

**Volume-2**

**NATIONAL AGRI-FOOD BIOTECHNOLOGY INSTITUTE (NABI)**

(Department of Biotechnology,  
Ministry of Science and Technology, Govt. of India)  
C-127, Industrial Area, Phage 8, SAS Nagar, Mohali, Punjab  
Phone: 0172-2290300 Fax: 0172-4604888

**FINANCIAL BID DOCUMENT**



**Construction, testing & commissioning Of Containment Facility/Transgenic House with Environment controlled parameters at Main Campus, NABI, Sector-81, Mohali**

# **TECHNICAL SPECIFICATIONS**

## **1.0 STANDARD SPECIFICATIONS ISSUED BY CPWD**

### **1.1 Civil Engineering Works**

CPWD Specification 2009 Vol. I & II along with latest correction slips. These Specifications have replaced CPWD Specifications 1996 along with Correction Slips issued on them. These Specifications cover all types of Works. The specifications are available as a printed document issued by CPWD and also in soft copy PDF Format in CPWD website.

### **1.2 Electrical Engineering Works**

- (A) CPWD General Specifications for Electrical Works Part I Internal - 2013.
- (B) CPWD General Specifications for Electrical Works Part IV Sub Station – 2013.
- (C) CPWD General Specifications for Electrical Works Part VII D.G. Sets - 2013.
- (D) General Specifications for Heating, Ventilation & Air-Conditioning (HVAC) - 2004

The above specifications shall be read with upto date correction slips (if any).

## **2.0 STANDARD SPECIFICATIONS ISSUED BY MINISTRY OF SURFACE TRANSPORT**

Specifications for Road and Bridge works (Fourth Revision) August 2001 have been published by Indian Road Congress as a priced document. These Specifications cover exhaustively various Road and Bridge works.

### **(A) CIVIL WORKS**

#### **WORKMANSHIP FOR THE ENTIRE PLUMBING WORK.**

The workmanship shall be best of its kind and shall conform to the specifications, as below or Indian Standard Specifications in every respect or latest trade practices and shall be subject to approval of the Engineer-in- Charge. All materials and/or Workmanship which in the opinion of the Engineer-in- Charge is defective or unsuitable shall be removed immediately from the site and shall be substituted with proper materials and/or workmanship forthwith.

#### **1. GI Sheet Gutters**

G.I. sheet gutters should be 0.80mm thick semi-circular in shape as per relevant IS codes. GI sheet gutter should be fixed with properly with clamps including fixing with pvc/MS painted clamps for making connections with rain water pipes. The sample of same should be got approved from Engineer-in- Charge before execution of work.

## **2. Polycarbonate sheet**

Polycarbonate sheet should be of double walled design/shape(2R10 Structure) of minimum 10 mm thickness , approx. weight 2000gm/m<sup>2</sup> with light & solar transmission 80% & 85% including U. value 0.52 Btu/Hr x F1 sqm x F & approved by the Engineer-in-charge & fixed complete all as per manufactures instruction/directed & shown on drawing. The sample of same should be got approved from Engineer-in- Charge before execution of work. The polycarbonate sheet should be fixed with the help of structural members (to be paid separately) as per design/drawing by skilled workers. Shop drawing of same shall be got approved from Engineer-in-charge before execution of work. All the joints, connection points with structural members should be sealed properly with silicon sealants etc.

## **3. 4MM THICK ALUMINUM COMPOSITE PANEL (ACP) SHEET:-**

The aluminium composite panel should be 4 mm inclusive of pre-coated aluminium sheet 0.5 mm minimum on both side of approved make & color complete to the satisfaction of Engineer-in-charge. The ACP sheet should be sealed at joints, gaps with silicon sealant on both sides. The sealant should have high resistivity to high temperature. The frame for jointing, supporting ACP sheet shall be of anodised aluminium sections of approved thickness(To be paid separately). The work shall be done to the precision and special care shall be taken in to consideration while execution by skilled/semi-skilled man power.

## **4. REVERSE OSMOSIS WATER PURIFIER:-**

SITC of commercial Reverse osmosis water purifier for 100 Ltr/hr average flow having inbuilt uv protection, pressure sand filter, activated carbon filter & antiscalant dosing system along with needful tank, fittings , accessories etc complete

## **(B) PLUMBING WORK**

### **WORKMANSHIP FOR THE ENTIRE PLUMBING WORK.**

The workmanship shall be best of its kind and shall conform to the specifications, as below or Indian Standard Specifications in every respect or latest trade practices and shall be subject to approval of the Engineer-in- Charge. All materials and/or Workmanship which in the opinion of the Engineer-in- Charge is defective or unsuitable shall be removed immediately from the site and shall be substituted with proper materials and/or workmanship forthwith.

### **MATERIALS FOR THE ENTIRE PLUMBING AND FIREFIGHTING WORK.**

All materials shall be best of their kind and shall conform to the latest Indian Standards.

All materials shall be of approved quality as per samples and approved by the Engineer-in-Charge. As and when required by the Engineer-in-Charge, the contractor shall arrange to test the materials and/or portions of works at his own cost to prove their soundness and efficiency. If after tests any materials, work or portions or work are found defective or unsound by the Engineer-in-Charge, the contractor shall remove the defective material from the site, pull down and re-execute the works at his own cost to the satisfaction of the Engineer-in-Charge. To prove that the materials used are as specified the contractor shall furnish the Engineer-in-Charge with original vouchers on demand.

## **a) SANITARY FIXTURES & FITTINGS**

### **1 GENERAL REQUIREMENT**

All fixtures and accessories shall be fixed in accordance with a set pattern matching the tiles or interior finish as per Engineer-in-Charge requirements. Wherever necessary, the fittings shall be centered to dimensions and pattern as called for. Fixing screws shall be half round head chromium plated (CP) brass screws, with CP brass washers unless otherwise specified. Fixtures shall be installed by skilled workman with appropriate tools according to the best trade practice.

All appliances, fittings and fixtures shall be fixed in a neat workmanlike manner true to level and to heights shown on the drawings and in accordance with the manufacturers' recommendations. Care shall be taken to fix all inlet and outlet pipes at correct positions. Faulty locations shall be made good and any damage to the finished floor, tiling, plaster, paint, insulation shall be made good by the contractor at his own cost. Fixtures shall be mounted rigid, plumb and true to alignment.

All materials shall be rustproof; materials in direct or indirect contact shall be compatible to prevent electrolytic or chemical (bimetallic) corrosion. Wall flanges, if any shall be provided on all walls, floors, columns etc. wherever supply and disposal pipes pierce through them. These wall caps shall be of chromium plated brass fittings and the receiving pipes and shall be large enough to cover the punctures properly.

Sanitary appliances, subject to the type of appliance and specific requirements, shall be fixed in accordance with the relevant standards and the following:

a. Contractor shall, during the entire period of installation and afterwards protect the appliances by providing suitable cover or any other protection so as to absolutely prevent any

damage to the appliances until handing over (The original protective wrapping shall be left in position for as long as possible)

b. The appliances shall be placed in correct position or marked out in order that pipe work can be fixed or partially fixed first.

c. The appliance shall be fixed in a manner such that it will facilitate subsequent removal if necessary.

d. The appliance shall be securely fixed. Manufacturer's brackets and fixing methods shall be used wherever possible. Compatible rust-proofed fixings shall be used. Fixing shall be done in a manner that minimizes noise transmission.

e. Appliances shall not be bedded (e.g. WC pans, pedestal units) in thick strong mortar that could crack the unit (e.g. ceramic unit)

f. Pipe connections shall be made with demountable unions. Pipe work shall not be fixed in a manner that it supports or partially supports and appliance.

g. Appliances shall be fixed true to level firmly fixed to anchor or supports provided by the manufacturer and additional anchors or supports where necessary.

The contractor shall fix all plumbing fittings such as water faucets, shower fittings, mixing valves etc. in accordance with manufacturer's instructions and connect to piping system. The contractor shall supply all fixing materials such as screws, raw plugs, unions, collars, compression fittings etc., as required.

Joints / gaps between all sanitary appliances / fixtures and the floor / walls shall be caulked with an approved mildew resistant sealant, having antifungal properties, of colour and shade to match that of the appliances / fixture and the floor / wall to the extent possible.

## **2. MOCKUP AND TRIAL ASSEMBLY**

The installation of the sanitary fixtures and fittings shall be as per the all drawings approved by the Engineer-in- Charge. The contractor shall have to assemble at least one set of each type of sanitary fixtures and fittings in order to determine precisely the required supply and disposal connections. Relevant instructions from manufacturers shall be followed as applicable. This trial assembly shall be developed to determine the location of puncture holes, holding devices etc. which will be required for final installation of all sanitary fixtures and fittings. The above assembly shall be subject to final approval by the Engineer-in- Charge.

The fixtures in the trial assembly can be re-used for final installation without any additional payments for fixing or dismantling of the fixtures.

