories as required as per the site conditions..	Each	2	
<b>XIV</b>	<b>STATUTORY / SAFETY APPROVAL</b>			
	<b>SHOP DRAWINGS</b>			

**BILL OF QUANTITIES**

**MEP WORK FOR PROPOSED OVERHAULING HANGAR AT M/s.BEML LIMITED AT KANJIKODE,PALAKKAD, KERALA.**

S. No.	Description	Unit	QTY	Remarks
<b>I.ELECTRICAL WORK</b>				
108	Preparation of 5 sets of coloured shop drawings for LT infrastructure including interior electrification works and all other Low side electrification works as per the CEA / Chief Electrical Inspector to Govt., of Kerala norms and as per the client/consultants requirements.	LS	1	
XV	<b>INSPECTION AND APPROVALS</b>			
109	Preparation of coloured LT Infrastructure drawings, Laminated schematic circuit diagram duly framed to be installed in substation and obtaining approval for drawing completion Report, Arranging for Inspection, attending defects report and obtaining safety certificate(for all electrical installations in Phase-2) from C.E.A (Central Electrical Authority)for commissioning. Preparation of Five sets as fitted drawings and obtaining approval from Safety Authorities.( including all required state electricity board statutory Norms ). The cost shall inclusive of handing over of 5 sets of Handing Documents (Drawings, Test Certificates equipments, test reports for installation, Gurantee /Warranty certificates with soft copy).	LS	1	
<b>Subtotal</b>				
<b>Mechanical works</b>				
<b>COMPRESSOR AIR LINE</b>				
	Compressed air piping carried out of Galvanised MS class 'C' pipes as per IS 1239 of latest version for sizes up to 150 mm and with including galvanised seamless fittings as Flanges, Blind Flanges, Elbow standard B16.9 234 grade WPB, Unequal& Equal Tee and CONCENTRIC REDUCER standard B16.9 234 grade A.234 WPB as per specifications of sizes and quantities listed below: The works shall include all necessary SECONDARY supports, painting & banding as per specifications. ALL JOINTS ARE TO BE WELDED. Make: TATA/JINDAL/APL APOLLO			
1	50 mm NB	RM	265	
2	40 mm NB	RM	55	
3	20 mm NB	RM	240	
	Cast Iron plug valve with flanges fasteners, support arrangement as per specifications of sizes and quantities as detailed below: AUDCO/KSB /ADVANCE/NORMAX MAKE			
4	50 mm NB	Each	2	
5	40 mm NB	Each	4	
	Cast Steel ball valves with socket weld ends#800, / socket weld adapters, etc.,as per specifications and of sizes and quantities as detailed below: AUDCO/KSB /ADVANCE/NORMAX MAKE			
6	20 mm NB	Each	24	
7	<b>AIR RECEIVER</b> Air receiver with complete supporting structure, flanged nozzles, manhole/ manhole, safety valve, isolation valves, pressure indicator and auto drain trap assembly shall be provided. Air Receiver shall be manufactured as per ASME Sec.VIII Div. I 1998/IS2825  Air receiver of 1.0 M <sup>3</sup> capacity to with stand maximum pressure of 19.5 kg/cm <sup>2</sup> in 515 Gr 70 MOC with safety relief valve are to be supplied. The receiver shall be included Moisture Separator with drain by pass valve.	Each	1	
<b>Subtotal</b>				
<b>DATA &amp; VOICE NETWORKING</b>				
<b>VOICE &amp; TV CABLING WORKS</b>				
1	Supplying and drawing following 2 pair 0.5 sq. mm FR PVC insulated annealed copper conductor, unarmored telephone cable in the existing surface/ recessed steel/ PVC conduit as required.	Meter	2600	
2	Supplying and drawing co-axial TV cable RG-6 grade, 0.7 mm solid copper conductor PE insulated, shielded with fine tinned copper braid and protected with PVC sheath in the existing surface/ recessed steel/ PVC	Meter	160	
3	Supply, fixing, Testing and Commissioning of 100 + 100 pair krone MDF with end termination including all other associated fixing accessories as required asper the site conditions.	Each	1	

