

Technical specifications

Clause.1 The Technical specifications contained herein shall be read in conjunction with other documents of bid.

Clause.2 The technical specification in accordance with which the entire Work shall be carried out and completed by the contractor shall comprise of the following

Clause 3.0 TECHNICAL SPECIFICATIONS

Clause 3.1. The work in general shall be carried out as per the latest CPWD specifications 2019 Vol- I & II with up-to-date correction slips, unless otherwise specified in the nomenclature of the individual item or as Specifications shall be carried out as per approved specifications. In case any item is not covered in any of these documents, the same shall be carried out as per the NBC-2016/ BIS Codes/IRC/MOST Specification or as per approval of Engineer in Charge of NBCC.

Clause.3.2 The Electrical works shall be carried out as per CPWD Specifications for Electrical works (Part-I) Internal (2023), (Part-II) External 2023, with up to date corrections slips, General specifications for Electrical works Part-VII (DG Sets) (2013), General Specifications for Electrical works Part-IV (Substation), 2013; General specifications for Electrical works – Part- V (Wet Riser & Sprinkler Systems) 2020, General specifications for Electrical works (Lifts & Escalators) Part-III,2003., General specification for Heating, Ventilation & Air-Conditioning (HVAC) 2024 and general specification on Fire detection and alarm system-2018 Part-VI.

Clause 3.3 The Horticulture and landscaping works shall be carried out as per CPWD Horticulture and landscaping specification 2025

Clause 3.4. If so far any Amended/ Modified/ added clause may come in conflict or be inconsistent with any of the provisions of the said specifications under reference, the latest Amended/Modified/ Added Clause/latest edition of corresponding standards shall always prevail.

Clause.3.5 If none of the foregoing applies, the construction and completion of works shall conform to sound Engineering practice as approved by the Engineer in charge. In case of any dispute arising out of the interpretations of the above, the decision of the Engineer in charge shall be final and binding on the bidder

GUARANTEE

The contractor shall guarantee the entire works & services, installation as per specifications both for components and for system as a whole. All equipment shall be guaranteed for One year from the date of handover to the Department/Client against unsatisfactory performance or breakdown due to defective design, manufacture and/or installation. The installation shall be covered by the conditions that the whole installation or any part thereof found defective within one year from the date of completion shall be replaced or repaired by the contractor free of charge, as decided by the Engineer-in-Charge.

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Clause.3.6, Technical specification for non-Schedule items are given below.

Sr. No.	<u>Item Description</u>
	CIVIL WORKS
1	Pre constructional anti-termite treatment by (A)Chemicals The chemical used for the soil treatment shall be of the following with the concentration shown is aqueous emulsion. Imidachloprid 30.5% SC, Doses: 2.1 ml per lit of water (B) Method of Treatment 1.Treatment of Top Surface of Plinth Filling. 2.Treatment at Junction of the wall and the floor 3.Treatment of Soil Along External Perimeter of Building 4. Treatment of Soil Surrounding Pipes, Waste and Conduits
2	Factory made Solid WPC door frame of size 95mmx55mm fabricated. The door frame consist of four segments which are provided with plug-in-socket arrangement in-situ in the mould. The segments are plugged in and are joined together by means of screw. The WPC frame shall be provided with the material and process for manufacturing the door frames shall conform to Relevant I.S. specification. The finish of door frame will be plain colour white/ Ivory/ Beige/ Light grey/ Golden brown/Mahogany/ Teak wood/sand stone/Champagne/Pastel blue or any other colour using high quality pigments complete in all respect as per specification in BOQ, drawings, BIS and direction of the Engineer in charge.
3	32mm thick flush door shutter with approved quality of 30mm thick BWR block board pasted with 1mm thick laminate sheet on both side of approved design and quality including cost of all door fittings and fixtures etc. complete in all respect as per specification in BOQ, drawings, BIS and direction of the Engineer in charge.
4	30 mm thick Glass Fibre Reinforced Plastic (FRP) panelled door shutter of required colour and approved brand and manufacture, made with fire - retardant grade unsaturated polyester resin, moulded to 3 mm thick FRP laminate for forming hollow rails and styles, with wooden frame and suitable blocks of seasoned wood inside at required places for fixing of fittings, cast monolithically with 5 mm thick FRP laminate for panels conforming to IS: 14856, including fixing to frames as per specification in BOQ, drawings, BIS and direction of the Engineer in charge.
5	Fiber Glass Reinforced plastic (FRP) Door Frames of cross-section 90 mm x 45 mm having single rebate of 32 mm x 15 mm to receive shutter of 30 mm thickness. The laminate shall be moulded with fire resistant grade unsaturated polyester resin and chopped mat. Door frame laminate shall be 2mm thick and shall be filled with suitable wooden block in all the three legs. The frame shall be covered with fiber glass from all sides. M.S. stay shall be provided at the bottom to steady the frame as per specification in BOQ, drawings, BIS and direction of the Engineer in charge.
6	Aluminium hanging floor door stopper with twin rubber & stopper as per specification in BOQ, drawings, BIS and direction of the Engineer in charge.
7	System Aluminum Sliding Windows - Single Glazed (With MESH): Providing and fixing System Aluminum works for Sliding windows with 50mm

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	&35mm visible aluminum section width in the center mullion. The extruded aluminums sections should be made from Grade 6063-T5 & Anodized with Tex guard coating, silicon coated to suit marine atmosphere. All profiles should be None insulated Profiles. Corner connection will be Butt joint with Screw using Nano gaskets for sealing. All other major Accessories should also be made by the same manufacture. All Slider windows will be center locking. Integrated Anti-lift in slider panel, EPDM gaskets should be used in slider windows in all meeting points instead of Brush Pile. Frame width shall be 72 mm for 3 track (2 Glazed panels and I Mesh panel track provision) with +/- 2mm maximum tolerance. Provision of mesh track must be inbuilt in the offered system. All materials which are used should be corrosion-resistant so that they are good functioning in different environments and that there are no negative influences either on the aluminium or on the surface treatment. The system should allow the application of glazing or panels with thickness up to 8mm. The external perimeter of aluminium sections should be Anodized with Tex guard coating. the system should qualify Airtightness ASTM E283: 10.7m3/h.m2 at 75Pa of pressure, Water tightness ASTM E300: 240 Pa, Wind load resistance ASTM E330: 2400 Pa. System should have a10 year warranty on properties, functionality and design, within restrictions defined by technical specifications of anodizing &1 year warranty on wearing parts only applies to normal and realistically foreseeable use. All Slider windows will be center locking as per specification in BOQ, drawings, BIS and direction of the Engineer in charge.
8	System Aluminium fixed cum lovoured ventilators – Single Glazed Providing and fixing System Aluminium fixed cum lovoured ventilators – Single Glazed with 50mm & 35mm visible aluminium section width in the center mullion. The extruded aluminium sections should be made from Grade 6063-T5 & Anodized with Tex guard coating, silicon coated to suit marine atmosphere. All profiles should be None insulated Profiles. Corner connection will be Butt joint with Screw using Nano gaskets for sealing. All other major Accessories should also be made by the same manufacture. in all meeting points instead of Brush Pile. All materials which are used should be corrosion-resistant so that they are good functioning in different environments and that there are no negative influences either on the aluminium or on the surface treatment. The system should allow the application of frosted glazing or panels with thickness up to 8mm. Part will be fixed, part will be louvered. The external perimeter of aluminium sections should be Anodized with Tex guard coating, the system should qualify Airtightness ASTM E283: 10.7m3/h.m2 at 75Pa of pressure, Water tightness ASTM E300: 240 Pa, Wind load resistance ASTM E330: 2400 Pa. System should have a 10-year warranty on properties, functionality and design, within restrictions defined by technical specifications of anodizing & 1-year warranty on wearing parts only applies to normal and realistically foreseeable use. All Slider windows will be center locking as per specification in BOQ, drawings, BIS and direction of the Engineer in charge.
9	Toilet/Sunken Single component synthetic rubber, AquaArm Saniflex based coating with a coverage of 1.2 kg /m2 over primer surface with AquaArm Uniprime GE .The coating shall be taken upto 300mm from finished floor level on the vertical walls. The coating shall have an elongation of a minimum of 80% when tested as per ASTM D 412 and tensile strength of 1 N/mm2.