## **3. SUPPORTING AND FIXING DEVICES**

The contractor shall provide all the necessary supporting and fixing devices to install the sanitary fixtures and fittings securely in position. The fixing devices shall be rigidly anchored into the building structure. The devices shall be rust resistant and shall be so fixed that they do not present an unsightly appearance in the final assembly. Where the location demands, the Engineer- In-Charge may instruct the contractor to provide chromium plated or other similarly finished fixing devices. In such circumstances the contractor shall arrange to supply the fixing devices and shall be installed complete with appropriate vibration isolating pads, washers and gaskets.

#### **4. FINAL INSTALLATION**

The contractor shall install all sanitary fixtures and fittings in their final position in accordance with approved trial assemblies and as shown on drawings. The installation shall be complete with all supply and waste connections. The connection between building and piping system and the sanitary fixtures shall be through proper unions and flanges to facilitate removal/replacement of sanitary fixtures without disturbing the built in piping system. All unions and flanges shall match in appearance with other exposed fittings.

Fixtures shall be mounted rigid, plumb and to alignment. The outlets of water closet pans and similar appliances shall be examined to ensure that outlet ends are butting on the receiving pipes before making the joints. It shall be ensured that the receiving pipes are clear of obstruction. When fixtures are being mounted, attention shall be paid to the possibility of movement and settlement by other causes. Overflows shall be made to ensure that necessary anchoring devices have been provided for supporting water closets, wash basins, sinks and other appliances.

#### **6. PROTECTION AGAINST DAMAGE**

The contractor shall take every precaution to protect all sanitary fixtures against damage, misuse, cracking, staining, breakage and pilferage by providing proper wrapping and locking arrangement till the completion of the installation. At the time of handing over, the contractor shall clean, disinfect and polish all the fixtures and fittings.

#### **7. MEASUREMENT**

7.1 Rate for sanitary fixtures accessories, CP fittings shall etc. include all items, and operations stated in the respective specifications and bill of quantities and nothing extra is payable.

7.2 Rates for all items under specifications para above shall be inclusive of cutting holes

and chases and making good the same, CP screws, nuts, bolts and any fixing arrangements required and recommended by manufacturers, testing and commissioning and making good to the satisfaction of the Engineer-in- Charge

## **8. TESTING**

All appliances, fixtures and fittings shall be tested before and after installation. Water seals of all appliances shall be tested. The contractor shall block the ends of waste and ventilation pipes and shall conduct an air test.

## **COMMISSIONING & GUARANTEE (For Entire Plumbing, Sanitary Installations)**

### **1. SCOPE OF WORK**

On award of work, Contractor shall submit a detailed proposal giving methods of testing and gauging the performance of the equipment to be supplied and installed under this contract.

Contractor shall provide all tools, equipment, metering and testing devices required for the purpose.

All tests shall be made in the presence of the Engineer- In-Charge or his representative or any inspecting authority. At least three working days' notice in writing shall be given to the inspecting parties before performing any test.

Water flow rates of all equipment and in pipe lines through valves shall be adjusted to design conditions. Complete results of adjustments shall be recorded and submitted.

Contractor shall ensure proper balancing of the hydraulic system and for the pipes /valves installed in his scope of work by regulating the flow rates in the pipe line by valve operation.

The contractor shall also provide permanent Tee connection (with plug) in water supply lines for ease of installing pressure gauge, temperature gauge & rotameters. Contractor shall also supply all required pressure gauge, temperature gauge & rotameter for system commissioning and balancing. The balancing shall be to the satisfaction of Consultant / Engineer Incharge.

Three copies of all test results shall be submitted to the Engineer in A4 size sheet paper within two weeks after completion of the tests.

### **2. PRECOMMISSIONING**

On completion of the installation of all pumps, piping, valves, pipe connections, insulation etc. the Contractor shall proceed as follows:

a. The water storage tanks and pipes shall first be filled with water and thoroughly flushed out. The storage tanks shall then be filled with water again and disinfecting chemical containing

chlorine added gradually while tanks are being filled to ensure thorough mixing. Sufficient chemical shall be used to give water a dose of 50 parts of chlorine to one million parts of water. If ordinary bleaching powder is used, the proportions will be 150 gm of power to 1000 litres of water. The power shall be mixed with water in the storage tank. If a proprietary brand of chemical is used, the proportions shall be specified by the manufacturer. When the storage tanks are full, the supply shall be stopped and all the taps on the distributing pipes are opened successively working progressively away from the storage tank. Each tap shall be closed when the water discharged begins to smell of chlorine. The storage tank shall then be filled up with water from supply pipe and added with more disinfecting chemical in the recommended proportions. The storage tank and pipe shall then remain charged at least for three hours. Finally the tank and pipes shall be thoroughly flushed out before any water is used for domestic purpose.

The pipe work shall be thoroughly flushed before supply is restored.

b. After the pipe work has been tested and approved, but before it is coupled, it shall be sterilized with a solution of chloride of lime.

c. Prior to start-up and hydraulic testing, the Contractor shall clean the entire installation including all water tanks, fittings and pipe work and the like after installation and keep them in a new condition. All pumping systems shall be flushed and drained at least once through to get rid of contaminating materials.

All pipes shall be rodded to ensure clearance of debris, cleaning and flushing shall be carried out in sections as the installation becomes completed.

d. All strainers shall be inspected and cleaned out or replaced.

e. When the entire systems are reasonably clean, a pre-treatment chemical shall be introduced and circulated for at least 8 hours. Warning signs shall be provided at all outlets during pre-treatment. The pre-treatment chemical shall:

- Remove oil, grease and foreign residue from the pipework and fittings;
- Pre-condition the metal surfaces to resist reaction with water or air.
- Establish an initial protective film;
- After pre-treatment, the system shall be drained and refilled with fresh water and left until the system is put into operation.
- Details and procedures of the pre-treatment shall be submitted to the Engineer- In-Charge for approval.

f. Check all clamps, supports and hangers provided for the pipes.



g. Check all the equipment, piping and valves coming under cold water system and operate each and every valve on the system to see if the valves are functioning properly. Thereafter conduct & hydro test of the system as for (b) above.

h. Fill up pipes with water and apply hydrostatic pressure to the system as given in the relevant section of the specification. If any leakage is found, rectify the same and retest the pipes.

### **3. STATUTORY AUTHORITIES' TESTS AND INSPECTIONS**

As and when notified in writing or instructed by the Engineer-in- Charge the Contractor shall submit all drawing and attend all tests and inspections carried out by Local Fire Authorities, Water Authority and other Statutory Authorities, and shall forthwith execute free of charge any rectification work ordered by the Engineer-in- Charge as a result of such tests and inspections where these indicate non-compliance with Statutory Regulations. Some of these tests may take place after the issue of Practical Completion of the Main Contract and the Contractor shall make all allowances in this respect.

The Contractor shall be responsible for the submission of all necessary forms and all drawings to the Statutory Authorities which shall conform in layout to the latest plans submitted to Engineer- In-Charge and kept by these Authorities.

The submission shall comply with the requirements set forth in the current Codes of Practice and circular letters of the Statutory Authorities. The all drawings to be submitted shall be forwarded to the Engineer-in- Charge for checking before submission.

The Contractor shall allow for at least two submissions of complete sets of all drawings to the Authorities, one to be made within six months after the award of the Contract but not less than six weeks before the inspection. The Engineer- In-Charge may at his discretion instruct the Contractor for additional submissions to the Local Authorities whenever necessary.

The Contractor shall notify the Engineer- In-Charge at least seven days in advance of his application for local Authority tests and inspections. On receipt of a confirmed date for test and inspection the Contractor shall inform the Engineer-in- Charge without delay.

### **4. FINAL ACCEPTANCE TESTS**

Following commissioning and inspection of the entire installation, and prior to issue of the Completion Certificate, the Contractor shall carry out final acceptance tests in accordance with a programme to be agreed with the Engineer- In-Charge.

Should the results of the acceptance tests show that plant, systems and/or equipment fail to perform to the efficiencies or other performance figures as given in this Specification, the Contractor shall adjust, modify and if necessary replace the equipment without further payment in order that the required performance is obtained.

Where acceptance tests are required by the relevant Authorities having jurisdiction, these tests shall be carried out by the Contractor prior to the issue of Completion Certificate to the acceptance of the Authorities.

## **5. REJECTION OF INSTALLATION / PLANT**

Any item of plant or system or component which fails to comply with the requirements of this Specification in any respect whatsoever at any stage of manufacture, test, erection or on completion at site may be rejected by the Engineer in- Charge either in whole or in part as he considers necessary/appropriate. Adjustment and/or modification work as required by the Engineer- In-Charge so as to comply with the Authority's requirements and the intent of the Specification shall be carried out by the Contractor at his own expense and to the satisfaction of the Engineer-in- Charge.

After works have been accepted, the Contractor may be required to carry out assist in carrying out additional performance tests as reasonably required by the Engineer-in-Charge.

## **6. WARRANTY AND HANDOVER**

The Contractor shall warrant that all plant, materials and equipment supplied and all workmanship performed by him to be free from defects of whatsoever nature before handover to the Engineer-in-Charge.

## **7. HANDING OVER OF DOCUMENTS**

All testing and commissioning shall be done by the Contractor to the entire satisfaction of the Engineer-in- Charge and all testing and commissioning documents shall be handed over to the Engineer-in-Charge.

