

**E&M works for the Development of NMRC Project Office at 2nd floor, Ganga Shopping Complex,
Sector-29, Noida.**

NOIDA METRO RAIL CORPORATION LIMITED



CONTRACT NO: NMRC/Elect (P)/2026/005

**E&M works for the Development of NMRC Project Office at
2nd floor, Ganga Shopping Complex, Sector-29, Noida.**

VOLUME-4

Bill of Quantities (BOQ)

NOIDA METRO RAIL CORPORATION LTD.

**Block-III, 3rd Floor, Ganga Shopping Complex,
Sector-29, Noida -201301,
District Gautam Budh Nagar, Uttar Pradesh, India**

PREAMBLE TO THE BOQ

1. The Bill of Quantities shall be read in conjunction with Instructions to Tenderers, General and Special Conditions of Contract, Notice Inviting Tender and Scope of Work.
2. Bill of Quantity comprises of E&M works for the Development of NMRC Project Office.
3. If the tenderer fails to quote against any item, the tender may be treated as incomplete and non-responsive and shall be rejected.
4. Tenderers shall quote their offer in Indian Rupees (INR) only.
5. Errors will be corrected by the employer for any arithmetic errors in computation or summation as per contract conditions.
6. All the unit rates and amounts should be filled only in figures. In case of any discrepancy between amount in figures and in words, the value provided in figures shall be treated as sacrosanct.
7. The work executed against the BOQ items would be paid on actual targets achieved basis.

E&M works for the Development of NMRC Project Office at 2nd floor, Ganga Shopping Complex, Sector-29, Noida.

S.No	DESCRIPTION	UNIT	QTY.	Rate Inclusive of GST	TOTAL Amount
1.0	WIRING IN STEEL AND PVC CONDUIT			0	0
1.1	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm FRLS/HFFR PVC insulated copper conductor single core cable etc. as required.				
1.1.1	Group C	Point	79	2,101	165979
1.2	Wiring for group controlled (looped) light point/fan point/exhaust fan point/ call bell point (without independent switch etc.) with 1.5 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable in surface/ recessed steel conduit, and earthing the point with 1.5 sq. mm FRLS/HFFR PVC insulated copper conductor single core cable etc. as required.				
1.2.1	Group C	Point	35	1,246	43610
1.3	Wiring for circuit/ submain wiring along with earth wire with the following sizes of FRLS/HFFR PVC insulated copper conductor, single core cable in surface/ recessed steel conduit as required.				0
1.4.1	2 X 1.5 sq. mm + 1 X 1.5 sq. mm earth wire	meter	983	370	363710
1.4.2	2 X 2.5 sq. mm + 1 X 2.5 sq. mm earth wire	meter	2499	414	1034586
1.4.3	2 X 4 sq. mm + 1 X 4 sq. mm earth wire	meter	80	476	38080
1.4.4	2 X 6 sq. mm + 1 X 6 sq. mm earth wire	meter	40	652	26080
1.4	Supplying and fixing of following sizes of steel conduit along with accessories in surface/recess including painting in case of surface conduit, or cutting the wall and making good the same in case of recessed conduit as required.				
1.5.1	20 mm	meter	80	254	20320
1.5.2	25 mm	meter	160	289	46240
1.5.3	32 mm	meter	150	360	54000
1.5	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 3 pin 5/6 A modular socket outlet and 5/6 A modular switch, connections etc. as required.	Each	53	545	28885
1.6	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 2 Nos. 3 pin 5/6 A modular socket outlet and 2 Nos. 5/ 6 A modular switch, connections etc. as required. (For light plugs to be used in non residential buildings).	Each	98	757	74186
1.7	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 20 A modular socket outlet and 2 SP MCB,including connections& Painting etc. as required. (For light plugs to be used in non residential buildings).	Each	2	807	1614

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1.10	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 A & 15/16 A modular socket outlet and 15/16 A modular switch, connections etc. as required.	Each	110	659	72490
1.11	Supplying and fixing 3 pin, 5 A ceiling rose on the existing junction box/ wooden block including connections etc. as required.	Each	6	104	624
1.12	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	2	402	804
1.13	Supplying and fixing modular blanking plate on the existing modular plate & switch box excluding modular plate as required.	Each	50	47	2350
1.14	Providing and fixing circular/hexagonal Fan box cast iron /metal sheet Box for ceiling fan clamp of internal dia 140mm , 73 mm height,Top id of 1.5mm thick MS sheet with its Top surface hacked of proper bonding top lid shall be screwed into cast iron /metal sheet Box by mean of 3.3mm dia round headed screw one lock at the corners.clamp shall be made of 12mm dia ms Bar band toshape as per standrd drawing.	Each	2	143	286
	TOTAL CARRIED TO SUMMERY				0
2.0	DISTRIBUTION BOARDS				0
2.1	Supplying and fixing following way, horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 V, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/ Isolator)				0
2.2.1	8 way (4 + 24), Double door	Each	4	6,337	25348
2.2	Supplying and fixing 5 amps to 32 amps rating, 240 volts, 'C' series, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				0
2.2.1	Single pole	Each	96	285	27360
2.3	Supplying and fixing single pole blanking plate in the existing MCB DB complete etc. as required.	Each	24	14	336
2.4	Supplying and fixing following rating, four pole, 415 volts, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required.				0
2.4.1	40 amps	Each	3	1,049	3147
2.4.2	63 amps	Each	1	1,115	1115
2.5	Supplying and fixing following rating, double pole, (single phase and neutral), 240 V, residual current circuit breaker (RCCB), having a sensitivity current 30 mA in the existing MCB DB complete with connections, testing and commissioning etc. as required.				0
2.5.1	40 amps	Each	9	2,512	22608
2.5.2	63 amps	Each	3	2,866	8598

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	TOTAL CARRIED TO SUMMERY				0
3.0	HOT DIP GI CABLE TRAYS				0
3.1	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray (Galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined 26 DELHI SCHEDULE OF RATES (E&M)-2025 with connectors, suspended from the ceiling with two numbers GI Suspenders i/c base of suitable size GI angle, GI bolts & nuts, fastner etc as required.				0
3.1.1	100 mm width X 50 mm depth X 1.6 mm thickness	Metre	66	754	49764
3.1.2	150 mm width X 50 mm depth X 1.6 mm thickness	Metre	10	803	8030
3.1.3	300 mm width X 50 mm depth X 1.6 mm thickness	Metre	60	1,062	63720
3.1.4	600 mm width X 50 mm depth X 2.0 mm thickness	Metre	53	1,925	102025
3.1.1.1	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Bends" (galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				0
3.1.1.2	100 mm width X 50 mm depth X 1.6 mm thickness	Each	15	1,252	18780
3.1.1.3	150 mm width X 50 mm depth X 1.6 mm thickness	Each	15	1,368	20520
3.1.1.4	300 mm width X 50 mm depth X 1.6 mm thickness	Each	15	1,977	29655
3.1.1.5	600 mm width X 50 mm depth X 2.0 mm thickness	Each	15	3,985	59775
3.1.1.1	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Tee" (galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				0
3.1.1.2	100 mm width X 50 mm depth X 1.6 mm thickness	Each	15	1,427	21405
3.1.1.3	150 mm width X 50 mm depth X 1.6 mm thickness	Each	15	1,486	22290
3.1.1.4	300 mm width X 50 mm depth X 1.6 mm thickness	Each	15	2,294	34410
3.1.1.5	600 mm width X 50 mm depth X 2.0 mm thickness	Each	15	4,687	70305
3.1.1.1	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "Cross members" (galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				0
3.1.1.2	100 mm width X 50 mm depth X 1.6 mm thickness	Each	15	1,427	21405
3.1.1.3	150 mm width X 50 mm depth X 1.6 mm thickness	Each	15	1,486	22290
3.1.1.4	300 mm width X 50 mm depth X 1.6 mm thickness	Each	15	2,513	37695
3.1.1.5	600 mm width X 50 mm depth X 2.0 mm thickness	Each	15	4,702	70530
3.1.1.1	Supplying and installing following size of perforated Hot Dipped Galvanised Iron cable tray "reducer" (galvanisation thickness not less than 50 microns) with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with G.I. suspenders including G.I. bolts & nuts, etc. as required.				0
3.1.1.2	100 mm width X 50 mm depth X 1.6 mm thickness	Each	15	1,771	26565