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	Thorough surface preparation by mechanical means to level and plain the surface of walls and floors of the toilet areas. All cracks and crevices to filled and made good to receive waterproofing coating treatment The coating shall cover all the floor area of the wet area (toilet) and be applied over on to the vertical walls minimum 300mm height above the floor in two or more coats to achieve required thickness. Protective Plaster: Providing and laying avg. 15 mm thick, CM 1:4 plaster admixed with, Integral Waterproofing Compound @ 200 ml / bag of cement. (cement and sand shall be supplied by the main contractor Pipes being fixed for plumbing shall be fixed in holes which are mechanically core cut, more than the dia of the pipes. Pipes shall be fixed by grouting the annular space with non-shrink cementitious grout of proprietary. Before grouting the pipes shall be wrapped with a waterproofing fleece material at least 50 mm wide and then grouted to fill in the grout, ensuring total watertight plumbing fittings as per specification in BOQ, drawings, BIS and direction of the Engineer in charge.
10	TERRACE WATERPROOFING Surface Preparation: Mechanically grinding the surface to remove the bitumen primer from the surface including sealing of cracks if any with epoxy putty/ SBR Latex. Treatment of Pipe Penetration: Providing and sealing the gaps in the core cuts around PVC pipes treated with epoxy bonding agent & sprinkled sand; using Armgrout M 65 non shrink grout followed by sealing of the same joint by using 2 coats of waterproofing coating & SealArm Joint Tape. Coving: Providing and making coving 50mm*50mm at the junction of slab and vertical offsets with Cement Mortar 1:3 and admixed with ReArm SBR 45 at dosage of 1Ltr per 50kg cement. (cement and sand shall be in the scope client) Application of Primer: Apply Epoxy based primer AquaArm Primer PUDC over well prepared surface at 250-300 gm/Sq.Mtr. Waterproofing Coating: Providing and applying single component moisture cured waterproofing coating to sound, moisture free concrete surface with AquaArm SPU SPL. Application of waterproofing coating @ recommended consumption of 1.5 kg/sqm for total average system thickness of 1 mm in two coats using Roller, all complete as per manufacturer's methodology. Membrane Termination shall be done at 300 mm above FFL or as per site conditions using 8mm * 8mm groove and filling with PU sealant,. Payment shall be made as per actual area of measurement. For vertical exposed areas, where plastering is to be done, sand shall be sprinkled over the tacky final coat of sealer coat on vertical surface. Later after final curing, plastering should be done. as per specification in BOQ, drawings, BIS and direction of the Engineer in charge. The membrane formed shall confirm to following minimum properties: 1) Solid Content: > 90% 2) Tensile strength :> 2 Mpa 3) Elongation at break: > 500 % 4) Crack Bridging ability > 2 mm Work shall be carried out by manufacturer's authorised applicator as per manufacturer's methodology. Geotextile: Providing and installing 200 GSM non-woven geotextile membrane over the finished waterproofing over the horizontal area

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	maintaining overlaps of geotextile. prior to protection screed. Protection Screed: Providing and laying of average 75 mm thick (min 50mm at the drains) M20 grade Concrete admixed with approved integral waterproofing compound.
11	Expansion joint Treatment Surface Preparation: The area to be treated should be cleaned thoroughly with mechanical means especially for structure. For new surfaces grinding, vacuum cleaning will be sufficient and it should be ensured that the substrate is clean fine pored and free from any loose particles, dust laitance, mould release agents & curing compounds etc. Use suitable methods to prepare the substrate dependent on its condition such as brushing, grinding milling, shot-blasting and water jetting. High performance Expansion joint Sealing system, 600mm x 250mm as per roll size of SealArm Tape TPE and fixing it with Epoxy adhesive ReArm Bond 4031, allows irregular and high movement in more than one direction, whilst maintaining a high quality seal, mixing by mechanical means of ReArm Bond 4031, Applying on both sides of the joint and Fixing of tape over joint as per suitable mentioned width of the tape, and complete work as per manufacturer's specification. The tape should be not fixed at the junction to allow free movement. The termination of the membrane on the parapet wall shall be done with epoxy adhesive as same on the horizontal slab as per specification in BOQ, drawings, BIS and direction of the Engineer in charge. The Parameters for Treatment are as follows: Shore A Hardness Approx.: 87 Tear Resistance-length wise (DIN EN 12311-2 Method B): >12.5 N / m Elongation at break (DIN EN 12311-2 Method B): >500% Tearing Resistance(nail shank) length wise (DIN EN 12310 -1): >200N Water vapour permeability (DIN EN 1931 Method B): >40 m.
	ELECTRICAL WORKS
1	Recessed wiring to light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor of ISI marked of Approved Make with 20 mm dia HMS FRLS PVC conduit ISI marked of Approved Make 6A modular type (anti-bacterial & flame retardant type) switch ISI marked Approved Make and ceiling rose ISI marked of modular type G.I box with metallic cover plate (both side) (anti-bacterial & flame retardant type) Approved Make of suitable size, modular box with 1.5 sq. Mm FRLS PVC insulated single core multi standard copper conductor as earth wire including all accessories and connection as per specification in BOQ, BIS and direction of the Engineer in charge.
2	6A Plug on the same board in existing switch board with complete fitting by 01 no of 6A switch & socket (modular type & other required accessories of ISI marked as approved as per specification in BOQ, BIS and direction of the Engineer in charge.
3	6A Plug on the separate board with complete fitting by 01 no of 6A switch & socket(modular type) (anti-bacterial & flame retardant type) with suitable size modular box & cover including supplying of all required accessories of ISI marked as approved as per specification in BOQ, BIS and direction of the Engineer in charge.
4	1x16A Plug on the separate board with complete fitting by 01 no of 16A switch & socket(modular type) (anti-bacterial & flame retardant type) with suitable size modular box & cover including supplying of all required accessories of ISI