### **(B) Heating, Ventilation and Air-conditioning (HVAC) system**

The HVAC system should be designed through DX type AHU of required capacity (as mentioned in Schedule of quantities) with 6 row deep coil, having one fresh air change connected with eco

friendly refrigerant system. It should be capable to maintain the temperature of 22 deg.C to 30 deg.C  $\pm$  2 in summer and 22 deg c to 24 deg.C  $\pm$  2 in winters in each chamber. Fresh air should be taken through inline fan so that it can be precisely controlled. The provision of standby HVAC unit shall be considered for each chamber of Containment facility.

Humidity should be maintained in each chamber from 50 % to 70% +/- 5% by using pan type humidifier, particle size will remain 5 to 10 $\mu$ m. It should be controlled through humidistat and digital controller. Supply of the same will be at supply air duct .Water supply to Pan type humidifier should be filtered or through water softner.

All work shall be done in conformity with the Good for Construction (GFC) drawings issued by the Consultant.

Apart from above, the manufacturer specifications along with the CPWD general specifications for HVAC Works-2004 shall follow.

### **(C) ELECTRICAL WORKS**

The lighting system should be such that to provide the Photo-synthetically Active Radiation(PAR) light for supplementing the natural day light by around 100  $\mu$ moles /m<sup>2</sup> /s and as per DIN and IEC standard using Metal Halide Lamps in each chamber of the Containment facility and as given in the Schedule of quantities. General lighting in each chamber shall be done with fluorescent lamps. The intensity of individual light source shall be provided in  $\mu$ moles/m<sup>2</sup>/s by the contractor as and when asked.

In case of DG set and AMF panel, the Manufacturer specifications shall prevail. The DG set shall be silent type with acoustic enclosure and shall comply with the applicable Central Pollution Control Board (CPCB) norms. The Height of the stack/exhaust of the DG set shall be as per the Punjab Pollution Control Board (PPCB) norms. The contractor shall ensure for complete Installation, Testing and Commissioning of DG set with AMF panel along with the testing with Mains Power supply.

Apart from above, the following specifications of CPWD shall follow:

- 1) CPWD General Specifications for Electrical Works Part I Internal - 2013.
- 2) CPWD General Specifications for Electrical Works Part IV Sub Station – 2013.
- 3) CPWD General Specifications for Electrical Works Part VII D.G. Sets - 2013.

### **(D) DATA LOGGER AND AUTOMATION SYSTEM:**

- 1) This system shall consist of temperature, humidity and light sensors for the remote monitoring of inside Temperature, Humidity and light conditions i.e, lux levels of each of the two chambers of containment facility separately along with the facility of Data logging.
- 2) This system shall also work as an automated lighting control system that will switch ON/OFF all the Metal halide lights in each of the two chambers of Containment facility after the lux level changes against the pre-set value. That control shall be done with the help of programmable lux sensor lighting control system.
- 3) This work shall include the supply, installation, testing and Commissioning of the complete system including all the necessary control wiring, data cabling, relays, contactors, timers, ports etc.

NOTE: Remote Monitoring means to monitor the parameters from the location which is approx 10kMs away from the Containment facility via some internet/software system etc. along with the facility of Data logger.

## **(E) FIRE EXTINGUISHERS**

### **1. ABC Dry powder type (6kg):**

Stored Pressure type 6 kg Capacity having Dry Chemical Powder IS: 14609 for Fighting A, B & C Class Fire rating, test pressure 30kg/cm<sup>2</sup> mild steel body pressurized by Nitrogen Gas. The Extinguisher shall have pressure gauge for indicating inside Pressure with opening and closing Lever of squeeze grip valve with tamper Proof seal. Extinguisher shall be externally Epoxy coated as per IS: 5 Colors shade No.538 complete with wall Bracket. The Extinguisher shall be manufactured strictly as per BIS: 15683 bearing ISI Marked. The Extinguisher body & valve shall be CE marked & E.N3.7 internationally approved.

FIRE RATING:	4A, 55B
WORKING PRESSURE:	15KGF/CM <sup>2</sup>
HYDRO PRESSURE:	35KGF/CM <sup>2</sup>
BURSTING PRESSURE:	55KGF/CM <sup>2</sup>

### **2. CO<sub>2</sub> type fire extinguisher:**

4.5kg capacity Fire extinguishers made from new seamless cylinder DOE & CCE Nagpur approved type Fitted with discharge hose & horn and wheel type valve with Initial charge as per IS: 15683 specification ISI Marked.

FIRE RATING:	21B
WORKING PRESSURE:	60KGF/CM <sup>2</sup>
HYDRO PRESSURE:	250KGF/CM <sup>2</sup>
BURSTING PRESSURE:	600KGF/CM <sup>2</sup>

### **3. ABC Dry powder type (9Kg):**

Stored Pressure type 9kg Capacity having Dry Chemical Powder IS: 14609 for Fighting A,B& C Class Fire fire rating, test pressure 30kg/cm<sup>2</sup> mild steel body pressurized By Nitrogen Gas. The Extinguisher shall

have pressure gauge for indicating inside Pressure with opening and closing Lever of squeeze grip valve with tamper Proof seal. Extinguisher shall be externally Epoxy coated as per IS: 5 Colors shade No.538 complete with wall Bracket. The Extinguisher shall be manufactured strictly as per BIS: 15683 bearing ISI Marked. The Extinguisher body & valve shall be CE marked & E.N3.7 internationally approved.

FIRE RATING: 6A, 89B  
WORKING PRESSURE: 15KGF/CM2  
HYDRO PRESSURE: 35KGF/CM2  
BURSTING PRESSURE: 55KGF/CM2

**NOTE: In case of any contradiction between the specifications, the contractor shall take the prior approval of the consultant before executing the same at site.**

## **LIST OF MAKES TO BE ADOPTED**

### **CIVIL & PUBLIC HEALTH WORKS**

S.No	Item	Make
1.	Cement	J K Lakshmi/ ACC/ Ultratech/ Ambuja
2.	Steel Reinforcement	Tata/JSW Jindal/ Sail/Vizag
3.	Structural hot dipped GI section members	Tata/ JSW Jindal/ Bhushan/ other as approved by Engg-In-Charge
4.	CP Fittings	Jaguar/ Hindware/ Cera
5.	GI pipes	Tata/ Jindal/ Swastic
6.	CPVC Pipes	Astral/Dutron/ Apollo
7.	Paint	Asian Paint/ Berger/Garware
8.	Polycarbonate Sheet	Lexan/Tuflite/Prakash Acrylics
9.	ACP Sheet	Alstone/Alstrong/Aludecor/Evabond
10.	Chinaware	Jaguar/Hindware/cera
11.	UPVC pipes	Diplast/Supreme/Kisan
12.	PVC tank	Diplast/Finolex/ Sintex
13.	RO water purifier	Eureka Forbes/Kent /H2O
14.	Glass	Mico/Saint Gobain/Gold Plus/ other as approved by Engg-In-Charge
15.	Aluminium section	Jindal, Hindalco (Indal), Gulf extrusion, Alualpha,

**Note:-** Any other material make not mentioned shall be ISI marked & got approved from Engg-in-charge

<b>S.No</b>	<b>Item</b>	<b>Make</b>
<b>For HVAC SYSTEM</b>		
1	Air Handling Units	Zeco/Flectwood/Trane
2	Outdoor Unit and it's Control Unit	Hitachi/Daikin/O-General
3	GI Sheets	Tata/Sail/Hindalco
4	Temperature Humidity Adjuster Package, Remote Controller for heating system	Anergy/Honeywell
5	Pan Type Humidifier	Rapid Cool/Emerald/KEPL
6	Pressure Relief Damper	Tristar/Shri Anand INC
7	Humidistat	Honeywell/Johnson Controls/DnB
8	Magnahelic Gauge	Dawre USA/Siemens Switzerland
9	Thermal Insulation	Accuflex/Armacell
10	Backward Curved Centrifugal Fan	Kruger/Nikotra/Comefri/Blowtech
11	Pre,Fine and Hepa Filters	Thermadyne/Puramatic.
12	Circular Inline Fan	System air/Vents/Ostemberg
13	Grills,Dampers,Diffusers, louvres	Dynacraft / Air Master / Cosmos / Ravistar / Tristar.
14	MCCB	Legrand / Siemens / ABB / Schneider Electric
15	MCB & ELCB	L & T / ABB / Siemens / Hager/ Schneider Electric
16	Power & control cables	Polycab / Finolex / KEI / Havells
17	Copper tubes / Pipes / Fittings	Mandev / Rajco/Totaline
18	Elastomeric Nitrile rubber	Accuflex/Armacell
19	Expanded Poly ethylene insulation	Supreme / Paramount / Trocellene
20	Open cell Nitrile Rubber for Acoustics	Armacell / Accuflex
21	PVC drain pipes	Astral / Finolex / Supreme / Prince
22	Flexible ducts	Atco / Caryaire/Sphere
23	Fire Dampers	Carryaire / Nutech / Dynacraft / Sphere
24	Heating controller	Anergy/Honeywell
25	Strip Heaters	Daspass/Escort or factory fitted by AHU manufacturer
26	Water based Paint	Falcon Chemicals/Equilent
27	GI Pipes	TATA/Jindal
28	Air-curtain	Euronics/Crompton Greaves/Panasonic
<b>For ELECTRICAL WORKS</b>		
29	MCCBs/MCBs/Isolators	L&T/ABB/Siemens/Legrand/Hager/Schneider Electric/MerlinGerin
30	Multifunction meter/VIF Meter etc.	L&T/ Schneider Electric/ Secure