**BILL OF QUANTITIES**

**MEP WORK FOR PROPOSED OVERHAULING HANGAR AT M/s.BEML LIMITED AT KANJIKODE,PALAKKAD, KERALA.**

S. No.	Description	Unit	QTY	Remarks
<b>I.ELECTRICAL WORK</b>				
4	Supply, fixing, Testing and Commissioning of 50 + 50 pair krone MDF with end termination including all other associated fixing accessories as required as per the site conditions.	Each	1	
5	Supply, fixing, Testing and Commissioning of 20 + 20 pair KRONE MDF with end termination including all other associated fixing accessories as required as per the site conditions.	Each	1	
6	Supply, fixing, Testing and Commissioning of 20 pair KRONE MDF with end termination including all other associated fixing accessories as required as per the site conditions.	Each	2	
7	Supply, laying Testing and commissioning of 50 Pair Outdoor Jelly filled Armoured Cable with 0.5mm dia with all other associated accessories as required as per the site conditions.	Meter	400	
8	Supply, laying Testing and commissioning of 10 Pair Outdoor Jelly filled Armoured Cable with 0.5mm dia with all other associated accessories as required as per the site conditions.	Meter	100	
9	Supply, laying Testing and commissioning of 20 Pair Outdoor Jelly filled Armoured Cable with 0.5mm dia with all other associated accessories as required as per the site conditions.	Meter	40	
	Supplying and fixing following modular switch/ socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.			
10	Telephone Socket outlet -RJ11	Each	65	
11	TV antenna socket outlet	Each	2	
12	Supplying, wiring, testing and commissioning single run of <b>CAT-6 data cable</b> in the existing conduit. As per the manufacturer specification and as per the direction of engineer incharge. (305 Mtr per Box)	Boxes	5	
13	Supply, fixing, Testing and Commissioning of CAT 6 Information Outlet RJ 45 with all other associated fixing accessories as required as per the site conditions.	Each	75	
14	Supply, fixing, Testing and Commissioning of CAT 6, 2Mtrs Patch Cord with all other associated fixing accessories as required as per the site conditions.	Each	75	
15	Supply, fixing, Testing and Commissioning of CAT 6, 1Mtr Patch Cord with all other associated fixing accessories as required as per the site conditions.	Each	75	
16	Supply, fixing, Testing and Commissioning of Quad/Dual Face box & Plate with all other associated fixing accessories as required as per the site conditions.	Each	75	
17	Supply, fixing, Testing and Commissioning of CAT 6, 48 Port Loaded Jack Panel with all other associated fixing accessories as required as per the site conditions.	Each	3	
18	Supply, fixing, Testing and Commissioning of 48 Port LIU with all other associated fixing accessories as required as per the site conditions.	Each	3	
19	Supply, fixing, Testing and Commissioning of 17U Wall Mountable Side Openable Rack with all other associated fixing accessories as required as per the site conditions.	Each	2	
20	Supply of 12 core Single mode outdoor type armoured 9/125, OS2 ,Optical fibre cable suitable for laying in HDPE pipe/ duct with required accessories as required for laying cable as per the site condition.	R M	120	
	<b>Subtotal</b>			
<b>II.PLUMBING WORK</b>				
1	Providing and fixing water closet squatting pan (Indian type W.C. pan) with 100 mm sand cast Iron P or S trap, 10 litre low level white P.V.C. flushing cistern, including flush pipe, with manually controlled device (handle lever) conforming to IS : 7231-White Vitreous china Orissa pattern W.C. pan of size 580x440 mm with integral type foot rests	each	4.00	

