TATA INSTITUTE OF FUNDAMENTAL RESEARCH
(Autonomous Institution of the Department of Atomic Energy, Government of India)
Survey No.36/P, Gopanpally Village, Serilingampally Mandal,Ranga Reddy District,
Hyderabad-500046, Telangana

Telephone:+91-40-20203009	**Date: 16.12.2022**
Website :www.tifrh.res.in	**Email: krishnaae@tifrh.res.in**

PUBLIC TENDER

(TWO PART TENDER) **for the following Works:**

Supply, Installation, Testing & Commissioning of 10000 class cleanroom for laser lab at TIFR, Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist., Hyderabad- 500046.

Tender No.	**TIFR/PD/CA22-170/221526**
Type of Tender	**Two Part Tender (Part-I: Technical Bid and Part- II: Price Bid)**
Estimated Cost	**Rs. 37,21,218/-**
Cost of EMD	**Rs. 74,425./- Demand Draft to be drawn in favor of "TIFR Center for Interdisciplinary Sciences", Payable at Hyderabad (To be enclosed with the Technical Bid Part – I). However, contractors who have a valid MSME/NSIC certificate are exempted from EMD.**
Pre bidding meeting & Time	**23.12.2022 at 11:00 Hrs.**
Last Date for Submission of Tender	**02.01.2023 by 13:00 Hrs.**
Date of Opening Bids(Only Part-I: Technical Bid)	**02.01.2023 at 15:00 Hrs.**
Tender Fee	**Rs. 500/-(Demand Draft to be drawn in favor of "TIFR Centre for Interdisciplinary Sciences "Payable at Hyderabad (To be enclosed with the Technical Bid Part –I)). However, contractors who have a valid MSME/NSIC certificate are exempted from the tender fee.**

- In case the Part "I" and Part "II" bids are not sealed in separate envelopes the tender will be rejected.
- The technical bid should not contain any indication of the price.
- The Technical Bid received without payment of tender fees and EMD shall be summarily rejected.
- Contacts: Mr. Krishna, Tel: 040- 2020 3009/3003 for any technical or commercial terms clarifications mentioned in the tender.

Sealed tenders are invited for the aforesaid works from contractors having similar work experience in reputed Research Institutions, Universities, Central Government/Public Sector Undertaking, Private Laboratories, Multinational Companies, etc. Interested contractors who are satisfying prequalification criteria stipulated by TIFR-Hyderabad shall only submit their bids. For further details and any clarification on the tender you may please contact Head-Technical Services, Survey No.36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District, Hyderabad-500046.

Last date for submission of the tender is 02.01.2023 by 13:00 Hrs.

(Rajasekhar. R)

Head-Technical Services

TENDER DOCUMENT

Supply, Installation, Testing & Commissioning of 10000 class cleanroom for laser lab at TIFR, Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist., Hyderabad-500046

NAME OF THE TENDERER:.....

Address: .....

.....

.....

.....

Last date of submission of the tender: On or before 02.01.2023 by 13:00 Hrs.

TECHNICAL BID

PART-I

Supply, Installation, Testing & Commissioning of 10000 class cleanroom for laser lab at TIFR, Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist., Hyderabad-500046

Tender Notice	:	**TIFR/PD/CA22-170/221526**
Name of Work	:	**Supply, Installation, Testing & Commissioning of 10000 class cleanroom for laser lab at TIFR, Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist., Hyderabad- 500046**
Location	:	**Tata Institute of Fundamental Research Survey No. 36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District, Hyderabad – 500046.**
Estimated Cost	:	**Rs.37,21,218/-**
EMD	:	**Rs.74,425/- (Demand Draft to be drawn in favour of "TIFR Centre for Interdisciplinary Sciences", Payable at Hyderabad (To be enclosed with the Technical Bid Part – I).**
Delivery Period	:	**90 Days (Completion Period)**
Validity	:	**75 (Seventy Five) days after opening of Part-I, Technical Bid**

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SECTION-I	**IMPORTANT INFORMATION**

INTRODUCTION

The Tata Institute of Fundamental Research is a National Centre of the Government of India, under the umbrella of the Department of Atomic Energy, as well as a deemed University awarding degrees for master's and doctoral programs. Tata Institute of Fundamental Research Centre for Interdisciplinary Sciences, Hyderabad invites bids for the following work:

Supply, Installation, Testing & Commissioning of 10000 class cleanroom for laser lab at TIFR, Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist., Hyderabad- 500046.

1. PARTICULARS

a)	Location	TIFR, Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist., Hyderabad-500046.
b)	Pre-Bid Meeting Date & Time	23.12.2022 at 11:00 Hrs
c)	Closing date & time of receipt of bids	02.01.2023 Upto 13:00 Hrs
d)	Date & time of opening of Sealed Cover-I containing Technical Bid	02.01.2023 at 15:00 Hrs
e)	Date of opening of Sealed cover-II containing Financial Bid of eligible bidders	To be intimated to eligible bidders within 7 days from the date of tender open.

2. GENERAL INSTRUCTIONS

2.1. TIFR shall award the contract for the project through the two Bid systems.

2.2. The Contractor is advised to visit and examine the site of work and its surroundings and obtain any information that may be necessary, in addition to those provided in this document. The Contractor shall be deemed to have fully acquainted himself about the site condition, whether he inspects it or not.

2.3. The Contractor should adhere to the building bye-laws applicable for the area.

2.4. All clarifications shall be sought before the date of pre-bid meeting. The bidders may make suggestions which shall be considered during the Pre Bid Meeting. No further clarifications shall be issued after the issue of noteworthy replies to the pre-bid queries.

2.5. The submission of the bid by Contractor would imply that they have carefully read and agreed to the terms and conditions contained in this bid document.

2.6. The bid for the work shall remain open for acceptance for a period of **75 (Seventy Five**) days from the date of submission of the bids, which period may be extended by mutual agreement and the Contractor shall not cancel or withdraw the offer during this period.

2.7. This bid document shall form a part of the contract agreement.

3. SUBMISSION OF BIDS

Bids shall be submitted to Head- Technical Services***, TIFR,*** **Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist, Hyderabad-500046** in a sealed Master envelope super scribed "Bid for **Supply, Installation, Testing & Commissioning of 10000 class cleanroom for laser lab at TIFR** with our enquiry no. and due date, containing two separate sealed covers clearly super scribed as **"Technical Bid"** and **" Financial Bid"** before the closing date and time of submission in the following manner:

a) **"Technical Bid":** This will contain Technical part, Eligibility Documents along with testimonials. Earnest Money Deposit (EMD).

b) **"Financial Bid":** This will contain the complete bidding document with duly filled in Schedule of Financial Quote of Financial Bid & Tender Drawings.

The Bids without signature of the authorized person of bidder and seal, without EMD, with conditions or conditional rebates shall be summarily rejected.

4. EVALUATION OF BID

4.1. **EVALUATION OF TECHNICAL BID:** The bids received will first be first opened and will be examined for EMD/ Declaration Letter, Eligibility Criteria, Conditions, etc. Conditional Tenders and Tenders without EMD shall be summarily rejected.

4.2. **EVALUATION OF FINANCIAL BID:** The Financial Bid should contain the complete bid document with duly filled in Schedule of Financial Quote of Financial Bid and signed Tender drawings. Financial Bids of Technically qualified Bidders will only be opened. Work will be awarded to lowest bidder (L1) based on their quotes after making necessary arithmetical checks.

5. SCOPE & OBJECTIVE

The Objective of the tender is to **Supply, Installation, Testing & Commissioning of 10000 class cleanroom for laser lab at TIFR, Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist., Hyderabad- 500046** as per the specifications and Bill of quantities mentioned in the Financial Bid.

Period of Completion of Work: 90 days from the date of issue of work order

Defect Liability Period: 12 months from the date of handing over of completed system as per tender.

6. PAYMENT SCHEDULE:

The contractor shall submit the bills for payments along with a detailed statement showing the actual works carried out under different heads of items in the format specified by the TIFR. Minimum value of the work for interim payment (Running Bills) shall be 35% of the work order value. All interim (Maximum one Running Bill) and final bills will be settled based on the joint measurements of each item of work and certified by TIFR Engineer. The bills for nonperishable materials on site may also be submitted and the payment by TIFR against the same shall be to the maximum extent of 60% of the value of these materials on production of sufficient documentary evidence ie. Original invoice, Inventory, etc. All interim bills will be paid within **15** days from the date of submission and Final Bill along with all relevant documents will be settled within **30** days from the date of submission with certification of TIFR Engineer.

SECTION-II ELIGIBILITY CRITERIA FOR TENDER QUALIFICATION

Supply, Installation, Testing & Commissioning of 10000 class cleanroom for laser lab at TIFR, Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist., Hyderabad- 500046

- **Eligibility criteria:**

1. The Agencies/Contractors shall have registered with the State/Central Government with valid license.
2. The Agencies/Contractors shall hold a valid labour license issued by appropriate authority and must be valid throughout the contractual period.
3. IT Returns for the last three consecutive financial years ended on March 31, 2022.
4. The Agencies/Contractors should have a latest solvency certificate issued by any nationalized bank of value not less than Rs.14.88 Lakhs.
5. The Agencies/Contractors should have an average annual turnover of Rs.14.88 lakhs during three previous financial years ending March 31, 2022 and should not have incurred any loss in more than two years during the immediate last five consecutive financial years, duly certified by the Chartered Accountant.
6. The Agencies/Contractors shall be in profit for the last three financial years and should have valid PAN from Income Tax Authority, GST registration No. etc. and any other registration applicable/mandatory for contract.
7. The Agencies/Contractors should have executed similar works successfully at least
   - 7.1. One similar work costing Rs.29.76 Lakhs or
   - 7.2. Two similar works costing Rs.22.32 Lakhs or
   - 7.3. Three similar works costing Rs.14.88Lakhs during the last 7 financial years ended on the end date of receiving tender for Research Institutes, Universities, Private Laboratories, R & D institutes, etc. in any Government /PSU/Private organizations of repute.

The Agencies/Contractors should furnish copies of work orders and completion certificates from the TIFRs in support of the above.

Note:

- ❖ Agencies/Contractors should have a full-fledged in-house project management team to undertake the jobs.
- ❖ The Agencies/Contractors shall **strictly furnish** aforesaid information in the formats/schedules given. **Non adherence to furnishing of information in the given format/schedules given will lead to disqualification of tender.**
- ❖ Instructions to Agencies/Contractors for furnishing the information is given as under:

- ➢ Each page of the application shall be signed by a person having necessary authority to do so.
- ➢ If the space in the proforma is insufficient for furnishing full details, such information may be given in separate sheets.
- ➢ Applicants are required to furnish information against each item of the application. In case a certain item is not applicable, please write NA. Application containing incorrect and or inadequate information is liable to be rejected.

SCHEDULE – A

BASIC INFORMATION

1.	Name of the firm	:
2.	a) Address	:
	b) Telephone / Fax No.	:
	c) Mobile No. Contact Person	:
	d) PAN No.	:
	e) GST Registration No.	:
		:
	f) Registration with State/ Central Government organization	:
	g) Branch Office if any in Hyderabad	:
3.	Type of Organization (Proprietorships / Partnership) Ltd. Co. / Co-Operative) (Copy of relevant document to be enclosed)	:
4.	Date of Incorporation	:
5.	Nature of Business	:
6.	Experience as prime Agencies/ Contractors (in Yrs.)	:
7.	Name and address of Bankers	:
8.	Organization chart of the Company including names and positions of directors / key personnel	:

Signature of the Applicant (s)

SCHEDULE – B

Major Cleanroom work (Copies of the completion certificate to be enclosed)

A. Similar work of costing Rs.29.76lakhs or two similar works of costing Rs 22.32 lakhs or 3 similar works of costing Rs.14.88 Lakhs during last 7 financial year ending March 31st 2022 for Research Institutes, Universities, Private Laboratories, R & D institutes, etc

Sr.No	Name of the project & Address	Description of work in brief	Name of the Engineer	Name of the TIFR also indicate whether Govt or semi Govt or Pvt body with full postal address	Contract Amount in Rs.	Year of commencement	Date of Completion		Whether work was left /uncompleted or the contract was terminated from either side? Give Details.	Any other relevant information relevant information
							Stipulated	Actual		
1.										
2.										

B. List of works in progress above Rs.14.88 lakhs.

Sr No.	Name of the project & Address	Description of work in brief	Name of the Engineer with full postal address.	Name of the TIFR. Also indicate whether Govt. or semi Govt. or Pvt. Body with full postal address	Contract Amount in (Rs.)	Date of Completion	Present stage of work with reasons if the work is getting delayed	Any other relevant information
1.								
2.								

Signature of the Applicant (s)

SCHEDULE – C

TECHNICAL PERSONNEL & SPECIAL EXPERIENCE

List of technical personnel in your establishment giving details about their technical qualification and experience

Sr No.	Name	Age	Qualification	Project Experience	Nature of works handled	Name of the project Handled	Date from which employed in your organization	Indicate special experience in setting up of cleanrooms in which were employed
1								
2								

2. Indicate other points if any to show your technical and managerial competency to indicate any important point in your favour.