31	Wires & Cables	Polycab / Finolex / KEI / Havells
32	Light Fixtures	As per Schedule of Quantities
33	Switch & Sockets, GI switch boxes	MK/Legrand-Mosaic/Schneider Electric
34	PVC conduit/Pipes	BEC/Polycab/AKG/Diplast
35	Distribution boards(DBs) & its accessories, Blanking plates etc.	L&T/ABB/Siemens/Legrand/Hager/Schneider Electric
36	Aluminium Lugs	Dowells/3D (Billets Elektro Werke Ltd.)/Electro
37	Cable Glands	Comet/Cable Glands India/Brass Turnomatics
38	Diesel Generator Set with AMF panel	Cummins India Ltd./Kirloskar Electric Co. Ltd./Greaves Cotton Ltd.
<b>For ACCESS CONTROL SYSTEM</b>		
39	Access Controller	Smart I/Samsung/Honeywell/Rosslare/Bosch/CeaseFire
40	Prox Point plus Proximity reader	HID/Smart-I/Honeywell/Bosch
41	U BRACKETS & Electromagnetic locks FOR UL275 SERIES LOCKS	Algatech/Dorma/Insyin/Ceasefire
42	The Door Release Button With Double Feature NO/NC (Aluminium) Size: 86Lx50Wx20T(mm)	Smart-I/Honeywell/Bosch/HID/Insyin
43	Proximity Cards - EM	HID/Samsung/Honeywell
44	CAT-6 cable	D-link/Smartlink/Digilink
<b>For FIRE ALARM SYSTEM</b>		
45	Fire Alarm Control panel	AGNI/Insyin/Ceasefire/Daccess
46	Smoke detectors	AGNI/Ceasefire/GST/Safex
47	Response Indicators	AGNI/Insyin/GST
48	Manual call Points	AGNI/Insyin/Daccess
49	Hooters	AGNI/NRS/Daccess
50	Fire Extinguishers	Safex/CeaseFire/Minimax



**Name of Work:- Construction of Containment facility/Transgenic house with environment controlled parameters at Main campus, NABI, Sector-81, Mohali**

**ABSTRACT SHEET**

<b>S.NO</b>	<b>PARTICULARS</b>	<b>AMOUNT (In INR)</b>
1	ESTIMATED COST	Rs. 93, 35,679.00
2	PERCENTAGE (% AGE) QUOTE + - BY BIDDER ON ESTIMATED COST (IN FIGURES)	
3	PERCENTAGE (% AGE) QUOTE + - BY BIDDER ON ESTIMATED COST (IN WORDS)	
4	NET AMOUNT AFTER UN-CONDITIONAL PERCENTAGE REBATE OR QUOTE ABOVE ESTIMATED VALUE ((IN FIGURES)	
5	NET AMOUNT AFTER UN-CONDITIONAL PERCENTAGE REBATE OR QUOTE ABOVE ESTIMATED VALUE ((IN WORDS)	
6	UN-CONDITIONAL REBATE, IF ANY	

Stamp & Signatures of bidder

## Schedule-A

### BILL OF QUANTITIES

S.No. DSR 2013 Ref.	Description.	Unit	Qty.	Estimate d Rate (In INR)	Estimated Amount (In INR)
	<b>CIVIL WORKS</b>				
<u>1/2.28</u>	Surface dressing of the ground including removing vegetation and in-equalities not exceeding 15cm deep and disposal of rubbish, lead upto 50 m and lift upto 1.5 m.	100 Sqm.	6.00	1245.75	7,474.50
	- All kind of soil.				
<u>2/2.8</u>	Earth work in excavation by mechanical means(hydraulic excavator)/manual means in foundation trenches of drains(not exceeding 1.5 m in width, 1.5 m in depth or 10 sqm. on plan), including dressing of sides and ramming of bottoms lift upto 1.5m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50m.				
		cum	56.85	157.5	8,953.58
<u>3/2.25</u>	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 upto 50 m and lift upto 1.5 m.				
	total in cum	cum	56.79	112.4	6,382.72
<u>4/2.27</u>	Supplying and filling in plinth with sand under floors, including watering, ramming consolidating and dressing complete.				
		cum	19.714	910.25	17,944.46
<u>5/4.1.1 0</u>	Providing & laying in position cement concrete of specified grade excluding the cost of centering and shuttering -All work upto plinth level.				
	1:5:10 (1cement: 5 coarse sand: 10 graded stone aggregate 40 mm nominal size).				
		cum	<b>27.44</b>	4004.0	1,09,863.49
-	Providing and laying damp-proof course 40				

6/4.1	mm thick with cement concrete 1:2:4(1cement: 2 coarse sand: 4 graded stone aggregate 12.5 mm nominal size).				
		Sqm.	9.0	257.8	2,328.83
7/5.1.2	Providing & laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement-All work upto plinth level and above				
	1:1:2 (1 cement : 1 coarse sand : 2 graded stone aggregate 20 mm nominal size)				
		cum	9.32	7,789.95	72,585.81
8/ 5.2.2	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement, with 1:1.5:3 (1 cement :1.5 coarse sand : 3 graded stone Aggregate 20 mm nominal size).				
		cum	12.81	7,074.30	90616.476
9	Centering & shuttering including strutting, propping etc. and removal of form for:-				
5.9.	Foundation, footings, bases of columns, etc. for mass concrete.				
5.9.1		Sqm.			
			17.84	196.45	3,505.43
5.9.6	Columns, Pillars, Piers, Abutments, Posts and Struts.				
		Sqm.	75.84	453.35	34,382.06
5.9.5	Lintels, beams plinth beams, girders, bressumers and cantilevers.				
		sqm.	22.751	332.15	7,556.72
5.9.3	Suspended floor, roofs, landing, balconies & access platform.				
	Septic Tank/Soak pit slab	Sqm.	12.25	401.65	4920.2125
	counter slabs	sqm.	6.00	401.65	2409.9
10	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level & above levels.				
5.22.6	-Thermo-mechanically treated bars.	Kg.	1622.090	68.1	1,10,464.33

11/6.1	Brick work with common burnt clay F.P.S. (non modular) bricks of class designation 7.5 in foundation and plinth in: Cement mortar 1:4 (1 cement : 4 coarse sand)				
		cum	5.07	4,918.65	24,959.69
12/10.2 DSR based	Structural hot dipped GI section work riveted/bolted with GI nut-bolts in trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of iron oxide over the GI sections all complete.	Kg	8270	73.95	6,11,566.50
13	Providing & fixing 18 mm thick gang saw cut, mirror polished, premoulded and prepolished machine cut for kitchen platforms, vanity counters, window sills, facias and similar locations of required size, approved shade, colour and texture laid over 20 mm thick base cement mortar 1:4(1cement: 4 coarse sand), 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.				
8.2	Area of slab over 0.50 sqm.				
8.2.2.2		Sqm.			
	sink counters, storage spaces	Sqm.	3.6		
		Sqm.	3		
			6.600	3907.4	25,788.84
12	Cement concrete flooring 1:2:4(1cement: 2 coarse sand: 4 graded stone aggregate) finished with a floating coat of neat cement, including cement slurry, but excluding the cost of nosing of steps etc. complete.				
11.3.	40 mm thick with 20 mm nominal size stone aggregate.		28.591	353.35	10102.61
14	Providing & 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.				
12.41.2	110 mm diameter.	Mtr.	30	231.65	6,949.50
15	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.				
12.4	110 mm bend	Nos.	5	161.55	807.75
<u>16</u>	20 mm thick cement plaster 1:4(1 cement:4 coarse sand) in two coat work.				
13.6.1					
		sqm.	260.9336	242.05	63,158.98
17/dsr	Finishing walls with Acrylic Smooth exterior paint of required shade :				
	New work (Two or more coat applied @ 1.67 ltr/10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/ 10 sqm)				
			109.74	90.00	9,876.60
18/Dsr	Finishing with Deluxe Multi surface paint system for interiors and exteriors using Primer as per manufacturers specifications :				
	Two or more coats applied on walls @ 1.25 ltr/10 sqm over and including one coat of Special primer applied @ 0.75 ltr /10 sqm				
		sqm.	126.5668	100	12,656.68
<u>19</u>	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade in metal or wall finishing:				
	Two or more coats on new work.				
13.61.1		Sqm.	350	74.4	26,040.00
<u>20</u>	Providing & fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/appropriate Z section and other sections of approved make conforming to IS:733 and IS: 1286, fixing with dash fasteners of required dia and size, including necessary fitting 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				
21.1					