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	marked as approved as per specification in BOQ, BIS and direction of the Engineer in charge.
5	3x6A+1X1 6A Plug on the separate board with complete fitting by 01 no of 16A+3 nos 6A switch & socket (modular type) (anti-bacterial & flame retradant type) (with suitable size modular box & metallic cover plate (both side) including supplying of all required accessories of ISI marked as approved as per specification in BOQ, BIS and direction of the Engineer in charge. (For equipment power). (Maximum 02 nos point in one circuit).
6	AC Point having 16-20A DP MCB, C series with enclosure of approved make of suitable size as required as per specification in BOQ, BIS and direction of the Engineer in charge.
7	32 amps, 240 volts, SPN, industrial type socket outlet, with 2 pole and earth metal enclosed plug top along with 32 amps. C-series, SP MCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket outlet, and complete with connections, testing and commissioning etc. as required as per specification in BOQ, BIS and direction of the Engineer in charge. ISI marked as approved.
8	Recess wiring for circuit/submain wiring with the following mentioned size PVC FRLS insulated, copper conductor, single core cable of approved make in recessed HMS FRLS PVC conduit of mentioned size as required as per direction of Engg.-in-Charge. 2 nos single core 1.5 sq. mm copper wire for phase and neutral and 01 no of single core 1.5 sq. mm copper wire for earth continuity conductor. In 20 mm dia non metallic heavy duty conduit (6ASB to LOOP SB/SECONDARY SB) (2X1.5+1X1.5) as per specification in BOQ, BIS and direction of the Engineer in charge.
9	Recess wiring for circuit/submain wiring with the following mentioned size PVC FRLS insulated, copper conductor, single core cable of approved make in recessed HMS FRLS PVC conduit of mentioned size as required as per direction of Engg.-in-Charge. 2 nos single core 2.5 sq. mm copper wire for phase and neutral and 01 no of single core 1.5 sq. mm copper wire for earth continuity conductor in 20 mm dia non metallic heavy duty conduit.(BDB to LSB/LIGHT CKT/5A PLUG) (2X2.5+1X1.5) as per specification in BOQ, BIS and direction of the Engineer in charge.
10	Recess wiring for circuit/submain wiring with the following mentioned size PVC FRLS insulated, copper conductor, single core cable of approved make in recessed HMS FRLS PVC conduit of mentioned size as required as per direction of Engg.-in-Charge. 2 nos single core 4 sq. mm copper wire for phase and neutral and 01 no of single core 1.5 sq. mm copper wire for earth continuity conductor in 20 mm dia non metallic heavy duty conduit .(PDB to PSB/ POWER POINT/AC POINT) (2X4+1X1.5) as per specification in BOQ, BIS and direction of the Engineer in charge.
11	Recess wiring for circuit/submain wiring with the following mentioned size PVC FRLS insulated, copper conductor, single core cable of approved make in recessed HMS FRLS PVC conduit of mentioned size as required as per direction of Engg.-in-Charge. 2 nos single core 6 sq. mm copper wire for phase and neutral and 01 no of single core 2.5 sq. mm copper wire for earth continuity conductor in 25 mm dia non metallic heavy duty conduit. (LFDB TO LBDB/UBDB) (2X6+1X2.5) as per specification in BOQ, BIS and direction of the Engineer in charge.

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12	Receass wiring for circuit/submain wiring with the following mentioned size PVC FRLS insulated, copper conductor, single core cable of approved make in recessed HMS FRLS PVC conduit of mentioned size as required as per direction of Engg.-in-Charge. 4 nos single core 6 sq. mm copper wire for phase and neutral and 02 nos of single core 4 sq. mm copper wire for earth continuity conductor in 32 mm dia non metallic heavy duty conduit.(LFDB TO LBDB) (4X6+2X2.5) as per specification in BOQ, BIS and direction of the Engineer in charge.
13	Receass wiring for circuit/submain wiring with the following mentioned size PVC FRLS insulated, copper conductor, single core cable of approved make in recessed HMS FRLS PVC conduit of mentioned size as required as per direction of Engg.-in-Charge. 4 nos single core 10 sq. mm copper wire for phase and neutral and 02 nos of single core 6 sq. mm copper wire for earth continuity conductor in 32 mm dia non metallic heavy duty conduit. (PFDB TO PBDB power) (4X10+2X4) as per specification in BOQ, BIS and direction of the Engineer in charge.
14	Receass wiring for circuit/submain wiring with the following mentioned size PVC FRLS insulated, copper conductor, single core cable of approved make in recessed HMS FRLS PVC conduit of mentioned size as required as per direction of Engg.-in-Charge. 4 nos single core 16 sq. mm copper wire for phase and neutral and 02 nos of single core 6 sq. mm copper wire for earth continuity conductor in 32 mm dia non metallic heavy duty conduit .(PFDB TO PBDB/ACDB power) (4X16+2X10) as per specification in BOQ, BIS and direction of the Engineer in charge.
15	Energy efficient LED tube light fittings with decorative alluminium batten and LED tube light having power rating not more than 20 watt and lumen output not less than 2200 lumen complete with electronic driver and all other accessories with diffuser having 2 years warranty i/c connection etc as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.
16	Energy efficient surface /recess mounted square /round shape 18 W LED luminaire of dimension of consists of white powder coated , die-cast Aluminium housing with high quality frosted diffuser for glare-free uniform lighting distribution with wattage not more than 18 watt and lumen output of 1800 lumens, , CRI not less than 80,CCT of 6000 degree K,THD less than 10%, with electronic driver, internal surge protection of 3 KV , L70 B50: 50000 hrs and all other accessories suitable for operation on 220 V to 240 V supply as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.
17	Energy efficient surface /recess mounted square /round shape 12 W LED luminaire of dimension of consists of white powder coated , die-cast Aluminium housing with high quality frosted diffuser for glare-free uniform lighting distribution with wattage not more than 12 watt and lumen output of 1200 lumens, , CRI not less than 80,CCT of 6000 degree K,THD less than 10%, with electronic driver, internal surge protection of 3 KV , L70 B50: 50000 hrs and all other accessories suitable for operation on 220 V to 240 V supply as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.

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18	Energy efficient recessed mounted LED luminaire made up of CRCA powder coated housing, bottom opening clean room LED luminaire of 600 X 600 x 65 mm size with of 36 W and system lumens output not less than 3600 lumens , IP65 ,dust free & zero maintenance , anti glare high transmittance PMMA diffuser , operating volatge range 150-265 V, high performance potentiometric electronic driver for zero maintenance , 2.5 KV internal urge protection, L70 B 50: 50,000 hrs., CRI not less than 80, CCT of 5700-6500 degree K, THD less than 10%,,IP 65 protection complete with all other accessories suitable for operation on 230 V, 50 Hz supply as required as per specification in BOQ, BIS and direction of the Engineer in charge.
19	Energy efficient Recess /Surface mounted square/round shaped LED luminaire made up of CRCA powder coated sheet steel of 25W (2'x2') 595mmx595mmx70mm and system lumens output not less than 3250 lumens (130 lm/ wt) with diffusers for better light transmission and pure effect with High luminous flux LEDs for better light output, CRI not less than 80, CCT of 5700-6500 degree K, THD less than 10%,internal surge protection of 3 KV, complete with Non integrated isolated electronic driver (protects the output /secondary side from any disturbance on the input / primary side ensuring safe operation) and all other accessories suitable for operation on140- 270 V, 50 Hz, L70 @50,000 burning hrs (5 years warranty) of approved make as required as per specification in BOQ, BIS and direction of the Engineer in charge.
20	Sleek LED 10 watt mirror light fitting with extruded polycarbonate housing, High optically efficient diffuser, above wash basin complete with all accessories etc. directly on wall, including connection with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable and earthing etc. as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.
21	10 watt LED BULK HEAD light fitting with extruded polycarbonate housing,High optically efficient diffuser complete with all accessoriesetc. directly on wall, including connection with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable and earthing etc. as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.
22	1200 mm sweep white/milky colour BLDC copper winding ceiling fan with aluminium blades having wattage not more than 28W and air delivery $\geq 215\text{m}^3/\text{min}$ of approved make including wiring the down rod of standard length (upto 30 cm) with 1.5 sq mm PVC insulated, copper conductor, single core cable etc. as required as per specification in BOQ, BIS and direction of the Engineer in charge.
23	20 cm length G.I. pipe 15 mm dia, heavy gauge including painting etc. as requiredas required as per specification in BOQ, BIS and direction of the Engineer in charge. (Note : More than 5 cm length shall be rounded to the nearest 10 cm and 5 cm or less shall be ignored) of ISI mark as approved.
24	5 step type Modular electronic Fan Regulator ISI Marked of approved make with all connection complete in all respect as per specification in BOQ, BIS and direction of the Engineer in charge.
25	Exhaust fan of heavy duty 300 mm sweep 1400 rpm with louvers of exhaust fan in the existing wall, including fixing & conntection as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.