Signature of the Applicant (s)

SCHEDULE – D

FINANCIAL POSITION AND WORKING RESULTS

				2019-20	2020-21	2021-22
1	Annual turnover	:	Rs.			
2.	Net Profit	:	Rs.			
3.	Credit Facilities from the Bank	:	Rs.			
a)	Cash Credit	:	Rs.			
b)	Overdraft Limit	:	Rs.			
c)	Guarantee	:	Rs.			
d)	Others	:	Rs.			
4.	Certificate from the Bankers regarding financial soundness of the applicant	:	Enclosed (Yes / No)			
5.	Solvency Certificate from the Bankers	:	Enclosed (Yes / No)			

Signature of the Application (s)

SCHEDULE – E
MISCELLANEOUS INFORMATION

1	Whether it would be possible to process Bank Guarantee for various advances during execution of the work.	:
2	Details of Civil Suits / Litigations arised during execution of the contracts in the last 5 years.	:
3	Latest Income Tax Clearance Certificate	:
4	Name of the two senior official of Organizations preferably Govt./Semi Govt/ Autonomous/ Public Sector Organization for whom you have executed important and major Electrical works, who may be directly contracted by TIFR to gather information about your ability, competence and capacity of your work/organization/etc.	:
5	Number of Supplementary sheets attached.	:

Signature of the Applicant (s)

SECTION-III **NOTICE & INSTRUCTIONS**

1. **Sealed item rate tenders** in the prescribed form are invited from Head-Technical Services, Tata Institute of Fundamental Research, Centre for Interdisciplinary Services, Hyderabad, for the following:

Tender Notice No.	**TIFR/PD/CA22-170/221526**
Name of Work	**Supply, Installation, Testing & Commissioning of 10000 class cleanroom for laser lab at TIFR, Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist., Hyderabad- 500046**
Estimated Cost	**Rs.37,21,218/-**
Time Limit	**90 days (Completion Period)**
Earnest Money Deposit	**Rs.74,425/- (Demand Draft to be drawn in favour of "TIFR Center for Interdisciplinary Sciences", Payable at Hyderabad (To be enclosed with the Technical Bid Part – I) However, contractors who have a valid MSME/NSIC certificate are exempted from the tender fee.**
Tender Fee	**Rs.500/- (Rupees Five Hundred only)**
Last Date & Time of Submission of Tender	**02.01.2023 Upto 13:00 Hrs**
Date & Time of Opening of Technical Bid	**02.01.2023 at 15:00 Hrs**

3. **Submission of Tender & Opening:**

Tenders shall be submitted in a sealed envelope super scribed with Tender enquiry No., Due Date and with heading as "**Supply, Installation, Testing & Commissioning of 10000 class cleanroom for laser lab at TIFR, Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist., Hyderabad- 500046"** containing two separate sealed covers clearly super scribed as "TECHNICAL BID" and "FINANCIAL BID" on or before the closing date and time of submission in the following manner:

"TECHNICAL BID": This will contain the following:

a) Proof of Tender Cost paid already

b) Earnest Money Deposit as stipulated

c) Schedules giving information on Eligibility Criteria with supporting documents specified for tender qualification.

"FINANCIAL BID": Signed copy of the Financial Bid quoting amount in the stipulated format and signed copies of the tender drawings.

5. Acceptance of Tender: The competent authority, on behalf of TIFR, Hyderabad does not bind itself to accept the lowest or any other tender, and reserves to himself the authority to reject any or all the tenders received, without assignment of any reason. All tenders, in which any of the prescribed conditions is not fulfilled or any condition, including that of conditional rebates, is put forth by the tenderer, shall be summarily rejected.

The Competent Authority, on behalf of TIFR, Hyderabad reserves to itself the right of accepting the whole or any part of the tender and the tenderer shall be bound to perform the same at the rates quoted. The officer inviting tenders shall have the right of rejecting all or any of the tenders and will not be bound to accept the lowest tender or any other tender.

6. Validity of Tender: The tender for the work shall remain open for acceptance for a period of 75 days from the last date of submission of tenders. If any tenderer withdraws his tender before the said period, or before issue of Letter of Intent, whichever is earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to the Department, then TIFR, Hyderabad shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the said earnest money absolutely. Further the tenderer shall not be allowed to participate in the retendering process of the work.

7. Levy / Taxes payable by contractor:

i. GST or any other tax on materials and services in respect of this contract shall be payable by the contractor and TIFR shall not entertain any claim whatsoever in this respect.

ii. The contractor shall deposit royalty and obtain necessary permit as required for supply of the sand, aggregate, stone etc. from local authorities.

8. Deduction of Income Tax : As per Section 194-C of Income tax Act 1961, as amended by letter No. 275/9/72/9-TJ (Circular No. 86) dated 19.5.72 and No. 275/14/91-IT (B) (Circular No. 593) dated 5.2.91, received from Ministry of Finance, Department of Revenue, Central Board of Direct Taxes, New Delhi, the Income tax @ 2% and Surcharge thereon @12% (or any other amended rate by Ministry of Finance from time to time), of the gross value of the work done will be recovered from the bills. A certificate for the amount so recovered will be issued by the Department.

9. Site visit by the tenderer before tendering: Tenderers are advised to inspect and examine the site and its surroundings during working hours and satisfy themselves before submitting their tenders as to the nature of the ground and subsoil (so far as is practicable), the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender. A tenderer shall be deemed to have full knowledge of the

site whether he inspects it or not and no extra charges consequent on any misunderstanding or otherwise shall be allowed.

10. Signing of Tender and receipts for payments: In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power-of-attorney authorizing him to do so, such power of attorney to be produced with the tender, and it must disclose that the firm is duly registered under the Indian Partnership Act-1952. Receipts for payments made on account of work, when executed by a firm, must also be signed by all the partners, except where contractors are described in their tender as a firm, in which case the receipts must be signed in the name of the firm by one of the partners, or by some other person having due authority to give effectual receipts for the firm.

11. Tenderer's responsibilities: The tenderer shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a tender by a tenderer implies that they have read this notice & all other contract documents, and has made himself aware of the scope & specifications of the work to be done and local conditions and factors having a bearing on the execution of the work.

12. signing of contract: The Notice Inviting Tender shall form a part of the contract document. The successful tenderer / contractor, on acceptance of his tender by the Accepting Authority, shall, within 15 days from the stipulated date of start of the work, sign the contract consisting of: the Notice Inviting Tender, all the documents including all conditions, specifications and drawings, if any, forms the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.

13. Canvassing, either directly or indirectly, in connection with the tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection and may be barred from future participation in TIFR works.

Head-Technical Services

*For and on behalf of **TIFR, Hyderabad***

SECTION-IV **GENERAL CONDITIONS OF CONTRACT**

1. Definition of Terms:

1.1. In constructing these general conditions and the specifications the following works shall have the meanings herein assigned to them unless there is something in the subject or context inconsistent with such construction.

1.2. The `Purchaser' shall mean Tata Institute of Fundamental Research- -Hyderabad, Tata Institute of Fundamental Research, 36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District, Hyderabad 500046 and shall include the Purchaser's heirs, successors and assigns.

1.3. The term 'Engineer In-Charge' and `Engineer' shall mean Engineer In-Charge, TIFR-Hyderabad or some other person for the time being or from time to time duly appointed in writing by the Purchaser to act as Engineer In-Charge for the purpose of the Contract or in default of such appointment the Purchaser.

1.4. The term `Contractor'/`Supplier'/`Bidder'/`Vender' shall mean the Bidder whose tender has been accepted by the TIFR and shall include the Bidder's heirs, successors and assigns approved by the Purchaser:

1.5. The term `Sub-Contractor' shall mean the firm or persons named in the contract for any art of the work or any person to whom any part of the work has been sublet with the consent in writing of the Engineer In-Charge and shall include his heirs, successors and assigns approved by the Purchaser.

1.6. The Term `Inspector' shall mean any person appointed by or on behalf of the Purchaser to inspect supplies, stores or work under the contract or any person deputed by the Inspector for the purpose.

1.7. The term `Particulars' shall mean, the following :

1.7.1. Specifications

1.7.2. Drawing (ANNEXURE-IV)

1.7.3. Sealed Pattern denoting a pattern sealed and signed by the Inspector.

1.7.4. Proprietary make denoting the product of an individual firm.

1.7.5. Any other details governing the construction, manufacture and/or supply as existing for the contract.

1.8. The term `Specification' shall mean the specifications annexed to or issued with these Conditions of Contract.

1.9. The term `Site' shall mean the place or places at which the Equipment is to be delivered or work done by the Contractor; and shall include, where applicable, the lands and buildings upon or in which the works are to be executed and shall also include the place or places at which fabrication and other work is being carried out by the Contractor.

1.10. ` Firefighting Equipment', `Stores', `Work' or `Works' shall mean and include equipment and materials to be provided and work to be done by the Contractor under the Contract.

1.11. The `Contract' shall mean acceptance of the work order placed on contractor/supplier under section (2) of these conditions and shall include these conditions of Contract, Specifications, Schedule, Drawing, Letter of Intent of the Purchaser and any subsequent amendments mutually agreed upon.

1.12. 'Tests on Completion' shall mean such tests which are prescribed by the specifications or have been mutually agreed to between the Contractor/Supplier and the Purchaser to be made before the equipment is taken over by the Purchaser.

1.13. Writing' shall include any manuscript, typewritten or printed statement under or over signature or seal as the case may be. Words importing `person' shall include firms, companies, corporations and association of individuals whether incorporated or not.

1.14. Words importing singular shall also include plural and vice versa where context requires.

1.15. Bidders are advised to visit and inspect the work-site to make themselves fully conversant with the site conditions and nature of work. Any claim by them after the opening of bids on account of themselves being unaware of any site condition shall not be entertained.

2. Contract

Contractor/Supplier/Manufacturer should send their acceptance letter on receipt of `Letter of Intent' or 'Work Order' or 'Purchase Order' within the stipulated period. On expiry of said period or exorbitant delay in commencing or executing the work, the Purchaser shall not be liable to any claim from the Contractor/ Supplier for work entrusted to and may revoke the contract.

3. Work at Site

3.1. Access to the works shall be allowed only to the Contractor/Supplier, Sub-Contractors or his duly appointed representatives. The Contractor/ Supplier shall not object to the execution of other works by other contractors or tradesmen and shall afford them every facility for execution of their several works simultaneously with his own.

3.2. Work at the Purchaser's premises shall be carried out at such time as the Purchaser may approve but the Purchaser shall give the Contractor/ Supplier all reasonable facilities for the same. The Contractor/Supplier shall provide sufficient fencing, notice boards etc. to guard the works and warn the public.

3.3. The Contractor shall obey Central, Local and State regulations and enactments pertaining to workmen and labour and the Engineer In-Charge shall have the right to enquire into and decide all complaints on such matters. The Contractor should comply with the Minimum Wages Act and should also ensure that safe practices are followed by his people at site.

4. Delays

The Contractor/Supplier shall not be entitled to any compensation for any loss suffered by him on account of delays in commencing or executing the work, whatever the cause for such delays may be, including delays in procuring Government controlled or other materials and delay in obtaining instructions and decisions from the Engineer In-Charge.

5. Taking Over

The equipment when erected at site shall be deemed to have been taken over by the Purchaser when the Engineer In-Charge will have certified in writing that the equipment has fulfilled the contract conditions.

6. Extension of Time

If the Contractor/Supplier is delayed in the progress of work by changes ordered in the work, or by any cause, which the Engineer In-Charge shall decide to justify the delay, then the time of completion shall be extended by a reasonable time. In this regard, Contractor shall maintain proper hindrance register and record all such events with due signature of E-I-C on occurrence of such instants for seeking extension of time. However, no such extension shall be allowed unless requested for extension is made in writing by the Contractor/Supplier to the Engineer In-Charge within 15 days from the date of occurrence of the delay.

7. Liquidated Damages

7.1. For all delays, which do not merit any extension of time, the Contractor/ Supplier shall attract 1% penalty per week for the first 4 weeks of delay and 2% penalty per week for the next 4 weeks of the total contract value. The amount of liquidated damages shall be recoverable from the payment due to the Contractor/Supplier up to maximum of 10% of value of contract.

7.2. The deduction of liquidated damages shall not, however, absolve the Contractor/Supplier of his responsibility and obligations under the contract to complete the work in its entirety and shall also be without prejudice to action by the Purchaser under clause:

`Termination of Contract by the Purchaser'. After that the same shall be completed by the Purchaser at the Contractor's/Supplier's risk and cost.

8. Other Damages:

8.1. The Contractor/Supplier/Manufacturer shall be responsible for all injury to persons, animals or things and for all damage to the works, structure of, and decorative work in the property which may arise from operation or neglect of himself or any of his Subcontractor or of his or Sub-Contractor's employees, whether such injury or damage may arise from carelessness, accident or any other cause whatever in any way connected with the carrying out of this contract. This clause shall be held to include any damage to buildings, whether immediately adjacent or otherwise, any damage to roads, streets, foot paths, as well as all damage caused to the works forming the subject of this contract by frost or other inclemency of weather. The Contractor/Supplier shall indemnify the Purchaser and hold him harmless in respect of all and any expenses on property as aforesaid and also in respect of any claim made in respect of injury or damage under any acts of Government or otherwise and also in respect of any award of compensation or damages consequent upon such claim. Contractor shall furnish necessary insurance documents (Contractor All Risk Policy) taken for the site before commencement of work.

8.2. The Contractor/Supplier/Manufacturer shall reinstate all damage of every sort mentioned in this clause, so as to deliver up the whole of the contract works complete and perfect in every respect and so as to make good or otherwise satisfy all claims for damage to the property of the TIFR/third parties.

8.3. The Contractor/Supplier/Manufacturer shall indemnify the Purchaser against all claims which may be made against the Purchaser, by any member of the public or other party, in respect of anything which may arise in respect of the works or in consequence thereof and shall, at his own expense, effect and maintain, until the work has been 'Taken Over' under clause 5.