	fasteners to be paid for separately).				
(a) 21.1.2	For shutters of doors, windows & ventilators including providing & 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).				
21.1.2.2	anodise aluminium(minimum thickness of powder coating 15micron).				
		KG	239.148	405.9	97,070.17
21	Providing & fixing glazing in aluminum 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).				
21.3.3.	-With float glass panes of 8 mm thickness.				
		Sqm.	14.838	1338.4	19,859.18
22/21.2.1	Providing / fixing 12 mm thick prelaminated Particle board flat pressed three layer or graded wood particle board conforming to IS: 12823 grade I type-II, in paneling fixed in aluminium doors, windows shutters & partition frame with C.P. brass/stainless steel screws etc. complete as per architectural drawings and direction of engineer-in-charges.				
	Pre-laminated particle board with decorative lamination on one side and balancing lamination on other side.	sqm	1.44	1040.95	1,498.97
23	Providing & fixing aluminium tower bolts, ISI marked, anodized(anodic coating not less than grade AC 10 as per ISI: 1868) transparent or dyed to required colour or shade, with necessary screws etc. complete.				
9.97	150x10 mm	Each	44	65.35	2875.4
-					
24/9.3	Providing and fixing aluminium hanging floor door stopper, ISI marked, anodised (anodic coating not less than grade AC 10 as per IS : 1868) transparent or dyed to required colour and shade, with necessary				

	screws etc. complete				
-	Twin rubber stopper	each	12	83.95	1007.4
<u>25</u>	Providing & fixing aluminium handles, ISI marked, anodized(anodic coating not less than grade AC 10 as per IS: 1868) transparent or dyed to required colour or shade, with necessary screws etc. complete.	Each	24	52.8	1267.2
9.1					
26/DS R	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 stainless steel cover plate minimum 1.25 mm thickness	nos	11	2039	22429.00
<u>27</u>	Providing & fixing bright finished brass 100 mm mortice latch and lock with 6 levers and a pair of lever handles of approved quality with necessary screws etc. complete.	Each	6	564.4	3,386.40
9.76					
28	Providing & fixing of 4mm thick aluminum composite panel (ACP) sheet of approved colour/shade in doors including cost of cutting, fixing with sealant etc complete in all aspects to the satisfaction of engg-in-charge.				
		SQM	60.069	1900.49	1,14,160.15
<u>28</u>	Kota stone slab flooring over 20 mm (average) thick base laid over and jointed with grey cement slurry mixed with pigment to match the shade of the slab including rubbing and polishing complete with base of cement mortar 1:4:9(cement: 4 coarse sand).				
11.26.1	- 25 mm thick				
		SQM	190.644	1141.4	2,17,601.06

29/12.5	Providing and fixing precoated galvanized iron profile sheets(size,shape & pitch of corrugation as approved by Engineer-in-charge) 0.50mm (+0.05%) total coated thickness with zinc coating 20 grams per sqm. as per IS:277, in 240mpa 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 firm of 25 microns minimum to avoid scratches during transportation and should be supplied in single length upto 12 meter or as desired by Engineer-in-charge. The sheet shall be fixed using self drilling/Self tapping screws of size(5.5x55mm) with EPDM seal, complete upto any pitch in horizontal/vertical or curved surfaces, excluding the cost of purlins, rafters and trusses and i/c cutting to size and shape wherever required.				
		sqm	17	622	10,574.00
<u>30/DS R BASED</u>	Provision of A.A.C. block(300x240x200mm) to be <b>laid in walls</b> of thickness 200mm with compressive strength >3n/mm sq.(MPa) & water absorption 8% bedded & jointed in c.m. 1:4 complete as directed.				
		cum	20.3	6386.95	1,29,904.18
<u>31/NS</u>	P.G.I. sheet gutters 0.80mm thick semi circular including fixing with clamps and making connections with rain water pipes.				
N.S.		Sqm.	75	538	40,350.00
-	Providing & fixing of 10 mm thick Polycarbonate sheet of double wall/design/shape(2R10 Structure) approx.weight 2000gm/m2 with light & solar transmission 80% & 85% INCLUDING U. value 0.52 Btu/Hr x F1 sqm x F & approved by the Engineer-in-charge & fixed complete all as per manufactures instruction/directed & shown on drawing.				
32/NS					
		SQM	506.9	1326.00	6,72,194.48
<u>33/NS</u>	Providing false ceiling of 9 mm thick E-board 2'x2' size including aluminium powder coated frame & M.S. suspenders including fixture / finishes etc.complete all as directed as site.				
	Corridor area	Sqm.	55	625	34,375.00



<u>34/NS</u>	Providing & fixing roller at bottom tables leg/stand of size/shapes as approved at site.	each	30	87.5	2,625.00
	<b>PH WORKS</b>				
<u>35</u>	Providing & fixing PTMT Bottle Trap for wash basin and sink.				
<u>17.7</u>	-Bottle trap 38 mm single piece moulded with height of 270mm, effective length of tail pipe 260mm from the centre of the waste coupling, 77 mm breadth with 25 mm minimum water seal, weighing not less than 263 gms.				
17.70.2		Each	4.00	440.75	1,763.00
<u>36</u>	Providing & 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. concealed work, including cutting chases and making good in the walls etc				
<u>18.8</u>					
18.8.4	32 mm nominal outer dia pipes.	Rmt.	2.50	422.4	1,056.00
(b)					
18.8.1	15 mm nominal outer dia pipes.	Rmt.	8	270	2,160.00
<u>37</u>	Providing & 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.(External work )				
<u>18.9</u>	-25 mm nominal outer dia pipes.	Rmt.	42	209.5	8,799.00
18.9.3					
<u>38</u>					
18.1	Providing & fixing G.I. pipes complete with G.I. fittings in trenching including filling etc.				

18.12.5					
	External work				
a	40 mm dia nominal bore	Rmt.	43	334.15	14,368.45
b	32 mm dia nominal bore	Rmt.	50	281.05	14,052.50
c	25 mm dia nominal bore	Rmt.	50	257.3	12,865.00
<u>39</u>	Providing & fixing gun metal non-return valve of approved quality(screwed end).				
<u>18.2</u>	-25 mm nominal bore. Horizontal				
18.19.1 .1		Each	5	411.25	2056.25
<u>(b)</u>					
<u>18.19.3</u>	40 mm nominal bore. Horizontal				
18.19.3 .1		Each	2	683.75	1367.5
<u>40</u>	Providing & fixing C.P. brass bib cock of approved quality conforming to IS: 8931.				
18.5	- 15 mm nominal bore.				
18.49.1		Each	2	459.5	919.00
<u>41</u>	Providing & fixing C.P. brass stop cock(concealed) of standard design and of approved make conforming to IS: 8931.				
18.5		Each	2	619.75	1,239.50
<u>42</u>	Constructing masonry chamber 30x30x50cm inside, in brick work in cement mortar 1:4(1cement: 4 coarse sand) for stop cock, with C.I. surface box 100x100x75mm(inside) with hinged cover fixed in cement concrete slab 1:2:4 mix(1cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) i/c necessary excavation, foundation concrete 1:5:10(1cement: 5 fine sand: 10 graded stone aggregate 40 mm nominal size) and inside plastering with cement mortar 1:3 cement (1cement: 3 coarse sand) 12 mm thick, finished with a floating coat of neat cement complete as per standard design.				
18.3	-With common burnt clay F.P.S. (non modular) bricks of class designation 7.5				
18.32.1		Each	1	1157.75	1157.75
<u>43</u>	Providing & 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.				
18.5		Ltr.	3000	6.3	18,900.00

<u>44</u>	Construction of soak pit (2.40x2.40x2.40m filled with brick including S.W. drain and 1.20mm long complete as per standard design.				
19.33 based		Each	1	4164.9	4,164.90
<u>45</u>	Providing & fixing wash basin with C.I. brackets, 15mm Stainless steel pillar taps, 32mm C.P. brass waste of standard pattern, including S.S. 15 mm bare angle cock/ painting of fittings and brackets, cutting and making good the walls wherever require.				
N.S.	-White Vitreous China wash basin size 550x400mm with 15 mm pillar tap & other above accessories completed all as specified/directed at site.(make Jaquar)				
		Each	4.00	4606.0	18,424.00
<u>46/DS R based</u>	Providing & fixing unplasticised Rigid PVC pipes conforming to IS:13592 Type A, including jointing with seal ring conforming to IS: 5382, leaving 10 mm gap for thermal expansion.				
	150 mm diameter.	Rmt.	140	315.044	44,106.16
<u>47/DS R based</u> 1 2.42.5. 2	Providing and fixing unplasticised-PVC moulded fittings/accessories for unplasticised Rigid PVC pipes conforming to IS: 13592 Type A, including jointing with seal ring conforming to IS 5382, leaving 10 mm gap for thermal expansion.				
	150 mm diameter bend	each	15	219.708	3295.62
<u>48/DS R based</u> 1 2.42.5. 2	150 mm diameter coupler	each	8	247.52	1980.16
<u>49/NS</u>	Providing & fixing of SWR floor drain (4" dia)along with SS cover plate complete in all respects complete to the satisfaction of Engg-in-charge	each	13	635.900	8266.7
	<b>(DRIP IRRIGATION &amp; FERTIGATION SYSTEM )</b>				
<b>S.No.</b>	<b>Description.</b>	<b>Unit</b>	<b>Qty.</b>	<b>Rate</b>	<b>Amount</b>
	<b>Supply , Installation, testing &amp; commissioninf of the following:-</b>				
<u>50</u>	a)P.V.C. pipes ISI marked 75 mm (IS:4985)	Rft.	50	101.25	5062.5