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3.1.1.3	150 mm width X 50 mm depth X 1.6 mm thickness	Each	15	2,049	30735
3.1.1.4	300 mm width X 50 mm depth X 1.6 mm thickness	Each	15	2,991	44865
3.1.1.5	600 mm width X 50 mm depth X 2.0 mm thickness	Each	15	5,418	81270
3.2	<u>GI Raceway & Junction boxes</u>				0
3.2.1	Providing and laying 1.6 MM thick AL factory fabricated raceways of the following sizes including providing removable 3 mm thick GI cover knock out holes and fixing accessories earthing with 8 SWG copper earth wire at ends complete as required including floor supports, bends, access boxes and tap off boxes as per specification and cross over as per site requirement.				0
3.2.2	75 mm wide x 40 mm deep raceway	RM	41	433.35	17767
3.2.3	100 mm wide x 40 mm deep raceway	RM	39	616.03	24025
3.2.4	150 mm wide x 40 mm deep raceway	RM	18	433.36	7800
3.2.5	300 mm wide x 40 mm deep raceway	RM	38	616.03	23409
3.2.6	Providing and fixing of 100 x 100 x 40 mm deep (Nominal size) wall junction box including providing 2 mm thick GI cover required as per specification.	No.	18	400.02	7200
3.2.7	Providing and fixing of 125 x 125x 40 mm deep (Nominal size) wall junction box including providing 2 mm thick GI steel cover required as per specification.	No.	18	466.69	8400
3.2.8	Providing and fixing of 175 x 175 x 40 mm deep (Nominal size) wall junction box including providing 2 mm thick GI cover required as per specification.	No.	6	600.03	3600
3.2.9	Providing and fixing of 325 x 325 x 40 mm deep (Nominal size) wall junction box including providing 2 mm thick GI cover required as per specification.	No.	19	1000.05	19001
	Coupler Plate	No.	15	1000.05	15001
4.0	EARTHING				0
4.1	Earthing with G.I. earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.DG-2No., LT Panel-2No. .	Set	4	8,351	33404
4.2	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.-DG-2No.,UPS-2No.& LV-2No.	Set	6	15,004	90024
4.3	Providing and fixing 25 mm X 5 mm copper strip on surface or in recess for connections etc. as required.	Meter	50	1,246	62300
4.4	Providing & fixing of 25mm x 5mm GI strip on surface or recess for earth connection as required.	Meter	300	287	86100
4.5	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing as required.	Meter	150	84	12600
4.6	Providing and fixing 6 SWG dia G.I. wire on surface or in recess for loop earthing along with existing surface/ recessed conduit/ submain wiring/ cable as required.	Meter	550	50	27500
5.10	Supplying and embedding following dia G.I. pipe (medium class) in pole collar/ foundation (during casting) for cable entry including bending the pipe to the required shape complete as required.				0
5.11	40 mm dia	Meter	15	589	8835

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5.0	LT CABLES				0
5.1	Supply of XLPE insulated and PVC sheathed Aluminium conductor armoured cable of 1.1 KV grade confirming to IS : 7098:1988 with upto date amendments of following sizes:-				0
	3.5C×400 Sq.mm.	Mtr	200	3024	604800
5.1.1	3.5 core, 240Sq.mm.	Mtr	200	1869	373800
	3.5 core, 150 Sq.mm.	Mtr	25	1195	29875
5.1.2	3.5 core, 95 Sq.mm.	Mtr	25	797	19925
5.1.3	4 core, 25 Sq.mm.	Mtr	250	297	74250
5.2	Supply of XLPE insulated and PVC sheathed copper conductor armoured cable of 1.1 KV grade confirming to IS : 7098:1988 with upto date amendments of following sizes				
5.2.1	4 core, 10 Sq.mm.	Mtr	250	819.2	204800
5.2.2	3 core, 6 Sq.mm.	Mtr	200	518.83	103766
5.2.3	4 core, 2.5 Sq.mm. Cu. Conductor cable	Mtr	50	242.72	12136
5.2.4	7 core, 2.5 Sq.mm. Cu. Conductor cable	Mtr	50	416.89	20845
5.3	Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on wall surface as required.				0
5.3.1	Upto 35 sq. mm (clamped with 1mm thick saddle)	Mtr	35	64	2240
5.3.2	Above 35 sq. mm and upto 95 sq. mm (clamped with 25x3mm MS flat clamp)	Mtr	50	151	7550
5.3.3	Above 185 sq. mm and upto 400 sq. mm	Mtr	165	271	44715
5.4.1	Upto 35 sq. mm (clamped with 1mm thick saddle)	Mtr	550	53	29150
5.4.2	Above 35 sq. mm and upto 95 sq. mm (clamped with 25x3mm MS flat clamp)	Mtr	275	109	29975
5.5	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.				0
5.5.1	3.5 core, 240 Sq.mm Aluminium cable	No.	6	1160	6960
5.5.2	3.5 core, 95 Sq.mm Aluminium cable	No.	2	684	1368
5.5.3	4 core, 25 Sq.mm Aluminium cable	No.	6	373	2238
5.5.4	4 core, 10 Sq.mm copper cable	No.	8	325	2600

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	MAIN LT PANEL'S & DISTRIBUTION BOARDS				0
6.0	<u>MAIN LT PANEL / MAIN DISTRIBUTION BOARDS AND FINAL DISTRIBUTION BOARDS</u>			-	0
	<u>Type Tested panel</u>	-	-	-	0
	Design , Supply, installation, testing & commissioning of PLC Based Main LT Panel/ Main distribution panels having 2 incomers as described below , fabricated out of 14 gauge CRCA sheet steel compartmentised front operated front access cubical free standing floor mounted type indoor totally enclosed dust and vermin proof (minimum protection IP 54) panels with neoprene gaskets, fabricated from 2 mm thick Cold Rolled Close Annealed (CRCA) sheets with powder coated finish (minimum thickness 50 micron), with reinforcement of suitable size angle iron, channel, 'T' sections and / or flats wherever necessary suitable for 415 volts 3 phase 4 wire 50 Hz system at 415 V including interconnections, bonding to earth etc. and flush doors conforming to relevant IEC (viz., IEC 61439, etc.) standard including the earth leakage protection complete as per specification & drawings as required and as given below. All internal wiring in the panels shall be carried out using high temperature FRLS PVC wires. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel in the form of shop drawings before fabrication. 2 Nos. earthing terminals shall be provided for all distribution panels.			2140000	2140000
	The panel has of no.2 incomers . One from main power supply and one from DG supplies from syn/load management panel.				0
	The Switchboards shall be provided with detachable gland plates for entry of cables from the top/bottom as required.				0
	All live accessible parts shall be shrouded and all equipment shall be finger touch proof. The busbars shall be insulated with heat shrinkable sleeves, SMC/DMC (Double Moulding Compound) shrouds and busbar supports suitably spaced shall be used				0
	Hinged doors with padlocking facility shall be provided on all equipment feeders with switch handles lockable in OFF position.				0
	Earthing all components, frame etc. to a common internal earth bar of minimum size as per IEC 61439 or equivalent Copper / Aluminium Bar				0
	All accessories & supporting structures such as channels, ISMC base frame, mounting brackets, lifting lugs, panel heaters, ventilation arrangement etc. as required.				0
	Each incomer and outgoing feeder shall be provided with minimum LED/neon type status indication lamps suitable for 230 V AC as approved.				0
	Overall Space provision shall be @ 25% for future expansion.				0
	Switchboard including interconnections, labeling, earthing, erection etc. complete as required.				0