8.4. The Contractor/Supplier/Manufacturer shall also indemnify the Purchaser against all claims which may be made upon the Purchaser whether under the Workmen's Compensation Act or any other statute in force during the currency of this contract or at common law in respect of any employee of the Contractor/Supplier or of any of his sub-contractor and shall at his own expense effect and maintain until the work has been `Taken Over', with an approved office. Contractor shall furnish a copy of the labour licence before commencement of work. If the aforesaid are not applicable contractor should furnish declaration to this effect and shall indemnify TIFR-Hyderabad, Hyderabad for violation of any such compliances.

8.5. The Purchaser, with the concurrence of the Engineer In-Charge, shall be at liberty and is hereby empowered to deduct the amount of any damages compensation costs, charges and expenses arising or accruing from or in respect of any such claims or damages from any sums due to or become due to the Contractor/Supplier.\

9. Earnest Money Deposit and Performance Guarantee/Security Deposit:

9.1. **Earnest Money Deposit (EMD):** EMD shall be submitted in the form of Demand Draft to be drawn in favour of "TIFR Centre for Interdisciplinary Sciences", Payable at Hyderabad (To be enclosed with the Technical Bid Part-I))

9.2. **Performance guarantee/Security Deposit:** The tenderer, whose tender is accepted, will be required to furnish a performance guarantee/security deposit of **3% of the tendered amount within 7 (seven) working days from the date of intimation** ie (including adjustment of EMD amount submitted). This guarantee shall be in the form Demand Draft / Pay Order / Banker's cheque / Deposit or Government Securities / Fixed Deposit Receipt (FDR) or Guarantee Bonds (BG) of any Scheduled Bank in accordance with the form as Annexure – I hereto. In case a fixed deposit receipt of any Bank is furnished by the contractor to TIFR as part of the performance guarantee and the Bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to TIFR to make good the deficit.

9.3. The Performance Guarantee/Security Deposit shall be initially valid up to the stipulated date of completion plus 365 days (i.e. 15 months from the date of supply whichever is ealier). The performance guarantee/security deposit shall be returned to the contractor, without any interest, after recording of the completion certificate for the work by the competent authority.

9.4. The Engineer-in-charge shall make a claim under the Performance guarantee/Security Deposit for amounts to which TIFR entitled under the contract (notwithstanding and / or without prejudice to any other provisions in the contract agreement) in the event of:

9.4.1. Failure to attend and rectify the problems in the guarantee period, in which event the Engineer-in-charge may claim the full amount of the Performance guarantee/Security Deposit.

9.4.2. Failure by the contractor to pay TIFR, Hyderabad any amount due, either as agreed by the contractor or determined under any of the Clauses / Conditions of the agreement, within 30 days of the service of notice to this effect by Engineer-in-charge.

9.5. In the event of the contract being determined under provisions of any of the relevant clauses of the agreement, the performance guarantee/security deposit shall stand forfeited in full and shall be absolutely at the disposal of TIFR, Hyderabad.

10. Guarantee and Defects Liability Period:

10.1. The Contractor/Supplier/Manufacturer shall guarantee that all equipment shall be free from any defect due to the defective materials and bad workmanship and that the equipment shall operate satisfactorily and that the performance and efficiencies of the equipment shall be not less than the guaranteed values. The guarantee shall be valid for a period of 12 months after the date of commissioning as certified by the Engineer In-Charge. Any parts found defective shall be replaced free of all costs by the Contractor/Supplier. The services of the Contractor's/Supplier's personnel if requisitioned during this period for such work shall be made available free of any cost to the Purchaser.

10.2. If the defects be not remedied within a reasonable time, the Purchaser may proceed to do so at the Contractor's/Supplier's risk and expense without prejudice to any other rights.

11. Terms of Payment

The contractor will be paid only one Running Account (RA) Bills and Final Bill considering the progress of works based on measurement of works completed. The contractor shall submit the bills for payments along with a detailed statement showing the actual works carried out under different heads of items in the format specified by TIFR-, Hyderabad. Minimum value of the work for interim payment shall be 35% of the work order value.

BILL FORMAT

Tender Item	Description of Item (At least 2 lines)	Unit	Tender Qty	Executed Qty	Rate	% work done	Amount

NOTE: All quantities in the bill should be cumulative.

All measurements should be in the order of tender sequence and should be recorded in the measurement book. The Measurement should be strictly in the below mentioned format only.

MEASUREMENT FORMAT

Tender Item No	Description of Item & Location against each Measurement	Nos.	Length	Breadth /width	Height	Qty.	Remarks

	taken						

The works which have been certified for running bills will also be verified along with the final bill and any defects found need to be replaced / rectified by the contractor at his cost. Till the time, the site is handed over in full, it is the contractor's liability to safeguard the works done and completed at site. The Progress of work should not be affected in any way quoting the reason of non-availability of funds / materials / releasing of running bill. The liability of the contractor is to complete all works in his scope in the scheduled time as per the terms of contract and will not relieve the contractors from his obligations once the Running bill is paid / kept pending.

Final Payment

Payments of Final bill shall be made after deduction of Performance guarantee as specified. The Security Deposit / Performance guarantee, shall be refunded on expiry of the Defects Liability Period after rectifying all defects to the satisfaction of the TIFR-Hyderabad/E.I.C. The acceptance of payment of the final bill by the Contractor would indicate that he would have no further claim in respect of the work executed.

12. Special conditions of Contract governing supplies of the Equipment of this Tender:

12.1. **Scope:**

12.1.1. This specification covers the supply of material as per the enclosed details and quantities and supervision of erection/installation, testing and commissioning of the material.

12.1.2. The Contractor/Manufacturer/Supplier shall quote for all the materials along with accessories as mentioned in the enquiry.

12.1.3. All the supply shall be in accordance with relevant I.S. Specifications and recognized standards.

12.2. **Inspection & Testing of Material:**

12.2.1. Contractor/Manufacturer/Supplier shall submit the lists of Type Tests and Routine Tests to be conducted on the material in the Technical Data Sheet.

12.2.2. All the materials shall be tested at factory as per IS Specifications of material by Purchaser's Engineer In-Charge/Engineers before dispatch at the cost of Contractor/Manufacturer/Supplier.

12.2.3. Contractor/Manufacturer/Supplier shall inform the concerned Engineer In-Charge for inspection and testing in accordance and fix up a suitable date for the same.

12.3. **Test Certificates:**

Contractor/Manufacturer/Supplier shall submit the Test Certificates of all materials.

12.4. **Delivery of Material:**

12.4.1. The Contractor/Manufacturer/Supplier shall arrange for safe transit and shall be held responsible for loading of all equipment and for the stores being sufficiently and properly packed for transport by rail, road, sea or air so as to ensure their being free from any loss or damage on arrival at destination. The packing and marking of packages shall be done by and at the expenses of Manufacturer/Supplier. Each package shall contain a packing note quoting purchase order number and detail of the contents.

12.4.2. All the materials must be delivered at site i.e. Hyderabad - TIFR at 36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District, Hyderabad-500046. The unloading and positioning of all equipment at the designated locations specified by the Engineer In-Charge shall be in the scope of the Supplier. The Supplier shall arrange for handling equipment, labour for rigging, etc. as required.

12.4.3. Material must be delivered at site in all respects as mentioned in the Purchase Order.

12.4.4. Contractor shall arrange necessary storerooms and security at site to store materials. TIFR shall not be responsible for any missing/theft of materials at site.

12.5. **Guarantee:**
If during the period of guarantee any fault or defect arises, the material shall be replaced/repaired immediately free of cost, as well as any replacement of accessories required shall be done free of cost.

12.6. **Mistake in Drawing:** The Contractor/Supplier shall be responsible for and shall pay for any alterations in works due to any discrepancies, errors or omissions the drawings or other particulars supplied by him whether such drawings or particulars have been approved by the Purchaser or not.

12.7. **Responsibility for Completeness:**
Any fittings or accessories which may not be specifically mentioned in the specifications but which are usual or necessary are to be provided by the Contractor/Supplier without extra charge and the equipment must be complete in all details.

12.8. **Extra/Deviation items & Variations in quantity**

TIFR-Hyderabad has the right to omit/delete any of the items and also increase/decrease the quantities mentioned in the tender. No claim or any compensation in this regard will be accepted or paid to the contractor. However, if any new /additional items/deviated items are to be executed, the contractor is bound to execute such items with prior approval from TIFR-Hyderabad after furnishing the proper rate analysis for such extra/deviated items

12.9. **Rejection of Defective Equipment:**

12.9.1. If the equipment after the acceptance thereof is discovered to be defective, notwithstanding that such defects could have been discovered at the time of inspection or found to have failed to fulfill the requirements of the contract or developed defects after the erection within a period of 12 months from the date of erection, even if such erection is done by the Purchaser, he shall be entitled to give a notice on the Contractor/Supplier setting forth details of such defects or failure and the Contractor/Supplier shall, provided such notice is given within a period of 14 months from the date of such erection or acceptance, forthwith make the defective equipment good or alter the same to make it comply with the requirements of the contract at his own cost and further if in the opinion of the Purchaser, the defects are of such a nature that the defects cannot be made good or required without impairing the efficiency or workability of the equipment or if in the opinion of the Purchaser the Equipment cannot be repaired or altered to make it comply with the requirements of the Contract, the Contractor/Supplier shall, provided a notice given by the Purchaser in this behalf within a period of 14 months from the date of erection or acceptance thereof, remove and replace the same with the equipment conforming to the stipulated particulars, in all respects at the Contractor's/Supplier's own cost. Should he fail to do so within a reasonable time, the Purchaser may reject and replace, at the cost of the Contractor/Supplier, with equipment of the same particulars or if equipment conforming to the stipulated particulars are not in the opinion of the Purchaser readily procurable, such opinion being final, then with the nearest substitutes.

12.9.2. In the event of such rejection the Purchaser shall be entitled to use the Equipment in a reasonable and proper manner for a time reasonably sufficient to enable him to obtain replacement equipment as herein before provided.

12.10. **Inspection and Final Tests:**

All tests necessary to ensure that the Equipment complies with the particulars and guarantee shall be carried out at such place or places as may be determined by the Inspector. Should, however, it be necessary for the final test as to performance or guarantee to be held over until the Equipment is erected at site they shall be carried out within one month of completion of erection.

12.11. **Intimation about Delivery:**

If the Purchaser shall have notified the Contractor/Supplier in writing that the former is not ready to take delivery, no equipment or materials shall be forwarded until an intimation in writing shall have been given to the Contractor/Supplier by the Purchaser that he is ready to take delivery.

12.12. **Delay in erection:**

Wherever erection of an equipment or machinery is the responsibility of the Contractor/Supplier as a term of the contract and in case the Contractor fails to carry out the erection as and when called upon as to do within the period specified by the Purchaser, the Purchaser shall have right to get the erection done through any source of his choice. In such an event, the Contractor/Supplier shall be liable to bear any additional expenditure that the Purchaser may

incur towards erection. The Contractor/Supplier shall, however not be entitled to any gain due to such an action by the Purchaser.

12.13. **Definition of Equipment:**

The work `Equipment' wherever, it appears in these `Special Conditions of Contract' governing supplier of Equipment in this Tender shall mean all switchgears, panels, etc. or parts thereof or what the Contractor/Supplier agrees to supply under Contract as specified in the work order.

12.14. **Force Majeure:**

Normally Force Majeure shall cover only acts of God, fire, wars, strike, riots and civil commotion, floods, epidemic, quarantine related strikes, freight embargoes, etc. The contractor shall not be liable for any liquidated damages for delay or any failure to perform the contract arising out of Force Majeure conditions, provided that the contractor shall within ten days from the beginning of such delay notify the department in writing the cause of delay along with convincing supporting evidence. The department once convinced and accepted the reason may extend the supply completion period by a suitable / reasonable margin.

12.15. **Termination of Contract by the Purchaser:**

12.15.1. If the Contractor/Supplier commits any `Act of Insolvency' or shall be adjudged an Insolvent or shall have an order for compulsory winding up made against him or pass effective resolution for winding up voluntarily, or if the Contractor/Supplier shall suffer any payment under this contract to be attached by or on behalf of any of the creditors of the Contractor/ Supplier, or shall assign the Contract without the prior consent in writing of the Engineer In-Charge, or shall charge or encumber this Contract or any payments due or which may become due to the Contractor/Supplier there under, or if the Engineer In-Charge shall certify in writing to the Purchaser that the Contractor/Supplier –

12.15.1.1. has abandoned the Contract, or has failed to commence the works, or has without any lawful excuse these conditions suspended the progress of the works for seven days after receiving from the Engineer In-Charge written notice to proceed, or

12.15.1.2. has failed to proceed with the work with such due diligence and failed to make such due progress as would enable the works to be completed in accordance with the approved programme of work,, or

12.15.1.3. has failed to remove materials from the site or to pull down and replace work for seven days after receiving from the Engineer In-Charge written notice that the said materials or work were condemned and rejected by the Engineer In-Charge under these conditions, or

12.15.1.4. has neglected or failed persistently to observe and perform all or any of the acts matters or things by this contract to be observed and performed by the Contractor for seven days after written notice shall have been given to the Contractor/ Supplier requiring the Contractor/Supplier to observe or perform the same, or

12.15.1.5. has to the detriment of good workmanship or in defiance of the Engineer In-Charge's instructions to the contrary sub-let any part of the contract, then and in any of the above said causes, the Purchaser with the written consent of the Engineer In-Charge may, notwithstanding

any previous waiver, after giving seven days' notice in writing under the provisions of this clause to the Contractor/Supplier, determine the contract but without prejudice to the powers of the Engineer In- Charge or the obligations and liabilities of the Contract, the whole of which shall continue to be in force as if the contract has not been so determined and as if the work subsequently executed has been executed by and on behalf of the Contractor/ Supplier.

