

***TENDER***

***FOR***

**CONSTRUCTION OF TISSUE CULTURE  
LABORATORY FOR JAWAHARLAL NEHRU  
TROPICAL BOTANIC GARDEN AND RESEARCH  
INSTITUTE AT KUZHUR, KODUNGALLUR,  
THRISSUR DISTRICT (PHASE I)**

**PART-III  
PRICE BID**

**TENDER NO. HLL/ID/15/34  
OCTOBER 2015**



**एचएलएल लाइफ़केयर लिमिटेड**  
(भारत सरकार का उद्यम)

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## **1 COMMERCIAL CONDITIONS**

1.0.1 **THE ABSTRACT OF BILL OF QUANTITIES IN THE PRICE BID SHALL BE INVARIABLY FILLED. THOSE WHO BIDDERS DO NOT FILL WILL BE NON-RESPONSIVE AND WILL BE DISQUALIFIED FROM EVALUATION AND WILL BE TREATED AS TECHNICALLY NOT QUALIFIED.**

1.0.2 The tendered rate shall inter alia be deemed to include for the provision of all materials, process, operation and special requirements detailed in the particular specification irrespective of whether these are mentioned in the description of equipment schedule and Bill of quantities or not. It is an express condition of the contract that the tendered rates for various items in the Bill of Quantities shall be deemed to include for the full, entire and final condition of the contractor respective items of the works in accordance with the provision of the contract.

1.0.3 The tendered rate shall include for all taxes, duties, etc. as applicable and shall be quoted on the works contract basis for **Construction of Tissue Culture Laboratory for Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI) at Kuzhur, Kodungallur, Thrissur District (Phase I).**

1.0.4 **The price should be quoted inclusive of all taxes and duties and the component of service tax applicable to the bidder.**

1.0.5 The tendered rate shall remain firm and free from variation due to rise in the cost of materials/ equipment, labour or any other reasons whatsoever during the contract period and valid extension on the case may be.

1.0.6 The quantum of excise duty included in the tendered price, the rate at which they were assumed etc. shall be indicated in the tender.

### **1.1 UNIT RATES**

1.11 Only approved work will be measured on completion and priced as per rates quoted against the respective items.

## **1.2 BRIEF DESCRIPTION OF PRICING**

1.2.1. Unforeseen difficulties for which provision has not been made in the tender will in no way relieve the successful tenderer from the full execution of the work.

1.2.2 The price quoted shall be the final amount for this finished work.

## **1.3 INCOME TAX**

Any payment to the contractor as per contract, will be made after deducting income tax as per the rules and regulations.

## **1.4 SALES TAX AND EXCISE DUTY**

The tenderer shall include all applicable taxes and duties in their quoted rates. The bid which mention that applicable taxes and duties extra shall be summarily rejected.

## **1.6. SUBMISSION OF BILL**

1.6.1. The contractor shall from time to time prepare and submit interim bills of the work executed and on completion of the contract, he shall prepare and submit the final bill. The measurements sheets in support of the interim and final bills shall be prepared by the contractor on the basis of measurements taken by him jointly with the project engineer and the said measurement sheets shall be submitted by him with the relevant bill.

## **1.7. EXTRA ITEMS**

The contractor is bound to carry out any items of work necessary for the completion of the job even though such items may not have been included in the schedule of probable quantities or rates, such items being necessary or essential for completing the job. Variation order in respect of such additional items and their quantities will be issued in writing by the employer.

1.7.1 All shavings, cuttings and other rubbish as it accumulates from time to time during the progress of work and on completion including that of the sub-contractors and

special tradesman and all materials condemned by the project engineer shall be cleared and removed from the site by the contractor without any extra charge.

1.7.2 All measuring steel taps, scaffolding, ladders instruments and tools that may be required for taking measurements shall be supplied by the contractor.

## **1.8. OVER TIME WORK**

If the contractor is required to work night or on holidays in order to maintain the time schedule he shall take prior approval from the Engineer-in-charge. He should also provide and maintain at his own cost sufficient lights as may be necessary to enable the work to proceed satisfactorily during the night.

1.8.1. The contractor shall give full facilities to all other contractors working on site. He shall also arrange his programme of work so as not hinder the progress of other trades. The decision of the Engineer-in-charge on any point of dispute between the various parties shall be final and binding.

1.8.2. It is specifically pointed out that the contractor shall not be entitled to any compensation whatsoever on account of delay in procurement or supply of controlled materials and the rates quoted in the contract are fixed till the completion of the contract.

1.8.3. The contractor shall co-operate with other agencies appointed by the owners for the work to proceed smoothly with the least possible delay and to the satisfaction of the owners, architects and the consultants.

1.8.4. The owners shall provide a source for power supply at one convenient point at site. The contractor shall at his own cost install a separate meter at the said source and lay additional cables from the said source also at his own cost. For the electricity consumed by the contractor he shall pay the owner the actual cost at the rate charged by the local authority for power for constructional purposes. The contractor shall also obtain the necessary permit for utilizing power for constructional purposes.

## **2 SPECIAL CONDITIONS**

### **2.1. EXECUTION WORK**

2.1.1. The whole of the work as described in the contract (including bills of materials, specification and all drawings pertaining thereto) and as advised by the Engineer-in-charge from time is to be carried out and completed in all parts to the entire satisfaction of the Employer. Any minor details of construction which are obviously and fairly intended, or which may not have been definitely referred to in this contract, but which are usual construction practice and essential to the work, shall be included in this contact.

### **2.2. CERTIFICATE OF COMPLETION**

2.2.1 The contractor shall intimate to the Engineer-in-charge in writing as and when the works are completed and put into beneficial use in order to enable the consultants to check certify to the owners to take over the plants.

2.2.2 The work shall not be considered as completed and put into beneficial use until the consultants have certified in writing that the same has been completed and put into beneficial use.

2.2.3 The defects liability period of one year shall commence from date of such completion or any specific date mentioned therein.

# TECHNICAL SPECIFICATIONS

## Air conditioning System

### SECTION - I

#### BRIEF DESCRIPTION OF WORK

##### **1.1 SCOPE OF WORK**

The scope of work covers supply, installation, testing and commissioning of Air-conditioning System at TISSUE CULTURE LABORATORY FOR JNTBGRI AT KUZHUR.

##### **1.2 SPACE TO BE AIR CONDITIONED**

The space to be air-conditioned is as per the drawings attached. Tenderers are advised to visit the site before submitting their bids.

##### **1.3 BILL OF QUANTITIES & EQUIPMENT**

The details of equipment and the bill of quantities required are furnished in relevant sections of this document. The technical specifications are also described. The tenderers are required to fill in the prices item wise all inclusive, as per format and submit the Bill of Quantities. The rate quoted should be inclusive of taxes, duties, freight, packing and forwarding, Octroi entry tax, loading, unloading, handling at site, etc. The tenderer shall not be eligible for any extra amount due to change in taxes, duties, etc.

##### **1.4 TECHNICAL DATA**

The tenderers are required to submit technical data documents as per the format. The data proposal sheets are enclosed in the tender document. The tenderer shall fill in all the data required.

## SECTION- II

### TECHNICAL DETAILS

#### 2.1 SCOPE OF WORK

The complete scope of work shall cover supply, installation, testing and commissioning of Air Conditioning System at TISSUE CULTURE LABORATORY FOR JNTBGRI AT KUZHUR including sizing of ducts, pipes routing etc. The contractor shall submit the Shop drawings for approval and obtain approval from Consultant/Client before commencement of works. The scope of work includes testing for air changes per hour with fresh air changes, Air velocity, Positive pressure, Air quality - air filtration-(particles test), temperature and humidity, validation of Hepa filters by appropriate tests like DOP.

#### 2.2 Basis of Design

The entire system has been designed based on climatological data available as given under the section basis of Design. The technical requirements given under here are only indicative and not descriptive and the contractor shall ensure that the whole system supplied is complete in all respects for the smooth operation of the plant and should be suitable for the rated performance.

#### 2.3 Terms and Definitions

The following terms have been used in the tender specifications, drawings, etc.

BIS	Bureau of Indian Standards
ASHRAE	American society of Heating, Refrigeration and Air-conditioning Engineers, USA.
ASME	American Society of Mechanical Engineers.
ASA	American Standard Association.
B.S	British Standards
CMH	Cubic Meter per Hour
CFM	Cubic Feet per Minute
US GPM	US Gallons per Minute
IGPM	Imperial Gallons per Minute.
RPM	Revolutions per Minute
BTU/Hr.	British Thermal Unit per Hour
KCal/Hr.	Kilo Calories per Hour
HZ	Hertz
H.P.	Horse Power
Kg/CM <sup>2</sup>	Kilo Gram per Square Centimeter
SG	Supply Air Grilles
SD	Supply Air Diffuser
SAF	Supply Air Filters
FD	Fire Damper
VCD	Volume Control Damper
RG	Return Air Grilles
RD	Return air diffuser
FAD	Fresh Air Damper

RH	Relative Humidity
DB	Dry Bulb Temperature
WB	Wet Bulb Temperature
MV	Mechanical Ventilation
DP	Drain Point.
RO	Rate Only

The design, manufacture, identification of material and testing of the equipment covered in this specification shall comply with the latest edition of the appropriate standard of the following:

- 1) Duct Work - IS:655 (latest edition)
- 2) Welding - IS:3589
- 3) Refrigeration and Air-conditioning - As per ASHRAE/ISI air-conditioning and refrigeration institute standards.
- 4) Sluice Valves for Water Lines - IS:778-1980
- 5) Copper alloy Gate/ Globe / Check Valve for water lines - IS:778
- 6) Colour code for the identification of pipe lines - IS:2379-1963
- 7) Specific requirements for the direct switching of the individual motors - IS:4064 (Part-II)-1978
- 8) PVC insulated (HD) Electric Cables for working voltage up including 1100 Volts - IS:1554 (Part I)
- 9) Starters - IS:8554 (Part-I) 1979
- 10) HRC Cartridge fuse links upto 650 Volts - IS:2208
- 11) Inspection and testing of installation IS:732 (Part-III) 1979
- 12) Galvanized steel wire for fencing - IS:277-1977
- 13) Three phase induction motors - IS:325
- 14) Horizontal centrifugal pumps - IS:1620
- 15) Wrought aluminum and aluminum alloy sheet and strip for general engineering purposes - IS:737
- 16) Bourdan tube pressure & vacuum gauges - IS:3624
- 17) Glossary of terms used in refrigeration and air-conditioning - IS:3615
- 18) Code for practice for standard for selection of standard worm and helical gears - IS:7403
- 19) PVC insulated (heavy duty) electric cables for working voltage upto and including 1100 watts: -IS:1554 (Part-I)
- 20) Expanded Polystyrene (EPS) : - IS 4671.
- 21) Resin bonded glass wool: - IS 8183.

## 2.4 Safety Codes

The following IS codes shall be followed:

- Safety code for mechanical refrigeration - IS:660
- Safety code for air-conditioning - IS:659
- Safety code for scaffolds & ladders -IS:3696
- Code of practice for fire precautions in welding & cutting operations - IS:3016
- Code for safety procedures and practices in electrical works - IS:5216
- Code of practice for safety and health requirements in electrical & gas welding and cutting operations - IS:3696
- Indian Electricity Act 1910

- Electricity Supply Act and Indian Electricity Rules.

## 2.5 MACHINERY

### **AIR COOLED PACKAGED/DUCTABLE AIR CONDITIONING UNIT**

#### 1. **Cabinet**

The packaged split air conditioning units shall have metal cabinet of min 1.6mm thick (16 gauge) galvanized sheet steel. The body should be machine pressed and adequately stiffened. The body should be chemically treated for corrosion resistance and Polyester powder coated.

#### 2. **Compressor**

All compressors shall be hermetically sealed scroll type of suitable capacities. Compressor shall be suitable for R22/R410 refrigerant. The compressor shall be electrically interlocked with indoor and outdoor fan motors, HP/LP cutouts and thermostat in the evaporator. The compressor shall be housed inside the Condenser.

#### 3. **Condenser (Air cooled)**

The coils shall be made of copper hydraulically bonded with aluminium fins. The tubes shall have a minimum of 9.5 mm outer diameter, firmly bonded with aluminium fins spaced at 12-14 fins/inch. The air velocity across the face of the coil shall not exceed 200 m/min. The coils shall be designed for a maximum working pressure of 35 kg./sq.cm. The condenser coil shall be protected on the open end by a wire mesh duly powder coated/plastic coated.

#### 4. **Evaporator coil**

The coils shall be made of copper hydraulically bonded with aluminium fins. The coils shall be hydrophilic in nature. The tubes shall have a minimum of 9.5 mm outer diameter, firmly bonded with aluminium fins spaced at 12-14 fins/inch. The air velocity across the face of the coil shall not exceed 170 m/min. The coils shall be designed for a maximum working pressure of 35 kg/sq.cm. The circuit should include a thermostatic expansion valve/capillary tube, distributor, liquid strainer, suction line shut off valve and liquid line shut off valve.

#### 5. **Condenser motor**

The condenser motor shall be of IP-55 rating.

#### 6. **Refrigeration piping and accessories**

Only hard drawn copper shall be used in piping with brass fittings wherever required. Brazing shall be with silver copper phosphorous alloy. Horizontal lines shall have a grading of at least 1:250 away from the compressor and towards condenser to prevent gravity draining of oil to compressor. Liquid lines shall be sized to ensure that flashing of liquid refrigerant does not occur. The circuit should include a thermostatic expansion valve, distributors, liquid strainer, de-hydrator and liquid lines shut off valve and suction line shut off valve.

Leaks shall be tested with soap solution at a minimum pressure of 21 kg/sq.cm. After all leaks have been repaired, system shall be tested with the test pressure maintained for a period of not less than 8 hours. No measurable drop in pressure should be detected after the pressure readings are adjusted for temperature changes. After satisfactory completion of the pressure test, the system shall be evacuated to reduce

the pressure to 0.1 Kg/Sq.cm. for a period of 6 hours and vacuum broken. A vacuum pump connected to the refrigeration system shall be used to create the vacuum and the installed compressor shall not be used to create the purpose. The system shall again be evacuated and a vacuum of 0.01 Kg/Sq.cm. maintain for 24 hours before charging with correct quantity of refrigerant and oil. The system shall be operated for 12 hours and then again tested for leaks.

7. **Drain Piping**

Drain pipe shall be of 25/32mm dia. PVC pipes. All Ductable Split units shall be provided with independent drain lines. And all the drain line above false ceiling shall be insulated. The drain shall be taken to the nearest exit points.

8. **Fan**

Fan section including wheel and housing shall be of heavy gauge steel/aluminium. Fans shall be centrifugal, forward curved multi-blade type. Fan housing shall have inlets and guide vanes for smooth air flow. Fans shall be complete with drive motor. The fans should be statically and dynamically balanced. The fan motor should be resilient mounted. The fan should deliver required static pressure as per specification.

9. **Dampers**

All fresh air intakes shall be provided with dampers. The fan outlets should be controllable with a damper. The supply collars, wherever mentioned, shall be provided with collar dampers.

10. **Filters**

All evaporator units shall be provided with air filters capable for filtration upto 20 microns. The filters shall be of washable synthetic fibre type.

11. **Control Panel**

All units shall have independent electrical control panels housing contactors, overload relays, voltage cutouts, time delays, interlocks, strip connectors, indication lamps, and control fuse. All these have to be housed inside the Outdoor unit of each circuit.

12. **Thermostat**

The Thermostat shall be control wired with the control panel and shall be placed in the return air path inside the boxing.

13. **Installation**

Adequate vibration isolation using rubber/neoprene pads/vibration springs in order to reduce transmission of vibrations to the floor shall be provided for all condensing units.

14. **Testing**

Ductable units after installation shall be tested for its conformity to specifications. Units shall also be tested for the rated capacity and power consumption.

15. **Electric motor**

The electric motor driving the compressor shall be as per manufacturer's standard for this compressor and motor shall be suitable for operation on A.C. supply. The motor shall be continuous duty rated for the application. The motor shall be selected such a way that the motor rating is for actual requirement.

The motor shall be provided with suitable bearing to take care of loads/thrust. Necessary lubricators shall be provided to enable the bearings to be correctly greased as required. The tenderer shall also calculate KW/TR.

16. **AHU**

The AHU shall be AR certified floor mounted/ceiling suspended type, double skinned type made of 0.6mm pre-coated GI sheets on both sides min 40mm thick PUF CFC free, 40kg/m<sup>3</sup> between sheets, SS 304 drain pan with nitrile rubber insulation, GSS base channel. Suitable for DX coil of copper 6 rows min, Aluminum fins, with synthetic non-woven type pre (EU4) and fine filters (EU 7) filtration up to 3microns. The AHU shall be with suitable static blower DIDW, centrifugal, forward curved blade, belt driven for hepa filter application comprising of suitable rated motor min EFF1 rated. The AHU shall also be provided with manual volume control damper on supply, return and fresh air sides to control the air volume. The AHU shall be UL certified for safety. The AHU shall be provided with access doors for filter cleaning and maintenance etc.

**2.6 DUCTING SYSTEM**

This section deals with supply, erection, testing and commissioning of all sheet metal ductwork conforming to specifications given below. The ducts shall be of factory fabricated.

**2.6.1 Material for Ducting**

All ducts shall be fabricated from galvanized sheet of 120 gm/sq.m (Class VIII) conforming to IS 277-1962 (revised). The fabrication of duct shall strictly conform to ISS 655-1963. The thickness of the sheet shall be as follows:

Maximum size (mm)	Thickness of sheet (mm)	Type of transverse joint connections	Bracing (if any)
Upto 300	0.63 24 G	S-drive, pocket or bar slips, on 2.5m centres	None
301 to 600 601 to 750	0.63 24 G	S-drive, pocket or bar slips, on 2.5m centres S-drive, 25mm pocket or 25mm bar slips on 2.5m centres drive	None 25x25x3mm angle 1.2m from joint
751 to 1000 1001 to 1500	0.80 22 G	40x40mm angle connections, or 40mm pocket or 40mm bar slips, with 35x3mm bar reinforcing on 2.5m centres	40x40x2mm angle 1.2m from joint
1501 to 2250	1.00 20 G	40x40mm angle connections, or 40mm pocket or 40mm bar slips, 1 m maximum centres with 35x3mm bar reinforcing	40x40x3mm angle / 40x40x3mm angle 60mm from joint.
2251 & above	1.25 18 G	50x50mm angle connections, or 40mm pocket or 40mm	40x40x3mm angle /

		bar slips, 1 m maximum centres with 35x3mm bar reinforcing	40x40x3 mm angle 60mm from joint.
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The following points shall be also taken into account while fabrication of ducts.