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	All MCCBs shall be current limiting type microprocessor-based (All MCCB's shall be of 35 KA breaking capacity) , suitable for requisite specified Service short circuit breaking capacity (Ics suitable for isolation conforming to latest IEC947-2/IS13947-2 duly marked on MCCB, at operating voltage (Ue) of 415 V, insulation voltage (U) 750 V and with trip free mechanism, handle indicating ON/OFF/tripped position. The breaking capacity shall match the Ics values. MCCBs shall be compact (As the Engineer may decide), suitably designed to provide protection of motors, cables, busbars to suit rated current, unbalanced power distribution as required and with front adjustable overload and short circuit releases and minimum electrical endurance of the order of 7000-10000 operation cycles (higher shall be preferred) & mechanical durability of 100-250 times. The MCCBs shall be provided with potential free contact for connection to PLC in ERP/SCUM Room for ON/OFF status and control, as required. MCBs shall be conform to IEC898/IS 8828 (latest), and with breaking capacity 9/10 kA at 415 V AC, current limiting type, lower loss approx 40-70% of the stipulated value and suitable for magnetic releases operating between 3 to 5 times rated current for normal power distribution application and 5 to 10 times rated current for motor application duty, with minimum Electrical endurance of the order of 20000 operation cycles. All incomer ACB's shall be provided with minimum 2 NO + 2 NC auxiliary contacts and all MCCB's shall be provided with 2 NO+2 NC auxiliary contacts, and there should be provision to add min. 6 Auxiliary contacts. All 4-pole ACBs shall have fully rated neutral pole. All 4-pole ACBs & MCCBs shall be provided earth fault protection. The panel shall be fitted with fire trace tube system. Payment for fire trace tube system shall be made under separate item. Scheme of fire trace tube system shall be got approved by Engineer before proceeding with manufacturing and assembly. The internal wiring to be FR PVC. Both Incommer breakers shall be electrically interlocked. All Outgoing breakers shall have ON/OFF indication light. All MCCBs shall be of 35 KA breaking capacity with overload,short-circuit and earth fault protection. Wiring with space heater, thermostat and control MCB shall be provided all vertical sections of Panel. LED light shall be provide in each section of Panel Suitable danger board shall be provided. Gas Flooding system- clean agent based shall be provided.			
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<u>Incommer -1 for Existing Transformer Supply and Incomer-2 from DG Sync panel</u>				
800 Amps 4 Pole <u>Electrically operated</u> (motorised) fully drawout type air circuit breaker with ON/OFF/TRIP indicating lamps with MCB and over current short circuit to withstand symmetrical fault level of 50 kA and earth fault microprocessor releases with LSIG protection (Type 2A of MG or equivalent make) -2 set.				
Qty of materials as below as per tender specs and standarad and Engineer Incharge				
Electronic energy meter (Conzerve – EM 6400 or eq. with RS485 port or equivalent) of accuracy class-I, with 3 Nos.600/5 amps 15VA CT class 0.5 accuracy				
Phase indicating light shall be protected by 2 Amps MCB				
Breaker ON / OFF / TRIP indicating lights with control MCB.				
240V Under voltage release				
230 V AC Motor wound spring closing mechanism.				
24 V DC Shunt trip coil.				
Under voltage relay MV12 or equivalnt (27)				
Over voltage relay MV 12 or equivalent (59)				
Breaker control switch				
Auto-manual selector switch				
Phase reversal relay				
Auxiliary contacts required for necessary interlocking of breakers.				
required CTs for APFCR.				
Surge arrestor				
Bus Bar				
1000 A TPN electrolytic Aluminium bus bar with heat shrinkable insulation sleeve. The neutral busbar shall be of 100% capacity.				
Bus Bar having a maximum current density of 1.0 A/mm² as per specification with heat shrinkable sleeves suitable to withstand symmetrical fault level of 50 kA for 1 sec. at 415 V.				
Outgoings				
630 amps Electrically operated (motorised) fully drawout type air circuit breaker with on Light 1 set, 50 KA fault capacity				
250 amps 4Pole MCCB With ON LIGHT - 1 No.				
200amps 4Pole MCCB With ON LIGHT - 1 No.				

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6.1	Auto load management/auto synchronizing / auto load sharing panel			0	
1	Supply, installation, testing and commissioning of auto load management,auto synchronizing / auto load sharing panel based on demand feed back for two DG sets having different capacity, Genset controller with load management PLC shall collect demand feed back from MFM in panels / transformer incomers & necessary wiring & communication from meter to PLC, auto change over, interlocking DG control and operation programmable logic controller (PLC) based logic panel cubicle type. Panel shall be Suitable for 2 Nos DG Set. (320KVA & 160 KVA) complete with all measuring instruments, protective devices, alarm, etc. as required, PLC with required digital & analogue input & output modules, input/output racks, power supplies and communication with Power Monitor. Gas Flooding system- clean agent based shall be provided. panel shall be fabricated out of 14 gauge CRCA sheet steel compartmentised front operated front access cubical free standing floor mounted type indoor totally enclosed dust and vermin proof (minimum protection IP 54) panels with neoprene gaskets, fabricated from 3 mm thick Cold Rolled Close Annealed (CRCA) sheets with powder coated finish (minimum thickness 50 micron), with reinforcement of suitable size angle iron, channel, `T' sections and / or flats wherever necessary suitable for 415 volts 3 phase 4 wire 50 Hz system at 415 V including interconnections, bonding to earth etc. and flush doors conforming to relevant IEC (viz., IEC 61439, etc.) standard including the earth leakage protection complete as per specification & drawings as required and as given below. All internal wiring in the panels shall be carried out using high temperature FRLS PVC wires. Lifting hooks shall also be provided in case of large panels. Approval shall be taken for each panel in the form of shop drawings before fabrication. 2 Nos. earthing terminals shall be provided for all distrtribution panels. microprocessor based Genset Controller with communciation cables etc. as required and degree of protection IP:54 & all relays shall be microprocessor based comprising of the following: DG Synchronization Panel for Substation This panel scheme is PLC based type tested panel. The panel has incomers from two nos. of DG sets of different capacity power supply. The same is required to be designed and interlocked in such a way when main power supply gets off DG-1 (320kVA) integrated with PLC shall act as Master and 160 kV DG set will act as a slave. if total load exceeds 80% of Master DG then PLC close the Bus coupler and start DG-2. Thereafter, both DG sets shall operate in parallel and share the load as per the programmed load-sharing logic. When the load decreases to a level that can be adequately supplied by a single DG set, the PLC shall automatically de-synchronize and stop one DG set based on the predefined operating logic, and the remaining DG set shall continue supplying the load.	SETS	1	1500000	1500000