12.15.2. After the issue of such notice, the Contractor/Supplier shall not be at liberty to remove from site any equipment, tools and materials belonging to him which shall have been placed thereon for the purpose of the works and the Purchaser shall have lien upon such equipment, tools or materials to subsist from the date of such notice and until the notice shall have been complied with.

12.15.3. If the Contractor/Supplier shall fail to comply with the requirements of said notice for seven days after such notice has been given, the Purchaser shall have the power to enter upon and take possession of the works and site and all equipment, tools and materials thereon, and to engage any other person, firm or agency to complete the works, utilizing the equipment, tools and materials to the extent possible. The Purchaser shall not in any way be responsible for damage or loss of the tools, equipment and materials and the Contractor/Supplier shall not have any compensation therefore.

12.15.4. Upon completion of the works, the Engineer In-Charge shall certify the amount of expenditure properly incurred consequent on and incidental to the default of the Contractor/Supplier as aforesaid and such amount shall be deducted from the payments due to the Contractor/Supplier, including the Security Deposit. If the said amount exceeds the payment due to the Contractor/Supplier, the Purchaser shall be at liberty to dispose off any of the Contractor's/Supplier's materials, tools or equipment and apply the proceeds for the payments due from the Contractor/Supplier and recover the balance by process of law.

12.15.5. After the works have been completed after the amounts due to the Contractor/Supplier, the Engineer In- Charge shall give notice in writing to the Contractor/Supplier to remove the surplus equipment and material from site. If such equipment and materials are not removed within a period of 14 days after such notice, the Purchaser shall have the power to remove and sell the same holding the proceed less the cost of removal and sale, to the credit of the Contractor/Supplier. The Purchaser shall not be responsible for any loss sustained by the Contractor/Supplier from the sale of the equipment and material.

13. Contractor's Representative:

13.1. The Contractor/Supplier shall employ at least one qualified representative with minimum 3 years of experience of similar works as stipulated by TIFR- Hyderabad in the work order) whose name shall have previously been communicated in writing to the Engineer In-Charge and approved by him to supervise the erection. Any written order or instructions given to the representative shall be deemed to have been given to the Contractor/Supplier. The Engineer In-Charge shall be at liberty to object to any particular representative/or any persons employed by the Contractor/Supplier on the work and the Contractor/Supplier shall remove the person objected to, on the receipt of the Engineer In-Charge, in writing, a request requiring him to do

so and shall provide in his place another competent representative acceptable to the Engineer In-Charge.

13.2. The Contractor's/Supplier's representative shall be a qualified electrical/ mechanical engineer possessing adequate site experience in similar nature of works.

14. Completion Time:

Unless otherwise agreed in writing between the Purchaser and the Contractor/Supplier, the work contract shall be completed within the stipulated period mentioned elsewhere in this tender document from the date of Work/Purchase Order issued to Contractor/Supplier by the Purchaser.

15. Measurements:

All joint measurements of quantities shall be done by the Contractor at his own cost in the presence of the Engineer In-Charge or any authorized person deputed by him who will certify the routes, length and quantities etc. for the purpose of determination of the amount payable.

16. Spare Parts & Manuals:

Manufacturer/Contractor/Supplier should submit operation, maintenance and spare part list and manuals for all equipment.

17. Training:

Manufacturer/Contractor/Supplier should provide training for operation and maintenance free of cost for equipment supplied.

18. Special Instruction for bidding process

This tender is a two part tender. The Part-I: Technical Bid and Part-II: Financial Bid. Bidders shall seal each bid separately with a clear label on the envelope about its content. Both the bids should be submitted in a single drop two cover method. Any pricing details must not appear in the Part-I: Technical Bid.

19. Drawings and Documentation:

As-built drawings as specified in this technical specifications shall be submitted by the Contractor.

20. Permissions and Approvals:

All necessary documentation for obtaining such permissions and approvals shall be done by the contractor. Purchaser shall assist in providing required declarations. Statutory fees shall be paid by the purchaser.

21. Guarantee:

The equipment shall be guaranteed against all design and manufacturing defects, poor workmanship etc. for a period of 12 months from the date of commissioning or 15 months from the date of supply, whichever is earlier. Any defects discovered during this period shall be rectified by the vendor free of cost to the purchaser.

SECTION-V **SCOPE & TECHNICAL SPECIFICATIONS**

1. SCOPE

1.1. supply, installation, testing and commissioning of wall and ceiling PUF panels with required accessories and cutouts, clean room doors, aAir shower, garment cubicle, etc.
1.2. Supply and installation epoxy flooring, Coving, etc
1.3. Supply and installation Riser panels, filter modules, filter, SS grills, etc
1.4. Supply, installation, testing and commissioning of electrical power & lighting distribution, clean room LED lights, DLP trunking, etc
1.5. Fire detection and alarm system
1.6. Validation of clean room
1.7. Any civil works if required.

2. TECHNICAL SPECIFICATIONS

2.1. WALK – ON CEILING SYSTEM

2.1.1. GENERAL:
The work in this section includes design, materials, hardware, installation supervision and testing complete in all aspects necessary for operation of ceiling systems in ISO class 6 clean room. Resultant ceiling system (panels & HEPA filters) shall be capable of providing clean room class conditions indicated for the specific areas. Walk–on ceiling system shall be offered for factory inspection and testing.

2.1.2. CEILING SYSTEM:
Provide walkable ceiling panels of 50 mm thick. made up of 0.8 mm thick for outer skin and 0.8 mm thick for inner skin electro zinc steel sheet on both sides with PUF insulation of density 42 kg / cub. mt.,. Powder coating thickness shall be 60 to 80 micron. Cutouts for HEPA filters and light fixtures are to be pre-engineered and factory made. The panel is to be filled with PUF insulation of density 42 kg / cub. mt.,. The ceiling system is to be independent from the partition system. The roof (ceiling panels) should be UL/CE classified.

- Suspension: Zinc coated threaded hook rods from true ceiling with turnbuckle arrangement as shown in drawing.
- Ceiling systems shall include Insert springs, perimeter connection with 2 spacers and J Channels, corner pieces.
- Modular installation system shall be of Hilti / Mupro / Unistrut.
- The ceiling panels shall be supported from true ceiling by M-8 rods with threaded ends, which shall be connected at one end to turnbuckles. The turnbuckle shall be attached to another M-8 threaded ends and a clip at the bottom of the rod to fit securely on the ceiling

system. The turnbuckle assembly in the overhead structure shall permit final leveling of the ceiling panels. Over all ceiling shall be level within + 2.5 mm throughout the room.

- Perimeter connections: For fixed perimeter where vibration of building movement is not a design criteria, 1" Wide J channel with a chamber shall be used. For perimeter with expansion or vibration joints, Z – spacers shall be used t isolate the ceiling from movement of the adjacent wall.
- Suspension spacing: Design suspension spacing for dead load of ceiling plus 73 Kg/Sq.m. live load.
- The suspenders shall be fastened free of vibrations; for this reason no common suspension with media duct and other systems shall be allowed.

2.1.3. FIRE RATING:

Ceiling panel confirm to minimum one hour fire rating. In case of cutouts, the fire resistance rate is maintained. The contractor to submit proof from reputed/established laboratory like CBRI, Roorkee/UL/CE for complying minimum one hour fire rating for skin.

2.1.4. SUBMITTALS:

Product data: Submit manufacturer's technical product data with component dimension describing components within assembly anchorage and fasteners and substantiating that the products would comply with the requirements.

- Shop drawings: Successful bidder to submit the following drawings

i. Ceiling suspension laying.
ii. Ceiling panel suspension hookup details showing the locations at which the Panels shall be suspended from true ceiling.
iii. Showing other system like HVAC ducts, cable trays, conduits, piping running Between the suspenders.
iv. Showing locations of HEPA filters, light fixtures in ceiling panels.

2.1.5 SUSPENDED POWER OUTLET MODULE:

Power outlet module shall be suspended from the ceiling and hermetically sealed as shown below. Housing shall be made of 1.6mm powder coated GI sheet and have a partition to isolate the DG and UPS power supply. Power Sockets shall be 16/6A, 230V AC supply.

Power outlet modules shall have provision for 2 No.s of 16/6Amps sockets for DG supply & 2 No.s LAN provision on one side and 2 No.s of 16/6Amps socketsUPS supply on other side.

2.2. CLEANROOM WALL SYSTEM:

Work shall include but shall not be necessarily limited to the following system:

2.2.1. Wall:

- Demountable, non-progressive module of 48 inch (1220mm) wide capable of four direction lateral expansion with reusable components.

- 80 mm thick. Modular powder coated clean room wall panel's made of 0.8 mm thick for outer skin and 0.8 mm thick for inner skin electro zinc steel sheezt on both sides with PUF insulation of density 42 kg / cub. mt., supports, cut outs, etc. Powder coating thickness shall be 60 to 80 micron. Aluminum interconnecting profiles, floor track for the level adjustment, etc. shall be provided. Powder coating thickness shall be 60 to 80 micron. Cut outs for RA raiser, switch socket outlets, exhaust outlets are to be pre-engineered and factory made. The panels are filled with PUF insulation of density 42 kg / cub. mt., .The wall system be independent from the ceiling system. The wall panels should be UL/CE classified.

- Butt vertical joints shall be snap-in-type with continuous concealed dry gasketing. Utility raceways and piping placed along wall on side.

- Hollow metal flush doors and frames in cleanroom wall system shall be an integral part of wall system.

- Door hardware shall be supplied and installed as required for the cleanroom wall system.

- Provide plexi glass/toughened in wall partition wherever shown in the drawing.

- Keep provisions for electrical power sockets, paging system, intercom and LAN system.

- Keep provision for electrical power sockets, paging system, intercom and LAN systems.

- Provision has to be made also for making openings in the partition wall for taking utility pipes, cables, drains, exhaust ducting etc., wherever necessary as per the instructions of the TIFR.

- Cleanroom support system shall be consisting primarily of bottom floor track and top runner system. Partition panel shall be with no exposed fastners. Finish shall be with epoxy enamels on at 450 deg F having abrasion resistance.

- Major accessory components shall include silicone sealant and continuous extruded closed cell polyethylene tape. Fasteners shall be as recommended by system manufacturer.

- Any modification and/or deviation from manufacturer's standard demountable partitions accessories etc. specified herein or shown on the drawing shall be the responsibility of the contractor including any design, additional material etc. necessitated by same.

2.2.2. INSTALLATION:

- Utilize methods of construction, which minimize the generation of contaminants.

- Partition components shall assemble in to a rigid structure with straight joints, capable of supporting panels and equipment utilities as required. Completed installation shall be free of exposed bolts, nuts, rivets and fasteners.

- Installation shall be by material manufacturer or a previously approved, qualified and authorized installer with at least 2 years of experience on similar construction.

2.2.3. SUBMITTALS:

- Product data: Submit manufacturer's technical product data with component dimensions, describing components with assembly anchorage and fasteners, glass and infill and substantiating the products would comply with the requirements.

- Shop drawings: Submit complete shop drawing and erection diagrams. Shop drawing shall be prepared by the wall system manufacturer incorporating power and utility cutout locations, return air grill and riser locations. Show details of all finished work as indicated on drawings including following items:

Attachments, reinforcement, assemblies and locations of all joints, joinery techniques, and materials, fastening and sealing methods, including metal alloys, fasteners and all shop and field sealants by product name and locate on shop drawings. Shop drawings shall include instructions and explanatory details for sequence of installation of all materials. Show relative layout of all adjacent construction, all correctly dimensioned. Provide isometric or other drawings, which explain or define certain interconnections when requested by TIFR.

Care should be taken so that the wall system do not behave like a medium for transfer of vibrations from elsewhere.

- Provide samples of all partition finishes and joint covers. Approved samples shall become the standard for acceptance of all installed work.

2.2.4. MANUFACTURER'S TEST DATA:

Provide necessary test results for structural requirements and outlined in the following:
Uniform Load test: Calculate or test partitions to prove they will resist 35 lbs/square foot in bending, and that deflection will not exceed L/360 with 10# per square foot load will not more than 11" permanent set.

- Air and light seal –Bright light test: All panel joints, ceiling joints and sill joints shall be tested for air and light leaks in the following manner; Darken room (clean area side of partition) to state of less than 0.5' candles general illumination. On opposite side of wall shine 100 watt floor light at all vertical and horizontal joints. Light source shall not be greater than 30' from perpendicular. Observe corresponding joints from darkened side of all. Any visible light through joint shall constitute a leak and shall be

sealed. Repair gasket seal as required to achieve proper seal. No liquid sealants are to be used.

2.2.5. PRODUCT DELIVERY, HANDLING AND STORAGE:

- Delivery: Deliver materials in their original unopened packages.
- Handling: Exercise care in handing partition components to prevent damage.
- Storage: Storage materials in an enclosed shelter, protected from damage and from the elements.
- Materials found to be defective or improperly installed shall be replaced.
- Periodically during work and after completion of work, clean up and remove all debris from job site. Remove all rubbish and cartons and leave job site broom clean.
- Protect the work of other during execution of work, and repair any damages caused.

2.2.6. FINISH:

- For ISO class 6 clean rooms, provide uniform color factory applied on both faces of all panels, Minimum paint thickness be 60 Microns.

2.2.7. FIRE RATING:

- Wall panels confirm to minimum one hour fire rating. In case of cutouts, the fire resistance rate is maintained. The contractor to submit proof from reputed / established laboratory like CBRI, Roorkee/UL/CE for complying minimum one hour fire rating for skin.

2.3. EPOXY FLOORING

2.3.1. GENERAL:

- The sub floor preparation with self-leveling compound. Sub floor preparation shall be done over normal concrete floor which will be executed by other agency. After the sub floor preparation, epoxy flooring shall be done.