- a) All ducts shall be as per gauges, etc. indicated on the approved drawings.
- b) All ducts of size larger than 450 mm shall be cross broken.
- c) All ducts shall be supported from RCC/truss by means of MS rods, angles, etc.
- d) The ductwork shall not extend outside and beyond height limits as specified on the approved drawings.
- e) All ducts shall be reinforced, if necessary and must be secured in place so as to avoid shifting of the ducts on its supports.
- f) The vanes shall be provided and securely fastened to prevent noise and vibration.
- g) The rubber gasket shall be installed between duct flanges in all connections and joints.
- h) The ductwork can be modified in consultation with Purchaser to suit actual conditions in the building.
- i) All flanges and supports should be primer coated on all surfaces before erection and painted with aluminum paint thereafter.
- j) The flexible joints are to be fitted to the suction and delivery of all fans with double heavy canvass. The length of flexible joints should not be less than 150 mm.
- k) All sheet metal gauges and fabrication procedure as given in BIS specification shall be strictly adhered to. The BIS specification shall form part of this contract.

### 2.6.2 Grilles/Diffusers

Material of construction - Extruded Aluminum

Supply air and return air grilles shall be continuous type and shall be fixed as given in the approved drawing. The square/rectangular diffusers shall be flush or step down type to match false ceiling pattern. The diffuser blades shall be die formed, flush mounted with single or double direction airflow. Supply of frames for fixing the grilles/diffusers, if required, is also in the scope of the contractor.

Return air grilles shall be with blanks and return air provisions. The size and appearance shall match with supply air grilles. The supply air grilles shall form part of the continuous return air grilles. The fixing of grilles/diffusers should be done in close co-ordination with false ceiling work and as directed by Purchaser.

The aluminum grilles/diffusers, etc. shall be powder coated of colours to match the interiors. However, successful bidder shall have to obtain prior approval regarding colour, finish, shape, etc. of grilles/diffusers and sample should be submitted to Purchaser for approval.

### 2.6.3 Testing

The complete duct system shall be tested for air leakage and complete air distribution systems shall be balanced in accordance with the approved drawings for achieving designed values inside the building.

## **2.7 THERMAL / ACOUSTIC INSULATION**

### **2.7.1 Material**

- ◆ Insulation material shall be Closed Cell Elastomeric Nitrile Butadiene Rubber.
- ◆ Insulation material shall have anti-microbial product protection. The antimicrobial product protection shall be an integral part of insulation that is built-in during the manufacturing process and the product protection should not allow the microbes to function, grow and reproduce.
- ◆ Resistance towards microbiological growth on insulation surface should confirm to following standards: Fungi Resistance – ASTM G21 where the fungal growth on the surface is NIL after 28 days of incubation at 28 – 30 deg C and Bacterial resistance – ASTM E 2180 where the reduction of bacterial growth is minimum 99.9% after 24 hours of incubation at 34 – 38 deg C.
- ◆ Thermal conductivity of Elastomeric Nitrile rubber shall not exceed 0.035 W/m<sup>2</sup>K at an average temperature of 20°C in accordance to EN12667
- ◆ The insulation shall have fire performance such that it passes Class 1 as per BS476 Part 7 for surface spread of flame as per BS 476 and also pass Fire Propagation requirement as per BS476 Part 6 to meet the Class 'O' Fire category as per 1991 Building Regulations (England & Wales) and the Building Standards (Scotland) Regulations 1990.
- ◆ Water vapour permeability shall not exceed  $1.74 \times 10^{-14}$  Kg/m.s.Pa, i.e. Moisture Diffusion Resistance Factor or 'μ' value should be minimum 10,000 according to EN 12086
- ◆ Density of Material shall be between 40 to 60 Kg/m<sup>3</sup>.

### **2.7.2 Duct Insulation**

External thermal insulation shall be provided as follow:

- ◆ The thickness of Nitrile rubber shall be as shown on drawing or identified in the schedule of quantity. Following procedure shall be adhered to:
- ◆ Duct surfaces shall be cleaned to remove all grease, oil, dirt, etc. prior to carrying out insulation work. Measurement of surface dimensions shall be taken properly to cut closed cell elastomeric rubbers sheets to size with sufficient allowance in dimension.
- ◆ Material shall be fitted under compression and no stretching of material shall be permitted. A thin film of adhesive shall be applied on the back of the insulating material sheet and then on to the metal surface. When adhesive is tack dry, insulating material sheet shall be placed in position and pressed firmly to achieve a good bond. All longitudinal and transverse joints shall be sealed as per manufacturer recommendations. The adhesive shall be strictly as recommended by the manufacturer.
- ◆ The detailed Application specifications are mentioned separately.

### **2.7.3 Insulation of Ducts Exposed Directly to Sunlight**

For installations exposed to sunlight, after giving 36 hours curing time for the adhesive apply manufacturer's recommended UV/Mechanical Protection. Please refer the separate detailed guidelines on UV/Mechanical Protection.

#### 2.7.4 Piping Insulation

All chilled water, refrigerant and condensate drain pipe shall be insulated in the manner specified herein. An air gap of 25 mm shall be present between adjacent insulation surfaces carrying chilled water or refrigerant. Before applying insulation, all pipes shall be brushed and cleaned. All Pipe surfaces shall be free from dirt, dust, mortar, grease, oil, etc. Nitrile Rubber insulation shall be applied as follows:

- ◆ Insulating material in tube form shall be sleeved on the pipes.
- ◆ On existing piping, slit opened tube of the insulating material (slit with a very sharp knife in a straight line) shall be placed over the pipe and adhesive shall be applied as suggested by the manufacturer.
- ◆ Adhesive must be allowed to tack dry and then press surface firmly together starting from butt ends and working towards centre.
- ◆ Wherever flat sheets shall be used it shall be cut out in correct dimension. All longitudinal and transverse joints shall be sealed as per manufacturer recommendations.
- ◆ The insulation shall be continuous over the entire run of piping, fittings and valves.
- ◆ All valves, fittings, joints, strainers, etc. in chilled water piping shall be insulated to the same thickness as specified for the main run of piping and application shall be same as above. Valves bonnet, yokes and spindles shall be insulated in such a manner as not to cause damage to insulation when the valve is used or serviced.

The detailed application specifications are as mentioned separately. The manufacturer's trained installer should only be used for installation.

#### 2.7.5 Recommended Adhesive

In all cases, the manufacturer's recommended Adhesive should be used for the specified purpose.

#### 2.7.6 Acoustic Insulation

Material shall be engineered Nitrile Rubber open cell foam.

The Random Incidence Sound Absorption Coefficients (RISACs) across the octave band frequencies; tested as per ISO 354, and Noise Reduction Coefficients (NRCs) for the Acoustic Insulation should be minimum as per the below chart:

<b>Freq (Hz)</b>	<b>125</b>	<b>250</b>	<b>500</b>	<b>1000</b>	<b>2000</b>	<b>4000</b>	<b>NRC</b>
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<b>10 mm</b>	0.03	0.04	0.14	0.40	0.88	1.00	0.40
<b>15 mm</b>	0.01	0.09	0.29	0.74	1.08	0.83	0.55
<b>20 mm</b>	0.04	0.13	0.40	0.90	1.04	0.90	0.60
<b>25 mm</b>	0.05	0.25	0.86	1.14	0.88	0.99	0.80
<b>30 mm</b>	0.07	0.32	0.99	1.16	0.93	1.08	0.85
<b>50 mm</b>	0.23	0.73	1.29	0.99	1.09	1.11	1.05

- The material should be fibre free.
- The density of the acoustic insulation should be minimum 140 Kg/m<sup>3</sup>
- The insulation should have Microban<sup>®</sup>; Built-in Anti-Microbial Product Protection, and should pass Fungi Resistance as per ASTM G 21 and Bacterial Resistance as per ASTM E 2180.
- The insulation should be non-eroding & should pass Air Erosion Resistance Test in accordance to ASTM Standard C 1071-05 (section 12.7).
- The material should have a thermal conductivity not exceeding 0.047 W/m.K @ 20 Deg. C
- The material should withstand maximum surface temperature of +85<sup>0</sup>C and minimum surface temperature of -20<sup>0</sup>C
- The material should confirm to Class 1 rating for surface spread of Flame in accordance to BS 476 Part 7 & UL 94 (HBF, HF 1 & HF 2) in accordance to UL 94, 1996.
- The acoustic insulation should be tested and approved by Sound Research Laboratories Ltd., U.K.
- Thickness shall be 10mm for Duct Acoustic Lining
- Duct so identified and marked on Drawings and included in Schedule of Quantities shall be provided with internal acoustic lining for a distance of minimum 6 meters (or 30% of the duct length whichever is more)
- Thickness of the insulation material shall be as specified for the individual application. The insulation should be installed as per manufacturer's recommendation.

### 2.7.7 Accessories

Adhesive to adhere insulation to the inside walls of the duct shall be from the Insulation manufacturer only.

### 2.7.8 Under deck insulation

- ◆ Insulation material shall be Closed Cell Elastomeric Nitrile Rubber
- ◆ Density of Material shall be between 40 to 60 Kg/m<sup>3</sup>
- ◆ Thermal conductivity of elastomeric nitrile rubber shall not exceed 0.035 W/m<sup>0</sup>K at an average temperature of 0<sup>0</sup>C
- ◆ The insulation shall have fire performance such that it passes Class 1 as per BS476 Part 7 for surface spread of flame as per BS 476 and also pass Fire Propagation requirement as per BS476 Part 6 to meet the Class 'O' Fire category as per 1991 Building Regulations (England & Wales) and the Building Standards (Scotland) Regulations 1990
- ◆ Material should be FM (Factory Mutual), USA approved.

- ◆ Water vapour permeability shall not exceed 0.017 Perm inch ( $2.48 \times 10^{-14}$  Kg/m.s.Pa), i.e. Moisture Diffusion Resistance Factor 'μ' value should be minimum 7000.

#### 2.7.9 Installation procedure:

- The ceiling surface shall be cleaned with brush to remove all dirt, cement etc. If surface is uneven it should be made smooth prior to carrying out insulation work.
- A layer of synthetic rubber adhesive should be applied on the ceiling with the help of brush so that all the pores are filled and surface becomes smooth and allow it to dry.
- Allow an additional 5 mm to the total dimensions while cutting Insulation sheet. Ensure you measure the cutting dimensions on the top surface of the insulation sheet. This can be identified by the products markings; "they are always on the top surface. This surface is the one you will see after installation.
- All Insulation sheet and ceiling surfaces shall have all-over adhesive coverage. Adhesive should be applied on the side that has no product markings and identification printing. This side is the one that curves inwards.
- During installation avoid air bubbles. Always apply pressure while fixing the Insulation sheet, this action will ensure maximum bond strength.
- All cut Insulation sheet edges shall be of a "clean cut nature and not cut rough".
- All seams and joint shall be sealed with synthetic rubber adhesive.
- Measurement of surface dimensions shall be taken properly to cut closed cell elastomeric rubbers sheets to size with sufficient allowance in dimension. Material shall be fitted under compression and no stretching of material shall be permitted. A thin film of adhesive shall be applied on the ceiling with brush and then on to the back of the insulating material sheet with brush/small piece of sheet metal having smooth edges. When adhesive is tack dry, insulating material sheet shall be placed in position and pressed firmly to achieve a good bond. All joints shall be sealed. The adhesive shall be strictly as recommended by the manufacturer. There is no need to make holes for wires etc. as no supporting wires/screws are required.

While doing installation on the metal roofing, it is important to ensure that metal roof should not face direct sun light, as metal sheets becomes very hot and adhesive may not work. In such conditions work should be done in the evening / night

## 2.8 FIRE DAMPERS

This section deals with supply, erection, testing and commissioning of fire dampers and box type dampers, conforming to general specification and suitable for duty selected, indicated in schedule of equipment/material.

### 2.8.1 Dampers

- a) The fire dampers of at least two hour rating shall be provided in all return air ducts at wall crossing. All fire dampers shall be fire tested by CBRI Roorkee for 120 minutes fire rating as per UL555-1995.

- b) 6G GSS sheet blade and frame with 165mm casing, heavy duty interlocking blades and fully enclosed blade linkage mechanism, SS lateral seal blade seals, self-lubricating sintered bronze bushes, fire rating as per UL555-1995 tested as per BS-476 part 20 with 18G extended sleeve 450mm and with fusible link, spring mechanism control panel temp sensor, smoke sensor, limit switch with lever for auto shut off in case of fire/smoke
- c) In the normal position the blades of the dampers shall remain open to allow maximum air to flow. The dampers shall be actuated using fusible link and spring mechanism. The fire damper shall also close due to temperature rise above 74°C.
- d) All fire dampers shall be mounted on wall with a duct sleeve 400 mm long depending on the wall thickness. The sleeve shall be factory fitted on the fire damper. The joint at the sleeve end shall be slip on type. Minimum thickness of GI sheet used for sleeves shall be 18G.

### 2.8.2 Exhaust Air Blowers

line exhaust air flow duct blowers suitable for single phase operations with direct driven class F motor, IP 54 insulation, max 1400rpm, necessary steel frame, and complete with GI box, with an operating sound level not exceeding 60dB at 3m distance.

### 2.8.3 Hepa Filter

Hepa Filter shall be of efficiency 99.97%. HEPA filters shall be aluminium corrugated and Mini pleat style. All filters shall be made up of high quality micro-fine glass fiber media. Filter frames shall be made up of Galvanized steel. Hepa filter shall ensure low pressure drop even at high airflows & with Antimicrobial protection.

All filters shall be made in accordance and tested to EN 1822 / ASHRAE 52.2 standards. These filters shall be tested at factory and test certificates from OEM's shall be produced. The Hepa filter shall be fixed in a plenum constructed at the AHU mouth.

## 2.9 PAINTING WORK

- 2.9.1** All equipment shall be painted as specified under respective headings. Grilles/ diffusers shall be powder coated as per approved colour matching with interiors. The contractor has to get approval of the quality and colour of paints for all types of painting work. All pipes for chilled water shall be painted as per standard code of practice and arrows indicating direction of flow of water shall be marked.

### 2.9.2 Colour scheme for the plant and equipment

i)	Compressor	.. Battle ship grey
ii)	Condenser	.. Battle ship grey
iii)	Refrigerant discharge line	.. Red
iv)	Refrigerant liquid line	.. Yellow
v)	Steel supports	.. Black
vi)	Direction of flow of water	.. White arrows
vii)	Electrical panels/sub-panel/remote control console	.. Light grey or any approved
viii)	Cable trays	.. Black
xi)	Supports for ducts/open ducts	.. Black.

## SECTION- III

### MODE OF MEASUREMENT

THE FOLLOWING MEASUREMENT CODE SHALL APPLY TO THIS CONTRACT:-

#### 3.1 MECHANICAL ITEMS

##### 3.1.1 Ducting

- i) All sheet metal ducting work shall be measured in terms of final sheet area installed in Sq. m.  
Eg:- Measurement of 600 mm x 300 mm duct of 1 m length =  $\frac{[(600+300) \times 2 \times 1]}{1000}$  = 1.80 Sq.m.
- ii) Duct fittings such as bends, elbows, tap-offs, collars, transformation pieces etc. shall be treated as ordinary duct pieces with their length measured along their centre line as mentioned in point (i).
- iii) Vanes, splitters, duct dampers, deflectors, access doors, etc. which are required to be installed in the duct work shall not be measured separately as it shall form part of the duct work.
- iv) Duct supports, stiffening members, etc. shall not be measured separately. All such supports/hangers shall form part of duct work.
- v) Equipment connections such as canvas/asbestos/rexine shall be deemed to be part of the duct work, and no separate measurement shall be allowed.
- vi) No separate special measurement shall be made for bends, transformation pieces, tap offset, elbows, etc.

##### 3.1.2 Grilles:

All grills will be measured in terms of effective area in Sq.m.

##### 3.1.3 Diffusers:

Diffusers will be measured in terms of effective area in Sq.m.

##### 3.1.4 Ducting Insulation

- d) Ducting insulation will be measured on the basis of centerline of insulation and not the outer line of insulation.  
Eg:- Measurement of 25mm thick insulation on 600 mmx300mm duct of 1m length =  $\frac{[(600+25)+(300+25)] \times 2 \times 1}{1000}$  Sq.m
- ii) No separate special measurement shall be made for insulation of bends, transformation pieces, tap offs, elbows, etc. All such insulation shall be treated as standard duct insulation.
- iii) Insulation item shall include all accessories and finishes as specified. No separate measurement will be made for such items.

## **3.2 Electrical items**

### **Mode of Measurement of Electrical Items**

The Works shall be measured, as prescribed in the specification of work, notwithstanding any general or local custom, except where otherwise specifically described or prescribed in the Contract. Wherever not specifically mentioned in the Contract, the mode of measurement as prescribed in the relevant IS codes shall be applicable and binding to the Contract. Only the latest editions of all the codes of practices including all latest official amendments and revisions shall be applicable.

## SECTION-IV

### TESTING OF AIR-CONDITIONING SYSTEM

- 4.1 Routine and type tests for the various items of equipment of the system shall be performed at the Contractor's own cost and test certificates are to be submitted.
- 4.2 The performance tests to determine whether or not the full intent of the specification is met shall be conducted by the contractor. After notification to Purchaser that the installation has been completed and the system has run continuously for a period of at least one week, the contractor shall conduct under the direction and the presence of Purchaser such tests as specified to establish the capacity of various equipment supplied and installed by the contractor.
- 4.3 The contractor shall operate, test and adjust the air-conditioning system units, fan, motors, all air handling appliances including adjustment of regulators, dampers, etc. All testing equipments, labour, operating personnel, oil, refrigerant or any other item required for these tests shall be provided by the contractor to enable the plant to be put in a continuous running test.

#### 4.4 **TEST PROCEDURE:**

##### 4.4.1 Design Conditions:

The inside and outside conditions shall be recorded on hourly basis. The outside and inside dry bulb and wet bulb temperatures shall be recorded by means of a sling psychrometer with mercury thermometers. The relative humidity shall be computed from the psychrometric chart. The inside dry bulb temperature and relative humidity shall fall within the specified limits.

The contractor should conduct performance such tests as indicated in the rated Technical Part and produce sufficient documentary proof that the plant is operating at the rated capacity.

- 4.5 The following readings shall be recorded hourly during the tests and capacity of the plant shall be computed.

#### 1. **Compressor**

- |                        |                            |
|------------------------|----------------------------|
| a. Suction pressure    | - Kg/cm <sup>2</sup> (psi) |
| b. Suction temperature | - °C (°F)                  |
| c. Discharge pressure  | - Kg/cm <sup>2</sup> (psi) |
| d. Condensing Tempr.   | - °C (°F)                  |
| e. Oil pressure        | - Kg/cm <sup>2</sup> (psi) |
| f. Compressor Speed    | - RPM                      |

#### 2. **Compressor motor**

- |                     |         |
|---------------------|---------|
| a. Rated capacity   | - HP    |
| b. Rated volts      | - Volts |
| c. Rated current    | - Amps  |
| d. Starting current | - Amps  |

- 3. Inside unit**
- a. Air velocity - M/Hr. (FPM)
  - b. Face area - M<sup>2</sup> (SFT)
  - c. Air quantity - M<sup>3</sup>/Hr. (CFM)
  - d. Entering air temp. DB - °C (°F)
  - e. Entering air temp. WB - °C (°F)
  - f. Leaving air temp. DB - °C (°F)
  - g. Leaving air temp. WB - °C (°F)
- 4. Air Grilles**
- a. Area of Grilles - M<sup>2</sup> (Sft)
  - b. Velocity - M/Hr (FPM)
  - c. Air flow rate - M<sup>3</sup> (FPM)
  - d. Temperature DB - °C (°F)
  - e. Temperature WB - °C (°F)
- 5. Air Diffusers**
- a. Area - M<sup>2</sup> (Sft)
  - b. Velocity - M/Hr (FPM)
  - c. Air flow rate - M<sup>3</sup> (FPM)
  - d. Temperature DB - °C (°F)
  - e. Temperature WB - °C (°F)
- 6. Filters**
- a. Total area - M<sup>2</sup> (Sft)
  - b. Effective area - M<sup>2</sup> (Sft)
  - c. Velocity of air - M/Hr (FPM)
  - d. Quantity of air - M<sup>3</sup> (CFM)

**SECTION-V**

**TECHNICAL DATA**

**(To be submitted along with the tender)**

**5.0** The following data shall be furnished along with the offer: (REFER LIST OF APPROVED MAKES)  
(Attach catalogues, brochures, etc.)