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(Note-G.A. Drawing of panel to be approved before fabrication). Qty of materials as below as per tender specs and standarad and Engineer Incharge ACBs shall have Icu= Ics =Icw 50 KA minimum for 1 sec MCCBs shall have Icu= Ics =36 KA minimum for 1 sec Incomer ACBs of panel shall have microprocessor-based release trip with O/C, S/C, E/F in built protection. Outgoing MCCB's of Main LT panel shall have thermal magnetic based release trip with O/C, & S/C protection. MCCBs shall be variable current setting, current limiting type with front extended rotary operating handle, phase shall have phase separators, spreader links, terminals, transparent polycarbonate sheet shrouding. All meters shall be digital type with class 1 accuracy. All indication lamps shall be LED type. SPD shall be pluggable type having the indication for in operation/ end of life, Incomer & Outgoing feeders shall be provided with 'ON', 'OFF' and 'TRIP' indication lamp All outgoing feeders of DG Panel shall be provided with digital type MFM-1 (Multi-function meter-1) for A,V, kW & kWh, PF, Hz, All live accessible parts shall be shrouded with 1mm thick polycarbonate/3 mm thick FRP sheet and all equipment shall be finger touch proof. The busbar insulation shall be with heat shrinkable sleeves according to the colour code. SMC shrouds and busbar supports shall be used. Galvanised hardware with zinc passivation shall be used in fabrication of Switchboards. All control, power and communication wiring shall be brought out up to the cable alley in the terminal blocks. 10% extra terminals shall be supplied along with Panel. All bus bar size after derating shall be equal to the ampere given in the BOQ. Incomer 1Nos. 320 kVA and1Nos. 160 kVA DG Set 1 No. 400 Amps & 1 No. 630 Amps and Electrically operated type 415, 50Hz, Volts, 4 Pole, MCCB breaker with CTs, built in overload + short circuit + earth fault and under voltage release etc. complete in all respects. Suitable Digital ammeter with built in selector switch and matching CTs for each DG set				
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1 No. 0-500 Volts, Digital voltmeter with built in selector switch and protection MCB for each DG set				
1 Nos. Multi data meter (kW, kWh, kVA, PF, A, V) with matching CTs for each DG set				
1 Set R Y B phase indicating lamps for each DG set				
1 Set of ON/OFF/TRIP indicating lamps for each incomer				
1 No. 8 Window Annunciation for alarm and trip for each DG set				
1 No. Auto / Manual selector switch for each DG set				
1Set of push buttons for DG start, DG Stop Reset & Emergency Stop for each DG set				
1 Set of automatic Battery charger with inbuilt facility of trickle / boost & consisting of following for each DG set				
DC Ammeter (0-30) V.				
DC Voltmeter. (0-30) Amp				
Charger ON, OFF indications.				
DG AMF, Load Management, Protection & Interlocking System.				
Micro logic PLC shall be suitable for DG Sets Auto start / stop, Load Management, interlocking and operation of DG sets, EB incomer ACB's and bus coupler, with auxiliary relays, indication lights, Push button, Emergency stop, UPS, A/M switch, PLC - CPU, 24V DC power supply as required.				
Bus Coupler				
1 No. 400 Amps or as per tender specification Electrically operated draw out type 415, 50Hz, Volts, 4 Pole, air circuit breaker with CTs, charging motor, built-in overload + short circuit + earth fault and				
undervoltage release, auxiliary contacts etc. complete in all respects.				
All Incomers and Bus coupler shall be Electrically interlocked with each other.				
Bus bar				
1000 Amps, 415 volts, 3 phase, 4 wire colour coded Al. bus bar.				
Outgoings				
1 Nos, 800 Amps 4 Pole Electrically operated (motorised) fully drawout type air circuit breaker with ON/OFF/TRIP indicating lamps with MCB and over current short circuit to withstand symmetrical fault level of 50 kA , 1 sec. and earth fault microprocessor releases with LSIG protection.				
Metering & Indication Lamp				

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	1 Nos. Multi data meter (kW, kWH, kVA, A, V) with matching CT's for each outgoing feeder				
	ON & OFF Indication lamp shall be provided in each outgoing feeder				
	Panel shall be complete with above mentioned switchgear, interlocking PLC, Energy meter with internal wiring.				
	<u>Sub-panel</u>				0
6.3	<u>Incoming (other discription and design of this pannel as mentioned above)</u>				
	1 No. 250 Amps, 415V, Ics = 25 kA, TPN MCCB and with variable overcurrent and short circuit releases & each complete with:				
	3 nos. cast resin current transformers of 250/5 ratio 15 VA burden with Ammeter and Ammeter Selector Switch • 1Set of (0-500 volts) digital voltmeter with selector switch with 2 amps MCB • 1 Set Red/Green ON/OFF indicating lamps • 1 Set of three phase (red, yellow, blue) indicating lamps Amber healthy trip indicating lamps with inbuilt selector switch				
	Phase indicating light shall be protected by 2 Amps SP MCB's. -3 Set.				
	<u>Busbar</u>				
	BUSBAR Electrolytic high conductivity Aluminium three phase and neutral busbars rated at 300 A as per specification with heat shrinkable insulation sleeves suitable to with asymmetrical fault level of 25 kA at 415 V. The neutral busbar is to be of same size as phases.				
	<u>Outgoing</u>				
	40 A 4 Pole- 2 No.Ics = 25 kA, TPN MCCB and with variable overcurrent and short circuit releases & each having indication lamps to give status	set	1		299930
	63 A 4 Pole - 2 No. Ics = 25 kA, TPN MCCB and with variable overcurrent and short circuit releases & each having indication lamps to give status			299930	
	100 A 4 Pole - 2 No. Ics = 25 kA, TPN MCCB and with variable overcurrent and short circuit releases & each having indication lamps to give status				
	<u>Spare MCB/MCCB's of the following :</u>				
	40 A 4 Pole MCB - 1No.				
	63 A 4 Pole MCB - 2 No.				
	25A 2Pole MCB - 3 No.				
	<u>Note:</u>				
	<i>All MCCB's shall be of 16 KA breaking capacity.</i>				
	<i>All MCB's shall be of 16 KA breaking capacity.</i>				

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	Total cost of MDB -1(SECOND FLOOR) _ described as above				
7.0	LIGHTING FIXTURE AND FANS				0
7.1	Supply installation Testing and commissioning of 36 watt Panel Down light 2x2 ft. LED Panel light 2x2 ft., (System lumen efficacy >135 lm/Watt), of following body material and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range -15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection, THD < 10% , P. F. ≥ 0.95, IP20, CRI >80, UGR (Unified Glare Rating) < 19, Flicker free, (flicker should be below 5 %), life time (LED, Driver & electrical circuitry), of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends , CCT 3000°K / 4000°K / 5700°K / 6000°K/6500°K (As per ANSI Bin), SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy >135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C). Powder coated die cast /Extruded aluminium Body (Thickness > 1.20 mm)	Nos	82	3806	312092

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7.2	Supplying installation Testing and commissioning of LED 15 watt. Recessed/surface Down lighter (Round /square/Rectangular) SMD type of following body material with PMMA and prismatic diffuser and construction as per IS : 10322 with driver as per the requirement with Driver efficiency >85%, Operating voltage AC 140-270 Volt, freq 50/60 hz, Operating temp range - 15 deg to 40 deg centigrade, internal surge protection of 2.5 KV with Short & Open circuit protection ,THD < 10% , P. F.≥0.95, IP20, CRI >80, UGR (Unified Glare Rating) < 19, Flicker free, (flicker should be below 5 %), life time (LED,Driver & electrical circuitary), life time of minimum 50000 Burning Hours with , 70% of initial Lumen maintained till life ends as per LM80 extrapolation IES TM-21-11 report, CCT 3000°K / 4000°K / 5700°K / 6000°K /6500°K (As per ANSI Bin) , SDCM(Standard Deviation Color Matching) <3, Maximum power consumption should not more than the specified rating and Fixture shall be of relevant BIS standard and trade mark certificate (T.C.). Manufactures Word Mark/ Name Engraved/ Embossing/ Screen printing on housing. OEM must have its own in house NABL lab setup for all testing facilities for LED fixtures. complete in all respect i/c connections with 1.5 sq mm FRLS, PVC insulated copper conductor single core cable and earthing etc. as required with Minimum 5 year OEM warranty. System lumen efficacy >135 lm/Watt output . LM79 & LM80 Test report from NABL lab for all testing required for LED fixtures as per BIS shall be submitted. Shape size and CCT shall be as approved by Engineer-in-Charge as per requirement. (Thermal management: heat sink of aluminium housing such that LED junction temperature shall not rise above 90°C). Powder coated die cast /Extruded aluminium Body including trim with Aluminium Reflector	Nos	127	1422	180594
7.3	Supply installation testing and commissioning of 25-36 Watt LED downlight luminaire linear in pendant-mounting in extruded aluminium for indoor architectural lighting solution, offering excellent energy saving and maintenance-free operation. Luminaires can be connected end-to-end to make a continuous lighting system of any length to uplift visual ambience.	Meter	8	11241	89928
7.40	Supply and fixing of Ceiling fan of 1200mm sweep (white colour), suitable for operation on 230 / 240V, 50 Hz, single phase, A.C, supply complete with double ball bearing motor, required down rod, capacitor, three MS blades etc complete.1200 MM Celing fan(Havells Fusion Five Star 3 Blade (1400 mm)	Nos	2	1952	3904
7.50	300MM Exhaust fan in approved colour by engineering Incharge with louvars.	Nos	8	2261	18088
7.60	Installation, Testing and Commissioning of ceiling fan, including wiring the down rods of standard length (upto 30 cm) with 1.5 sq. mm FRLS/HFFR PVC insulated, copper conductor, single core cable etc. as required.	Nos	2	532	1064