**BILL OF QUANTITIES**

**MEP WORK FOR PROPOSED OVERHAULING HANGAR AT M/s.BEML LIMITED AT KANJIKODE,PALAKKAD, KERALA.**

S. No.	Description	Unit	QTY	Remarks
<b>I.ELECTRICAL WORK</b>				
2	Providing and fixing white vitreous china pedestal type water closet (European type) with seat and lid, 10 litre low level PVC flushing cistern & C.P. flush bend with fittings & C.I.brackets, 40 mm flush bend, overflow arrangement with specials of standard make and mosquito proof coupling of approved municipal design complete, including painting of fittings and brackets, cutting and making good the walls and floors wherever required :W.C. pan with ISI marked white solid plastic seat and lid	each	4.00	
II	Providing and fixing Star white vitreous china extended wall mounting water closet of size 790x370x690 mm of approved shape including fixing of cistern with lid and dual flush fitting of flushing capacity 3/6 litre including chair brackets, EWC pan connector, necessary fittings including seat cover with all fittings and fixtures complete, angle valve with riser pipe, including cutting and making good the walls and floors wherever required:			
3	Star white Extended Wall mounted water closet Cornice type, Adjustable Vitreous China Cistern with lid and White plastic seat (solid) cover with C.P. brass hinges and rubber buffers etc.,	each	5.00	
4	European type W.C. (Wall-Mount - Type 3): Providing and fixing white vitreous china wall mounted water closet of size 550*360*385 mm of approved shape including fixing of Concealed cistern size 460*450*80mm with dual flush chromium plated/ stainless steel dual flush push plate for concealed cistern flush plates of flushing capacity 3 litre/ 6 litre including chair brackets, EWC pan connector, necessary fittings including seat cover with all fittings and fixtures complete, angle valve with riser pipe, including cutting and making good the walls and floors wherever required:	each	1.00	
5	Providing and fixing white vitreous china flat back half stall urinal of size 580x380x350 mm with flush valve, with fittings, standard size C.P. brass flush pipe, spreaders with unions and clamps (all in C.P. brass) with waste fitting as per IS : 2556, C.I. trap with outlet grating and other couplings in C.P. brass, including painting of fittings and cutting and making good the walls and floors wherever required :	each	11.00	
6	Providing and fixing white vitreous china Counter top wash basin size 550 x 450 x 200mm, installed counter top at Granite / Marble counter with 15 mm C.P.brass Pillar cock, 32mm C.P brass waste coupling of standard pattern, including 2 nos. angle valve with riser pipes, connectors, adopters, all fittings etc cutting and making good the walls/slabs wherever required.(cut size it is recommended to make the cut in the marble/ Slab according to Wash Basin)	each	9.00	
7	Providing and fixing white vitreous china Table top wash basin size - 610*460*140mm, installed above granite / marble counter with 15 mm C.P. brass basin Pillar cock, 32mm C.P brass waste coupling of standard pattern, including 2 nos. angle valve with riser pipes, connectors, adopters, all fittings etc. cutting and making good the walls/slabs wherever required.	each	1.00	
8	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS: 13983 with C.I. brackets and stainless steel plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required :510x1040 mm bowl depth 300 mm	each	2.00	
9	Providing and fixing P.V.C. waste pipe for sink or wash basin including P.V.C. waste fittings complete.40 mm dia	each	20.00	
10	Providing and fixing 600x450 mm beveled edge mirror of superior glass (of approved quality) complete with 6 mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers complete.	each	9.00	
11	Providing and fixing soil, waste and vent pipes :Centrifugally cast (spun) iron socket & spigot (S&S) pipe as per IS: 3989. This includes jointing of pipes & fittings, with lead caulked joints and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer-in-Charge. 100 mm dia	metre	80.00	