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	BDBS, DB, AC DB, FLOOR PANELS, MCBS
26	Three pole/single pole and neutral, sheet steel,double door MCB distribution board, 415 volts/240 volts shall be as per IEC 61439-3,integrated door earthing system offering additional safety to the user,High quality polyurethane Gasket,the box and cover shall be fabricated to withstand IK09,the DB should be properly pre-treated with 7 tank process and duly powder coated, phosphatized with powder coated finish, on surface/recess, complete with terminal blocks,with suitable size FR PVC insulated copper conductor up to terminal blocks, tinned copper busbar, neutral busbar, earth bar, din bar as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.
27	4 Way(8+12) Way TPN MCB DD DB Horizontal Type as per IEC 61439-3 suitable for Flush mounting and Surface mounting with 100A Copper Bus Bar for each phase, with neutral Bus bar, Earth Bar & Cable ties for cable management, prefitted masking sheet, IP43-IK09 with metal door as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge. (FOR LIGHT,ComputerDB)
28	6 Way(8+18) Way TPN MCB DD DB Horizontal Type suitable for Flush mounting and Surface mounting with 100A Copper Bus Bar for each phase, with neutral Bus bar, Earth Bar & Cable ties for cable management, prefitted masking sheet, IP43-IK09 with metal door(FOR LIGHT,POWER INDOOR,3-PH,POWER LOAD) as per specification in BOQ, BIS and direction of the Engineer in charge.
29	8 Way(8+24) Way TPN MCB DD DB Horizontal Type suitable for Flush mounting and Surface mounting with 100A Copper Bus Bar for each phase, with neutral Bus bar, Earth Bar & Cable ties for cable management, prefitted masking sheet, IP43-IK09 with metal door as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge. (FOR POWER & INDOOR AC DB)
30	12 way DD single pole and neutral sheet steel MCB distribution board 250V on surface/recess complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, detachable gland plate, interconnections, phosphatized and powder painted including earthing etc. as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.
31	2+4 way MCB Enclosure DB (GLAZED door) (only each EM. CONNECTION UPS LOAD) as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.
32	6- 32 amps rating, 240 volts, C series, Single poles MCB of approved make in the existing MCB DB complete with connections as per specification in BOQ, BIS and direction of the Engineer in charge.
33	6- 32 amps rating, 240 volts, C series, Double poles MCB of approved make in the existing MCB DB complete with connections as per specification in BOQ, BIS and direction of the Engineer in charge.
34	40 Amps rating,4P 440V, RCCB 30mA of approved make in the existing MCB DB complete with connections, testing and commissioning etc. as required as per specification in BOQ, BIS and direction of the Engineer in charge. The RCCB should be

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35	63Amps 4P 415 volts RCCB 30 mA of approved make in the existing MCB DB complete with connections as per specification in BOQ, BIS and direction of the Engineer in charge.
	PANELS
	MAIN PANEL AT GF
36	CPRI tested LT indoor floor mounted cubical type electrical main panel (for both light and power circuit) made out by 2mm CRCA steel sheet duly derusted & painted by siemens gray powder cote paint fallowed by 9 tank acid treatment is designed as G.A drawing as per direction of Engg.-in-Charge. Warranty period of replacement of panel & accessories must be 3 year & complete test certificate must be submitted along with panel board including component list. 80X10MM Separate Aluminium Earth bus bar should be installed as per specification in BOQ, BIS and direction of the Engineer in charge. Incommer 200A 4P onload changeover switch - 1 no 200A 4P MCCB '36kA', Icu=100%Ics, with Thermal Magnetic Protection- 1 No Busbar 04 numbers of 200Amps aluminium busbar with 0.8A/SQ.MM current carrying capacity. busbar duly sleeved by color coated PVC sleeve & supported by suitable size DMC insulator. (for outgoing) Out going 63A 4P MCB, '10kA'- 9 nos 32A 4P MCB, '10kA'- 9 nos 32A 2P MCB, '10kA'- 6 nos Instrument 03 numbers phase indicating lamp with toggle switch & HRC fuse. 01 set of digital type multifunction meter with CT for voltage, current, frequency, PF, THD indication with RS 485 COMPACTIVITY FOR BMS DATA.
	CABLING AND END TERMINATION MAIN AREA
37	PVC insulated armoured and PVC sheathed XLPE property AL. conductor power cable of 1.1 KV grade following size cables as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge. 3.5core x 120 sq mm
	LAYING OF CABLE
38	PVC Insulated PVC Seated /XLPE power cable of 1.1 kv grade size exceeding 25 SQ. MM but not exceeding 120 SQ. MM direct in ground in the trench in one horizontal formation including excavation, sand cousing protection covering and refilling the trench etc as required as per specification in BOQ, BIS and direction of the Engineer in charge.

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39	PVC Insulated PVC Seated /XLPE power cable of 1.1 kv grade size not exceeding 120 SQ. MM From 25 SQ. MM in surface with shaddle and screw etc as required as per specification in BOQ, BIS and direction of the Engineer in charge.
	TERMINATION
40	End termination with brass double compression gland and aluminium lugs for following mentioned size cable as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge. 3.5 core x 120 sq mm
41	G.I. pipe (medium class) in ground complete with G.I fitting incl. trenching(75 mm depth) and refilling as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge. 50 mm dia
	EARTHING INSTALLATION
42	GI earth plate 600mmx600mmx6mm thick ISI marked with G. I. nut bolts & washers including cost of burnt wood charcoal, salt, foreign soil, water pouring arrangements, brick masonry enclosure on top with removable RCC cover complete with labour for excavation of pit in all kinds of soil & rock as required and as per specification in BOQ, BIS and direction of the Engineer in charge.
43	Copper earth plate 600mmx600mmx3.18mm thick ISI marked with G. I. nut bolts & washers including cost of burnt wood charcoal, salt, foreign soil, water pouring arrangements, brick masonry enclosure on top with removable RCC cover complete with labour for excavation of pit in all kinds of soil & rock as required and as per specification in BOQ, BIS and direction of the Engineer in charge.
44	25mm x 5 mm GI strip on surface or in recess for connections etc. as required as per specification in BOQ, BIS and direction of the Engineer in charge.
45	50mm x 6 mm GI strip on surface or in recess for connections etc. as required as per specification in BOQ, BIS and direction of the Engineer in charge.
	LAN SYSTEM
46	4 pair Cat6 23 awg U/UTP LSZH Cable in the existing surface/ recessed steel/ PVC conduit as required: The 4 pair Unshielded Twisted Pair cable shall be UL Listed,exceeds the requirements of ANSI/TIA-568-C.2 and ISO/IEC 11801 Class E , 4 twisted pairs separated by internal PE Cross Separator. Full separator. Half shall not be accepted. Rip Cord is must,Insertion Loss of 32.8 db/100m at 250 MHz ,Cable should support operating temperature from -20° to +70°C Cable support Conductor Resistance $\leq 9.38 \Omega/100m$ Max., Cable support Delay Skew: < 45 ns/100m, Operating Voltage: 72V , Impedance: $100 \pm 15 \Omega @100$ MHz. and Propagation Delay @250 MHz : 536 ns/100m, ETL Verified 4 connector channel performance up to 700 MHz , RoHS Compliant as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.

