



GOVERNMENT OF TELANGANA



**TELANGANA STATE MEDICAL SERVICES &
INFRASTRUCTURE DEVELOPMENT
CORPORATION**

**Design, Fabrication, Installation and Commissioning on
Turnkeybasis the work of “Establishment of State Organ
Transplant Centre” in the 8th Floor, SW-Block of Gandhi
Hospital, Secunderabad.**

Tender Enquiry Document(VOLUME-II)

SECTION-VII

Annexure – II

TECHNICAL SPECIFICATIONS AND SCOPE OF WORK

INTRODUCTION:

The Government vide G.O. Rt No. 519, Dt. 06.09.2018 of HM&FW have accorded administrative Sanction for an amount of Rs. 3500 lakhs (Rs. 1000 lakhs for civil works plus Rs. 2500 lakhs for MOTs furniture & Equipment) for the work of “Establishment of State Organ Transplant Centre with Modular Operation Theatres and Modern ICUs at Gandhi Hospital, Secunderabad.

Accordingly, in the 8th floor of Gandhi Hospital, it is proposed for establishing the State Liver Unit with (4) Modular Operation Theatres and other connected components. The project is proposed to be completed and commissioned within a period of **270 days**.

Responsibilities of the Bidder on Turnkey Basis:

1. Bidder shall be responsible for complete design, construction, testing, trial running and commissioning of truly Modular Operation Theatres, Transplant Isolation Rooms and ICUs based on seamless integration with modular concept **as per NABH standards** with a five year un-conditional warranty including running, operation and maintenance cost during the un-conditional warranty period.
2. Bidder shall execute all required civil, electrical and peripheral lighting, plumbing, air-conditioning system (Ducting inside the OTs&TIRs and wherever required), **installation of fire safety sensor & instrument**, demolition and other works as may be required for complete installation and trouble-free functioning of the operation theatres, Transplant Isolation Rooms and ICUs as a part of the “Turnkey work”. The bidder shall be responsible for the complete works including the submission of Working Drawings, and walk through view.
3. Bidder shall be responsible for installation and commissioning of medical equipment for MOTs as wherever required in the Surgical and Gastro enterology block in coordination with respective institute/hospital authorities.
4. The bidder shall provide UPS power supply in OT complex with necessary cabling as per electrical standard.
5. Bidder shall be responsible for free maintenance with spares for the entire Surgical Gastro Enterology block during un-conditional warranty period.
6. Bidder shall be responsible for commissioning of Medical Gas pipe line System, Pendants, LED OT Light and Gas outlets for the OTs and other associated works to make MOT fully functional in coordination with the Hospital authorities.
7. Bidder shall be responsible for maintaining suitable air conditioning inside the MOTs & TIRs. Setting and monitoring of temperature and Relative Humidity shall be in the scope of the MOTs.

8. Bidder shall provide factory test certificates for the material used for the construction of modular theatres and for other works as defined separately under Special Conditions of the contract (or) elsewhere in the document.
9. Bidder shall supply complete set of manuals, service manuals for all the systems and subsystems supplied.
10. Final electrical safety test, system test, and calibration shall be done as per International standards by authorized persons using calibrated test equipment and declaration should be submitted by the vendor.
11. The consignee /user has to be trained for a month by the Engineers from the OEMs.
12. OEM or his authorized agent shall post a trained Engineer who shall be available at site or shall reach the site within 24 hrs of raising a service call.
13. Regarding Outlets of the Anaesthesia & Surgeon Pendants, bidders have to supply same type of outlets as installed in the same building/block. Before shipment of the Pendants, bidders shall take necessary action for selecting the same outlets.
14. The bidder shall have a satisfactory installation of complete Organ Transplant Center as asked for in the tender and a demo may be taken for the same. The bidder has to clarify their doubts or pre-requisites during the Pre-bid meeting. **No extra pre-requisites or clarifications will be addressed after the placement of order.**
15. **Medical Gas Pipeline System:** The Bidder shall design a Dedicated MGPS for the entire State Organ Transplant Centre for all the four blocks (viz., NE, NW, SE & SW blocks) in the 8th Floor. The bidder shall install & commission a Dedicated MGPS with specifications for Super Specialty Hospital, to cover the entire SW block. Provision shall be made for the outlets for integration of the other three blocks. The bidder shall include only the design of MGPS (with Technical specifications for General hospital) for the other three blocks.
16. The turnkey work includes all modifications to the built up space provided at the hospital site including Installation of Medical Equipment, Communication Systems, all civil works, electrical works, plumbing works, interior decoration, air conditioning ducting inside MOT, Medical Gas Pipe Lines, within the Organ transplant block & interconnection with HVAC and other related works of the Organ transplant block required for the smooth and efficient functioning of the center. These works shall comply with all relevant safety and standards guidelines. The vendor is fully responsible for installation, testing and commissioning of all equipment mentioned in the tender.
17. **Whatever the values listed in the bid document are only indicative. Bidders are strongly advised to visit the site for assessment before the submission of bid.**
18. **Option Clause:** - During the currency of the contract, the Purchaser can exercise an option to procure an additional 50% of the original contracted quantity in accordance with the same terms & conditions of the present contract. This will be applicable within currency of contract. The Bidder is to confirm the acceptance of the same for inclusion in the contract. It will be entirely the discretion of the Purchaser to exercise this option or not.

19. Commissioning and installation of SS wall & ceiling panelling, Frame Structures & substructure, PVC flooring, Lighting, Touch Screen Control Panel, laminar flow, OT pendants, OT Lighting, Peripheral Lighting & Clean Room Luminaries, MGPS lines installations, Isolation Panel Systems(IPS), Painting (if any), all fire safety & electrical installations, PS, windows and Doors, Video, Audio & Image Management systems etc. as per technical specifications.

20. All cable conduit, trenches and railings wherever required.

21. All electrical accessories like cable wire, electrical outlets, switches, Control panels, etc shall be fireproof, of reputed make meeting ISI standards, certified for electrical safety.

22. Bidder has to provide Pass Box/Hatch box, storage shelves, scrub stations and other services areas as mentioned in the tender.

23. Testing, Installation, trial running and commissioning of all equipment/services.

24. Any other necessary work as required for continuous satisfactory performance of the Organ Transplant centre and **not mentioned/specified in this document**.

25. The bidder has to submit the working drawings within 15 to 30 days from the date of issue of Notification of Award and after the site visit. These working drawings shall be submitted in due consultation with the Experts Doctors Team and after obtaining their signatures.

26. Final performance and capacity testing and validation:

All the certification and validation parameters for the MOTs must be done in accordance with GMP&NABH guidelines.

There shall be periodic mid-term assessment of the project (after plumbing, electrical works, ducting and AHU installation, construction of interiors and dry run) by identified technical people and Engineer-in-Charge to assess the timely and proper execution of the project.

After completion of the construction and installations, all the MOTs, all the equipment, systems and services shall be validated by the bidder at Bidder's cost through an approved 3rd Party agency, under supervision of a committee of the consultants / client as follows:

Operational performance testing for: -

- HVAC System.
- Dynamic Pass box
- Fire Detection & Alarm system
- UPS Backup system
- Internal Electrification
- Medical Gas Pipeline System
- Any other System

a) Prior to validation, the bidder shall prepare and submit a detailed "Validation Document for approval.

- The Validation Document shall provide the detailed procedure for validation, parameters for validation, validation schemes and formats for recording the validation details.
- The bidder shall arrange to do a mandatory third-party validation
- The bidder shall arrange for all the instruments, tools, manpower etc. required for the validation. The validation results shall be recorded and documented and shared with the purchaser.

b) The above validation tests shall be performed half yearly during the un-conditional warranty as well as during the Annual Comprehensive Maintenance period.

In addition to the above validation tests, preventive maintenance servicing of all installations, operational performance testing as listed above shall be carried out on a quarterly basis during the un-conditional warranty and during CAMC period as well.

i. Maintenance Services: After the completion of un-conditional warranty period of five years, Comprehensive Annual Maintenance shall be taken up by the same agency for a period of five years. Apart from annual validation and quarterly preventive maintenance servicing as described above, it shall include attending breakdown maintenance calls as and when required, repair/replacement of compressors, refrigerant gas charging of condensing units, besides replacement of spares required (due to wear and tear).

ii. Training of personnel:

8.1 Institution personnel (at least 10 persons) to be trained over 2 or 3 days for:

- (a) Operation of HVAC Plant and all other equipment and systems.
- (b) Adjustments of settings for controls and protective devices
- (c) Servicing and Preventive maintenance
- (d) Emergency response training.

8.2 Training shall be provided for a month by the factory trained Engineers of Original Equipment Manufacturers (OEM).

iii. Submission of specialized systems and services layout schemes prior to initiation of the work: Conceptual layout plans and schematic drawings of various specialized services and utilities showing tentative locations of equipment and furniture such as to be submitted before initiating work at site for approval to the Engineer-in-Charge and the User Department. This activity shall be completed **with in 20-30 days** from the date of Notification of the Award.

- a) HVAC system
- b) Air filtration system
- c) Fire Detection and Alarm system
- d) Electrical distribution system
- e) Water supply and drainage system
- f) AHU Design &Control Panel System
- g) Un-interrupted Power Supply system
- h) Medical Gas Pipeline System

- **Documents for final submission:** The following documents are required to be submitted after Final assessment and validation of MOTs for verification and approval of Purchaser and the user department as well, within 15 days of completion of successful validation.

The drawings and layout of final commissioned MOTs shall be shared with the user Department and Purchaser (both in soft and hard copy) for verification.

- All Test Certificates/Maintenance manuals/As Built drawings/Required Spare Parts List shall be submitted to the Purchaser and the user Department after validation within one week.

Detailed document on Validation Procedures to be included as below:

MOTs Validation procedures which specify and coordinates all relevant activities ensuring compliance with Good Management Practices (GMP). In accordance with the guidelines for GMP&NABH regulations, all components for installation in the MOTs have to undergo validation every half yearly to ensure that the component is of appropriate design and capacity and that it will consistently function as intended.

Design Qualification for evaluating a design for the user's requirements and specifications. Design qualification shall be performed for design of equipment, evaluation of quality, and confidence level of bidder, and using purpose of user for compatibility decision and equipment selection. The process of design qualification is as follows.

- First, simple specifications are documented prior to the purchase of equipment's.
- Second, the bidder to supply equipment's, which meet the user's specifications and functional requirements, shall be selected.
- Third, the user's requirement specifications are presented and checked. Functional requirements, which the bidder presents to the user, must be checked as related contents: study object, facility manual, SOP, technique for operation, training, total sample volume, explanation of total sample volume, data acquisition, service, utilities, expendable supply, environmental conditions and ranges (e.g., humidity, temperature, vibration, dust), equipment maintenance method, calibration cycle (including contract that has a calibration cycle), item and cost, certificate, maintenance, un-conditional warranty period, health, safety and information about environmental issues.

Installation Qualification for verifying that each evaluation item passed design specification and installation. The installation qualification must be performed before the user uses the facility. The installation qualification consists of equipment design features (e.g., materials of construction, clean ability) and installation conditions (e.g., wiring, utilities, functionality). The user shall also check that the equipment and processes follow design specification. The process of installation qualification checks that the acquisition, equipment, and accessories follow the purchaser specifications. The user shall also check the installation environmental conditions (e.g., cleanroom requirements, temperature, and humidity) with the bidder. After the user receives equipment, hardware, software, accessory, and spare parts, he or she must check with the manufacture that they meet the purchase specifications. The user shall check the operational manual for equipment installation, maintenance, training, calibration, safety training, equipment operation, software installation, and external damage of equipment by the validation specialist and the manufacturer, and then develops the draft SOP, which includes developing the calibration SOP for each apparatus, preventative maintenance items and cleaning schedules.

Operational Qualification for verifying that each operational procedure and test factor are able to satisfy the acceptance criteria through verification. Operational qualification is performed to pass design qualification and installation qualification. The test items of facility must reproduce the perfect results in an installed environment. First of all, a user

must learn the technical information about the equipment's such as operation process, maintenance, safety items, cleaning and sterilization. The validation specialist develops a working SOP, checks that the facility follows the process of working SOP, and confirms that the equipment to check getting result indicating value of each alarms and interlock. This result must fulfill the test item and acceptance criteria, which set up system requirement specifications. When a high technical skill is required for an operational qualification of special equipment, the expert of manufacturer shall perform the qualification process.

Performance Qualification for demonstrating that an instrument will function according to the operational specifications. Performance qualification is performed for an operating facility that already has undergone design qualification, installation qualification, and operational qualification. This qualification is performed to ensure that the test items are reproducible with meeting the acceptance criteria and show an intended use. This process is performed by the user, who demonstrates operation according to the procedure for operation and the SOP. The process corrects for a deviation factor from each proof item, and establishes an intended use. The validation specialist checks that the test results are reproducible following accepted criteria. He or she checks the reproducibility of a test result more than three times and shall set up a plan to maintain the integrity of the equipment. Also, it is useful to test the results of limit value, low and high values, and worst case of equipment. The user confirms the SOP from the installation and operational qualifications.

CRITICAL CONSIDERATIONS TO BE FOLLOWED IN DESIGN:

The proposed Modular Operation Theatres shall be constructed in accordance with GMP&NABH guidelines. Some of the minimum essential critical considerations for construction of the proposed MOTs shall be as under:

- (a) Restricted and controlled access shall be provided for entry into the MOTs.
- (b) The HVAC systems shall be provided as per Technical Specifications.
- (c) Safety measures for fire and electricity shall be provided.

1. GENERAL CONSTRUCTION

The detailed working drawings shall be submitted by the bidder for review and approval by the Purchaser within 20-30 days from the date of notification of the award. However, some of the critical elements of the building and features are highlighted here under:

a. Building Planning Concept:

The proposed organ Transplant Centre shall be constructed on primary and secondary containment barrier system concept.

b. The Primary Barriers:

Stainless steel wall & ceiling panels with anti bacterial/Anti fungal coating, Dynamic passboxes, etc. shall constitute the primary containment barrier and shall be placed suitably to contain the contamination.

c. The Secondary Barriers:

The Air management and control system shall provide the secondary barrier system. Sustained directional airflow from "lesser contaminated area" towards "potentially higher contaminated areas" shall be achieved through differential pressure in areas/zones.

d. Building Construction and Finishing:

Irrespective of what has been specified elsewhere in the bid document, the internal building finishing shall provide impervious and monolithic construction and all materials used for internal construction and finishing shall be non-particle shredding type and chemical resistant. Joints like wall to wall, wall to floor and ceiling to wall shall be provided with covings for easy cleaning. All joints and penetrations in the building shall be sealed with silicon sealant.

DETAILED TECHNICAL SPECIFICATIONS

MODULAR OPERATION THEATRES& TIRs

Complete Planning, Design, Supply, Construction, Testing & Commissioning of truly Modular O.Ts and TIRs and its component parts conforming to the following specifications, bill of quantities including necessary Turnkey works and providing free spare parts & service during the un-conditional warranty Period and CAMC. All steel material shall be preferably Indigenous of Tata or Jindal make of SS 304 medical grade, certified by a notified body/NABL Lab.

1. Stainless Steel Pre-fabricated Walls/Ceilings: System shall comprise of the following:

- a) SS Wall Panels & Ceiling Panels
- b) The ceiling suspension

1.a.1 STAINLESS STEEL WALL PANELS & CEILING PANELS

- i. The Wall & Ceiling panels shall be from the same manufacturer, pre-fabricated truly modular construction with GI aluminum profiles on all sides for joining the two panels (no welding is allowed), Stainless steel Panels shall be **preferably indigenous make of TATA/Jindal/SAIL, not less than 50mm thick**, double skin, totally flush, pre-fabricated panels with **Stainless Steel SS 304 medical grade** sheets on both sides (each side sheet of thickness not less than 0.8 mm), with core consisting of rigid polyurethane foam, which has been injected under high pressure with a **minimum density of 40 kg/cum**, supporting hardware to provide seamless operating room.
- ii. The steel panels shall be with minimum number of junctions & the junctions shall be seamless. Rails at the floor for fixing the panels shall be made of SS-304/Aluminum.
- iii. The SS Panels shall be finished to fine grain surface & treated to take anti-fungal / anti-bacterial paint. The wall panel shall be painted on operating room side. The color will be selected by the end-user.
- iv. The total distance between the inside and outside surfaces of the operating room, shall be variable to suit the architect's layout, but shall be sufficient for the flush mounting of equipments. The cavity between the inner and outer walls shall be left with minimum obstructions for the possible addition of equipment at a later date and to enable services, pipes, conduits etc, to be run within the cavity. All wall-mounted equipment shall be flush mounted. The wall panel design and construction shall allow for the installation and support of all equipment and the provision of openings required for installations, without affecting rigidity and strength. There shall not be any sharp edges and corners shall be smoothened.

v. The individual wall panels shall be made of single sheet without any joints. The individual wall panels shall be attached to each other with inter-connections and equivalent fastening system which will allow fast installation as well as removal for service. Welding of wall panels on site will not be permitted. Liquid silicone shall not be used for sealing. Once fixed they have to provide complete hygienic conditions inside the MOTs.

vi. All pre-fabricated internal surfaces of walls & Ceiling panels shall be covered with protective sheath to prevent scratches during installations. It shall have high heat stability and it shall be highly durable against mopping and steam. Shade of anti-fungal/anti-bacterial coating shall be confirmed with the user department. Resistance against common hospital cleaning and disinfection agents must be ensured. Certification from regulatory authorities is essential. **The 3rd party test certificate from material testing lab from Govt. Authorized to be provided during pre-dispatch inspection/supply.**

b. The ceiling suspension from concrete ceiling shall be as:

- Suspension elements: Suspension Bracket with Tension Spring
- Stability: Permanent
- Material High Quality Galvanized Steel

1.1 Anti Bacterial / Anti – fungal Coating:

a) The internal surfaces of walls and ceilings of the OT shall have an anti bacterial paint (Factory internal test report to be submitted). The ant-bacterial / Anti – fungal coating shall over lap the floor, coving, ceiling systems and door frames to provide a continuous sealed surface. It shall be non reflective type highly resistant to abrasives, water detergents, weak acids and alkalis used in the cleaning area.

b) The coating shall have no loss of performance or adhesion to the substrate in the case of regular steam cleaning. Anti bacterial paint shall not leach out in order to maintain anti bacterial system throughout the life of the product. **The coating shall have biocide action prevention property against the growth of mould, bacteria and yeast for at least ten years i.e., during un-conditional warranty and CAMC Period.**

1.2 Protection against Radiation:

NOT APPLICABLE

1.3 Sound insulation:

Without any additional measures the sound insulation values shall be a Maximum of 40 dB. Test reports of sound insulation shall be submitted.

1.4 Fire protection:

The panels shall be of Fire Retardant material. There shall be installations of Fire-safety Sensors/Instruments inside the Organ transplantcenter, TIRs etc.

1.5 Dynamic Hatch Box:

Dimension: 600 x 600 x 1000 mm (W D H)

MOC: SS 304, 1.20 mm thickness, No 4 Matt finish

Fresh Air: G5 Grade with HDPE Media 10 microns down to @ 90% Efficiency

Pre filter: F5 Grade with HDPE Media 5 microns down to @95% Efficiency

HEPA Filter: 0.3 microns down to 99.999% efficiency, H 14 Grade;

Make: AAF/Freudenberg
DOP / PAO Port: Provided for HEPA Integrity test during Validation
Motor cum Blower: it is in built Blower cum motor, Centrifugal blower with DIDW type, Make: of ISI Standard.

Manual Dimmer / Potentiometer: Provided
LED: Not less than 300 LUX.
UV Light & UV Hour Meter: Provided.
Interlocking System: Electro Magnet Door Interlocking system with Micro process based board, Magnets, Visual indication key pads.
Pass Box Doors: with View Panel 6 mm thick Toughened glass provided with support SS 304 frame.

1.6 Pass box:

Pass box of size 2ft x 2ft shall be provided in each operation theatre being located at a height of 2.5ft from the floor. The purpose of the Pass box is to deliver dirty linen, plastic bags containing biomedical waste to the dirty corridor.

1.7 Ceiling :

- i) (OT and TIR's) As specified in technical specification (1) above.
- ii) (Corridors) False ceiling with PPGI panel with supportive aluminum grid system and as specified in technical specification (1) above.

2. FLOORING :

2.1 Seamless Conductive flooring inside MOTs, TIRs:

- a. It shall be self leveling, 3.00mm anti static seamless PVC flooring.
- b. Floor shall be smooth, non-slip, impervious material conductive enough to dissipate static electricity but not conductive enough to endanger personnel from electric shock.
- c. It shall be Electro Static Discharge (ESD) combat PVC seamless flooring of very high quality thickness not less than 2.00mm. Continuous roll shall be used and with minimum joints. The Joints to be welded by special PV thermal units using PVC welding bars of same colors.
- d. The sheet shall be highly durable to shock and indentation. It shall be scratch proof, inert to body fluids, chemicals and disinfectants & shall not be affected by the temperature variations.
- e. The flooring shall be done by skilled workers of the accredited agencies, authorized by the supplier of PVC sheets. The Electrical resistance (Point to ground) shall be within 2.5×10^4 to 5×10^6 Ohms. The floor shall not allow build up of Electrical charges beyond 100V due to antistatic effect. The corners shall not be terminated sharply & concealed coving shall be used to overlap the wall panel to a height of approx. 25mm & sealed perfectly & uniformly. Self leveling compounds shall be used.
- f. The Conductive copper grid laid underneath the PVC Sheet shall be supported by liquid epoxy compounds allowed to set as a uniform and level surface. The copper strips to be made visible by grinding and no copper strips shall project more than 0.5mm above level surface to avoid damage to the PVC sheet. One earthing lead shall be brought out from every 150 square feet area and attaching it to the main earthing strip/ Ground.

g. Copper grounding strips (0.05mm Thick, 50 mm width) shall be laid flat on the floor in the conductive adhesive and connected to copper strip of grounding. The connection from copper grid shall be brought out uniformly at places to form equipotential grid.

h. The flooring shall be mechanically shock proof, scratch proof, flame retardant and anti antibacterial.

i. The floor shall efficiently discharge Electric charges up to 2KV. The Floor shall offer Electrical Resistance.

j. The Final Surface shall be non-corrosive to biological fluids & detergents, shall be fire retardant & anti-microbial, color shall be uniform, pleasant & matching with ambience.

2.2 Seamless Vinyl Flooring in Corridors and other places:

Flooring with Vinyl Flooring sheets/tiles having a nominal total thickness of 2 mm with a wearing surface impregnated polyurethane homogeneous mixture of PVC, Plasticizers, Urethane, color pigments with wearing resistance and Fire Resistance as per standards, fixing Sheets over existing flooring with full depth jointing and pointing to the sheet with epoxy emulsion grout/synthetic/resin adhesive including cost and conveyance of all materials like epoxy emulsion grout/synthetic/resin adhesive, sheet etc., to site including cost of materials and all labour charges, laying sheet to required slope as directed by the Engineer-in-charge etc., complete for finished item of work. (APSS No.701 & 707).

3. UNIDIRECTION LAMINAR AIR FLOW SYSTEM :

a. The ceiling filtration system shall be designed to ensure unidirectional homogeneous low turbulence flow of sterile air, to the surgical theatre to ensure the cleanliness of all the area covered by the air flow.

b. The Laminar flow system shall comprise of thick extruded aluminum profiles of suitable size frame and sealed gasket. The filters installed in the plenum shall be suitable for application for laminar flow and clean rooms.

These filters shall meet following specifications:

- Separators : continuous thermo plastic chord
 - Sealant : Polyurethane
 - Gasket : One piece polyurethane
 - MPPS average efficiency > 99.95%
 - 3 Micron DOP efficiency > 99.99%
 - Final Pressure drop: 600 pa (max)
 - Maximum Operating Temp: 60 degree Celsius
 - Maximum RH: 40-50 %
- c. There must be air filtration unit with two sets of washable flange type pre-filters of efficiency 90% down to 10 microns and 99 % down to 5 microns capacity with aluminum SS 304 frame within the AHU.
- d. The ceiling system shall be equipped with “H 14” class HEPA filters position in the ceiling to achieve 0.25m/sec flow at the diffuser.
- e. Air quality at the supply i.e., @ grill level shall be at class 100/ISO class 5 (at rest

condition) and Bacteriological Class B. Particle Decontamination kinetics CP=5min. Shall meet ISO14644/1 Classification.

- f. Third Party validation by Govt. approved Environmental lab after installation.
- g. Filtration Ceiling System holding structure, Filter frames and top plenum shall be made of Aluminum/Stainless Steel.
- h. The filtration ceiling system shall have diffuser/flow equalizer to achieve uniform & constant air distribution over the whole surface area of minimum 8ftX8ft. It shall be CE/UL certified.
- i. Return air exhaust cabinet shall be made from SS304 material and shall be from the same manufacturer of wall panel.

3.1 AIR HANDLING UNIT (AHU):

a. Design, construction, supply, installation, testing and commissioning of factory fabricated Direct Exchange Air Handling Unit for individual MOT. The unit will have to be installed at the designated place on the roof top. The AHU shall be compliant with the latest guidelines in NABH (National Accreditation Board for Hospitals and Healthcare Providers) Standards for Super Specialty MOT or equivalent international standards. The AHU shall supply fresh and re-circulated air. The fresh air shall be minimum 20%. The system shall have provision to keep the blower on during non-functional hours, without temperature control.

Makes: Zeco/Ravi/Edgetech/Aircon/Wave/Systemair

- Minimum total air changes shall be 20 and the fresh air component of the air change required is to be 4 air changes
 - Air velocity shall be of 25-35 fpm
 - Positive pressure shall be 2.5 Pascal.
 - Temperature to be maintained is 21+/- 3 degrees
 - RH to be maintained is 20-60%
 - CFM for OTs of 400sft area shall be about 4,000 CFM and for larger OTs of 600sft area it shall be 6000 CFM.
- b) It shall essentially have temperature and humidity control inside MOTs & TIRs.
 - c) Each Operation Theatre & each TIR shall have a dedicated AHU and all the AHUs shall be mounted on the terrace, with Anti Vibration Pads. The housing /superstructure for all the AHUs shall be within the scope of the bidder.
 - d) Supply, fabrication, installation and testing of Aluminum sheet metal ducting duly oxysulphide sealed complete with Splitter Damper, vanes, etc. as required for OT/TIR and as per Bureau of Indian standards or equivalent specifications. The aluminum sheet shall be of at least 22G, 20 G.
 - e) All the ducting for the MOT shall be scope of the MOT bidder.
 - f) All the ducting shall be as per industry ASHRAE standard and Aluminum Sheet shall be of appropriate thickness and insulated as per industry standard.

3.1.1 Thermal insulation

- a) Supply air duct insulation with 13 mm Thick Cross Linked Polyethylene insulation with factory laminated Aluminum foil All joints of insulation shall be cover with aluminum tape

b) Supply air duct insulation with 09 mm Thick Cross Linked Polyethylene insulation with factory laminated Aluminum foil All joints of insulation shall be cover with aluminum tap.

3.1.2 Terminal box, risers, perforated sheet, dampers.

Supply, installation, testing & commissioning. of Laminar Air Flow Plenum Supply, installation & testing of factory fabricated Laminar air flow pattern perforated plenum made of 16 G aluminum sheet, Aluminum VCD, DOP tested Hepa filters of efficiency 99.97 % down to 0.3 micron particle size & suitable for operation theatre with all accessories as required & to suit site condition of size 8 x 8 FT². SS 304 polished buffed perforated sheet for terminal boxes Supply, installation, testing, commissioning of Factory made risers made of 20G Aluminum sheet duly powder coated, SS 304 Return air riser grill with 20 micron pre filters and Room operated volume Control dampers.

3.2. CONDENSING UNIT: Supply, Installation, testing, commissioning of Air cooled condensing unit with energy efficient of Scroll type compressor with Suitable capacity. This includes required HP/LP cutouts, single phase, under/over voltage relay, phase sequencing. Trip provision to receive the control command from temperature controller. Compressor crank case heater interconnected control/power cables and other accessories etc. The unit shall be precharged With R410a/407c refrigerant (to include with any top up charging at the time of commissioning) .the controls , Required isolation valves, expansion valves, filter drier and accessories etc complete suitable for connected to the AHUs

Make: Daikin/ Blue Star / Mitsubishi/Carrier/ Hitachi.

3.3 EXHAUST SYSTEM IN MOTS & TIRS:

- a. All the ducting shall be scope of the bidder.
- b. All the ducting shall be as per industry standard and sheet shall be Aluminum of appropriate thickness and insulated as per industry standard.
- c. The exhaust air cabinets shall be openable and cleanable.
- d. These cabinets shall have suction from bottom and top also.
- e. Designed flow rate shall not be less than 1000 m³/hr. Distribution of exhaust air volume shall be divided between fluff strainers to maintain the required pressure within the theatre without causing turbulence.
- f. Return air exhaust cabinet shall be made from SS 304 material and shall be from the same manufacturer of wall panel.

3.4 SHED AND PLATFORM FOR HVAC

AHU SHED

It will be required where AHU is installed on roof as decided after consultation with the Engineer-in-Charge. The shed with provision for fencing, door with lock-key arrangement shall be provided as under:

- (a) Framework vertically made of M S Square Pipe frame: 2 Inches X 2 Inches, 16 Gauge
- (b) M S Fencing with wire mesh: ½ inch X ½ inch
- (c) Supporting Structure M S Angle: 50 X 5 mm

- (d) GI pre-coated corrugated profile roof sheet: 0.5 mm thick duly supported with J Hook
- (e) 10 SWG with provision of door with lock and key, with fencing should be duly enamel painted and with anti-rust coating from both sides. The height covered shall be at least 8feet. There should be no gap between roof sheet and wire mesh, if any angle creates gap, it should be covered with iron bars and wire mesh in between.

Platform: In places where firm, even and concrete surface is not available, the same will have to be constructed (masonry work) for the entire surface area which will be enclosed within AHU Shed. There would be independent supply and exhaust system with unidirectional inward airflow and 100% exhaust.

4. PRESSURE RELIEF DAMPERS :

- a. Pressure relief dampers or Over flow ports shall be provided in each room to prevent contamination of air from clean and dirty areas.
- b. Suitably sized air pressure relief damper shall be strategically placed, enabling differential room pressure to be maintained and ensure that when doors are opened between clean and dirty areas.
- c. Counter- weight balancing system shall be provided in the PRD to maintain positive pressure inside the operation room.
- d. Air pressure stabilizers shall have unique capability of controlling differential pressure to close tolerance. The PRD shall remain closed at pressure below the set pressure and shall open fully at a pressure only fractionally above the threshold pressure.
- e. The body shall be epoxy powder coated as per standard BS colors. High grade electrolyzed steel plate shall be used for body and high grade SS304 stainless steel for blades.

5. CEILING MANAGEMENT SYSTEM: EACH CONSISTS OF THE FOLLOWING:

5.1 Pendants

- a) Anesthesia Pendant
- b) Surgical Pendants
- c) Medical Gas Outlet Points in pendants

5.2 Triple Dome Ceiling OT LED Light (Imported), separate fourth arm for HD Screen and audio video cabling to outside the theatre

5.3 Double Dome operating LED Light, with 3rd arm for monitor.

5.4 Detachable HD camera

5.1 PENDANTS FOR ANESTHETIST AND SURGEON (Imported)

The Pendant shall have the following specification:

- i. The Pendants shall be imported & comply with NFPA 99C/HTM 02-01/ISO 7396-1/DIN. The support arms shall be extremely robust and revolve on high quality bearings, so that the pendant head glides smoothly and quickly to any desired position. **The Pendant shall be European CE certified with 4 digit code notified body number or US FDA Approved, under Medical Devices directive.**

- ii. Double moveable arms (any combination) with total coverage of not less than 1800mm and 330 deg. for horizontal movements for each arm, which can be easily adjusted to suit the desired mode of operation.
- iii. Vertical movement shall be motorized for anesthesiologist pendant and mechanical movement for the surgical pendent. The arm height shall remain to a height greater than 6.5 feet above floor level.
- iv. Weight carrying capacity of the arm shall not be less than 180 Kgs. Shall have pneumatic brakes.
- v. The Pendant Service Heads shall be modular with minimum 1200mm head. The heads shall be capable of accepting a range of shelves, and infusion poles or other accessories. The Pendant Heads shall support the range of Physiological Monitor Mounting Solutions.
- vi. The Pendant Service Heads shall be supplied with medical gas terminal units and 5/15 or 6/16 Amps hybrid sockets with switches.