- 2 mm thick epoxy flooring. Flooring shall be finished with VDF flooring and self-leveling compound before the epoxy flooring

2.4. SWINGING FLUSH DOORS AND FRAMES FOR CLEANROOMS:

2.4.1. Work Included:

a) Swinging metal doors and frames of wall matching material location of which are indicated in schedule and in drawings.

b) Vision glass and glass desiccant infill panels as per drawings.

c) Finish hardware as specified in hardware schedule.

2.4.2. System Description:

a) The door leaves be made of 2 metallic steel sheet skins 0.8 mm thick, bent, Clipped and glued. The whole door shall be a monolithic solid element. Dimensions in width are as per site requirements, dimension in height are according to the precise needs of the rooms to be built. The door leaves be both sides flush with door frame and the partition, vision glass, iron monger, shop fabricated factory finished, infill and attachment devices.

2.4.3. Submittals:

a) Product data: Submit manufacturer's technical product data with component dimensions, describing components within assembly anchorage and fasteners, glass and infill and substantiating that the products would comply with the requirements.

b) Shop drawings: Submit for fabrication and installation of metal doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of constructions, location and installation requirement of finish hardware and reinforcement, and details of joints on connections. Show anchorage and accessory items.

i. Provide schedule of doors and frames using same reference numbers of details and opening as those of contract drawings.
ii. Indicate coordination of glazing frames and stops with glass and glazing requirements.
iii. Indicate coordination of doorframes with clean room walls.

2.4.4. Delivery, Storage and Handling:

a) Deliver hollow metal flush doors and frames cartooned are created to provide protection during transit and job storage. Provide additional sealed plastic wrapping for factory finished doors.

a) Protect pre finished metal surfaces with wrapping strippable coating. Do not use adhesive papers or sprayed coatings, which bond when exposed to sunlight or weather.

c) Inspect hollow metal flush doors and frames upon delivery for damage. Minor damages may be repaired, provided refinished items are equal in all respect to new work and acceptable to TIFR, otherwise remove and replace damage items as directed.

d) Store doors and frames at building site under cover. Place units on minimum 4" (100 mm) high wood blocking. Avoid use of non-vented plastic or canvas shelters, which could create humidity chamber, if cardboard wrapper on door becomes wet, remove carton immediately. Provide ¼" (6mm) spaces between stacked doors to promote air circulation.

2.4.5. Materials:

a) Electro zinc steel /Galvanized steel /Aluminum honeycomb
b) Fasteners: Stainless steel, Make – HILTI.
c) Door hardware:

- Handles	- BRITON EXIT hardware/DORMA
- Door closer	- DORMA/RYOBI
- Reversible panel latch	- BRITON EXIT hardware/DORMA
- Concealed flush bolt	- BRITON EXIT hardware/DORMA
- SS304 Ball bearing butt hinges	- BRITON EXIT hardware/DORMA
-Panel latch with DDs box keeper	- BRITON EXIT hardware/DORMA
- Float vision glass	- Ashai
- Lock (Mortise sash lock with	- DORMA (lever handles)
- Automatic door button (concealed)	-BRITON EXIT hardware/DORMA

2.4.6. Components:

Doors: 46mm thick fully flush, double skin door shall with lock seam joints at stile edges. In-fill of Honeycomb Kraft paper or Rockwool be used to give the required rigidity and effective acoustic and thermal insulation.

2.4.7. Glass and Glazing Mouldings:

Double flush glazing glued on the kit shall be provided for ease of cleaning and maintenance. No crevices/joints/sloped profiles are allowed for fixing the glass to avoid particle contamination and dust accumulation.

2.4.8. Fabrication:

a) Fabricate components with minimum clearances and shim spacing around Perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
b) Accurately fit and secure joints and corners. Make joints flush.
c) Prepare components to receive anchor devices, Fabricate anchors.
d) Arrange fasteners and attachments to conceal from view.
e) Prepare components with internal reinforcement for door hardware.

2.4.9. Finishes:

The door frames and door shutters be finished with matching cleanroom wall Paint having paint thickness minimum 90 Microns or with thermosetting Polyurethane paint of Aliphatic grade providing high levels of scratch resistance and durability which is also of Antistatic quality.

2.4.10. Execution:

a) Verify site condition.
b) Verify dimensions, tolerances and method of attachment with other work.
c) Verify wall openings and adjoining air and vapor seal materials are ready

to receive work in this section.

b) In case doors specified in BOQ are not wide enough for the equipment to go through, it is therefore necessary that the equipment be installed before mounting the walls. Should this not be possible, the wall can remain open and be closed at a later date.

e) Align assembly plumb and level, free of warp of twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

f) Install hardware using template provided.

g) Adjust operating hardware for smooth operation.

h) Clean work after finish.

i) Remove protective material from pre finished metal surfaces.

j) Wash down surfaces with an approved cleaning solution, applied with soft, clean wiping clothes. Take care to remove dirt from corners. Wife surfaces clean.

i) Protect finished work from damage.

2.5. GLASS AND GLAZING:

2.5.1. General:

- The work in general shall consist of supplying and fixing all glass and glazing wherever required as shown on drawings and specifications supply of metal glazing beads and neoprene gaskets shall not be included in this scope.

- Provide samples for approval. Approved samples shall become the standard for acceptance of all installed work.

2.5.2. Installation:

- The contractor shall supply cleanroom glazed wall panels, glazed doors, vision panels and install all glass and glazing as required for various doors and partitions, unless otherwise stated from approved manufacturer like Indo-Ashai or equivalent, having uniform refractive index and free from flaws, specks and bubbles. The glass shall be brought to site in the original packing from the manufacturer and cut to size at site.

- Clear glass shall be float glass of minimum 5.0 mm thick.

- All glass shall be thoroughly cleaned putting in position. All holes that may be necessary for holding the clips, glazing heads and all other attachments shall be drilled by the Contractor.

- After completion of glazing work, the Contractor shall remove all dirt stains, clean the glass panel as per procedure suitable for cleanroom and leave the work in perfectly acceptable condition. All broken cracked or damaged glass shall be replaced by new ones at the Contractor’s own cost.

- All installation shall be free from cracked, broken or damaged glass. Edges of large panes of thicker glass and absorbing glass shall be inspected carefully for chipped cracked edges or edges not ground properly.

- Glazing shall be carefully done to avoid direct contact with metal frames.

- All glass shall be fixed by neoprene gaskets to give a leak proof installation.

- At completion, the panes shall be free from duct, stains, etc. to the complete satisfaction of the engineer in charge.

- Glass shall be tested for antistatic properties after chemical spray etc.

2.6. SEALANTS AND JOINT FILLER:

2.6.1 General:

- The applications for sealants and joint fillers as work of this section include wall / ceiling joints.

- Except as otherwise indicated, joint sealers are required to establish and maintain airtight and water proof continuous seals on a permanent basis, with in recognized limitations of wear and aging as indicated for each application. Failures of installed sealers to comply with this requirement will be recognized as failures of material and workmanship.

- Provide manufacturer standard custom sealant colors selected by TIFR.

2.6.2. Submittal:

- Product data: Submit manufacturer's product specification, handling / installation / curing instructions, and performance tested data sheets for each sealant and joint filler proposed for use.

- Certified tests: With product data submit certified test report for sealants on aged performances as specified, including hardness, stain resistance, adhesion, cohesion or tensile strength, elongation, low temperature flexibility, compression set modules of elasticity, water absorption, and resistance (Aging, weight loss, deterioration) to heat exposures and to ozone and ultraviolet light.

2.6.3. Execution:

2.6.3.1. Inspection:

- Installer must examine joint surfaces and conditions under which joint sealer work is to be performed, and must notify contractor in writing of unsatisfactory conditions. Do not proceed with joint sealer work until unsatisfactory conditions have been corrected in a manner acceptable to installer.

- Beginning work indicates acceptance of surfaces.

2.6.3.2. Installation:

- Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified, and except where manufacturer's technical representative directs otherwise.

- Set joint filler units at depth or position in joint as indicated to co-ordinate with other work, including installation of bond breakers, backer rods and sealants. Do not leave voids gaps between ends of joint filler units.

- Install sealant backer rod for liquid applied sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for application indicated.

- Install bond breaker tape where indicated and where required by manufacturer's recommendations to ensure that liquid applied sealants will perform as intended.

- Employ only proven installation techniques, which will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.

- For normal moving joints sealed with elastomeric sealants but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than ½" deep nor less than ¼" deep.
- For joints sealed with no elastomeric sealants and caulking compounds, fill joints to a depth in range of 75% to 125% of joint width.

- Don't allow sealants or compounds to over flow from confines of joints, or to spill on to adjoining work, or to migrate into voids of exposed finishes. Clean adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.

- Recess exposed edges of gaskets and exposed joints fillers slightly behind adjoining surfaces, unless otherwise shown, so that compressed units will not protrude from joints.

- Bonds ends of gaskets together with adhesive or 'weld' by other means as recommended by manufacturer to ensure continuous watertight and airtight performance. Meter – cut and bond ends at corners unless molded corner units are provided.

2.6.3.3. Cure and protection:

- Cure sealants in compliance with manufacturer's instructions an recommendations, to obtain high early bond strength, internal cohesive strength and surface durability.

- Advice contractor of procedures required for pure and protection of joint sealers during construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at time of substantial completion. Cure and protection of joint sealer during construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at time of substantial completion. Cure and protest sealants in a manner, which will minimize increase in modulus of elasticity and other accelerated aging effects.

- Replace or restore sealants which are damaged or deteriorated during construction period.

2.6.3.4. Schedule:

Required application of sealants and caulking include, but are not necessarily limited to following locations:

- Interior air sealed joints: performed butyl rubber, interior grade or acrylic latex caulking compound.
- Joints at clean room walls above ceiling: Silicon rubber.

- Vibration joints and expansion joints at clean room floors and walls: Silicone sealants non-ascetic type.

2.7. TECHNICAL SPECIFICATION FOR CLEAN BUILD:

2.7.1. Introduction:

This specification includes requirements for the cleaning of the building and its surrounding materials and equipment as well as procedures designed to maintain clean environmental conditions during cleanroom erection phase. All procedures shall be ongoing and continuous throughout the course of the project.

Cleanroom areas are identified on drawing and include all environmentally controlled areas with mechanical air circulation / filter bank arrangements designed to reduce airborne particulate levels.

Procedures contained in this section include specific requirements for:

1. On –going cleaning procedures.

2. Stages of 'build clean' construction.

2.7.2. Definitions:

2.7.2.1. Build Clean' Requirements: Requirements specified and supplemented by the Contractor for building in the clean environment.

2.7.2.2. Office Clean: Defined as that cleanliness that would be typically experienced at a commercial office space. No visible sign of oil, grease, dirt, debris, or dust on any wall, floor or work surfaces. Cleaning and vacuuming shall be performed as required to maintain this cleanliness status.

2.7.2.3. Interstitial Space : The space between the cleanroom ceiling and true ceiling (roof slab) which houses exhaust duct work, clean supply and return duct work, and electrical.

2.7.2.4. Cleanroom: Inclusive of the covering over the perimeter walls, cleanroom walls, chases, ceiling panels, all exposed pipe, conduit, ducts that reside within either the supply or return cleanroom airflow.

2.7.2.5. Single (wash down) "Course Cleaning": 1000:1 mix water to nonionic, non-phosphate liquid detergent followed by a plain potable water wash. Use non shedding foam wipes rated for clean room use.

2.7.2.6. Vacuum cleaning – Portable units.

2.7.3. Quality Assurance:

Contractor shall maintain, during the entire course of construction, an on–going and continuous housekeeping program designed to facilitate required cleanliness defined by this specification. TIFR will determine primary methods and procedures to be followed. Additional procedures for continued maintenance shall be established by Contractor. Procedures shall be communicated to all tradesmen involved, and noticeably posted. Procedures shall include appointment of a cleanliness supervisor (a representative of the Contractor) who shall have the responsibility of assuring that construction is free of trapped dirt and debris through regular and thorough inspection of work.

2.7.4. Submittals:

The Contractor shall submit a description of "build clean" requirements and schedule.

2.7.5. Product Delivery, Handling and Storage:

Do not store more materials in staging area than can be installed in one day's work. Do not store contaminated materials in the staging areas.

2.7.6. Materials to be Supplied and Used by Contractor:

- Vacuum cleaners.
- Rags.
- Lint – Free Towels.
    - Soap wash: Nonionic, Non phosphate liquid detergent, 5000:1 mix with potable water.

2.7.7. Installation and Cleaning Procedures:

Contractor shall institute procedures for fabrication and placement of specified materials which will preclude entrapment of construction soils, refuse, dust and other debris in finished work. Each installer shall carefully inspect the subtract over which succeeding work is to be installed and shall perform such cleaning activities as required to maintain 'build clean' conditions as specified. Cleaning activities shall include daily room cleaning of exposed floor surfaces and wipe down/vacuuming of various substrates.

Solvent wiping and general vacuum procedures shall be employed to insure final construction will be free of trapped debris of particulars contaminants.

No smoking or eating shall take place within construction at any time.

Stage of Build Clean Construction:

Stage I concrete foundation and structural steel frame:

1. Daily trash removal.
2. Daily clean up.
3. No special 'build clean' requirements.
4. Hard hats worn at all times.
5. Heavy soled work shoes required
6. Pressures wash all structural steel if necessary.