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7.70	Installation, Testing and Commissioning of exhaust fan in the existing opening, including making good the damage, connection, testing, commissioning etc. as required.			0	0
7.80	Upto 450 mm sweep	Nos	8	556	4448
7.90	Extra for fixing the louvers/ shutters complete with frame for a exhaust fan of all sizes.	No	8	260	2080
8.0	UPS SYSTEM				0
	Supply, installation, Testing and commissioning of the following rating UPS as per Technical Specifications and complete in all respects.				0
8.1	Online UPS- Input supply: Three Phase, Output supply: Three Phase. Supplying, installation, Testing & Commissioning of following capacity at full load (Unity Power Factor) at operating temperature 0 to 40 °C, Relative humidity 0 to 95%, Online double conversion true sine wave Uninterrupted hot swappable (allow for the replacement or addition of battery modules without shutting down the entire system) modular Power Supply (UPS) system with N+1 modules (N denotes total number of modules required for rated capacity). The UPS shall include a Rectifier, inverter, battery bank suitable for 30 minutes back up (Battery VAH capacity shall not be less than 1600 VAH per KVA of UPS rating per Hour backup time) on full load (Battery shall be VRLA, SMF in ABS Container) and Static Bypass switch along with provision for manual bypass, suitable isolation transformer for additional protection against neutral faults etc. UPS shall have inbuilt phase sequence correction. The UPS systems offered are to be of the latest technology with Digital Control Microprocessor based for reliable operation using Insulated Gate Bipolar Transistor (IGBT)'s both for the rectifier & inverter (3 Level) with PWM (Pulse Width Modulation). The quality of design, manufacturing and inspection process should confirm to the relevant International standards such as IEC/EN/VDE. The operating efficiency of the UPS systems shall be >96% while operating on battery mode and delivering quality power to the 100% non-linear loads. Current total harmonic effect (ITHD) on the input grid shall be < 5% at 50 %load. (The required LC (inductor (L) and a capacitor (C)) filters shall be included in UPS cost), extreme power factor kit to be included to limit the input power factor (PF) to 0.99 and output power factor shall be unity (i.e. kw rating of the UPS shall be kva rating x 1), however UPS shall be suitable to take load at 0.7 lagging to 0.7 leading power factor loads. UPS shall be suitable for incoming supply AC : 3Phase 400V +/-20%, 50 Hz +/-5 Hz, AC Output voltage: 3Phase 415 Volt, 50 Hz +/- 0.2Hz, Overload capacity of 120% for 10 mins, Sine wave output. Non condensing, noise level less than 60db at 1 meter distance, protections: Input Under voltage over voltage, abnormal out voltage, battery over charging, output over current, short circuit protection, battery deep discharge protection, 10KV surge. UPS must comply with low voltage				0

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	electromagnetic compatibility (EMC) achieved as per EN 6204, EN6204 Part I and Part 2, it shall be a Voltage and Frequency Independent (VFI)-type UPS. . Communication RS232/RS485/SNMP port open protocol for BMS integration, all hardware & software for IoT Communication as per approved by Engineering in charge. Required battery racks and interconnecting copper conductor cables of suitable size and connectors and all required accessories are inclusive of the cost). This system must provide a means for logging and alarming of all monitored points plus email notification. Forced air-cooling with integral inbuilt fans with redundancy (if one fan fail UPS should be able to handle at least 80% of the load, Noise Level 65 DB at 1 meter distance. The system shall be in compliance IEC 62040- 1,2 & 3, IS: 16242 and CPWD Specification. Display Panel (minimum) (In-built 5 inch or more LC Display /LED) to display : a) Input: Voltage, current, Frequency. b) Bypass: Voltage, Frequency. c) Output: Voltage, frequency, Current. d) Battery: Voltage, Capacity. e) Load: KVA, KW, Percentage. f) Temperature: STS, Inverter, PFC. g) Event Logging & Statistical Data (On LCD/LED): UPS should capture and display up to 3000 events like: Over temperature / DC Bus Fail / Fan Fail / Fuse Fail / Overload / Short-circuit / Device Fail / Inverter Fail / Rectifier Fail / Bypass Fail, etc. h) Statistical Data: No. of power failures / Transfers to Bypass /Total Running time, etc. i) Mains Mode of Operation /Battery Mode of Operation / Bypass feeding the load / UPS Fault /Battery charging and discharging, overload, battery voltage and battery capacity. j) Audible Alarms : Mains Failure, Battery Low Alarm, UPS Overload, Fault, Shutdown, Input Over, Under Voltage, Output Over, Under Voltage, Battery Over, Under Voltage, Over Load and short circuit, Over Temperature. The UPS should have QR code which should contain drawing, test report OEM manual, Geo- Tag of manufacturing location etc				
	20KVA (Each Power module shall be < 10 KVA)	Set	1	341,772	341772
9	FIRE HYDRANT SYSTEM				0
9.1	Supplying and fixing air vessel made of 250 mm dia, 8 mm thick MS sheet, 1200 mm in height with air release valve on top and flanged connection to riser, drain arrangement with 25 mm dia gun metal wheel valve with required accessories, pressure gauge and painting with synthetic enamel paint of approved shade as required.	set	2	19,402	38804
9.2	Providing & fixing dial type (100 mm) pressure gauge with isolation ball valve suitable for working pressure of 250 PSI. Cost shall be inclusive of providing any short pieces, nipples, elbows etc as required.	Nos	3	2466	7398

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	SUBHEAD: II: Hydrants, Sprinkler,Piping & Accessories				0
10	Providing, laying, testing & commissioning of 'C' class heavy duty MS pipe conforming to IS 1239/Class -II of IS: 3589 including Welding, fittings like elbows, tees, flanges, tapers, nuts bolts, gaskets etc. and fixing the pipe on the wall/ceiling with suitable clamp/support frame and painting with two or more coats of synthetic enamel paint of required shade complete as required :				0
10.1	100 mm dia	Metre	30	3,077	92310
10.2	80 mm dia	Metre	40	2,277	91080
10.3	65 mm dia	Metre	50	1,955	97750
10.4	50 mm dia	Metre	60	1,557	93420
10.5	40 mm dia	Metre	70	1,259	88130
10.6	32 mm dia	Metre	80	1,039	83120
10.7	25 mm dia	Metre	100	920	92000
10.8	Supplying, fixing, testing and commissioning of butterfly valve of PN 1.6 rating with bronze/gunmetal seat duly ISI marked complete with nuts, bolts, washers, gaskets conforming to IS 13095 of following sizes as required				0
10.9	50 mm dia	Nos.	2	4,114	8228
11	80 mm dia	No.	4	5,406	21624
11.1	100 mm dia	No.	4	7,271	29084
11.2	Supplying and fixing first-aid Hose Reel with MS construction spray painted in post office red, conforming to IS 884 complete with the following as required. (a) 20 mm nominal internal dia water hose thermoplastic (Textile reinforced) type -2 as per IS: 12585 (b) 20 mm nominal internal dia gun metal globe valve & nozzle. (c) Drum and brackets for fixing the equipments on wall. (d) Connections from riser with 25 mm dia stop gun metal valve & M.S. Pipe and socket.	No.	2	9,440	18880
11.3	Supplying and fixing 63 mm dia, 15 m long RRL hose pipe with 63 mm dia male and female couplings duly bound with GI wire, rivets etc. conforming to IS 636 (type-A) as required : Gun Metal	No.	4	5,455	21820
11.4	Supplying & fixing 63 mm dia gun metal short branch pipe with 20 mm nominal internal diameter size nozzle conforming to IS 903 suitable for instantaneous connection to interconnect hose pipe coupling as required: Gun Metal	Nos	4	4,977	19908
11.5	Providing and fixing 5 mm thick glass door (with M.S. frame) of size 2.1 m x 1.2 m with center opening for fire hose cabinet. Suitably marked on the outside with the letters "FIRE HOSE" including locking arrangement. All M.S. work to be in Red P.O. colour over appropriate primer. The above item is only for masonry fire station.	No.	2	15620	31240
11.6	Supplying, installation, testing & commissioning of sprinkler flexible pipe (UL Listed) of stainless steel complete with 15 NPT on reducer thread with maximum working pressure of 175 PSI test pressure of 875 PSI (Burst) with branch line (Inlet) 25mm NPT male thread to sprinkler head (Outlet) 15mm NPT female thread with reducer, nipple, 2 side brackets, center bracket, stockbar of following sizes complete as required.	Nos	70	1,703	119210