**BILL OF QUANTITIES**

**MEP WORK FOR PROPOSED OVERHAULING HANGAR AT M/s.BEML LIMITED AT KANJIKODE,PALAKKAD, KERALA.**

S. No.	Description	Unit	QTY	Remarks
<b>I.ELECTRICAL WORK</b>				
12	Providing and fixing soil, waste and vent pipes :Centrifugally cast (spun) iron socket & spigot (S&S) pipe as per IS: 3989. This includes jointing of pipes & fittings, with lead caulked joints and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer-in-Charge. 75 mm dia	metre	69.00	
13	Providing and fixing terminal guard Centrifugally cast (spun) iron S&S as per IS - 3989-100 mm	each	10.00	
14	Providing and fixing terminal guard Centrifugally cast (spun) iron S&S as per IS - 3989-75 mm	each	10.00	
15	Providing and fixing M.S. stays and clamps for centrifugally cast (spun) iron pipes of diameter :100 mm	each	5.00	
16	Providing and fixing M.S. stays and clamps for centrifugally cast (spun) iron pipes of diameter :75 mm	each	5.00	
17	Providing and fixing trap of self cleansing design with screwed down or hinged grating with or without vent arm complete, including cost of cutting and making good the walls and floors : 100 mm inlet and 100 mm outlet:Sand cast iron S&S as per IS: 3989	each	10.00	
18	Painting sand cast iron/ centrifugally cast (spun) iron soil, waste vent pipes and fittings with two coats of synthetic enamel paint of any colour such as chocolate grey, or buff etc. over a coat of primer (of approved quality) for new work :100 mm diameter pipe	metre	80.00	
19	Painting sand cast iron/ centrifugally cast (spun) iron soil, waste vent pipes and fittings with two coats of synthetic enamel paint of any colour such as chocolate grey, or buff etc. over a coat of primer (of approved quality) for new work :75mm diameter pipe	metre	69.00	
20	Providing and fixing PTMT Bottle Trap for Wash basin and sink-Bottle trap 38 mm single piece moulded with height of 270 mm, effective length of tail pipe 260 mm from the centre of the waste coupling, 77 mm breadth with 25 mm minimum water seal, weighing not less than 263 gms	each	20.00	
21	Providing and fixing PTMT towel ring trapezoidal shape 215 mm long, 200 mm wide with minimum distances of 37 mm from wall face with concealed fittings arrangement of approved quality and colour, weighing not less than 88 gms.	each	10.00	
22	Providing and fixing PTMT towel rail complete with brackets fixed to wooden cleats with CP brass screws with concealed fittings arrangement of approved quality and colour.600 mm long towel rail with total length of 645 mm, width 78 mm and effective height of 88 mm, weighing not less than 190 gms	each	6.00	
23	Supplying and fixing of Square (125x125mm) & Round Stainless Steel grating of SS-304 including GI hopper for connection of wash basin/ urinal with fittings, connectors & adopters.and all fittings etc., complete.	each	19.00	
24	Supplying and fixing of Square (125x125mm) & Round Stainless Steel – SS 304 clean out cover and include GI hopper for connection of CI pipe with fittings, connectors & adopters and all fittings etc., complete.	each	4.00	
III	Providing and fixing M.S. holder bat clamp of approved design to sand cast iron/ cast iron (spun) pipes comprising of M.S. flat brackets made of 50x5 mm flat of specified shape, projecting 75 mm outside the wall surface and fixed on wall with 4nos, 6mm dia expansion hold fasteners, including drilling necessary holes in brick wall/ CC/ RCC surface and the cost of bolts etc. The pipes shall be fixed to the already fixed brackets with the help of 30 mm x1.6 mm galvanised M.S. flats of specified shape and of total length 420 mm and shall be fixed with M.S. nuts, bolts, & washers of size 25x6 mm, one bolts on each side of the pipe.	each		
25	Total bracket length 580 mm of approved shape and design (for single 100 mm dia pipe)	metre	10.00	
26	Total bracket length 1040 mm of approved shape and design (for three 100 mm dia pipes)	metre	10.00	
27	Providing & fixing UPVC pipes and all kind of fittings as per ASTM 1785 & Schedule 80 complete as per specification, This includes jointing of pipes & fittings with solvent and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in	metre	27.00	