5.1 (a) Single arm pendant for anesthetists

Each pendant shall be supplied with pre-fitted outlets and probes as below:

- a) Oxygen Outlets – 2 nos.,
- b) Vacuum Outlets – 2 nos.,
- c) Nitrous oxide – 1 no.,
- d) Compressed Air(4 bar) Outlets - 2 nos.,
- e) AGSS outlet - 1 no
- f) Electrical sockets - 12 nos. (six on each side)
- g) Shall have provision for data port and telephone jack
- h) Shelf with two rails one on each side – 3 no. Each of min. 30 kg capacity and shall not be less than of size 500 x 500 x 400 mm
- i) Shall have 1 drawer for placing accessories
- j) Shall have dual I.V rod stand with capacity of 30 kg & each rod having 4No. hooks
- k) Data socket RJ-45/CAT6 -2 nos.
- l) The pendants shall be European CE with 4-digit notified body number or USFDA certified under Medical devices directive.
- m) Pendant supplier shall provide cutouts for Patch Panels in Integrated OTs.
- n) Anesthetist pendant should have NIST connection for all gases to connect the MGPS System.

5.1 (b) Each Surgical PendantSystem shall have the following Technical Specifications:-

- a) The same shall be placed at the foot end of the OT Table.
- b) Load capacity shall be 180 Kg or above
- c) Shall be Dual Arm of 800 mm / 800 mm.
- d) Range of movability shall be 330degrees
- e) Shall have 5 platforms of not less than 500 mm x 500mm x 400mm.
- f) Shall have 1 Drawer for placing Accessories.
- g) Each platform shall have weight bearing capacity of minimum 30 Kg Each.
- h) Shall have I.V. rod stand with a capacity of 30 Kg with 4-hooks for each rod.
- i) The following medical gas outlets shall be provided on the back of the service head.
 - CO2 - 2 Nos.

- Vacuum - 2 Nos.
 - Air (7 Bar) – 2 Nos
 - j) Electrical sockets 12 No. shall be provided on the service head (6 on each side)
 - k) Shall have Data Port RJ-45/CAT6 - 2 No's.
 - l) All interfaces for integration.
 - m) The length of the drop tube from the extension arm shall be suitable to the OT height.
 - n) The pendants shall have braking systems which are Pneumatic.
-
- o) The pendant shall have a small spring arm on the side to support a additional monitor.
 - p) The pendants shall be European CE with 4-digit notified body number or USFDA certified under Medical devices directive.
 - q) Pendant supplier shall provide cutouts for Patch Panels in Integrated OTs.
 - r) Surgeon pendant should have NIST connection for all gases to connect the MGPS system.

5.1 (c) The Medical Gas Outlets Points on the pendants shall be duly CE marked.

It shall have Integral check valve, shall allow removal of the housing and socket assemblies for maintenance without closing down the entire pipeline and each outlet shall be individually tested. It shall have a failsafe mechanism after accidental damage (causing no damage to first fix and enabling easy replacement without isolation). Each of the gas specific components must have the gas service engraved onto it, to ensure safety and compliance with standard. Shall have safety features which eliminate the risk of connecting a socket assembly of one gas to the terminal block of another, either during installation or maintenance.

5.2 TRIPLE DOME CEILING OT LED LIGHT (IMPORTED), Shall have a separate fourth arm for HD Screen and audio video cabling to outside the theatre:

- a) Triple dome LED Light to be suspended from the ceiling.
- b) Life of LED's must be at least 60,000 hours.
- c) Each dome shall have a multi-lens matrix for a shadow free, homogenous, pure white, natural light field.
- d) It shall be designed for laminar air flow ceilings.
- e) It shall have a IR-free Illumination.
- f) Colour rendering index Ra and Red Colour Rendering Index R9: both minimum 96.
- g) The illumination intensity shall be at least 1,60,000 lux at one meter distance or more for each dome.
- h) Shall have light field diameter of 220/240/260 mm for the domes
- i) Color temperature shall be Variable 3,500 to 4,500 K
- j) Illumination Depth shall be more than 125 cm.
- k) Shall have adjustable focus system.
- l) It shall have light dimming range: 30% to 100% (minimum).

- m) It shall be with dual controls for all controllable parameters: one at dome assembly and down and another, wireless remote on the wall.
- n) Shadow dilution with one mask shall be 40%, 2 mask shall be 40%
- o) It shall be possible to adjust the dome at any position, have easy maneuverable, free up and down and swing movements and freely rotatable at any angle.
- p) It shall be supplied with 6 nos of additional sterile handles.
- q) The entire system shall be from one and the same company.
- r) Shall accept detachable HD cameras supplied.(as per the specifications cl. 1.6).
- s) Acrobat 3000 arm to mount 32" medical grade monitor

General Requirements: It shall be with European CE mark with 4 digit notified body or US FDA certified or Declaration of conformity for quoted model with ISO 13485 issued by 4 Digit notified body.and complying to IEC 60601/60602.

Tropicalization :

- Operating room temperature: Up to 40°C ;
- Storage temperature : Up to 60°C
- Relative Humidity: Up to 90% non condensing

5.3 DOUBLE DOME CEILING OT LED LIGHT (IMPORTED), separate arm for HD Screen and audio video cabling to outside the theatre:

- a. Double dome LED Light to be suspended from the ceiling.
- b. Life of LED's must be at least 60,000 hours.
- c. Each dome shall have a multi-lens matrix for a shadow free, homogenous, pure white, natural light field.
- d. It shall be designed for laminar air flow ceilings.
- e. It shall have a IR-free Illumination.
- f. Colour rendering index Ra and Red Colour Rendering Index R9: both minimum 96.
- g. The illumination intensity shall be at least 1,60,000 lux at one meter distance or more for each dome.
- h. Shall have light field diameter of 220/240/260 mm for the domes
- i. Color temperature Shall be Variable 3,500 to 4,500 K
- j. Illumination Depth shall be more than 125cm
- k. Shall have adjustable focus system.
- l. It shall have light dimming range: 30% to 100% (minimum).
- m. It shall be with dual controls for all controllable parameters: one at dome assembly and down and another, wireless remote on the wall.
- n. Shadow dilution with one mask shall be 40%, 2 mask shall be 40%
- o. It shall be possible to adjust the dome at any position, have easy maneuverable, free up and down and swing movements and freely rotatable at any angle.
- p. It shall be supplied with 6 nos of additional sterile handles.
- q. The entire system shall be from one and the same company.
- r. Acrobat 3000 arm to mount 32" Medical grade monitor.

General Requirements: It shall be with European CE mark with 4 digit notified body or US FDA certified or Declaration of conformity for quoted model with ISO 13485 issued by 4 Digit notified body. And complying to IEC 60601/60602.

Tropicalization :

- Operating room temperature: Up to 40°C ;
- Storage temperature : Up to 60°C
- Relative Humidity: Up to 90% non condensing

5.4 HIGH DEFINITION CAMERA

- a) The OT lights system shall have a uniform European CE/USFDA certification.
- b) The cameras shall be detachable and can be fitted to light in any O.T.
- c) The Camera shall be wireless High definition and have full HD video Output. The Camera shall have facility for zoom (min 10 x optical and 30 x digital)
- d) The Camera shall have convenient control of all camera functions via a separate control unit.
- e) There shall be no image interference caused by electro-surgery unit.
- f) Shall be attachable to the light supplied.

Camera shall have the following Technical Features:

Image sensor	1/3" CMOS or equivalent
Number of pixels	1920 x 1080 p
Effective pixel number	approx. 2,000,000
Signal system	Standard : 1080p / 60 Hz
Aspect (height-to-width) ratio	16:9
Minimum illumination	1/30s: Color: 0.5 lux, W&B: 0.1 lux DSS 1/7.5s: Color: 0.125 lux, W&B: 0.025 lux
Signal-to-noise ratio (SNR)	>50 dB
Zoom	10 x optical / 30 x digital
Focal length (zoom lens)	f = 5.1 mm to 51 mm
Mark of conformity	European CE / USFDA
Resolution	1080 progressive

5.5 CEILING/WALL MOUNTED HD ROOM CAMERA

Image Sensor :	1/2.5 type ExmorR CMOS Image
Sensor (Number of Effective Pixels) :	Approx. 2.1M pixels
Signal System:	1080 (60p),
Minimum Illumination (50IRE):	1.6 lux (1/30s)
Gain:	Auto/Manual <50 dB)
Shutter Speed:	1/1 to 1/10000 sec (60 Hz)/ 1/1 to 1/10000 sec (50Hz)
Zoom:	12X
Focus:	Auto/ Manual
Horizontal Viewing Angle:	70° (Wide)
Focal Length:	f=4.4mm (Wide) to 52.8mm (Tele) F2.0 to F3.7
Minimum Object Distance:	80 mm (Wide)~400 mm (Tele)
Pan/Tilt Angle:	Pan: ±170° Tilt: +90°/-20
HD Video Output	3G-SDI x1, HDMI x1
White Balance:	Auto/One Push/ Manual

6. LED PERIPHERAL LIGHT CUM CLEAN ROOM (OT) LUMINARIES (Wipro/Philips/CG/Jaquar)

- a) To provide peripheral lighting and clean room luminaries with intensity min 1500 Lux (In each OT minimum 8 numbers) and 2000 Lux (minimum 14 lights) in other peripheral areas with stepless, flicker less dimming control down to 5% level. There shall be two minimum independent circuits. Control equipment for the general lighting and the light dimming shall be provided in the theatre control panel.
- b) Luminaries cover shall be made of highly resistant, disinfectant proof laminated safety glass with stylish fine grained surface, glass pane with white coated steel frame.
- c) The white luminaries body shall be made of sheet steel/ perfectly powder coated, supplied ready for connection optionally for individual or series circuit dimmable.
- d) Recess frames shall be gas tight. The fitting shall be flush with the ceiling and shall be removable from top or bottom. The light fitting shall be uniformly and aesthetically distributed on the ceiling to provide uniform illumination in the OT. Light shall not interfere when green mode endoscopy is performed
- e) Peripheral lighting shall be done according to **IP65** (Ingress Protection rating regulations).
- f) Control equipment for the general lighting and the light dimming shall be provided in the theatre control panel
- g) Shall be from these make - Philips/ GE/ Crompton/ Wipro/ Jaquar.

7. VIEW WINDOW

- a) The view window with motorised horizontal venetian blinds sandwiched in two parallel toughened glasses 5mm thick complete with FHP motor control for 90 degrees rotation. Size shall be 4 ft length x 4 ft height.
- b) Window frame shall be Stainless steel of approved shape flush mounted with wall paneling. It shall be aligned with present window and made of suitable size for each theatre after consultation with concerned department. Maximum dimensions possible shall be provided if asked for keeping in mind present civil setup. Motorized blinds shall be provided which will be able to fully open and close such that full view from window is available or it can be closed fully. Also it shall allow angulation of blinds view outside.

8. DOOR AND FRAMES: HERMETICALLY SEALED DOORS

- a) The door shall be a hermetically sealed, single sliding:
- b) The controller shall be capable of being operated by elbow switches / foot switch as well as touch less sensor.
- c) The track shall be of stainless steel/Aluminum and the running surface for the top rollers shall be suitably angled to reduce resistance to movement
- d) Door opening handle tower bolt 2 Nos. of 100mm x 10mm, 2 Nos of handles 100mm long and Heavy duty and shall be strong and sturdy. Material shall be of SS (gloss/Matt finish). Shall be provided with high quality cylindrical/ESPG lock.

- e) Opening and closing of the door shall be microprocessor controlled electromechanical movement.
- f) The door material shall be of SMS/HPL Color shall match the interior and care shall be taken to make the leaf strong and light weight.
- g) One shall be able to open and close the door effortlessly in case of failure of automatic mechanism.
- h) Door opening handle shall be strong and sturdy. Material shall be of SS (gloss/Matt finish). Shall be provided with high quality cylindrical/ESPG lock.
- i) Door leaf shall have high quality synthetic rubber gasket with long life to ensure

hermetic sealing (to maintain air pressure differential). Air tightness 99.99% at a pressure of 75Pa.

- j) The finished floor on either side of the door shall be perfectly level (maximum permissible difference +1mm).
- k) The overall thickness of the finished door shall be 55 to 60mm. The inner part of the door shall be filled with CFC free polyurethane foam thickness of 48mm or nearby. (Sealed airtight to prevent further ingress of any microbial organism).
- l) The door and controls shall comply with IEE regulation. All motors used shall be DC brushless / PMDC motors with essential isolation from mains.
- m) Door shall be with vision window 300 mm x 300 mm with double glazed 5mm thick panels and hermetically sealed with lead line protection.
- n) Door movement shall have minimum noise.
- o) The starting time after receiving the signal shall be adjustable between 0.5 to 20 seconds.
- p) The door controller shall be CE marked.
- q) Test certificate for hermetically sealed door frame (factory test certificate) shall be enclosed with the pre dispatch documents.
- r) Lead protection on glass cut out is also required. Lead protection as per NABH Guide lines.

9. AUDIO SYSTEM for Operating room to hear soothing music and radio channels. It shall be able to play pen drive, hand held device.

10. STORAGE UNIT:

Size of around 1200mm x 2000mm x 300mm deep 2 in number in each MOT. The storage unit made from 1.5mm of Stainless steel. The doors of the storage cabinet shall house vacuum insulated glass, these doors shall be installed on the storage units with the help of fittings allowing an opening allowance of at least 160°. The storage unit shall be divided in 2 equal parts and each part shall have individual doors with locking system. Each part shall be provided with 5mm thick glass racks as per user department. These shall be completely detachable type.

11. WRITING BOARD(List Board) Size:

About 1000mm x 700mm x 60mm deep

Writing board shall be made of ceramic having Magnetic properties and shall be flushed to the wall of the operation room.

12. X-RAY/ CT SCAN LED VIEWING SCREEN

LED type flat panel X-ray viewing panel should be supplied.

This should comply with relevant electrical safety codes.

Mounting should be flush with the wall to avoid dust accumulation and growth of organisms between wall and panel.

Body should be of extruded aluminum powder coated with bacteria resistant and disinfectant resistant finish.

The diffuser on the front panel should be a uniformly lit screen.

Dimming electronic control should be enclosed at the bottom of the cabinet.

Proper spring loaded film clip with rollers should be provided to hold the films firmly and to remove the film without scratches.

This should be 2 Numbers of dual panel viewing screen (14"x 17" each), it may be on one wall panel or adjacent.

13. TOUCH SCREEN SURGEON CONTROL PANEL (20" or more)

The control panel should be touch screen panel. This control panel should work as the central control panel for the HVAC controls, instruction board. Touch screen, OT light control. The controller should be capable of adjusting the temp adjustment of +/- 5 Deg with in 5Minutes. It should be CE or UL Listed.

The touch screen should be wall mounted, stationed in the visibility line of the surgeon and OT staff. The access height should be convenient for the nurse to operate and help/assistant when in need. The panel should accommodate digital clock and the elapsed time indicator.

The medical gas alarm should indicate high and low gas pressures for each gas service (Except for vacuum, for vacuum it should be normal or low) present in the OT including vacuum. This should be supported by audible alarm also. The panel should have an alarm mute (fault annunciation) facility. The sensors (pressure switches) should be at the nearest isolation valve Control for general lighting: ON/OFF and dimming controls organized in groups to provide uniform illumination.

On/Off Control of the operating light (major and satellite) should be provided. Hand free telephone set with memory should be located at one side. Temperature and humidity control for the room connected to the AHU. (Adjustable from the panel)

The controller should be capable of adjusting the temp adjustment of +/- 5 Deg with in 5Minutes wherever separate AHU is provided for each OT. Digital room pressure indicator in cm of H₂O or equivalent (signal from pressure sensor shall be provided to indicate pressure differential between OT and outside) HEPA filter bank differential pressure indicator. The control Panel should be able to integrated with HIS/BMS. The Control Panel should able to display the Isolation Panel Alarm Conditions along with MGPS Alarms

14. 2-BAY SCRUB STATION/SINK: To be fixed to wall of the OT corridor

- a) Compact Surgical Scrub Sink shall be designed for use in the OT complex providing for pre-procedural scrub up with minimum two bay sink combination as suitable.
- b) The Scrub Station shall be made of Stainless Steel of 304 grade sheet with minimum thickness of 1.5mm and designed as per the high aesthetics of the theatre complex. Shall have smoothened surfaces & corners.
- c) All units shall have reduced anti-splash fronts. The scrub sink shall be provided with a front access panel which shall be easily removed for access to the water controlled valve, waste connections, stoppers & strainers.
- d) Hands free operation shall include infrared sensors with programmable adjustment.
- e) Shall have thermostatic mixing, valve control shall be located behind the access panel & maintain constant water temperature.
- f) Timings shall be adjustable to meet individual applications requirements.
- g) Shall be provided with infra red sensors, thermostatic control taps with fail safe temperature controls.
- h) Knee/Foot operated switch shall be provided additionally.
- i) Shall have provision for fresh water and waste water piping ready for connections. And have four opto-electronic tap, four soap & disinfectant dispenser, one brush dispenser.

15. TRANSPLANT ISOLATION ROOM SPECIFIC REQUIREMENTS

- 1. Should have one exclusive AHU for each TIR with laminar flow and Hepa filters (same specifications as mentioned for MOT).
- 2. Should have UPS Backup.
- 3. Should have fire safety measures.
- 4. Each TIR should have 12mm thick glazed Glass partition for nursing station.
- 5. Shall have Hermetically Sealed Doors (1.50mtX 2.10mt).
- 6. Roof mounted screens
- 7. Wall mounted monitor fixing station 2 in each room
- 8. LED Television 43 inches Full HD.
- 9. Good Room lighting system.
- 10. Should have R.O. Port in each Transplant isolation room
- 11. Medical Gas pipeline system (Refer item 88 for detailed Specifications.)

16. VIDEO & IMAGE MANAGEMENT SYSTEM IN MOTs

OT lights, in light HD camera, full HD monitor and Data Recording system shall be compatible with each other for better compatibility, highest vision quality and serviceability. All items shall be US FDA/European CE approved.

Scope of work:

- a. Complete Supply, Installation testing and commissioning of Video & Image Management system for Modular OTs in accordance with the specifications, bill of quantities. The above works shall also entail necessary Turnkey works including providing of free spare parts and service during Un-conditional warranty Period.
- b. The MOTs shall be connected to the Auditorium for live Transmissions in Full HD over Hospital LAN. It shall enable the surgeons to do Audio-Video Communication between the MOT and Auditorium and to outside the hospital, anywhere in the world.
- c. It shall enable the surgeon to control the routing of source images and decide how to display them in either PAP, PIP or Full Screen Mode from the touchscreen. It shall be possible to swap the picture in the PIP mode and the PAP mode and move the PIP picture.
- d. The system shall receive the signal from different image sources like Endoscopy camera, In-Light camera, C-Arm, Patient Vital Signs, Room camera, Archiving system and Surgical Robot etc. It shall support minimum 8 or more input and output. The system shall be able to handle various native signal sources such as Composite, S-Video, VGA, SDI/3G HD SDI, 12G SDI, HDMI 2.0, and DVI-D video signals.

Technical Specifications:

The system shall be deployed on a movable trolley. The Video & Image Management system shall comprise of separate and dedicated Video Image Processor and be able to integrate all video signals available inside the MOT. It shall be able to manage the following Inputs and route the signal to any of the Outputs inside the MOT.

Sl. No	Input (Source)	Signal Type	Output (Destination)
1.	Surgical Robot	3G/HD-SDI	55" Large screen on wall 4K
2.	Endoscopic Camera 4K	12G SDI	32" 4K monitor on spring arm of OR Light
3.	In-Light HD Camera	HD-SDI/ DVI	Archive
4.	C-Arm	DVI/ S-Video	Conference Room/Auditorium on OR floor
5.	Patient Vital Sign	VGA	Video Conference
6.	Room camera	DVI/3G SDI	
7.	PACS PC	HDMI	
8.	Video Conference	HDMI	

- a) The system shall have 11" or more Touch Screen based control in each MOT. The same shall allow the Surgeon to see more than one image on any of the monitors in PIP and PAP mode as well as move position of the images as per his convenience. Archiving system, and Communication systems shall be controlled from this touch screen.
- b) It shall be able to route Full HD, 3D and 4K videos and images, whether in analog or digital formats.

- c) It shall allow Streaming of surgical videos to be transmitted outside the MOT within the Hospital LAN network. Audio communication shall be bi-directionally. It shall allow for videos to be commented visually with telestration over Hospital LAN. The drawings in the MOT are only displayed in the preview but shall be routed to the monitor of choice in the MOT as well as the conference hall and auditorium. Drawing shall disappear automatically after approx. 10 seconds. It shall be possible to capture the stream in the Archiving system.
- d) Each MOT shall have Dual Channel Digital Archiving system for parallel recording of videos /stills from two Video sources & it shall be a High - end computer system based on Window 10 embedded platform, with inbuilt access security, designed specifically for recording, managing, and archiving surgical images and video in native full HD, 3D and 4K resolution. The inbuilt storage capacity shall be at least 2 TB or more. It shall have integrated surgical checklist following the WHO standard.
- i. The captured Full HD, 3D and 4K images & videos shall be accessible from the hard drive for printing or saving onto multiple forms of external media which includes USB Flash Drive & Hospital network via 11" or more touch screen.
- ii. It shall allow for storage on internal memory (2TB, FIFO), USB storage media via 2.0 and 3.0, optical media, network drive, FTP. It shall allow for Intelligent, adaptive storage management and Automatic storage in the background to reduce the time between the surgical procedures.
- iii. It shall have integrated security software as a protection against malware, independent from security patches of the operating system and it is only possible to run certified software.
- iv. It shall have internal memory: SSD (70GB or more) | HDD (2 TB or more), Memory RAM: 8GB or more.
- v. It shall allow for
 - Image format: BMP, JPG, JPG2000.
 - Video format: MPEG-4, MPEG-2, MOV
 - Video signal inputs: 1 x DP 1.2a, 1 x HDMI 2.0.
 - Color system: PAL, NTSC
 - Resolution still images: up to 3840x2160p, Aspect ratio 16:9
 - Resolution video: up to 3840x2160p@60Hz Progressive Scan for 25/30 frames.

Shall be US FDA/ European CE certified

16.1. MEDICAL GRADE MONITOR 32" 4K RESOLUTION

The monitor shall be mounted on the separate arm of the OT light & shall have:

- HDTV display in original 16: 9/ 16:10 HDTV format.
- 3840x2160p@60Hz displays possible.
- LED display.
- Screen diagonal – 32" (+ - 5%).
- Desktop with pedestal.

- Shall have the facility of PIP mode.
- Shall be US FDA/ European CE certified

16.2. WALL MOUNTED LARGE SCREEN DISPLAY 55" (Commercial Grade)

It shall meet the following specifications.

- HD TFT Flat Screen Monitor size 55" with stand,
- Aspect Ratio 16:9 HD format
- Resolution: 3840x2160 Pixels
- Power Supply 100-240 VAC

16.3. CABLE CONNECTIONS FOR OT INTEGRATION INSIDE THE MOT:

- All necessary Cables, Transmitters, Receivers, and other accessories for connection to the Monitor and Large screen available inside the OT shall be supplied by the vendor.
- Non Integrated OT's to have conduiting as of the conduit layout of the Integrated OT's for provisioning of cabling in the future

16.4. CABLE CONNECTIONS FOR OT INTEGRATION WITH CONFERENCE ROOM:

Cable connection of OT to the conference room for Video transmission upto the resolution of 4K & Bi-Directional audio communication between OT & Conference Room. Distance of upto 200 mt to be considered.

16.5. WIRELESS MICROPHONE

The wireless Lapel Microphone for the surgeon in the OT shall meet the following specifications.

- Super-cardioid condenser headset microphone shall be easy to wear.
- Shall have good pop protection.
- Frequency response (microphone) 80-18000Hz
- Presets 12
- Microphone electret
- Sound pressure level (SPL) 150dB (SPL) max
- THD, total harmonic distortion <0.9%
- AF sensitivity 1.6mV/Pa
- Signal-to-noise ratio > 110 dB(A)
- RF frequency range 516-865MHz.
- RF output power 30 mW.

16.6. DIGITAL MIXER AMPLIFIER

The Digital Amplifier shall meet the following specifications.

- Rated power of 2 X 120W@4 Ohms.
- 2 X 100W@70/ 100V
- 3 or more input channels and 3 output channels
- THD <0.5%
- 3 Mic/Line Input or input.

- 1 Page Input
- 1 Direct Input

16.7. CEILING MOUNTED SPEAKER

The Ceiling Mounted speaker in the OT shall meet the following specification:

- High output loudspeaker with frequency response of 75Hz-18kHz
- 15W or more Continuous power (400W peak)
- Nominal dispersion of 180°H X 75° V
- Sensitivity of 85 dB SPL
- Max SPL of 105 dB SPL
- Transformer tapping shall be possible

16.8. VIDEO CONFERENCING SYSTEM

Full HD Video Conferencing Codec system along with camera shall be deployed in the cart of Video & Image Management System. It shall allow for external communication from the OT to locations both outside & inside the hospital. The system shall be able to transfer high-quality real-time images and audio signals from multipoint at a suitable data transfer speed. The system shall be compatible with 1080p full HD resolution for transmission over the hospital provided (ISDN lines or IP Service).

17. AV MANAGEMENT SYSTEM FOR MINI AUDITORIUM (in 8th Floor)

17.1. HOME THEATRE POWER CONDITIONER 230V

AC Current Capacity: Input- 10 Amp capacity, Output- 10 Amps RMS (maximum, all outlets combined - continuous)

Linear Noise Attenuation:

Transverse (Differential) Mode

>40 dB from 10Khz. - 100 kHz.

>80 dB from 100 Khz. – 1GHz.

(Linear attenuation curve from 0.05 – 100 ohms line impedance)

Transient Voltage Surge Suppression:

230VAC Line (Series Multi-Stage Protection, non-sacrificial with zero ground contamination, 266V peak clamping @ 6000V 3000A input) Cable / Satellite (Less than .1dB line loss).

Outlets: 4 (Linearly filtered outlets), 4 (Linearly filtered outlets with additional ultrasonic filtering for video components).

Power Consumption 2 Watts for display and control circuit.

17.2. AMPLIFIER (8 CHANNEL):

Dynamic output power 4 ohms in watts:	8 x 350
Dynamic output power 8 ohms in watts:	8 x 175
Dynamic output power bridged 8 ohms in watts:	4 x 650
Minimum impedance load per channel in ohms:	4
Power consumption (max) in watts:	2200
Height- rack units (1U=44 mm) in U:	2

Depth (build in) in mm:	330
Power supply:	115 - 230 VAC
Output channels:	8
Line input unbalanced:	8
Power amp topology:	class-D
Applicable low impedance:	yes
RMS output power 4 ohms in watts:	8 x 250
RMS output power 8 ohms in watts:	8 x 125
Output power RMS bridged 8 ohms in watts:	4 x 500
Minimum impedance load bridged per channel in ohms:	8
19" (483 mm wide) rack mounting:	yes
Power supply technology:	switching mode power supply
Line input balanced:	8
Channel separation:	> 60 dB @ 1 kHz
Applicable in 100V:	no
Net weight product (kg):	21.7

17.3. HiFi ACTIVE SUB WOOFER

Loudspeaker system:	single
Woofers cone material:	coated paper
Low impedance dynamic power in watts:	125
SPL 1W/1m in dB:	89
Frequency response in Hz:	20 - 180
Grille main material:	cloth
Active:	Yes
Power supply:	230 VAC
Woofers size in inch:	8
Mounting system:	spikes
Impedance (ohms):	4
Low impedance RMS power in watts:	60
Max SPL 1m in dB:	109
Main construction material:	wood
Closest RAL colour (subject to deviations):	RAL9016 (W) / RAL9005
(BL)	

17.4. CEILING MOUNTED TWO WAY LOUD SPEAKER

Woofers size in inch:	6.5
Tweeter size in inch:	1
Impedance (ohms):	8
Low impedance RMS power in watts:	150
Max SPL 1m in dB:	110
Main construction material:	ABS plastic
Vertical dispersion angle 1000 Hz:	180°
Loudspeaker system:	2-way
Woofers cone material:	coated paper
Mounting system:	click mount
Low impedance dynamic power in watts:	200
SPL 1W/1m in dB:	90
Frequency response in Hz:	65 - 20k
Grille main material:	aluminum

Horizontal dispersion angle 1000 Hz:	180°
Closest RAL colour (subject to deviations):	RAL9016 (W) / RAL9011 (BL)

17.5. 4K LASER PROJECTION TV

Projection System:	True 3-chip (3LCD) Ultra Short-throw
Smart TV Operating System:	Included Android TV
Projection Method:	Tabletop Front Facing
Screen Type:	Ceiling Light-rejecting Thin-bezel Fixed Frame
Screen Size:	120-inch 16:9
Projector Color:	Black or White
Driving Method:	Poly-silicon TFT Active Matrix
Maximum Resolution:	4096 x 2160
Supported Resolutions:	3840 x 2160, Full HD 1080p/i, HD 720p, 576p/i, 480p/i
Native Aspect Ratio:	16:9 widescreen (4:3 resize, 16:10 and 1.9:1 resize)
Pixel Arrangement:	Cross Stripe
Liquid Crystal Type:	Vertical Alignment
Micro Lens Array:	Yes
Focus Control:	Precision Analog Slider
Output Refresh Rate:	Up to 60 Hz
Color Brightness:	Color Light Output: 4,000 lumens
White Brightness:	White Light Output: 4,000 lumens
Dynamic Contrast Ratio:	Over 2,000,000:1 (Color Mode: Dynamic; Consumption: Normal; Zoom: Wide)
Maximum Color Gamut:	Rec.709
Chroma Sub sampling:	4:2:2 (4K 60 fps HDR10), 4:4:4 (4K 30 fps HDR10), 4:4:4 (4K 60 fps no HDR)
Color Reproduction:	Full 10-bit (up to 1.07 billion colors)
Throw Ratio Range:	0.28 (Zoom: Wide), 0.38 (Zoom: Tele)
Size (Projected Distance from Lens):	120" (lens to screen 29.6"; front to screen 35.2"; back to screen; 20.4")
Keystone Correction:	Vertical: ±3 degrees Horizontal: ±3 degrees
High Dynamic Range:	HLG and Full 10-bit HDR
Real-time HDR Curve Adjustment:	Yes – 16 Steps
Digital Color Processing:	Real-time 12-bit Analog-to-digital
Light Source:	Laser diode
Dynamic Laser Life:	Up to 20,000 hours (Power Consumption: Normal, Quiet)

Projection Lens

Type:	Manual focus
F-number:	1.5
Focal Length:	3.9 mm
Zoom Ratio:	1.0 – 1.35 Digital Zoom

Other Features:

Built-in Audio:	Front-firing 10 W Stereo Speakers
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Instant ON/OFF:	Yes
3D Compatibility:	Yes – Using Active RF 3D Glasses
Computer Compatibility:	PC, Mac®
Operating Temperature:	41 ° to 95 °F (5 ° to 30 °C)(20% – 80% humidity, no condensation)
Power Supply Voltage:	100 – 240 VAC ± 10%, 50/60 Hz
Power Consumption	
ECO Mode:	236 W
Normal Mode:	381 W
Networked Standby:	2.0 W
Energy Saving:	0.5 W
Fan Noise	
Quiet Mode:	23 dB
Normal Mode:	36 dB

17.6. DRIVE RACK

Analog inputs

Number of Inputs:	2 line inputs, 1 RTA mic input
Connectors:	2 female XLR line inputs, 1 female XLR RTA mic input
Type:	Electronically balanced/RF filtered
Impedance:	> 50 kΩ
Max Input Level (line inputs):	> +20 dBu
CMRR:	> 45 dB
RTA Mic Preamp Phantom Power:	+15 VDC

Analog Outputs

Number of Outputs:	6 line outputs
Connectors:	Male XLR
Type:	Electronically balanced, RF filtered
Impedance:	120 Ω
Max Output Level:	+20 dBu
Alignment Delay:	Up to 10ms per output channel pair

A/D performance

A/D Converter:	24-bit with dbx Type IV Conversion System
A/D Dynamic Range:	112 dB A-weighted, 110 dB unweighted
Type IV Dynamic Range:	123 dB with transient material, A-weighted, 22kHz BW; 121 dB with transient material, unweighted, 22kHz BW; 115 dB typical with program material, A-weighted, 22kHz BW

D/A Performance

D/A Converter:	24-bit
D/A Dynamic Range:	112 dB A-weighted, 110 dB unweighted

System performance

Internal Processing Word length:	32-bit floating point
Sample Rate:	48 kHz
Dynamic Range:	110 dB A-weighted 107 dB unweighted

THD + Noise:	0.003% typical at +4 dBu, 1 kHz, 0 dB input gain
Frequency Response:	20 Hz – 20 kHz, +0 /- 0.5 dB
Inter channel Crosstalk:	< -110 dB, -120 dB typical (input-to-output: < -100 dB)
Latency: Input to output:	1.847 ms

Power supply

Operating Voltage:	100-120 VAC 50/60 Hz or 220-240 VAC 50/60 Hz
Power Consumption:	22 Watts

17.7. LINEAR FILTERING AC POWER CONDITIONER

AC Current Capacity: Input- 10 Amp capacity, Output- 10 Amps RMS (maximum, all outlets combined - continuous)

Linear Noise Attenuation:

Transverse (Differential) Mode

>40 dB from 10Khz. - 100 kHz.