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11.7	Providing, fixing, testing & commissioning of 15mm dia quartzoid bulb type sprinklers of rating 68 OC with required accessories :Pendent Sprinkler	Nos	70	599	41930
11.8	Providing & fixing flow switch in following sizes M.S. pipe including connection etc as required.150mm dia	Nos	2	9,644	19288
11.9	Providing, fixing, testing & commissioning of installation control valve of cast iron body, brass/bronze working parts comprising of water motor alarm, bronze seat clapper, clapper arm and hydraulically driven mechanical gong bell to sound continuous alarm when the wet riser/sprinkler system activates, pressure gauges, emergency releases, strainer, pressure switch, cock valve complete with drain valve and bypass, test control box, ball valves, MS pipe of required size, flanges, orifice plate, gasket etc of following sizes as required	Nos	2	47,460	94920
12	SUBHEAD: III: Portable Chemical Fire Extinguishers				0
12.1	Supply, installation, testing and commissioning of following types of extinguisher with provision of wall bracket (fixed with anchor fastener). ISI marked (IS:940) portable chemical fire extinguisher, water (gas pressure) type capacity 9 litres with gun metal cap and nozzle and complete in all respects including initial fill and wall suspension brackets	Each	1	3749	3749
12.2	Supply, installation, testing and commissioning of following types of extinguisher with provision of wall bracket (fixed with anchor fastener).ISI marked (IS:2878) Fire Extinguisher, Carbon-di-oxide type capacity 4.5 Kg. Flat base including valve, discharge hose of not less than 10 mm dia, 1M long and complete in all respects including initial fill with CO2 gas conforming to IS:307-1966 filled to a filling rate of not more than 0.667 and wall suspension bracket.	Each	5	5613	28065
12.3	Supply, installation, testing and commissioning of following types of extinguisher with provision of wall bracket (fixed with anchor fastener). ISI marked (IS:2171) Portable Dry Chemical Power Type Fire Extinguisher with Gun Metal cap and nozzle and complete in all respects including initial fill and wall suspension bracket.	Each	5	3724	18620
12.4	Supplying and installing at approved location approved make fire buckets of 24 gauge galvanized steel sheet, standard 9 litre capacity and of round bottom shape, painted white inside and red outside and black on the bottom, inscribed with letters "FIRE" in black and gold. Cost shall be inclusive of providing MS stand duly painted over a coat of primer.	Nos	1	6248	6248
13.0	FIRE ALARM SYSTEM			0	0
13.1	Existing FACP model (NFS2-3030) & all materails mentioned in the BOQ shall be compatbile to this existing Model)			0	0
13.2	PHOTOTHERMAL (MULTITECH) DETECTOR Supply, Installation, Testing & Commissioning, Installation of UL listed Intelligent Addressable MultiCriteria smoke cum Heat detector, optical type with blinking LED and standard base, being capable of being addressed electronically. Manual Addressing not acceptable. complete with base etc. as required. Approved Make:- Notifier	Nos.	50.00	4154	207700

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13.3	MANUAL CALL POINT Supply, Installation, Testing & Commissioning of UL Listed Intelligent Addressable Double action manual pull station, capable of being addressed electronically complete etc.as required. Approved Make:-Notifier	Nos.	2.00	4024	8048
13.4	FAULT ISOLATOR Supply, Installation, Testing & Commissioning of UL Listed Addressable Fault Isolator module complete which detects short circuit and seperates the segment, complete etc. as required.and as per specifications. Approved Make:-Notifier/Ansul/Edwards	Nos.	3	3762	11286
13.5	CONTROL MODULES Supply Installation, Testing & Commissioningof UL Listed Addressable control module (MCP) complete as required for switching ON of smoke extraction fans / Pressurisation Fans etc. and switching off AHU' s, capable of being addressed electronically. Manual Addressing (Dip/ Rotary Switches) not acceptable, complete as required.and as per specifications. Sprinkler flow switches. Approved Make:-Notifier	Nos.	6	5192	31152
13.6	Supply, Installation, Testing & Commissioning of MONITOR MODULES UL Listed Addressable Monitor module complete as required for monitoring flow switches/ interface with any third party equipment capable of being addressed electronically etc. completeas required and as per specifications Hooters Circuit. Approved Make:-Notifier	Nos	6	3894	23364
13.7	Suppluing abd Installation , of exit signs: photo luminescent safety signage made up of photo luminescent material of rare earth aluminates, non radioactive working.	Nos	6	714	4284
13.8	Supply, Installation, Testing & Commissioning of PVC Insulated 2 x 1.5 sq mm FRLS copper conductor Armoured cable with termination on each end with ferrules .	RM	1100	175	192500
13.9	Supply, installing, testing and commissioning of Response Indicator. Approved Make:-Notifier	Nos.	20	123	2460
13.1.1	Supply, installing, testing and commissioning of UL Listed Addressable Rate of Rise Heat Detector rated at 9.4 deg C/min. The detector shall have twin bi-colour LED for 360 deg viewing. Addressing shall be with user friendly rotary decimal switches. Approved Make:-Notifier	Nos.	4	3894	15576
13.1.2	Supply, Installation, Testing and Commissioning of UL Listed Fire Alarm Hooter (sound output of minimum 90 dB upto a distance of 30 meters) cum Strobe (Selectable 15, 30, 75, or 110 cd), made Addressable with the help of Intelligent Addressable Signal Module (cost of the Module to be included), capable of being addressed electronically. Manual Addressing (Dip/ Rotary Switches) not acceptable, with seperate power supply arrangement complete as required. Approved Make:-Notifier	Nos.	2	4543	9086
13.1.3	Supply, installing, testing and commissioning ofUL Listed 2W/6W Ceiling Mounted speaker with capacity to have 1/4,1/2,1 and 2 watt tapping, working at 83dB compatible with amplifier complete as required. As per existing Model of PA and Speakers	Nos.	12	1558	18696