**BILL OF QUANTITIES**

**MEP WORK FOR PROPOSED OVERHAULING HANGAR AT M/s.BEML LIMITED AT KANJIKODE,PALAKKAD, KERALA.**

S. No.	Description	Unit	QTY	Remarks
<b>I.ELECTRICAL WORK</b>				
28	Providing & fixing UPVC pipes and all kind of fittings as per ASTM 1785 & Schedule 80 complete as per specification, This includes jointing of pipes & fittings with solvent and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge. Internally exposed-50 mm nominal outer dia Pipes	metre	32.00	
IV	Providing & fixing UPVC pipes and all kind of fittings as per ASTM 1785 & Schedule 80 complete as per specification, This includes jointing of pipes & fittings with solvent and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge. Concealed pipes.			
29	15 mm nominal outer dia Pipes	metre	19.00	
30	20 mm nominal outer dia Pipes	metre	44.00	
31	25 mm nominal outer dia Pipes	metre	11.00	
32	32 mm nominal outer dia Pipes	metre	40.00	
33	Providing and fixing G.I. pipes complete with G.I. fittings and clamps,i/c cutting and making good the walls etc.-32 mm dia nominal bore	metre	32.00	
34	Providing and fixing G.I. pipes complete with G.I. fittings and clamps,i/c cutting and making good the walls etc.-40 mm dia nominal bore	metre	32.00	
35	Providing and fixing G.I. pipes complete with G.I. fittings and clamps,i/c cutting and making good the walls etc.-50 mm dia nominal bore	metre	210.00	
36	Making connection of G.I. distribution branch with G.I. main of following sizes by providing and fixing tee, including cutting and threading the pipe etc. complete :25 to 40 mm nominal bore	Each	30.00	
37	Making connection of G.I. distribution branch with G.I. main of following sizes by providing and fixing tee, including cutting and threading the pipe etc. complete :50 to 80 mm nominal bore	Each	10.00	
38	Providing and fixing C.P. brass stop cock (concealed) of standard design and of approved make conforming to IS:8931:15 mm nominal bore	Each	5.00	
39	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end):32 mm nominal bore	each	5.00	
40	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end):40 mm nominal bore	each	5.00	
41	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end):50 mm nominal bore	each	5.00	
42	Providing and fixing ball valve (brass) of approved quality, High or low pressure, with plastic floats complete :25 mm nominal bore	each	3.00	
43	Providing and fixing uplasticised PVC connection pipe with brass unions-30 cm length:15 mm nominal bore	each	10.00	
44	Providing and fixing uplasticised PVC connection pipe with brass unions-30 cm length:20 mm nominal bore	each	10.00	
45	<b>Painting G.I. pipes and fittings with synthetic enamel white paint with two coats over a ready mixed priming coat, both of approved quality for new work :32 mm diameter pipe</b>	metre	32.00	
46	Painting G.I. pipes and fittings with synthetic enamel white paint with two coats over a ready mixed priming coat, both of approved quality for new work :40 mm diameter pipe	metre	32.00	
47	Painting G.I. pipes and fittings with synthetic enamel white paint with two coats over a ready mixed priming coat, both of approved quality for new work :50 mm diameter pipe	metre	210.00	
V	Providing and fixing G.I. Union in G.I. pipe including cutting and threading the pipe and making long screws etc. complete			
48	32 mm nominal bore	Each	10.00	
49	40 mm nominal bore	Each	5.00	
50	50 mm nominal bore	Each	5.00	
51	65 mm nominal bore	Each	2.00	
52	80 mm nominal bore	Each	2.00	
53	Providing and placing on terrace (at all floor levels) polyethylene water storage tank, ISI : 12701 marked, with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank.	per litre	3000.00	
54	Providing and fixing C.P. brass bib cock of approved quality conforming to IS:8931 :15 mm nominal bore	each	10.00	

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**MEP WORK FOR PROPOSED OVERHAULING HANGAR AT M/s.BEML LIMITED AT KANJIKODE,PALAKKAD, KERALA.**