>80 dB from 100 Khz. – 1GHz.

(Linear attenuation curve from 0.05 – 100 ohms line impedance)

Transient Voltage Surge Suppression:

230VAC Line (Series Multi-Stage Protection, non-sacrificial with zero ground contamination, 266V peak clamping @ 6000V 3000A input) Cable / Satellite (Less than .1dB line loss).

Outlets: 4 (Linearly filtered outlets), 4 (Linearly filtered outlets with additional ultrasonic filtering for video components).

Power Consumption 2 Watts for display and control circuit.

17.8. SOUND ANALOG MIXER

Frequency Response

Input to STEREO OUT: +0.5db/-1.0dB (20Hz to 48 KHz),refer to the nominal output level @1 KHz,

GAIN knob : min

Total harmonic distortion (THD+N)

Input to STEREO OUT : 0.02 %@ +14 dBu (20 Hz to 20 kHz,GAIN knob:Min 0.003%@ +24 dBu(1kHz),

GAIN knob : Min

Hum & noise *1 (20Hz to 20 kHz)

Equivalent input noise : -128dBu (Mono input channel, Rs.150 , GAIN

Knob : Max)

Residual output noise : -102dBu (Stereo out, stereo level knob :Min)

Crosstalk (1 kHz) *2 : -83dB

Input channels : 10 channels: Mono [MIC/LINE]: 4,

STEREO [Line]:3

Out put channels : STEREO OUT : 2 PHONES :1,
MONITOR OUT :1, AUX [FX] SEND :1

Bus	: Stereo :1,AUX[FX],1
Input channel Function	
PAD(Mono)	: 26 dB
HPF (Mono)	: 80Hz, 12dB/oct
COMP	: 1 - Knob compressor threshold + 22 dBu to – 8dBu, Ratio :1:1 to 4:1, out put level :0dB to 7dB Attack time : approx 25msec, Release time : approx 300 msec
EQ HIGH shelving	: Gain +15db/-15dB, Frequency : 10 KHz
EQ MID	: Gain + 15db/-15dB, Frequency : 2:5 KHz Peaking
EQ LOW	: Gain + 15db/-15dB, Frequency : 100 Hz Shelving
PEAK LED (Mono)	: LED Turns on when post EQ signal reaches 3 dB Below clipping Level Meter
Post STEREO LEVEL Knob	: 2 X 7 - Segment LED meter (peak +10,+6,+0,-6,-10, -20 dB)
Internal Digital Effect	
SPX algorithm	: 24 programs
USB Audio	
2 IN/ 2 OUT	: USB Audio class 2.0 compliant Sampling Frequency : Max 192 kHz, Bit depth 24 - bit
Phantom Power Voltage	: +48 V
Power Supply adaptor	: PA-10 (AC 38 VCT, 0.62 A cable length = 3.6 m) or equivalent recommended by Yamaha
Power Consumption	: 22.9 W
Dimensions (WxHxD)	: 244mm x 71mmx294mm (9.6" x 2.8" x 11.6")
Included Accessory	: AC Adaptor, Owners Manual, Cubase AL Download information Technical Specifications
Optional Accessory	: Mic Stand adaptor: BMS-10A, Foot Switch: FC5
Operating Temperature	: 0 to +40°c

18. PICTURE ARCHIVING & COMMUNICATION SYSTEM (PACS) PC

PACS dedicated PC (dicom enabled) must be provided in OTs or suitable system to receive and transmit the PACS Images in the OT, including required cabling & required license.

Should be integrated with Hospital PACS. Vendor has to do the necessary coordination with Hospital Authorities for connecting the PACS monitor.

19. ELECTRICAL INSTALLATIONS IN MOTs

Power distribution within the MOTs shall be provided from the isolated power supply distribution board located local to each theater. Insulation faults, leakages, short circuits shall be indicated and displayed in MOTs, as per IEC.

The Bidder shall carry out all internal electrification such as, wiring, all switches, Sockets, fixtures, Distribution boards etc.

The Bidder shall provide all Electrical panels for Raw power, Lighting, HVAC, UPS, IPS etc including connecting the same from hospital source with UG cables as per requirement.

Earthing for all the items shall be done as per standards.

Each wall in MOT shall have minimum 2 Nos 6A/16A Hybrid Switch and socket & 32A Industrial socket at any two walls as per IEC standards.

All the equipments shall be fully and permanently labeled to identify and describe the function, operation and voltage of the apparatus connected. Throughout and upon completion of the electrical installation, tests in accordance with relevant section of the local wiring regulation shall be carried out and the results should be recorded.

All necessary interconnection of LAN, AV, Telephone/Intercom etc, to MOTs and other areas from hospital sources is the scope of the bidder.

All internal luminaries in the MOTs shall be of IP 65 and rest of the areas as per relevant standards.

20. DEMOLISHING, RECONSTRUCTING, WATER PROOFING, PLUMBING, REPAINTING AND REPLACEMENT

- a. Any demolition, reconstruction, water proofing, necessary plumbing, anti-microbial painting, etc.
- b. Replacement of any door or windows to provide structured design for modular OT shall be carried out by the bidder.
- c. Disposal of demolished waste at appropriate places as suggested by the competent authorities of respective institute/hospital.

21. SPECIAL CONDITIONS:

- a) All the required medical devices shall conform to the certifications mentioned in the technical specifications.
- b) The bidder/contractor will have to submit the detailed working Engineering Drawings. Approval for the same shall be taken from the user department HOD and the Engineer of the contract before proceeding with the factory fabrication work.
- c) Six sets per each Modular O.T. of the appropriate size/s, readable with normal eye sight as built drawings for all systems e.g. electrical, plumbing, AGSS, Medical Gas, civil, etc. shall be supplied.
- d) Duly bound, operation manual for the entire O.T. (2 copies per O.T.) including the various devices and systems supplied as a part of the contract shall be supplied.
- e) The electric wiring, plumbing pipes, etc. shall be firmly identifiable by colour codes. Shall have identification tags at suitable places permanently fixed and readable over the period of at least 10 years. All the panels also shall have similar arrangements.

- f) All the individual devices shall be supplied with factory test certificates.
- g) The relevant provisions in the different Parts of ISO 14644, the Clean Rooms and Associated Controlled Environments standard shall be adhered to wherever necessary.
- h) The relevant provisions in different Parts of IEC 60601 standard on Medical Electrical Equipment shall be adhered to.
- i) The entire contract works are to be guaranteed for Five years and thereafter to be covered by 5 years annual Comprehensive Maintenance Contract (CMC).
- j) Isolation, where necessary, with temporary partitions of adjoining working operation theaters to continue clinical work without disturbance will be the responsibility of the contractors.
- k) Bidder shall clearly mention country of origin of each and every product quoted.
- l) The ambient conditions prevalent in Hyderabad shall be considered for the work.
- m) Demonstration: On site, where similar/identical truly modular OT is installed by the bidder or their principles and is functional. If some of the offered medical devices are not in the demo OT, demonstration of the same may be insisted at other places.
- n) Mostly, any structural changes may not be possible. Medical Gas pipe Line if any, has to be included in the offer and hence to part of the commercial bid. Electrical lines, etc. are available near by the proposed theater areas. Those need to be tapped for use with Modular OTs. The work needs to be completed in co-ordination and in consultation with hospital engineers, architect / heritage consultant and the user HODs.
- o) Cost of above works shall be included in quoted cost.
- p) Prospective bidder are requested to visit the existing O.T.s and acquainted with the works to be carried out, then quote the cost.
- q) Separate item for each Modular O.T. is to be provided to quote the rate.

ELECTRICAL ITEMS:

22. CONDUIT PIPE:

- a) Supply and Fixing of 25mm dia outer dia medium grade, FRLS with IS:9537 part 3 rigid surface P.V.C. pipe (ISI MARK) with all accessories fixing on chromium plated metallic base saddles including all labour charges etc., complete for run of mains. Makes:- Sudhakar / Finolex / Modi / VIP / Precision / Universal / Polycab / DEC.
- b) Supply and laying of ISI 25mm outer dia medium grade with IS:9537 part 3 rigid PVC pipe concealed in wall with all required PVC / Metallic Junction Boxes including masonry work and labour charges etc., Makes:- Sudhakar / Finolex / Modi / VIP / Precision / Universal / Polycab / DEC.

23. WIRING:

- a) Wiring with run of 2 of 1.5 Sqmm FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable in existing PVC conduit pipe

including Supply and fixing of Jumbo Ceiling rose and 6A/10A ISI Mark 1way Modular switch with required modular box and cover frame in existing Surface or Concealed pipe wiring including cost and conveyance of all material and all labour charges etc., complete for light, Fan, Exhaust fan and bell points in N.R.B. Makes of wires : Finolex / RR kabel / Havells / Gold Medal(HFFR) / Million(HFFR) / KEI (HFFR) / Polycab (HFFR) / DEC(HFFR) Makes of switches : Legrand Arteor / Schneider Zen celo / Honeywell Blenge Plus / Crabtree Amare / Logus Platina / Gold Medal GIFA / GM-Zenova/ L&T.

b) Wiring with run of 2 of 1.5 Sqmm FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable in existing PVC conduit pipe including Supply and fixing of Jumbo Ceiling rose and 6A/10A ISI Mark 1way Modular switch with required modular box and cover frame in existing Surface or Concealed pipe wiring including cost and conveyance of all material and all labour charges etc., complete for staircase light points in N.R.B.

Makes of wires : Finolex / RR kabel / Havells / Gold Medal(HFFR) / Million(HFFR) / KEI (HFFR) / Polycab (HFFR) / DEC(HFFR) Makes of switches : Legrand Arteor / Schneider Zen celo / Honeywell Blenge Plus / Crabtree Amare / Logus Platina / Gold Medal GIFA / GM-Zenova/ L&T- Englaze.

c) Supply and fixing of 6A/10A ISI Mark 3/2 pin Modular socket with 6A/10A 1way Modular switch, 3 Module box with cover frame a Common switch board including cost and conveyance of all materials and all labour charges etc., complete in N.R.B. / R.B. Makes of switches : Legrand Arteor / Schneider Zen celo / Honeywell Blenge Plus / Crabtree Amare / Logus Platina / Gold Medal GIFA / GM-Zenova/ L&T- Englaze.

d) Wiring with 3 of 1.5 sq.mm (phase, neutral and earth) FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 in existing pipe with 6A switch and 6A, 3/2 pin socket Modular type with 6A switch control and MS boxes with cover plate and GI switch box fixing on separate board including all labour charges etc., complete. Makes of wires : Finolex / RR kabel / Havells / Gold Medal(HFFR) / Million(HFFR) / KEI (HFFR) / Polycab (HFFR) / DEC(HFFR) Makes of switches : Legrand Arteor / Schneider Zen celo / Honeywell Blenge Plus / Crabtree Amare / Logus Platina / Gold Medal GIFA / GM-Zenova/ L&T- Englaze.

e) Supply and fixing of 6A switchs - 2 Nos and 6A 3/2 pin socket - 3 Nos Modular type with cover plate and GI switch box fixing on separate board including all labour charges with connections etc., complete. Makes of switches : Legrand Arteor / Schneider Zen celo / Honeywell Blenge Plus / Crabtree Amare / Logus Platina / Gold Medal GIFA / GM-Zenova/ L&T- Englaze.

f) Supply & fixing of 16A/6A, 2 in one socket with 16A switch control modular type with and GI switch box with front cover plate including all labour charges etc., complete. Makes of switches : Legrand Arteor / Schneider Zen celo / Honeywell

Blenge Plus / Crabtree Amare / Logus Platina / Gold Medal GIFA / GM-Zenova/ L&T- Englaze.

g) Supply & fixing of 32A, socket with switch control modular type with and GI switch box with front cover plate including all labour charges etc., complete.

Makes of switches:- Legrand Arteor / Schneider Zen celo / Honeywell Blenge Plus / Cabtree Amare / Logus Platina / Gold Medal GIFA / GM-Zenova/ L&T- Englaze.

h) Supply & fixing of 64A, socket with 64A switch control modular type with and GI switch box with front cover plate including all labour charges etc., complete.

Makes of switches:- Legrand Arteor / Schneider Zen celo / Honeywell Blenge Plus / Cabtree Amare / Logus Platina / Gold Medal GIFA / GM-Zenova/ L&T- Englaze.

24. RUN OF MAINS:

a) Supply and Run of 1 of 1.5 sq.mm (phase, neutral and earth) FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable for in existing pipe for earth continuity including all labour charges etc., complete. Finolex / RR kabel / Havells / Gold Medal(HFFR) /Million(HFFR) / KEI (HFFR) / Polycab (HFFR) / DEC(HFFR)

b) "Supply Supply and Run of 3 of 1.5 sq.mm (phase, neutral and earth) FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable for earth continuity including all labour charges etc., complete. Finolex / RR kabel / Havells / Gold Medal(HFFR) /Million(HFFR) / KEI (HFFR) / Polycab (HFFR) / DEC(HFFR)

c) "Supply and Run of 3 of 2.5 sq.mm (phase, neutral and earth) FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable of in existing pipe for run of mains including all labour charges etc., complete.

Makes of wires : Finolex / RR kabel / Havells / Gold Medal(HFFR) /Million(HFFR) / KEI (HFFR) / Polycab (HFFR) / DEC(HFFR)

d) " Supply and Run of 3 runs of 4.0 sq mm (phase neutral and earth) FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable of in existing pipe for run of mains including all labour charges etc., complete. for 16A Soxkets & AC points." Makes of wires : Finolex / RR kabel / Havells / Gold Medal(HFFR) /Million(HFFR) / KEI (HFFR) / Polycab (HFFR) / DEC(HFFR)

e) " Supply and Run of 3 of 6.0 Sq.mm FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable of in existing pipe for run of mains including all labour charges etc., complete. for SPN DB's " Makes of wires : Finolex / RR kabel / Havells / Gold Medal(HFFR) /Million(HFFR) / KEI (HFFR) / Polycab (HFFR) / DEC(HFFR)

f) " Supply and Run of 5 of 6.0 Sq.mm FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable of in existing pipe for run of mains including all labour charges etc., complete." Makes of wires : Finolex / RR kabel / Havells / Gold Medal(HFFR) /Million(HFFR) / KEI (HFFR) / Polycab (HFFR) / DEC(HFFR)."

g) "Supply and Run of 5 of 10.0 Sq.mm FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable of in existing pipe for run of mains including all labour charges etc., complete."

Makes of wires : Finolex / RR kabel / Havells / Gold Medal(HFFR) / Million(HFFR) / KEI (HFFR) / Polycab (HFFR) / DEC(HFFR)

25. DISTRIBUTION BOARDS:

a) "Supply and fixing of DP Metal Enclosure with IP 20 Protection DB Make with 1 No 20A, 10 KA DP MCB including internal connection and labour charges for Flush Mounting etc.,complete. Makes : Legrand / Schneider / Siemens / L&T / Crabtree Xpro"

b) "Supply and fixing of 4 Way TPN DB Horizontal with IP 43 Protection as per IS:13032 and Supply and Fixing of 1 No., of 40A FP Isolator as incomer and 12 Nos 6-32 A 10kA SP MCBs as out goings including internal connections and labour charges for FLUSH Mounting etc., complete. (For Lighting DBs) DB Makes : Legrand / Schneider / Siemens / L&T. Isolator & MCB Makes : Legrand-DX3 / Schneider-Acti9 / Siemens / L&T Exora.

c) "Supply and fixing of 4 Way TPN DB Horizontal with IP 43 Protection as per IS:13032 and Supply and Fixing of 1 No., of 63A FP Isolator as incomer and 12 Nos 6-32 A 10kA SP MCBs as out goings including internal connections and labour charges for FLUSH Mounting etc., complete for DBs. DB Makes : Legrand / Schneider / Siemens / L&T. Isolator & MCB Makes : Legrand-DX3 / Schneider-Acti9 / Siemens / L&T Exora."

d) Supply and fixing of 8 Way VTPN DB with IP 43 Protection as per IS:13032 Mand Supply and Fixing of 1 No., of 125A TPN MCCB, Adjustable, Confirms to IS/IEC 60947-2 having Breaking Capacity 25 KA with thermal magnetic release Panel Mounted as incomer with 8 Nos of 63A, 10KA, TP MCBs C Curve ISI Mark as Out goings including internal connections and labour charges for FLUSH Mounting etc., complete. DB Makes : Legrand / Schneider / Siemens / L&T. MCCB Makes : L&T- D sine / Schneider-NS NSX/Legrand -DP X3/ Siemens-3VL / Hager-h3/C&S -Winbreak. MCB Makes : Legrand-DX3 / Schneider-Acti9 / Siemens / L&T Exora / Crabtree.

e) "Supply and fixing of cable adopteres box with cover for DBs including, massanory work etc., complete.,
Makes : Legrand / Schneider.

26. EARTHINGS:

a) Providing independent earthing for Important equipment with 40mm dia 'B' class 2.5m long G.I pipe and 19mm dia 'B' class G.I pipe of 0.3mtr. long connected with reducer providing G.I funnel with mesh enclosed in C.C/ brick massonry chamber of 450m x 450m x 400mm with R.C.C. Slab cover duly providing staggered holes filling with 20Kg Salt and 40Kg Charcoal or 40Kg bentonite powder from the bottom of the pipe giving earth connection from electrode through G.I strip of 40 x 6mm x 200mm length with all accessories and labour charges complete, as per IS specifications 732/1982 (Part II).

b) "Providing independent earthing by exacavating a pit to a depth of 2.25Mtr in all soils as per size specified in the data for Sophisticated Electronic equipment with

600mm x 600mm x 3.15mm thick copper plate rigidly fixed to 19mm dia 'B' Class G.I Pipe of 2.5Mtr length with funnel as per National Electric Code and earth connection from electrode GI strip of 40mm x 5mm x 200mm length to be bolted with nut bolts to G.I. pipe including 25mm x 3mm copper strip of 6Mtrs length connected from plate to GI strip including filling with 20Kg Salt and 40Kg Charcoal or 40Kg bentonite powder from the bottom of the pipe and providing CC / Brick masonry chamber 450mmX450mmX400mm and covered with R.C.C. Slab including all accessories and labour charges etc complete as per IS specification 732/1982(Part II)."

c) Providing independent earthing for Important equipment with 100mm dia Heavy gauge C.I (Cast iron) pipe with Flange 2.5m long enclosed in C.C/ brick masonry chamber of 450m x 450m x 400mm with R.C.C. Slab cover duly providing staggered holes filling with salt and charcoal from the bottom of the pipe giving earth connection from electrode through flange with all accessories and labour charges complete, as per IS specifications 732/1982 (Part II)

d) Supply and Run of 50mm x 6mm G.I Strip including cost of all accessories and labour charges etc., complete. (2.36 Kg / Mtr)

e) Supply and Run of 25mm x 3mm copper strip (Cuurent Carrying Capacity 270A) including cost of all accessories and labour charges etc., complete. (0.663Kgs/1Mtr)

27. FIXTURES:

a) Supply, transportation and fixing of 22W +/- 10% , >/ 2300 lumens, 1200mm length LED light housing made with aluminum anodised body, wide operating voltage with PF \geq 0.9, Surge protection: > 2KV, THD<10%, with inbuilt driver and frosted cover CCT: 3000K - 6500K as desired by the department as per IS, minimum CRI \geq 80 etc., complete with 5 years warranty with BIS Certification with BIS Certification. LUMINAIRE MAKE: Phillips / OSRAM / GE Venture / Wipro / Crompton / Bajaj / Havells / Jaquar. LED MAKE : PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG / LG LEDs.

b) Supply, transportation and fixing 32-36W (\geq 3600 Lumens), 2' x2' (600mm x 600mm) slim panel LED luminaire Square Housing Made of Aluminum alloy with corrosion resistant powder coat, with acrylic diffuser, Constant current out put of Driver operating voltage range of 150 to 265 Volts AC, Power factor \geq 0.9 high power LEDs having efficacy of \geq 100 lumens/watt, junction temperature less than 85 degrees centigrade and THD is less than 12% etc., complete. LUMINAIRE MAKE: Phillips / OSRAM / GE Venture / Wipro / Crompton / Bajaj / Havells / Jaquar. LED MAKE : PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG / LG LEDs.

c) Supply, transportation and fixing 12 W +/-10% (\geq 1200 Lumens) Down lighter back lit LED Down Light Recessed / Surface mounting round / square with housing made of Powder coated Pressure die cast aluminium housing with extended heat sink, with Protruded high efficiency diffuser, IP20, with wide operating voltage range, Power factor > 0.9, Surge protection: > 2KV, System efficacy of >100 lumens/watt, CCT: 3000K - 6500K as desired by the department and as per IS, CRI >80, and THD is less than 15% etc., complete with 5 years warranty with BIS Certification. LUMINAIRE MAKE: Phillips / OSRAM / GE Venture / Wipro / Crompton / Bajaj / Havells / Jaquar.

LED MAKE : PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG / LG LEDs.

d) Supply, transportation and fixing 18 W +/-10% (≥ 1800 Lumens) Down lighter back lit LED Down Light Recessed / Surface mounting round / square with housing made of Powder coated Pressure die cast aluminium housing with extended heat sink, with Protruded high efficiency diffuser, IP20, with wide operating voltage range, Power factor > 0.9 , Surge protection: $> 2KV$, System efficacy of >100 lumens/watt, CCT: 3000K - 6500K as desired by the department and as per IS, CRI >80 , and THD is less than 15% etc., complete with 5 years warranty with BIS Certification. LUMINAIRE MAKE: Phillips / OSRAM / GE Venture / Wipro / Crompton / Bajaj / Havells / Jaquar. LED MAKE : PHILIPS LUMILEDS / CREE / NICHIA / OSRAM / SAMSUNG / LG LEDs.

e) Supply and fixing of ISI mark batten holder / slanting holder for Mirror Light Makes : Anchor / Gold Medal Olive / Million Zoom in lieu of ceiling rose of light point complete with all connections and all labour charges with 5W LED Batten Makes: Phillips / OSRAM / GE Venture / Wipro / Crompton / Bajaj / Havells / Jaquar / IB LED / Panasonic / Halonix .

f) Supply, Transportation of energy efficient fan, 1200 mm sweep, aluminium body, consuming 28 W, BEE 5 star rated, ceiling fan with Brush Less Direct Current(BLDC) motor, class of insulation: B, 3 no's blades, 30 cm long down rod, 2 no's canopies, shackle' kit, safety rope, copper winding, Power Factor greater than 0.90, Service Value (CMMAV) greater than 8.5, Air delivery minimum 235 CMM, 350 RPM(tolerance as per IS:374-2019), THD less than 10%. with remote or compatible to electronic step type regulator unit for speed control and all remaining accessories including safety pin, nut bolts, washers, temperature rise=75 degree C(max), insulation resistance more than 2 mega ohm, suitable for 230V, 50 HZ, single phase AC supply, earthing etc., including all standard accessories etc., complete. Makes : Atomberg (Efficio) / Havells / Orient

f1) Supply and fixing of Modular type Stepped electronic regulator for sweep AC ceiling fans of 1200mm / 1400mm complete with connections. Makes : Legrand Arteor / Schneider Zen celo / Honeywell Blenge Plus / Crabtree Amare / Logus Platina / Gold Medal GIFA / GM-Zenova/ L&T Englaze.

f2) Labour charges for fixing of ceiling fan and regulator including transportation and giving connections with twin core wire etc., complete. Makes : Finolex / RR Kabel / Havells / Polycab / GM / Million / V-Guard / Gold Medal / HPL / RPG. f3) Supply and erecting 19/20mm steel tube down rod of one meter length with bolts & nuts duly painted with matching colour of fan complete

g) Supply, Transportation of light duty exhaust fan 12"(300 mm) size 900 rpm with metal blades wire mesh with all accessories etc complete. Makes: Crompton / Bajaj Bahar WG / Havells Ventil Air-DB / Orient hill air.

h) Supply, Transportation of 12" (300mm) ISI, 900 RPM Heavy duty exhaust fan with metallic blades wire mesh with all accessories etc complete Makes: Crompton / Almounard / Havells Turbo Force.

i) Supply and fixing of louver shutter suitable for 12" Exhaust fan including all labour charges etc complete with connections and colouring matching to the wall with enamel paint.

j) Supply and fixing of GI louver shutter including GI mesh

28. PANEL BOARDS

28 A. Main Power Panel

"Supply installation testing and commissioning of 3 phase and neutral 415V free standing floor mounted Out door Type MV panel made out of No.16/14 gauge CRCA sheet steel after 7 tank process and painting with powder coating. The panel shall consists of suitable rating TPN Alluminium busbar (with rating of 0.8A/Sqmm)supported with DMC /SMC barriers and colourcoated with heat shrinkable sleeves, flexibiltioy to accept the up four out going cables and necessary cable chamber . The panel shall have comprised of following switch gear . Including supply and fixing the same and painting with powder coating including internal connections cost and conveyance of all materials &labour charges. "

1250A Aluminium Bus Bar arrangement for to accept required outgoing cables with insulators with colour code.(0.8A/Sqmm).

Earthing Flat: Providing suitable G.I Flat

Incomer:Incomer: Incomer: 1000 A 4 Pole ACB Drawout type, motorised , (Confirms to IS/IEC 60947-2 having Breaking Capacity 50KA with thermal magnetic release Panel Mounted. - 1 Nos.

Makes : Siemens (Sentron- 3WL) / L&T U Power / Schneider Master Pact / ABB Emax /C&S.Winmaster2 / Legrand DMX3

Outgoings:

800A 4P MCCB, Adjustable, Confirms to IS/IEC 60947-2 having Breaking Capacity 50 KA with thermal magnetic release Panel Mounted. - 1 Nos.

630A 4P MCCB, Adjustable, Confirms to IS/IEC 60947-2 having Breaking Capacity 50 KA with thermal magnetic release Panel Mounted. - 1 Nos.

400A 4P MCCB, Adjustable, Confirms to IS/IEC 60947-2 having Breaking Capacity 50 KA with thermal magnetic release Panel Mounted. —4 Nos.

250A 4P MCCB, Adjustable, Confirms to IS/IEC 60947-2 having Breaking Capacity 35 KA with thermal magnetic release Panel Mounted Makes : L&T- D shine / Schneider- NS NSX / Legrand -DP X3 / Siemens-3VL / Hagerh3 / C&S -Winbreak - 3 Nos

0-415V volt Digital meter of size 96x96mm on exisiting box / panel board including connections etc., complete of CONZERVE / ELMEASURE / MECO / HPL MAKE. - 1 No.

0-100 / 200 / 400 / 600 /1000 - 5A CT Digital Ammeter of size 96x96mm on existing box / panel board including connections etc., complete of CONZERVE / ELMEASURE / MECO / HPL MAKE. - 1 No.

Analog selector switch for voltmeter / Ammeter on the existing box / panel including connections etc., complete. L&T / C&S / SALZAR / HPL MAKE. - 2 Nos

Analog LED indicator lamps on the existing box / panel board. L&T / C&S / SALZAR / HPL MAKE. - 3 Nos.

Analog LT current transformer with bar primary 100/5A to 1000 / 5A ratio in the existing box / panel including connections etc., complete. KAPPA MAKE. - 3 Nos.

Labour charges etc complete with connections for Finished item of work.

28 B. Floor Power Panel

“Supply installation testing and commissioning of 3 phase and neutral 415V free standing floor mounted outdoor model LT panel made out of No.16/14 gauge CRCA sheet steel after 7 tank process and painting with powder coating. The panel shall consists of suitable rating TPN Aluminium busbar (with rating of 0.8A/Sqmm) supported with DMC /SMC barriers and colourcoated with heat shrinkable sleeves, flexibility to accept the up four out going cables and necessary cable chamber . The panel shall have comprised of following switch gear . Including supply and fixing the same and painting with powder coating including internal connections cost and conveyance of all materials &labour charges.”

800A Aluminium Bus Bar arrangement for to accept required outgoing cables with insulators with colour code.(0.8A/Sqmm).

Earthing Flat: Providing suitable G.I Flat

Incomer: 630A 4 Pole MCCB, Adjustable, Confirms to IS/IEC 60947-2 having Breaking Capacity 35/36 KA with thermal magnetic release Panel Mounted. - 1 No.
Makes of MCCB : L&T- D sine / Schneider-NS NSX / Legrand -DP X3/ Siemens-3VL / Hager-h3/C&S -Winbreak.

Outgoings:

250A 4P MCCB, Adjustable, Confirms to IS/IEC 60947-2 having Breaking Capacity 35 KA with thermal magnetic release Panel Mounted Makes : L&T- D shine / Schneider-NS NSX / Legrand -DP X3 / Siemens-3VL / Hagerh3 / C&S -Winbreak - 4 Nos

125A 4P MCCB, Adjustable, Confirms to IS/IEC 60947-2 having Breaking Capacity 25 KA with thermal magnetic release Panel Mounted. Makes : L&T- D shine / Schneider-NS NSX / Legrand -DP X3 / Siemens-3VL / Hagerh3 / C&S -Winbreak - 10 Nos.

63A 4P MCCB, Adjustable, Confirms to IS/IEC 60947-2 having Breaking Capacity 25 KA with thermal magnetic release Panel Mounted
Makes : L&T- D shine / Schneider-NS NSX / Legrand -DP X3 / Siemens-3VL / Hagerh3 / C&S -Winbreak - 4 Nos.

0-415V volt Digital meter of size 96x96mm on existing box / panel board including connections etc., complete of CONZERVE / ELMEASURE / MECO / HPL MAKE. - 1 No.

0-100 / 200 / 400 / 600 /1000 - 5A CT Digital Ammeter of size 96x96mm on existing box / panel board including connections etc., complete of CONZERVE / ELMEASURE / MECO / HPL MAKE. - 1 No.

Analog selector switch for voltmeter / Ammeter on the existing box / panel including connections etc., complete. L&T / C&S / SALZAR / HPL MAKE. - 2 Nos

Analog LED indicator lamps on the existing box / panel board.L&T / C&S / SALZAR / HPL MAKE. - 3 Nos.