Stage II exterior Building Skin and Interior Rough In:

1. Concrete work complete, including sealer.
2. Installation of all fire proofing, painting, mechanical, electrical, fire sprinklers and plumbing rough – ins.
3. Access through temporary stairs and ladders.
4. Equipment and materials access through material hoist or forklift.
5. No special garments required, except heavy soled boots and hard hats.
6. Duct work may be shop cleaned and sealed for transportation to the site in enclosed trailers or assembled on site in a clean environment, wiped clean and sealed for installation.
7. Concealed walls spaces vacuumed clean before double up.
8. Fire sprinkler piping, plumbing piping and electrical conduit shall be wiped clean with solvent if necessary to remove any grease are oil on outside surface of pipe.

2.8. HEPA FILTER MODULE:

HEPA Module made of with Galvanized Iron sheet duly powder coated with suspension arrangement and provision for grill fixing arrangement. VCD controlled from inside the cleanroom with bevel gear arrangement. Filter loading from inside the cleanroom.

HEPA Filter shall be Hooded Terminal type. HEPA filter shall be of mini pleat type with efficiency of not less than 99.97% down to 0.3 microns EN 1822 standard H13 grade with protection grid on one side. HEPA filter initial pressure drop shall be of 25mmwg at the rated flow. HEPA Filter shall be fixed in a soldered GI box with a flanged frame & facility to have DOP / PAO Test at site. Each filter shall be tested by DOP / PAO method and a certificate/s to the effect that such tests have been conducted shall be furnished by the contractor. The details of the DOP / PAO method adopted by the contractors / manufacturers at their works including those applicable to the aerosol generator, particle counter and the method of testing shall be described fully by the tenderers in their tender. The tenderer shall confirm that they will afford every facility for the TIFRs / consultants or their representatives to observe the manufacturing of filters and witness the tests if they so desire. The TIFRs / consultants reserve the right to stipulate that a leak test be performed on any or all filters on their receipt at site before taking delivery. The tenderers shall specifically confirm that they are agreeable to comply with this requirement. TIFRs / Consultants will witness the Test of few HEPA filters as desired.

2.9. FILTERS:

Refer the BOQ also for filter specifications.

2.9.1. Mini Pleat HEPA Filters:

HEPA Module made of with Galvanized Iron sheet duly powder coated with suspension arrangement and provision for grill fixing arrangement. VCD controlled from inside the cleanroom with bevel gear arrangement. Filter loading from inside the cleanroom.

HEPA Filter shall be Hooded Terminal type. HEPA filter shall be of mini pleat type with efficiency of not less than 99.97% down to 0.3 microns EN 1822 standard H13 grade with protection grid on one side. HEPA filter initial pressure drop shall be of 25mmwg at the rated flow. HEPA Filter shall be fixed in a soldered GI box with a flanged frame & facility to have DOP / PAO Test at site. Each filter shall be tested by DOP / PAO method and a certificate/s to the effect that such tests have been conducted shall be furnished by the contractor. The details of the DOP / PAO method adopted by the contractors / manufacturers at their works including those applicable to the aerosol generator, particle counter and the method of testing shall be described fully by the tenderers in their tender. The tenderer shall confirm that they will afford every facility for the TIFRs / consultants or their representatives to observe the manufacturing of filters and witness the tests if they so desire. The TIFRs / consultants reserve the right to stipulate that a leak test be performed on any or all filters on their receipt at site before taking delivery. The tenderers shall specifically confirm that they are agreeable to comply with this requirement. TIFRs / Consultants will witness the Test of few HEPA filters as desired.

2.9.2. Micron filters in the Return Air Raisers:

10 Micron filters in the return air raiser. Filters shall be rated for 500 fpm face velocity and should have easy fixing method with the filter frame in the return air raiser. Filters shall be assembled in the return air raiser with filter frame.

2.10. SS PERFORATED GRILLES:

SS perforated grilles shall be made of 20 G SS 304 for supply / return air in the clean room. The grilles shall have round / elliptical perforations and the % area of opening shall be to the maximum extent possible. The edges of the grille shall be made inclined to avoid projections in the cleanroom. Grilles shall have flush type fixing screws made of SS and should have SS cap nut.

For Return Air Riser inlet complete with provision for fixing / holding the Pre-Filter (EN 779: G4) with magnetic arrangement shall be provided.

2.11. MAGNEHELIC PRESSURE GAUGES:

Magnehelic pressure gauges shall have range of 0 to 10 mm WC and shall be fitted with SS box. Pressure shall be measured w.r.t. atmospheric pressure / adjacent area. Magnehelic gauge shall be flushed with the panel. Sensing probes made of brass and coated with nickel / SS shall be installed in the areas for sensing the pressure. Reinforced PU tube shall be laid from sensing probes to magnehelic gauges. These shall be installed in designated locations approved by the TIFR.

2.12. EQUIPMENT:
Cleanroom equipment shall be suitable for ISO Class 7 (Class 10000) cleanroom. Clean room equipment shall be supplied and installed in the cleanroom as per the approved drawings.

2.12.1. AIR SHOWER:

Air shower will have single entry and single exit, high velocity, low pressure system SS 304 nozzles, pre and HEPA filters, completely self-contained unit, utilizing low wall return (floor grill type not accepted). The unit shall be consisting of ISO class 7 cleanroom compatible pre-fabricated units built-up, in place having fluorescent lamp with acrylic cover, electronic ballast, both side red and green indicators, electro - magnetic latches on both sides of Dorma make to ensure both doors do not open simultaneously 5.0 mm thick viewing glass, SS 304 finish handles of Dorma make, door closer with hold open arm of Dorma make, blower, control wiring emergency stop switch etc. Complete interior of the air shower shall be of SS 304. Outer shall match with the cleanroom panel finish.

2.12.2. GARMENT CUBICLE:

Garment cubicle of required size with GI powder coated sheet with pre filters, blower, and HEPA filters suitable for 10 pairs as per the drawing. Garment cubicle shall have a levelling bolt, hangers, UV tube light of 15 W, sliding glass door, etc. Garment cubicle shall be compatible for ISO Class 7 cleanroom.

2.12.3. CROSS OVER BENCH:

Cross over bench specifications shall be followed as per the BOQ.

2.13. VIEW PANEL:

View panel made of GI powder coated body shall be installed. 5 mm thick. Float glass shall be fixed on both sides. Size of the view panel shall be 900 x 900 mm size and thickness shall match as per drawing. Glass shall have a uniform refractive index and free from flaws, specks and bubbles. All glass shall be fixed by neoprene gaskets to give a leak proof installation. Necessary desiccant shall be filled in the view panel.

2.14. ESD CLEANROOM CLOTHING:

Cleanroom clothing suitable for Class 10000 & Class 100000 cleanroom consisting of apron, cap, and mouth cover, sleepers, etc. The clothing shall be suitable for ESD cleanrooms. ESD Aprons / coats are specially designed for use in Electronic assembly or testing zone for operators. ESD aprons do not generate charges and at same time dissipate the charges present on the normal clothing through the human body. The garments shall be made with plastic buttons, zippers or Velcro for ease of wearing.

Product Specification:		
Composition	:	Polyester 100%
Weaving Structure	:	TWILL 2 up / 1 down
Yarn (Denier)	:	Wrap 75D Wept 100 D
Density (Thread / Inch)	:	Wrap 192 Wept 92
Electro Conductive Yarn Interval	:	Wrap 5 mm Wept 5 mm
Conductive Yarn Type	:	Suffused in to the surface
Weight	:	110 Gm / Sqm
Friction Charge	:	30 V
Surface Resistivity	:	10E6-10E7 Ohms / Sq
Decay Time	:	< 0.1 Sec
Particle Filtration Efficiency	:	85 %
Air Permeability	:	8.9 Cc / Sqcm / Sec
Moisture Permeability	:	349 Gm / Sqm / Hr
Colour	:	White / Blue
Aprons available in standard sizes:		S, M, L, XL

2.15. ESD PALM GLOVES:

PU coated gloves are used in Electronic manufacturing to maintain the cleanliness of the product due to operator handling. Since gloves are the closest proximity to the ESD Sensitive components, these gloves need to be ESD safe as well apart from other regular requirements for gloves. These gloves also provide moderate protection to operator hands from sharp objects on the electronics assemblies. The PU coating also provides an anti-slip property to the palm and fingertips.

Product Specification:		
Category	:	General Purpose
Configuration	:	Palm Coated Elastic Wrist
Type coating	:	Solvent Based, Foamed Polyurethane
Type Fabric	:	Conductive Copper Yarn + Nylon

Sizes	:	S, M, L, XL
Liner	:	Brown / Grey
Coating	:	White
Shelf Life	:	Functional: 5 Yrs

2.16. PROVISIONS IN THE CLEANROOM PANELS AND CEILING:

Provisions shall be made in the cleanroom panels for various services like all water pipe lines, return air risers, conduits for electrical wiring, switch boards for lighting and equipment, cutouts for terminal HEPA modules, lights, switch boards, etc. Necessary cut outs and provisions shall be made as far as possible at factory. Cutting the panels at site shall be avoided. All services shall be laid by TIFR. After laying the services, all gaps around the services pipes, etc. shall be closed with the sealant.

2.17. TEST CERTIFICATES AND CALIBRATION CERTIFICATES:

Test certificates shall be submitted for all materials, equipment, filters, etc. All instruments, gauges, etc. shall have valid calibration certificates.

2.18. DOCUMENTATION:

Color drawings of layout in the appropriate size shall be laminated / framed and shall be displayed in the Plant room, AHU Room, Air conditioned area, etc. as per the instructions of Engineer – In - Charge.

2.19. IDENTIFICATION OF SERVICES AND EQUIPMENT:

For pipe work services & its insulation the colors of the bands shall comply with BS 1710: 1971. For duct work & its insulation the colors of the triangles shall comply with BS 1710: 1971.

All equipment, Panels, HEPA filter modules, Supply Air Diffusers / Grilles, Return Air Diffusers, etc. shall be numbered for proper identification. The tag numbers shall be stickered / painted on the equipment and same numbers shall be referred to as built drawings / documents.

2.20. CONTROL CABLING:

Control cabling shall be laid in PVC / GI conduits of required size. Conduits should be clamped neatly. Cable terminations and dressing shall be done properly and neatly.

2.21. WIRING AND TERMINATIONS:

MCC shall be completely factory assembled and wired.

Power connection shall be done by 660/1100 V grade single core PVC insulated copper conductor of min. cross section 4.0 Sq. mm. and control wiring shall be 650 V/1100 V PVC stranded single core copper conductor of minimum cross section 1.5 Sq.mm.

Each wire shall be identified by ferrules at each end in accordance with the schematics.

Wiring to the door shall be done by flexible cable and the cables shall be bunched, sleeved and cleated so that no mechanical damage can occur to the cables while opening/closing the door.

Not more than 2 wires shall be terminated at one control terminal to suit individual feeder requirements.

All terminations shall be of adequate current rating and size to suit individual feeder requirements.

Outgoing power terminations shall be designed for connecting PVC / XLPE aluminum cables. Suitable provision shall be made for termination of higher size cables.

Each control terminal block shall have 20% spare terminals.

Inter module wiring in the same panel shall be through vertical cable alley.

Inter panel wiring shall be through horizontal cable chamber at bottom.

Separate terminal blocks shall be provided for power and control cables.

2.22. CLEANROOM LIGHTING:

2.22.1. GENERAL:

General illumination at 500 lux for cleanrooms and 300 lux for corridors/grey area shall be provided by air tight cleanroom lighting suitable for 240V, single phase, and 50Hz power supply. The light fixture to be mounted in ceiling panels in such a manner to create a unitized assembly, free from and possible leaks at assembly locations. The fixture shall be of anodized aluminum/powder coated. Each lighting fixture shall be effectively earthed and earthing connection shall be taken from respective ballast box.

2.22.2. PRODUCT FEATURES:

- Approximate Size: 600 mm x 600 mm
- Recess mounted, bottom access, cleanroom LED light fixture.
- 42/18 Wattage, 240v light fixture

2.22.3. INSTALLATION:

- The light fixture manufacturer to give precise ceiling opening size before placing order to cleanroom contractor / ceiling manufacturer.
- For power supply of lighting fixtures, necessary wiring through flexible GI metal conduit with ball socket coupling from junction box up to terminal block of ballast box shall be done. Contractor has to take connections from the terminal block.
- The ballast box shall have provision for earthing by flexible PVC insulated single core (1.0sqmm) stranded copper conductor.
- Separate circuit wiring (up to 30%) be laid for lighting circuits which will have UPS backing.

2.22.4. MAKE & MODEL:

Shall be suitable for maintenance from bottom.

Light fixture : Wipro/Philips/Havells

3. STANDARDS

1. BS: EN: 779 – Filters
2. ISO 14644 Cleanroom classification standards.

4. TESTING PROCEDURE AT SITE

CLEANROOM CERTIFICATION AND ACCEPTANCE PROCEDURE

4.1. General:

This chapter is designed in order to define the requirements and the scope of the certification measurements. It shall include all details and requirements of the performance and documentation of the measurements. In addition, the qualification of equipment and certifying agency / crew is also given.

4.2. Certification:

Cleanroom classification is ISO 7 (Class 10000) at rest and ISO 8 (Class 100000) in operation.

The primary responsibility of the contractor is the certification of clean room at rest. Responsibility of certification of cleanroom in operation also lies with the contractor. However all the procedure suggested by the contractor will be followed by TIFR during certification of clean room in operation.

Cleanroom certification shall not be done by contractor and shall be done by qualified / experienced third party. Contractor shall take the approval for third party from consultant / TIFR before engaging them. Cleanroom certification shall be done at two stages. First certification is at rest condition and second certification when the clean room is occupied and operated.

4.3. Tests:

Certification shall be defined as the completion of measurements and the preparation of a summary report detailing the operation condition of the cleanroom.

For ISO class 7, following tests should be carried out, preferably in the order given.