S. No.	Description	Unit	QTY	Remarks
<b>I.ELECTRICAL WORK</b>				
55	Cutting holes up to 15x15 cm in R.C.C. floors and roofs for passing drain pipe etc. and repairing the hole after insertion of drain pipe etc. with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), including finishing complete so as to make it leak proof.	each	20.00	
56	Providing and fixing square-mouth S.W. gully trap class SP-1 complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design :180x150 mm size P type	Each	10.00	
57	Constructing chamber for underground C.I. inspection chamber and bends with concrete blocks in cement mortar 1:4 (1 cement : 4 coarse sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg), R.C.C. top slab with 1:1.5:3 mix (1 cement :1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size), foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand), finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design - Inside dimensions 500x700 mm with maximum depth of 1500mm depth as per site condition .	Each	6.00	
58	Steel work welded in built up sections/ framed work including cutting,hoisting, fixing in position and applying a priming coat of approved steelprimer using structural steel etc. as required.In gratings, frames, guard bar, ladder, railings, brackets,gates and similar works.	Kg	100	
59	Supply and fixing in position the Single Acting Air Valve of large orifice type Cast iron body pressure rating of 10 Kg/Cm2, 16 Kg/Cm2 conforming to IS 14845 : 2000 manufacturing standards, and including all unions and effective proper connections.-32 mm nominal bore	Nos	4	
60	Supply and fixing in position the Single Acting Air Valve of large orifice type Cast iron body pressure rating of 10 Kg/Cm2, 16 Kg/Cm2 conforming to IS 14845 : 2000 manufacturing standards, and including all unions and effective proper connections.-40 mm nominal bore	Nos	2	
61	Supply and fixing in position the Single Acting Air Valve of large orifice type Cast iron body pressure rating of 10 Kg/Cm2, 16 Kg/Cm2 conforming to IS 14845 : 2000 manufacturing standards, and including all unions and effective proper connections.-50 mm nominal bore	Nos	2	
62	Supply and fixing in position the following Solenoid Valves with Brass body, SS-304 spring, pressure limit of 12 Kg/Cm2 and assembled with NBR seal, Include power cable, control cable, level probe/sensor/ elcetrode with all fitting & accessories complete set-32 mm nominal bore	Nos	1	
	Supply and fixing in position the following lever operated, full flow, quarter turn, Ball Valves of Forged Brass body and chrome plated brass ball with chrome plated steel handle with PVC sleeve and PTFE seal tested to 25 Kg/Cm2 pressure rating, conforming to BS : 5159 manufacturing standards, including all unions and effective proper connections.			
63	20 mm nominal bore	Nos	2	
64	25 mm nominal bore	Nos	1	
65	32 mm nominal bore	Nos	2	
66	40 mm nominal bore	Nos	2	
67	50 mm nominal bore	Nos	2	
68	Providing and fixing on wall face unplasticised Rigid PVC rain water pipes and fittings conforming to IS : 14735 Type B, including solvent cement joint, GI supports, accessories complete etc.: <b>160 mm dia</b>	Rm	158	
69	Supplying, fixing and commisioning of approved make & suitable model for <b>Large Water Dispenser</b> with purified normal hot and cold water outlets including all fittings and acessories complete.,	Nos	2	

**BILL OF QUANTITIES**

**MEP WORK FOR PROPOSED OVERHAULING HANGAR AT M/s.BEML LIMITED AT KANJIKODE,PALAKKAD, KERALA.**

S. No.	Description	Unit	QTY	Remarks
<b>I.ELECTRICAL WORK</b>				
70	Supplying, fixing and commissioning of approved make & suitable model for <b>Small Water Dispenser</b> with purified normal hot and cold water outlets including all fittings and accessories complete.,	Nos	2	
71	Supplying, fixing and Stainless Steel Grab bars for Disable Toilets including all fittings and accessories complete.,	Nos.	4	
<b>Subtotal</b>				
<b>III.FIRE FIGHTING</b>				
1	Excavating trenches of required width for pipes, cables, etc, including excavation for sockets, depth upto 1.5 m, including getting out the excavated materials, returning the soil as required in layers not exceeding 20 cm in depth, including consolidating each deposited layers by ramming, watering etc., stacking serviceable material for measurements and disposal of unserviceable material as directed, within a lead of 50 m : <del>Pipes, cables etc. exceeding 80 mm dia but not exceeding 300 mm dia</del>	cum	97	
2	Providing and fixing in position GM gate valve with C.I. wheel of approved quality (screwed end) nominal bore including cost of all materials, labour and HOM of equipments with all leads complete as per specifications. <b>25mm</b>	Nos	6	
3	Providing and fixing in position GM gate valve with C.I. wheel of approved quality (screwed end) nominal bore including cost of all materials, labour and HOM of equipments with all leads complete as per specifications. <b>65mm</b>	Nos	6	
4	Constructing Chamber 90x90x100 cm inside, with concrete block in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100 mm top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size ), i/c necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size ) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design :	Nos	2	
1	Supply, erection, testing and commissioning of following MS 'C' Class Heavy Duty Pipe as per IS 1239 to withstand a developing pressure of 10 kg. / sq.cm including necessary fittings like MS flange of table 'E', elbows, reducers, gaskets, bolt, nuts with washers & joints as per standard method of arc welding, including one coat metal primer and two coat Post Office Red painting including conveyance, all incidental charges, necessary scaffolding and re-doing the dismantled portions to its original condition wherever found necessary, etc., complete as per standard specification and as directed by the Departmental Officers.			
5	150mm dia	Rm	250	
6	100mm dia	Rm	25	
7	80mm dia	Rm	20	
8	65mm dia	Rm	10	
9	50 mm dia	Rm	10	
10	40mm dia	Rm	10	
11	32mm dia	Rm	10	
12	20mm dia	Rm	10	
13	Wrapping and coating of U/G pipe line work includes one coat of anti erosion paint (Black) and two coats of Bituminous cloth. <b>150mm dia</b>	Rm	250	
14	Wrapping and coating of U/G pipe line work includes one coat of anti erosion paint (Black) and two coats of Bituminous cloth. <b>100mm dia</b>	Rm	25	
15	Providing and fixing blank flanges as per table "E" with asbestos gasket, nut, bolts, washers complete <b>100mm dia</b>	Nos	6	
16	SITC of 63mm dia single headed Gun metal Hydrant value with black cap and wheel as per IS 5290 etc., complete	Nos	6	
17	SITC of Hose cabinet made out of 18 gauge M.S. Sheet with double glass door with locking arrangement and painted with two coats of Fire red Enamel paint at outer side of the box and two coats of white enamel paint at inner side of the box is to accommodate 2 nos. of Fire hose box size 800 x 600 x 250	Nos	6	