Analog LT current transformer with bar primary 100/5A to 1000 / 5A ratio in the existing box / panel including connections etc., complete.KAPPA MAKE. - 3 Nos.

Labour charges etc complete with connections for Finished item of work.

28. C : FLOOR LIGHTING PANEL

"Supply installation testing and commissioning of 3 phase and neutral 415V free standing floor mounted Out door Type MV panel made out of No.16/14 gauge CRCA sheet steel after 7 tank process and painting with powder coating. The panel shall consists of suitable rating TPN Alluminium busbar (with rating of 0.8A/Sqmm)supported with DMC /SMC barriers and colourcoated with heat shrinkable sleeves, flexibiltioy to accept the up four out going cables and necessary cable chamber.The panel shall have comprised of following switch gear . Including supply and fixing the same and painting with powder coating including internal connections cost and conveyance of all materials &labour charges. "

400A Aluminium Bus Bar arrangement for to accept required outgoing cables with insulators with colour code.(0.8A/Sqmm).

Earthing Flat: Providing suitable G.I Flat

Incomer: 250 A 4 Pole MCCB, Adjustable, Confirms to IS/IEC 60947-2 having Breaking Capacity 35/36 KA with thermal magnetic release Panel Mounted. - 1 No.

Makes of MCCB : L&T- D sine / Schneider-NS NSX / Legrand -DP X3/ Siemens-3VL / Hager-h3/C&S -Winbreak.

Outgoings: 125A 4P MCCB, Adjustable, Confirms to IS/IEC 60947-2 having Breaking Capacity 25 KA with thermal magnetic release PanelMounted.Makes : L&T- D shine / Schneider-NS NSX / Legrand -DP X3 / Siemens-3VL / Hagerh3 / C&S -Winbreak - 4 Nos.

63A 4 Pole MCCB, Adjustable, Confirms to IS/IEC 60947-2 having Breaking Capacity 16 KA with thermal magnetic release PanelMounted.Makes : L&T- D shine / Schneider-NS NSX / Legrand -DP X3 / Siemens-3VL / Hagerh3 / C&S -Winbreak - 3 Nos.

0-415V volt Digital meter of size 96x96mm on exisiting box / panel board including connections etc., complete of CONZERVE / ELMEASURE / MECO / HPL MAKE. - 1 No.

0-100 / 200 / 400 / 600 /1000 - 5A CT Digital Ammeter of size 96x96mm on existing box / panel board including connections etc., complete of CONZERVE / ELMEASURE / MECO / HPL MAKE. - 1 No.

Analog selector switch for voltmeter / Ammeter on the existing box / panel including connections etc., complete. L&T / C&S / SALZAR / HPL MAKE. - 2 Nos

Analog LED indicator lamps on the existing box / panel board.L&T / C&S / SALZAR / HPL MAKE. - 3 Nos.

Analog LT current transformer with bar primary 100/5A to 1000 / 5A ratio in the existing box / panel including connections etc., complete.KAPPA MAKE. - 3 Nos.

Labour charges etc complete with connections for Finished item of work.

28. D :130KVAR Out Door Capacitor panel

“Supply installation testing and commissioning of 3 phase and neutral 415V free standing floor mounted Outdoor model panel made out of No.16/14 gauge CRCA sheet steel after 7 tank process and painting with powder coating. The panel shall consists of suitable rating TPN Aluminium busbar (with rating of 0.8A/ Sqmm)supported with DMC /SMC barriers and colourcoated with heat shrinkable sleeves, flexibility to accept the up four out going cables and necessary cable chamber . The panel shall have comprised of following switch gear . Including supply and fixing the same and painting with powder coating including internal connections cost and conveyance of all materials &labour charges.”

Incomer: 250A FP MCCB, Adjustable, Confirms to IS/IEC 60947-2 having Breaking Capacity 36/35 KA with thermal magnetic release Panel Mounted - 1 No

Makes of MCCB : L&T- D sine / Schneider-NS NSX / Legrand -DP X3/ Siemens-3VL / Hager-h3/C&S -Winbreak.

63A 10KA TP MCB, C/D Curve ISI Mark Makes : Legrand-DX3 / Shneider-Acti9. - 9 Nos.

20 KVAR Capacitor Duty contactors

Makes : L&T / Siemens / EPCOS / Meher. - 5 Nos.

10 KVAR Capacitor Duty contactors

Makes : L&T / Siemens / EPCOS / Meher. - 2 Nos.

5 KVAR Capacitor Duty contactors

Makes : L&T / Siemens / EPCOS / Meher. - 2 Nos.

Supply and fixing of 12 stage APFC Relay with connection etc complete. Makes : L&T / Siemens / EPCOS / Schneider / Elmeasure- 1 No

MPP type heavy duty capacitor of operating voltage not less than 480V and losses not more than 0.35W per KVAR and inrush current withstand capability 300 times the rated current.(20KVARx5 Nos.= 100 KVAR, 10KVAR X2 Nos=20 KVAR, 5KVAR X 2 No's=10KVAR). Total = 130KVAR Makes:L&T/Siemens/Schneider/Epcos.

0-415V volt Digital meter of size 96x96mm on existing box / panel board including connections etc., complete of CONZERVE / ELMEASURE / MECO / HPL MAKE. -1 No.

0-100 / 200 / 400 / 600 /1000 - 5A CT Digital Ammeter of size 96x96mm on existing box / panel board including connections etc., complete of CONZERVE / ELMEASURE / MECO / HPL MAKE. - 1 No

Analog selector switch for voltmeter / Ammeter on the existing box / panel including connections etc., complete. L&T / C&S / SALZAR / HPL MAKE. - 2 Nos

Analog LED indicator lamps on the existing box / panel board. L&T / C&S / SALZAR / HPL MAKE. - 3 Nos

8 Stage APFC Relay with connection etc complete. - 1No.
Makes : L&T / Siemens / EPCOS / Schneider / Elmeasure

Analog LT current transformer with bar primary 100/5A to 1000 / 5A ratio in the existing box / panel including connections etc., complete. - 3 Nos. KAPPA MAKE.

Labour charges etc complete with connections for Finished item of work.

29. 630 KVA Transformer OLTC for transformers with RTCC and LT Kiosk with 1000A Breaker

Supply, Transportation, Installation, Testing and Commissioning of 630 KVA TRANSFORMER with all test reports. The Transformer shall be designed and manufactured as per IS:1180 OLTC with level-II with initial filling of oil as per IS 335-1993.

1 No. 1000 A ACB at LT side shall be provided.

The basic details of the Transformer are as under.

Makes: Kirloskar / PETE / Esennar / Voltamp / Crompton / ABB / Schneider.

1. Quantity : 1
2. Rated KVA : 630 KVA
3. Service & Location: Continuous Outdoor
Distribution Transformer
4. Mounting : Plinth.
5. Wound : Copper Double wound
6. Type : Core type oil immersed
7. Cooling : ONAN
8. Temp Rise : 40⁰C in oil, 45⁰C by resistance
9. Vector Group: Dyn 11
10. Primary Connection : Delta
11. Nominal Voltage / Current : 415V/433 V
12. Highest system Voltage: 12000V
13. Primary Frequency :50 HZ +/- 3%
14. Number of Phases : 3
15. Primary wires: 3
16. Secondary connection : Star
17. Secondary Volts / Current : 433V
18. Secondary phases : 3
19. Secondary wires: 4
20. Taps on primary winding for primary voltage
variation : +5% to - 10% in steps of 2.5% of 7
position (6 Steps)
21. Terminal arrangement.
a.HV: HT terminal box as per the site
condition.

- b. LV: Cable box suitable to receive -----
--Sq.mm XLPE cable
- 22. LV: One separate terminal for earthing.
- 23. Total Losses at 50% Loading [Watts] [Max] ---
as per IS
- 24. Total Losses at 100% Loading [Watts] [Max] ---
as per IS
- 25. Percentage Impedance at 75 deg. C at -----
as per IS
- 26. No Load current: Less than 2% of full load
current.
- 27. Standard Fittings & Accessories.
 - a. Rating and terminal marking plate: One
 - b. Lifting Lugs: Two
 - c. Off-circuit tap switch :One
 - d. Earthing Terminals :Two
 - e. Radiators (Attachable)
:Adequate
 - f. Explosion vent with Diaphragm :One

29.B: 750 KVA Generator Set with AMF Control Panel

Supply, Transportation, erection and commissioning (Excluding Foundation) of 3 Phase, 415, 50Hz, water cooled multi cylinder diesel generator set with alternator of 750 KVA output continuous rating directly coupled Engine and Alternator 750 KVA, 415 Volts with guard and mounted on a common base plate of Robust construction and complete with AMF panel having IP-52 protection, Acoustic Enclosure as per CPCB norms , sound absorbing material, t to restrict sound level up to 75 dB up to 1 Mtr distance and as per CPCB norms etc as per following specifications mentioned below

A. Alternator : Kirloskar / Stamford / Crompton Greaves / Leroy Somer make. The alternator of

the output rating shall be 3 Phase, 415V, 50Hz, Ac , 0.8 P.F. lagging at 1500 RPM. The alternator

is self-excited, self-regulated, and shall confirm to IS: 13364 of 1992 with regulation of +5% from

no load to full load. degree of protections shall be IP21.

B. Diesel Engine : Kirloskar / Cummins / Mahindra & Mahindra / Greaves Cotton / Eicher

/ Ashok Leyland Diesel Engine start, developing suitable ----- BHP output at 1500 RPM with mechanical / electronic governing so as to enable the alternator to give - - - -KVA continuous output at 0.8 P.F. lagging at NTP conditions. The diesel engine shall be capable of providing 10% O/L for 1 Hr for every 11 Hrs. of continuous running at full load. The engine with 1st filling of oil and Diesel etc.

01. Exhaust pipe of required size and length with insulation or cladding.

02. Diesel tank suitable for 8 to 12 Hours running capacity.

03. Residential Silencer.

04. SMF Batteries with leads as per the Manufacturer standards

C. AMF Control Panel:- AMF control panel shall be fabricated with 16SWG CRCA sheet shall be totally enclosed with dust and Vermin proof, floor mounted / wall mounted type and shall be comprising the following.

01. Voltmeter with selector switch.
02. 4 Pole MCCB incomer of -----A rating of Schneider / L&T make for EB and DG .
03. Ammeter with selector switch with CTs.
04. PF Meter and frequency Meter.
05. Indicator lamps (set Run, Load ON) with fuses.
06. KWH Meter of required rating.
07. Set of control fuses and current transformer.
08. Input Terminal board and output Terminal Board.
09. Battery charger with transformer rectifier unit.
10. Alternator supply air break contactor of L&T make.
11. Main supply air break contactor of L&T make.
12. Audio Visual annunciation .
13. Main supply voltage set of control relays and timers with one mode selector switch, set of push buttons.
14. Control cable up to 15 Mtrs 2.5Sq.mm 6 Core

30. LT C ABLES:

Supply of the Following PVC XLPE armoured cable 1100 V Grade with ISI mark stranded / solid, aluminium conductor complete.

- a) 25 Sqmm 3.5 Core
- b) 50 Sqmm 3.5 Core.
- c) 70 Sqmm 3.5 Core
- d) 120 Sqmm 3.5 Core
- e) 185 Sqmm 3.5 Core
- f) 240 Sqmm 3.5 Core
- g) 300 Sqmm 3.5 Core

Makes: Torrent / Unicab / Universal / Polycab / Havells / Gloster / KEI / Finolex / Paragon.

31. LT CABLE TERMINATIONS

Providing of end termination for the LT Cable with Gland and Aluminium lugs , crimping with machine tool , insulation tape tagging and as directed by the department including cost and conveyance of all materials and labour charges etc., complete.

- a) 3.5 Core 25 Sqmm UG Cable
- b) 3.5 Core 50 Sqmm UG Cable
- c) 3.5 Core 70 Sqmm UG Cable
- d) 3.5 Core 120 Sqmm UG Cable
- e) 3.5 Core 185 Sqmm UG Cable
- f) 3.5 Core 240Sqmm UG Cable
- g) 3.5 Core 300Sqmm UG Cable

- h) Earth work excavation of Trench in hard ground soil and Sand filling shall be provided at the bottom of trench before laying the cable and laying of U.G cables up to 70 sqmm covering the cable with back filling of Trench duly providing Cable

route Indicators of size 152mm round / 102mm x 102mm / 152mm x 152mm at every 8 Mtrs distance embedded in C.C including cost and conveyance of materials and labour charges etc., complete.

- i) Earth work excavation of Trench in hard ground soil and Sand filling shall be provided at the bottom of trench before laying the cable and laying of U.G cables from 95 Sqmm up to 420 sqmm covering the cable with bricks and back filling of Trench duly providing Cable route Indicators of size 152mm round / 102mm x 102mm / 152mm x 152mm at every 8 Mtrs distance embedded in C.C including cost and conveyance of materials and labour charges etc., complete.
- j) Laying of PVC armoured under ground cable up to 95 Sqmm fixing on chromium plated metallic base saddles on wall as per IS 1255 and as directed by the department including cost and conveyance of all materials and labour charges etc., complete.
- k) Laying of PVC armoured under ground cable from 120 Sq.mm to 400 Sqmm fixing on chromium plated metallic base saddles on wall as per IS 1255 and as directed by the department including cost and conveyance of all materials and labour charges etc., complete.

32. PERFORATED CABLE TRAY

a) Supply and Installation of 150mm x 50mm x 2mm thick hot dip GI perforated cable tray without cover along with coupler plates, T's, Bends, Reducers, Anchor bolts, nuts, washers and slotted channels / Angle Iron Channels etc complete and the tray should be fitted on the wall / Ceiling etc. complete for finished item of work. Makes: DEC/MNR/ H FAB or equivalent

b) Supply and Installation of 300mm x 50mm x 2mm thick hot dip GI perforated cable tray without cover along with coupler plates, T's, Bends, Reducers, Anchor bolts, nuts, washers and slotted channels / Angle Iron Channels etc complete and the tray should be fitted on the wall / Ceiling etc. complete for finished item of work. Makes: DEC/MNR/ H FAB or equivalent

33. UPS SYSTEM

a) Supply, Transportation and installation of 10KVA / 312V DC on line UPS system IGBT based rectifier with input power factor correction 32 bit microprocessor based with isolation transformers double conversion, SNMP controls, LCD display, Pure sine wave output, with auto static switch three phase input / Three phase output and modular structure for better thermal technology / cooling facility, with warranty up to three years. Makes: APC / Numeric / Emerson.

b) Supply andfixing of 12V, 150 AH MF battery including wire leads.

Makes : Amar Raja (Power Zone) or Equivalent model of Exide / Panasonic / Gotech.

c) Supply and providing of UPS cum battery rack 20 batteries

33.1Supply, Transportation, Installation, Testing and commissioning of storage / Pressure type Vertical / Horizontal 230/250V single phase 2000watts ISI mark 5 Star rated water heater with ABS plastic body of 15 Ltrs capacity to withstand up to 8.0 bar of water pressure including all standard accessories and dead weight pressure reducing valve on out let side, including cost of 2 Nos SS flexible braided hose pipe, testing and all labour charges etc., complete. Makes : Crompton Solarium BLX / Jaquar Elena /

Venus Lyra / Racold Eterno Swift / Racold Andris Lux Plus / AO Smith HSE SDS / AO Smith HSE SES / Havells Puro Turbo or equivalent as approved by the Dept.

34. 26 PERSONS ICU BED CUM PASSENGER Capsule LIFT Supplying, installation, commissioning, testing, putting into operation and handing over of **26 Persons Bed cum Passenger Lift (1786 Kgs)** with following specifications. **Makes :Kone/OTIS/Schindler/MITSUBISHI.**

Type & Capacity: Bed and 1786 Kgs 26 Passenger lift , Speed Approximately: 1.0 m/sec, Type of Drive: Variable voltage variable frequency drive (v3f), Location of Machine Room: Top Above Lift well, Travel: Approximately 35 mts to 40 mtrs, Serving: 10 Stops, Ten Landings and 10 Openings(C,G,1,2,3,4,5,6,7,8), Well Size approximately: 2070mm Wide x 3000 mm Depth, Power Supply: 415 V, 3 phase 50 Cycles AC, Auxiliary required: Single Phase 220 V, 50 Cycles AC, Car size (clear inside) approx.: 1200 mm wide x 2400 mm deep x 2200 height., Car Enclosure: Stainless Steel Hairline Finish, Flooring-aluminium, Car Illumination: LED Lighting, Electric Light/Fan: LED/400 mm, No. of Entrances: 10 (all are on same side), Car Entrance: Telescope doors SS finish, Landing Entrance: Telescope doors SS finish, Door size: 1000 mm wide x 2000 mm height, Control: Micro Processor based simplex full collective control with attendant operation, Indicators: Car & Landings: LCE type direction and Position Indicators with Stainless steel face plates. Including Scaffolding, minor building works like chipping, Grouting and pocket cutting.

Other Feature Included:

All Civil works (Civil Work of Pit Shaft) Scaffolding, Cladding & Other Provisions as required and

- 1.Minor Builders Work
- 2.Landing Push Button In Landing Door Frames
- 3.3 Way Intercom / Press And Speak Phone
- 4.Battery Operated Emergency Light And Alarm Bell
- 5.Floor Annunciator With Music
- 6.Automatic Rescue Device (ARD)
- 7.Vandal Proof S.S. Button With S.S. Cover
- 8.Push Button - Orange L E D Illumination
- 9.Call Register Signal And V f Door Operator
- 10.Full Car Operating Panel
- 11.LCE Type D & P Indicators In Car & Landings -Orange Colour
- 12.False Ceiling In Car
- 13.Firemans Switch
- 14.Infra Red Door Screen
- 15.Provision For Music
- 16.Overload Warning Indicator
17. Provision For EPABX
- 18.Necessary Scaffolding
- 19.Buffer Rails
- 20.Pit Ladder

- 21. Gearless Motor
- 22. Car Door Safety lock-additional safety

35. HEATING VENTILATION & AIR – CONDITIONING (HVAC) SYSTEM

35.1. Split Air Conditioners

Supply, Transportation and Installation of Inverter type split AC units with high wall Supply, Transportation and installation of 1.5 TR 3 Star capable of delivering 18000 BTU/hr split AC unit with high wall mounted 100% copper indoor unit and outdoor condensing unit Hermetically sealed compressor suitable for operation on 230V, 50Hz, 1Phase AC supply capable of performing cooling dehumidifying air circulating and filtering with cooling and condensing units with 3.0 mts of copper piping, insulation kit and 4 mts of 3 core copper flexible chord (Voltage range 160- 264 volts) and cordless remote control with 5 years warranty compressor for 5 years including servicing. Makes : Carrier / Daikin / Blue Star / Hitachi.

35.2. Supply, Transportation and installation of 2.0 / 1.8 TR 2-3 Star capable of delivering 21600 BTU/hr and above of capable of delivering 18000 BTU/hr split AC unit with high wall mounted 100% copper indoor unit and outdoor condensing unit Hermetically sealed compressor suitable for operation on 230V, 50Hz, 1Phase AC supply capable of performing cooling dehumidifying air circulating and filtering with cooling and condensing units with 3.0 mts of copper piping, insulation kit and 4 mts of 3 core copper flexible chord (Voltage range 160- 264 volts) and cordless remote control with 5 years warranty compressor for 5 years including servicing. Makes Daikin / Thoshiba / O General / Carrier / Blue Star / Hitachi.

35.3. Voltage Stabilizers:

Supply and erecting fully automatic line voltage stabilizer for operation on input voltage 200 to 250V. rated for 4 KVA maximum load and time delay model with Volt meter, selector switch, 6A / 16A flush type, 5 pin socket for output and with 3 core flexible chord and 3 pin 6/16A plug top suitable for refrigerator for continuous operation including cost and conveyance of all materials and all labour charges etc., complete. Makes: V-Guard / Real Guard / Uni Stab / ITL.

35.4. Supply and erecting fully automatic line voltage stabilizer for operation on input voltage 200 to 250V. rated for 5 KVA maximum load and time delay model with Volt meter, selector switch, 6A / 16A flush type, 5 pin socket for out put and with 3 core flexible chord and 3 pin 6/16A plug top suitable for refrigerator for continuous operation including cost and conveyance of all materials and all labour charges etc., complete. Makes : V-Guard / Real Guard / Uni Stab / ITL.

35.5 Ductable Air Conditioners

Supply, Errection, Testing and Commissioning of Ductable Split Air Conditioners with scroll compressor (multiple numbers) including electrical panel with scanner for phase sequence under voltage, over and single phase preventor ON/OFF indicators for compressor and initial charges of Refrigerant gas and oil as required. MS structural work for supporting air cooled condensers on wall / flooring and PVC drain piping for the units with Copper tubes for suction and liquid between indoor and outdoor unit, Fresh air intake GI louvers with bird screen as per standard.

Make : Daikin/ Blue Star / Mitsubhishi/Carrier/ Hitachi/Voltas .

35.5. 5.5 TR with ISEER ≥ 4

35.6. 8.5TR with ISEER ≥ 4

35.7. 11.0 TR with ISEER ≥ 4

a) Erecting, Testing and Commissioning of Air Conditioners with initial charging of refrigerant for filling in pipe line Gas and MS structural work for supporting air cooled condensers. on wall / flooring and PVC drain piping for the units

b) Supply, installation and testing of Refrigerant Piping consisting of Copper tubes of wall thickness 20G/22G inclusive of Suction Gas Piping & Fittings, Liquid Line Piping & Fittings, with class "O" nitrile rubber Insulation with finish as required. The piping to be mounted & supported properly with suitable size of clamp, M.S. hanger, tray etc., as required at site

Makes: Totaline/Mandav/Mexico

c) The insulation shall be closed cell/cross linked elastomeric Nitrile rubber of thickness 13/19 mm. The insulation thickness up to 19.1 mm dia pipe shall be 13 mm and above 19.1 mm dia, the insulation thickness shall be 19 mm. Testing of refrigerant piping and procedure shall be done as per Manufacturer's recommendations.

d) Supply, erection, testing and commissioning of Fresh air intake GI louvers with bird screen as per standard specifications.

e) Supply, installation, testing & commissioning of GSS Ducting with required angle flanges & installation materials such as heavy duty supports by anchor fasteners etc as required as per IS 655 /SMACNA Standards.

Makes: TATA/Jindal

f) Supply, installation and testing of Canvas connection for the Treated Fresh Air units to the duct & Indoor unit to Ducts.

g) Supply and fixing of 12/25 mm thickness closed cell nitrile rubber (Class O) insulation on existing duct after applying 2 coats of cold setting adhesive (CPRX Compound). The joints shall be sealed with 50mm wide and 3mm thick self adhesive nitrile rubber tape insulation complete.

h) Supply and fixing of 25 mm thickness closed cell nitrile rubber (Class O) insulation on existing duct after applying 2 coats of cold setting adhesive (CPRX Compound). The joints shall be sealed with 50mm wide and 3mm thick self adhesive nitrile rubber tape insulation complete with star bond coating and covered with 24 guage aluminum cladding as per specifications for outdoor applications.

i) Supply, Installation, Testing and commissioning of extruded Aluminum powder coated grills/ diffusers for supply with removable core type with volume damper

j) Supply, Installation, Testing and commissioning of collar damper.

k) Supply, Installation, Testing and commissioning of fire damper.

l) Supply and Fixing of Condenser stand for Ductable machines etc., complete.

36 FIRE FIGHTING & FIRE DETECTION SYSTEM

36.1. INTERNAL HYDRANT SYSTEM

a) Supply and fixing single headed internal / External hydrant valve with instantaneous Gunmetal of 63 mm dia with cast iron wheel ISI marked conforming to IS 5290 (Type -A) with blank Gunmetal/Stainless Steel cap and chain as required

Make: Mini Max / Safex / Newage / Winco / Newtech / Padmini.

(SSR 20-21, Item NO: 10.7.18)

b) Supplying and fixing of Hose Cabinet of size 750mm X 600mm x 250mm made of No 16 gauge SWG CRCA sheet with 6mm thick glazed glass door including necessary locking arrangement suitable to accommodate 2 Nos 15 mtr long Hose pipe, 1 No branch pipe, mounted on wall OR raised brick platform and duly painted with Post office red externally and white internally with synthetic enamel paint complete in all respect, for external hydrant as required.

Make: Mini Max / Safex / Newage / Winco / Padmini.

MAKE: Approved makes

(SSR 20-21., Item NO: ELEC-10.7.26)

c) Supply and fixing 63mm dia, 15 mtr long RRL hose pipe with 63mm dia Male and Female Gun metal / SS couplings duly binded with GI wire, rivets etc conforming to IS 636 (Type -A) as required.

Make: Mini Max / Safex / Newage / Winco /
Newtech / Padmini.

(ELEC-10.7.23)

d) Supply and fixing 63mm dia Gun metal branch pipe with 20mm (Nominal internal diameter) size Gun metal conforming to IS 903, suitable for instantaneous connection to interconnect hose pipe coupling as required.

Make : Mini Max / Safex / Newage / Winco / Newtech / Padmini.

(ELEC-10.7.27)

e) Supplying and fixing First -Aid Hose Reel with MS construction spray painted in Post office Red, Conforming to Is 884 with upto date amendments, complete with the following as required.

- 36.6 Mtr Long 20mm (Nominal internal) dia water hose Thermoplastic / Textile reinforced / Rubber braided / Polypropylene Type - 2 as per IS:12585 Make: Eversafe/ Reliance/ Newage/ SRI

- 20mm (Nominal internal) dia gun metal globe valve and nozzle. Make: Newage / Winco / Padmini / Safex.

- Drum and brackets for fixing the equipments on wall.

- Connections from riser with 25mm dia stop valve (gun metal) & MS pipe.

(ELEC-10.7.25)

f) Supply, Transportation, laying, testing & commissioning following of 'C' class heavy duty MS pipe conforming to IS 3589/IS 1239 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

Makes : Jindal / Hissar / Tata pipes (ELEC-10.7.19)

g) Supplying, fixing, testing and commissioning of butterfly valve PN 1.6, with Bronze / Gun metal seat duly ISI marked complete with Nuts, Bolts, Washers, gaskets,

conforming to IS 13095 of following sizes as required. Makes: Audco / Kirloskar / BDK / H-Shankar / Leader/ Zolotto / Intervalve / Honeywell.

h) Supply, installation, testing and commissioning of 25 / 20mm dia Air Release Valve.(ELEC-10.7.39)

i) Supply and fixing air vessel made of 250 mm dia, 8 mm thick MS sheet, 1200mm in height with air release valve on top and flanged connection to riser, drain arrangement with 25mm dia Gun metal wheel valve, with required accessories, pressure gauge and painting with synthetic enamel paint of approved shade as required.
(ELEC-10.7.29)

j) Supply, fabricating , installing structural steel supports for fixing all sizes of MS pipes from ceiling / wall with MS Channels, Angles, Flats, Rods, as required at site with anchor fasteners, Clamps, threaded rods, nuts, bolts,washersetc complete with painting.
(ELEC-ELEC-9.1.27)

36.2 AUTO SMOKE DETECTION SYSTEM

a) Supply and instillation of UL approved intellegent analogue addressable photo electric smoke detector including cost of base plate etc., complete as per specification with required fittings and accessories.

Makes: Siemens / Morley IAS / Bosch /
Ravel / Honeywell/cooper

(Above False Ceiling)

(ELEC-10.2.15).

b) Supply and instillation of UL approved intellegent analogue addressable photo electric smoke detector including cost of base plate etc., complete as per specification with required fittings and accessories.

Makes: Siemens / Morley IAS / Bosch /Ravel / Honeywell/cooper

(Above False Ceiling)

(ELEC-10.2.15).

c) Supply and installation of response indicators for above false ceiling detectors.
(ELEC-10.3.5).

d) Supply and installation of intallegent analogue addressable rate of rise cum fixed temperature heat detectors including the cost of base plate. 75mm dia MS outlet box for fixing of the detector base, mounting accessories etc., complete as per specifications and asrequired. Makes: Notifier / Edwards / Honeywell / Morley IAS / Bosch / Honeywell / Morley IAS / Bosch (ELEC-10.2.7)

e) Supply of 2 Core x 1.5Sqmm FRLS armoured copper cable as per IS. 7098 / Part-I / 1988 including all taxes etc., complete.

Makes: Universal / Unicab / Polycab / Finolex /Havells. (2 CORE 1.50 SQMM)

f) Supply and installation of Repeater panel including the cost of mounting accessories complete as per specifications and as required. Makes: System Censor / Ravel /Vertex (ELEC-10.3.2)

36.3. AUTOMATIC ALARAM SYSTEM

- a) Supply and installation of addressable analogue automatic call point with resettable flexible element to initiate alarm including the cost of mounting accessories etc. complete. Makes: Siemens / Morley IAS / Bosch / Ravel / Honeywell/cooper (ELEC-10.2.14)
- b) Supply and fixing of addressable wall mounting strobes cum hooters including the cost of mounting accessories complete as per specifications and as required including testing and commissioning. Makes: Notifier / Edwards / Honeywell /Morley IAS / Bosch / Honeywell / Morley IAS / Bosch/Cooper.(ELEC-10.2.4)
- c) Supply of 2 Core x 1.5Sqmm FRLS armoured copper cable as per IS. 7098 / Part-I / 1988 including all taxes etc., complete. Makes: Universal / Unicab / Polycab / Finolex /Havells.(2 CORE 1.50 SQMM

36.4FIRE EXTINGUISHERS

Supply & Fixing of 4.5Kg, CO2 Type Fire Extinguisher, Trolley Mounted, Easy Weight Management, Used Unused Mechanism, Squeeze Grip, Gross Weight 19.1 Kg, Empty Weight 14.6 Kg, Can Height 860MM, Diameter 140MM, Discharge time minimum 13 Secs, Controllable discharge mechanism, Range minimum 2 Meters, Applicable on Class B,C & electrically started Fire, B Rating 13B, Can Construction : HotSpinning / Forging, Valve Construction : Forging & Machining, Internal Coating of Can : Not Applicable, External Coating of Can : Spray Painting, Sheet metal thickness : 4.5MM, ISI & CE Approved, 2 Year Warranty Including transportation, all taxes and all labour charges etc complete. Makes : Safex / Kenex / Bharat / Reliance

- 36.5.** Supply and fixing of ABC stored pressure squeeze grip type fire extinguishers, 9 kg capacity, IS:15683 : 2006, filled with ABC Mono Ammonium Phosphate base powder-90 complete with discharge hose and wall mounting bracket, 2mm Mild Steel, EPDM Rubbers, Pressure Gauge, which work effectively on all class of fires (A, B, C & Electrical fires) with 5 years warranty Including transportation, all taxes and all labour charges etc complete. Makes : Safex / Kenex / Bharat / Reliance.
- 36.6**Supply and fixing of ABC Powder MAP 4 Kg Fire extinguisher Mono ammonium phosphate power 90, stored pressure type, IS 15683 : 2006, pressure gauge gross wt. 6.9 kg, empty wt. 2.9 kg, can Ht.440mm, Diameter 140mm, Discharge time less than 13 sec, controllable discharge mechanism, range min. 4 mts applicable on classes A,B, C & electrically started fires, A- rating 3A, B-rating 34B, can construction: Deep drawn Co2 mig welding, wall construction: Forging & Machining, internal coating of can: Epoxy power coating, External coating of Can: Epoxy polyester powder coating, sheet metal thickness:1.60mm, Helium leakage detection tested, ISI & CE approved with 5 years warranty Including transportation, all taxes and all labour charges etc complete. Makes : Safex / Kenex / Bharat / Reliance
- 36.7**Supply and fixing of 2 Kg Fire extinguisher Clean Agent HCFC 123, Stored pressure type, IS 15683 :2006 pressure gauge, gross weight 3.7 Kg empty weight 1.7 Kg, can height 344mm, Diameter 108mm, discharge time minimum 8 secs, controllable discharge mechanism, range minimum 2 meters, applicable on class A,B,C and electrically started Fire, A rating 1A, B rating 21B, can construction: Deep drawn & CO2 mig welded, Valve construction: Forging & Machining, Internal coating of Can: Epoxy powder coating, External coating of can: Epoxy polyester powder coating,

sheet metal thickness:1.60 mm, Helium leak detection tested, ISI & CE approved, 5 Years warranty. Makes : Safex / Kenex / Bharat.