N.S.					
	b) P.V.C. pipes ISI marked 63 mm (IS:4985)	Rft.	60	72	4320.00
<u>51</u>	(a) LLDPE Lateral ISI marked C12 (IS:12786)16				
N.S.		Rft.	140	15.64	2189.60
	(b) LLDPE Lateral ISI marked C12 (IS:12786)16	Rft.	25	10.68	267.00
<u>52</u>					
N.S.	Emitter (ISI) T.F./P.F.				
(a)	Sand filter 16mm sq./Hr.	No.	1	12,003.75	12,003.75
(b)	Pre-filter (Screen Filter) 200 mm sq./Hr. (IS: 12785)	No.	1	3937.5	3937.5
<u>53</u>					
N.S.	Fertilizer Tank.				
	Micro Sprinkler upto 10 m Radius with assembly (with 8 mm, 1.20m Galvanized rod) complete.				
a)	G.M. control Valve 2"	No.	1	1912.5	1912.5
b)	Control Ball valve 75 mm	No.	1	956.25	956.25
c)	Control Ball valve 63 mm	Nos.	4	618.75	2475
d)	Flush valve 63 mm	Nos.	8	135	1080
e)	By pass Assembly 2x2"	No.	1	2362.5	2362.5
f)	Ventury Assembly/Manifold 1".	No.	1	3375	3375
g)	Air release valve 1".	No.	1	1068.75	1068.75
h)	Non return valve 2".	No.	1	1687.5	1687.5
54	Supply, Installation, Testing & Commissioning of 5HP Mono block pump complete as per directions of Engg-in-charge (Crompton).	No.	1	21,937.50	21,937.50
<u>55</u>					
	SITC of commercial Reverse osmosis water purifier for 100 Ltr/hr average flow having inbuilt UV protection, pressure sand filter, activated carbon filter & antiscalant dosing system along with needful tank, fittings, accessories etc complete	No.	1	2,40,017	2,40,017

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
<b>HVAC WORKS</b>					
56	<b>Air-cooled Ductable Split type unit</b>				
56.1	Supply of Ductable AC outdoor unit of capacity 11Tr having ecofriendly refrigerant with microprocessor remote and PCB complete.	No.	4	143,880.00	575,520.00
56.2	Supply & Installation of Copper piping of size 1-1/8" & 5/8" with Nitrile rubber insulation ,NH3 Pressure testing, Refrigerant top up, electrical cabling from AHU to ODU,Testing and commissioning of complete refrigeration system.	Rmt	55	1,989.25	109,408.75
56.3	Supply & Installation of Outdoor control unit mounted on MS stand for Ductable Outdoor units.	No.	4	5,232.00	20,928.00
57	<b>AIR HANDLING UNIT OR INDOOR UNIT</b>				
57.1	Installation testing and commissioning of Double skin air handling unit including shifting, assembling, installation of expansion valve, gas charging, supply and installation of heating system,Volume control damper on discharge air with canvass connection and other ancillary work.	No.	4	65,400.00	261,600.00

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
57.2	Supply of Double skin ceiling mounted Air handling unit, Panel thickness in mm 25+/-2, panel insulated with cfc free puf of 40+/-2 kg/m <sup>3</sup> , centrifugal Backward curved blade fan, drive sets, squirrel cage 3 phase induction motor of capacity 7200 CFM / 11 Tr, 6 row deep DX-coil, 45-60 mm SP WG, pre filter of 10 micron, Heating system factory fitted 4kW x 3 nos. strip heaters. unit may be factory/site assembled.	Nos	2	168,950.00	337,900.00
57.3	Supply of Double skin ceiling mounted Air handling unit, Panel thickness in mm 25+/-2, panel insulated with cfc free puf of 40+/-2 kg/m <sup>3</sup> , centrifugal Backward curved blade fan, drive sets, squirrel cage 3 phase induction motor of capacity 6000 CFM/11 Tr, 6 row deep DX-coil, 45-60 mm SP WG, pre filter of 10 micron, Heating system factory fitted 4Kw x 3 nos. strip heaters. unit may be factory/site assembled.	Nos	2	143,880.00	287,760.00
<b>58</b>	<b>Pan Type humidifier and humidistat</b>				
58.1	Supply, install, testing and commissioning of snap acting humidistat .	No.	4	1,635.00	6,540.00

<b>S.No.</b>	<b>Item description</b>	<b>Unit</b>	<b>Qty.</b>	<b>Estimated Rate (in Rs.)</b>	<b>Estimated Amount (in Rs.)</b>
59.0	Supply, install, test and commission wall / floor mounted Pan Type Humidifier package of following capacity				
59.1	8.0 KW	No.	4	49,355.20	197,420.80
60	<b>Humidity/Heating Controls</b>				
60.1	Supply, installation testing and commissioning of micro-processor based humidity sensor and remote adjuster package with suitable mounting. This package shall have a temperature and humidity display and individual control of humidity in chamber.	Set	4	24,852.00	99,408.00
60.2	Supply installation testing & commissioning of remote controller for heating system with geyser stat.	set	4	3,815.00	15,260.00
61.0	<b>Inline fan</b>				
61.1	Supply, installation, testing and commissioning of Circular Inline fan of 150 CFM capacity, 12 mm static pr.with single phase motor,same can be regulate to specify air changes.	Nos.	4	8,175.00	32,700.00
<b>NOTE :</b>	Necessary hardware, supporting arrangement, fasteners etc. needed to be included in above installation items.				

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
62.0	<b>Condensate drain piping</b>				
	Supply, installation, testing & commissioning of following GI pipes for condensate drain with insulation., cut to required length and installed with all screw joints , including the necessary fittings.				
62.1	32mm dia	RM	18	517.75	9,319.50
62.2	25 mm dia	RM	18	425.10	7,651.80
<b>63.0</b>	<b>AIR DISTRIBUTION</b>				
<b>63.1</b>	<b>Site Fabricated Duct - GI</b>				
	Supply,Fabrication , Installation and testing of sheet metal ducts in accordance with the approved shop floor drawings and specifications , and shall also confirm to the BIS specifications. The nut bolts shall be chrome plated or of stainless steel. All lateral and transverse joints shall be sealed with "O" class 9mm Nitrile rubber.				
63.1.1	0.63mm (24 gauge) GSS	SqM	150	739.02	110,853.00
63.1.2	0.8 mm (22 gauge) GSS	SqM	100	790.25	79,025.00
<b>64.0</b>	<b>Diffusers/Grills</b>				
64.1	Zet Diffusers with flexible duct connections.	Nos	20	6,322.00	126,440.00
64.2	Liner grills for return air.	Sqmt	12	6,093.10	73,117.20
<b>65.0</b>	<b>FRESH/EXHAUST AIR REGISTERS</b>				



S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
	Supply, Installation and Testing of Fresh/Exhaust air louvers including the expanded wire mesh filter, volume control damper. The louvre shall be of extruded aluminum construction, and powder coated to the approved finish and colour.	SqM	1	14,802.00	14,802.20
<b>66.0</b>	<b>DUCT INSULATION :</b>				
66.1	Supply and installation of Acoustic lining within supply air ducts, as per the approved shop drawings/specifications. 25mm thick ecosound (Open cell Nitrile rubber) rubber of 32kg./m <sup>3</sup> density.	Sqm	100	817.50	81,750.00
66.2	Supply and installation of External thermal insulation on ducts as per the approved shop drawings/ specifications. 9mm thick closed cell elastomeric nitrile rubber class 'O' secured with approved adhesive.	Sqm	150	490.50	73,575.00
66.3	Supply, Installation, Testing and Commissioning of AIR CURTAIN of following size as per the approved make				
66.4	900mm long (High Flow Type)	Nos.	2	24,525.00	49,050.00
67	Overall, Testing & Commissioning of	lot	4	54,500.00	218,000.00

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
	System.				
<b>ELECTRICAL WORKS</b>					
68	<b>MAIN LT PANEL (IN SERVICE ROOM)</b>				
68.1	Supply at site, installation, testing & commissioning of FLOOR mounted cubical type electrical panel fabricated with 16 S.W.G. MS sheet. The panel shall be free standing type totally enclosed dust & vermin proof construction with rubber gaskets. The floor mounting panel shall have ISMC mounting channels, Copper earth bus bar, bus bar chamber cable alleys interconnections with solid bar/PVC insulated copper conductor as per requirement, and suitable supports of bus bars. The panel shall be powder coated in Siemens Grey shade and shall be provided with designation of incoming and outgoing feeder as detailed below:-				
	<b>INCOMING</b>				
a)	1 No 250A, 4P MCCB of breaking capacity 35kA with microprocessor release with adjustable O/L, S/C & E/F protection and with extended rotary handle	1	Set	162440.59	162440.59
b)	1 Set of 250 amp, 4 strips Copper bus bar				