- Air supply and extract quantities (Air flow volume determination).
- Air movement control between areas (Room pressurization measurement).
- Air movement control within the room (Air Balancing Test).
- Filter installation leakage test (DOP Test).
- Air borne particles.

- Lighting level measurement.
- Sound pressure level measurement.
- Uniformity measurement of temperature and relative humidity.
- Recovery test.
- Floor to ground resistance measurements.
- Wall to ground resistance measurements.

Any adjustments / rectifications / replacements required during the certification process shall be carried out by the contractor. If the defective HEPA filters are identified during the course of certification and testing, the same shall be replaced with new filters.

All the tests shall be done in accordance with the ISO standards and certification results shall be submitted in ISO formats.

All the instruments used for certification shall have calibration certificates. Calibration of all equipment should be traceable to nationally recognized standards within the previous twelve months or according to the recommendations of the equipment manufacturer. Calibration certificates shall be submitted to TIFR before starting the tests.

Certification shall not be started unless all the works are completed in the cleanroom.

Air conditioning system, lighting, etc. shall be fully commissioned and established before starting the certification tests.

Certification test shall be done in the presence of TIFR representative.

LIST OF MAKES

S.No.	Item Description	Approved Make
1	PUF panel	As per sample approved
2	DLP Truncking	Legrand/MK/Equivalent Approved
3	Wire mesh tray	Cablofil/Equivalent Approved
4	LED lights	Phillips/Wipro/Havells/Equivalent Approved
5	Cables	Polycab/Finolex/Havells/Equivalent Approved
6	MCB	Legrand/Schinder/Siemens/Equivalent Approved
7	Distribution Board	Legrand/Schinder/Siemens/Equivalent Approved
8	Switches & Sockets	Legrand/Schinder/Siemens/Equivalent Approved
9	Fire Alarm system	
10	Access control System	As per sample approved
11	Room Temperature, Humidity & Differential Pressure Sensor	Johnson Controls Siemens Honeywell MSR (Germany) GE Sauter OMicron Radix Greystone
12	Communication Cables / Signal Cable/ Control Cable	Varsha Deepanjan Technoflex
13	CA 6 cable	Dlink Amp Beldon

SECTION-VI **ANNEXURES**

ANNEXURE-I

Form of Performance Security (Guarantee) Bank Guarantee Bond-Format - I In consideration of the President of India (hereinafter called "The Government") having offered to accept the terms and conditions of the proposed agreement between…….and ……..……. (Hereinafter called "the said Contractor(s)") for the work…… (Hereinafter called "the said agreement") having agreed to production of an irrevocable Bank Guarantee for Rs. ……. (Rupees …… only) as a security/guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement. 1. We, ……. (hereinafter referred to as "the Bank") hereby undertake to pay to the Government an amount not exceeding Rs. …….. (Rupees……. Only) on demand by the Government. 2. We, …….(indicate the name of the Bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demure, merely on a demand from the Government stating that the amount claimed as required to meet the recoveries due or likely to be due from the said contractor(s). Any such demand made on the bank shall be conclusive as regards the amount due and payable by the bank under this Guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. …….. (Rupees …….only) 3. We, the said bank further undertake to pay the Government any money so demanded notwithstanding any dispute or disputes raised by the contractor(s) in any suit or proceeding pending before any court or Tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor(s) shall have no claim against us for making such payment. 4. We, ……. (indicate the name of the Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said agreement and that it shall continue to be enforceable till all the dues of the Government under or by virtue of the said agreement have been fully paid and its claims satisfied or discharged or till Engineer-in- Charge on behalf of the Government certified that the terms and conditions of the said agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee. 5. We, ……. (indicate the name of the Bank) further agree with the Government that the Government shall have the fullest liberty without our consent and without affecting in any manner our obligation hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Government against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act of omission on the part of the Government or any indulgence by the Government to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us. 6. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s). 7. We, ……. (indicate the name of the Bank) lastly undertake not to revoke this guarantee except with the previous consent of the Government in writing. 8. This guarantee shall be valid up to ……unless extended on demand by the Government. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. …… (Rupees ……..) and unless a claim in writing is lodged with us within six months of the date of expiry or the extended date of expiry of this 105 guarantee all our liabilities under this guarantee shall stand discharged. Dated the ……..day of ……for…….(indicate the name of the Bank).

ANNEXURE II

UNDERTAKING BY THE TENDERER

I / We have read and examined the Tender document including terms & conditions, specifications, Schedule of quantities, drawings and designs, general rules & directions, General Conditions of Contract, Special Conditions of Contract and all relevant other documents, publications and rules referred to in the Conditions of Contract and all other contents in the tender documents for the work.

I / We, hereby tender for execution of the work specified for the TIFR-Hyderabad, Hyderabad within the time specified and in accordance in all respects with the specifications, designs, drawings and instructions in writing.

We agree to keep the tender open for seventy five (75) days from the last date of its submission and not to make any modifications in its terms and conditions. A sum of Rs..... ……has been deposited in cash / receipt treasury challan / deposit at call receipt of scheduled bank / fixed deposit receipt of scheduled bank / demand draft of a scheduled bank / Bank Guarantee issued by a Scheduled Bank as earnest money. If I / we, fail to furnish the prescribed performance guarantee within prescribed period, I / we agree that the said TIFR-Hyderabad, Hyderabad or its authorized officer shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I / we fail to commence work as specified, I / we agree that the TIFR-Hyderabad, Hyderabad shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said earnest money and the performance guarantee absolutely, otherwise the said earnest money shall be retained by TIFR- Hyderabad, Hyderabad towards security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein.

Further, I / We agree that in case of forfeiture of earnest money or both Earnest Money & Performance Guarantee as aforesaid, I / We shall be debarred for participation in the re-tendering process of the work.

I / We hereby declare that I / We shall treat the tender documents, drawings and other records connected with the work as secret / confidential documents and shall not communicate information derived there-from to any person other than a person to whom I / We am / are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Seal & Signature of Contractor Postal Address

Dated

Witness

Address Occupation

ANNEXURE-III

CERTIFICATE OF LOCAL CONTENT

***We [name of manufacturer] hereby confirm in respect of quoted item(s) that local Content is equal to or more than 50% and come under 'Class-I Local Supplier' Category. As being 'Class-I Local Supplier', we are eligible for Purchase Preference under 'Make in India' Policy vide GoI Order No.P-45021/2/2017-PP (B.E.-II) dated 15.06.2017 (subsequently revised vide orders dated 28.05.2018, 29.05.2019 and 04.06.2020)**

OR

***We [name of manufacturer] hereby confirm in respect of quoted items(s) that Local Content is more than 20% but less than 50% and come under 'Class-II Local Supplier' Category.**

The details of the location (s) at which the local value addition made is / are under:
1. ……

2. ……

Date: **Seal & Signature of the Bidder**

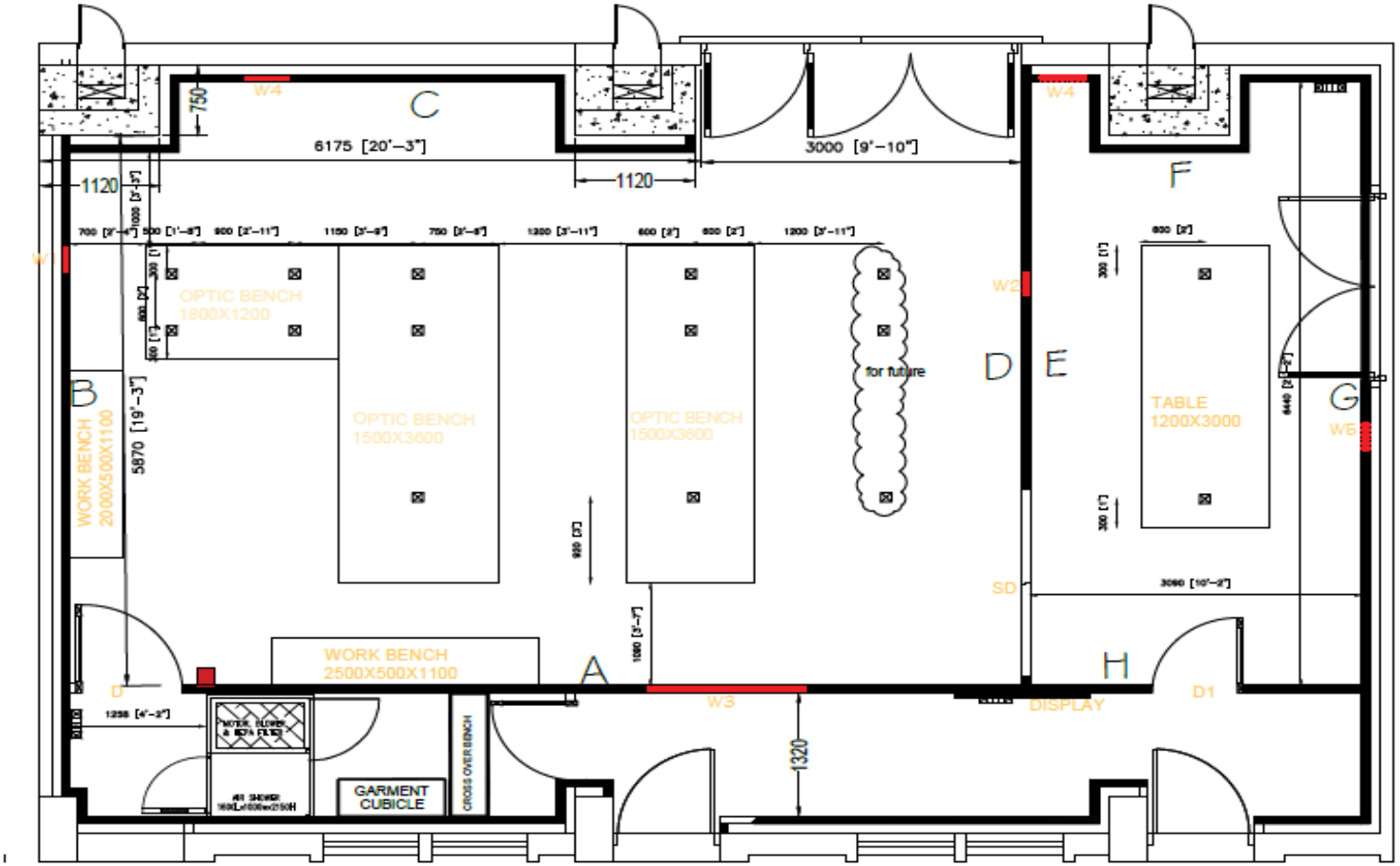
NOTE:

Self-certification that the item offered meets the minimum local content (as above) giving details of the location(s) at which the local value addition is made in case the bidder wishes to avail the benefits under the make in India policy, if applicable.

In cases of procurement for a value in excess of Rs.10 crores, the local supplier shall be required to provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content to avail the benefits under the make in India policy, if applicable

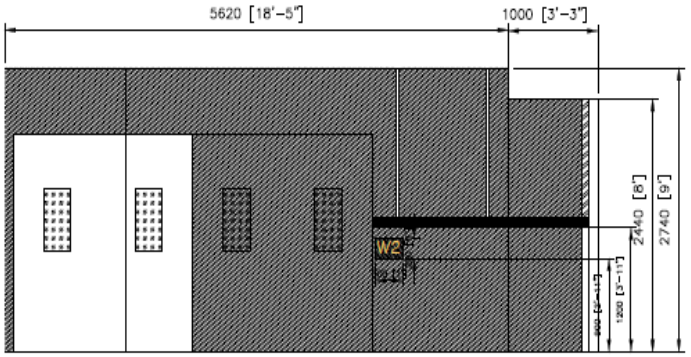
ANNEXURE-IV

10000 CLASS CLEANROOM LAYOUT

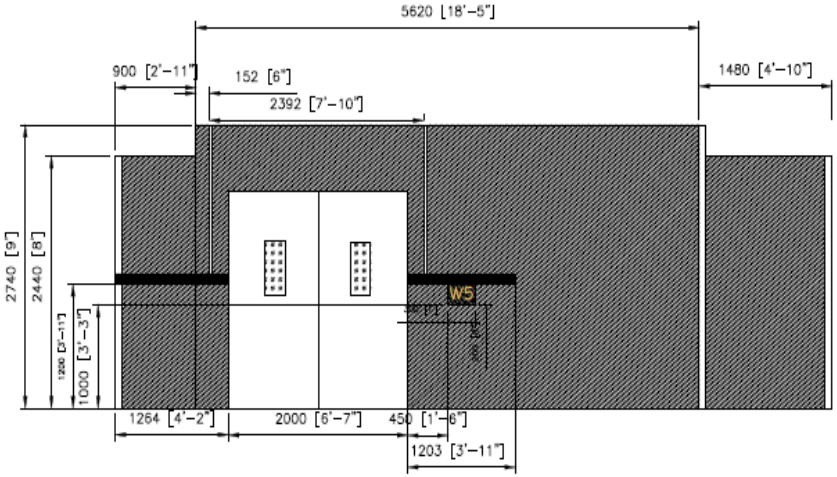


ELEVATIONS


1000 [3'-3"]
100 [4"]
1598 [5'-3"]
1300 [4'-3"]
1250 [4'-1"]
1047 [3'-5"]
1500 [4'-11"]
W3
1350 [4'-5"]
1200 [3'-11"]
8893 [29'-2"]
ELEVATION A
1018 [3'-4"]
3520 [11'-7"]
1300 [4'-3"]
2440 [8']
W4
5863 [19'-3"]
ELEVATION C
5770 [18'-11"]
750 [2'-6"]
1780 [5'-10"]
1000
600 [2']
W1
2740 [9']
2440 [8']
1200 [3'-11"]
ELEVATION B
5620 [18'-5"]
W2
2180 [7'-2"]
ELEVATION D