36.8 SIGNAGE BOARDS

Supply and fixing of Escape and all room identifications signage boards in Rigid Photo luminescent based glow in Dark rigid sheet with high intensity luminous properties with specification of Cease Fire or its equivalent, make Model-1ES01(ELEC-10.5.4)

36.9 FIRE RATED DOORS

Supply & Fixing of Stainless steel Fire Rated doors, frames & shutters made of Stainless steel of 304 grade hairline finish, frame with 1.2mm thick Stainless steel of 304 grade hairline finish sheet formed to double rebate profile of size 143 mm X58 mm with maximum bending radius of 1.4 mm and filled with in-fill Polyurethane foam, the Door Shutters are with 0.80 mm thick Stainless steel of 304 grade hairline finish Sheet formed to provide a 46 mm thick fully flush, double skin door shell with Lock Seam joints at stile edges, fitted with in-fill of Honeycomb Kraft Paper and coated with polyester powder of Pure polyester/ epoxy polyester or polyurethane powder for powder coating of thickness 60 – 65 microns and are coated with Zinc Phosphate Primer to receive any paint on site or finished with Thermosetting Polyurethane paint of Aliphatic Grade providing high levels of scratch resistance and durability, the Shutter provided with 6 MM clear float vision glass in Circular, Square or Rectangular shapes, Stainless Steel Ball Bearing Butt Hinges 3 mm thick fixed flush to the frame and shutter (Profile 102x76x3mm thick). Mortise Sash Lock with Lever Handles, Mortise Dead Bolt, etc for 60 minutes Fire Rated door conforming to IS:3614 (Part2) 1992 BMT-N.60)

37 TELEPHONE & EPABX-NETWORK

a) Supply and fixing of Modular telephone Jack with connector on modular box with cover frame

Makes : GM Four-Five / Legrand Arteor / Schneider Zen celo / Million / Logus / Gold Medal Curve / Anchor Roma viola / CPL / Great White in existing concealed pipe wiring including cost and conveyance of all material and all labour charges etc., complete

b) Supply, Transportation and Run of 1 of 2 Pair, 0.5mm telephone copper wire
Makes: Finolex / Delton / Surabi / Polycab in the existing cable tray/ conduit pipe and labour charges etc., complete.

c) Supply, Transportation and Fixing of 50 pair Telephone distribution box with back mount frame, krone connector, powder coated metal body with lock and key arrangement including all accessories and labour charges etc., complete.

38 LAN –NETWORK

a) "Supply, Transportation and Fixing of Cat 6 RJ-45 information outlets Makes : D Link / AMP / Molex / Legrand / Krone including dual face plate including all accessories and labour charges etc., complete.

b) Supply, Transportation and Run of 1 of LAN Cable cat - 6 UTP cable Makes : D Link / AMP / Molex / Legrand / Krone in the existing cable tray/ conduit pipe and labour charges etc., complete.

c) "Certificate, Testing and Documentation etc., of each LAN Point complete.

d) Supply, Transportation and Fixing of 19" 6U floor / Wall mounting net work rack
Makes : HCL / Vall with power spike including all accessories and labour charges etc., complete.

e) Supply, Transportation and Fixing of 24 Port manageable switches Makes : CISCO / Net Gear / HP / D link. including all accessories and labour charges etc., complete.

39 BIOMETRIC ACCESS CONTROL

Supply, erection, testing, trial running and commissioning of Biometric access control with time and attendance module, including all accessories, PC, required licenses, Software requirement for PC interconnection complete etc. complete

Specifications:

Credential Support:	Card, Fingerprint and PIN
Fingerprint Module:	Optical
Fingerprint Templates:	9600
LCD (128x64 Dot -Matrix):	Yes
Touch Sense Keys (16):	Yes
Type of Card:	Smart and Proximity
USB:	Yes
Communication:	Ethernet and RS -485
Events Buffer:	50000
Communication Speed:	10/100Mbps on Ethernet and 115.2Kbps on RS -485
External Reader:	1 Port for Card or Fingerprint Reader
External Reader Interfaces:	RS -232 and Wiegand
External Reader Power:	12VDC@0.5A
Exit Switch Port:	Yes
Door Status Sense:	Programmable NO, NC, Supervised
Door Lock Relay:	Relay SPDT, Form C, 1A@30VDC
Door Lock Power:	Internal 12VDC@0.5A or External
Auxiliary Input Port:	Programmable NO, NC, Supervised
Auxiliary Output Relay:	Relay SPDT, Form C, 1A@30VDC
Tamper Detection:	Yes
Buzzer:	Yes
LED Indication:	4 LEDs (Status, Alarm, Allowed and Denied)
CPU:	32 -Bit Micro -Controller
Memory:	128KB SRAM, 512KB Internal Flash+2M B External Flash
Input Power:	12VDC@2 A
Environment:	0 ⁰ C to +50 ⁰ C (32 ⁰ F to 122 ⁰ F), 5% to 95% RH
Non -Condensing	
Make :	Honeywell, Matrix, Cisco, D-link, HP

CIVIL ITEMS

40. Supply and placing of the Design Mix Concrete M 25 grade corresponding to IS 456 with minimum cement content of 380 kgs per 1 cum of concrete using Concrete Batching Plant with 20mm size graded machine crushed hard granite metal (coarse aggregate - as per IS 383 - 1970 and IS 2386 Part 1 to Part 8) from approved quarry

including cost and conveyance of all materials like cement, fine aggregate (sand) coarse aggregate, water etc., to site and sales & other taxes excluding GST on all materials, centering using Casurina Ballies, Bamboos, Wooden Reapers, Runners, Wood Posts, Steel Plates etc., including all operational, incidental and labour charges such as weigh batching, machine mixing, lifting of concrete manually, laying concrete, curing, overheads complete for finished item of work (APSS No. 402)

41. Reinforced Cement Concrete M 20 design mix using 12mm size hard granite machine crushed graded metal (coarse aggregate - as per IS 383 - 1970 and IS 2386 Part 1 to Part 8) from approved quarry, using a minimum quantity of 350 kgs. of cement per 1 cum of concrete using Concrete Batching Plant including cost and conveyance of all materials like cement, fine aggregate (Sand), coarse aggregate, water etc., to site including steel centering, shuttering, labour charges such as weigh batching, machine mixing, laying concrete, lift charges, curing etc., complete for finished item of work (APSS No. 402 & 403) for platforms and shelves.

42. Masonry work in CM (1:6) prop (Cement : Screened sand) in superstructure with fly ash cement / lime solid blocks of size 290mm x 225mm x 140mm from approved source having minimum crushing strength of 50 Kg/Sqcm. including cost and conveyance of all materials like cement, sand, bricks, water etc., to site, including sales & other taxes excluding GST on all materials and such as labour charges, like mixing cement mortar, scaffolding charges, constructing masonry, lift charges, curing, complete for finished item of work. (APSS No. 501 & 504).

43. Reinforced Masonry for partition walls (100 mm thick) in CM (1:4) prop. (Cement : Screened sand) using fly ash cement / lime solid blocks of size 290mm x 100mm x 140mm having minimum compressive strength of 50 Kg/Sq.cm and placing 2 Nos. of 6mm M.S plain rods in every third layer with free ends of the reinforcement pegged into mortar joints of main brick walls where applicable including cost and conveyance of all materials like cement, steel, sand, bricks, water etc., to site, including sales & other taxes excluding GST on all materials, all operational, incidental charges such as labour charges for mixing cement mortar, scaffolding charges, constructing masonry, lift charges, curing, complete for finished item of work. (APSS No. of 509).

44. Plain Cement Concrete (1:3:6) nominal mix using 20mm size graded machine crushed hard granite metal (coarse aggregate - as per IS 383 - 1970 and IS 2386 Part 1 to Part 8) from approved quarry including cost and conveyance of all materials like cement, fine aggregate(sand), coarse aggregate, water etc. to site, including sales & other taxes excluding GST on all materials and including all charges for mixing, laying concrete in position, curing etc., & lift charges , for finished item of work. (APSS No. 402).

45. Filling with light weight concrete in Cement Concrete (1:5:10) proportion using brick jelly for low roofs including cost and conveyance of all materials like cement,

sand, brick bats etc., to site including cost of all labour charges for laying concrete, ramming, curing, etc., complete for finished item of work. (APSS No. 402).

46. Providing Thermo Mechanically Treated (TMT) (Fe -500/500D/550D from Primary producer TATA, SAIL, VSP, JSW & Shyam Steel etc as per IS 1786-2008) of different diameters for RCC works , including labour charges for straightening, cutting, bending to required sizes and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire of 18 SWG, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars, including all wastages such as overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in position, tying including sales and other taxes excluding GST on all materials etc complete for finished item of work. (APSS No.126).

47. Providing Mild steel (MS) steel bars (Fe 250 grade as per IS 432) of different diameters including labour charges for straightening, cutting, bending to required sizes and shapes, placing in position with cover blocks of approved materials and size and tying and lap-splicing with binding wire of 18 SWG, forming grills for reinforcement work as per approved designs and drawings, including cost and conveyance of steel bars, including all wastages such as overlaps, couplings, chairs, spacer bars including cost and conveyance of binding wire, cover blocks and all incidental, operational, labour charges such as cutting, bending, placing in position, tying including sales and other taxes excluding GST on all materials etc. complete for finished item of work.(APSS No.126).

48. Ornamental ceiling plastering 12mm thick in two coats using screened sand with base coat of 8mm thick in CM (1:6) and top coat of 4mm thick in CM (1:4) with dubara sponge finishing including cost and conveyance of all materials like cement, sand, water etc., to site, including sales & other taxes excluding GST on all materials, and all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, scaffolding, lift charges, curing, including cutting grooves as directed by Engineer-in-charge etc., complete for finished item of work. (SS 901,903 & 904).

49. Plastering 12mm thick in two coats using screened sand with base coat of 8mm thick in CM (1:6) and top coat of 4mm thick in CM (1:4) with dubara sponge finishing including cost and conveyance of all materials like cement, sand, water etc., to site, including sales & other taxes excluding GST on all materials, and all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, scaffolding, lift charges, curing, including cutting grooves as directed by Engineer-in-charge etc., complete for finished item of work. (SS 901,903 & 904).

50. Plastering 12mm thick in two coats using screened sand with base coat of 8mm thick in CM (1:6) and top coat of 4mm thick in CM (1:4) with dubara sponge finishing including cost and conveyance of all materials like cement, sand, water etc., to site, including sales & other taxes excluding GST on all materials, and all operational, incidental charges on materials and including cost of all labour charges for mixing mortar, finishing, scaffolding, lift charges, curing, including cutting grooves as directed by Engineer-in-charge etc., complete for finished item of work. (SS 901,903 & 904).

51. Providing impervious coat to exposed RCC roof slab surfaces of sump, sump side wall, sump bottom slab, in side of septic tank, in sunken slabs etc. to required slopes with CM (1:3) prop. using screened sand 12mm thick mixed with integral cement water proofing liquid conforming to IS: 2645-2003 manufactured by reputed manufacturers as approved by Engineer-in-charge at 1 Kg per one bag of cement, laid over roof slab when it is green, finished smooth with a floating coat of neat cement and thread lining at regular intervals of 45cmx45cm where ever necessary including cost and conveyance of all materials like cement, sand, water proofing compound, water etc., to site, including sales & other taxes excluding GST on all materials and operational, incidental, and labour charges for mixing mortar, laying, lift charges, rendering smooth and thread lining, curing including rounding off junctions of wall and slab etc., complete for finished item of work. (APSS No. 901 & 903). For Toilets.

52. Flooring with polished shahabad / Tandur stone slabs of 15mm to 18mm thick set over a base coat of CM (1:8), 12mm thick using screened sand over already laid CC bed / RCC roof slab including neat cement slurry of honey like consistency spread @ 3.3 Kgs per Sqm and jointed with neat cement to full depth including cost and conveyance of all materials like cement, sand, water, flooring stones etc. complete including sales & other taxes on all materials including all labour charges like dressing of flooring stones to the required size, mixing of cement mortar, laying, lift charges, cost of base coat, water charges etc., complete for finished item of work. (APSS No.703 & 701).

53. Flooring with non-skid full body ceramic floor tiles of size 300mm x 300mm and thickness between 7 - 8mm 1st quality conforming to IS: 13711, IS: 13712, IS: 13630(Part 1 to 15) of any colour and finish in all shades and designs as approved by Engineer-in-charge, set over base coat of cement mortar (1:8), 12mm thick using screened sand over CC bed already laid or RCC roof slab, including neat cement slurry of honey like consistency spread @ 3.3 Kgs per Sqm & jointed neatly with white cement paste to full depth mixed with pigment of matching shade, including cost of all materials like cement, screened sand, water and tiles etc., complete for finished item of work. (APSS No.701 & 707).

54. Providing skirting to internal walls to 10.00 cm height with Polished Shahabad/Tandur stone slabs 15mm to 18mm thick, length equal to flooring stones set

over base coat of CM(1:5) 12 mm thick using screened sand with cement slurry of honey like consistency spread at the rate of 3.30 kgs per sqm and jointing with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like tiles, cement, sand and water etc., complete complete for finished item of work.(APSS No.701 &707).

55. Providing dadoing to walls with glazed full body porcelain wall tiles of size 300 x 600 mm with any type of design texture such as marble finish, wooden, bamboo, stone finishes etc., scratch less, stain free and thickness between 6-8 mm 1st quality conforming to IS:13711, IS:13712, IS:13630 (Parts 1 to 15) of any colour and finish in all shades and designs with borders as approved by Engineer-in-Charge set over base coat of CM(1:5) 12 mm thick using screened sand with cement slurry of honey like consistency spread at the rate of 3.30 kgs per sqm and jointing with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like tiles, cement, sand and water etc., complete for finished item of work.

56. Providing dadoing to walls with glazed full body Ceramic tiles of any size and thickness between 5.0 to 7.0mm first quality confirming to IS: 13711, IS: 13712, IS: 13630 (Parts 1 to 15) of any colour and finish in all shades and designs with borders as approved by the Engineer-in-Charge set over base coat of CM (1:5)12 mm thick using screened sand with cement slurry of honey like consistency spread at the rate of 3.30 kgs per sqm and jointing with white cement paste mixed with pigment of matching shade to full depth, including cost of all materials like tiles, cement, sand and water etc., complete for finished item of work.

57. Supply & application of one coat water based cement primer of interior grade I and two coats of acrylic emulsion paint having VOC (Volatile Organic Compound) content less than 50 grams/litre for internal walls including cost and conveyance of all materials to site, sales & other taxes excluding GST, incidental, operational and all labour charges etc., complete for finished item of work in all floors.

58. Supply & application of one coat water based cement primer of exterior grade II and two coats of acrylic emulsion paint exterior grade with silicon additives having VOC (Volatile Organic Compound) content less than 50 grams/ liter for exterior walls including cost and conveyance of all materials to site, sales & other taxes excluding GST, incidental, operational and all labour charges etc., complete for finished item of work in all floors.

59. Painting to new wood work and flush shutters with lappam finish, over a primary coat and painting two coats of synthetic enamel paint Grade-II VOC (Volatile Organic Compound) content less than 50 grams/litre of approved shade including cost and conveyance of all materials to site cost of primer coat and all labour charges etc. complete including applying sand paper on lappam coats for neat finish including sales

& other taxes excluding GST on cost of all materials etc., complete in all floors (APSS No.1200, 1207 & 1211).

60. Painting two coats with synthetic enamel paint Grade-II VOC (Volatile Organic Compound) content less than 50 grams/litre over primer coat of red oxide to new iron work including cost and conveyance of all materials to site, sales & other taxes excluding GST, incidental, operational and all labour charges etc., complete for finished item of work in all floors. (SS No. 1201, 1212 & 1207).

61. Supplying and fixing of two shutter cupboards as per drawing with medium teak wood frames of size 100mm x 40mm and MDF Board Interior grade both sides laminated 18mm thick for shutters with 18mm x 12mm teak wood beading around and supplying and fixing Aluminum fixtures 3 Nos. butt hinges of size 100mm long (for each shutter), tower bolt 2 Nos. of 100mm x 10mm, 2 Nos of handles 100mm long and Heavy duty mortise lock 6/7 levers (IS:2209) with PC or CP handles complete set for shutters including cost and conveyance of all materials to site, labour charges, etc., complete for finished item of work.

62. RCM facia 50mm thick in CM (1:3) using screened sand for drop walls, fins with rabbit wire mesh & nominal reinforcement as directed by Engineer - In - Charge with dubara sponge finishing, including cost and conveyance of all materials to site, sales & other taxes excluding GST on all materials, operationals & incidental, cost and conveyance of cement, wire mesh, water to work site, centering, scaffolding and form work, lift charges etc., complete for finished item of work but excluding cost of steel and its fabrication charges for finished item of work (APSS NO.403&903).

63. Supplying and fixing of Unplasticised Poly Vinyl Chloride (UPVC) 3 track sliding windows with mesh shutter – (2-glass shutters and 1-mesh shutter) duly manufactured using UPVC reinforced profiles (Composition of profile shall consist of a minimum of 5.5 PHR of TiO₂ and not more than 12 PHR of CaCO₃ for every 100 parts of PVC resin) of (94mm x 45 mm)/(80 mm x 52 mm) x 2.20 mm for outer frames, (58 mm x 39 mm)/(54 mm x 38 mm) x 2.20mm for sliding shutter frames capable of mounting single glazing system structurally reinforced with hot dip galvanized up to 50 microns of minimum thickness of 1.0/1.2 mm prefabricated & welded through fusion welding. The window sash shall be fitted with 5 mm thick clear float glass of reputed make and mesh shutter frame shall be (42 mm x 25mm)/(52 mm x 21.5 mm) x 2.0 mm fitted with Vinyl Coated Fiber mesh- on rollers/ pulley duly fixed with Grey colour TPV Gasket for sash & Glazing bead shall be co-extruded with Grey colour soft PVC. System shall have single point locking with Touch Lock and the system is to be installed at the site using anchor fasteners, silicon rubber sealant, easy glazing/deglazing at site etc., including cost and conveyance of all materials, accessories, labour charges for transportation, erection at site including etc., complete for finished item of work.

64. Providing, supplying & fixing of Fixed Louvered Ventilator made out of multi chambered uPVC sections with Glazing bead shall be co-extruded with Grey colour soft PVC. having isolated drainage and reinforced with Galvanized Iron profiles throughout the window. The outer frame having an overall size of 60 mm x 55 mm x 2.40 with reinforcement of 1 mm thickness and Mullion with overall size of 74 mm x 60 mm x 2.40 mm with reinforcement of 1 mm thickness. (Composition of profile shall consists a minimum of 5.5 PHR of TiO₂ and not more than 12 PHR of CaCo₃ for every 100 parts of PVC resin). Ventilator shall be provided with 4.5 mm Pin Head glass, standard hardware. Wall thickness of frame & Mullion shall be 2.4 mm., including cost and conveyance of all materials, accessories, labour charges for transportation, erection at site including etc., complete for finished item of work.

65. Supplying and fixing of MS Grill to windows / in open court yards using 25mm x 6mm MS flat alround and 10mm MS square bars horizontally at 125mm centre to centre and vertically at 300mm centre to centre including fixing with 4 Nos of MS Z holdfasts (2 on each side) duly making cutting brick masonry, fixing and making to original surface neatly and painting grill with one coat of red oxide primer including cost all taxes excluding GST and conveyance of all materials including cutting, bending, welding including all operational charges and all labour charges etc., complete for finished item of work.

66. Flooring with 16 to 18 mm thick high polished granite stone slabs black colour as approved by the Engineer-in-Charge of length not less than 2.43 mts set over base coat of cement mortar (1:8), 20mm thick using screened sand over CC bed already laid or RCC roof slab including neat grey cement slurry of honey like consistency spread @ 3.3 Kg per sqm and jointed neatly with white cement paste mixed with pigment of matching shade to full depth including cost and conveyance of all materials like cement , sand , water , granite slabs etc., to work site and all operational, incidental labour & lift charges, half rounding the edge , polishing charges and all other taxes excluding GST on all materials, cost of base coat complete for finished item of work (S.S.701 & special).

67. Supply and fixing of doors as per approved drawings with medium teak wood frame of section 100mm x 65 mm with split type fan light of 500mm at the top fixed with 4mm thick pin headed glass using 12mm x 12mm Teak Wood beading and 2 Nos. of 10mm MS Square bars and ISI marked flush door shutter of 30mm thick double shutters with bond wood solid block board type core having cross bands and face veneers, hot pressed bonded with water proof phenol formaldehyde synthetic resin factory made conforming to IS 2202-1991 (Part-I) both sides commercial ply with internal lipping on all sides, including cost and conveyance to site of teak wood frame, flush shutter including supply and fixing 6 Nos. MS Z hold fasts of size 300 mm x 40 mm x 5mm including cost of ISI marked Aluminum fixtures of 6 Nos. butt hinges (IS:205) 150mm long, 1 No. aldrop (IS:2681) 300mm long, 2 Nos. tower bolts (IS:204)

of 200 mm x 10 mm dia at top, 2 Nos. 150mm long handles (IS:208), 2 Nos. door stoppers and 2 Nos. rubber bushes including fixing the fixtures to door with required number of screws, bolt and nuts including labour charges for fixing the frame in position, fixing the shutter to the frame, fixing glass in fan light portion etc., including for finished item of work as per APSS 1001 & 1002 (The vertical frame of door shall be embedded in flooring for a depth of not less than 10 mm) (1500mm x 2600mm).

68. Supply and fixing doors as per drawings with medium teak wood frame of section 100mm x 65 mm and ISI marked flush door shutters of 30 mm thick single shutter with bond wood solid block board type Core having cross bands and face veneers, hot pressed bonded with water proof phenol formaldehyde synthetic resin factory made conforming to IS 2202-1991 (Part-I) both sides commercial ply with internal lipping on all sides including cost and conveyance to site of teak wood frame, flush shutter including supply and fixing 6 Nos. MS Z hold fasts of size 300 mm x 40 mm x 5mm including cost of ISI marked Aluminum fixtures of 3 Nos. butt hinges (IS:205) 150mm long, 1 No. aldop (IS:2681) 300mm long, 1 No. tower bolt (IS:204) of 200 mm x 10 mm dia at top , 2 Nos. 150 mm long handles (IS:208), 1 No. door stopper and 1 No. rubber bush including fixing the fixtures to door with required number of screws, bolt and nuts including labour charges for fixing the frame in position, fixing the shutter to the frame etc., including complete for finished item of work as per APSS 1001 & 1002 (The vertical frame of door shall be embedded in flooring for a depth of not less than 10 mm) (1000mm x 2100mm).

69. Supply and fixing doors as per drawings with medium teak wood frame of section 100mm x 65mm and ISI marked flush door shutter of 30mm thick single shutter with bond wood solid block board type Core having cross bands and face veneers, hot pressed bonded with water proof phenol formaldehyde synthetic resin factory made conforming to IS 2202-1991 (Part-I) both sides commercial ply with internal lipping on all sides including cost and conveyance to site of medium teak wood door frame, flush shutter, including supply and fixing 6 Nos. MS Z hold fasts of size 300mm x 40mm x 5mm including ISI marked Aluminum fixtures 3 Nos. butt hinges (IS:205) of 150mm long, 1 No. aldop (IS:2681) 250 mm long, 1 No. tower bolt (IS:204) of 150 mm x 10mm dia, 2 Nos. 125mm long handles (IS:208), 1 No. rubber bush including supplying and fixing 1.20mm thick PVC sheet to full height of the shutter inside including labour charges for fixing the frame in position, fixing the shutter to the frame etc., including complete for finished item of work as per APSS 1001 & 1002. (The vertical frame of door shall be embedded in flooring for depth of not less than 10mm) (800mm x 2100mm).

70. Providing & Fixing of Scientific Doors with metal door frames and door shutters made of galvanize steel(base steel as per IS 513 of 0.58 mm thick D quality, galvanized as per IS 277 with Zinc of 120 GSM) coated with Zinc Phosphate Primer to receive any paint on site or finished with Thermosetting Polyurethane paint of Aliphatic

Grade providing high levels of scratch resistance and durability/Epoxy polyester powder for powder coating paint thickness 50-60 microns (Dry film thickness) outer frame section of 100 x 58 mm x 1.2 mm thick, shutter section of 0.80 mm thick galvanized steel sheet pressed (roll formed) for 46mm thick fully flush, double skin door shell seam joints at stile edges, in-fill of honeycomb kraft paper used to give the required rigidity and effective acoustic insulation with 6" Tower bolt – 2 Nos., 6" D handles – 2 Nos., 10" Aldrop – 1 No., Butt Hinges – 6 Nos, Mortise Lock of approved quality – 1 No, frames fixed to the concrete/masonry wall by means of self expanding screws etc., complete for finished item of work for Double leaf Door.

71. Supplying and fixing Gyp board Fine line Grid false ceiling (GS-FLC-4.6) using 12.5mm thick Gyp Board sheet tiles of size 595mm x 595mm conforming to IS 2095 - 1992 fixing to Gyp steel precoated GI wall angle of size 25mm x 25mm x 0.70mm thick along the perimeter of ceiling screw fixed to brick work / partition at 610mm center to center and suspending the frame work using precoated GI Tee section (24mm x 38mm x 0.7mm) from soffit at 1220mm center to center fixed with GI Soffit Cleat, rawl plugs and steel expansion fasteners & connecting clip to the GI Tee section with 4mm dia GI rod with galvanised spring steel level clip of PVC universal holding clips system at 1200mm center to center and fixing the 12.5mm Gypboard sheet tiles of size 595mm x 595mm and finishing two coats of drywall top coat complete for finished item of work in all floors.

72. Flooring with Vinyl Flooring Sheets/ tiles having a nominal total thickness of 2 mm with a wearing surface impregnated polyurethane homogeneous mixture of PVC, Plasticizers, Urethane, color pigments with wearing resistance and Fire Resistance as per standards, fixing Sheets over existing flooring with full depth jointing and pointing to the sheet with epoxy emulsion grout/ synthetic / resin adhesive including cost and conveyance of all materials like epoxy emulsion grout/ synthetic / resin adhesive , sheet, etc., to site including cost of materials and all labour charges, laying sheet to required slope as directed by the Engineer- in-charge etc., complete for finished item of work. (APSS No.701 & 707).

73. Perforated wall panels channeled wood works sheets of width 128mm, thickness of 16mm and length 2440 mm made of a high density particle board substrate with a

laminated facing as per the approved shade/ species & finish and a melamine balancing layer on the reverse side, with a special perforation pattern fluted perforation on the visible surface with a minimum sag resistance of RH90 and a fire rating class of 1 as per Part 7 of BS 476 with a "tongue-and-grooved" edges and the back of the perforated panel is with sound absorbing nonwoven Acoustical fleece.

74. Providing impervious coat to exposed RCC roof slab surfaces to required slopes with CM (1:3) prop. using screened sand 20mm thick (average) mixed with

integral cement water proofing liquid confirming to IS: 2645-2003 manufactured by reputed manufacturers as approved by Engineer-in-charge at 1 Kg per one bag of cement, laid over roof slab when it is green, finished smooth with a floating coat of neat cement and thread lining at regular intervals of 45cmx45cm including cost and conveyance of all materials like cement, sand, water proofing compound, water etc., to site, including sales & other taxes excluding GST on all materials and operational, incidental, and labour charges for mixing mortar, laying, lift charges, rendering smooth and thread lining, curing including rounding off junctions of wall and slab etc., complete for finished item of work. (APSS No. 901 & 903).

PLUMBING & SANITARY ITEMS

75. Supplying and fixing of 4" (101.6mm) multi floor trap with jali - UPVC/SWR pipe fittings as per site requirements with standard practice for all floors including cost and conveyance of all materials to site, labour charges etc., complete for finished item of work.

76. Supplying and fixing 580mm x 440mm long Orissa pan white glazed Water Closet 1st quality ISI marked confirming to IS:2556-Part-3-1981 with "P" or "S" trap, ISI marked and providing masonry seat, CC squatting plate and 10 litres capacity single flush PVC low level cistern with internal components fixed on 2 Nos. of teak wood blocks of size 76.20mm x 101.60mm using required size of nails, screws as approved by Engineer-in-charge, 15 mm nominal size CP finish brass angled stop valve screw type with internal /external threaded conforming to IS 8931, 12.70mm PVC connection with brass union nuts CP coated, 31.75mm brass plumber union, P trap or S trap of Indian W.C. shall be encased on CC (1:2:4) 150mm allround well above the joint to stop leakage at the joint etc., complete including cost and conveyance of all materials to site, cost of CC bed, complete for finished item of work.

77. Supplying and fixing European Water Closet of 1st quality conforming to IS:2556-Part-2-1973 of white glazed with 'S' trap, supplying and fixing best Indian make plastic seat and lid for European water closets with rubber or plastic Buffers as per IS 2548-1996 and 10 litres capacity single flush PVC low level cistern with internal components and fixed using required size of nails and screws, 15 mm nominal size CP finish brass angled stop valve screw type with internal /external threaded conforming to IS 8931, 12mm PVC connections with brass union nuts CP coated including cost and conveyance of all materials to site, etc., complete for finished item of work for all floors.

78. Supplying and fixing Indian make Flat Back Wash Hand Basin 1st quality conforming to IS:2556-Part-4:1972 of size 550mm x 400mm with 32 mm nominal size C.P. Fitting with parallel pipe thread conforming to IS:2963-1979 and fitted with 15 mm nominal bore Chromium Plated Pillar Tap of 1st quality Indian make heavy duty complete with standard CI brackets including wooden blocks, 1 No. 12.70mm PVC

connection with brass union nuts CP coated , angle stop cock 12.70mm dia. first quality Indian make heavy duty, 30mm dia. PVC flexible waste pipe 914.4mm length of 1st quality including cost and conveyance of all materials to site, labour charges for finished item of work.

79. Supplying and fixing CP finish brass soap dish of approved make ISI quality including cost and conveyance of all materials, labour charges for fixing for finished item of work in all floors.

80. Supplying and fixing TV shape mirror with plastic frame of size 609.6mm x 457.2mm , plywood back with NP screws 1st quality including cost and conveyance of all materials, labour charges for finished item of work in all floors.

81. Supplying and fixing of 25.4mm dia , 609.6mm long aluminum anodized towel rods with brackets and aluminum screws including cost and conveyance of all materials, labour for finished item of work.

82. Supplying and fixing 15 mm brass body CP finish bib tap of not less than 300 grams weight screw type (full turn) with internal / external threaded connection conforming to IS 8931 as approved by the Engineer-In-Charge including cost and conveyance of all materials, labour charges complete for finished item of work in all floors.

83. Supplying and fixing 15 mm brass body CP finish self closing tap push type conforming to IS 1711 as approved by the Engineer-In-Charge including cost and conveyance of all materials, labour charges complete for finished item of work in all floors.

84. Supplying and fixing Chromium plated finish brass body quarter turn Bibcock cum Health Faucet with 1m long tube and wall hook with 7 - 10 years un-conditional warranty with necessary fittings etc., complete including cost and conveyance of all materials, labour charges complete for finished item of work in all floors.

85. Supply and fixing of Ashirvad/ Ajay/ Astral Flowguard or equivalent CPVC Pipes and Fittings SDR 11 to meet the requirement of ASTM-D 2846 and are produced in CTS (Copper Tube Sizes 1/2" to 2") for hot and cold water (IS 15778:2007) including cost and conveyance of all materials to site, labour charges for fixing for finished item of work at all floor levels.

86. Supplying and fixing Bronze Gate/ Globe valve as per IS - 778 Class - I, Indian make heavy type including cost and conveyance of all materials, labour charges complete for finished item of work.