**1. Ductable Split unit**

Manufacturer  
Model  
Actual capacity TR  
Overall dimensions  
Over all weight  
Operating weight  
Refrigerant

**Compressor**

Manufacturer  
Model  
Type  
Capacity at the specified water temp. and flow rates - in TR  
Type of capacity control provided  
Type of lubrication  
KW / TR

**Motor**

Model  
Manufacturer  
Number of motors  
Capacity HP  
Whether provided with part winding  
Type  
Class of insulation  
Speed RPM  
Characteristics  
Type of starter  
Rating  
Whether the following protections are provided.

- |  |        |
|--|--------|
| i) Overload  | Yes/No |
| ii) Under voltage  | Yes/No |
| i) Single phase protection<br>(for three phase motor starters) | Yes/No |

**2. Inside units**

Manufacturer  
Model  
Type of fan  
Fan speed (R.P.M.)  
No. of fans.  
Fan wheel diameter (mm)  
Drive arrangement  
Material and thickness of fan wheel and blades.  
Materials and thickness of housing.  
Fan outlet area  
Outlet velocity.  
Total air quantity  
Static pressure at outlet. (mm. of water)  
Whether statically and dynamically balanced.  
B.H.P. Consumed  
Total weight of all items

### ***Cooling Coil***

Material of Tubes  
Material of fins  
Tube diameter  
Tube thickness  
Fin thickness  
Method of bonding of fins  
No. of fins/cm.  
Total tube surface outside  
Test pressure  
Coil face area

### **Filter**

Manufacturer  
Type of filters  
Filter medium  
Material of frame work and its thickness  
Face area  
Face velocity across filters  
Pressure drop across filters (mm of water)

### ***Motor***

Manufacturer  
Model  
Number of motors  
Capacity HP  
Type  
Class of insulation  
Speed RPM

Characteristics

Type of starter

Rating

Whether the following protections are provided.

- |  |        |
|--|--------|
| i) Overload  | Yes/No |
| ii) Under voltage  | Yes/No |
| iii) Single phase protection<br>(for three phase motor starters) | Yes/No |

### **3. Ducting**

Material

Manufacturer

### **4. Insulation (for ducting)**

Manufacturer

Material

'k' Value at 10 (°C) mean temperature

Thickness.

Density

Fire Retardant property

Note : Any other data relevant to each equipment shall also be furnished.

### Approved make of items - HVAC

1.	AC Condensing Outdoor Units/Ductable Units /Split AC	-	Voltas/ Carrier /Hitachi/Daikin
2.	AC Compressor	-	Danfoss/Koplan/Emerson
3.	AC AHU's	-	Edgetech/VTS/Zeco
4.	De-humidifier	-	Bry Air/Dessicant Rotor
5.	Air- curtain		Almonard, Russel
6.	Copper Pipes	-	Totaline/Mandev/Piyush
7.	Three phase motors	-	Siemens/Kirloskar/Crompton/ABB /Alsthom
8.	Aluminium Conductor Cables	-	Finolex/NICCO/Havells//Gloster
9.	Stabilizer	-	V Guard/VOLTAS/Everest
10	GI/Al Sheets	-	SAIL/TATA/JINDAL/HINDALCO/NACL
11	Resin bonded Glass wool	-	UPTWIGA /Owens Coning/KIMMCO
12	Nitrile Rubber Insulation	-	Armaflex/K Flex
13	Grilles/Diffusers	-	Airmaster/Carryaire/ Cosmic/ Air Flow/Ravistar
14	Pressure gauges	-	Feibig/H-Guru/Jaspin
15	Industrial type thermometers	-	Feibig/H-Guru/Jaspin
16	Fire/Volume Control Dampers	-	Carryaire/Airmaster/Air Flow/ Ravistar
17	Exhaust/ Duct Fans	-	System Air/Kruger/Nicotra
18	Paints	-	ICI/Asian/Berger
19	PVC pipe	-	Any ISI marked
20	Hepa Filter	-	Aerofoil/Pyramid/AAF/Thermodyne
21	Valves	-	Audco, Leader, Kirloskar, Advance,
22	Factory Fabricated Ducts	-	ZECO, Western Air Ducts,Rolstar,Camduct
23	Double Skin Aluminum Panel	-	Lloyd, Rinac
24	Duct Fan	-	System air, Kruger, NICOTRA

**LIST OF APPROVED MAKES FOR ELECTRICAL WORKS**

<b>S.NO.</b>	<b>MATERIALS</b>	<b>PREFERED MAKE</b>
1	AB switch, DO fuse, LA, TOD meter	Approved makes from KSEB.
2	Unitised substation (Indoor Type)	Intrans / Megawin / Crompton / Resitech
3	HT / LT cables	Gloster / Finolex / Havells / KEI
4	Diesel Engine	Cummins / Kirloskar / Caterpillar
5	Alternator	Stamford / Kirloskar / Lerroy Somer / BHEL
6	HT Cable Termination	Raychem / M-seal / 3M
7	MCCB / SDU	L&T / Legrand / Siemens / Schneider
8	Indication lamp, selector switch, push button	Salzer / L&T / Havells / HPL
9	Indication and Protection meters	L&T / Siemens / Schneider / Beluk
10	Current / Potential Transformer	Intrans / Resitech / PGR Powertech
11	LT cable gland, lugs	Comet / Dowell / Jainson / Hex / Multi-pressing
12	MCBs, DBs, Industrial plugs	Legrand / Havells / Siemens / Schneider
13	PVC wires (Copper)	RR Kabel / Traco / Lapp Kabel / Finolex / V-guard
14	PVC Conduit & accessories, Casing & capping	Precision / Konseal / Balco
15	Modular Switches	Legrand-Myrius / Schneider-Livia / Havells-Coral / Anchor-Allure
16	Cat 6 UTP, Telephone, Co-axial cable	Finolex / RR Kabel / Lapp Kabel / Havells
17	Light fitting	Philips / Wipro / Havells / Bajaj
18	Ceiling, Exhaust fans	Usha / Crompton / Orient

19	UPS	Numeric / Socomec / Powerone / Riello
20	Battery	Exide / Panasonic / Amaron
21	Telephone Terminal box	Krone / Connectwell
22	EPBAX	BPL / NEC / Nortal
23	Batten Holder	Goldmedal / Anchor / Havells / HPL
24	Network Switch	Belkin / Netgear / D-Link
25	Network rack, Patch panel	Netrack / President / Legrand / Valrack
26	LCD Projector	Sony / Panasonic / Hitachi / Toshiba
27	Projector Screen	Liberty / Diaper

## BILL OF QUANTITIES

**(ALL ROWS SHALL BE FILLED, THIS IS MANDATORY  
(IF NIL OR NA, THAT MAY ALSO BE SHOWN)**

### Abstract

<b>Sl No.</b>	<b>Description</b>	<b>Amount (Rs.)</b>
1	Civil works	
2	Plumbing works	
3	Construction of sump	
4	Construction of Compound wall	
5	Dismantling of existing building	
6	Septic Tank & Soak pit	
7	Electrical works	
8	Air conditioning	
9	Fire protection	
	<b>Total</b>	
	Service tax component to be paid by the bidder	
	Service tax component to be directly paid by the HLL in case the bidder is a Proprietary firm	
	<b>GRAND TOTAL [INCLUDING 100% SERVICE TAX (a +b)]</b>	