**BILL OF QUANTITIES**

**MEP WORK FOR PROPOSED OVERHAULING HANGAR AT M/s.BEML LIMITED AT KANJIKODE,PALAKKAD, KERALA.**

S. No.	Description	Unit	QTY	Remarks
<b>I.ELECTRICAL WORK</b>				
18	Providing and fixing two way fire service inlet to the 100mm dia GI 'C' class pipe wet riser to be house in MS bolt with glass cover for front side.etc. complete.	Nos	2	
19	SITC of Gun metal Branch pipe size of 63mm dia x 19mm dia as per IS 903	Nos	6	
20	<b>Fire Alarm System</b> -SITC of 2x1.5 Sq.mm copper armoured cable with fixture etc., .	Rm	400	
21	<b>Fire Alarm System</b> -SITC of electronic Hooter, it consists of electronic circuit to give dual Fire alarm sound with works 24V DC with speaker all enclosed in suitable in MS. 16 gauge red painted box.	Nos	6	
22	<b>Fire Alarm System</b> -Providing and laying 25mm dia M.S. 16 gauge conduit pipes and fittings for fire alarm system, including necessary all accessories etc. complete.	Rm	30	
23	<b>Fire Extinguishers</b> -Providing 6Kg Fire Extinguisher Mono Ammonium Phosphate Powder 50, Stored Pressure Type, Pressure Gauge, Gross weight 9.5 Kg, empty weight 3.5 Kg, Can Height 435MM, Diameter 160MM, Discharge Time less than 9 Sees, Controllable discharge mechanism, Range minimum 4 meters, applicable on Class A,B,C and electrically started Fire, A Rating 21A, B Rating 898, Can construction: Deep drawn & Co., Mig welded, valve construction : Forging and Machining, Internal Coating of Can ; Epoxy powder coating, External Coating of Can : Epoxy Polyester power coating, sheet metal thickness: 1.60MM, Helium Leak Detection Tested, ISI and EN Approved, 5 years warranty.	Nos	16	
24	<b>Fire Extinguishers</b> -Providing 4.5 Kg C02 Gas Type Fire Extinguisher, Trolley Mounted, Easy Weight Management used Unused Mechanism, Squeeze Grip, Gross weight 19.1 Kg, empty Weight 14.6 Kg, Can Height 857MM Diameter 140MM, Discharge Time Less than 10 Secs, Controllable discharge: ( ' mechanism, Applicable on Class B&C Fire, B Rating 218, Can Construction :Hot spinning/Forging, Value Construction: Forging & Machining, Internal Coating of Can : Not Applicable, External Coating of Can : Spray Painting, Sheet metal thickness : 4.5 MM ISI Approved, 1 Year Warranty.	Nos	4	
25	<b>Fire Buckets and Stand</b> - Supplying of four bucket stand along with buckets.	Nos	1	
26	<b>Fire Hose</b> - SITC of RRL Fire hose of 63mm dia 15m length as per IS 84.23 binded with one set of male and female Instantaneous Gun metal coupling as per IS 903 WINCO/NEW AGE	Nos	6	
27	<b>Hose Reel</b> -SITC of Hose reel cane M.S. Pressed reel of 600mm dia and swing upto 170 -degree with "L" shape carrier	Nos	6	
28	<b>Hose Reel</b> -SITC of 19mm dia with wire binded Nylon hose. length of 36.5 mtrs.	Nos	6	
29	<b>Hose Reel</b> -SITC of <b>Manual Call point</b> : It consists of Micro push button switch with LED and circuitry etc., works on 24V DC LED indicator with glass Fronted, Aiso with hammer for breaking the glass incase of Fire. Accomodated in 75x75x30mm size M.S. 16 gauge red enamel painted box. make : to suit main control panel	Nos	6	
30	<b>Hose Reel</b> -SITC of Gun metal AIR RELEASE VALVE SIZE OF 25mm dia	Nos	6	
31	<b>Hose Reel</b> - Y ' Strainer - CI 'Y' strainer with bronze perforated sheet basket including rubber gasket, flanges, nuts, bolts and washers, complete as required. <b>100mm dia</b>	Nos	6	
	Providing and fixing FLEXIBLE CONNECTORS (Expansion bellows) - On all suction and delivery lines double flanged reinforced neoprene flexible pipe connectors shall be provided. Connectors should be suitable for maximum working pressure of each pipe line on which it is mounted and tested to a test pressure of 1:5 time the operating pressure. Length of the connector shall be as per manufacturer's standard.			
32	65mm dia	Nos	2	
33	80mm dia	Nos	2	
34	100mm dia	Nos	4	
35	150mm dia	Nos	4	