87. Supplying and fixing of SWR PVC pipes (Prince/ Sudhakar/ Kisan/ Supreme or any ISI brand) 4 Kg/Sq.cm. and fixing all special such as plain bends, off sets, door bends,

single junctions, double junctions as per site requirement, fixing with PVC clamps if necessary with required number of Bombay nails including cost and conveyance of all materials to site, labour charges for finished item of work at all floor levels. (APSS No. 1302 1319 & 1326)

87A. Supplying and fabricating, erecting and fixing in position trusses of approved design with structural steel other than MS circular tubes including roof frame work consisting of rafters, ties struts and purlins including cost of foundations bolts, cleats, bearings plates, etc., complete as per the sketch enclosed and including cost of primary coat with red oxide paint including cost and conveyance of all materials, labour charges for erecting & fixing all structural steel works erecting in position and fixing by using chain pulley blocks, Derek pole arrangements and cranes etc., complete in position, labour charges for fabrication, all incidental charges, overheads and contractor profit etc., complete for finished item of work as directed by the Engineer-in-Charge

87B. Supplying and fixing of Pre-painted Galvalume Trapezoidal Profile Roofing sheets with 0.50mm thickness, Coating: Alu-Zinc coating AZ150 GSM. Tensile Strength: 550 MPA. Paint coating: Regular Modified Polyester painting. Painting Thickness (Top): 18 to 20 Microns, (Bottom): 5 to 7 Microns. Sheet Width: 1.020, Length: Maximum 12 Meters with Regular Range Colours fixed with G.I 'J' bolts & nuts 8 mm dia with bitumen & G.I limpet washers filled with white lead & including a coat of approved steel primer and two coats of approved paint on over lapping of sheets complete (up to a pitch of 600) etc., complete, excluding the cost of purlins, rafters, trusses including cost and conveyance of all materials, labour charges, overheads and contractors profit etc., complete for finished item of work in all floors.

87C. Supplying and fixing 15 mm brass body CP finish self closing tap push type conforming to IS 1711 as approved by the Engineer-In-Charge including cost and conveyance of all materials, labour charges, overheads & contractors profit complete for finished item of work in all floors.

87D. Supplying and fixing white glazed flat back Bowl urinals of size 440 mm x 265 mm x 315 mm with integral flushing rim fixed with screws complete Indian make (HSW/Parry/Neycer) conforming to IS:2556-1995 as approved by Engineer-in-charge, including supply and fixing 12.7mm PVC connection with brass plumber union nuts CP coated, 12.70mm push cock 1st quality of approved make, 30mm dia PVC flexible waste pipe of 914.4 mm length of 1st quality including cost and conveyance of all materials to site, labour charges, overheads & contractors profit complete for finished item of work for all floors.

87E. Supplying and fixing of 16mm to 20 mm thick polished marble slab partitions of size 4' 0" x 2' 0" for urinals including full rounding the edges, fixing in position, polishing, including cost and conveyance of all materials and labour charges, overheads & contractors profit complete for finished item of work for all floors.

88. MEDICAL GAS PIPE LINE SYSTEM (MGPS)

The MGPS comprises of:

- a) Oxygen Manifold and Emergency oxygen manifold with automatic control panels
- b) Nitrous Oxide Manifold and Emergency NO₂ Manifold with automatic control panel

- c) CO2 Manifold and Emergency CO2 Manifold with automatic control panel
- d) Medical Air Supply System (4 Bar & 7 Bar) complete.
- e) Medical Vacuum (suction) Supply System Complete.
- f) Distribution Piping Complete with Accessories.
- g) Area Valve Service System.
- h) AGSS system Complete
- i) Alarm Systems (Master & Area)
- j) Gas Outlets with Probes
- k) Bed Head Panels

The bidder should ensure that all works carried out are to the recommendation made in the

Department of Health and Social Securities HTM 02-01 /NFPA 99C / DIN

Bidder should provide Oxygen, Air, Vacuum, AGSS, and Nitrous Oxide supply to Operation Theatres through a separate & dedicated pipeline system.

Bidder shall be responsible for supply, installation, testing and commissioning of complete MGPS system inside the operation theatre including Distribution piping, Pendants, outlets and other essential accessories.

Terminal units should be gas specific and only accept the correct Medical gas probe. Gas specific components shall be pin indexed to ensure that a correct gas specific assembly is accepted.

Each terminal unit should be identified by the appropriate recognized name or symbol, color-coding and shape as per HTM 02-01 /NFPA 99C. Outlets should be CE certified/UL listed.

Copper pipes should be of solid drawn, seamless, deoxidized, non-arsenical, half hard, tempered and degreased copper pipe. All copper pipes should be degreased & delivered capped at both ends.

The pipes should be accompanied with manufacturers test certificate for the physical properties & chemical composition. The copper pipe should comply with EN 13348.

Copper pipe must have reputed third party inspection certificate (Eg. Lloyd's, TUV, SGS).

Fittings should be made of copper and suitable for a working Pressure of up to 17bar and especially made for brazed socket type connections

The copper fitting should comply with EN 1254-1

The Brazing filler material should comply with EN 1044.

88.1. Supply and fixing of Copper Pipe Lines for Main line & Distribution lines, pipes shall be half drawn, tempered, seamless, phosphorous deoxidized, non arsenic and degreased confirming to BS: **EN 13348:2008/ ASTM B819** standards and Copper fittings should comply with **EN 1254:1** factory degreased and brazing filler metals

should comply with **EN 1044**. Fitting should be degreased, individually packed for medical use. including cost and conveyance of pipes, necessary specials made of copper and suitable for a steam working pressure of **17 bar** and should confirm to **BS 864** with specially made for brazed socket type connections, including taxes, transportation charges including laying and jointing, testing, commissioning and all other labour charges etc. complete for finished item of work (Copper pipe must have reputed third party inspection certificate (Eg. Lloyd's or TUV or SGS). **All the pipes from manifold/plant up to the outlets should be painted with two coats of synthetic enamel paint and colour codification should be as per standards followed and with consultation with competent authorities of the Institute.**

For Main lines:

- 28 mm dia. and 0.90 mm thick - 1500 Rmt
- 42 mm dia. and 1.20 mm thick - 600 Rmt
- 54 mm dia. and 1.20 mm thick - 800 Rmt

For Distribution lines:

- 12 mm dia. and 0.70 mm thick
- 15 mm dia and 0.90 mm thick
- 22mm dia and 0.90 mm Thick

88.2. Supply and fixing of **Isolation Valves** with necessary end fittings designed for a working pressure of 300 psi / 27 inc. Hg. Vacuum, Non Ferrous, Non Lubricated with 90 degrees turn, Hand lever operated of standard make of valves including cost and conveyance of all materials, taxes, transportation charges, fixing charges and testing charges and all labour charges etc. complete for finished item of work.

- i) 15 mm Valves (1/2")
- ii) 22 mm Valves (3/4")
- iii) 28 mm Valves - 3 Nos
- iv) 42 mm Valves - 2 Nos
- v) 54 mm Valves - 2 Nos

88.3. Supply and fixing **Gas Outlet Points with probes for Oxygen with S Brackets**, self ceiling brass valves with nut and cap and it should be 100% self sealing type, so that at the time of removal of probe, it should stop gas flow automatically, outlet should be single hand insertion, non inter changeable for specific gas, it should accept only correct medical gas adapter. with down tube of the specific gas should be brazed with brass bracket of the outlet, there after brass bracket should be fixed in wall with the help of the steel screw, with self sealing valve which should be screwed with the front portion of brass bracket and there after it should be covered by plastic cover duly colour coded as per specific gas, design of outlet should be such that it can be installed vertically on wall, horizontally on ICCU panel and also vertical to fit in pendants including cost and conveyance of all materials, erection charges, commissioning charges and all other labour charges etc, complete for finished item of

work. (**Medical gas outlets shall confirm to HTM 02-01/ NFPA 99 C/EN/DIN/ ISO 7396-1.**)

88.4. ALARM PANELS

Supply and fixing of **Digital Alarm Panel** consisting of all necessary accessories ie pressure sensors, regulators, hand valves, pressure gauges etc. complete including cost and conveyance of all materials, taxes, transportation charges etc. complete for finished item of work.

A) AREA ALARM PANELS

- 2 Gas Digital Alarm Panel
- 3 Gas Digital Alarm Panel
- 5 Gas Digital Alarm Panel

B) MASTER ALARM PANEL

88.5. ACCESSORIES

a) Supply and fixing of **BPC Flow meter with Humidifier bottle and L adapter** near out let point, flow meter body made of brass material and should be back pressure compensated suitable for accurate gas flow measurement and control within a range of 0-13 litres per minute, flow tube and components should be made of clear impact resistant polycarbonate and Humidifier should have built in safety valve and should be made of unbreakable polycarbonate material and autoclavable at 134 degrees centigrade, including cost and conveyance of materials, erection charges, commissioning charges etc. for finished item of work

b) **L Type Adapter** for Oxygen Flow meters

c) Supply and fixing of **Kit for conversion of Oxygen** consisting high pressure pin index tube with connecting pin including cost and conveyance of materials, taxes, transportation charges and labour charges for fixing etc. complete for finished item of work.

d) Supply and fixing of **Suction Jars of 600 ml capacity** at outlet points with regulator and pressure pipe connections made of unbreakable poly carbonate material which is fully autoclavable at 134 degrees centigrade including cost and conveyance of all materials, erection, commissioning charges and all labour charges etc. complete for finished item of work.

e) Adapters for Vacuum

f) Adapters for Air

g) Adapters for Nitrous Oxide

h) Vacuum Tube

88.6. BED HEAD WALL PANEL HORIZONTAL

Supply and fixing of **Bed Head Panels of 1500 mm Single railing** with 6 No. of Electric Switch, Socket and provision of Medical Gas out lets and other accessories including cost and conveyance of all materials, erection charges, commissioning charges and all other labour charges etc, complete for finished item of work.

88.7. SINGLE ARM PENDENT

a) Supply and Fixing of Single Arm Pendent with provision for 8 gas outlets (O₂ -2, N₂O -1, Air -2 & Vac -2, AGSS -1 and CO₂ -1) and 6 electrical sockets with switch, 2 nos. IV Hooks, with indication lamp, should carry 90 kg weight.

b) Supply and Fixing of Valve box as per approved ISI specifications

Valve box -2 services

Valve box -3 services

Valve box -6 services

88.8. CO₂ MANIFOLD SYSTEM

a) Supply and Fixing of **4 + 4 size of CO₂ manifold** complete with 8 nos. pig tail pipes CE Certified as per specifications it including cost and conveyance of materials erection charges, commissioning charges and all other labour charges etc, complete for finished item of work.

b) Supply and Fixing of **2 cylinder emergency manifold** CE Certified as per specifications it including cost and conveyance of materials erection charges, commissioning charges and all other labour charges etc, complete for finished item of work.

c) Supply and Fixing of Fully Automatic **CO₂ Control System** (Imported for Oxygen as technical specifications. NFPA-99 (imported) it including cost and conveyance of materials erection charges, commissioning charges and all other labour charges etc, complete for finished item of work.

88.9. Air 4, Air 7 & AGSS

Supply and Fixing of Aneste Iwata Make **TFS 150 C9 Model**, Compresso Two stage, Motor 15 HP & 57.18 CFM, 60 CFM Air Dryer with 2000 Ltrs Receiver Twin System as per approved specification directed by Engineer-in-charge, all charges etc, complete for finished item of work.

88.10. SUPPORTING STRUCTURE

Manufacturing supplying and fixing of Ismb Columns, beams, MS angles, Flats and square rods as per approved designs and drawings including fixing in position, cost conveyance of all materials and labour charges for finished item of work

88.11. OXYGEN MANIFOLD SYSTEM

2x20 Oxygen Main manifold with 19mm ODx12mm I.D. Copper pipe mounted on top frame, Middle frame and Bottom frame along with brass blocks, NRVs/ cylinder valves and pigtail pipes of 1m long of 8mm OD x 3mm I.D. duly tested at 250Kg/Cum 2 pressure & semi automatic control panel for Oxygen.

88.12. ELECTRICAL CONTROL PANEL FOR MGPS

SITC of Electrical Control panel should be automatic change over panel for changeover from A to B and then from B to A and then from B to C. If any pump trips then the second should start automatically. The panel should consist of contactors Amp meter, Volt meter, Single phase protector, MCB, phase indicator, compressor on –off trip indicator and pressure switch.

88.13. VACCUM SYSTEM

2 nos. of Ingersoll Rand make Model 15V x 10 Model with 7.5 HP Motor with 1000 litres Receiver, Filters, Electricals, etc.
Secretion Trap and bacteria filter

88.14. ROOMWISE REQUIREMENTS

(All the quantities are indicative & the bidder shall make his own assessment before offering his bid on Turnkey basis)

For MOTs (9 Nos)

A) COPPER PIPING (As per EN-13348, 3rd Party inspection by LLOYD's

12mm O.D x 0.7 mm thick copper pipe - 200 Rmt

15mm O.D x 0.9mm thick copper pipe - 400 Rmt

22mm O.D x 0.9mm thick copper pipe - 400 Rmt

B) ISOLATION VALVES WITH END FITTINGS

15 mm Valves (1/2") - 45 Nos

22 mm Valves (3/4") - 18 Nos

C) GAS OUTLETS

Gas outlet Points with S brackets & self sealing valves

(Oxygen-9, Nitrous Oxide-9, Air -9, AGSS -9, Vacuum -9 & CO₂ - 9)

D) AREA ALARM PANELS

5 Gas Area Alarm Panels

E) ACCESSORIES

Oxygen Flow meters with Humidifier Bottles

L Type Adapter for Oxygen Flow meters

Adapters for Oxygen

Ward Vacuum Units with 600 ml Jar

Adapters for Vacuum

Adapters for Air

Vacuum Tube

F) SINGLE ARM PENDANT

Single Arm Pendant with provision for 8 gas outlets (O₂-2, N₂O-1, Air-2, Vac-2& AGSS-1) and 6 electrical sockets with switch 2 nos, IV Hooks with indication lamp, should carry 90 Kg weight.

For T.I.R.s 1, 2 & 3 (3 Nos) For one patient in each TIR

A) COPPER PIPING (As per EN-13348, 3rd Party inspection by LLOYD's

12mm O.D x 0.7 mm thick copper pipe - 27 Rmt

15mm O.D x 0.9mm thick copper pipe - 60 Rmt

22mm O.D x 0.9mm thick copper pipe - 45 Rmt

B) ISOLATION VALVES WITH END FITTINGS

15 mm Valves (1/2") - 3 Nos

22 mm Valves (3/4") - 1 No

C) GAS OUTLETS

Gas outlet Points with S brackets & self sealing valves

(Oxygen-3, Nitrous Oxide-3, Air -3 & Vacuum -3)

D) AREA ALARM PANELS

3 Gas Area Alarm Panels

E) ACCESSORIES

Oxygen Flow meters with Humidifier Bottles

L Type Adapter for Oxygen Flow meters

Adapters for Oxygen
Ward Vacuum Units with 600 ml Jar
Adapters for Vacuum
Adapters for Air
Vacuum Tube

F) Bed Head Wall Panel Horizontal

Modular Bed Head Wall Panel Horizontal with provision for 4 gas outlets and 3 electrical sockets with switch & 1 Nurse call System 1.50 Mtr Length.

For Transplant ICU block (For 20 Beds)

A) COPPER PIPING (As per EN-13348, 3rd Party inspection by LLOYD's

12mm O.D x 0.7 mm thick copper pipe - 150 Rmt
15mm O.D x 0.9mm thick copper pipe - 120 Rmt
22mm O.D x 0.9mm thick copper pipe - 200 Rmt

B) ISOLATION VALVES WITH END FITTINGS

15 mm Valves (1/2") - 20 Nos
22 mm Valves (3/4") - 2 Nos

C) GAS OUTLETS

Gas outlet Points with S brackets & self sealing valves
(Oxygen-20, Nitrous Oxide-0, Air -20 & Vacuum - 20)

D) AREA ALARM PANELS

3 Gas Area Alarm Panels

E) ACCESSORIES

Oxygen Flow meters with Humidifier Bottles
L Type Adapter for Oxygen Flow meters
Adapters for Oxygen
Ward Vacuum Units with 600 ml Jar
Adapters for Vacuum
Adapters for Air
Adapters for Nitrous Oxide
Vacuum Tube

F) Bed Head Wall Panel Horizontal

Modular Bed Head Wall Panel Horizontal with provision for 3 gas outlets and 3 electrical sockets with switch & 1 Nurse call System 1.50 Mtr Length.

For POST ICU block – 2 Nos. (For 20 Beds Each)

B) COPPER PIPING (As per EN-13348, 3rd Party inspection by LLOYD's

12mm O.D x 0.7 mm thick copper pipe - 300 Rmt
15mm O.D x 0.9mm thick copper pipe - 240 Rmt
22mm O.D x 0.9mm thick copper pipe - 400 Rmt

B) ISOLATION VALVES WITH END FITTINGS

15 mm Valves (1/2") - 40 Nos
22 mm Valves (3/4") - 4 Nos

C) GAS OUTLETS

Gas outlet Points with S brackets & self sealing valves
(Oxygen-40, Nitrous Oxide-0, Air -40 & Vacuum - 40)

D) AREA ALARM PANELS

3 Gas Area Alarm Panels

E) ACCESSORIES

Oxygen Flow meters with Humidifier Bottles
L Type Adapter for Oxygen Flow meters

Adapters for Oxygen
Ward Vacuum Units with 600 ml Jar
Adapters for Vacuum
Adapters for Air
Adapters for Nitrous Oxide
Vacuum Tube

F) Bed Head Wall Panel Horizontal

Modular Bed Head Wall Panel Horizontal with provision for 3 gas outlets and 3 electrical sockets with switch & 1 Nurse call System 1.50 Mtr Length.

For Transplant Recovery rooms (12 Nos) For One patient in each room

A) COPPER PIPING (As per EN-13348, 3rd Party inspection by LLOYD's

12mm O.D x 0.7 mm thick copper pipe - 36 Rmt

15mm O.D x 0.9mm thick copper pipe - 90 Rmt

2mm O.D x 0.9mm thick copper pipe - 90 Rmt

B) ISOLATION VALVES WITH END FITTINGS

15 mm Valves (1/2") - 12 Nos

22 mm Valves (3/4") - 12 No

C) GAS OUTLETS

Gas outlet Points with S brackets & self sealing valves

(Oxygen-12, Nitrous Oxide-0, Air -12 & Vacuum -12)

D) AREA ALARM PANELS

2 Gas Area Alarm Panels

E) ACCESSORIES

Oxygen Flow meters with Humidifier Bottles

L Type Adapter for Oxygen Flow meters

Adapters for Oxygen

Ward Vacuum Units with 600 ml Jar

Adapters for Vacuum

Adapters for Air

Adapters for Nitrous Oxide

Vacuum Tube

F) Bed Head Wall Panel Horizontal

Modular Bed Head Wall Panel Horizontal with provision for 3 gas outlets and 3 electrical sockets with switch & 1 Nurse call System 1.50 Mtr Length.

For Point of Care Lab (For 6 beds)

A) COPPER PIPING (As per EN-13348, 3rd Party inspection by LLOYD's

12mm O.D x 0.7 mm thick copper pipe - 18 Rmt

15mm O.D x 0.9mm thick copper pipe - 25 Rmt

22mm O.D x 0.9mm thick copper pipe - 15 Rmt

B) ISOLATION VALVES WITH END FITTINGS

15 mm Valves (1/2") - 6 Nos

22 mm Valves (3/4") - 1 No

C) GAS OUTLETS

Gas outlet Points with S brackets & self sealing valves

(Oxygen-6, Nitrous Oxide-6, Air -6 & Vacuum -6)

D) AREA ALARM PANELS

3 Gas Area Alarm Panels

E) ACCESSORIES

Oxygen Flow meters with Humidifier Bottles

L Type Adapter for Oxygen Flow meters
Adapters for Oxygen
Ward Vacuum Units with 600 ml Jar
Adapters for Vacuum
Adapters for Air
Adapters for Nitrous Oxide
Vacuum Tube

F) Bed Head Wall Panel Horizontal

Modular Bed Head Wall Panel Horizontal with provision for 3 gas outlets and 3 electrical sockets with switch & 1 Nurse call System 1.50 Mtr Length.

For Pre OP Ward (For 14 beds)

A) COPPER PIPING (As per EN-13348, 3rd Party inspection by LLOYD's

12mm O.D x 0.7 mm thick copper pipe - 70 Rmt

15mm O.D x 0.9mm thick copper pipe - 85 rmt

22mm O.D x 0.9mm thick copper pipe - 105 Rmt

B) ISOLATION VALVES WITH END FITTINGS

15 mm Valves (1/2") - 1 No

22 mm Valves (3/4") - 1 No

C) GAS OUTLETS

Gas outlet Points with S brackets & self sealing valves
(Oxygen-14, Nitrous Oxide-14, Air -14 & Vacuum -14)

D) AREA ALARM PANELS

3 Gas Area Alarm Panels

E) ACCESSORIES

Oxygen Flow meters with Humidifier Bottles

L Type Adapter for Oxygen Flow meters

Adapters for Oxygen

Ward Vacuum Units with 600 ml Jar

Adapters for Vacuum

Adapters for Air

Adapters for Nitrous Oxide

Vacuum Tube

F) Bed Head Wall Panel Horizontal

Modular Bed Head Wall Panel Horizontal with provision for 3 gas outlets and 3 electrical sockets with switch & 1 Nurse call System 1.50 Mtr Length.

For CSSD Room

A) COPPER PIPING (As per EN-13348, 3rd Party inspection by LLOYD's

12mm O.D x 0.7 mm thick copper pipe - 5 Rmt

15mm O.D x 0.9mm thick copper pipe - 17 rmt

22mm O.D x 0.9mm thick copper pipe - 6 Rmt

B) ISOLATION VALVES WITH END FITTINGS

15 mm Valves (1/2") - 1 No

22 mm Valves (3/4") - 1 No

C) GAS OUTLETS

Gas outlet Points with S brackets & self sealing valves
(High end Air7 – 1 No)

Master Alarm Panel - 1 No

89. RO Water Purification System:

The RO water purification system of 500 LPH capacity shall be as per the following Specifications:

S. No	ITEM	CAPACITY	MOC/MAKE
1	Raw water Tank	1000 Liters	HDPE
2	Raw water Pump	0.5 HP	TOSHIO/EQLNT
3	Dual Media Filter	size - 12 X 48	PENTAIR/EQLNT
4	Sand Bag	Required size	
5	Carbon Bag	25 Kgs	
6	Multiport Valve	25 NB	INITIATIVE/EQLNT
7	Antiscalent Dosing Pump	Required size	I-DOSE/EQLNT
8	MCF Housing	Required size	
9	Micron Filters	Required size	
10	High Pressure Pump	Required size	TOSHIO/EQLNT
11	Membrane Housing	40 X 40	
12	Membrane	4"	TOSHIO/EQLNT
13	SS Skid	32 MM	SS
14	Control Panel	Required size	
15	Flow Meter	1200 & 1600 LPH	
16	Pressure Gauges	0-21 Kgs	
17	Pipeline & Fittings	Required as per design	CPVC
18	PU Fitting	Required as per design	
19	Product Tank	2000 LPH	SS

The RO Purification System shall be connected to the existing supplying system as per the directions of the Engineer-in-Charge.

SHED:

It will be required where RO plant is installed on roof as decided after consultation with the Engineer-in-Charge. The shed with provision for fencing, door with lock-key arrangement shall be provided as under:

- Framework vertically made of M S Square Pipe frame: 2 Inches X 2 Inches, 16 Gauge
- M S Fencing with wire mesh: ½ inch X ½ inch
- Supporting Structure M S Angle: 50 X 5 mm
- GI pre-coated corrugated profile roof sheet: 0.5 mm thick duly supported with J Hook
- 10 SWG with provision of door with lock and key, with fencing should be duly enamel painted and with anti-rust coating from both sides. The height covered shall be

at least 8feet. There should be no gap between roof sheet and wire mesh, if any angle creates gap, it should be covered with iron bars and wire mesh in between.

Platform: In places where firm, even and concrete surface is not available, the same will have to be constructed (masonry work) for the entire surface area which will be enclosed within RO Shed.

90. GEYSER – 15 Litre Capacity – Supply & Fixng

Makes :Crompton / Bajaj / Havells / Jaquar / AO Smith / Racold / Orient

91. CCTV Cameras –

Image Sensor 1/2.8" Progressive Scan CMOS Min.Illumination

Color: 0.01 LUX @(F1.2,AGC ON), 0Lux with IR Shutter Speed 1/3 s to 1/100,000

s,Support Slow shutter Lens 2.8 mm@F2.0,horzontal field of view 105.8 , 4 mm

@F2.2 horizonatal field of View 83.6 deg , Day & Night IR cut filter with auto switch

NVR (Network Video Recorder)

4K NVR

Up to 32-ch IP camera inputs

H.265+/H.265/H.264+/H.264 video formats

Up to 2-ch@8 MP or 4-ch@4 MP or 8-ch@1080p decoding capacity

1 HDMI and 1 VGA interfaces, both interfaces support independent video output

2 SATA interfaces for HDD connection (up to 10 TB capacity per HDD)

Up to 256 Mbps incoming bandwidth

92. GENERAL REQUIREMENTS:

a) All the above equipments shall be new and manufactured from virgin materials. All the requirements of this supply shall be necessary sourced from the original equipment manufacturer of the model quoted except. In case the machine is imported one, no import substitution is permitted neither before the award nor after the award for any part or accessory. Third party inspection certificate shall be applied from the port of origin of shipping of equipment from the parent company's country of origin.

b) Equipment shall operate on 230 V, single phase / 440 V, three phase, 50 Hz electric supply. The necessary protective relaying / circuitry shall be there with the machines. The mains supply voltage variation may be max.±10% and frequency variation maximum ±3 %.

c) The equipments and all accessories shall conform to the Technical Specifications already mentioned.

d) The equipments shall be provided with one hard copy in original of the detailed service manual and operation manual. Further, a soft copy is also required.

e) Among the other things, the responsiveness of the bid will be based on successful demonstration of the offered model of the equipments to officials as mentioned elsewhere in the tender specifications.

- f) The bidder has to submit users list with address & contact telephone numbers.
- g) The work must be completed within 270 days from the date of approval of the working drawings.

Un-conditional Warranty & CAMC:

- h) The un-conditional warranty of five years and CAMC shall cover the list of the spare parts and their rates, which are valid for total 10 years irrespective of whether those are treated as consumables or otherwise.
- i. The equipments shall be having un-conditional warranty of five years as per the conditions of contract of TED for all equipment described in the tender document elsewhere, from the date of successful commissioning, trial run and the handing over the equipment/ project.
- ii. After sales service centre shall be available at the city of the project 24 hoursX 7 daysX 365days basis. Complaints should be attended properly, a maximum of within 8 hours. Undertaking by the principals that the spares for the equipment shall be made available for at least 10+2 years from the date of supply.
- iii. 95 % uptime warranty of complete equipment with extension of warranty period by double the down time period on 24 hoursX 7 daysX 365days basis.
- iv. If the equipment is not restarted back in to working condition within 24 hours from the time of reporting the breakdown, a penalty will be levied as per the tender conditions.
- v. The successful bidder has to ensure that all the required spares and services are available during the period of CAMC and **2 years after the contract period of ten years.**
- vi. During CAMC, the supplier is required to visit the consignee site at least once in six months for preventive maintenance.
- vii. The payment for CAMC will be made on six monthly basis after satisfactory completion of the said period duly certified by the end user on receipt of BG at 5% of the Total Contract Value (the Contract value of the project + the CAMC cost for 5-years) and its validity shall be two months of after expiry of entire CAMC period.
- viii. Failure of the above clauses under h(i – vii) shall be treated as breach of contract and would lead to forfeiture of the BG during CAMC.

Turnkey/ Site Modification work

The bidder shall examine the existing site where the proposed project is to be commissioned and in consultation with the HOD & Hospital superintendent, the bidder is required to quote prices indicating break-up of the prices of the equipment and turnkey jobs including of all taxes payable.

Note :

- i. The tenderer is required to provide details informations, confirmations etc. accordingly failing which the tender is liable to be ignored
- ii. Bidders are requested to make sure that they attached the list of equipments for carrying out routine and preventive maintenance and should make sure that electrical

safety analyser/ tester for medical equipments to periodically check the electrical aspects as per BIS safety standards IS:13540/ IEC 60601 is a part of the equipments. If the electrical safety analyser/tester is not available they should get the equipments checked for electrical safety compliance with electronic regional; test labs/electronic test and development centre, on every preventive maintenance call

- iii. Adequate training of personnel and non locked open software and standard interface interoperability conditions for networked equipment in hospital management information system (HMIS).
- iv. The successful bidder will be required to provide it his own cost technical training for the personnel involved in the use and handling of the equipments on site, at the institute immediately after its installation for a minimum period of one month.
- v. All software updates shall be provide free of cost during the un-conditional warranty and CAMC periods.

LIST OF IMPORTANT MATERIALS AND MAKES:

CIVIL:

S. No	Name of the Material	Makes for the Material
1	VINYL FLOORING	MARBLEX/AMSTRONG or Equivalent
2	CERAMIC TILES (Non Skid)	KAJARIA/ HR JOHNSON/NITCO/SOMANY/ORIENT BELL
3	PORCELAIN WALL TILES	KAJARIA/ HR JOHNSON/NITCO/SOMANY/ORIENT BELL
4	SCIENTIFIC DOORS	AHLADA/SHAKTHI HORMANN/NICOMAC/IClean
5	DOORS	NCL/ANAND/POLYWOOD or Equivalent
6	UPVC WINDOWS	NCL/AHLADA/ELIXIR/FENESTA
7	FALSE CEILING	GYPSUM INDIA /VISAKA/GYPROC- SAINT GOBAIN
8	PARTICLE BOARD	NCL BISON/RAJSHRI/GREEN PLY/KAJARIA PLY
9	PLY WOOD	KITPLY/CENTURY PLY/ NATIONAL PLY/ GREEN PLAY
10	PAINTS & POLISHES	ASIAN/BERGER/NEROLAC
11	STEEL	TATA/SAIL/VSP/JSW/SHYAM/

PLUMBING:

S. No	Name of the material	Makes for the materials
1.	Multi floor trap	As per approved specification
2.	Western water closet pan	Hindware/CERA/SENIOR/NICE
3.	Indian water closet pan	As per approved specification
4.	Wash basin	Hindware/CERA/SENIOR/NICE

5.	Soap dish	As per approved specification
6.	TV Mirror	As per approved specification
7.	Towel rod	As per approved specification
8.	Bib tap	As per approved specification
9.	Brass tap	As per approved specification
10.	CPVC pipe	SUPREME/ASHIRVAD/ASTRAL
11.	Bronze Gate/ Globe valve	ZOLOTO/R-BRAND
12.	PVC pipe	PRINCE/ SUDHAV/ KIRAN/ SUPREME/ ASTRAL/ FINOLEX/ AJAY/ASHIRVAD

ELECTRICAL:

S No	Name of the Material	Makes for the material
1	CONDUIT PIPE	Sudhakar / Finolex / Modi / VIP / Precision / Universal / Million Plast / Gold / Polycab / DEC / Beljin / Champion / Austro
2	WIRING	Finolex / RR kabel / Havells / APAR EBXL / KEI (HFFR) / Polycab ((HR_FR-LF) / L&T / V-Guard (HFFR).
3	SWITCHES & SOCKETS	Makes of switches:- Legrand Arteor / Schneider Zen celo / Honeywell Blenge Plus / Cabtree Amare / Logus Platina / Gold Medal GIFA / GM-Zenova/ L&T- Englaze.
4	CABLE ADAPTOR BOX	Legrand / Schneider.
5	LIGHT	Phillips / OSRAM / GE Venture / Wipro / Crompton / Bajaj / Havells / Jaquar / IB LED / Panasonic / Halonix
6	FAN	Crompton HS Plus / Havells ES NEO / Orient Energy Star
7	LD EXHAUST FAN	Crompton / Bajaj Bahar WG / Havells Ventil Air-DB / Orient hill air.
8	HD EXHAUST FAN	Crompton / Almounard / Havells Turbo Force.
9	TELEPHONE	GM Four-Five / Legrand Arteor / Schneider Zen celo / Million / Logus / Gold Medal Curve / Anchor Roma viola / CPL / Great Whit
10	TELEPHONE COPPER WIRE	Finolex / Delton / Surabi / Polycab
11	LAN -NETWORK	D Link / AMP / Molex / Legrand / Kron
12	DISTRIBUTION BOARDS	Legrand-DX3 / Schneider-Acti9 / Siemens / L&T Exora / Crabtree.