Signature of the Bidder with date

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		<b>Civil works</b>				
1	2.31	Clearing jungle including uprooting of rank vegetation, grass, brush wood, trees and saplings of girth upto 30 cm measured at a height of 1 m above ground level and removal of rubbish upto a distance of 50 m outside the periphery of the area cleared.	2400.00	m2		
2	2.33	Felling trees of the girth (measured at a height of 1 m above ground level) including cutting of trunks and branches, removing the roots and stacking of serviceable material and disposal of unserviceable material.				
a	2.33.1	Beyond 30 cm girth upto and including 60 cm girth	2.00	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
b	2.33.2	Beyond 60 cm girth upto and including 120 cm girth	35.00	Each		
c	2.33.3	Beyond 120 cm girth upto and including 240 cm girth	4.00	Each		
3	2.6.1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30cm in depth. 1.5m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed. All kinds of soil	455.00	m3		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
4	2.7.1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30 cm in depth, 1.5m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50 m and lift upto 1.5 m, disposed earth to be levelled and neatly dressed. Ordinary rock	905.00	m3		
5	2.25	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m	1135.00	m3		
6	2.27 analysis	Supplying and filling in plinth with quarry dust under floors, including watering, ramming, consolidating and dressing complete	72.00	m3		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
7	16.3.9	Supplying conveying, filling and compacting good earth for levelling yard	5790.00	m3		
8	2.34.1	Supplying chemical emulsion in sealed containers including delivery as specified Chlorpyriphos/ Lindane emulsifiable concentrate of 20%	431.00	litre		
9	2.35.3.1	Treatment of soil under existing floors using chemical emulsion @ one litre per hole, 300 mm apart including drilling 12 mm diameter holes and plugging with cement mortar 1 :2 (1 cement : 2 Coarse sand) to match the existing floor : With Chlorpyriphos/Lindane E.C. 20% with 1% concentration	776.00	Sqm		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
10	4.1.5	1:3:6 (1 Cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size).	168.00	m3		
11	4.17	Making plinth protection 50mm thick of cement concrete 1:3:6 (1 cement :3 coarse sand : 6 graded stone aggregate 20 mm nominal size) over 75mm thick bed of dry brick ballast 40 mm nominal size, well rammed and consolidated and grouted with fine sand including finishing the top smooth	160.00	Sqm		
12	5.37	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying , excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS : 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in - charge.				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		(Note :- Cement content considered in this item is @ 330 kg/cum. Excess/less cement used as per design mix is payable/recoverable separately).				
a	5.37.1	All works upto plinth level.	505.00	m3		
b	5.37.2	All works above plinth level upto floor V level.	315.00	m3		
13	5.35	Add for using extra cement in the items of design mix over and above the specified cement content therein	328.00	ql.		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
14	5.2.3	Reinforced cement concrete work in walls (any thickness), including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts etc. up to floor five level excluding cost of centering, shuttering, finishing and reinforcement : 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size).	13.00	m3		
15	5.9	Centering and shuttering including strutting, propping etc. and removal of form for :				
a	5.9.1	Foundations, footings, bases of columns, etc. for mass concrete.	570.00	Sqm		
b	5.9.2	Walls (any thickness) including attached pilasters, butteresses, plinth and string courses etc.	171.00	Sqm		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
c	5.9.3	Suspended floors, roofs, landings, balconies and access platform.	980.00	Sqm		
d	5.9.5	Lintels, beams, plinth beams, girders, bressumers and cantilevers.	1491.00	Sqm		
e	5.9.6	Columns, Pillars, Piers, Abutments, Posts and Struts.	714.00	Sqm		
f	5.9.7	Stairs, (excluding landings) except spiral-staircases.	38.00	Sqm		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
g	5.9.1 6.1	Edges of slabs and breaks in floors and walls.Under 20 cm wide	340.00	metr e		
h	5.9.1 9	Weather shade, Chajjas, corbels etc., including edges.	53.00	Sqm		
16	5.11. 1	Extra for additional height in centering, shuttering where ever required with adequate bracing, propping etc. including cost of de-shuttering and decentering at all levels, over a height of 3.5 m, for every additional height of 1 metre or part thereof (Plan area to be measured) Suspended floors, roofs, landing, beams and balconies (Plan area to be measured).	950.00	Sqm		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
17	5.22.6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete Thermo-Mechanically Treated bars.	99960.00	kg		
18	6.1.2	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in: Cement mortar 1:6 (1 cement : 6 coarse sand)	11.00	m3		
19	6.4.2	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level in all shapes and sizes in : Cement mortar 1:6 (1 cement : 6 coarse sand)	299.00	m3		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
20	6.12.2	Half brick masonry with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundations and plinth in.cement mortar 1:4 (1 cement : 4 coarse sand)	115.00	Sqm		
21	6.15	Extra for providing and placing in position 2 Nos. 6mm dia. M.S. bars at every third course of half brick masonry.	115.00	Sqm		
22	8.2.2.2	Providing and fixing 18mm thick gang saw cut mirror polished pre moulded and prepolished) machine cut for kitchen platforms, flooring, vanity counters, window sills, facias and similar locations of required size of approved shade, colour and texture laid over 20mm thick base cement mortar 1:4 (1 cement : 4 coarse sand) with joints treated with white cement, mixed with matching pigment, epoxy touch ups, including rubbing, curing, moulding and polishing to edges to give high gloss finish etc. complete at all levels. Granite of any colour and shade: Area of slab over 0.50 sqm.(Lowest retails price not less than Rs. 2000/m2)	80.00	Sqm		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
23	8.5	Extra for providing opening of required size & shape for wash basins/ kitchen sink in kitchen platform, vanity counters and similar location in marble/Granite/stone work including necessary holes for pillar taps etc. including moulding, rubbing and polishing of cut edges etc. complete.	4.00	Each		
24	9.1.1	Providing wood work in frames of doors, windows, clerestory windows and other frames, wrought framed and fixed in position with hold fast lugs or with dash fasteners of required dia & length ( hold fast lugs or dash fastener shall be paid for separately).Second class teak wood	1.20	m3		
25	9.5.1. 1 + 9.14	Providing and fixing panelled or panelled and glazed shutters for doors, windows and clerestory windows including ISI marked Stainless Steel butt hinges bright finished of required size with necessary screws excluding, panelling which will be paid for separately, all complete as per direction of Engineer-in-charge. Second class teak wood: 35 mm thick shutters	28.00	m2		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
26	9.7.1	Providing and fixing panelling or panelling and glazing in panelled or panelled and glazed shutters for doors, windows and clerestory windows (Area of opening for panel inserts excluding portion inside grooves or rebates to be measured). Panelling for panelled or panelled and glazed shutters 25 mm to 40 mm thick :Second class teak wood	22.00	m2		
27	9.9.1. 1 + 9.11. 1 + 9.14	Providing and fixing glazed shutters for doors, windows and clerestory windows using not less than 5.5 mm thick float glass panes including ISI marked Stainless Steel butt hinges bright finished of required size with necessary screws. Second class teak wood 35 mm thick	21.00	m2		
28	9.53	Providing 40x5 mm flat iron hold fast 40 cm long including fixing to frame with 10 mm diameter bolts, nuts and wooden plugs and embedding in cement concrete block 30x10x15cm 1:3:6 mix (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size)	65.00	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
29	9.147	Providing and Fixing, uPVC factory made, white colour casement/sliding window and door made of extruded profiles. Profiles of frames and sash will be mitered cut and fusion welded at all corners including drilling of holes for fixing hardware and drainage of water etc., making arrangement for fixing of hardware, EPDM gasket, 1.2 ± 0.2mm thick galvanised steel profile to be inserted in required profile, frame will be fixed to the wall with 8 mm x 100 mm long fasteners, all complete as per direction of Engineer-in-charge. (Glazing, hardware hinges and fitting etc. to be paid separately.) Note :- Each member of window to be measured separately with clear length.				
	9.147 .2	Casement Window (With friction hinge & outward opening)				
a)	9.147 .2.1	Casement Frame (67mm x 62mm)	112.00	m		
b)	9.147 .2.2	Casement Window Sash/Mullion (67mm x 75mm ) (style, rail and intermediate section)	227.00	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
c)	9.147 .2.3	Casement Glazing bead (35mm x 18 mm)	196.00	m		
30	9.148	Providing and fixing stainless steel (SS-304 grade) friction hinges to the side/ top hung uPVC windows, of approved quality with necessary stainless steel screws etc. as per direction of Engineer-in-charge.				
a)	9.148 .1	200 x 19 x 1.9 mm	8.00	Each		
b)	9.148 .3	300 x 19 x 1.9 mm	45.00	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
31	9.149	Providing and fixing casement handle made of zinc alloyed (white powder coated) for uPVC casement window with necessary screws etc. complete.	53.00	Each		
32	9.68.1	Providing and fixing oxidised M.S. casement stays (straight peg type) with necessary screws etc. Complete-300 mm weighing not less than 200 gms	53.00	Each		
33	21.3.2	Providing and fixing glazing in uPVC door, window, ventilator shutters and partitions etc. with EPDM rubber / neoprene gasket etc. complete as per the architectural drawings and the directions of engineer-in-charge . : With float glass panes of 5.50 mm thickness	35.00	m2		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
34	10.6.1	Supplying and fixing rolling shutters of approved make, made of required size M.S. laths, interlocked together through their entire length and jointed together at the end by end locks, mounted on specially designed pipe shaft with brackets, side guides and arrangements for inside and outside locking with push and pull operation complete, including the cost of providing and fixing necessary 27.5 cm long wire springs manufactured from high tensile steel wire of adequate strength conforming to IS: 4454 – part 1 and M.S. top cover of required thickness for rolling shutters: 80x1.25mm M.S. laths with 1.25 mm thick top cover.	11.00	m2		
35	10.7	Providing and fixing ball bearing for rolling shutters.	1.00	Each		
36	10.8.1	Extra for providing mechanical device chain and crank operation for operating rolling shutters. Exceeding 10.00 sqm and upto 16.80 sqm in the area.	11.00	m2		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
37	9.48.2	Providing and fixing M.S. grills of required pattern in frames of windows etc. with M.S. flats, square or round bars etc. including priming coat with approved steel primer all complete. Fixed to openings /wooden frames with rawl plugs screws etc.	1180.00	kg		
38	9.81.1	Providing and fixing bright finished brass handles with screws etc. complete: 125 mm	54.00	Each		
39	9.82	Providing and fixing bright finished brass hanging type floor door stopper with necessary screws, etc. complete.	27.00	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
40	9.84	Providing and fixing aluminium extruded section body tubular type universal hydraulic door closer (having brand logo with ISI, IS : 3564, embossed on the body, door weight upto 36 kg to 80 kg and door width from 701 mm to 1000 mm) with double speed adjustment with necessary accessories and screws etc. complete.	29.00	Each		
41	9.136	Providing and fixing fire resistant door frame of section 143 x 57 mm having built in rebate made out of 16 SWG G.I.sheet (zinc coating not less than 120 gm/sqm) duly filled with vermiculite based concrete mix, suitable for mounting 60 minutes fire rated door shutters. The frame is fitted with intumescent fire seal strip of size 10x4 mm (minimum) around the frame and fixing with dash fastener of approved size and make, including applying a coat of approved brand fire resistant primer etc. complete as per direction of Engineer-in-charge (Dash fastener to be paid for separately).	13.50	metre		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
42	9.137	Providing and fixing 50 mm thick glazed fire resistant door shutters of 60 minutes fire rating conforming to IS:3614 (Part-II) tested and certified as per laboratory approved by Engineer-in-charge with suitable mounting on door frame, consisting of vertical styles, lock rail, top rail 100mm wide, bottom rail 200mm wide, made out of 16 SWG G.I. sheet (zinc coating not less than 120 gm/m <sup>2</sup> ) duly filled FR insulation material and fixing with necessary stainless steel ball bearing hinges of approved make, including applying a coat of approved fire resistant primer etc. all complete as per direction of Engineer-in-charge (paneling to be paid for separately).	2.00	Sqm		
43	9.138 .1	Providing and fixing glazing in fire resistant door shutters, fixed panels, ventilators and partitions etc., with G.I. beading of appropriate size made out of 20 SWG G.I.sheet (zinc coating not less than 120 gm/m <sup>2</sup> ), fire resistant sealant, including applying a coat of approved fire resistant primer on G.I. beading etc. complete all as per direction of Engineer-in-charge. With clear fire resistant glass panes 6mm thick of approved brand, having minimum 60 minutes fire resistance	5.20	Sqm		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
44	9.141	Providing and fixing PVC Door Frame of size 50x47mm with a wall thickness of 5 mm ( $\pm$ 0.2 mm) made out of single piece extruded PVC profile, with mitred cut joints and joint with 2nos of PVC bracket of size 190 mm x 100 mm long arms of cross section size 35 x 15mm & self driven self tapping screws, the vertical door profiles to be reinforced with 40x20mm M.S. rectangular tube of 0.8 mm , including providing EPDM rubber gasket weather seal throughout the frame, including jointing 5mm PVC frame strip with PVC solvent cement on the back of the profile. The door frame to be fixed to the wall using 8 x100mm long anchor fasteners complete, all as per manufacturer's specification and direction of Engineer - in- charge.	12.00	metre		
45	9.142 .2	35 mm thick factory made Solid panel PVC Door shutter made out of single piece extruded solid PVC profiles, 5 mm ( $\pm$ 0.2mm) thick, having styles & rails (except lock rail) of size 95 mmx 35 mm x 5 mm, out of which 75 mm shall be flat and 20 mm shall be tapered (on both side), having one side thickness of 15 mm integrally extruded on the hinge side of the profile for better screw holding power, including reinforcing with MS tube of size 40 mm X 20 mm x 1 mm, joints of styles & rails to be mitred cut & joint with the help of PVC solvent cement, self driven self tapping screws & M.S. rectangular pipes bracket of size 190 mm X 100 mm of cross section size 35 mm x 17 mm x 1 mm at each corner.				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		Single piece extruded 5mm thick solid PVC Lock rail of size 115 mm x 35 mm x 35 mm, out of which 95 mm to be flat and 20 mm to be tapered at both ends, having 15 mm solid core in middle of rail section integrally extruded, fixing the styles & rails with the help of solvent and self driven self tapping screws of 125 mm x 11 mm, including providing 5 mm Single piece solid PVC extruded sheet inserted in the door as panel, all complete as per manufacturer's specification and direction of Engineer-in-charge. Decorative finish (wood grained finish).	3.50	Sqm		
46	10.5.1	Providing and fixing 1mm thick M.S. sheet door with frame of 40x40x6mm angle iron and 3mm M.S. gusset plates at the junctions and corners, all necessary fittings complete, including applying a priming coat of approved steel primer: Using M.S. angels 40x40x6 mm for diagonal braces.	11.20	Sqm		
47	10.17	Providing and fixing M.S. fan clamp type I or II of 16 mm dia M.S. bar bent to shape with hooked ends in R.C.C. slabs, beams during laying including painting the exposed portion of loop, all as per standard design complete.	30.00	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
48	10.28	Providing and fixing stainless steel (Grade 304) railing made of Hollow tubes, channels, plates etc. including welding, grinding, buffing, polishing and making curvature (wherever required) and fitting the same with necessary stainless steel nuts and bolts complete i/c fixing the railing with necessary accessories & stainless steel dash fasteners, stainless steel bolts etc., of required size, on the top of the floor or the side of waist slab with suitable arrangement as per approval of Engineer-in-charge. (for payment purpose only weight of stainless steel members shall be considered excluding fixing accessories such as nuts, bolts, fasteners etc.)	415.00	kg		
49	11.36	Providing and fixing 1st quality ceramic glazed wall tiles 300x450mm size conforming to IS : 15622 (thickness to be specified by the manufacturer) of approved make in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in-Charge, in skirting, risers of steps and dados over 12 mm thick bed of cement Mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm including pointing in white cement mixed with pigment of matching shade complete.(Lowest retail price not less than Rs. 400/m2) Make: NITKO, KAJARIA, ORIENT.	110.00	Sqm		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
50	11.40	Providing and laying rectified Glazed Ceramic floor tiles 300x300 mm or more (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 15622 of approved make in all colours, shades, except White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick Cement Mortar 1:4 (1 Cement : 4 Coarse sand) including pointing the joints with white cement and matching pigments etc., complete (Lowest retail price not less than Rs. 500/m <sup>2</sup> ) Make: NITKO, KAJARIA, ORIENT.	33.00	Sqm		
51	11.41 .2	Providing and laying vitrified floor tiles in different sizes (thickness to be specified by the manufacturer) with water absorption's less than 0.08% and conforming to IS : 15622 of approved make in all colours and shades, laid on 20mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including grouting the joints with white cement and matching pigments etc., complete. Size of Tile 600x600 mm: (Lowest retail price not less than Rs. 900/m <sup>2</sup> ) Make: NITKO, KAJARIA, ORIENT.	625.00	Sqm		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
52	11.46 .2	Providing and laying Vitrified tiles in different sizes (thickness to be specified by manufacturer) with water absorption less than 0.08 % and conforming to I.S. 15622, of approved make in all colours & shade in skirting, riser of steps, over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand), including grouting the joint with white cement & matching pigments etc. complete. Size of Tile 600x600 mm: (Lowest retail price not less than Rs. 900/m2) Make: NITKO, KAJARIA, ORIENT.	63.00	Sqm		
53	12.52	Providing and fixing tiled false ceiling of approved materials of size 595x595 mm in true horizontal level suspended on inter locking metal grid of hot dipped galvanized steel sections ( galvanized @ 120 gsm/sqm, both side inclusive) consisting of main "T" runner with suitably spaced joints to get required length and of size 24x38mm made from 0.30mm thick (minimum) sheet, spaced at 1200mm center to center and cross "T" of size 24x25mm made of 0.30mm thick (minimum) sheet, 1200mm long spaced between main "T" at 600mm center to center to form a grid of 1200x600 mm and secondary cross "T" of length 600mm and size 24x25mm made of 0.30 mm thick (minimum) sheet to be interlocked at middle of the 1200x600mm panel to form grids of 600x600mm and wall angle of size 24x24x0.3 mm				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		and laying false ceiling tiles of approved texture in the grid including, wherever, required, cutting/making, opening for services like diffusers, grills, light fittings, fixtures, smoke detectors etc. Main "T" runners to be suspended from ceiling using GI slotted cleats of size 27 x 37 x 25 x 1.6 x mm fixed to ceiling with 12.5 mm dia and 50 mm long dash fasteners, 4mm GI adjustable rods with galvanised butterfly level clips of size 85 x 30 x 0.8 mm spaced at 1200mm center to center along main T, bottom exposed width of 24 mm of all T-sections shall be pre-painted with polyester paint, all complete at all heights as per specifications drawings and as directed by Engineer-in-charge.				
a	12.52 .3	12.5mm thick square edge PVC Laminated Gypsum Tile of size 595x595mm, made of Gypsum plasterboard; manufactured from natural gypsum as per IS 2095 part I and laminated with white 0.16mm thick fire retardant PVC film on the face side and 12micron metalized polyester on the back side with all edges sealed with the face side PVC film which goes around and wraps the edges and is bonded to the edges and the back side metalized polyester film so as to make the tile a completely sealed unit.	340.00	Sqm		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
54	12.56	Providing and laying roof insulation with 40 mm thick impervious sprayed, closed cell free Rigid Polyurethane foam over deck insulation conforming to IS - 12432 Pt. III (density of foam being 40-45 kg/cum), over a coat of polyurethane primer applied @ 6-8 sqm per litre, laying 400 G polythene sheet over PUF spray and providing a wearing course of 40 mm thick cement screed 1: 2 : 4 (1 cement : 2 coarse sand : 4 stone aggregate 20 mm nominal size) in Chequerred rough finish, in panels of 2.5 m x 2.5 m and embedding with 24 G wire netting and sealing the joints with polymerized mastic, all complete as per direction of Engineer-in-Charge.to the top of roof slab	700.00	Sqm		
55	13.1.1	12 mm cement plaster of mix 1:4 (1 cement: 4 fine sand) for inside walls	2405.00	Sqm		
56	13.2.1	15 mm cement plaster on the rough side of single or half brick wall of mix :1:4 (1 cement: 4 fine sand) for outside walls	1270.00	Sqm		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
57	13.16 .1	6 mm cement plaster of mix : 1:3 (1 cement: 3 fine sand) for under side of roof slab	885.00	Sqm		
58	13.9. 1 + 13.21	Cement plaster 1:3 (1 cement: 3 coarse sand) finished with a floating coat of neat cement.12 mm cement plaster including providing and mixing water proofing material in cement plaster work in proportion recommended by the manufacturers. to the top surface of sunshade	160.00	Sqm		
59	13.80	Providing and applying white cement based putty of average thickness 1 mm, of approved brand and manufacturer, over the plastered wall surface to prepare the surface even and smooth complete.	3290.00	Sqm		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
60	13.43 .1	Applying one coat of water thinnable cement primer of approved brand and manufacture on wall surface :	3290.00	Sqm		
61	13.47 .1	Finishing walls with Premium Acrylic Smooth exterior paint with Silicone additives of required shade New work (Two or more coats applied @ 1.43 ltr/ 10 sqm. over and including priming coat of exterior primer applied @ 2.20 kg/ 10 sqm).	1270.00	Sqm		
62	13.52 .2	Finishing with Epoxy paint (two or more coats) at all locations prepared and applied as per manufacturer's specifications including appropriate priming coat, preparation of surface, etc. complete.to the walls	270.00	m2		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
63	13.60 .1	Wall painting with acrylic emulsion paint of approved brand and manufacture to give an even shade: Two or more coats on new work.	3290.00	Sqm		
64	13.61 .1	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade: Two or more coats on new work.	55.00	Sqm		
65	16.68	Providing and laying 60mm thick factory made cement concrete interlocking paver block of M -30 grade made by block making machine with strong vibratory compaction, of approved size, design & shape, laid in required colour and pattern over and including 50mm thick compacted bed of fine sand, filling the joints with fine sand etc. all complete as per the direction of Engineer-in-charge.	215.00	Sqm		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
66	16.69	Providing and laying at or near ground level factory made kerb stone of M-25 grade cement concrete in position to the required line, level and curvature, jointed with cement mortar 1:3 (1 cement: 3 coarse sand) including making joints with or without grooves (thickness of joints except at sharp curve shall not to more than 5mm), including making drainage opening wherever required complete etc. as per direction of Engineer-in-charge (length of finished kerb edging shall be measured for payment). (Precast C.C. kerb stone shall be approved by Engineer-in-charge).	3.50	m3		
67	11.20 .3	Chequerred precast cement concrete tiles 22 mm thick in footpath & courtyard, jointed with neat cement slurry mixed with pigment to match the shade of tiles including rubbing and cleaning etc. complete, on 20 mm thick bed of cement mortar 1:4 (1 cement: 4 coarse sand). Dark shade using ordinary cement.	75.00	Sqm		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
68	21.1. 1.2	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other sections of approved make conforming to IS: 733 and IS: 1285, fixing with dash fasteners of required dia and size, including necessary filling up the gaps at junctions, i.e. at top, bottom and sides with required EPDM rubber/ neoprene gasket etc. Aluminium sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminium snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing, paneling and dash fasteners to be paid for separately) : For fixed portion Powder coated aluminium (minimum thickness of powder coating 50 micron)	545.00	kg		
69	21.1. 2.2	For shutters of doors, windows & ventilators including providing and fixing hinges/ pivots and making provision for fixing of fittings wherever required including the cost of EPDM rubber / neoprene gasket required (Fittings shall be paid for separately). Powder coated aluminium (minimum thickness of powder coating 50 micron)	255.00	kg		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
70	21.2.2	Providing and fixing 12mm thick pre-laminated particle board flat pressed three layer or graded wood particle board conforming to IS: 12823 Grade I Type II, in panelling fixed in aluminum doors, windows shutters and partition frames with C.P. brass / stainless steel screws etc. complete as per architectural drawings and directions of engineer-in-charge. Pre-laminated particle board with decorative lamination on both sides.	20.00	Sqm		
71	21.3.2	Providing and fixing glazing in aluminium door, window, ventilator shutters and partitions etc. with EPDM rubber / neoprene gasket etc. complete as per the architectural drawings and the directions of engineer-in-charge. (Cost of aluminium snap beading shall be paid in basic item): With float glass panes of 5.50 mm thickness	12.00	Sqm		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
72	21.4.2	Providing and fixing double action hydraulic floor spring of approved brand and manufacture conforming to IS : 6315, having brand logo embossed on the body / plate with double spring mechanism and door weight upto 125 kg., for doors, including cost of cutting floors, embedding in floors as required and making good the same matching to the existing floor finishing and cover plates with brass pivot and single piece M.S. sheet outer box with slide plate etc. complete as per the direction of Engineer-in-charge. With brass cover plate minimum 1.25 mm thickness.	2.00	Each		
73	21.12.2	Providing and fixing aluminium tubular handle bar 32 mm outer dia, 3.0 mm thick & 2100 mm long with SS screws etc .complete as per direction of Engineer-in-Charge. Powder coated minimum thickness 50 micron aluminium tubular handle bar	26.00	Each		
74	21.13	Providing and fixing 100mm brass locks (best make of approved quality) for aluminium doors including necessary cutting and making good etc. complete	11.00	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
75	21.18	Providing and fixing 12 mm thick frameless toughened glass door shutter of approved brand and manufacture, including providing and fixing top & bottom pivot & spring type fixing arrangement and making necessary holes etc. for fixing required door fittings, all complete as per direction of Engineer-in-charge (Door handle, lock and stopper etc.to be paid separately).	5.00	Sqm		
76	22.5	Providing and laying water proofing treatment in sunken portion of WCs, bathroom etc., by applying cement slurry mixed with water proofing cement compound consisting of applying : a) First layer of slurry of cement @ 0.488 kg/sqm mixed with water proofing cement compound @ 0.253 kg/sqm. This layer will be allowed to air cure for 4 hours. b) Second layer of slurry of cement @ 0.242 kg/sqm mixed with water proofing cement compound @ 0.126 kg/sqm. This layer will be allowed to air cure for 4 hours followed with water curing for 48 hours. The rate includes preparation of surface, treatment and sealing of all joints, corners, junctions of pipes and masonry with polymer mixed slurry	33.00	Sqm		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
77	21.10	Providing and fixing double glazed hermetically sealed glazing in aluminium windows, ventilators and partition etc. with 6 mm thick clear float glass both side, having 12 mm air gap, including providing EPDM gasket, perforated aluminium spacers, desiccants, sealant (Both primary and secondary sealant) etc. as per specifications, drawings and direction of Engineer-in-charge complete.	14.00	m2		
78	10.16 .1	Steel work in built up tubular (round, square or rectangular hollow tubes etc.) trusses etc. including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer, including welding and bolted with special shaped washers etc. complete. Hot finished welded type tubes.	1265.00	kg		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
79	12.50	Providing and fixing precoated galvanised iron profile sheets (size shape and pitch of corrugation as approved by Engineer-in-charge) 0.50 mm + 0.05 %, total coated thickness with zinc coating 120 gsm as per IS: 277 in 240 mpa steel grade, 5-7 microns epoxy primer on both side of the sheet and polyester top coat 15-18 microns. Sheet should have protective guard film of 25 microns minimum to avoid scratches while transportation and should be supplied in single length upto 12 metre or as desired by Engineer-in-charge. The sheet shall be fixed using self drilling /self tapping screws of size (5.5x 55mm) with EPDM seal, complete upto any pitch in horizontal/ vertical or curved surfaces excluding the cost of purlins, rafters and trusses and including cutting to size and shape wherever required.	137.00	m2		
80	7.23.1.5	Stone work (machine cut edges) for wall lining etc. (vener work) upto 10 metre height, backing filled with a grout of average 12 mm thick cement mortar 1:3 (1 cement : 3 coarse sand) including pointing in white cement mortar 1:2 (1 white cement : 2 stone dust) with an admixture of pigment matching the stone shade : (To be secured to the backing and the sides by means of cramps and pins which shall be paid for separately) :Red sand stone/Fine laterite stone - exposed face fine dressed with rough backing.30 mm thick.	64.00	m2		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
81	7.25	Providing and fixing stainless steel cramps of required size and shape for anchoring stone wall lining to the backing or securing adjacent stones in stone wall lining in cement mortar 1:2 (1 cement : 2 coarse sand) including making the necessary chases in stone and holes in walls wherever required.	128.00	kg		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
82	MR	<p>Providing &amp; Fixing of Armstrong Orcal Clip-in swing down Aluminium non perforated precoating 600 X 600X 0.7 mm clip in tiles of stainless steel in 0.35 mm thickness with bevel edge in white colour (RAL 9010) with Light Reflectance &gt; 60% and suitable for Green Building application, with Recycled content of 25%.Installation: To comprise 3000mm long 'C' channels spaced at 1200mm centres securely fixed to the structural soffit by support clamp &amp; approved hangers. The last hanger at the end of each C channel should not be greater than 600mm from the adjacent wall. Use a C-channel connector for splicing two pieces of C-channels. 4000mm Dp-12 Main carriers (spring tee bars) shall be spaced at 600mm centres in a direction perpendicular to the C-channels and shall be secured at every intersection with C channel using a dp-12 hanger. Tiles should be clipped in between two Dp-12 carriers (spring tee bars) from below. Perimeter trims to be of Armstrong wall angles of white colour secured to walls at 450mm maximum centres. Cut tiles to be secured to the wall angles using a spring clamp. Required Openings are to be made to accommodate laminar flow air-conditioning unit filters as per site conditions.</p>	90.00	m2		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
83	LMR	<b>Priming</b> :- Providing and applying <b>R3E or R2C</b> , solvent free epoxy primer in two coats, on the prepared floor , using a brush or short / medium pile roller at a time gap of 8 hrs by ensuring a uniform coating is achieved and compensated the differences in surface porosity, allowing second coat to dry for 24 Hrs, etc and complete as per manufacturer's specification.				
		<b>Self Leveling Epoxy Topping</b> : Providing and installing Ardex <b>R 25 CE</b> , high performance, epoxy resin flooring system by mixing all 4 components using heavy duty slow speed drilling machine fixed with mixing paddle, pouring of mixed material on the primed surface and spreading it using suitable notch trowel at <b>2 mm thickness</b> , gently rolling the spike roller to remove the entrapped air, etc and complete as per manufacturer's specification. [The properties are as follows:- Pot life : 30 min; Initial hardness : 24 hours; Full cure : 7 days; Bond strength : >1.5 N/mm <sup>2</sup> ; Compressive strength : 70 N/mm <sup>2</sup> ; Flexural strength : 31 N/mm <sup>2</sup> ; Tensile strength : 23 N/mm <sup>2</sup> ]	90.00	m2		
84	LMR	Supplying and fixing of 10mm thick multiwall Bronze colour with UV protection treatment trade code name <b>Lexan Bronze LMB 10/2RS 1.7 of SABIC PLASTICS</b> sheet weight not less than 1700gm /Sqm light transmission of 65%				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		b) The masking carrying instruction as to which side UV protection and the shade should be installed facing outwards.				
		c) Fire retardant confirming to IS 14443-1987				
		d)Aluminium leak proof fixing management system membrane system minimum 50micron powder coated with approved colour, confirming IS 733-1987 Alloy 606373 EPDM rubber gaskets, Silicone sealent, cold forged fasterns to be used for fixing the polycarbonate sheet.	60.00	m2		
85	LMR	Providing and fixing R.P pattern tiles to the top of porch over 12mm thick cement mortar 1:3, including cost of tiles, cement mortar etc complete	118.00	m2		
		<b>Total Amount</b>				