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47	Cat6 I/O with Dual Face plate: The Outlet shall meet or exceed requirement as per ANSI/TIA 568C.2,ISO/IEC 11801, & EN50173. The information outlet NEXT, PSNEXT, FEXT, ELFEXT, PSELFEXT and return loss should be verified for CAT6 @ 250Mhz & CAT6A @ 500Mhz. The information outlet connector shall be of gold/nickel, thickness of gold > 0.8 µm. The connectors shall be compatible as per IEEE 802.3af standard for POE application. The PVC material of Face plate should complie ABS /UL94-V-O certified as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.
48	Cat 6, 24-port loaded, 1U Modular Jack Panel Should accommodate Cat6 with Rear Cable Management and Front removable Toolless Information outlet. Should have easy clip management with labels and clear label covers, Made with of Dicast Aluminium Alloy Material and Non Corrosive with Cat6 toolless RJ45 x 24 ports with color code front panel with patch cord locking as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.
49	Cat 6 UTP 24 AWG Patch Cord Patch cord: 6 UTP Patch Cords are Factory Tested for Better Quality and Suitable for the High Speed Data Transmission. Complies to the Standard ANSI/TIA/EIA-568-C.2 Standard. Supports Data Networks Speeds Up to 10/100-Base-T and 1000-Base-T. Available In LSZH Jacket- Reduced Toxic Gasses Emitted During Combustion , RJ45, 8P8C, 2 FORK 50µ" Gold Plated Contacts , 100% Factory Tested , Transparent Boot Cable Assemblies as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge. for 1mtr Length
50	Cat6 UTP 24 AWG Patch Cord Patch cord: 6 UTP Patch Cords are Factory Tested for Better Quality and Suitable for the High Speed Data Transmission. Complies to the Standard ANSI/TIA/EIA-568-C.2 Standard. Supports Data Networks Speeds Up to 10/100-Base-T and 1000-Base-T. Available In LSZH Jacket- Reduced Toxic Gasses Emitted During Combustion , RJ45, 8P8C, 2 FORK 50µ" Gold Plated Contacts , 100% Factory Tested , Transparent Boot Cable Assemblies as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge. for 2mtrs Length
51	6 core Single mode OS2 Unitube Armoured Optical fiber cable through existing conduit: The Fiber should be OS2 Single Mode Optical Fiber Cable of Size 9/125µm. Outdoor Corrugated Steel tape Central loose tube. (Standard Approved: ISO 11801 2nd edition/ EN 50173-1:2002 / IEC 60794-1/IEC 60793-2-50 class B1.3 / EN 60793-2-50: class B1.3 / ITU Recommendation G.652.D - the oder ITU designations A, B and C are also fulfilled / OS1/ISO/IEC 24702:2006, cat. OS2; also OS1 requirements are fulfilled/IEEE 802.3 - 2002 incl. 802.3ae) Jacket as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.
52	Rack mount Draw Type Loaded 6 port LIU available in Standard 19" ,Dimensions (mm) : 430 X 220 X 1U , Cold Rolled Steel as Raw Material , Consist of Top Cover and Bottom Panel , Easy to Assemble and Disassemble , Three Types of Input Holes Cable Entry Through Water Proof Cable Clamp , 12 Duplex SC or LC Adapter Interface , Splice 24 Fibers at Most with 1 Tray ,Adaptor, SM, Duplex SC, PC Type ,Pigtail, Support the TIA/EIA Telecommunication Wiring Standards. Compact Design , Telcordia GR-326-

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	Core as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.
53	OFC Patch Cor, SM (OS2), Duplex LC-SC, LC-LC PC Type, 3M, LSZH Fiber Optic Single Mode OS2 Patch Cords are offered in LSZH Jackets with Corning Fiber, Insertion Loss : ≤ 0.2 db, Max 0.3db/MTRJ: Max 0.5db Return Loss : PC ≥ 45 db, UPC ≥ 50 db, APC ≥ 60 db as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.
54	1G-LX/LH SFP transceiver module, SMF, 1310nm, 9/125 um Single mode Fiber Type up to 20 KM as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.
55	24 Port Layer 2 PoE+ Switch having 24 x 10/100/1000 Mbps Ethernet PoE+ ports with 4 x 1/10Gig SFP+ ports ,1 x RJ45 port console port ,Switching Capacity 128 Gbps , Throughput 96 Mpps ,MAC Address 16k , Switch should support IEEE 802.3af (15.4W) & IEEE 802.3at (30W). Total PoE power: 370W or above , Switch should support DHCP server/relay/client, DHCP snooping/option82 , Switch should support Console, Telnet, SSH v1/2, HTTP, HTTPS, SNMP v1/v2/v3, RMON , TFTP, FTP, SFTP, NTP, ZTP, SPAN, RSPAN, Switch should support support ICMPv6, DHCPv6, ACLv6 ,IPV6 Telnet ,Temperature 0°C -50°C ,Power Supply AC: 100-240V as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.
56	9U/500D Wall Mount Rack with Accessories: The rack size should be 600W x 500D, Front frame integrated with top, bottom, front and two side panels for better rigidity and strength, Front Glass Door with Lock loaded, Compliance with standards shall be UL 2416., DIN 41494, IEC EN 60529, IEC EN 62262 , IEC EN 60068-2-11 , ISO 9001:2008 including Power Distribution Unit (06/16 Amp Indian-Standard - 06 Socket - Single Pole / Screw Mountable / 16 Amp MCB / Alternating Current - 16 Amp 3 Pin Plug with Power Cable 2.5 sq.mm 3 meter Lengt), 1 cooling Fan(230V AC - 90 CFM, dB 42), 2nos 1U Metal Cable manager with Plastic cable loops and H/W screw as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge.
57	Heavy class PVC FRLS conduit ISI marked along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required as per specification in BOQ, BIS and direction of the Engineer in charge. 20 MM 25 MM
58	Gate way Router with Built-in firewall provides anti-virus, layer 3-7 IDS/IPS, DPI, SSL detection, and more. Built-in VPN router supports 2.5Gbps or 3Gbps to allow easy remote access. 2 x 2.5 Gigabit SFP port and 10 x Gigabit Ethernet ports *3x Fixed WAN. 2.5Gbps Router. 4 x PoE out ports, IEEE802.3af/at, Maximum PoE Wattage: 36W as required of approved make as per specification in BOQ, BIS and direction of the Engineer in charge. (IP-PBX System)