Indicative Details of Measurements-1

I .Details of Theatre Dimensions for walls:

Indicative Floor areas:

MOT No.	Dimension (meters)		Area (sqm)
1	5.915	7.155	42.322
2	5.915	7.155	42.322
3	5.915	7.155	42.322
4	5.915	7.155	42.322
		Total	169.287

Future Expansion Proposed OTs Floor areas:

MOT No	Dimension (meters)		Area (sqm)
5	5.915	7.015	41.494
6	5.915	7.155	42.322
		Total	83.816

Indicative Wall areas:

MOT No.	Length (m)	Width (m)	Height (m)	Wall Area (sqm)	Win A (sqm)	Door A (sqm)	Net wall Area (sqm)
1	5.915	7.155	3.45	90.183	5.04	6.93	78.213
2	5.915	7.155	3.45	90.183	5.04	10.08	75.063
3	5.915	7.155	3.45	90.183	5.04	6.93	78.213
4	5.915	7.155	3.45	90.183	5.04	3.78	81.363
Total wall Area							312.852

Future Expansion Proposed OTs Wall areas:

MOT No.	Length (m)	Width (m)	Height (m)	Wall Area (sqm)	Win A (sqm)	Door A (sqm)	Net wall Area (sqm)
5	5.915	7.015	3.45	89.217	5.04	6.93	77.247
6	5.915	7.155	3.45	90.183	5.04	10.08	75.063
Total wall Area							152.31

II. Details of Transplant Isolation Rooms:**Indicative Floor areas:**

TIR No.	Dimension (meters)		Area (sqm)
1	5.915	5.35	31.65
2	5.915	5.335	31.56
3	6.03	3.485	21.01
		Total	84.22

Indicative Wall areas:

TIR No.	Length (m)	Width (m)	Height (m)	Wall Area (sqm)	Win A (sqm)	Door A (sqm)	Net wall Area (sqm)
1	5.915	5.35	3.45	77.73	4.68	3.78	69.27
2	5.915	5.335	3.45	77.63	4.68	3.78	69.17
3	6.03	3.485	3.45	65.65	5.4	3.78	56.47
Total wall Area							194.91

Note: These are only indicative. The bidder is advised to visit the site to ascertain for him selves the trueness.

MOT – Modular Operation Theatre

TIR- Transplant Isolation Rooms.

WA – Wall Area

Win.A – Window Area (1.2 M X 1.5M)

DA – Door Area (1.8 M X 2.1 M)

Measurement details –2 of Turnkey Work Areas

Clinical & Non Clinical Indicative floor areas:

Room Name	Length (m)	Width (m)	Wall Area (sqm)
Sterile Store	5.915	5.915	34.987
Clean Store	3.000	3.185	9.555
Surgeons Lounge	5.915	5.350	31.645
Anesthetist Lounge	5.915	5.350	31.645
Doctors Room	5.860	3.485	20.422
Change Rooms & Shoe Rack	5.915	5.770	34.130
Duty Nurses Room	5.915	2.400	14.196
Counselling room	5.915	2.400	14.196
HOD Room-1	5.915	3.415	20.200
TRANSPLANT ICU	5.915	14.285	84.496
Point of care Lab	5.915	7.600	44.954
Wash area for Point of care lab	4.560	3.415	15.572
Lab Store	4.560	4.065	18.536

POST OP ICU - 1	25.245	5.915	149.324
MOT Integration panel room	5.915	11.000	65.065
CSSD	6.360	5.915	37.619
Dirty utility for CSSD	1.800	5.915	10.647
Clean utility for CSSD	1.800	2.830	5.094
Trolley bay adjacent to WAITING	3.270	5.260	17.200
Waiting Area	6.530	5.260	34.348
Corridor from Access Contol to MOTs Gate (CSSD Side)	23.030	3.000	69.090
Corridor MOTs Complex	44.030	3.000	132.090
Corridor infront of Transplant ICU & Access control gate (Post OP ICU)	39.750	3.000	119.250
Corridor (TIR'S)	18.320	3.370	61.738
Corridor + POST OP ICU to Fire Exit	29.240	3.000	87.720
Electrical Room	5.915	4.400	26.026
UPS Room - 1	1.500	1.645	2.468
UPS Room - 2	5.030	3.485	17.530
Total			1154.76

Inductive Wall Area

Room Name	Length (m)	Width (m)	Height (m)	Wall Area (sqm)	Win A (Sqm)	Door A (Sqm)	Net wall Area (Sqm)
Sterile Store	5.915	5.915	3.450	81.627	1.490	3.900	76.237
Clean store	3.000	3.185	3.450	42.677	1.490	3.900	37.287
Surgeons Lounge	5.915	5.350	3.450	77.729	1.490	3.900	72.339
Anesthetist Lounge	5.915	5.350	3.450	77.729	1.490	3.900	72.339
Doctors Room	5.860	3.485	3.450	64.481	1.490	3.900	59.091
Change Rooms & Shoe Rack	5.915	5.770	3.450	80.627	1.490	3.900	75.237
Duty Nurses Room	5.915	2.400	3.450	57.374	1.490	3.900	51.984
Counselling room	5.915	2.400	3.450	57.374	1.490	3.900	51.984
HOD Room-1	5.915	3.415	3.450	64.377	1.490	3.900	58.987
TRANSPLANT ICU	5.915	14.285	3.450	139.380	1.490	3.900	133.990
Point of care Lab	7.600	5.915	3.450	93.254	1.490	3.900	87.864
Wash area for Point of care lab	4.560	3.415	3.450	55.028	1.490	3.900	49.638
Lab Store	4.560	4.065	3.450	59.513	1.490	3.900	54.123
POST ICU - 1	25.245	5.915	3.450	215.004	1.490	3.900	209.614

MOT Integration panel room	5.915	11.000	3.450	116.714	1.490	3.900	111.324
CSSD	6.360	5.915	3.450	84.698	1.490	3.900	79.308
Dirty utility for CSSD	1.800	5.915	3.450	53.234	1.490	3.900	47.844
Clean utility for CSSD	1.800	2.830	3.450	31.947	1.490	3.900	26.557
Trolley bay adjacent to WAITING	3.270	5.260	3.450	58.857	1.490	3.900	53.467
Waiting Area	6.530	5.260	3.450	81.351	1.490	3.900	75.961
Corridor from Access Contol to MOTs Gate (CSSD Side)	23.030	3.000	3.450	179.607	1.490	3.900	174.217
Corridor MOTs Complex	44.030	3.000	3.450	324.507	1.490	3.900	319.117
Corridor infront of Transplant ICU & Access control gate (Post OP ICU)	39.750	3.000	3.450	294.975	1.490	3.900	289.585
Corridor (TIR'S)	18.320	3.370	3.450	149.661	1.490	3.900	144.271
Corridor + POST OP ICU to Fire Exit	29.240	3.000	3.450	222.456	1.490	3.900	217.066
Electrical Room - 1	5.915	4.400	3.450	71.174	1.490	3.900	65.784
UPS Room -1	1.500	1.645	3.450	21.701	1.490	3.900	16.311
UPS Room -2	5.030	3.485	3.450	58.754	1.490	3.900	53.364
Total							2618.97

Measurement details –3 Wash Areas

Wash Areas Indicative floor areas:

Room Name	Dimension (meters)		Total area in Sqm
Attached Toilet for Surgeons Lounge	1.400	1.600	2.240
Attached Toilet for Anesthetist Lounge	1.400	1.470	2.058
Attached Toilet for Doctors Room	1.400	1.600	2.240
Attached Toilet for HOD Room-1	1.400	1.600	2.240
Toilet block adjacent TRANSPLANT ICU	5.915	3.485	20.614
Toilet block adjacent Post Op ICU	5.915	1.830	10.824
Total			40.216

Wash Rooms: Indicative Wall areas:

Room Name	Length (m)	Width (m)	Height (m)	Wall Area (sqm)	Ven	Door	Net Wall Area
Attached Toilet for Surgeons Lounge	1.400	1.600	3.450	20.700	0.300	1.680	18.720
Attached Toilet for Anesthetist Lounge	1.400	1.470	3.450	19.803	0.300	1.680	17.823
Attached Toilet for Doctors Room	1.400	1.600	3.450	20.700	0.300	1.680	18.720
Attached Toilet for HOD Room-1	1.400	1.600	3.450	20.700	0.300	1.680	18.720
Toilet block adjacent TRANSPLANT ICU	5.915	3.485	3.450	64.860	0.300	1.680	62.880
Toilet block adjacent Post Op ICU	5.915	1.830	3.450	53.441	0.300	2.100	51.041
							187.90

SECTION-VI

Annexure- I

USER REQUIREMENTS

- (I) USER REQUIREMENTS (CIVIL)**
- (II) USER REQUIREMENTS (Electrical, Fire Fighting, MGPS, Plumbing)**
- (III) USER REQUIREMENTS (ELECTRICAL& UPS)**

SECTION VII

Annexure- III

Bill of Quantities (BOQ)

- For dimensions of theatres, refer to Measurement Details-1
- For dimensions of TIRs , refer to Measurement Details-1
- There can be a variation in quantities as per clause 39 of GCC, TED

Note: These are only indicative. The tenderer is advised to visit the site & satisfy himself for the actual measurements before offering the financial bid.

S. No.	Tech. Spec Cl. No in TED	DESCRIPTION OF ITEM	Qty.	Unit
		FOR MOTs		
1	1	Stainless Steel Pre-fabricated Wall panels	400	Sqm
2	1	Stainless Steel Pre-fabricated Ceiling panels In MOTs & MOTs Corridor	385	Sqm
3	1.5	Dynamic Hatch Box	2	Nos
4	2.1	Electro conductive Flooring inside MOTs	160	Sqm
5	2.2	Flooring with Vinyl Sheets In MOT Corridor	175	Sqm
6	3	Uni Directional Ceiling Laminar Airflow Systems	4	Nos
7	3.1	Air Handling Units (AHUs) 11 TR	4	Nos
8	3.2	Condensing Units	4	Nos
9	4	Pressure Relief Dampers	4	Nos
10	5.1	Single arm Anesthesia Pendants (Imported)	4	Nos
11	5.2	Triple Dome Ceiling OT LED Lights (Imported)	2	Nos
12	5.3	Double Dome Ceiling OT LED Lights (Imported)	2	Nos
13	5.4	Detachable Hi Definition Cameras in Triple Dome Ceiling OT Lights	2	Nos
14	91	Ceiling/Wall mounted CCTV Room Camera	4	Nos
15	6	LED Peripheral Lights cum clean room (OT) luminaries	62	Nos
16	7	View Window with Motorised Blinds	4	Nos
17	8	Hermetically Sealed Doors (1.80mt x 2.10 mt)	4	Nos
18	8	(1.50mt x 2.10 mt) Sliding Auto Glass Doors	2	Nos
19	10	Storage Units	4	Nos
20	11	Writing Board (List Board)	4	Nos
21	12	X-Ray CT Scan LED viewing Screen	4	Nos
22	13	Touch Screen Surgeon Control Panels	4	Nos
23	14	3-Bay Scrub Stations/Sinks	2	Nos
24	16	Video and Image Management system	1	Nos
25	16.1	Medical Grade Monitors 32 inch 4 K Resolution	4	Nos
26	16.2	Wall mounted large screen display 55 inch (Commercial Grade)	2	Nos
27	16.3 & 16.4	Cable connections for integration within MOTs and with Workshop Projector Hall, Networks with OFC Cable	4	Job

28	16.5	Wireless Microphone	1	Nos
29	16.6	Digital mixer Amplifier	1	Nos
30	16.7	Ceiling Mounted Speakers	4	Nos
31	16.8	Video Conferencing System	1	Nos
32	17.1	Home Theatre Power Conditioner, 230 V	1	Nos
33	17.2	Amplifier (8 Channel)	1	Nos
34	17.3	HiFi Active Sub Woofer	1	Nos
35	17.5	4K Laser Projection TV	1	Nos
36	17.6 & 17.7	Equalization & Loud Speaker Control System	1	Nos
37	17.8	Sound Analog Mixer	1	Nos
38	19	Electrical Installations in MOTs & TIRs	7	Job
		TIR'S (3 Nos)		
39	1	Stainless Steel Pre-fabricated Wall panels	202	Sqm
40	1	Stainless Steel Pre-fabricated Ceiling panels in TIRs and TIR Corridor	146	Sqm
41	2.1	Electro conductive Flooring inside TIRs& TIR Corridor	146	Sqm
42	2.2	Flooring with Vinyl Sheets In TIR Corridor	61	Sqm
43	3	Uni Directional Ceiling Laminar Airflow Systems	3	Nos
44	3.1	Air Handling Units (AHUs) 11 TR	2	Nos
45	3.1	Air Handling Units (AHUs) 8.5 TR	1	Nos
46	3.2	Condensing Units	3	Nos
47	4	Pressure Relief Dampers	3	Nos
48	7	View Window with Motorised Blinds	3	Nos
49	8	Hermetically Sealed Doors (1.80mt x 2.10 mt)	3	Nos
50	15	12mm thick glazed Glass partition walls in TIRs	40	Sqm
51	15	Wall mounted LED TV43 inchesFull HD	3	Nos
52	91	Ceiling/Wall mounted CCTV Room Camera	3	Nos
53	88.6	BED HEAD PANEL FOR TIR WITH DOUBLE OUTLETS AND ELECTRICAL OUTLETS	3	Nos
		Other Requirements		
54	12	X-RAY VIEWERS FOR ALL ICUS AND PRE OPP AREAS AND DOCTORS ROOMS	5	Nos
55	11	WRITING BOARDS FOR ICUS, PRE OPP	5	Nos
56	91	CCTV CEILING CAMERA	10	Nos
		Electrical		
57	22 a	Supply and Fixing of 25mm dia Conduit Pipes surface on wall.	10000	Rmt

58	22 b	Supply and Fixing of 25mm dia Conduit Pipes Concealed on wall.	4000	Rmt
59	23 a	Wiring with run of 2 of 1.5 Sqmm Copper cable for points wiring.	570	Pts
60	23 b	Wiring with run of 2 of 1.5 Sqmm Copper cable for staircase points wiring.	10	Pts
61	23 c	Supply and fixing of 6A/10A ISI Mark 3/2 pin Modular socket Common switch board	25	Pts
62	23 d	Wiring with 3 of 1.5 sq.mm with 6A switch and 6A, 3/2 pin socket Modular type with 6A switch control fixing on separate board.	50	Pts
63	23 e	Supply and fixing of 6A switchs - 2 Nos and 6A 3/2 pin socket - 3 Nos Modular type with cover plate	200	Pts
64	23 f	Supply & fixing of 16A/6A, 2 in one socket with 16A switch control modular type	200	Nos
65	23 g	Supply & fixing of 32A, socket with switch control modular	18	Nos
66	23 h	Supply & fixing of 64A, socket with 64A switch control modular type	4	Nos
67	24 a	Supply and Run of 1 of 1.5 sq.mm (phase, neutral and earth) FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable.	2000	Rmt
68	24 b	Supply and Run of 3 of 1.5 sq.mm (phase, neutral and earth) FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable .	2000	Rmt
69	24 c	Supply and Run of 3 of 2.5 sq.mm (phase, neutral and earth) FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable.	8000	Rmt
70	24 d	Supply and Run of 3 runs of 4.0 sq mm (phase neutral and earth) FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable.	5000	Rmt
71	24 e	Supply and Run of 3 of 6.0 Sq.mm FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable.	300	Rmt
72	24 f	Supply and Run of 5 of 6.0 Sq.mm FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable.	300	Rmt
73	24 g	Supply and Run of 5 of 10.0 Sq.mm FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable.	500	Rmt

74	25 a	Supply and fixing of DP Metal Enclosure with IP 20 Protection DB Make with 1 No 20A, 10 KA DP MCB	8	Nos
75	25 b	Supply and fixing of 4 Way TPN DB Horizontal with IP 43 Protection as per IS:13032 (For Lighting DBs)	10	Nos
76	25 c	Supply and fixing of 4 Way TPN DB Horizontal with IP 43 Protection as per IS:13032 (For Power DB's)	14	Nos
77	25 d	Supply and fixing of 8 Way VTPN DB with IP 43 Protection as per IS:13032	5	Nos
78	25 e	Supply and fixing of cable adopter box with cover for DBs including, masonry work etc., complete.,	10	Nos
79	26 a	Providing independent earthing for Important equipment with 40mm dia 'B' class 2.5m long G.I pipe (GI Earthing)	18	Nos
80	26 b	Providing independent earthing by excavating a pit to a depth of 2.25Mtr in all soils as per size specified in the data for Sophisticated Electronic equipment (Copper Earthing)	18	Nos
81	26 b 1	Providing independent earthing for Important equipment with 100mm dia Heavy gauge C.I Earthing	6	Nos
82	26 c	Supply and Run of 50mm x 6mm G.I Strip	400	Rmt
83	26 d	Supply and Run of 25mm x 3mm copper strip	400	Rmt
84	27 a	Supply, transportation and fixing of 22W +/- 10% , >/ 2300 lumens, 1200mm length LED light	20	Nos
85	27 b	Supply, transportation and fixing 32-36W (>=3600 Lumens), 2' x2' (600mm x 600mm) slim panel LED luminaire	60	Nos
86	27 c	Supply, transportation and fixing 12 W +/-10% (>= 1200 Lumens) Down lighter back lit LED Down Light Recessed / Surface	215	Nos
87	27 d	Supply, transportation and fixing 18 W +/-10% (>= 1800 Lumens) Down lighter back lit LED Down Light	95	Nos
88	27 e	Supply, transportation and fixing ISI mark batten holder / slanting holder	8	Nos
89	27 f	Supply, Transportation of energy efficient fan, 1200 mm sweep, aluminium body, consuming 28 W, BEE 5 star rated, ceiling fan	40	Nos
90	27 f 1	Supply and fixing of Modular type Stepped electronic regulator.	40	Nos
91	27 f 2	Labour charges for fixing of ceiling fan and regulator	40	Nos
92	27 f 3	Supply and erecting 19/20mm steel tube down rod of one meter length	40	Nos
93	27 g	Supply of 12" (300mm) Light duty exhaust fan	5	Nos

94	27 h	Supply,Transportation of 12" (300mm) ISI, 900 RPM Heavy duty exhaust fan	10	Nos
95	27 i	Labour charges for fixing the exhaust fan in wall with necessary connections	15	Nos
96	27 j	Supply and fixing of GI louver shutter including GI mesh	15	Nos
97	28 a)	Main Power Panel with 1000A 4 Pole ACB as incomer - 1 No and out goings 800 A 4P MCCB - 1 No., 630 A 4P MCCB - 1 No., 400A 4P MCCB - 4 Nos & 250A 4P MCCB - 3 No's with required Digital Ammeter and Voltmer, LED Indicators	1	Nos
98	28 b)	Floor Power Panel : Incomer: 630A 4 Pole MCCB,- 1 No Outgoings 250 A 4P MCCB - 4 No's 125 A 4P MCCB - 10 No's, 63 A 4P MCCB - 4 No's with required Digital Ammeter and Voltmer, LED Indicators	1	Nos
99	28 c)	Electrical Lighting Panels : Incomer: 250 A 4 Pole MCCB - 1 No, Out Goings 125 A 4P MCCB - 4 No's 63 A 4P MCCB - 3 No's with required Digital Ammeter and Voltmer, LED Indicators	2	Nos
100	28 d)	130KVAR Out Door Capacitor panel : Incomer: 250A FP MCCB - 1 No, 63A 10KA TP MCB - 9 Nos. 20 KVAR Capacitor Duty contactors - 5 Nos., 10 KVAR Capacitor Duty contactors - 2 Nos, .5 KVAR Capacitor Duty contactors - 2 Nos. 12 stage APFC Relay - 1 No	1	Nos
101	29 a)	630 KVA Transformer OLTC for transformers with RTCC: Supply, Transportation, Installation, Testing and Commissioning of 630 KVA TRANSFORMER with all test reports. The Transformer shall be designed and manufactured as per IS:1180 OLTC with level-II with initial filling of oil as per IS 335-1993. 1000 A LT Breaker Kiosk - 01 No.The basic details of the Transformer are as under. Makes: Kirloskar / PETE / Esennar / Voltamp / Crompton / ABB / Schneider.	1	Nos
102	30 a)	Supply of 25 Sqmm 3.5 Core XLPE insulated UG Cable.	200	Rmt
103	30 b)	Supply of 50 Sqmm 3.5 Core XLPE insulated UG Cable.	200	Rmt
104	30 c)	Supply of 70 Sqmm 3.5 Core XLPE insulated UG Cable.	75	Rmt
105	30 d)	Supply of 120 Sqmm 3.5 Core XLPE insulated UG Cable.	50	Rmt
106	30 e)	Supply of 185 Sqmm 3.5 Core XLPE insulated UG Cable.	50	Rmt
107	30 f)	Supply of 240 Sqmm 3.5 Core XLPE insulated UG Cable.	100	Rmt
108	30 g)	Supply of 300 Sqmm 3.5 Core XLPE insulated UG Cable.	500	Rmt
109	31 a)	Termination of UG cables of 3.5 core 25 Sq.mm	8	Nos

110	31 b)	Termination of UG cables of 3.5 core 50 Sq.mm	8	Nos
111	31 c)	Termination of UG cables of 3.5 core 70 Sq.mm	8	Nos
112	31 d)	Termination of UG cables of 3.5 core 120 Sq.mm	4	Nos
113	31 e)	Termination of UG cables of 3.5 core 185 Sq.mm	4	Nos
114	31 f)	Termination of UG cables of 3.5 core 240 Sq.mm	4	Nos
115	31 g)	Termination of UG cables of 3.5 core 300 Sq.mm	12	Nos
116	31 h)	Earth work excavation of Trench laying of U.G cables up to 70 sqmm	100	Rmt
117	31 i)	Earth work excavation of Trench laying of U.G cables from 95 Sqmm	100	Rmt
118	31 j)	Laying of PVC armoured under ground cable up to 95 Sqmm on wall	200	Rmt
119	31 k)	Laying of PVC armoured under ground cable from 120 Sq.mm to 400 Sqmm saddles on wall	700	Rmt
120	32 a	Supply, Transportation and Installation of 150mm x 50mm x 2mm thick hot dip GI perforated cable tray	200	Rmt
121	32 b	Supply, Transportation and Installation of 300mm x 50mm x 2mm thick thick hot dip GI perforated cable tray	100	Rmt
122	33 a	Supply, Transportation and installation of 10KVA / 312V DC on line UPS system	7	Nos
123	33 b	Supply and fixing of 12V, 150 AH MF battery	182	Nos
124	33 c	Supply and providing of UPS cum battery rack 20 batteries	7	Nos
125	33 d	Supply, Transportation, Installation, Testing and commissioning of storage / Pressure type 5 Star rated water heater with ABS plastic body of 15 Ltrs	7	Nos
126	34	26 persons ICU bed cum passenger lift (1768 Kgs) G+8 Floors, 9 stops,9 Openings (Cost Includes amount for Construction of Shaft / Cladding from Ground to 8th Floor)	1	Nos
		Air Conditioning		
127	35.1	1.50 TR with , 18000 BTU/Hr High Wall mount Split Air Conditioners	6	Nos
128	35.2	2.0 TR with , 24000 BTU/Hr High Wall mount Split Air Conditioners	2	Nos
129	35.3	Voltage stabilizer for 4 KVA maximum load	6	Nos
130	35.4	Voltage stabilizer for 5 KVA maximum load	2	Nos
131	35.5	Ductable Air Conditioners 11.0 TR with ISEER ≥ 4	1	Nos
132	35.6	Ductable Air Conditioners 8.5 TR with ISEER ≥ 4	2	Nos
133	35.7	Ductable Air Conditioners 5.5 TR with ISEER ≥ 4	1	Nos
		FIRE FIGHTING		

134	36.2	Automatic Smoke Detection System	1	Job
135	36.3	Automatic Fire Alarm System	1	Job
136	36.4	Supply & Fixing of 4.5Kg, CO2 Type Fire Extinguisher.	6	Nos
137	36.5	Supply and fixing of ABC stored pressure squeeze grip type fire extinguishers, 9 kg capacity.	6	Nos
138	36.6	Supply and fixing of ABC Powder MAP 4 Kg Fire extinguisher	10	Nos
139	36.7	Supply and fixing of 2 Kg Fire extinguisher Clean Agent	10	Nos
140	36.8	Supply and fixing of Escape signage boards in Rigid Photo luminescent based glow	150	Nos
141	36.9	Supply & Fixing of Powder Coated Fire Rated doors.	6	Sqm
		ELV System		
142	37	Telephone & EPABX System	1	Job
143	38	Local Area Network (LAN) System	1	Job
144	39	Biometric Access Control System	2	Nos
		CIVIL & PLUMBING		
145		Dismantling, clearing away and carefully stacking useful materials for re-use and disposal of unserviceable materials with 100m lead as directed by Engineer-in-Charge duly taking actual premeasurements before dismantling including all charges complete (Reinforced cement concrete)	10	Cum
146		Dismantling, clearing away and carefully stacking useful materials for re-use and disposal of unserviceable materials with 100m lead as directed by Engineer-in-Charge duly taking actual premeasurements before dismantling including all charges complete (Unreinforced cement concrete)	1.5	Cum
147		Dismantling, clearing away and carefully stacking useful materials for re-use and disposal of unserviceable materials with 100m lead as directed by Engineer-in-Charge duly taking actual premeasurements before dismantling including all charges complete (Brick Masonary)	118	Cum
148		Dismantling, clearing away and carefully stacking useful materials for re-use and disposal of unserviceable materials with 100m lead as directed by Engineer-in-Charge duly taking actual premeasurements before dismantling including all charges complete (Kadapa slabs or shahabad stone slabs on sand bed)	25	Sqm

149		Dismantling doors, windows and clear storey windows, Ventilators etc., (wood or steel) shutters including Chowkhats, architraves, hold fasts and other attachments etc., and stacking them within 100m lead including charge etc., complete for finished item of work. (Not exceeding 3 sqm in area)	57	Nos
150		Conveyance of un-useful excavated earth to a distance of 16 KM for disposal including hire charges of T and P, labour charges etc., complete for finished item of work.	250	Cum
151	40	RCC M 25 grade design mix (For lintels)	3	Cum
152	41	RCC M 20 grade design mix (50mm thick platforms)	12	Sqm
153	41	RCC M 20 grade design mix (25 mm thick Shelves)	12	Sqm
154	42	Brick Masonry work in CM (1:6) prop in superstructure	3	Cum
155	43	Reinforced Masonry for partition walls (100 mm thick) in CM (1:4)	500	Sqm
156	44	PCC (1:3:6) nominal mix using 20mm size graded m/c (For bed blocks and hold fasts)	1.5	Cum
157	45	Filling with light weight concrete in Cement Concrete (1:5:10) proportion using brick jelly for low roofs	23	Cum
158	46	Thermo Mechanically Treated (Fe -500/500D/550D) for RCC works	1.25	MT
159	49	Plastering 12mm thick in two coats with base coat of 8mm thick in CM (1:6) and top coat of 4mm thick in CM (1:4). for Internal walls.	1600	Sqm
160	51	Impervious coat to exposed RCC roof slab surfaces (APSS No. 901 and 903) For Toilets	77.78	Sqm
161	92	Providing and applying Wall putty of White Cement or Polymer or Cement based of average 1 to 2 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying knifing paste filler by putty knife / muslin pad, air dry for 2 - 3	4447	Sqm
162	53	Flooring with non-skid full body ceramic floor tiles	85	Sqm
163	55	Dadoing to walls with glazed full body Porcelain wall tiles	225	Sqm
164	56	Dadoing to walls with glazed full body Ceramic tiles	350	Sqm
165	57	Painting one coat water based cement primer of interior grade I and two coats of acrylic emulsion paint for ceiling and Walls	4447	Sqm
166	59	Painting to new wood work	313	Sqm
167	60	Painting to new iron work	88	Sqm
168	61	Two shutter cupboards	100	Sqm
169	64	UPVC Fixed Louvered Ventilator	7	Sqm

170		UPVC 3 track Sliding Windows	15	Sqm
171		MS Grills to Windows	150	Sqm
172	66	Flooring with 16 to 18 mm thick high polished granite stone slabs black colour for platforms (S.S.701 and special)	50	Sqm
173	67	Doors as per approved drawings with medium teak wood frame (1500mm x 2600mm)	50	Sqm
174	68	Doors as per approved drawings with medium teak wood frame (1000mm x 2100mm)	45	Sqm
175	69	Doors Shutters WPC(800mm x 2100mm)	40	Sqm
176	70	Scientific Doors with metal door frames and door shutters made of galvanize steel	45	Sqm
177	71	False ceiling as per Technical specification	1400	Sqm
178	72	Vinyl flooring	500	Sqm
179	74	Impervious coat to exposed RCC roof slab surfaces of 20mm thick (APSS No. 901 and 903)	350	Sqm
180	63	Fixed Glass Window – 1200 x 1200	53.55	Sqm
181	95	Grouting the holes with neat cement slurry of 20mm dia with all required accessories of all materials etc., including cost & Conveyance of all labour Charges etc., complete finished item of work (*As per SSR2021-22 of S.NO:-8)	500	Nos
182	96	Pressure grouting the drilled holes with neat cement slurry or with approved grout admixture using pump - excluding cost of drilling holes after fixing nozzles as technical specification approved by the department etc., including cost & Conveyance of all labour charges etc., complete finished item of work	500	Nos
183	87A	Supply and fabricating, erecting and fixing in position trusses of approved design with structural steel other than MS.	6500	Kgs
184	87B	Supply and fixing of pre painted Galvalume Trapezoidal Profile Roofing with 0.50mm Thickness.	65	Sqm
185	75	4" (101.6mm) multi floor trap with jali - UPVC/SWR	25	Nos
186	76	580mm x 440mm long Orissa pan white glazed Water Closet	4	Nos
187	77	European Water Closet of 1st quality	9	Nos
188	78	Indian make Flat Back Wash Hand Basin 1st quality	16	Nos
189	79	CP finish brass soap dish	21	Nos
190	80	TV shape mirror with plastic frame of size 609.6mm x 457.2mm	25	Nos
191	81	25.4mm dia , 609.6mm long aluminium anodized towel rods	36	Nos
192	82	15 mm brass body CP finish bib tap of not less than 300 grams weight	25	Nos
193	87C	Self Closing Tap - Push Type	25	Nos