**PLUMBING WORKS**

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
1	17.3.1	Providing and fixing white vitreous china pedestal type water closet (European type) with seat and lid, 10 litre low level white vitreous china flushing cistern & C.P. flush bend with fittings & C.I.brackets, 40mm flush bend, overflow arrangement with specials of standard make and mosquito proof coupling of approved municipal design complete including painting of fittings and brackets, cutting and making good the walls and floors wherever required : W.C. pan with ISI marked white solid plastic seat and lid.(Make: Hindware, Jaquar, Parryware)	2	Each		
2	17.7.1	Providing and fixing wash basin/counter wash basin with C.I. brackets, 15 mm C.P. brass pillar taps,32 mm C.P. brass waste of standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever require White Vitreous China Wash basin size 630x450 mm with a pair of 15 mm C.P. brass pillar taps. (Make: Hindware, Jaquar, Parryware)	4	Each		
3	17.28.2.2	Providing and fixing P.V.C. waste pipe for sink or wash basin including P.V.C. waste fittings complete. Flexible pipe 40 mm dia	6	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
4	17.32 .2	Providing and fixing mirror of superior glass (of approved quality) and of required shape and size with plastic moulded frame of approved make and shade with 6 mm thick hard board backing :Rectangular shape 453x357mm	2	Each		
5	17.34 .1	Providing and fixing toilet paper holder :C.P. Brass	4	Each		
6	17.70 .2	Providing and fixing PTMT Bottle Trap for Wash basin and sink. Bottle trap 38mm single piece moulded with height of 270mm, effective length of tail pipe 260mm from the centre of the waste coupling 77mm breadth with 25mm minimum water seal, weighing not less than 263gms	4	Each		
7	17.73 .2	Providing and fixing PTMT towel rail complete with brackets fixed to wooden cleats with CP brass screws with concealed fitting arrangement of approved quality and colour.600mm long towel rail with total length of 645mm, width 78mm and effective height of 88mm, weighing not less than 190gms.	6	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
8	18.7	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge. Make: Supreme, Finolex, Astral <b>Internal work - Exposed on wall</b>				
a	18.7. 1	15 mm nominal outer dia .Pipes.	3	Metre		
b	18.7. 2	20 mm nominal outer dia .Pipes.	5	Metre		
c	18.7. 3	25 mm nominal outer dia .Pipes	20	Metre		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
d	18.7.4	32 mm nominal outer dia .Pipes.	15	Metre		
e	18.7.5	40 mm nominal outer dia .Pipes.	15	Metre		
9	18.8	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings i/c fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and the cost of cutting chases and making good the same including testing of joints complete as per direction of Engineer in Charge. Make: Supreme, Finolex, Astral <b>Concealed work including cutting chases and making good the walls etc.</b>				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
a	18.8. 1	15 mm nominal outer dia .Pipes	5	Metre		
b	18.8. 2	20 mm nominal outer dia .Pipes	20	Metre		
c	18.8. 3	25 mm nominal outer dia .Pipes.	10	Metre		
10	18.9	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes, having thermal stability for hot & cold water supply including all CPVC plain & brass threaded fittings This includes jointing of pipes & fittings with one step CPVC solvent cement, trenching, refilling & testing of joints complete as per direction of Engineer in Charge. Make: Supreme, Finolex, Astral <b>External work</b>				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
a	18.9. 2	20 mm nominal outer dia .Pipes.	20	Metre		
b	18.9. 3	25 mm nominal outer dia .Pipes.	30	Metre		
c	18.9. 4	32 mm nominal outer dia .Pipes.	50	Metre		
11	18.17	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) :				
a	18.17 .1	25 mm nominal bore	10	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
b	18.17 .2	32 mm nominal bore	10	Each		
12	18.18	Providing and fixing ball valve (brass) of approved quality, High or low pressure, with plastic floats complete				
	18.18 .2	20 mm nominal bore	4	Each		
	18.18 .3	25 mm nominal bore	4	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
13	18.33 .1	Constructing masonry Chamber 60x60x75 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for sluice valve, with C.I. surface box 100mm. top diameter, 160 mm bottom diameter and 180 mm deep (inside) with chained lid and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size ) , i/c necessary excavation, foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick finished with a floating coat of neat cement complete as per standard design : With common burnt clay F.P.S.(non modular) bricks of class designation 7.5.	1	Each		
14	18.37 .1	Constructing masonry Chamber 60x45x50 cm inside, in brick work in cement mortar 1:4 (1 cement : 4 coarse sand) for water meter complete with C.I. double flap surface box 400x200x200 mm (inside) with locking arrangement and RCC top slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) , i/c necessary excavation, foundation concrete 1:5:10 ( 1 cement : 5 fine sand:10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 (1 cement : 3 coarse sand) 12 mm thick finished with a floating coat of neat cement complete as per standard design : With common burnt clay F.P.S.(non modular) bricks of class designation 7.5.	1	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
15	18.48	Providing and placing on terrace (at all floor levels) polyethylene water storage tank ISI : 12701 marked with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank	10000	Litre		
16	18.51 .1	Providing and fixing C.P. brass long body bib cock of approved quality conforming to IS standards and weighing not less than 690 gms.: 15 mm nominal bore: Make: Jauqar, Hindware, Parryware, crome	4	Each		
17	18.52 .1	Providing and fixing C.P. brass stop cock (concealed) of standard design and of approved make conforming to IS:8931.:15 mm nominal bore.: Make:Jauqar, Hindware, Parryware, crome	4	Each		
18	18.53 .1	Providing and fixing C.P. brass angle valve for basin mixer and geyser points of approved quality conforming to IS:8931 a) 15 mm nominal bore:15mm nominal bore: Make: Jauqar, Hindware, Parryware, crome	12	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
19	18.58 .2.1	Providing and fixing PTMT grating of approved quality and colour.: Rectangular type with openable circular lid.150 mm nominal size square 100 mm diameter of the inner hinged round grating	8	Each		
20	18.64	Providing and fixing PTMT swivelling shower, 15mm nominal bore. Weighing not less than 40gms.Make:Jauqar, Hindware, Parryware, crome	4	Each		
21	18.65	Providing and fixing PTMT soap Dish Holder having length of 138mm, breadth 102mm, height of 75mm with concealed fitting arrangements. Weighing not less than 106 gms.	6	Each		
22	18.76 .1	Cutting holes up to 30x30 cm in walls including making good the same: With common burnt clay F.P.S. (non modular) bricks.	10	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
23	18.77	Cutting holes up to 15x15cm in R.C.C. floors and roofs for passing drain pipe etc. and repairing the hole after insertion of drain pipe etc. with cement concrete 1:2:4 (1 cement :2 coarse sand : 4 graded stone aggregate 20 mm nominal size) including finishing complete so as to make it leak proof.	15	Each		
24	12.41 .2	Providing and fixing on wall face unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A including jointing with seal ring conforming to IS : 5382 leaving 10 mm gap for thermal expansion.(i) Single socketed pipes. 110 mm diameter	50	Metre		
25	12.42	Providing and fixing on wall face unplasticised - PVC moulded fittings/ accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A including jointing with seal ring conforming to IS : 5382 leaving 10 mm gap for thermal expansion.				
a	12.42 .1.2	Coupler: 110 mm	10	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
b	12.42 .3.2	Single tee with door: 110x110x110 mm	8	Each		
c	12.42 .5.2	Bend 110 mm	24	Each		
d	12.42 .6.2	110 mm Shoe	8	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
26	12.43 .2	Providing and fixing unplasticised -PVC pipe clips of approved design to unplasticised - PVC rain water pipes by means of 50x50x50mm hard wood plugs, screwed with M.S. screws of required length including cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse sand) and making good the wall etc. complete. 110 mm	15	Each		
27	12.44	Providing and fixing to the inlet mouth of rain water pipe cast iron grating 15 cm diameter and weighing not less than 440 grams.	8	Each		
28	19.4	Providing and fixing square-mouth S.W. gully trap class SP-1 complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design : 100x100 mm size P type With common burnt clay F.P.S. (non modular) bricks of class designation 7.5				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
a	19.4.3.1	180x150 mm size P type With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	2	Each		
29	2.10.1.2	Excavating trenches of required width for pipes, cables, etc including excavation for sockets, and dressing of sides, ramming of bottoms, depth upto 1.5 m including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth, including consolidating each deposited layer by ramming, watering, etc. and disposing of surplus excavated soil as directed, within a lead of 50 m :All kinds of soil:Pipes, cables etc. exceeding 80 mm dia. but not exceeding 300 mm dia.	100	Metre		
30	19.6.2	Providing and laying non-pressure NP2 class (light duty) R.C.C. pipes with collars jointed with stiff mixture of cement mortar in the proportion of 1:2 (1 cement : 2 fine sand) including testing of joints etc. complete : 150 mm dia. R.C.C. Pipe	100	Metre		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
31	19.7	Constructing brick masonry manhole in cement mortar 1:4 ( 1 cement : 4 coarse sand ) with R.C.C. top slab with 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), foundation concrete 1:4:8 mix (1 cement : 4 coarse sand : 8 graded stone aggregate 40mm nominal size), inside plastering 12mm thick with cement mortar 1:3 (1 cement : 3 coarse sand) finished with floating coat of neat cement and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) finished with a floating coat of neat cement complete as per standard design :				
a	19.7. 1.1	Inside size 90x80 cm and 45 cm deep including C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg) : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	2	Each		
b	19.7. 3.1	Inside size 120x90 cm and 90 cm deep including C.I. cover with frame (heavy duty) 560 mm internal diameter, total weight of cover and frame to be not less than 208 kg (weight of cover 108 kg and weight of frame 100 kg) : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	4	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
32	19.8	Extra for depth for manholes				
a	19.8.1.1	Size 90x80 cm With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	2	Metre		
b	19.8.2.1	Size 120x90 cm With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	4	Metre		
33	19.16	Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910 on 12mm dia steel bar conforming to IS : 1786 having minimum cross section as 23 mmx25mm and over all minimum length 263 mm and width as 165mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having	15	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		manufacture's permanent identification mark to be visible even after fixing, including fixing in manholes with 30x20x15 cm cement concrete block 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) complete as per design.				
34	MR	Providing & fixing of CP <b>Health faucet. Hand operated spray unit (instand type)</b> . Make:Jauqar, Hindware, Parryware, crome., (Lowest retail price not less than 1200/each. Materials to be selected by the Engineer in charge)	2	Set		
39	M.R.	Providing and fixing <b>PVC</b> soil, waste and vent pipe to IS : 13592 of SWR quality, including all fittings, like EG : Bends, Tees, Elbows, Collars, junction, inspection doors, cowls, offsets, access pipes, jointing with rubber ring / solvent cement by application of leak proof adhesive like FRP paste including cutting holes in walls and floors and making good. Make: Supreme, Finolex, Astral				
a)	MR	50mm dia (6kg / sq.cm)	10.00	Mtr.		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
b)	M.R.	63mm dia (6kg / sq.cm)	10.00	Mtr.		
c)	M.R.	75mm dia (6kg / sq.cm)	10.00	Mtr.		
d)	M.R.	110mm dia (6 kg / sq.cm)	10.00	Mtr.		
40	M.R.	Providing and fixing <b>PVC floor trap</b> self cleansing design with or without vent arm complete including cutting and making good the walls and floors. Make: Supreme,Finolex,Prince etc.,110mm dia.	8	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
41	MR	Supplying and fixing Wash Basin with one pair mounting brackets, EWC & Cistern complete with fittings & seat cover, hinged rail, grab rails and one no of faucet for WB with Rack Bolt, Flexible Tube for pillar Tap & Waste Coupling Designed for people with special needs (Handicapped/ Physically disabled People) P trap, Angle valve, including fittings and brackets, cutting and making good the walls wherever required, including cost & conveyance of all materials, labour charges, sundries etc complete as directed by the Engineer in charge.(Materials should be selected by Engineer in charge).(Make Hindware No. 70002-	2	Each		
		<b>Total Amount</b>				

**SUMP**

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
1	2.6.1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30cm in depth. 1.5m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50m and lift upto 1.5m, disposed earth to be levelled and neatly dressed. All kinds of soil	m3	10.00		
2	2.7.1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30 cm in depth, 1.5m in width as well as 10 sqm on plan) including disposal of excavated earth, lead upto 50 m and lift upto 1.5 m, disposed earth to be levelled and neatly dressed: Ordinary rock	m3	19.00		
3	2.7.1 + 2.26.2	Do do 2nd depth 1.5m to 3.0m do do All classes of soil	m3	19.00		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
4	4.1.5	1:3:6 (1 Cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size).	m3	2.00		
5	4.1.3	1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size)	m3	0.10		
6	5.37.1	Providing and laying in position ready mixed M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, manufactured in fully automatic batching plant and transported to site of work in transit mixer for all leads having continuous agitated mixer, manufactured as per mix design of specified grade for reinforced cement concrete work including pumping of R.M.C. from transit mixer to site of laying , excluding the cost of centering, shuttering finishing and reinforcement including cost of admixtures in recommended proportions as per IS : 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in - charge	m3	13.00		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
7	5.35	Add for using extra cement in the items of design mix over and above the specified cement content therein.	ql	6.50		
8	5.9	Centering and shuttering including strutting, propping etc., and removal of form for,				
8a	5.9.1	Foundations, Footings, bases of columns, etc for mass concrete.	m2	5.00		
8b	5.9.2	Walls any thickness including attached pilasters buttersesses, Plinth and string courses etc.	m2	60.00		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
8c	5.9.3	Suspended floors, roofs, landings ,Balconies and access platform	m2	16.00		
9	5.22.6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto Plinth level.: Termo – Mechanically Treated Bars	kg	1560.0		
10	2.25	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc., in layers not exceeding 20cm in depth: consolidating each deposited layer by ramming and watering etc complete, and form uniform level for flooring concrete.	m3	10.00		
11	1.1.2 (8)	Conveying from site and disposing off the excess earth as per the direction of engineer in charge.	m3	39.00		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
12	13.9.1 + 13.21	Cement plaster 1:3 (1 cement: 3 coarse sand) finished with a floating coat of neat cement :12 mm cement plaster including water proofing compound	m2	72.00		
13	LMR	Providing and fixing C.I. M.H.cover with frame (medium duty) 500 mm internal diameter, total weight of cover and frame to be not less than 116 kg (weight of cover 58 kg and weight of frame 58 kg) :	Each	1		
		<b>Total</b>				

### CONSTRUCTION OF COMPOUND WALL AND GATE

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
1	2.8.1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil.	m3	135.00		
2	7.1.1	Random rubble masonry with hard stone in foundation and plinth including levelling up with cement concrete 1:6:12 (1 cement : 6 coarse sand : 12 graded stone aggregate 20mm nominal size) upto plinth level with : Cement mortar 1:6 (1 cement : 6 coarse sand).	m3	125.00		
3	7.2.1	Random rubble masonry with hard stone in superstructure above plinth level and upto floor five level, including leveling up with cement concrete 1:6:12 (1 cement : 6 coarse sand : 12 graded stone aggregate 20mm nominal size) at window sills, ceiling level and the like. Cement mortar 1:6 (1 cement : 6 coarse sand).	m3	85.00		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
4	6.4.2	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in superstructure above plinth level up to floor V level in all shapes and sizes in : Cement mortar 1:6 (1 cement : 6 coarse sand)	m3	155.00		
5	4.1.8	1:4:8 (1 Cement: 4 coarse sand : 8 graded stone aggregate 40 mm nominal size).	m3	1.10		
6	5.1.2	Providing and laying in position specified grade of reinforced cement concrete excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level :1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size)	m3	3.00		
7	5.2.2	Reinforced cement concrete work in walls (any thickness), including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts etc. up to floor five level excluding cost of centering, shuttering, finishing and reinforcement: 1:1.5:3 (1 cement : 1.5 coarse sand : 3	m3	12.00		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		graded stone aggregate 20 mm nominal size)				
8	5.9	Centering and shuttering including strutting, propping etc. and removal of form for :				
a	5.9.1	Foundations, footings, bases of columns, etc. for mass concrete.	m2	7.00		
b	5.9.3	Suspended floors, roofs, landings, balconies and access platform.	m2	35.00		
c	5.9.5	Lintels, beams, plinth beams, girders, bressumers and cantilevers.	m2	19.00		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
d	5.9.6	Columns, Pillars, Piers, Abutments, Posts and Struts.	m2	40.00		
9	13.4.1	12 mm cement plaster of mix : 1:4 (1 cement: 4 coarse sand)	m2	1550.00		
10	13.7.1	12 mm cement plaster finished with a floating coat of neat cement of mix : 1:3 (1 cement: 3 fine sand)	m2	35.00		
11	13.16.1	6 mm cement plaster of mix : 1:3 (1 cement: 3 fine sand)	m2	35.00		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
12	7.23.1.5	Stone work (machine cut edges) for wall lining etc. (veneer work) upto 10 metre height, backing filled with a grout of average 12 mm thick cement mortar 1:3 (1 cement : 3 coarse sand) including pointing in white cement mortar 1:2 (1 white cement : 2 stone dust) with an admixture of pigment matching the stone shade : (To be secured to the backing and the sides by means of cramps and pins which shall be paid for separately) :Red sand stone/Fine laterite stone - exposed face fine dressed with rough backing.30 mm thick.	m2	40.00		
13	7.25	Providing and fixing stainless steel cramps of required size and shape for anchoring stone wall lining to the backing or securing adjacent stones in stone wall lining in cement mortar 1:2 (1 cement : 2 coarse sand) including making the necessary chases in stone and holes in walls wherever required.	kg	80.00		
14	13.47.1	Finishing walls with Premium Acrylic Smooth exterior paint with Silicone additives of required shade New work (Two or more coats applied @ 1.43 ltr/ 10 sqm. over and including priming coat of exterior primer applied @ 2.20 kg/ 10 sqm).	m2	1545.00		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
15	5.22.6	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto Plinth level.: Termo – Mechanically Treated Bars	kg	1440.00		
16	LMR	Providing and fixing R.P pattern tiles to the top of porch over 12mm thick cement mortar 1:3, including cost of tiles, cement mortar etc complete	m2	35.00		
		<b>Total</b>				