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14.0	PUBLIC ADDRESS SYSTEM				0
14.1	Supplying and drawing following sizes of FRLS PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/ PVC conduit as required.				0
14.2	2 x 1.5 sq. mm	meter	140	77	10780
14.3	Supplying and fixing of following sizes of steel conduit with accessories in surface/recess including painting in case of surface conduit or cutting the wall and making good the same in case of recessed conduit as required.				0
14.4	25 mm	Metre	50	289	14450
14.5	Supplying, installation, testing & commissioning of 1.5/3/6W metal box ceiling/wall speakers complete as required.	No.	17	1,891	32147
14.6	Cost of Digital audio amplifier 50 Watt 25VRMS operating of 240 Volt AC Supply.	No.	2	73,000	146000
14.7	Cost of Digital voice command keypad	no	1	37,082	37082
14.8	Micro phone assembly	no	1	24,576	24576
14.9	Cost of Exit point directional sound speaker with voice and integral audio amplifier with selectable sound pulse patterns	no	1	7,600	7600
14.1	6 Zone, voice alarm controller with USB, MP3,AM/FM player (including zone button paging station).	no	1	95,250	95250
15.0	DG SYSTEM				0
15.1	Supply, installation, testing and commissioning of 320 KVA prime continuous (actual) rating radiator cooled type diesel generating set (alternature at 47 deg C temperature) with Acoustic Enclosure along with electronic governor (The Engine shall be as per CPCB-IV and Governor shall have feather for AMF) base frame, Alternator (capable of delivering true 320 kVA output), Static Excitation System, Lube Oil System, Batteries, Battery charger, Instrumentation, Silencer with bellows, alarms, Engine Control Panel, AVM pads, AVR Panel, 400 A 4Pole MCCB Isolator, Terminal arrangements in termination box suitable to 3.5cx240 sqmm aluminium cables with all other associated equipment / work as per specifications.	Set	1	3,832,640	3832640
15.2	Supply, installation, testing and commissioning of exhaust pipe 'B' class heavy duty MS pipe with all fixing accessories and hardwares. The exhaust pipes shall be insulated with 75 mm thick mineral wool insulation wrapped in chicken mesh and clad with 24 gauge aluminium sheet including all support.				0
15.3	100 mm dia	RM	15	6,728	100920
15.4	200 mm dia	RM	15	8,352	125280
15.5	Supply, installation, testing and commissioning of MS supported self standing structure for DG exhaust pipe 'B' class heavy duty MS pipe with all fixing accessories and hardwares. The exhaust pipes shall be insulated with 75 mm thick mineral wool insulation wrapped in chicken mesh and clad with 24 gauge aluminium sheet including all support, lighting arrester, avation light as required complete in all respect. the structure shall be painted with two coat of primer and two coat of aluminium , GI paints as good as required.(the Cost of pipe is including in item 1.1)	TON	1	550,000	550000

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16	AC EQUIPMENT				0
16.1	Supplying, Installation, Testing & Commissioning of Modular type Variable Refrigerant Flow/Variable Refrigerant Volume air cooled Outdoor units suitable for cooling/heating having 100% hermetically sealed inverter type twin Rotary/Scroll Compressor(s), minimum two compressors (with individual separate PCB) for above 14HP modules, microprocessor based Controller, top discharge type condensing unit(s), with R-410-A Refrigerant or equivalent, vibration Isolators with suitable foundation etc. complete as required. To have better efficiency condenser fan shall be capable to operate at different speed with respect to load. The unit shall deliver the rated capacity and in confirmation as per IS 18728:2024 and CPWD Specifications and work even at 50°C ambient temperature without tripping. The system shall be able to deliver 100% of the rated capacity upto 39 °C. The unit shall be suitable to work on 400V +/- 10%, 3 . Phase, 50Hz AC power supply and BMS compatible. The unit shall be filled with first charge of the refrigerant and ready for use as required. The condenser should be coated with a hydrophilic film to prevent water accumulation on the surface of the heat exchanger, enhance water dispersion, and reduce the risk of degradation, thereby improving overall performance and durability. The Indian Seasonal Energy Efficiency Ratio (ISEER) of the unit shall be as per Energy Conservation and Sustainable Building Code (ECSBC) 2024 as below and complete as per CPWD specification, connections, inter connections etc. as required. (For capacity <40 kW ISEER 7.4, Capacity > 40 and <70 ISEER 7.5, Capacity > 70 ISEER 7.6 for Super ECSBC Building)				0
1	Outdoor Units				0
16.1	20 HP	PER HP	1	21659	433180
16.2	16 HP	PER HP	1	21659	346544
	VRV DUCTABLE UNIT				0
17	Supplying, Installation, Testing and Commissioning of following minimum capacity and external static pressure VRF/VRV ceiling mounted mid high static ductable type Indoor unit equipped with washable synthetic media prefilter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX copper coil, electronic expansion valve, corded remote control, outer cabinet, vibration Isolators, drain pan, drain pump, other necessary supports etc., suitable for operation on single phase AC supply 230 V ± 10%, 50 Hz complete as required. The Indoor units must shut down upon receiving a signal from the BMS System/Fire Signals. The system shall be capable to adjust air flow as per room requirement automatically. The cooling capacity of indoor unit will be at air inlet conditions of 27 OC DB and 19 OC WB temperature. (Make will be same as of Outdoor) High Static Ductable units (minimum 49 to 77 pascal external static pressure)				0
	The unit shall be Mid Static Ductable units (minimum 45 pascal external static pressure)				0

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	DUCT TYPE INDOOR UNITS				0
17.2	4.6 TR Ceiling Suspended Unit	No.	1	64568	64568
	DUCT TYPE INDOOR UNITS				0
18	Supplying, Installation, Testing and Commissioning of following minimum capacity and external static pressure VRF/VRV ceiling mounted high ductable type Indoor unit equipped with washable synthetic media pre-filter, fan section with low noise fan/dynamically balanced blower, multispeed motor, coil section with DX copper coil, electronic expansion valve, corded remote control, outer cabinet, vibration Isolators, drain pan, drain pump, other necessary supports etc., suitable for operation on single phase AC supply 230 V $\pm$ 10%, 50 Hz complete as required. The Indoor units must shut down upon receiving a singal from the BMS System/Fire Singnals. The cooling capacity of indoor unit will be at air inlet conditions of 27 OC DB and 19 OC WB temperature. (Make will be same as of Outdoor) .				0
18.1	7.95/8 TR Ceiling Suspended Unit High Static Ductable units (minimum 78 pascal external static pressure)	No.	4	85191	340764
19	Supplying, Installation, Testing and Commissioning of Y/T/Multi Joints. Joints shall be of same Original Equipment Manufacturer (OEM) make as of ODUs and IDUs				0
19.1	Indoor Units	Nos.	5	4,535	22675
19.2	Outdoor Multi Joint	Nos.	5	8098	40490
20	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete channel iron 75mm x 40 mm x 6 mm (7.14 Kg/Meter) for VRV outdoor Unit as per specification as recommended.	Kg	100	134	13400
	REFRIGERENT & DRAIN PIPING				0
21	COPPER REFRIGERANT PIPING				0
	Supplying, Installation, testing and commissioning including vaccumiazation and Nitrogen testing of following nominal sizes of soft/hard drawn copper refrigerant piping for VRV/VRF system, complete with fittings, with suitable adjustable ring type hanger supports, jointing/brazing including accessories, insulated with XPLE Class-O tubular insulation/with Class-O closed cell elastometric nitrile rubber tubular sleeves sections of 19 mm thick insulation as given below for Suction and Liquid lines, all accessories as per specifications etc. as required :				0
21.1	9.5 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	RM	50	346.00	17300
21.2	12.7 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	RM	25	487.00	12175
21.3	15.86 mm dia (OD) (Soft drawn) with tube thickness 1.2 mm	RM	15	615.00	9225
21.4	22.2 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm	RM	40	904	36160
21.5	28.58 mm dia (OD) (Hard drawn) with tube thickness 1.2 mm	RM	35	1,157	40495