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59	Hybrid EPABX system equipped with 128 Analog extensions and 6 Analog Trunk, including required hardware and software etc as required as per specification in BOQ, BIS and direction of the Engineer in charge.
60	Desktop telephone sets with colour ID as required as per specification in BOQ, BIS and direction of the Engineer in charge.
61	10 pair krone box
62	0.5 sq mm FR PVC insulated annealed copper conductor, unarmored telephone cable in the surface/ recessed steel/ PVC conduit as required as per specification in BOQ, BIS and direction of the Engineer in charge. 2 Pair 10 Pair
	LIGHTNING ARRESTER
63	Lightning conductor finial, made of 25 mm dia 300 mm long, G.I. tube, having single prong at top, with 85 mm dia 6 mm thick G.I. base plate including holes etc. complete as required as per specification in BOQ, BIS and direction of the Engineer in charge.
64	Lightning conductor finial (single prong) with base plate including holes etc. complete as required as per specification in BOQ, BIS and direction of the Engineer in charge.
65	Jointing copper / G.I. tape (with another copper/ G I tape, base of the finial or any other metallic object) by riveting / nut bolting/ sweating and soldering etc as required as per specification in BOQ, BIS and direction of the Engineer in charge.
66	G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required as per specification in BOQ, BIS and direction of the Engineer in charge. (For horizontal run)
67	G.I. tape 20 mm X 3 mm thick on parapet or surface of wall for lightning conductor complete as required as per specification in BOQ, BIS and direction of the Engineer in charge. (For vertical run)
68	Joint, made of 20 mm X 3 mm thick G.I. strip, 125 mm long, with 4 nos. of G.I. bolts, nuts, chuck nuts and spring washers etc. complete as required as per specification in BOQ, BIS and direction of the Engineer in charge.
	FIRE FIGHTING WORK
69	FIRE FIGHTING -: Electric Motor Driven Pressurization Terrace Pump having discharge of 900 LPM at 35 Mtr head complete with Pump Set, Electric Motor suitable for operation on 415 V ,3 ph, 50 c/s AC supply, Base Frame as per specification in BOQ, BIS and direction of the Engineer in charge.
70	Floor/Wall mounted sectionalised, front operated top entry dust and vermin proof M.V.Panel Boards suitable for operation at 415V, 3 phase, 4 wire, 50Hz distribution system fabricated out of 2.0 mm thick CRCA sheet, insulated busbar with heat shrinkable PVC sleeve, base frame, complete with all accessories including interconnections, earth bus etc as required comprising

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	of One (1)- 63 Amp, 10 KA,TPN (Class-C) MCB with 3 Nos Phase indicating lamps with control fuse/ MCB, Digital Voltmeter with selector switch. DOL starter with O/L and Single Phasing Preventor suitable for 7.5 HP motor. ON/OFF indication lamps, Auto manual switch and ON/OFF push button. as per specification in BOQ, BIS and direction of the Engineer in charge. Control panel for fire pumps for auto action.
71	FRLS, PVC outer sheath, steel armoured, aluminium, 1100v grade power cables with glands etc. The minimum size of the cables shall as mentioned below as per specification in BOQ, BIS and direction of the Engineer in charge. 3.5C x 16 mmsq
72	2 core 1.5 sq.mm, multi strand, copper conductor, FRLS (Fire Retardent Low Smoke)-PVC insulated GI Screened Armoured cable with saddle and required accessories. & Power Cable as per specification in BOQ, BIS and direction of the Engineer in charge.
73	G.I. earthing strips of 25mm x 6mm thick, strip shall be run for PUMPS
	PIPE & VALVES ETC.
74	'C' class MS Pipe as per IS1239 for underground/over ground pipes with welded / flanged connection with saddles, supports (all with screwed/welded joints) as required including pipe of shorter lengths, tapering connecting pieces, short or long bends, specials like sockets, union nuts, elbows, reducers, plugs, Tees etc. Complete to make the system operative as required by LFA / TAC authorities the pipes will have to be laid and fixed in trenches. The work includes excavation in all types of soils and back filling, dewatering, etc., making holes in brick or RCC walls, slabs/ roofs and making good the damages by bringing to the original condition to the satisfaction of the client and painting two coats of approved shade(Post office red)of enamel paint over a coat of approved primer for overheads pipes and providing and fixing pyp kote (corrosion protection tape) including supply and application of pipe coating and spiral Wrapping for underground piping (wrapping should have overlap of 15 to 20 mm) etc.l.Complete as per ASTM standards/IS: 10221 for corrosion protection of pipes for the underground installation.Note: The piping installation has to be put to hydraulic test to1.5 times the working pressure & as per latest applicable codes & standard before applying paint or pipe coating or wrapping etc. complete as per specification in BOQ, BIS and direction of the Engineer in charge. 100mm NB 80mm NB 25mm nb
75	'C' class MS Pipe as per IS1239 for underground/over ground pipes with welded / flanged connection with saddles, supports (all with screwed/welded joints) as required including pipe of shorter lengths, tapering connecting pieces, short or long bends, specials like sockets, union nuts, elbows, reducers, plugs, Tees etc. Complete to make the system operative as required by LFA / TAC authorities the pipes will have to be laid and fixed in trenches. The work includes excavation in all types of soils and back filling, dewatering, etc., making holes in brick or RCC walls, slabs/ roofs and making good the damages by bringing to the original condition to the satisfaction of the client and painting two coats of approved shade(Post office red)of enamel paint over a

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	coat of approved primer for overheads pipes and providing and fixing pyp kote (corrosion protection tape) including supply and application of pipe coating and spiral Wrapping for underground piping (wrapping should have overlap of 15 to 20 mm) etc. Complete as per ASTM standards/IS: 10221 for corrosion protection of pipes for the underground installation. Note: The piping installation has to be put to hydraulic test to 1.5 times the working pressure & as per latest applicable codes & standard before applying paint or pipe coating or wrapping etc. complete as per specification in BOQ, BIS and direction of the Engineer in charge. 100mm NB
76	Cast iron double flanged type dual plate Non return Valve as per IS- 5312 (Part 1): 2004 with ISI mark of pressure rating PN-1.60 including fixing the same with supply of required jointing materials like flanges, rubber insertion, MS nuts & bolts, paint etc. and testing the joints with required water pressure etc. all complete as per specification in BOQ, BIS and direction of the Engineer in charge. 100mm NB
77	Pressure gauge of 0-16 Kgf/sq.cm. range with cut-off bronze ball valves of suitable size with all accessories as per specification in BOQ, BIS and direction of the Engineer in charge.
78	Pressure Switch with cut-off bronze ball valves with integral strainer & flare nut (mixed ends) of suitable size with all accessories as per specification in BOQ, BIS and direction of the Engineer in charge.
79	Stainless steel strainer fabricated out of 1.6 mm thick stainless steel sheet Y Strainer with 3 mm dia holes with stainless steel flange as required as per specification in BOQ, BIS and direction of the Engineer in charge. 100mm NB
	DOWN COMER SYSTEM
80	Stainless steel Hydrant Valve / Landing valve, of 63 mm NB size, type-A, single headed , oblique type, as per IS :5290/93 and as per specification in BOQ, BIS and direction of the Engineer in charge.
81	SS short branch pipe with 63 mm male inlet and 19 mm outlet nozzle, as per IS:903 and as per specification in BOQ, BIS and direction of the Engineer in charge.
82	63 mm NB and 15meter long RRL Fire Hose fitted with 63mm instantaneous stainless steel male & female SS coupling, complete by GI wire binding for Internal Hydrant as per specification in BOQ, BIS and direction of the Engineer in charge.
83	MS Hose Box for of suitable size(750X600X250mm) to accommodate 2 nos. of 15/ 1 no of 30 mtr long fire hose and a branch pipe, wall mounted type as per specification in BOQ, BIS and direction of the Engineer in charge.
84	Swinging pattern wall fixing first aid hose reel made from MS sheet and waterways and moving parts with rubber hose of 20 mm dia. and 30 mtrs. long with ABS(Plastic) shut-off nozzle as per IS: 444/IS: 12585 Type-I., complete with all accessories as per specification in BOQ, BIS and direction of the Engineer in charge.