**DISMANTLING AND DEMOLISHING**

<b>Item No</b>	<b>Code</b>	<b>Description of Item</b>	<b>Quantity</b>	<b>Unit</b>	<b>Rate (Rs. in words &amp; in figures)</b>	<b>Amount (Rs.)</b>
1	15.7.4	Demolishing brick work manually/ by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50 metres lead as per direction of Engineer-in-charge. In cement mortar	82.00	m3		
2	15.12.1	Dismantling doors, windows and clerestory windows (steel or wood) shutter including chowkhats, architrave, holdfasts etc. complete and stacking within 50 metres lead :Of area 3 sq. metres and below	3.00	nos		
3	15.2.2	Demolishing cement concrete manually/ by mechanical means including disposal of material within 50 metres lead as per direction of Engineer - in - charge. Nominal concrete 1:4:8 or leaner mix (i/c equivalent design mix)	17.00	m3		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
4	15.17.1	Dismantling steel work in single sections including dismembering and stacking within 50 metres lead in:R.S. Joists	395.00	kg		
5	15.9.2	Demolishing stone rubble masonry manually / by mechanical means including stacking of serviceable material and disposal of unserviceable material within 50 metres lead as per direction of Engineer-in-Charge: In cement mortar	130.00	m3		
6	15.14.1	Dismantling wood work in frames, trusses, purlins and rafters up to 10 metres span and 5 metres heightincluding stacking the material within 50 metres lead: Of sectional area 40 square centimetres and above	0.90	m3		
7	15.19	Dismantling steel work manually / by mechanical means in built up sections without dismembering and stacking within 50 metres lead as per direction of Engineer-in-Charge.	1940.00	kg		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
8	15.2	Extra for dismantling trusses, rafters, purlins etc. of steel work for every additional span of one metre or part thereof beyond 10 metres	1940.00	kg		
9	15.3	Demolishing R.C.C. work manually / by mechanical means including stacking of steel bars and disposal of unserviceable material within 50 metres lead as per direction of Engineer-in-Charge.	10.50	m3		
10	15.52	Dismantling of flushing cistern/ IWC / Ewc / WB of all types (C.I./PVC/Vitrious China) including stacking of useful materials near the site and disposal of unserviceable materials within 50 metres lead.	1.00	no		
		<b>Total</b>				

**SEPTIC TANK & SOAK PIT**

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		<b>EARTH WORK</b>				
1	2.8.1	Earth work in excavation by mechanical means (Hydraulic Excavator )/ manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil.	27.00	Cum		
2	2.26.1	Extra for every additional lift of 1.5 m or part thereof in excavation /banking excavated or stacked materials. All kinds of soil.	9.00	Cum		
3	2.25	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20cm in depth, consolidating each deposited layer by ramming and watering, lead up to 50 m and lift upto 1.5 m.	6.00	Cum		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		<b>PLAIN CEMENT CONCRETE</b>				
4	4.1.10	Cement concrete (Cast-in-situ) Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering- All work upto plinth level 1:5:10 (1 cement : 5 coarse sand : 10 graded stone aggregate 40mm nominal size)	2.00	Cum		
		<b>REINFORCED CEMENT CONCRETE</b>				
5	5.1.2	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level 1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size)	13.00	Cum		
6	5.9.5	Centering and shuttering including strutting, propping etc. and removal of form for :Lintels, beams, plinth beams, girders, bressumers and cantilevers	97.00	Sqm		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
7	5.22.6	Reinforcement for RCC works including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically treated bars (Using Vizac, Tata or SAIL)	1518.00	Kg		
		<b>FINISHING WORKS</b>				
8	13.23.2	Extra for plastering on circular work not exceeding 6 m in radius:In two coats	10.00	Sqm		
9	13.7.1	12 mm cement plaster finished with a floating coat of neat cement of mix : 1:3 (1 cement: 3 fine sand)	43.00	Sqm		
		<b>INTERNAL WATER SUPPLY &amp; SANITARY INSTALLATIONS</b>				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
10	LMR	Providing and jointing PVC110mm PVC pipes of (pressure 4 kg/cm <sup>2</sup> ) for drainage line including testing of joints etc complete. (Rain water Down pipe) 110mm diameter (OD)	2.00	RM		
11	LMR	Providing and jointing PVC110mm PVC TEE of (pressure 4 kg/cm <sup>2</sup> ) for drainage line including testing of joints etc complete. (Rain water Down pipe)	2.00	Each		
		<b>DRAINAGE WORKS</b>				
12	19.32.1	Making soak pit 2.5 m diameter 3.0 metre deep with 45 x 45 cm dry brick honey comb shaft with bricks and S.W. drain pipe 100 mm diameter, 1.8 m long complete as per standard design. With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	1.00	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
13	19.33	Constructing soak pit 1.20x1.20x1.20 m filled with brickbats including S.W.drain pipe 100 mm diameter and 1.20 m long complete as per standard design.	2.00	Each		
14	19.18.3	Supplying and fixing C.I. cover with frame for manholes :560 mm diameter C.I. cover (heavy duty) the weight of the cover to be not less than 108 kg	3.00	Each		
		<b>Total</b>				

**ELECTRICAL WORKS**

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		<b>A. LT Wiring</b>				
1	1.10.3	Wiring for light point/ fan point/ exhaust fan point/ call bell point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in recessed medium class PVC conduit, with modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm. FRLS PVC insulated copper conductor single core cable etc as required.	180	Each		
2	1.11	Wiring for twin control light point with 1.5 sq.mm FRLS PVC insulated copper conductor single core cable in surface / recessed PVC conduit, 2 way modular switch, modular plate, suitable GI box and earthing the point with 1.5 sq.mm. FRLS PVC insulated copper conductor single core cable etc as required.	4	Each		
3		Wiring for circuit/submain wiring along with earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/recessed medium class PVC conduit as required.				
3.1	1.14.1	2 x 1.5 sq.mm + 1 x 1.5 sq.mm earth wire	825	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
3.2	1.14.2	2 x 2.5 sq.mm + 1 x 2.5 sq mm earth wire	950	m		
3.3	1.14.3	2 x 4.0 sq.mm + 1 x 4.0 sq mm earth wire	450	m		
3.4	1.14.4	2 x 6.0 sq. mm + 1 x 6.0 sq. mm earth wire	150	m		
4	1.18.2	Supplying and drawing 2 pair 0.5 mm dia FRLS PVC insulated annealed copper conductor, unarmored telephone cable in the existing surface/ recessed steel/ PVC conduit as required.	400	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
5	1.19	Supplying and drawing co-axial TV cable RG-6 grade 0.7mm solid copper conductor PE insulated, shielded with fine tinned copper braid and protected with PVC sheath in the existing surface / recessed steel / PVC conduit as required.	100	m		
6		Supplying and fixing of following sizes of medium class PVC conduit along with accessories in surface/recess including cutting the wall and making good the same in case of recessed conduit as required.				
6.1	1.21.1	20 mm	550	m		
6.2	1.21.2	25 mm	250	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
6.3	1.21.3	32 mm	100	m		
7	1.22.1 2	Supplying and fixing metal box of 200 x 250 x 100 mm deep (nominal size) on surface or in recess with suitable size of phenolic laminated sheet cover in front including painting etc as required.	10	Each		
8		Supplying and fixing following modular switch / socket on the existing modular plate & switch box including connections but excluding modular plate etc. as required.				
8.1	1.24.6	Telephone socket outlet	15	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
8.2	1.24.7	TV antenna socket outlet	2	Each		
9	1.25	Supplying and fixing stepped type electronic fan regulator-modular on the existing modular plate switch box including connections but excluding modular plate etc. as required.	10	Each		
10	1.26	Supply and fixing modular blanking plate on the existing modular plate & switch box excluding modular plate as required.	80	Each		
11		Supplying and fixing following size / modules, GI box alongwith modular base & cover plate for modular switches in recess / surface etc as required.				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
11.1	1.27.1	1 or 2 module	30	Each		
12	1.31	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 3 pin 5/6 amps modular socket outlet and 5/6 amps modular switch, connection etc. as required.	60	Each		
13	1.32	Supplying and fixing suitable size GI box with modular plate and cover in front on surface or in recess, including providing and fixing 6 pin 5/6 & 15/16 amps modular socket outlet and 15/16 amps modular switch, connection etc. as required.	35	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
14	1.33	Supplying and fixing 3 pin, 5 amp ceiling rose on the existing junction box/ wooden block including connection etc as required.	30	Each		
15	1.41	Installation, testing and commissioning of pre-wired, fluorescent fitting / compact fluorescent fitting of all types, complete with all accessories and tube etc. directly on ceiling/ wall including connection with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable and earthing etc. as required.	70	Each		
16	1.44	Installation, testing and commissioning of ceiling fan, including wiring the down rods of standard length (upto 30 cm) with 1.5 sq. mm FRLS PVC insulated, copper conductor, single core cable etc. as required.	10	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
17	1.48	Supplying and fixing extra conduit down rod of 20 cm length GI pipe 15 mm dia, heavy guage including painting etc as required.( Note: More than 5 cm length shall be rounded to the nearest 10 cm and 5 cm or less shall be ignored).	20	Each		
18		Installation of exhaust fan in the existing opening, including making good the damage, connection, testing, commissioning etc. as required.				
18.1	1.50.1	Upto 450 mm sweep	8	Each		
19	1.53	Supplying and drawing of UTP 4 pair CAT 6 LAN cable in the existing surface / recessed steel / PVC conduit as required.	300	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		<b>B. MCBs, DBs and Cable Trays</b>				
1		Supplying and fixing following way single pole and neutral, sheet steel, MCB distribution board, 240 volts on surface / recess complete with tinned copper busbar, neutral busbar, earth bar, din bar, interconnections, powder painted including earthing etc as required (But without MCB/RCCB/Isolator).				
1.1	2.3.5	6 way double door	1	Each		
1.2	2.3.6	8 way double door	2	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
2		Supplying and fixing following way horizontal type three pole and neutral, sheet steel, MCB distribution board, 415 volts on surface / recess complete with tinned copper busbar, neutral busbar, earth bar, din bar, interconnections, powder painted including earthing etc as required (But without MCB/RCCB/Isolator).				
2.1	2.4.4	4 way double door	4	Each		
2.2	2.4.5	6 way double door	2	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
2.3	2.4.6	8 way double door	2	Each		
3		Supplying and fixing following ways surface / recess mounting, vertical type, 415 volts, TPN MCB distribution board of sheet steel, dust protected, duly powder painted, inclusive of 200 amps tinned copper busbar, common neutral link, earth bar, din bar, for mounting MCBs,(but without MCB's and incomer) as required. (Note: Vertical type MCB TPDB is normally used where 3 phase outlets are required).				
3.1	2.5.4	4 way double door	2	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
3.2	2.5.5	8 way double door	2	Each		
4		Supplying and fixing 5 amps to 32 amps rating, 240/415 volts, "C" curve, miniature circuit breaker suitable for inductive load of following poles in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
4.1	2.10.1	Single pole	110	Each		
4.2	2.10.4	Triple pole	12	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
4.3	2.10.5	Triple pole and neutral	5	Each		
5	2.11	Supplying and fixing single pole blanking plate in the existing MCB DB complete etc as required.	65	Each		
6		Supplying and fixing following rating, double pole, 240 volts, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
6.1	2.12.1	40 amps	2	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
6.2	2.12.2	63 amps	2	Each		
7		Supplying and fixing following rating, four pole, 415 volts, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
7.1	2.13.1	40 amps	4	Each		
7.2	2.13.2	63 amps	4	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
8		Supplying and fixing following rating, double pole, (single phase and neutral), 240 volts, residual current circuit breaker (RCCB), having a sensitivity current upto 300 milliamperes in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
8.1	2.14.1	25 amps	2	Each		
8.2	2.14.2	40 amps	2	Each		
9		Supplying and fixing following rating, four pole, (three phase and neutral), 415 volts, residual current circuit breaker (RCCB), having a sensitivity current upto 300 milliamperes in the existing MCB DB complete with connections, testing and commissioning etc. as required.				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
9.1	2.15.1	25 amps	2	Each		
9.2	2.15.2	40 amps	2	Each		
9.3	2.15.3	63 amps	2	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
10	2.16	Supply and fixing DP sheet steel enclosure on surface recess along with 16/25/32/ amps 240V "C" curve DP MCB complete with connections, testing and commissioning etc as required.	4	Each		
11	2.17	Supply and fixing TP sheet steel enclosure on surface recess along with 16/25/32/40 amps 415V "C" curve TP MCB complete with connections, testing and commissioning etc as required.	8	Each		
12	2.18	Supplying and fixing 20 amps, 240 volts, SPN industrial type, socket outlet, with 2 pole and earth, metal enclosed plug top alongwith 20 amps "C" curve, SP, MCB, in sheet steel enclosure, on surface or in recess, with chained metal cover for the socket out let and complete with connections, testing and commissioning etc. as required.	10	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
13	4.1.4	Supply and installing 300mm x 50 mm depth x 1.6mm thick perforated GI cable trays with perforations not more than 17.5% in convenient sections, joined with connectors, GI suspenders including nuts and bolts, bends, tees etc as required	150	m		
		<b>C. Earthing</b>				
1	5.2	Earthing with GI earth pipe 3.0 m long, 40 mm dia including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe etc. with charcoal/ coke as required.	8	Each		
2	5.4	Earthing with GI earth plate 600 mm X 600 mm X 6 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke as required.	10	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
3	5.6	Earthing with copper earth plate 600 mm X 600 mm X 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke as required.	6	Each		
4	5.7	Supplying and laying 8 SWG GI wire at 0.5m below ground level for conductor earth electrode, including connection / termination with GI thimble etc as required.	300	m		
5	5.8	Supply and laying 25mm x 5mm copper strip at 0.5m below ground as strip earth electrode, including connection / terminating with nut, bolt, spring, washer etc as required (Jointing shall be done by overlapping and with 2 sets of brass nut bolt & spring washer spaced 50mm).	60	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
6	5.9	Supply and laying 25mm x 5mm GI strip at 0.5m below ground as strip earth electrode, including connection / terminating with nut, bolt, spring, washer etc as required (Jointing shall be done by overlapping and with 2 sets of GI nut bolt & spring washer spaced 50mm).	180	m		
7	5.14	Providing and fixing 25 mm X 5 mm copper strip on surface or in recess for connections etc. as required.	30	m		
8	5.15	Providing and fixing 25 mm X 5 mm GI strip on surface or in recess for connections etc. as required.	300	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
9	5.16	Providing and fixing 8 SWG dia G.I. wire on surface or in recess for loop earthing as required.	150	m		
10	5.17	Providing and fixing 4 mm dia copper wire on surface or in recess for loop earthing as required.	100	m		
		<b>D. MV &amp; HV Cable laying and Termination</b>				
1		Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1kV grade of following size direct in ground including excavation, sand cushioning protective covering and refilling the trench etc as required.				
		Upto 35 sqmm	510	m		
1.1	7.1.1					