194	84	Chromium plated finish brass body quarter turn Bibcock cum Health Faucet	12	Nos
195	85	Ashirvad/ Ajay/ Astral Flowguard or equivalent CPVC Pipes and Fittings - 15.90mm OD pipe	55	Rmt
196	85	Ashirvad/Ajay/Astral Flowguard or equivalent CPVC Pipes and Fittings - 22.20mm OD pipe	115	Rmt
197	85	Ashirvad/ Ajay/ Astral Flowguard or equivalent CPVC Pipes and Fittings -28.60mm OD pipe	143	Rmt
198	86	Bronze Gate/ Globe valve - 25mm Nominal bore	15	Nos
199	87	SWR PVC pipes (Prince/ Sudhakar/ Kisan/ Supreme or any ISI brand) 4 Kg/Sq.cm. - 75mmdia	145	Rmt
200	87	SWR PVC pipes (Prince/ Sudhakar/ Kisan/ Supreme or any ISI brand) 4 Kg/Sq.cm. -110mmdia	145	Rmt
201	90	Supplying and fixing 15 mm nominal size 152.0 mm CP finish iron body shower rose 1st quality including cost and conveyance of all materials, labour charges , overheads & contractors profit for finished item of work in all floors.	5	Nos
202	87D	Supply and Fixing of white glazed flat back bowl urinals	4	Nos
203	87E	Supply and fixing of 16mm to 20 mm thick ploished marbles slab partitions of size 4'0"*2'0"	10	Nos
		MGPS		
204	88.1	28 mm dia. and 0.90 mm thick Copper Pipe Lines for Main lines	700	Rmt
205	88.1	42 mm dia. and 1.20 mm thick Copper Pipe Lines for Main lines	200	Rmt
206	88.1	54 mm dia. and 1.20 mm thick Copper Pipe Lines for Main lines	550	Rmt
207	88.1	12 mm dia. and 0.70 mm thick Copper Pipe Lines for distribution lines	320	Rmt
208	88.1	15 mm dia. and 0.90 mm thick Copper Pipe Lines for distribution lines	525	Rmt
209	88.1	22 mm dia. and 0.90 mm thick Copper Pipe Lines for distribution lines	530	Rmt
210	88.2	15 mm (1/2") Isolation Valves	40	Nos
211	88.2	22 mm (3/4") Isolation Valves	15	Nos
212	88.2	28 mm Isolation Valves	3	Nos
213	88.2	42 mm Isolation Valves	2	Nos
214	88.2	54 mm Isolation Valves	2	Nos
215	88.3	Gas Outlet Points with probes for Oxygen with S Brackets	189	Nos
216	88.4	2 Gas Digital Area Alarm Panels	2	Nos
217	88.4	3 Gas Digital Area Alarm Panels	4	Nos

218	88.4	5 Gas Digital Area Alarm Panels	5	Nos
219	88.4	Master Digital Alarm Panels	1	Nos
220	88.5	BPC Flow meter with Humidifier bottle and L adapter	27	Nos
221	88.5	L Type Adapter for Oxygen Flow meters	27	Nos
222	88.5	Kit for conversion of Oxygen	27	Nos
223	88.5	Suction Jars of 600 ml capacity	27	Nos
224	88.5	Adapters for Vacuum	27	Nos
225	88.5	Adapters for Air	27	Nos
226	88.5	Adapters for Nitrous Oxide	15	Nos
227	88.5	Vacuum Tube	27	Nos
228	88.6	Bed Head wall panel horizontal 1500 mm long single railing	27	Nos
229	88.7 b	Valve box -2 services	1	Nos
230	88.7 b	Valve box -3 services	3	Nos
231	88.7 b	Valve box -6 services	1	Nos
232	88.8 a	4 + 4 size of CO2 manifold System	1	Job
233	88.8 b	2 cylinder emergency manifold	1	Job
234	88.8 c	Fully Automatic CO2 Control System	1	Job
235	88.9	Aneste Iwata Make TFS 150 C9 Model, Compresso Two stage, Motor 15 HP & 57.18 CFM, 60 CFM Air Dryer with 2000 Ltrs Receiver Twin System (For Air4, Air7 & AGSS)- Units	1	Job
236	88.10	Supporting structure for MGPS lines with Ismb Columns, beams, MS angles, Flats and square rods	1	Job
237	88.11	2x20 Oxygen Main manifold System	1	Job
238	88.12	Electrical Control Panel for MGPS	1	Job
239	88.13	Vaccum system – 2 Units	1	Job
240		Any Other Item as Deemed Important by The Bidder		
241		Any Other Item as Deemed Important by The Bidder		
242		Any Other Item as Deemed Important by The Bidder		
243		Any Other Item as Deemed Important by The Bidder		
244		Any Other Item as Deemed Important by The Bidder		
245		Any Other Item as Deemed Important by The Bidder		
246		Any Other Item as Deemed Important by The Bidder		
247		Any Other Item as Deemed Important by The Bidder		
248		Any Other Item as Deemed Important by The Bidder		

249		Any Other Item as Deemed Important by The Bidder		
250		Any Other Item as Deemed Important by The Bidder		
	Note:	* The Bidder Shall quote for the above items as deemed important and shall furnish the details for his quote by enclosing an annexure, detailing the items and their rates		

Seen the TED Volume-II and found satisfactory:

Experts Doctors Committee:

1. Dr. M. Raja Rao

2. Dr. Ch. Madhusudhan

3. Dr. P. Sravan Kumar

4. Dr. B. Ramesh Kumar

SECTION – XI
Annexure-IV

PRICE SCHEDULE

(Price to be filled in the relevant field of Price Format in Excel provided in the e-tendering portal)

Note: Details of Quoted Item/product (Brand and Model offered in Tender) as per BOQ. Complete details shall be furnished in all the columns. Failure would entail, the tender to be ignored.

S. No.	Tech. Spec Cl. No in TED	DESCRIPTION OF ITEM	Qty.	Unit	Make	Model/Product Code	HSN Code	Unit Price (Basic Price)	Total Taxes Applicable	Total Price (Inclusive of all Taxes)
		FOR MOTs								
1	1	Stainless Steel Pre-fabricated Wall panels	400	Sqm						
2	1	Stainless Steel Pre-fabricated Ceiling panels In MOTs & MOTs Corridor	385	Sqm						
3	1.5	Dynamic Hatch Box	2	Nos						
4	2.1	Electro conductive Flooring inside MOTs	160	Sqm						
5	2.2	Flooring with Vinyl Sheets In MOT Corridor	175	Sqm						
6	3	Uni Directional Ceiling Laminar Airflow Systems	4	Nos						
7	3.1	Air Handling Units (AHUs) 11 TR	4	Nos						
8	3.2	Condensing Units	4	Nos						
9	4	Pressure Relief Dampers	4	Nos						
10	5.1	Single arm Anesthesia Pendants (Imported)	4	Nos						
11	5.2	Triple Dome Ceiling OT LED Lights (Imported)	2	Nos						
12	5.3	Double Dome Ceiling OT LED Lights (Imported)	2	Nos						
13	5.4	Detachable Hi Definition Cameras in Triple Dome Ceiling OT Lights	2	Nos						
14	91	Ceiling/Wall mounted CCTV Room Camera	4	Nos						
15	6	LED Peripheral Lights cum clean room (OT) luminaries	62	Nos						
16	7	View Window with Motorised Blinds	4	Nos						
17	8	Hermetically Sealed Doors (1.80mt x 2.10 mt)	4	Nos						
18	8	(1.50mt x 2.10 mt) Sliding Auto Glass	2	Nos						

		Doors									
19	10	Storage Units	4	Nos							
20	11	Writing Board (List Board)	4	Nos							
21	12	X-Ray CT Scan LED viewing Screen	4	Nos							
22	13	Touch Screen Surgeon Control Panels	4	Nos							
23	14	3-Bay Scrub Stations/Sinks	2	Nos							
24	16	Video and Image Management system	1	Nos							
25	16.1	Medical Grade Monitors 32 inch 4 K Resolution	4	Nos							
26	16.2	Wall mounted large screen display 55 inch (Commercial Grade)	2	Nos							
27	16.3 & 16.4	Cable connections for integration within MOTs and with Workshop Projector Hall, Networks with OFC Cable	4	Job							
28	16.5	Wireless Microphone	1	Nos							
29	16.6	Digital mixer Amplifier	1	Nos							
30	16.7	Ceiling Mounted Speakers	4	Nos							
31	16.8	Video Conferencing System	1	Nos							
32	17.1	Home Theatre Power Conditioner, 230 V	1	Nos							
33	17.2	Amplifier (8 Channel)	1	Nos							
34	17.3	HiFi Active Sub Woofer	1	Nos							
35	17.5	4K Laser Projection TV	1	Nos							
36	17.6 & 17.7	Equalization & Loud Speaker Control System	1	Nos							
37	17.8	Sound Analog Mixer	1	Nos							
38	19	Electrical Installations in MOTs & TIRs	7	Job							
		TIR'S (3 Nos)									
39	1	Stainless Steel Pre-fabricated Wall panels	202	Sqm							
40	1	Stainless Steel Pre-fabricated Ceiling panels in TIRs and TIR Corridor	146	Sqm							
41	2.1	Electro conductive Flooring inside TIRs& TIR Corridor	146	Sqm							
42	2.2	Flooring with Vinyl Sheets In TIR Corridor	61	Sqm							
43	3	Uni Directional Ceiling Laminar Airflow Systems	3	Nos							
44	3.1	Air Handling Units (AHUs) 11 TR	2	Nos							
45	3.1	Air Handling Units (AHUs) 8.5 TR	1	Nos							
46	3.2	Condensing Units	3	Nos							
47	4	Pressure Relief Dampers	3	Nos							
48	7	View Window with Motorised Blinds	3	Nos							
49	8	Hermetically Sealed Doors (1.80mt x 2.10 mt)	3	Nos							
50	15	12mm thick glazed Glass partition walls in TIRs	40	Sqm							

51	15	Wall mounted LED TV43 inchesFull HD	3	Nos						
52	91	Ceiling/Wall mounted CCTV Room Camera	3	Nos						
53	88.6	BED HEAD PANEL FOR TIR WITH DOUBLE OUTLETS AND ELECTRICAL OUTLETS	3	Nos						
		Other Requirements								
54	12	X-RAY VIEWERS FOR ALL ICUS AND PRE OPP AREAS AND DOCTORS ROOMS	5	Nos						
55	11	WRITING BOARDS FOR ICUS, PRE OPP	5	Nos						
56	91	CCTV CEILING CAMERA	10	Nos						
		Electrical								
57	22 a	Supply and Fixing of 25mm dia Conduit Pipes surface on wall.	1000 0	Rmt						
58	22 b	Supply and Fixing of 25mm dia Conduit Pipes Concealed on wall.	4000	Rmt						
59	23 a	Wiring with run of 2 of 1.5 Sqmm Copper cable for points wiring.	570	Pts						
60	23 b	Wiring with run of 2 of 1.5 Sqmm Copper cable for staircase points wiring.	10	Pts						
61	23 c	Supply and fixing of 6A/10A ISI Mark 3/2 pin Modular socket Common switch board	25	Pts						
62	23 d	Wiring with 3 of 1.5 sq.mm with 6A switch and 6A, 3/2 pin socket Modular type with 6A switch control fixing on separate board.	50	Pts						
63	23 e	Supply and fixing of 6A switches - 2 Nos and 6A 3/2 pin socket - 3 Nos Modular type with cover plate	200	Pts						
64	23 f	Supply & fixing of 16A/6A, 2 in one socket with 16A switch control modular type	200	Nos						
65	23 g	Supply & fixing of 32A, socket with switch control modular	18	Nos						
66	23 h	Supply & fixing of 64A, socket with 64A switch control modular type	4	Nos						
67	24 a	Supply and Run of 1 of 1.5 sq.mm (phase, neutral and earth) FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable.	2000	Rmt						

68	24 b	Supply and Run of 3 of 1.5 sq.mm (phase, neutral and earth) FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable .	2000	Rmt						
69	24 c	Supply and Run of 3 of 2.5 sq.mm (phase, neutral and earth) FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable.	8000	Rmt						
70	24 d	Supply and Run of 3 runs of 4.0 sq mm (phase neutral and earth) FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable.	5000	Rmt						
71	24 e	Supply and Run of 3 of 6.0 Sq.mm FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable.	300	Rmt						
72	24 f	Supply and Run of 5 of 6.0 Sq.mm FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable.	300	Rmt						
73	24 g	Supply and Run of 5 of 10.0 Sq.mm FRLSH / HFFR PVC insulated 1100V grade as per IS:694/1990, IS 17048 specifications for Copper cable.	500	Rmt						
74	25 a	Supply and fixing of DP Metal Enclosure with IP 20 Protection DB Make with 1 No 20A, 10 KA DP MCB	8	Nos						
75	25 b	Supply and fixing of 4 Way TPN DB Horizontal with IP 43 Protection as per IS:13032 (For Lighting DBs)	10	Nos						
76	25 c	Supply and fixing of 4 Way TPN DB Horizontal with IP 43 Protection as per IS:13032 (For Power DB's)	14	Nos						
77	25 d	Supply and fixing of 8 Way VTPN DB with IP 43 Protection as per IS:13032	5	Nos						
78	25 e	Supply and fixing of cable adopteres box with cover for DBs including, massanory work etc., complete.,	10	Nos						
79	26 a	Providing independent earthing for Important equipment with 40mm dia 'B' class 2.5m long G.I pipe (GI Earthing)	18	Nos						
80	26 b	Providing independent earthing by exacavating a pit to a depth of 2.25Mtr in all soils as per size specified in the data for Sophisticated Electronic equipment (Copper Earthing)	18	Nos						

81	26 b 1	Providing independent earthing for Important equipment with 100mm dia Heavy gauge C.I Earthing	6	Nos						
82	26 c	Supply and Run of 50mm x 6mm G.I Strip	400	Rmt						
83	26 d	Supply and Run of 25mm x 3mm copper strip	400	Rmt						
84	27 a	Supply, transportation and fixing of 22W +/- 10% , > / 2300 lumens, 1200mm length LED light	20	Nos						
85	27 b	Supply, transportation and fixing 32-36W (>=3600 Lumens), 2' x2' (600mm x 600mm) slim panel LED luminaire	60	Nos						
86	27 c	Supply, transportation and fixing 12 W +/- 10% (>= 1200 Lumens) Down lighter back lit LED Down Light Recessed / Surface	215	Nos						
87	27 d	Supply, transportation and fixing 18 W +/- 10% (>= 1800 Lumens) Down lighter back lit LED Down Light	95	Nos						
88	27 e	Supply, transportation and fixing ISI mark batten holder / slanting holder	8	Nos						
89	27 f	Supply, Transportation of energy efficient fan, 1200 mm sweep, aluminium body, consuming 28 W, BEE 5 star rated, ceiling fan	40	Nos						
90	27 f 1	Supply and fixing of Modular type Stepped electronic regulator.	40	Nos						
91	27 f 2	Labour charges for fixing of ceiling fan and regulator	40	Nos						
92	27 f 3	Supply and erecting 19/20mm steel tube down rod of one meter length	40	Nos						
93	27 g	Supply of 12" (300mm) Light duty exhaust fan	5	Nos						
94	27 h	Supply,Transportation of 12" (300mm) ISI, 900 RPM Heavy duty exhaust fan	10	Nos						
95	27 i	Labour charges for fixing the exhaust fan in wall with necessary connections	15	Nos						
96	27 j	Supply and fixing of GI louver shutter including GI mesh	15	Nos						
97	28 a)	Main Power Panel with 1000A 4 Pole ACB as incomer - 1 No and out goings 800 A 4P MCCB - 1 No., 630 A 4P MCCB - 1 No., 400A 4P MCCB - 4 Nos & 250A 4P MCCB - 3 No's with required Digital Ammeter and Voltmer, LED Indicators	1	Nos						
98	28 b)	Floor Power Panel : Incomer: 630A 4 Pole MCCB,- 1 No Outgoings 250 A 4P MCCB - 4 No's 125 A 4P MCCB - 10 No's, 63 A 4P MCCB - 4 No's with required Digital Ammeter and Voltmer,	1	Nos						

		LED Indicators								
99	28 c)	Electrical Lighting Panels : Incomer: 250 A 4 Pole MCCB - 1 No, Out Goings 125 A 4P MCCB - 4 No's 63 A 4P MCCB - 3 No's with required Digital Ammeter and Voltmer, LED Indicators	2	Nos						
100	28 d)	130KVAR Out Door Capacitor panel : Incomer: 250A FP MCCB - 1 No, 63A 10KA TP MCB - 9 Nos. 20 KVAR Capacitor Duty contactors - 5 Nos., 10 KVAR Capacitor Duty contactors - 2 Nos, .5 KVAR Capacitor Duty contactors - 2 Nos. 12 stage APFC Relay - 1 No	1	Nos						
101	29 a)	630 KVA Transformer OLTC for transformers with RTCC: Supply, Transportation, Installation, Testing and Commissioning of 630 KVA TRANSFORMER with all test reports. The Transformer shall be designed and manufactured as per IS:1180 OLTC with level-II with initial filling of oil as per IS 335-1993. 1000 A LT Breaker Kiosk - 01 No.The basic details of the Transformer are as under. Makes: Kirloskar / PETE / Esennar / Voltamp / Crompton / ABB / Schneider.	1	Nos						
102	30 a)	Supply of 25 Sqmm 3.5 Core XLPE insulated UG Cable.	200	Rmt						
103	30 b)	Supply of 50 Sqmm 3.5 Core XLPE insulated UG Cable.	200	Rmt						
104	30 c)	Supply of 70 Sqmm 3.5 Core XLPE insulated UG Cable.	75	Rmt						
105	30 d)	Supply of 120 Sqmm 3.5 Core XLPE insulated UG Cable.	50	Rmt						
106	30 e)	Supply of 185 Sqmm 3.5 Core XLPE insulated UG Cable.	50	Rmt						
107	30 f)	Supply of 240 Sqmm 3.5 Core XLPE insulated UG Cable.	100	Rmt						
108	30 g)	Supply of 300 Sqmm 3.5 Core XLPE insulated UG Cable.	500	Rmt						
109	31 a)	Termination of UG cables of 3.5 core 25 Sq.mm	8	Nos						
110	31 b)	Termination of UG cables of 3.5 core 50 Sq.mm	8	Nos						
111	31 c)	Termination of UG cables of 3.5 core 70 Sq.mm	8	Nos						
112	31 d)	Termination of UG cables of 3.5 core 120 Sq.mm	4	Nos						

113	31 e)	Termination of UG cables of 3.5 core 185 Sq.mm	4	Nos						
114	31 f)	Termination of UG cables of 3.5 core 240 Sq.mm	4	Nos						
115	31 g)	Termination of UG cables of 3.5 core 300 Sq.mm	12	Nos						
116	31 h)	Earth work excavation of Trench laying of U.G cables up to 70 sqmm	100	Rmt						
117	31 i)	Earth work excavation of Trench laying of U.G cables from 95 Sqmm	100	Rmt						
118	31 j)	Laying of PVC armoured under ground cable up to 95 Sqmm on wall	200	Rmt						
119	31 k)	Laying of PVC armoured under ground cable from 120 Sq.mm to 400 Sqmm saddles on wall	700	Rmt						
120	32 a	Supply, Transportation and Installation of 150mm x 50mm x 2mm thick hot dip GI perforated cable tray	200	Rmt						
121	32 b	Supply, Transportation and Installation of 300mm x 50mm x 2mm thick hot dip GI perforated cable tray	100	Rmt						
122	33 a	Supply, Transportation and installation of 10KVA / 312V DC on line UPS system	7	Nos						
123	33 b	Supply and fixing of 12V, 150 AH MF battery	182	Nos						
124	33 c	Supply and providing of UPS cum battery rack 20 batteries	7	Nos						
125	33 d	Supply, Transportation, Installation, Testing and commissioning of storage / Pressure type 5 Star rated water heater with ABS plastic body of 15 Ltrs	7	Nos						
126	34	26 persons ICU bed cum passenger lift (1768 Kgs) G+8 Floors, 9 stops,9 Openings (Cost Includes amount for Construction of Shaft / Cladding from Ground to 8th Floor)	1	Nos						
		Air Conditioning								
127	35.1	1.50 TR with , 18000 BTU/Hr High Wall mount Split Air Conditioners	6	Nos						
128	35.2	2.0 TR with , 24000 BTU/Hr High Wall mount Split Air Conditioners	2	Nos						
129	35.3	Voltage stabilizer for 4 KVA maximum load	6	Nos						
130	35.4	Voltage stabilizer for 5 KVA maximum load	2	Nos						
131	35.5	Ductable Air Conditioners 11.0 TR with ISEER ≥ 4	1	Nos						
132	35.6	Ductable Air Conditioners 8.5 TR with ISEER ≥ 4	2	Nos						
133	35.7	Ductable Air Conditioners 5.5 TR with ISEER ≥ 4	1	Nos						

		FIRE FIGHTING									
134	36.2	Automatic Smoke Detection System	1	Job							
135	36.3	Automatic Fire Alarm System	1	Job							
136	36.4	Supply & Fixing of 4.5Kg, CO2 Type Fire Extinguisher.	6	Nos							
137	36.5	Supply and fixing of ABC stored pressure squeeze grip type fire extinguishers, 9 kg capacity.	6	Nos							
138	36.6	Supply and fixing of ABC Powder MAP 4 Kg Fire extinguisher	10	Nos							
139	36.7	Supply and fixing of 2 Kg Fire extinguisher Clean Agent	10	Nos							
140	36.8	Supply and fixing of Escape signage boards in Rigid Photo luminescent based glow	150	Nos							
141	36.9	Supply & Fixing of Powder Coated Fire Rated doors.	6	Sqm							
		ELV System									
142	37	Telephone & EPABX System	1	Job							
143	38	Local Area Network (LAN) System	1	Job							
144	39	Biometric Access Control System	2	Nos							
		CIVIL & PLUMBING									
145		Dismantling, clearing away and carefully stacking useful materials for re-use and disposal of unserviceable materials with 100m lead as directed by Engineer-in-Charge duly taking actual premeasurements before dismantling including all charges complete (Reinforced cement concrete)	10	Cum							
146		Dismantling, clearing away and carefully stacking useful materials for re-use and disposal of unserviceable materials with 100m lead as directed by Engineer-in-Charge duly taking actual premeasurements before dismantling including all charges complete (Unreinforced cement concrete)	1.5	Cum							
147		Dismantling, clearing away and carefully stacking useful materials for re-use and disposal of unserviceable materials with 100m lead as directed by Engineer-in-Charge duly taking actual premeasurements before dismantling including all charges complete (Brick Masonary)	118	Cum							

148		Dismantling, clearing away and carefully stacking useful materials for re-use and disposal of unserviceable materials with 100m lead as directed by Engineer-in-Charge duly taking actual premeasurements before dismantling including all charges complete (Kadapa slabs or shahabad stone slabs on sand bed)	25	Sqm						
149		Dismantling doors, windows and clear storey windows, Ventilators etc., (wood or steel) shutters including Chowkhats, architraves, hold fasts and other attachments etc., and stacking them within 100m lead including charge etc., complete for finished item of work. (Not exceeding 3 sqm in area)	57	Nos						
150		Conveyance of un-useful excavated earth to a distance of 16 KM for disposal including hire charges of T and P, labour charges etc., complete for finished item of work.	250	Cum						
151	40	RCC M 25 grade design mix (For lintels)	3	Cum						
152	41	RCC M 20 grade design mix (50mm thick platforms)	12	Sqm						
153	41	RCC M 20 grade design mix (25 mm thick Shelves)	12	Sqm						
154	42	Brick Masonry work in CM (1:6) prop in superstructure	3	Cum						
155	43	Reinforced Masonry for partition walls (100 mm thick) in CM (1:4)	500	Sqm						
156	44	PCC (1:3:6) nominal mix using 20mm size graded m/c (For bed blocks and hold fasts)	1.5	Cum						
157	45	Filling with light weight concrete in Cement Concrete (1:5:10) proportion using brick jelly for low roofs	23	Cum						
158	46	Thermo Mechanically Treated (Fe - 500/500D/550D) for RCC works	1.25	MT						
159	49	Plastering 12mm thick in two coats with base coat of 8mm thick in CM (1:6) and top coat of 4mm thick in CM (1:4). for Internal walls.	1600	Sqm						
160	51	Impervious coat to exposed RCC roof slab surfaces (APSS No. 901 and 903) For Toilets	77.78	Sqm						

161	92	Providing and applying Wall putty of White Cement or Polymer or Cement based of average 1 to 2 mm thickness over plastered surface to prepare the surface even and smooth after thoroughly brushing the surface to remove all dirt and remains of loose powdered materials, applying emery paper, Sand the surface, clean & wipe off loose dust, applying knifing paste filler by putty knife / muslin pad, air dry for 2 - 3	4447	Sqm						
162	53	Flooring with non-skid full body ceramic floor tiles	85	Sqm						
163	55	Dadoing to walls with glazed full body Porcelain wall tiles	225	Sqm						
164	56	Dadoing to walls with glazed full body Ceramic tiles	350	Sqm						
165	57	Painting one coat water based cement primer of interior grade I and two coats of acrylic emulsion paint for ceiling and Walls	4447	Sqm						
166	59	Painting to new wood work	313	Sqm						
167	60	Painting to new iron work	88	Sqm						
168	61	Two shutter cupboards	100	Sqm						
169	64	UPVC Fixed Louvered Ventilator	7	Sqm						
170		UPVC 3 track Sliding Windows	15	Sqm						
171		MS Grills to Windows	150	Sqm						
172	66	Flooring with 16 to 18 mm thick high polished granite stone slabs black colour for platforms (S.S.701 and special)	50	Sqm						
173	67	Doors as per approved drawings with medium teak wood frame (1500mm x 2600mm)	50	Sqm						
174	68	Doors as per approved drawings with medium teak wood frame (1000mm x 2100mm)	45	Sqm						
175	69	Doors Shutters WPC(800mm x 2100mm)	40	Sqm						
176	70	Scientific Doors with metal door frames and door shutters made of galvanize steel	45	Sqm						
177	71	False ceiling as per Technical specification	1400	Sqm						
178	72	Vinyl flooring	500	Sqm						
179	74	Impervious coat to exposed RCC roof slab surfaces of 20mm thick (APSS No. 901 and 903)	350	Sqm						
180	63	Fixed Glass Window – 1200 x 1200	53.55	Sqm						
181	95	Grouting the holes with neat cement slurry of 20mm dia with all required accessories of all materials etc., including cost & Conveyance of all labour Charges etc., complete finished item of work (*As per	500	Nos						

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182	96	Pressure grouting the drilled holes with neat cement slurry or with approved grout admixture using pump - excluding cost of drilling holes after fixing nozzles as technical specification approved by the department etc., including cost & Conveyance of all labour charges etc., complete finished item of work	500	Nos							
183	87A	Supply and fabricating,erecting and fixing inposition trusses of approved design with structural steel other than MS.	6500	Kgs							
184	87B	Supply and fixing of pre painted Galvalume Trapezoidal Profile Roofing with 0.50mm Thickness.	65	Sqm							
185	75	4" (101.6mm) multi floor trap with jali - UPVC/SWR	25	Nos							
186	76	580mm x 440mm long Orissa pan white glazed Water Closet	4	Nos							
187	77	European Water Closet of 1st quality	9	Nos							
188	78	Indian make Flat Back Wash Hand Basin 1st quality	16	Nos							
189	79	CP finish brass soap dish	21	Nos							
190	80	TV shape mirror with plastic frame of size 609.6mm x 457.2mm	25	Nos							
191	81	25.4mm dia , 609.6mm long aluminium anodized towel rods	36	Nos							
192	82	15 mm brass body CP finish bib tap of not less than 300 grams weight	25	Nos							
193	87C	Self Closing Tap - Push Type	25	Nos							
194	84	Chromium plated finish brass body quarter turn Bibcock cum Health Faucet	12	Nos							
195	85	Ashirvad/ Ajay/ Astral Flowguard or equivalent CPVC Pipes and Fittings - 15.90mm OD pipe	55	Rmt							
196	85	Ashirvad/Ajay/Astral Flowguard or equivalent CPVC Pipes and Fittings - 22.20mm OD pipe	115	Rmt							
197	85	Ashirvad/ Ajay/ Astral Flowguard or equivalent CPVC Pipes and Fittings - 28.60mm OD pipe	143	Rmt							
198	86	Bronze Gate/ Globe valve - 25mm Nominal bore	15	Nos							
199	87	SWR PVC pipes (Prince/ Sudhakar/ Kisan/ Supreme or any ISI brand) 4 Kg/Sq.cm. - 75mmdia	145	Rmt							

200	87	SWR PVC pipes (Prince/ Sudhakar/ Kisan/ Supreme or any ISI brand) 4 Kg/Sq.cm. -110mmdia	145	Rmt						
201	90	Supplying and fixing 15 mm nominal size 152.0 mm CP finish iron body shower rose 1st quality including cost and conveyance of all materials, labour charges , overheads & contractors profit for finished item of work in all floors.	5	Nos						
202	87D	Supply and Fixing of white glazed flat back bowl urinals	4	Nos						
203	87E	Supply and fixing of 16mm to 20 mm thick ploished marbles slab partitions of size 4'0"*2'0"	10	Nos						
		MGPS								
204	88.1	28 mm dia. and 0.90 mm thick Copper Pipe Lines for Main lines	700	Rmt						
205	88.1	42 mm dia. and 1.20 mm thick Copper Pipe Lines for Main lines	200	Rmt						
206	88.1	54 mm dia. and 1.20 mm thick Copper Pipe Lines for Main lines	550	Rmt						
207	88.1	12 mm dia. and 0.70 mm thick Copper Pipe Lines for distribution lines	320	Rmt						
208	88.1	15 mm dia. and 0.90 mm thick Copper Pipe Lines for distribution lines	525	Rmt						
209	88.1	22 mm dia. and 0.90 mm thick Copper Pipe Lines for distribution lines	530	Rmt						
210	88.2	15 mm (1/2") Isolation Valves	40	Nos						
211	88.2	22 mm (3/4") Isolation Valves	15	Nos						
212	88.2	28 mm Isolation Valves	3	Nos						
213	88.2	42 mm Isolation Valves	2	Nos						
214	88.2	54 mm Isolation Valves	2	Nos						
215	88.3	Gas Outlet Points with probes for Oxygen with S Brackets	189	Nos						
216	88.4	2 Gas Digital Area Alarm Panels	2	Nos						
217	88.4	3 Gas Digital Area Alarm Panels	4	Nos						
218	88.4	5 Gas Digital Area Alarm Panels	5	Nos						
219	88.4	Master Digital Alarm Panels	1	Nos						
220	88.5	BPC Flow meter with Humidifier bottle and L adapter	27	Nos						
221	88.5	L Type Adapter for Oxygen Flow meters	27	Nos						
222	88.5	Kit for conversion of Oxygen	27	Nos						
223	88.5	Suction Jars of 600 ml capacity	27	Nos						
224	88.5	Adapters for Vacuum	27	Nos						
225	88.5	Adapters for Air	27	Nos						
226	88.5	Adapters for Nitrous Oxide	15	Nos						
227	88.5	Vacuum Tube	27	Nos						

228	88.6	Bed Head wall panel horizontal 1500 mm long single railing	27	Nos						
229	88.7 b	Valve box -2 services	1	Nos						
230	88.7 b	Valve box -3 services	3	Nos						
231	88.7 b	Valve box -6 services	1	Nos						
232	88.8 a	4 + 4 size of CO2 manifold System	1	Job						
233	88.8 b	2 cylinder emergency manifold	1	Job						
234	88.8 c	Fully Automatic CO2 Control System	1	Job						
235	88.9	Aneste Iwata Make TFS 150 C9 Model, Compresso Two stage, Motor 15 HP & 57.18 CFM, 60 CFM Air Dryer with 2000 Ltrs Receiver Twin System (For Air4, Air7 & AGSS)- Units	1	Job						
236	88.10	Supporting structure for MGPS lines with Ismb Columns, beams, MS angles, Flats and square rods	1	Job						
237	88.11	2x20 Oxygen Main manifold System	1	Job						
238	88.12	Electrical Control Panel for MGPS	1	Job						
239	88.13	Vaccum system – 2 Units	1	Job						
240		Any Other Item as Deemed Important by The Bidder								
241		Any Other Item as Deemed Important by The Bidder								
242		Any Other Item as Deemed Important by The Bidder								
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249		Any Other Item as Deemed Important by The Bidder								
250		Any Other Item as Deemed Important by The Bidder								
	Note:	* The Bidder Shall quote for the above items as deemed important and shall furnish the details for his quote by enclosing an annexure, detailing the items and their rates								

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Managing Director