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21.6	Drain piping supply , installation , testing, commissioning of rigid heavy duty PVC piping, 25MM dia	RM	55	146	8030
	AIR DISTRIBUTION				0
22	Supplying, installation, balancing and commissioning of fabricated at site GSS sheet metal rectangular/round ducting complete with neoprene rubber gaskets, elbows, splitter dampers, vanes, hangers,supports, bends, transitions, reducers, end caps,collars etc as required complete in all respect in confirmation with IS : 655 and approved drawings and specifications of following sheet thickness complete as required.				0
22.1	24 gauge galvanised sheet steel Thickness 0.63 mm sheet	Sqm.	250	1213	303250
22.2	20 gauge galvanised sheet steel Thickness 0.80 mm sheet	Sqm.	65	1415	91975
22.3	18 gauge galvanised sheet steel Thickness 1.00 mm sheet	Sqm.	50	1851	92550
23	Supplying, installation, testing and commissioning of GI volume control duct damper complete with neoprene rubber gaskets, nuts, bolts, screws linkages, flanges etc in confirmation to SMACNA/IS and as per specifications complete etc. as required.	Sqm.	4	7580	30320
24	Supply, installation, testing and commissioning of Motorized (ON-OFF Type) duct mounted GI volume control damper with enthalpy sensor and necessary control wire for integration within AHU room complete with neoprene rubber gaskets, nuts, bolts, screws linkages, flanges etc in confirmation to SMACNA/IS and as per specifications complete etc. as required.				0
24.1	Damper	Sqm.	2	18377	36754
24.2	Actuator	Each	5	9793	48965
25	Supplying and fixing of acoustic lining of supply air duct and plenum with 25 mm thick resin bonded glass wool having density of 32 kg/m ³ , with 25 mm X 25 mm GI section of 1.25 mm thick, at 600 mm centre to centre covered with Reinforced Plastic tissue paper and 0.5 mm thick perforated aluminium sheet fixed to inside surface of ducts with cadmium plated nuts, bolts, stick pins, CPRX compound in confirmation to SMACNA/IS and as per specifications complete etc. as required.	Sqm.	2	890	1780
26	Supply, fabrication, installation and testing the flexible Canvas constructed of fire resistant double resin sleeve as per the approved shop drawings.	Nos.	5	0	0
	Air Grill and diffusers				0
27	Supplying, Fixing, installation, testing and commissioning of powder coated extruded aluminium Supply Air Grills with aluminium volume control dampers in confirmation to SMACNA/IS and as per specifications complete etc. as required.	Sqm.	3.5	9623	33681
28	Supplying & fixing of powder coated extruded aluminium Return Air Grills with louvers but without volume control dampers complete in confirmation to SMACNA/IS and as per specifications complete etc. as required.	Sqm.	3.5	6285	21998

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29	Supplying, Fixing, installation, testing and commissioning of supply air diffusers of powder coated aluminium with aluminium volume control dampers with anti smudge ring & removable core in confirmation to SMACNA/IS and as per specifications complete etc. as required.	Sqm.	1	12841	12841
30	Supplying, Fixing, installation, testing and commissioning of Return air diffusers of powder coated aluminium without volume control dampers with anti smudge ring & removable core in confirmation to SMACNA/IS and as per specifications complete etc. as required.	Sqm.	1.2	8595	10314
31	THERMAL INSULATION & ACCOUSTIC LINING				0
32	Supplying, fixing acoustic lining on wall and ceiling of AHU rooms with 50mm thick, density 32 kg/cu.m resinbonded glass fiber insulation friction fixed in 610mm x610 mm frame work made of 25X50X50X50X25 mmmade out of 0.6mm thick GI sheet U shaped channeland covered with reinforced fiber glass tissue and finished with 0.80 mm perforated aluminium sheet etc. complete as required and as per specifications.	sq.m	2	1057	2114
33	Supplying and fixing of 19mm thickness duly laminated aluminium foil of mat finish closed cell Nitrile rubber (Class "O") insulation on existing duct after applying suitable adhesive for Nitrile rubber. The joints shall be sealed with 50 mm wide and 3 mm thick self adhesive nitrile rubber tape insulation complete as per specifications and as required. 19mm	sQM	365	810	295650
35	TOWER AC SPLIT TYPE				0
36	Supplying, Installation, Testing and Commissioning of Air Cooled Floor standing Tower type split Air conditioners complete with Indoor unit(IDU), Out door unit (ODU), surface / concealed copper Refrigerant piping with insulation (closed cell elastomeric nitrile rubber tubular pipe section) upto 5 Mtr (IDU to ODU), copper power cable upto 5.5 Mtr (IDU to ODU), i/c drain pipe of suitable length and size. R-32/R-410/R-407C Green Refrigerant, wireless Remote control, suitable for working between 180-260V with low & high voltage cutoff and 50 hz ,1 phase AC supply capable of performing cooling, dehumidification, air circulation of following capacity with Scroll / rotary with min 5 year Original Equipment Manufacturer (OEM) warranty both compressor and Printed Circuit Board (PCB). as specified. The system shall be able to deliver 100% of the rated capacity as per relevant IS Code. The lab testing reports as per IS: 1391 shall be submitted from National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited as per International Electrotechnical Commission (IEC) 17025 standards /Central Power Research Institute (CPRI)/ Electrical Research and Development Association (ERDA)with Original Equipment Manufacturer (OEM) etc. complete as per CPWD specification and as per IS: 1391 as required. Cooling Only		*		0
37	2.4 TR BEE 5 Star Rating	Nos.	2	93613	187226
38	3.3 TR BEE 5 Star Rating	Nos.	1	104086	104086
39	HI WALL				0

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40	Supply, installation, testing, commissioning and handing over of Self-contained split type Inverter air-conditioning complete with compressor, motor, copper cooling coil with aluminium fins, air cooled condenser with copper tubes and fins with fan. The unit shall be in two parts i.e. indoor and outdoor unit complete as required at site/ as per drawing layout, wiring, safeties, controls, cordless remote etc. in a unit The unit shall be of following capacities:1.5 TR (5 Star Rating) with one year warranty and minimum five year PCB and 10 year compressor warranty (R 410A)	Nos.	1	50925	50925
41	Supply, installation, testing, commissioning and handing over of Self contained split type Inverter air-conditioning complete with compressor, motor, copper cooling coil with aluminum fins, air cooled condenser with copper tubes and fins with fan. The unit shall be in two parts i.e. indoor and outdoor unit complete as required at site/ as per drawing layout, wiring, safeties, controls, cordless remote etc. in a unit The unit shall be of following capacities:2 TR (5 Star Rating) with one year warranty and minimum five year PCB and 10 year compressor warranty	Nos.	1	65,876	65876
42	Supply, installation and Testing & commissioning copper refrigerant piping and gas charging, to interconnect indoor unit and outdoor unit and routing the piping through the shaft / ceiling as per required. Refrigerant piping shall be insulated complete with required size of closed cell elastomeric nitrile rubber tubular between each set of indoor & outdoor units (On both suction and discharge pipe), all the piping inside shall be properly supported with GI hanger. Size for 1.5 TR unit:- (Suction:- 1/2"and Liquid:-1/4")	Rmt	6	1,663	9978
43	Supply, installation and Testing & commissioning copper refrigerant piping and gas charging, to interconnect indoor unit and outdoor unit and routing the piping through the shaft / ceiling as per required. Refrigerant piping shall be insulated complete with required size of closed cell elastomeric nitrile rubber tubular between each set of indoor & outdoor units (On both suction and discharge pipe), all the piping inside shall be properly supported with GI hanger. Size for 2.0TR unit:- (Suction:- 5/8" and Liquid:-1/4")	Rmt	6	1,663	9978
44	Supply and fixing of normal Base stand suitable for 2TR/1.5 TR outdoor unit frame duly painted with enamel paint.	Nos.	2	1,758	3516
45	Spray of Corrosion Prevention Coating on indoor and outdoor Coil of air condition (1.5 TR to 2 TR)	Nos.	2	712.95	1426
46	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 commissioning etc. as required.	Nos.	2	2,376	4752
47	Drain Piping Supply, installation and Testing & commissioning of rigid heavy duty PVC piping. 25 MM DIA	Rmt.	25	141	3525
Total Estimate					19286438.2