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
1.2	7.1.2	Above 35 sqmm and upto 95 sqmm	30	m		
1.3	7.1.3	Above 95 sqmm and upto 185 sqmm	20	m		
1.4	7.1.4	Above 185 sqmm and upto 400 sqmm	80	m		
2		Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1kV grade of following size in the existing RCC / HUME / METAL pipe as required.				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
2.1	7.5.1	Upto 35 sqmm	120	m		
2.2	7.5.2	Above 35 sqmm and upto 95 sqmm	20	m		
2.3	7.5.3	Above 95 sqmm and upto 185 sqmm	10	m		
2.4	7.5.4	Above 185 sqmm and upto 400 sqmm	10	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
3		Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size in the existing masonry open duct as required.				
3.1	7.6.1	Upto 35 sq. mm	80	m		
3.1	7.6.2	Above 35 sq. mm and upto 95 sq. mm	20	m		
3.3	7.6.3	Above 95 sq. mm and upto 185 sq. mm	20	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
3.4	7.6.4	Above 185 sqmm and upto 400 sqmm	10	m		
4		Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on wall surface as required.				
4.1	7.7.1	Upto 35 sq. mm (clamped with 1mm thick saddle)	120	m		
4.2	7.7.2	Above 35 sq. mm and upto 95 sq. mm (clamped with 25x3mm MS flat clamp)	20	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
4.3	7.7.3	Above 95 sq. mm and upto 185 sq. mm (clamped with 25/40x3mm MS flat clamp)	10	m		
4.4	7.7.4	Above 185 sq. mm and upto 400 sq. mm (clamped with 40x3mm MS flat clamp)	10	m		
5		Laying and fixing of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size on cable tray as required.				
5.1	7.8.1	Upto 35 sq. mm (clamped with 1mm thick saddle)	185	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
5.2	7.8.2	Above 35 sq. mm and upto 95 sq. mm (clamped with 25x3mm MS flat clamp)	30	m		
5.3	7.8.3	Above 95 sq. mm and upto 185 sq. mm (clamped with 25/40x3mm MS flat clamp)	30	m		
5.4	7.8.4	Above 185 sq. mm and upto 400 sq. mm (clamped with 40x3mm MS flat clamp)	10	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
6	7.9	Supplying and making cable route marker with cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size ) of size 60 cm X 60 cm at the bottom and 50 cm X 50 cm at the top with a thickness of 10cm including inscription duly engraved as required.	40	Each		
7		Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size direct in ground including excavation, sand cushioning, protective covering and refilling the trench etc as required.				
		Above 120 sq. mm and upto 400 sq. mm	100	m		
7.1	8.1.2					
8		Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size in the existing RCC/ HUME/ METAL pipe as required.				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
8.1	8.3.2	Above 120 sq. mm and upto 400 sq. mm	10	m		
9		Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size in the existing masonry open duct as required.				
9.1	8.4.2	Above 120 sq. mm and upto 400 sq. mm	15	m		
10		Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
10.1	9.1.30	3.5 x 300 sqmm	6	Each		
10.2	9.1.29	3.5 x 240 sqmm	4	Each		
10.3	9.1.27	3.5 x 185 sqmm	4	Each		
10.4	9.1.25	3.5 x 120 sqmm	8	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
10.5	9.1.24	3.5 x 95 sqmm	4	Each		
10.6	9.1.22	3.5 x 50 sqmm	8	Each		
10.7	9.1.21	3.5 x 35 sqmm	4	Each		
10.8	9.1.20	3.5 x 25 sqmm	10	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
10.9	9.1.33	4 x 16 sqmm	16	Each		
10.10	9.1.32	4 x 10 sqmm	24	Each		
10.11	9.1.32	4 x 6 sqmm	16	Each		
10.12	9.1.7	3 x 4 sqmm with Cu lug	20	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
11	10.4.3	Supplying and making indoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for 3 core, 150sqmm XLPE aluminium conductor cable of 11 KV grade as required :	1	Each		
12	10.5.3	Supplying and making outdoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for 3 core, 150sqmm XLPE aluminium conductor cable of 11 KV grade as required :	1	Each		
13	14.13.3	Providing, laying and fixing of 100mm dia G.I. pipe (medium class) in ground complete with G.I. fittings including trenching (75 cm deep)and re-filling etc as required	20	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
14	14.14.2	Providing, laying and fixing of 150 mm dia RCC pipe NP2 class (light duty) in ground complete with RCC collars, jointing with cement mortar 1:2 (1 cement : 2 fine sand) including trenching (75 cm deep) and refilling etc as required.	40	m		
		<b><u>LMR Item</u></b>				
		<b>A. 11 kV System</b>				
1		<b>DP Structure</b>				
		Supply, fabrication, erection, testing & commissioning of 11 KV DP structure using required size of ISMB for poles and required size cross channel with ISMC for supporting structure for 11kV components, 11 KV pin, disc and stay insulators, supports, jumpers /interconnecting conductors with 0'SWG Cu, 25x3mm braided copper earthing for non current moving part like handle of AB switch etc. The item includes erection of DP structure on suitable concrete foundation and painting with one coat of metal primer after fabrication and two coats of aluminium enamel paint after erection complete and consists of the following. The cost of the civil foundation shall be measured along with civil items. The design of the foundation shall be got approved from Engineer-in-charge before execution.				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		11KV,400A single brake,TP, gang operated AB switch with operating handle & locking mechanism - 1 set				
		11 KV Lighting Arrestors - 1 set				
		11 KV Drop out fuses - 1 set				
		The consumers DP structure shall be braced with state electricity board DP structure if required & interconnection shall be done with 0 SWG Cu wire.				
		The DP structure shall be with all necessary accessories for connecting 11kV cable as per particular specification & drawing. The 11kV DP structure shall be done as per the requirement of statutory authority.	2	Job		
2		Supply, installation, testing & commissioning of 11kV outdoor type CT/PT unit with CT rating suitable as per KSEB, class 0.5, 15VA CT & 11kV/110V class 0.5 100VA PT to be mounted on to the DP structure. The item also include supply & installation of TOD meter in a suitable weather proof sheet steel enclosure (14SWG) in 600mm plinth including Test terminal block, control fuses & 10C 2.5sqmm armoured copper cable between CT/PT unit & TOD meter. The work shall be as per state electricity board norms. The cost of the civil foundation shall be measured along with civil items. The design of the foundation shall be got approved from Engineer-in-charge before execution.	1	Job		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
3		Supply, fabricating & erection of 1.8 mtr high chain link fencing (50mm cross link) over 600 mm high brick masonry, using 4 mm thick GI chain link with a framework of 50x50x6 mm MS angle between vertical posts of ISMC 75x50mm at 2400 mm interval, which are fixed to the concrete footing (1:2:4) of size 450x450x200 mm (above GL) with adequate footing depth, between the brick / block masonry. Brick / block masonry (345 mm thick) and 200 mm from ground level for foundation & plinth in cement mortar (1:6). The brick masonry is to be pointed using cement mortar 1:3 to have a flush finish. Earth strip shall be connected to the fencing for its earthing. The MS framework for chain link fencing is finished using zinc chromate primer & 2 coats of synthetic enamel paint. 1.5 mtr wide gate shall be provided with suitable locking arrangements. The rate shall be inclusive of all materials, labour, lead, lift, etc including excavation works and fabrication and assembly works including all nuts, bolts & other miscellaneous items, etc. complete	25	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
4		Supply, erection, testing and commissioning of 400 kVA indoor type unitised substation (USS),11 kV / 433 V, 3 phase, Vector DYn-11, Copper wound, resin cast transformer with off circuit tap changer from +10% to - 10 % in steps of 2.5 %. The HV side shall be connected to HTSFU and LV cable box suitable for connecting 3 runs 3.5C x 300sqmm XLPE Aluminium cable. The transformer shall be provided with O/C and E/F protection on HV side, winding temperature indicator and all other standard fittings and accessories conforming to IS 11171/85 and IS2026/1975. The low set earth fault relay with neutral CT 120/5A, class 5P10, 10VA shall be provided.				
		All the equipments shall be mounted on a common galvanised GI base with fabricated enclosure painted with outdoor type rust proof paint / powder coated. The wall of the enclosure shall be detachable type with louvers for natural cooling The busbars inside the cubicle shall be sleeved using heat shrinkable sleeves.				
		The HV side of the USS shall be provided with 11kV, 18.4kA, 630A, load break switch with earth switch. The HT HRC fuse, seal off bushing, 230V shunt trip coil, space heater with thermostat, 400A Copper busbar with support insulator shall be provided.				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		Space for the TOD meter with sealing facility as per KSEB shall be provided. (Make: Intrans / Megawin / Resitech / Crompton Greaves)	1	Job		
5		Supply and installation of suitable CT ratio /5A, 15VA, class 0.5 as per KSEB. 11kV/ 110V, 100VA, class 0.5 fixed type PT, TOD meter in the space provided in USS.	1	Job		
		<b>B. DG set</b>				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
1		Supply, Installation, Testing and Commissioning of 200 KVA, silent type, water cooled, radiator type, four stroke, electric start D.G Set with acoustic enclosure and standard control panel. The engine shall be capable of taking 10% overload for one hour after 12 hours of continuous operation. The DG shall be suitable for AMF operation. The alternator shall be brushless, self excited, self regulated, SPDP enclosure, class F/H insulation, suitable for continuous operation at 1500 rpm, generating 415 V +/- 5% at 0.8 p.f, 50Hz, 0.85 load factor, 3 phase, 4 wire system generally conforming to BS: 2613 & IS: 4722. The neutral of the DG set shall be provided with low set earth fault relay using 60/5A 5P10 10VA CT in the neutral earthing conductor. The DG set shall be provided with Engine control panel for mounting Engine control unit, control switches etc.				
		Both Engine and Alternator shall be mounted on common channel iron base frame, and with standard accessories such as antivibration pad, lead acid batteries (as specified by engine manufacturer) and engine driven battery charger along with leads, battery stand, fuel piping from fuel tank to Engine, electronic governor, Residential silencer, suitable size cable termination box etc as required. Rate shall be inclusive of all lift, lead charges. The work should be as per Electrical Inspectorate / Pollution control board norms.	1	Job		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
2		Supply & installation of exhaust gas piping of suitable diameter for 200kVA DG set as per manufactures standard welded black MS, B class pipe confirming to IS:3589 cut to required lengths and installed with necessary bends, supports and clamps, anti- vibration mountings, insulation of exhaust system with mineral wool / Rockwool, 50mm thick wire mesh & aluminum cladding etc.	12	m		
3		Supply, Installation, Testing & Commissioning of cubicle type AMF panel board, made out of 2mm thick CRCA sheet, totally enclosed, IP42, free standing, floor mounting, dust and vermin proof, powder coated, indoor, compartmentalised, suitable for operation on 3 phase and neutral, 415 V, 50Hz AC system, including internal wiring with suitable size wires, rotary handle, spreaders etc. The panel shall include supply & installation of following switchgears, metering instruments and accessories as per specification.				
		<b>Incomer</b>				
		2 nos. 315A, 25kA, TP+NL MCCB having isolation duty with E/F release, adjustable thermal magnetic release for O/L & SC protection.				
		2 nos. 315A, FP, AC3 duty Power Contactor.				
		Electrical & mechanical interlock between the incomers.				
		<b>Busbar</b>				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		1 Set of 350 Amp TPN busbars of high conductivity electrolytic quality Aluminium alloy.				
		<b>Instruments</b>				
		2 No 3 phase Digital Multi function meter to read V, A, F, kWh with Acc class 1.				
		2 Set of phase indicating lamps, LED type, RYB				
		1 Set of indicating lamps for Main On, DG On, Load on DG etc.				
		2 Set of 2A 10kA C curve SP control MCB				
		2 Set of 320/5A, Class 1.0, 10VA, Cast Resin CT for metering.				
		1 set Low set earth fault relay connected with the neutral CT of DG set.				
		1 set microprocessor based AMF control relay with all protective features for the starting and stopping of the DG set automatically.				
		1 set Auto / manual, test, off selector switch.				
		1 set SMPS based battery charger with inbuilt auto/manual current & float/boost facility adjustment with DC Volt meter & Ammeter(separate)				
		The panel shall be with all required accessories & control wiring for AMF operation.				
		<b>Outgoing</b>				
		1 no. 250A, 25kA, TP+NL MCCB with thermal magnetic release for adjustable O/L & SC protection.				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		1 no. 160A, TPN Switch disconnecter with extended rotory handle, spreaders etc				
		1 no. 160A, 25kA, TP+NL MCCB with thermal magnetic release for adjustable O/L & SC protection.				
		3 nos. 100A, 25kA, TP+NL MCCB with thermal magnetic release for adjustable O/L & SC protection.	1	Job		
		<b>C. LT Panel Board and Accessories</b>				
1		Supply, Installation, Testing & Commissioning of cubicle type Main MV panel board, made out of 2mm thick CRCA sheet, totally enclosed, IP42, free standing, floor mounting, dust and vermin proof, powder coated, indoor, compartmentalised, suitable for operation on 3 phase and neutral, 415 V, 50Hz AC system, including internal wiring with suitable size wires, rotary handle, spreaders etc. The panel shall include supply & installation of following switchgears, metering instruments and accessories as per specification.				
		<b>Incomer</b>				
		1 no. 630A, 35kA, TP+NL MCCB having isolation duty with microprocessor based release for adjustable O/L, SC & E/F protection.				
		<b>Busbar</b>				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		1 Set of 650 Amp TPN busbars of high conductivity electrolytic quality Aluminium conductor.				
		<b>Instruments</b>				
		1 No 3 phase Digital Multi function meter to read V, A, F, kWh with Acc class 1.				
		1 Set of phase indicating lamps, LED type, RYB.				
		1 Set of 2A 10kA C curve SP control MCB				
		1 Set of 630/5A, Class 1.0, 10VA, Cast Resin CT for metering.				
		1 Set of 630/5A, Class 1.0, 10VA, Cast Resin CT for APFC relay.				
		3 nos Digital Type Ammeter (0-600A), Acc class 1				
		<b>Outgoing</b>				
		2 nos. 315A, 35kA, TP+NL MCCB with thermal magnetic release for adjustable O/L & SC protection.				
		2 no. 250A, 35kA, TP+NL MCCB with thermal magnetic release for adjustable O/L & SC protection.				
		2 nos. 200A, 35kA, TP+NL MCCB with thermal magnetic release for adjustable O/L & SC protection.	1	Job		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
2		Supply, Installation, Testing & Commissioning of 100kVAR APFC panel, cubicle type, made out of 2mm thick CRCA sheet, totally enclosed, IP42, free standing, floor mounting, dust and vermin proof, powder coated, indoor, compartmentalised, suitable for operation on 3 phase and neutral, 415 V, 50Hz AC system, including internal wiring with suitable size wires, rotary handle, spreaders etc. The panel shall include supply & installation of following switchgears, metering instruments and accessories as per specification.				
		<b>Incomer</b>				
		1 no. 250A, 25kA, TP+NL MCCB with thermal magnetic release for adjustable O/L & SC protection.				
		<b>Busbar</b>				
		1 Set of 250 Amp TPN busbars of high conductivity electrolytic quality Aluminium conductor.				
		<b>Instruments</b>				
		1 No 3 phase Digital Multi function meter to read V, A, F with Acc class 1.				
		1 Set of phase indicating lamps, LED type, RYB.				
		1 Set of 2A 10kA C curve SP control MCB				
		1 Set of 250/5A, Class 1.0, 10VA, Cast Resin CT for metering.				
		1 no. 6 stage microprocessor based APFC relay				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		6 set On, Off push button				
		6 set On, Off LED type indication lamp				
		1 set Auto / manual selector switch.				
		<b>Outgoing</b>				
		2 No 63A, TPN, C curve MCB.				
		2 No 40A, TPN, C curve MCB.				
		2 Nos 32A, TPN, C curve MCB.				
		2 Nos. 25 kVAR MPP heavy duty capacitor with capacitor duty contactor.				
		2 Nos. 15 kVAR MPP heavy duty capacitor with capacitor duty contactor.				
		1 Nos. 10 kVAR MPP heavy duty capacitor with capacitor duty contactor.				
		1 No. 10 kVAR MPP heavy duty capacitor directly connected.	1	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
3		Supply, Installation, Testing & Commissioning of cubicle type Floor panel board, made out of 2mm thick CRCA sheet, totally enclosed, IP42, free standing, floor mounting, dust and vermin proof, powder coated, indoor, compartmentalised, suitable for operation on 3 phase and neutral, 415 V, 50Hz AC system, including internal wiring with suitable size wires, rotary handle, spreaders etc. The panel shall include supply & installation of following switchgears, metering instruments and accessories as per specification.				
		<b>Incomer</b>				
		1 no. 250A, 25kA, TP+NL MCCB with thermal magnetic release for adjustable O/L & SC protection.				
		<b>Busbar</b>				
		1 Set of 250 Amp TPN busbars of high conductivity electrolytic quality Aluminium conductor.				
		<b>Instruments</b>				
		1 No 3 phase Digital Multi function meter to read V, A, F, kWh with Acc class 1.				
		1 Set of phase indicating lamps, LED type, RYB.				
		1 Set of 2A 10kA C curve SP control MCB				
		1 Set of 250/5A, Class 1.0, 10VA, Cast Resin CT for metering.				
		<b>Outgoing</b>				
		4 nos. 100A, 16kA, TP+NL MCCB with thermal magnetic release for adjustable O/L & SC protection.				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		4 nos. 63A, 16kA, TP+NL MCCB with thermal magnetic release for adjustable O/L & SC protection.	1	Job		
		<b>D. HT &amp; LT Cables</b>				
1		Supply of 11kV, 3C 150sqmm (E) grade XLPE insulated PVC sheathed compact circular armoured aluminium conductor HT power cable, insulation screened with extruded semi conducting compound in combination with copper tape suitable for 11kV earthed system confirming to relevant standard.	125	m		
-	-					
2		Supply of the following size 1.1kV grade XLPE insulated PVC sheathed, armoured Aluminium conductor power cable confirming to IS 7098 (part 1) amended upto date.				
2.1		3.5 x 300 sqmm cable	30	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
2.2		3.5 x 240 sqmm cable	90	m		
2.3		3.5 x 185 sqmm cable	40	m		
2.4		3.5 x 120 sqmm cable	50	m		
2.5		3.5 x 95 sqmm cable	40	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
2.6		3.5 x 50 sqmm cable	80	m		
2.7		3.5 x 35 sqmm cable	55	m		
2.8		3.5 x 25 sqmm cable	150	m		
2.9		4 x 16 sqmm cable	225	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
2.10		4 x 10 sqmm cable	235	m		
2.11		4 x 6 sqmm cable	150	m		
3		Supply of the 3Cx4sqmm 1.1kV grade XLPE insulated PVC sheathed, armoured copper conductor power cable confirming to IS 7098 (part 1) amended upto date.	200	m		
		<b>E. Light Fixtures</b>				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
1		Supply of 1x28W flourescent tube fitting, powder coated CRCA steel channel complete with all electrical accessories like electronic ballast, lamp holder, 28W T5 lamp etc complete as required. (Philips TMS122M 1xTL-528W EBT / Wipro WIF 90128 SG / Bajaj BTIR 128 / Havells LHFYBYF10N1W028)	50	Each		
2		Supply & installation of 4x14W recess mounting flourescent tube light luminaire with mirror optic with all electrical accessories like electronic ballast, lamp holder, 14W T5 lamps etc including accessories for installation like anchor fastner, chain, hook etc complete as required. (Philips TBS869 4xTL5-14W EBP D8 / Wipro WVF 22414 SGW / Bajaj BTMRA 414 V2 WH / Havells LHCTD1414049).	20	Each		
3		Supply and installation of recess mounted type 2x36W cleanroom light fitting with front opening in robust CRCA housing, glass cover with all electrical accessories like electronic ballast, lamp holder, 36W CFL lamps, mounting chain, hook etc complete as required. (Philips FCS650 2xTL-L36W EBP FOP GT / Wipro WIP 43236 SGA / Bajaj BPRF 236 C LHD TG SL / Havells LHHCO2236127)	4	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
4		Supply and installation of 30W recess mounted circular LED down light fixture with all electrical accessories like driver etc complete as required. (Philips BBS182 1xDLED-5000 PSU WH / Wipro CRDL11RO33HP57)	15	Each		
5		Supply and installation of 15W recess mounted circular LED down light fixture with all electrical accessories like driver etc complete as required. (Philips BBS181 1xDLED-5000 PSU WH / Wipro CRDL11RO17HP57 / Bajaj BGSLO SLEEK 18W RD / Havells LHEBLAP7UZ1W015)	40	Each		
6		Supply and installation of 18W surface mounted LED luminaire with all electrical accessories like driver etc complete as required. (Wipro CRCO14S024HP57 / Bajaj BCTBLS 18 ZT WH / Havells LHEAASP7UL1W018)	10	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
7		Supply of 1x11W surface mounted luminaire with diffuser and decorative end cap complete with all electrical accessories like electronic ballast, lamp holder, 11W CFL lamp etc. complete with all mounting accessories etc as required. (Wipro WRP 21111 / Bajaj BCJ 111 / Havells LHFOECF1OZ1W011)	10	Each		
8		Supplying and fixing ISI marked PVC angle batten holder with 11W CFL lamp including all connection etc as required.	10	Each		
9		Supply of ceiling fan 1200mm sweep, double ball bearing, approved colour and quality with original down rod, suspension shackle, canopy etc without regulator complete with all accessories as required. (Usha Technix Decorative (5 star rating) / Crompton High Breeze plus (5 star) / Orient Energy star)	10	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
10		Supply & installation of 400mm sweep,Wall fan powder coated guard suitable for single phase 230 volt, 50Hz AC supply complete with motor, capacitor and all accessories as required complete. (Make : Usha Max Air white or equivalent)	5	Each		
11		Supply of heavy duty exhaust fan 300 mm sweep, single phase, 900 rpm of approved colour including all accessories as required (Crompton HDEF / Usha Turbo heavy duty / Havells Turbo Force)	3	Each		
12		Supply of ventillating fan 250 mm sweep of approved colour, for single phase 230 volt, 50Hz AC supply complete with motor, capacitor, auto close and open grill cover and all accessories as required complete.	5	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
13		Supply & installation of Hot dipped Galvanised (internally and externally), seamless, octogonal pole of overall length 5M with single arm bracket of 1.5m length 48mm dia x 3.25mm thick with standard arm cap. The pole shall have inbuilt cable loop in loop out with flush door and locking facility. The bottom dia of the pole shall be 135mm and top 70mm with 3mm sheet thickness. The pole shall be with base plate of 225x225x16mm and 4nos required size of foundation bolt. The pole shall be mounted on suitable size foundation (design to be got approved) with baseplate arrangement and provided with 4A SP C curve MCB, loop in loop out terminals block, required dia GI / PVC pipe shall be provided in the foundation for taking cable in & out from the pole, 3Cx1.5sqmm unarmoured PVC insulated round copper cable from loop in loop out to light fixture etc with all required accessories. The cost of the civil foundation is not considered in this item. The design of the foundation to be got approved from Engineer-in-charge before execution.	15	Nos		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
14		Supply & installation of Hot dipped Galvanised (internally and externally), seamless, octogonal pole of overall length 5M with double arm bracket of 1.5m length 48mm dia x 3.25mm thick with standard arm cap. The pole shall have inbuilt cable loop in loop out with flush door and locking facility. The bottom dia of the pole shall be 135mm and top 70mm with 3mm sheet thickness. The pole shall be with base plate of 225x225x16mm and 4nos required size of foundation bolt. The pole shall be mounted on suitable size foundation (design to be got approved) with baseplate arrangement and provided with 4A SP C curve MCB, loop in loop out terminals block, required dia GI / PVC pipe shall be provided in the foundation for taking cable in & out from the pole, 3Cx1.5sqmm unarmoured PVC insulated round copper cable from loop in loop out to light fixture etc with all required accessories. The cost of the civil foundation is not considered in this item. The design of the foundation to be got approved from Engineer-in-charge before execution.	5	Nos		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
15		Supply, installation, testing & commissioning of IP66, 24W LED street light fixture, with die cast aluminium housing, stainless steel toggle, electronic driver etc as required. The light fitting shall be suitably installed with all required accessories to the street light pole. (Similar to Philips BRP 320 lx24 LED / Wipro LR01-025-XXX-WH-XX / Havells LHETAXU7UN6W024 / Bajaj BCLST 25W LED)	25	Nos		
16		Supply and installation of 30W LED, IP65, flood light luminaire with high pressure die cast housing, high power LED including all accessories like driver, installation accessories etc as required. (Make: Havells LHEPCZUEIN6W030 / Bajaj BJFL 30W LED)	3	Nos		
		<b>Total Amount in Rs</b>				
		<b>F. UPS and MCBs</b>				
1		Supply, installation, testing & commissioning of 15 kVA, 3 phase, input, 3 phase output, true on-line UPS system with 30 minutes back up (full load), including all accessories, SMF batteries VRLA type with powder coated MS cabinet, battery cabling including all accessories as required complete having following specification.				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		Fully digital controlled based on DSP (IGBT based)				
		Power factor corrected from end > 0.9				
		Pure sine wave output.				
		Full time output voltage & frequency regulation				
		Auto regulation of battery end voltage				
		Intelligent interface with LED/LCD display				
		Static bypass switch & manual by pass switch				
		Auto temperature compensation	1	Nos		
2		Supplying and fixing 40A / 63A TP MCB, 415 Volts, "C" series, miniature circuit breaker in the existing MCB DB complete with connections, testing and commissioning etc as required.	6	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
3		Supplying and fixing FP sheet steel enclosure (outdoor type) on surface/ recess along with 16/25/32/40 amps 415 volts "C" curve TPN MCB complete with connections, testing and commissioning etc. as required.	5	Each		
4		Supply and fixing FP sheet steel enclosure (double door) on surface along with 100 amps, 415V, TPN, 16kA, MCCB with Thermal magnetic based release with O/L, SC protection complete with connections, testing and commissioning etc as required.	1	Each		
5		Supplying and fixing following ways surface / recess mounting vertical type, 415 volts, TPN MCB distribution board of sheet steel, dust protected, duly powder painted. Inclusive of 200 amps tinned copper bus bar, common neutral link, earth bar, din bar for mounting MCBs with 100 amps TP 16kA MCCB as incomer interconnection between incomer MCCB and busbar (but without MCBs/MCCB) as required. (Note vertical type MCB TPDB is normally used where 3 phase outlets are required).				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
5.1		4 way	2	Each		
5.2		8 way	2	Each		
6		Supply and installation of structural steel work with required size MS angle, MS flat etc for cable tray work including cutting, hoisting, welding, bolting, fixing in position, hanging, and applying 2 coat of steel primer and 2 coat of enamel paint of approved quality all complete. The GA drawing and fixing arrangement shall be got approved from the Engineer-in-charge.	1000	kg		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
7		Earthing with GI earth plate 1200 mm X 1200 mm X 12 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	6	Each		
8		Providing and fixing 10 SWG copper wire on surface or in recess for loop earthing along with existing surface / recessed conduit/ submain wiring / cable etc as required.	200	m		
9		Supply and laying 40mm x 6mm GI strip at 0.5m below ground as strip earth electrode, including connection / terminating with nut, bolt, spring, washer etc as required (Jointing shall be done by overlapping and with 2 sets of GI nut bolt & spring washer spaced 50mm).	150	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
10		Providing and fixing 40mm X 6mm GI strip on surface or in recess for connections etc. as required.	60	m		
		<b>G. Telephone system</b>				
1		Supply, installation, testing & commissioning of Digital EPBAX, PCM/TDM, 100% non-blocking, main box equipped with				
		8 Trunk lines expandable to 20 nos				
		32 Analogue extension expandable to 100 nos				
		1 no. operator console				
		Voice guided FAX / DID module				
		Analog Clip (both on Trunk and Extension)				
		Flexible numbering Scheme, Call back on busy/ no answer				
		Call Forward – Internal/ External, Optional ADSL interface	1	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
2		Supply and laying 10 pair 0.5 sqmm FR PVC insulated annealed copper conductor, jelly filled armoured telephone cable in surface / through pipe / underground including excavation and re-filling including all accessories as required.	200	m		
3		Supply and Installation of 100 pair MDF box, back mount frame and original 50 pair krone connectors with all required accessories.	1	Each		
4		Supply and Installation of 20 pair MDF box, back mount frame and original krone connectors with all accessories.	1	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
5		Supply and Installation of 10 pair MDF box, back mount frame and original krone connectors with all accessories.	3	Each		
		<b>H. Network system</b>				
1		Supply & fixing modular type computer outlet (RJ-45) with modular base and cover plate, GI box complete with all accessories, connection etc. complete as required.	10	Each		
2		Supply, installation, testing & commissioning of 24 port unmanaged Gigabit 10/100/1000 Mbps Unmanaged Switch, RoHS compliant with all required accessories.	1	nos		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
3		Supply and installation of 6-24 port fully loaded connect jack panel 1U with cable manager, 4 feet, Cat 6, RJ-45, UTP patch cord and all required accessories complete as required.	1	nos		
4		Supply and installation of 9 U wall mounted Network Rack made of steel, powder coated, front glass cover with PDU's, cable manager and cooling fans including all required accessories.	1	nos		
		<b>I. OHP system</b>				
1		Supply, installation, testing & commissioning of LCD Projector with 3400 lumen (lamp mode Standard) with contrast ratio of 3700:1 with a resolution of (1280 X 800) pixels, supplied with cordless remote control, VGA cable, ceiling mount kit with all required accessories as required. (Similar to Sony VPL-CW255 or Equ).	1	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
2		Supply & installation of motorised screen with synchronous motor, dual control, High Gain mat white with size 7 ft X 5 ft with all required accessories as required. (Similar to Liberty Grand view or Equ).	1	Each		
		<b>J. Miscellaneous</b>				
1		Supply and providing 6 mm thick & 1 m wide electrical grade chequered type rubber mat to withstand 3.3 KV dielectric strength conforming to IS 5429/ 1969.	10	m		
2		Supply and providing 12 mm thick & 1 m wide electrical grade chequered type rubber mat to withstand 15 KV dielectric strength conforming to IS 5429/ 1969.	5	m		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
3		Supply, fabrication and fixing 3 nos MS Fire buckets on suitable fabricated MS angle iron stand with hook, painting with red paint & filled with dry sand as required with all required accessories.	1	Set		
4		Supply and providing 15" long rubber hand gloves 15kV.	2	Pair		
5		Supply and providing First Aid Chart duly framed and placed in a conspicuous location for clear vision.	2	Each		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
6		Supply and providing Electrical main single line Diagram duly framed and placed in a conspicuous location for clear vision.	1	Each		
7		Preparation of electrical drawing, submission of drawings to Electrical inspectorate / KSEB and obtaining approval, arranging inspection for entire installation and other utilities, obtaining road cutting permission obtaining sanction orders for the energisation of the installation complete. Including all incidental expenses except the fees payable to the statutory authorities in the name of client.	1	Job		
		<b>Total Rs</b>				