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
c)	1 No. Digital Multifunction Meter indicating Voltage, Current, frequency, KW, KWH, KVA, KVAR etc along with one Set of CTs (3Nos.) with CT ratio 300/5 A and indicating lights LED type with protection fuses 2 sets (one for PSPCL and other for DG set)				
	<b>OUTGOING</b>				
d)	1 nos. of 100 A, FP MCCB of breaking capacity 25kA with adjustable type thermal magnetic release(for DB in Corridor ) and with extended type rotary handle				
e)	3 nos. of 63 A, C curve, TPN MCB with breaking capacity 10 KA, (1 no for DB- service room & 2 nos. as spare for misc. loads)				
f)	10 nos. of 40 A, C curve, TPN MCBs with breaking capacity 10 KA each, (8 nos for indoor & outdoor A.C Units & 2 as spare for misc. loads)				
69	<b>DISTRIBUTION PANEL (IN CORRIDOR)</b>				

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
69.1	Supply at site installation, testing & commissioning of wall mounted cubical type Electrical Distribution panel fabricated with 16 S.W.G. MS sheet. The Distribution panel shall be totally enclosed dust & vermin proof construction with rubber gaskets. Copper earth bus bar, bus bar chamber cable alleys interconnections with solid bar/PVC insulated copper conductor as per requirement, and suitable supports of bus bars. This shall be powder coated in Siemens Grey shade shall have be provided with designation of incoming and outgoing feeder as detailed below:-	1	Set	71921.16	71921.16
	<b>INCOMING</b>				
a)	1 No. 100A, 4P MCCB of breaking capacity 25kA with microprocessor release with adjustable O/L, S/C & E/F protection				
b)	1 Set of 100 amp, 4 strips Copper bus bar				
c)	1 No.VIF Digital Meter indicating Voltage, Current, frequency, along with one Set of CTs (3Nos.) with CT ratio 125/5 A and indicating lights LED type with protection fuses				
	<b>OUTGOING</b>				

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
d)	3nos. of 63A DP MCB, C-curve, breaking capacity 10 KA, (2nos. for each Chamber Lighting Controller and 1no. as spare)				
e)	8 nos. of 16 A, C curve, SP MCBs with breaking capacity 10 kA( for Power Plugs etc. )				
f)	10nos. of 6 A , C curve SP MCB's breaking capacity 10 KA, (for Light Plugs & Lighting Circuit of Working room & Buffer area etc.)				
70	<b>SUPPLY,INSTALLATION, TESTING &amp; COMMISSIONING (SITC) OF FOLLOWING FITTING/ FIXTURES</b>				
70.1	SITC of following type of light fixtures/ceiling/ exhaust fan /wall fan as per the site requirement including connections etc. complete				
a)	1x28Watt T-5 Fitting Water proof as per cat ref. of Philips TCW450 1xTL-5-28W EBT or equivalent of Wipro/GE Lighting complete with luminaire and lamp (in service room)including making, fixing arrangement with 25x5 mm MS Clamps hardware etc. as per site requirement.	3	Nos.	3595.45	10786.36

<b>S.No.</b>	<b>Item description</b>	<b>Unit</b>	<b>Qty.</b>	<b>Estimated Rate (in Rs.)</b>	<b>Estimated Amount (in Rs.)</b>
b)	2x28Watt T-5 Fitting Water proof as per cat ref. of Philips TCW450 2xTL-5-28W EBT or equivalent of Wipro/GE Lighting (9 in each chambers)complete with luminaire and lamp including making, fixing arrangement with 25x5 mm MS Clamps hardware etc. as per site requirement.	18	Nos.	4232.70	76188.55
c)	2x400Watt Metal Halide Flood Light as per cat ref. of Philips RVP302 2x HPIT400W MHL complete with control gear and lamps (equivalent make: Wipro/GE Lighting) (9 in each Chamber) including making, fixing arrangement with 35x5 mm MS Strip Clamp & angle 35x35x5 mm, hardware as per site requirement.	18	Nos	17787.26	320170.73
d)	LED Down Lighter as per cat ref. of Philips DN 193B LED 12S-6500 PSU WH or equivalent of Wipro/GE Lighting (For working room & buffer area)	6	Nos	2214.75	13288.52
e)	65Watt Street Light Fitting Crompton Greaves make cat ref no. SCEN 1365 BC or equivalent of Wipro/Havells/Philips including making , fixing arrangement with G.I. Pipe and clamps hardware etc as required.	4	Nos	3050.47	12201.90

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
f)	225mm sweep Metallic Exhaust Fan with aluminium louvers, to be fitted in service room & Working room CG Models Trans Air 9" or equivalent of Bajaj/ Khaitan	2	Nos	2241.31	4482.61
g)	400mm sweep wall fan of make CG/ Bajaj/Khaitan	2	Nos	2186.21	4372.42
71	<b>WIRING</b>				
71.1	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 surface / 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.				
a)	Group C	15	Point	718.00	10770.00
71.2	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. (For light plugs to be used in non residential buildings).	15	Each	303.00	4545.00

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
71.3	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.	10	Each	395.00	3950.00
71.4	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.				
a)	25 mm	300	Mtrs	65.00	19500.00
b)	40 mm	30	Mtrs	110.00	3300.00
71.5	Supplying and drawing following sizes of FRLS PVC insulated copper conductor, single core cable in the existing surface/ recessed steel/ PVC conduit as required.				
a)	3 x 1.5 sq. mm	150	Mtrs	50.00	7500.00
b)	5 x 1.5 sq. mm	25	Mtrs	81.00	2025.00
c)	7 x 1.5 sq. mm	25	Mtrs	112.00	2800.00
d)	9 x 1.5 sq. mm	80	Mtrs	148.00	11840.00
71.6	Wiring for circuit/submain wiring alongwith earth wire with the following sizes of FRLS PVC insulated copper conductor, single core cable in surface/ recessed medium class PVC conduit as required				
a)	2 x 16 sq. mm + 1 x 16 sq. mm earth wire	30	Mtrs	480.00	14400.00



S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
71.7	Wiring for light/power plug with 2x4sq.mm FRLS PVC insulated copper conductor single core cable in surface/ recessed medium class PVC conduit alongwith 1 No 4 sq.mm FRLS PVC insulated copper conductor single core cable for loop earthing as required.	80	Mtrs	162.00	12960.00
72	<b>DISTRIBUTION BOARDS (DBs)</b>				
72.1	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 bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without MCB/RCCB/Isolator)				
a)	4way (4 + 12), Double door (For Service Room)	1	Nos	2175.00	2175.00
72.2	Supplying and fixing following way, single pole and neutral, sheet steel, MCB distribution board, 240 volts, on surface/ recess, complete with tinned copper bus bar, neutral bus bar, earth bar, din bar, interconnections, powder painted including earthing etc. as required. (But without				

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
	MCB/RCCB/Isolator)				
a)	2 + 12 way/ 14way , Double door (For Chambers)	2	Nos	1344.00	2688.00
72.3	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.				
a)	Single Pole	30	Nos	169.00	5070.00
b)	Triple pole	2	Nos	696.00	1392.00
72.4	Supplying and fixing following rating, four pole, 415 volts, isolator in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
a)	63 amps	1	Nos	670.00	670.00
72.5	Supplying and fixing following rating, double pole, 240 volts, C curve, MCB in the existing MCB DB complete with connections, testing and commissioning etc. as required.				
a)	63 amps(For Chambers)	2	Nos	1095.69	2191.38
72.6	Supply & Fixing 4way 4module sheet steel enclosure duly painted on surface/recess along with 32 /40A, 415V, C curve, 10kA breaking capacity TPN MCB complete with	4	Nos	2482.02	9928.08

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
	connections, testing & commissioning etc. as required.(for indoor AC units)				
72.7	Supply & Fixing 4/6way 4/6module sheet steel weather proof enclosure duly painted on surface/recess along with 32 /40A, 415V, C curve, 10kA breaking capacity TPN MCB complete with connections, testing & commissioning etc. as required.(for outdoor AC units)	4	Nos	4194.62	16778.47
72.8	Supply & Fixing single pole blanking plate in the existing MCB DB complete etc. as required.	20	each	7.00	140.00
73	<b>CABLE TRAYS AND CABLES</b>				
73.1	Supplying and installing following size of perforated pre-painted M.S. cable trays with perforation not more than 17.5%, in convenient sections, joined with connectors, suspended from the ceiling with M.S. suspenders including bolts & nuts,suspenders etc as required.				
a)	300 mm width X 50 mm depth X 1.6 mm thickness	10	Mtr.	789.00	7890.00
73.2	Supplying and installing following size of perforated pre-painted M.S. cable trays Tee's with perforation not more than 17.5%, joined				