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85	C.I. 25 MM single air relief valve with stop cock confirming to IS:14845/2000 with ISI mark for water works purpose including fixing the same with hydrant riser including testing & commissioning the system etc. all complete as per specification in BOQ, BIS and direction of the Engineer in charge.
86	4-Way GM fire brigade connection consisting of 63 mm dia instantaneous type male couplings with built-in check valves, 150mm dia flanged outlet complete with bolts, nuts and rubber insertions confirming to IS:904 with ISI mark including testing & commissioning the system etc. all complete as per specification in BOQ, BIS and direction of the Engineer in charge.
	EXTINGUISHER SYSTEM
87	CO2 type Fire Extinguisher 4.5 kg capacity confirming to IS: 2878 made from ISI marked seamless cylinder confirming to IS: 7285, fitted with ISI marked controlled valve confirming to IS: 3224, high pressure 1mtr discharge hose & horn complete with initial gas charged with carrying handle & wall mounting bracket as per specification in BOQ, BIS and direction of the Engineer in charge.
88	ABC type fire extinguishers of 6 kg capacity including cost of all material & labour etc complete as per specification in BOQ, BIS and direction of the Engineer in charge.
89	Fire buckets (FILLED WITH SAND) round bottom type enamel painted, white inside & Red out side and Letter "FIRE" in black out side and handle with mounting bracket as per specification in BOQ, BIS and direction of the Engineer in charge.
	AUTOMATIC FIRE ALARMING SYSTEM
90	4 Loop Network Panel Micro processor based 4 wire fault tolerant loop, with inbuilt network port (each loop accessing 99 or more detectors and 99 or more modules) fire alarm/detection control panel. The Panel shall have 10000 or more event log history. Panel shall be capable of having 1600 or more configurable zones. The panel shall be able to give location of all fire/fault conditions of addressable units via the address codes. Further, the panel must be able to automatically switch ON /OFF respective control module when ever any alarm is triggered. The panel shall have 7 Inch Touch Screen unit to indicate Fire/Fault Signal with address and analog output, external/inbuilt printer to log all fire or fault events complete in all respects. The Panel Shall be Sheet Steel Painted, sealed to IP30. The Panel Shall have provision for 40 or more Zones with Individual LED Indicators expandable upto 200 Zones or higher. The panel shall have a built in power supply and battery charger along with maintenance free 7 AH, 2 x 12 volt SMF Lead acid batteries capable of running for a minimum of 48 hours with battery charger complete as required. and as per specifications. conforming to BS5839 Standards and Duly Approved by EN54 The panel shall support detection logics like coincidence & verification detections for the false alarm management. The Panel shall adjust the sensitivity between day and night to maintain the better detection/reponse time. The Panel shall be capable of programming through PC; Touch Screen of USB .This panel having facility of MODBUS protocol over TCP/IP for BMS integration. The panel should have provision for inbuilt RJ45 connection terminal for connecting to the LAN with inbuilt BACNET Protocol as per specification in BOQ, BIS and direction of the Engineer in charge.

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91	Addressable multi sense smoke detector with inbuilt isolator module/isolator base, base, junction box and other accessories as per specification in BOQ, BIS and direction of the Engineer in charge.
92	Addressable Manual Call Point with inbuilt monitor module and back box as per specification in BOQ, BIS and direction of the Engineer in charge.
93	Addressable Hooter at 85 dBA @ 3m for Audible annunciation and 75cd flashing at 1 Hz for visual indication with all accessories etc., complete as per specification in BOQ, BIS and direction of the Engineer in charge.
94	2C x 1.5 sq. mm, Twisted Pair PVC insulated FRLS Armored Cable with Accessories confirming to IS standards and specifications. The quoted rate shall includes of Acrylic Fire stop Sealant in the opening for cables passing through fire compartment walls of RCC floors, masonry walls to provide up to 2 hours fire rating as per specification in BOQ, BIS and direction of the Engineer in charge.
	PA SYSTEM
95	6 zone,voice alarm controller with USB, MP3 player (including 6 zone button paging station) with seamless integration facility with main fire alarm panel for voice evacuation complete as required as per specification in BOQ, BIS and direction of the Engineer in charge.
96	Power amplifier of 480 watt.The amplifier should be clean reliable audio for public address amplification.Line input less than 1 volt, unbalanced& line output less than 1 volt unbalanced as per specification in BOQ, BIS and direction of the Engineer in charge.
97	12 Watt wall mounted speakers with built in line matching transformer, grill flush mounting type in side the utility rooms as per specification in BOQ, BIS and direction of the Engineer in charge.
98	2 runs of 40 strand and each of 0.2 mm thick, Twisted Pair PVC insulated FRLS unarmored Cable with Accessories confirming to IS standards and specifications. The quoted rate shall includes of Acrylic Fire stop Sealant in the opening for cables passing through fire compartment walls of RCC floors, masonry walls to provide up to 2 hours fire rating as per specification in BOQ, BIS and direction of the Engineer in charge.
	SIGNAGES
99	SIGNAGES:-Sign boards made out of 3mm thick flexible photoluminescent based glow in dark sheeting with luminous properties enclosed in a weather proof Uvstabilized film with UV screen printing by imported links pasted over 3 mm thick cast acrylic from front side with 6 mm thick acrylic, -20 to+80 deg C, Suitable for indoor use, greenish yellow, glow visible upto 4-6 hr in total darkness for floor indication, fire exit, hydrant, hose reel, fire extinguisher, MCP, fire alarm panel, in case of fire, lift, alarm valve signages, FIRE EVACUATION PLAN as per specification in BOQ, BIS and direction of the Engineer in charge.
	PH WORK
1	Wall or ceiling and floor C-PVC pipes conforming to pipe fittings of the following nominal bore with clamps including making good the wall, ceiling and floor all complete as per specification in BOQ, BIS and direction of the Engineer in