**Air Conditioning Works**

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
<b>PART A</b>		<b>MACHINERY</b>				
1	LMR	Supply, installation, testing and commissioning (SITC) of 8.5 TR capacity aircooled Outdoor condensing unit with scroll compressor as per specifications complete with suitable capacity drive motor, air cooled condenser with all accessories, hermetically sealed scroll compressor, electronic microprocessor pendant controller with digital display, first charge R 22 refrigerant gas, vibration isolator pads and safety devices like thermal protector, pressure relief valve, over load relays single phase preventor, high-low pressure cut out, suitable for three phase 440V supply.	1	Nos		
2	LMR	Supply, installation, testing and commissioning of suitable hard drawn copper refrigerant piping for 8.5 TR machine with 13 mm nitrile rubber insulation interconnecting the condensing unit to evaporating unit for packaged units as per site condition	10	Rmt		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
3	LMR	SITC of DX type double skinned air handling units, ceiling suspended/floor mounting type 8.5 TR, 5000 cfm capacity complete with suitable DIDW blower (asper approved make), blower section, static pressure of 100mm of water column, built in pre filter(EU4), fine filter(EU7) , HEPA Filter and controls connected to condensing units, insulated SS drain pan, 6 row cooling coil, electric motor, belt drive package with TEFC motor class 'B' insulation, suitable for 3 phase, 415 V, 50Hz supply, suitable AHU panel & cabling, AHU temp & speed control panel , ARI certified, with 0.8mm double skinned 40mm thick PUF panel, belt guards, suitable supports for suspending from slab, vibration isolator, etc. conforming to specifications. The air handling units shall have 1 inlet refrigerant coils and 1 outlet refrigerant coils suitable for 1 numbers of 8.5 TR capacity ODU and shall conform to specifications.	1	Nos		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
4	LMR	Supply, installation, testing and commissioning (SITC) of 3 TR capacity aircooled Outdoor condensing unit with scroll compressor as per specifications complete with suitable capacity drive motor, air cooled condenser with all accessories, hermetically sealed scroll compressor, electronic microprocessor pendant controller with digital display, first charge R 22 refrigerant gas, vibration isolator pads and safety devices like thermal protector, pressure relief valve, over load relays single phase preventor, high-low pressure cut out, suitable for three phase 440V supply.	1	Nos		
5	LMR	Supply, installation, testing and commissioning of suitable hard drawn copper refrigerant piping for 3 TR machine with 13 mm nitrile rubber insulation interconnecting the condensing unit to evaporating unit for packaged units as per site condition	10	Rmt		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
6	LMR	SITC of DX type double skinned air handling units, ceiling suspended/floor mounting type 3 TR, 1600 cfm capacity complete with suitable DIDW blower (as per approved make), blower section, static pressure of 40mm of water column, built in pre filter(EU4), fine filter(EU7), HEPA Filter and controls connected to condensing units, insulated SS drain pan, 6 row cooling coil, electric motor, belt drive package with TEFC motor class 'B' insulation, suitable for 3 phase, 415 V, 50Hz supply, suitable AHU panel & cabling, AHU temp & speed control panel , ARI certified, with 0.6mm double skinned 40mm thick PUF panel, belt guards, suitable supports for suspending from slab, vibration isolator, etc. conforming to specifications. The air handling units shall have 1 inlet refrigerant coils and 1 outlet refrigerant coils suitable for 1 numbers of 11 TR capacity ODU and shall conform to specifications.	1	Nos		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
7		Supply, installation, testing and commissioning of Air Cooled High Wall mounted Split Air Conditioner of following capacity consisting of high wall mounted type room unit (fan coil) with cordless remote control and one number outdoor condensing unit comprising of energy efficient suitable rotary compressor for operation on single phase, 230 V, 50Hz supply, fixing the outdoor unit on a raised platform as per manufacturers recommendation and fixing of room (fan coil) unit on wall, standard 4 m distance refrigerant copper piping with 13mm nitrile rubber insulation, providing and making interconnection between room & condenser as per site conditions, comprising of 1" dia drain PVC pipe with insulation 4m, canvas connections, full electrical cabling from power plug near indoor unit and to outdoor unit, ODU MS stand, first charge refrigerant gas, suitable stabilizer etc complete as required.				
7.1	LMR	2 TR 5 star rated as per BEE	5	Nos		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
8	LMR	Supply, installation, testing and commissioning Ceiling Suspended Cassette type room Air-conditioner following capacity unit three phase 415V, compact cooling coil, electronic expansion valve, suction air grill, in built drain pump coated with silver ions to prevent slime, mould and bacterial growth, air filter with anti-mould and anti bacterial treatment & decorative panel. Outdoor unit with highly energy efficient Compressor with copper coils, first charge refrigerant gas and with MS stand. Unit to be capable of maintaining 22±1° C indoor condition with cordless remote with various features like 3 speed, auto manual selection etc also. Unit capable of 30 meter maximum interunit piping length and 15 maximum installation level difference. Decorative panel to be part of supply of units.				
8.1	LMR	3 TR	1	Nos		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
8.2	LMR	2.5 TR	1	Nos		
8.3	LMR	2 TR	2	Nos		
9	LMR	Supply, Laying and Fixing of control cabling of suitable size required from the Indoor to outdoor units for all units as per specification.	40	Rmt		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
10	LMR	Supply, installation, testing and commissioning PVC drain pipe of 25mm dia ISI marked, connecting the drain lines from the indoor units to floor sump, with 9mm nitrile rubber insulation as per specification	20	Rmt		
11	LMR	SITC of Humidity Controller electric strip heaters in supply air plenum complete with fixing arrangements humdistat and safety thermostat including all supports, terminations, power and control wiring	1	Nos		
<b>PART B</b>		<b>AIR DISTRIBUTION</b>				
12		Supply, installation, testing and commissioning of factory fabricated rectangular Aluminium sheet metal ducting for Supply/return/fresh air for Clean Room, duct/collar connecting to indoor unit as per ducting specifications and with suitable supports using MS angles, channels, rods, anchor bolts, etc to roof /truss as per IS 655 and as per specifications.				

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
12.2	LMR	22 G	150	SQM		
13		Supply, installation, testing and commissioning of factory fabricated rectangular GSS sheet metal ducting for Supply/return/fresh air duct/collar connecting to indoor unit as per ducting specifications and with suitable supports using MS angles, channels, rods, anchor bolts, etc to roof /truss as per IS 655 and as per specifications.				
13.2	16.12.1.2	22 G	50	SQM		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
13.3	16.12.1.1	24 G	30	SQM		
14	LMR	SITC of External thermal insulation on supply air ducts using min 13mm thick nitrile rubber class "O" closed cell type with antimicrobial protection as per specifications	210	SQM		
15	LMR	Supply, installation, testing and commissioning of Acoustic duct lining using 10mm nitrile rubber insulation open cell type inside the ducts, antimicrobial protection at the outlets of all indoor units upto 4m distance from fan outlet as per spec provided.	20	SQM		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
16	LMR	Supply, fabrication, installation, testing of flexible connections made out of fire resistant flexible double canvas sleeve.	2	Set		
17	16.17	SITC supply air diffusers of powder coated aluminium with aluminium volume control dampers with anti smudge ring & removable core.	1	SQM		
18	16.18	SITC supply air diffusers of powder coated aluminium without volume control dampers with anti smudge ring & removable core.	1	SQM		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
19	LMR	SITC of Fire Control Damper made of 16G GSS sheet blade and frame with 165mm casing, heavy duty interlocking blades and fully enclosed blade linkage mechanism, SS lateral seal blade seals, self lubricating sintered bronze bushes, fire rating as per UL555-1995 tested as per BS-476 part 20 with 18G extended sleeve 450mm and with fusible link, spring mechanism.	2	SQM		
20	LMR	SITC of multi blade type volume control dampers made of extruded aluminium for ducts/ collars to be provided with suitable links, levers and quadrants for manual control of volume of air flow and for proper balancing of the air distributions system in main ducts, return ducts & other area as per specification.	10	SQM		
21	LMR	SITC of Fresh air GI louvers of size 350x350 mm with wire mesh and birds screen for IDUs/AHUs as per specifications.	5	SQM		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
22		Supply and fixing of Terminal HEPA Filters having filtering efficiency of 99.7% down to 0.3 microns with aluminum frame works, suitable for fixing in the Supply air plenum boxes				
22.1	LMR	610 x 610 x305	24	Nos		
23		SITC of Plenum box made of 18G Aluminium sheet with frame work for fixing HEPA filters at terminals and provision of access door for removing the HEPA Filters for cleaning and replacement. The size shall be to suit				
23.1	LMR	610 x 610 x305 mm	20	Nos		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
24	LMR	Supply installation testing and balancing of continuous Perforated Stainless Steel Grilles for supply and return air grilles in accordance with the approved shop drawings size 610 x 610 mm & 450 x 450 mm	8	SQM		
		<b>TOTAL FOR PART B</b>				
		<b>Total Amount (Part A+B)</b>				

**FIRE DETECTION SYSTEM**

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
		<b>FIRE DETECTION SYSTEM</b>				
1	LMR	Addressable Fire Alarm Control panel with battery back up for 8 hours normal operation and 15 minutes alarm operation. The Panel Shall be 4 loop capacity. The control panel, battery charger etc, The panel shall consisting with 80 character LCD display and RS 485 for networking.	Each	1		
2	LMR	Addressable Smoke detector with base, Junction box and other accessories as required and detectors. <u>Above Smoke Detector &amp; Below</u>	Each	50		
3	LMR	Response indicator for all detectors located above false ceiling	Each	25		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
4	LMR	Addressable Single action Manual pull station having an integrally mounted addressable module that monitors and reports contact status.	Each	2		
5	LMR	Supply, installation, testing & commissioning of Addressable Hooter with minimum of 85 db at 10 feet including all accessories, UL/ FM/BIS/LPCB approved	Each	2		
6	LMR	Supply, installation, testing & commissioning of 2C x 1.5sq.mm FRLS twisted pair shielded, 1.1KV grade PVC insulated armored copper conductor cable	M	500		

Item No	Code	Description of Item	Quantity	Unit	Rate (Rs. in words & in figures)	Amount (Rs.)
7	LMR	Supply, installation, testing & commissioning of dry chemical powder type (DCP) fire extinguishers (ABC Type) of 4 kg capacity, IS 13849	Each	5		
8	LMR	Supply and installation, testing and commissioning of <b>CO2 type fire extinguisher</b> with 4.5kg. Capacity complete with installation brackets with ISI mark IS:15638	Each	5		
		<b>TOTAL</b>				