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
	with connectors, suspended from the ceiling with M.S. suspenders including bolts & nuts, painting suspenders etc as required.				
a)	300 mm width X 50 mm depth X 1.6 mm thickness	3	each	2704.00	8112.00
74	Supply, laying & fixing of XLPE insulated PVC sheathed armoured cables of 1100 V grade(IS-1554 part 1) of following sizes(clamped or saddled wherever required):-				
a)	4Cx10sq.mm. Copper conductor cable for outdoor A.C Units	100	mtrs	681.33	68133.05
b)	4Cx6sq.mm. Copper conductor cable for indoor A.C units	100	mtrs	445.20	44519.84
c)	3.5Cx50sq.mm. Aluminium conductor cable for panel in Corridor	40	mtrs	454.29	18171.67
d)	3.5Cx25 sq.mm. Aluminium conductor cable for DB in Service Room	10	mtrs	277.18	2771.83
e)	3.5Cx240 sq.mm. Aluminium conductor cable from DG Set to AMF panel and from AMF Panel to Main LT panel	35	mtrs	1620.99	56734.57
75	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				

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
	required.				
a)	3½ X 25 sq. mm (28mm)	2	Nos	247.00	494.00
b)	3½ X 50 sq. mm (35mm)	2	Nos	342.00	684.00
c)	3½ X 240 sq. mm (62mm)	4	Nos	969.00	3876.00
d)	4 X 10/6sq. mm (25mm)	16	Nos	193.00	3088.00
76	<b>Earthing.</b>				
76.1	Earthing with copper earth plate 600 mm x 600 mm x 3 mm thick including accessories, and providing masonry enclosure with cover plate having locking arrangement and watering pipe of 2.7 metre long etc. with charcoal/ coke and salt as required.	4	set	9292.00	37168.00
76.2	Supplying and laying 25 mm X 5 mm copper strip at 0.50 metre 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 at 50mm)	10	Mtrs.	753.00	7530.00
76.3	Providing and fixing 25 mm X 5 mm copper strip in 40 mm dia G.I. pipe FRLSom earth electrode including connection with brass nut, bolt, spring, washer excavation and re-filling etc. as required.	40	Mtrs.	1082.00	43280.00

<b>S.No.</b>	<b>Item description</b>	<b>Unit</b>	<b>Qty.</b>	<b>Estimated Rate (in Rs.)</b>	<b>Estimated Amount (in Rs.)</b>
76.4	Providing and Fixing 25x5mm Copper strip on surface or in recess for connections etc. as required.	40	Mtrs.	856.00	34240.00
76.5	Providing and fixing 4.00 mm dia copper wire on surface or in recess for loop earthing as required.	250	Mtrs.	99.00	24750.00
77	Supply & laying of 6" Dia 6kg/sqmm pressure pipe for underground cable laying including excavation and backfilling etc. complete as required at site.	50	Mtrs.	705.79	35289.56
78	Supply, Installation, Testing & Commissioning of 3phase, 3HP Monoblock pump along with 3phase, DOL starter including the protection/covering of pump and starter etc.as per the site requirement.	1	No.	20253.41	20253.41
79	Supply & laying of 3Cx2.5sq.mm PVC insulated and PVC sheathed Flat cable for the 3HP Monoblock pump including connections etc. as required at site.	50	mtr.	64.98	3249.17

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
80	Supplying, receiving, storing, handling, fixing, testing, erection and commissioning of 160 KVA, 3 phase ,415V, 50 Hz, DG set consisting of AC alternator coupled to a diesel engine of required BHP complete with all accessories such as automatic starting device, instrument/control panel, relays CTs etc., inclusive of steel base frame and concrete block foundations bolts, AVM pads, required silencer, starting battery with battery charger, Inbuilt Fuel tank, first charge of fuel & Engine oil, coolant etc., MS fuel oil piping with valves etc., filter's lubricating oil, control cabling complete, special tools, operating and instructions manual as per technical specifications.	1	set	1202067.69	1202067.69
81	Supplying, receiving, storing, handling, fixing, testing, erecting and commissioning of automatic mains failure panel (AMF) as per specification along with KWH meter, CTs relays etc as per specifications.	1	no	117753.45	117753.45

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
<b>DATA LOGGER AND AUTOMATION SYSTEM*</b>					
82	Supply, Installation, Testing and Commissioning of following Automation system with Data logger facility to monitor temperature ,humidity & light conditions inside the chambers from the remote location(i.e., from the NABI/Institute's interim facility which is approx.10kms away from the Containment facility) as per the Technical specifications and site requirement and including all necessary control wiring, data cabling, relays, contactors, timers, ports etc.				
82.1	Main PLC for the Control system 24DI/16DO/2AI/2AO	nos.	1	41097.38	41097.38
82.2	PC interface with Input & Output 8DI/8DO	nos.	1	20551.50	20551.50
82.3	Remote Operating system with GSM card with touch screen	nos.	1	65122.88	65122.88
82.4	SD card 2GB, card for data storage	nos.	1	478.13	478.13
82.5	Communication cable HMI	nos.	1	1659.38	1659.38
82.6	Programming/Software development	lot	1	21825.00	21825.00
82.7	Temperature & Humidity sensor	nos.	2	24750.00	49500.00
82.8	Lux sensor	nos.	2	70087.50	140175.00
82.9	Electrical panel with all necessary contactors, relays, wiring etc.	nos.	1	179820.00	179820.00



S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
82.10	Installation, Testing, Commissioning charges for the system	JOB	1	100000.00	100000.00
*NOTE:	Any other accessory/item/UPS back-up/Lightning arrestor etc. if required for the proper functioning of above system shall be considered part of the scope of the work and nothing shall be paid extra on account of that.				
<b>ACCESS CONTROL SYSTEM</b>					
83	Supply, Installation, Testing and Commissioning of Access Control System with following items:				
83.1	TCP/IP based 2 Door / 2 Reader Channel Access Controller with Battery back-up, Power Supply & Metal Enclosure with Advance Security Features.	set	1	28632.15	28632.15
83.2	Prox Point plus Proximity reader	nos.	1	3119.25	3119.25
83.3	U BRACKETS FOR UL275 SERIES LOCKS	nos.	1	1005.84	1005.84
83.4	600lbs electromagnetic lock unmonitored type 12V LED Lamp Only	nos.	1	2283.71	2283.71
83.5	The Door Release Button With Double Feature NO/NC (Aluminium) Size: 86Lx50Wx20T(mm)	nos.	1	1112.14	1112.14
83.6	Proximity Cards - EM	nos.	10	43.43	434.30
84	Supply & laying of following annealed/ Tinned Copper conductor cabling for readers/communication cable and for EM locks.				
84.1	2C x 1.5 sq. mm. PVC insulated PVC sheathed copper flexible cable	mtr.	15	16.97	254.52

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
84.2	CAT-6 cable	mtr.	15	25.45	381.78
85	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.				
85.1	25 mm	mtr.	20	68.93	1378.65
86	Installation, testing & Commissioning charges	Job	1	3000.00	3000.00
<b>FIRE ALARM SYSTEM</b>					
87	Supply, Installation, Testing & Commissioning of Microprocessor based 2 Zone capacity fire alarm control panel 240 volts AC power supply, automatic battery charger, 24 volts sealed lead acid batteries sufficient for 24 hours normal working and then be capable of operating the system for 2 hours during an emergency conditions(i.e., in case of Power failure, Fire etc.) as required. Environment Operating Limits: Temperature-0 deg. to 50deg and Humidity - 80% to 85%	set	1	17716.50	17716.50
88	Supply & 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				

S.No.	Item description	Unit	Qty.	Estimated Rate (in Rs.)	Estimated Amount (in Rs.)
	as required				
88.1	25mm	mtr.	225	74.30	16716.38
89	Supply & drawing following sizes of FRLS PVC insulated copper conductor, single core cable in the existing surfacee/ recessed steel/ PVC conduit as required.				
89.1	2x1.5sq.mm	mtr.	225	41.15	9258.30
90	Supply, Installation, Testing & Commissioning of Ionization type smoke detector as per the site requirement	nos.	20	1885.95	37719.00
91	Supply, Installation, Testing & Commissioning of Hooter/speaker as per the site requirement	nos.	4	1085.85	4343.40
92	Supply, Installation, Testing & Commissioning of Manual call point as per the site requirement	nos.	4	971.55	3886.20
93	Supply, Installation, Testing & Commissioning of Response Indicator as per the site requirement	nos.	4	1428.75	5715.00
94	Supply & Installation of following type of Fire Extinguishers & items as per the site requirement and the specifications laid down in the tender:				
94.1	ABC Dry Powder type stored pressure 6Kg Fire Extinguisher	nos.	4	2286.00	9144.00
94.2	CO2 type Fire Extinguisher-4.5Kg capacity	nos.	4	5143.50	20574.00

<b>S.No.</b>	<b>Item description</b>	<b>Unit</b>	<b>Qty.</b>	<b>Estimated Rate (in Rs.)</b>	<b>Estimated Amount (in Rs.)</b>
94.3	ABC Dry Powder type stored pressure 9Kg Fire Extinguisher	nos.	2	2971.80	5943.60
94.4	Fire Bucket set including 04nos. Fire bucket & 01nos.MS stand	set	1	3771.90	3771.90

Note:- The rates quoted should be inclusive of all taxes, profits & overheads etc .

Stamp & Signature of Contractor