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	charge.
2	Wall or ceiling and floor pvc pipes conforming to ASTM-D-1785/04 (Sch-80) and pipe fittings of the following nominal bore with clamps including making good the wall, ceiling and floor all complete as per specification in BOQ, BIS and direction of the Engineer in charge. Ground Floor 25mm UPVC ASTM Pipe
3	Cutting holes through existing brick or laterite masonry wall for taking HCI pipes and fittings including making good the damages etc all complete as per PH specification and direction of the Engineer in charge 250mm to 375mm thick wall. G. Floor to 5th floor
4	Brass/CP fittings of the following nominal bore with supply of all jointing materials complete as per specification in BOQ, BIS and direction of the Engineer in charge. 15mm dia long body Bib Cock cock 15mm dia CP S.B Bib cock 20mm dia CP concealed stop cock 15mm dia CP angle stop cock Elbow action Sink Cock 15mm dia CP SINK cock 15mm dia CP Pillar cock HAND SHOWER (HEALTH FAUCET) WITH 1 METER 15mm dia Twoway Bib Cock Shower arm Overhead shower 100mm dia round 25mm dia brass or gun metal full way valve 32mm dia brass or gun metal full way valve 40mm dia brass or gun metal full way valve 50mm dia brass or gun metal full way valve 15mm dia CP Flange 15mm dia CP Extention Nipple 125mm CP grating
5	1000 Litre HDPE Overhead Water Tank (2-layer, 3-layer, etc.) m. of approved make with UV stabilization, food-grade material & manhole cover complete and commissioning complete with approved quality and make as required as per specification in BOQ, BIS and direction of the Engineer in charge.
6	(Aqua guard) Pure Chill 120 PSS UV of size 750x570x1350mm height with water storage capacity 120 liters along with 3 nos of faucets 2 for cold water and 1 for normal water including a flow of 1.5 ltr per minute etc all complete as per specification in BOQ, BIS and direction of the Engineer in charge.

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7	Waterproofing material of torch shield P3160(3mm) with its primer 2 coats or equivalent water proofing material after drying cleaning the concrete surface over the concrete floor/roof/ balcony/sunken and dado upto 1"6" in wall including cleaning, applying and mending as per specification including cost, conveyance, taxes, royalties of all materials to work site etc. all complete as per specification in BOQ, BIS and direction of the Engineer in charge. (Sqm)
8	Cinder including watering, curing, conveyance of all materials to worksite, all complete as per specification in BOQ, BIS and direction of the Engineer in charge.
9	Submersible pump with squirrel cage induction type submersible type submersible electric motor to run on 3 phase/1 phase line voltage ranging from 320 volt to 450 volt conforming to IS: 8034/89 with following specifications with suitable control panel, jointing with GI/PVC/HDPE pipes, electrification, testing, commissioning, trial running, conveyance of all materials to worksite, payment of taxes etc all complete as per specification in BOQ, BIS and direction of the Engineer in charge. 1.50 H.P single phase (vertical submersible pump motor) 3 stage head range 20 to 35 metres, discharge 145 to 110 L.M.P with outlet dia of 25mm DOL Control panel 2.50sqmm flat cable 20mm dia rigid UPVC pipes Steel rope with cover Well cap 50mm size CI bracket 32mm dia steel short piece Labour charges for lowering including transportation
10	Bore well protection chamber of the inside size 650x650x1000high with cement concrete (1:3:6) using 40mm size hard granite metal on foundation, 1st class Fly ash brickwork in cement mortar (1:3), with base cement concrete (1:2:4) using 12mm size h.g chips, 12mmthick cement plaster (1:4) inside and outside, R.C.C cover slab in (1:1.5:3) using 12mm size h.g chips, earthwork in excavation in all kinds of soil and refilling the cavity around the chamber including watering, curing, conveyance of all materials to worksite, payment of royalty, taxes etc all complete as per specification in BOQ, BIS and direction of the Engineer in charge.
11	Wall or ceiling and floor HDPE pipes and pipe fittings conforming to IS: 4984/2000 (10kgf/sqcm) of the following nominal bore with clamps and jointing by Fusion welding method including testing, making good the wall, ceiling and floor all complete as per specification in BOQ, BIS and direction of the Engineer in charge. 32mm HDPE pipes
12	Inspection chamber of the following size with cement concrete(1:3:6) using 40mm size hard granite metal on bed, 1st class fly ash brickwork in cement mortar(1:6), moulding and shaping the channel inside and benching with cement concrete (1:2:4) using 12mm size h.g chips, 12mmthick cement

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	plaster (1:3) with punning to inside, cement flush pointing (1:3) to outside, RCC cover slab in (1:1.5:3) using 12mm size h.g chips with RCPC man hole cover, earthwork in excavation in all kinds of soil and refilling the cavity around the chamber including watering, curing, conveyance of all materials to worksite, payment of royalty, taxes etc all complete as per specification in BOQ, BIS and direction of the Engineer in charge. Inside size 760mmx760mmx460mm
13	Man hole chamber of the following size with cement concrete(1:3:6) using 40mm size hard granite metal on bed, fly ash brickwork in cement mortar(1:6), moulding and shaping the channel inside and benching with cement concrete (1:2:4) using 12mm size h.g chips, 12mm thick cement plaster (1:3) with punning to inside, cement flush pointing (1:3) to outside, R.C.C cover slab in (1:1.5:3) using 12mm size h.g chips with RCPC man hole cover, earthwork in excavation in all kinds of soil and refilling the cavity around the chamber including watering, curing, conveyance of all materials to worksite, payment of royalty, taxes etc all complete as per specification in BOQ, BIS and direction of the Engineer in charge. Inside size 910mmx910mmx910mm
14	Soakway pit of the following size with dry brick walling from bottom upto invert of inlet pipe and fly ash brickwork in cement mortar (1:6) for the remaining height at top, cement concrete (1:4:8) using 40mm size hg chips on bed, 12mm thick cement plaster (1:4) inside and outside over masonry brickwork, gravel backing in the rear of well steining, RCC cover slab in cement concrete (1:2:4) using 12mm size hg chips fitted with iron lifting handles including earthwork in open well excavation in all kinds of soil and refilling of cavity around the pit & painting the iron works, watering, curing, conveyance of all materials to worksite, payment of royalty, taxes etc all complete as per specification in BOQ, BIS and direction of the Engineer in charge. 1.40m dia x 2.00m deep soakway pit
15	Trenches (to level or slope) unplasticized PVC pipes conforming to IS: 4985/2000 of the following outside dia for class-3(0.60mpa) including jointing with supply of approved solvent cement by non-heat application method/as per manufacturer's specification, providing and laying in trench cement concrete (1:4:8) with 40mm size hard granite metal in the Type C-1 standard bedding surrounding or encasing including concrete for bedding and curing etc all complete as per PH specification and direction of the Engineer in charge. 110mm dia U-PVC Around Concrete 160mm dia U-PVC Around Concrete
16	100mm x 100mm x 100mm SW Tee in wall including filling the recess with cement concrete (1:3:6) with 12mm size h.g chips all complete including watering, curing, conveyance of all materials to worksite, payment of royalty all complete as per specification in BOQ, BIS and direction of the Engineer in charge.
17	MS step iron in 20mm diameter MS steel bars and fixing into walls of man hole/septic tank duly embedded in cement concrete (1:3:6) complete as per specification in BOQ, BIS and direction of the Engineer in charge.