**BILL OF QUANTITIES**

**MEP WORK FOR PROPOSED OVERHAULING HANGAR AT M/s.BEML LIMITED AT KANJIKODE,PALAKKAD, KERALA.**

<b>S. No.</b>	<b>Description</b>	<b>Unit</b>	<b>QTY</b>	<b>Remarks</b>
<b>I.ELECTRICAL WORK</b>				
36	Supplying and fixing MS Cabinet (size 600 x 450 x 150mm) fabricated from 16 gauge M.S.Sheet with full front glass door and locking arrangement for placing spare sprinklers including fire man axe.	Nos	6	
37	Providing & fixing <b>butterfly valve</b> (Body : Grey Cast Iron, Shaft : SS, Disc : SG Iron (Rilson coated), Liner : HT - EPDM) (upto 150mm dia with hand lever operation & above with gear box operation). Tested to a pressure not less than 15 Kg/Sq.cm. Including rubber gasket, flanges, nuts, bolts, washers & painting complete as required. <b>100mm nominal dia</b>	Nos	6	
38	Providing & fixing <b>butterfly valve</b> (Body : Grey Cast Iron, Shaft : SS, Disc : SG Iron (Rilson coated), Liner : HT - EPDM) (upto 150mm dia with hand lever operation & above with gear box operation). Tested to a pressure not less than 15 Kg/Sq.cm. Including rubber gasket, flanges, nuts, bolts, washers & painting complete as required. <b>150mm nominal dia</b>	Nos	6	
39	Supply, installation, testing and commissioning of intelligent addressable fire alarm system extended to the ward with the following items. As per the manufacturer specification and as per the direction of engineer-in-charge. <b>Single Loop Analog addressable fire alarm control panel.</b>	Nos	1	
40	SITC OF Smoke/Heat detector Photo electric type detector with base LED indicator on smoke detector fixed cum rise temperature type heat detector with base Make Applow/System Sensor	Nos	17	
41	Supply, fixing and commissioning Analogue Addressable <b>Monitor module</b>	Nos	1	
42	Supply, fixing and commissioning Analogue Addressable <b>Control module</b>	Nos	1	
43	Fire Alarm Repeater Panel as per standard specification and to match with the detector manufacturer's specifications for parallel vision of fire risks.	Nos	1	
44	Designing, providing and fixing <b>Orifice plate</b> made out of stainless steel plate (thickness as per specification) for following size of pipe to reduce pressure upto 3.5 Kg/sqcm complete in all respects. <b>100mm dia</b>	Nos	2	