ELEVATION
E



ELEVATION
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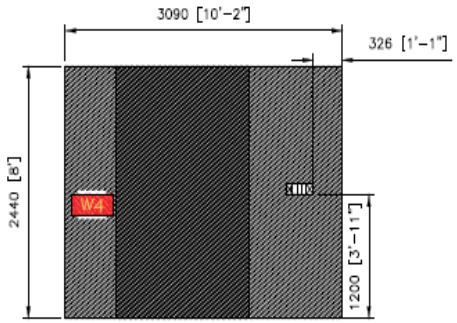
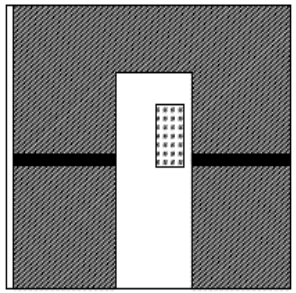
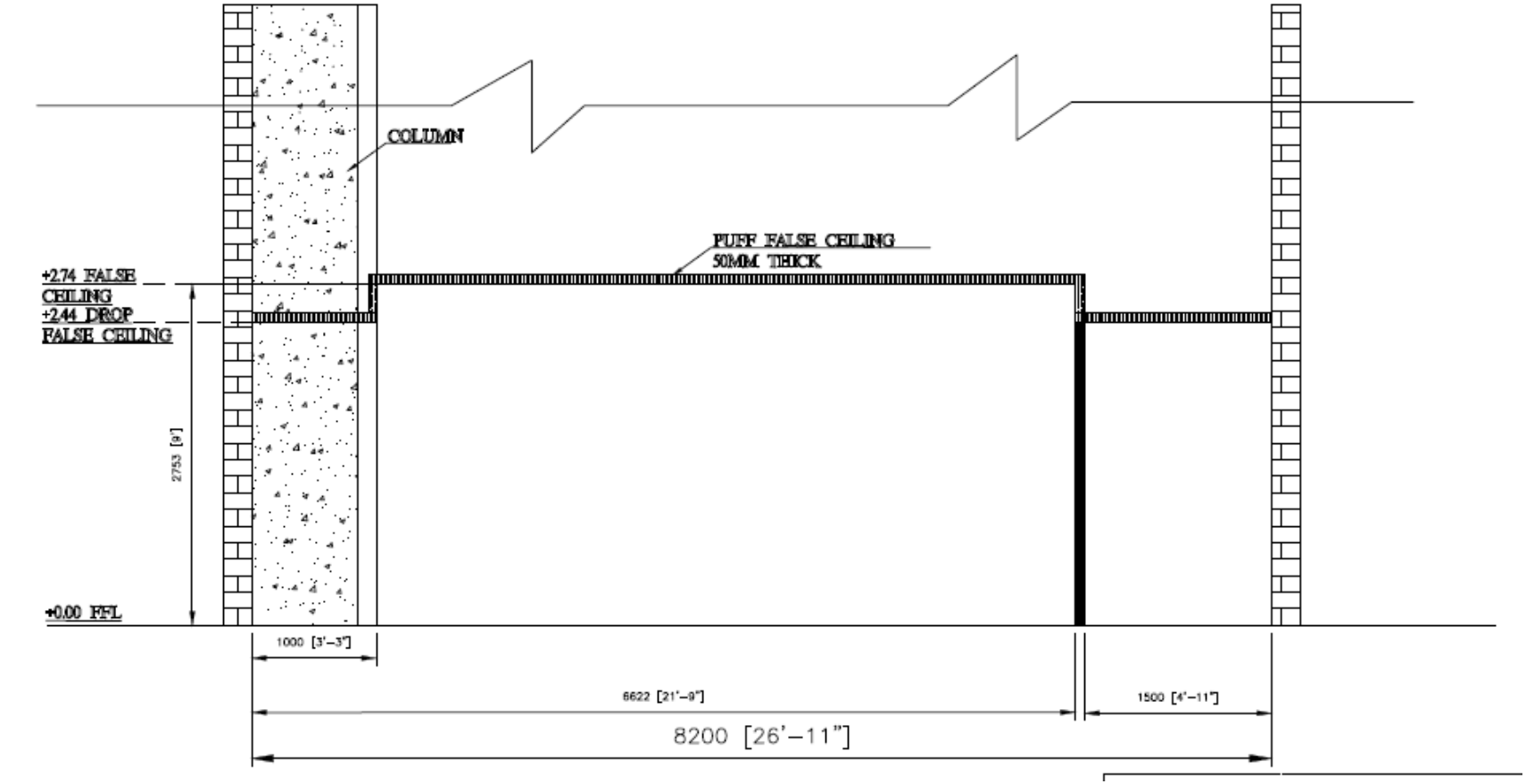


ELEVATION
F



ELEVATION
H

CROSS SECTION



SECTION-VII	FINANCIAL BID

INVITATION OF BIDS FOR

Supply, Installation, Testing & Commissioning of 10000 class cleanroom for laser lab at TIFR, Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist., Hyderabad-500046

PART-II

FINANCIAL BID

SCHEDULE OF QUANTITIES

S.No.	Work Description	Qty (A)	Unit	Rate/ Unit (B)	Amount (C=AXB)
1	Supply and Installation of 80 mm thick modular powder coated clean room wall panels made of 0.8 mm thick for outer skin and 0.8 mm thick for inner skin electro zinc steel sheet on both sides with PUF insulation of density 42 kg / cub. mt., supports, cut outs, etc. Powder coating thickness shall be 60 to 80 micron. Aluminium interconnecting profiles, floor track for the level adjustment, etc. shall be provided. Panels shall have all the provisions required for services entry, return air grilles, switch boards, isolators, etc. The areas of doors / view panel will not be included in the measurement. All other cutouts will not be deducted in the measurement. All cutouts shall be properly finished with end cover with concealed screws, etc. All cutouts shall be done at factory as per the approved shop drawings. Shop drawings shall be submitted for review and approval. Panels shall have the conduits necessary for various switch boards, DLP bar, sockets, etc. Prototype mock up shall be submitted and get it approved.	155	SQMTR		
2	Supply and Installation of 50 mm thick modular powder coated clean room ceiling panels made of 0.8 mm thick for outer skin and 0.8 mm thick for inner skin electro zinc steel sheet on both sides with PUF insulation of density 42 kg / cub. mt., supports, cut outs, etc. Powder coating thickness shall be 60 to 80 micron. Panels shall have ceiling suspension system with GI threaded rods, leveling arrangement, Hilti anchor fasteners, aluminium interconnecting profiles, etc. The ceiling panels shall have cutouts for filter modules, lights, provision for fixing the smoke detectors, etc. The cutouts for light fixtures / filter modules / etc. will not be deducted from the measurement. All cutouts shall be done at factory as per the approved shop drawings. Shop drawings shall be submitted for review and approval. Ceiling shall be capable of taking the dead load and suitable for walking freely. Prototype mock up shall be submitted and get it approved.	135	SQMTR		

3	Supply and Installation of powder coated clean room 50 mm thick single leaf flushed doors made of 0.8 mm thick for outer skin and 0.8 mm thick for inner skin electro zinc steel sheet on both sides with PUF insulation of density 42 kg / cub. mt., with all fittings, view panel, door closure, etc. Size of the door shall be considered tentatively as indicated in the drawing. Powder coating thickness shall be 60 to 80 microns. Doors shall have door frame, double glazing see thru glass / view panel, hardware like door closure, SS handles, SS ball bearing butt hinges and automatic door bottom seal, etc. Each door shutter shall be with lock seam joints at style edges with required no. of stainless steel butt hinges SS304 of size 100mm*75mm-(3nos) with HSN screws.Mortice Lock(make: Door set)-1no., auto drop bottom seal 1set,SS Sick plate-1set,Dtype 19mm dia *250mm steel handel for pull & push -2no.,Door closer (Dorma/ equivalent make) 1no. All the fittings shall be compatible for a clean room. Doors shall have an automatic bottom flap to seal the gap below the door when the door is closed. View panel size in each leaf of the door shall be 600 x 300 mm. Complete door hardware and accessories shall be of Dorma make. Size : 1000 x 2100 mm - 4 no.	8.5	SQMTR		
4	Supply and Installation of powder coated clean room 50 mm thick double leaf flushed doors made of 0.8 mm thick for outer skin and 0.8 mm thk for inner skin electro zinc steel sheet on both sides with PUF insulation of density 42 kg / cub. mt., with all fittings, view panel, door closure, etc. Size of the door shall be considered tentatively as indicated in the drawing. Powder coating thickness shall be 60 to 80 microns. Doors shall have door frame, double glazing see thru glass / view panel, hardware like door closure, SS handles, SS ball bearing butt hinges and automatic door bottom seal, etc. Each door shutter shall be with lock seam joints at style edges with required no. of stainless steel butt hinges SS304 of size 100mm*75mm-(3nos) with HSN screws.Mortice Lock(make: Door set)-1no., auto drop bottom seal 1set,SS Sick plate-1set,Dtype 19mm dia *250mm steel handel for pull & push -2no.,Door closer (Dorma/ equivalent make) 1no. All the fittings shall be compatible for clean room. Doors shall have automatic bottom flap to seal the gap below the door when the door is closed. View panel size	4.2	SQMTR		

	in each leaf of the door shall be 600 x 300 mm. Complete door hardware and accessories shall be of Dorma make. Size : 2000 x 2100 mm - 1 no.				
5	Design, Supply and Installation of powder coated clean room 50 mm thk.single leaf flushed manual operated sliding door made of 0.8 mm thk for outer skin and 0.8 mm thk for inner skin electro zinc steel sheet on both sides with PUF insulation of density 42 kg / cub. mt., with all fittings, view panel, door closure,SS Door frame, ss internal & external handle, rail guide, sliding rail, supports, wheels and other required components to complete the sliding door to ensure hermetically sealed. Size of the door shall be considered tentatively as indicated in the drawing. Powder coating thickness shall be 60 to 80 microns. Complete door hardware and accessories shall be of Dorma make. Size : 2000 x 2100 mm - 1 no.	4.2	SQMTR		
6	Supply and Installation of view panel of 1500 x 500 mm size with both sides glass completely sealed with necessary frame, etc. as per the specifications.	1	NO		
7	Supply and Installation of Aluminium powder coated coving shall be R 50 and painted with the same colour of ceiling panels, etc. Coving shall be provided at floor to wall corners, wall to ceiling corners and wall to wall corners. External corners also shall be coving wherever is applicable. Coving shall be fixed with snap fit and corner round shall be considered as required. Refer the drawing enclosed.	280	RMT		
8	Supply and Installation of 750MM width concealed return air raisers made of 24 G powder coated GI sheet shall be provided in the Sr. No. 1 clean room panels wherever required and as per the drawing.	12	NOS		
9	Supply and Installation of 450MM width concealed return air raisers made of 24 G powder coated GI sheet shall be provided in theSr No.1 clean room panels wherever required and as per the drawing .	2	NOS		
10	Charges for making removable panel of 300mm X 200mm size with proper fixing arrangement and sealant. The removable panel is meant for taking the services like water / gas utilities through the panel. Once all the services are in place, client will make a marking on the	3	NOS		

	panel where the cutouts / openings are required. Removal panels need to be taken to the factory and make the required openings and reinstall the panels. After installing the services by the client, gaps around the services shall be closed / sealed with single chemical expandable PUF spray tins.				
11	Charges for making removable panel of 450mm X 200mm size with proper fixing arrangement and sealant. The removable panel is meant for taking the services like water / gas utilities through the panel. Once all the services are in place, client will make a marking on the panel where the cutouts / openings are required. Removal panels need to be taken to the factory and make the required openings and reinstall the panels. After installing the services by the client, gaps around the services shall be closed / sealed with single chemical expandable PUF spary tins.	2	NOS		
12	Supply, Installation, Testing and Commissioning of MS / GI epoxy painted bottom loading terminal boxes with damper for mounting mini pleat HEPA filters with all accessories suitable for 610 x 610 x 150 mm filters. Damper shall be operated from below through bevel gear arrangement. Shall have the arrangement for DOP test, etc. Filter modules shall be suitable for knife edge filters and necessary gel seal shall be provided.	12	NOS		
13	Supply, Installation, Testing and Commissioning of MS / GI epoxy painted bottom loading terminal boxes with damper for mounting mini pleat HEPA filters with all accessories suitable for 310 x310 x 150 mm filters. Damper shall be operated from below through bevel gear arrangement. Shall have the arrangement for DOP test, etc. Filter modules shall be suitable for knife edge filters and necessary gel seal shall be provided.	2	NOS		
14	Supply & fixing of Supply Air EN 1822 standard H13 HEPA Filter mini pleat type, false ceiling type, fabricated out of GI Powder Coated. Filters shall be rated for 500 CFM at face velocity of 125 fpm. EN 1822 H13 standard HEPA Filter. HEPA Filter Size: 610mm x 610mm x 150mm Ht (For Supply Module) - 500 cfm capacity. Filters shall be box type with knife edge suitable for the above filter module with gel seal.	12	NOS		

15	Supply & fixing of Supply Air EN 1822 standard H13 HEPA Filter mini pleat type, false ceiling type, fabricated out of GI Powder Coated. Filters shall be rated for 500 CFM at face velocity of 125 fpm. EN 1822 H13 standard HEPA Filter. HEPA Filter Size: 305mm x 305mm x 150mm Ht (For Supply Module) - 150 cfm capacity. Filters shall be box type with knife edge suitable for the above filter module with gel seal.	2	NOS		
16	Supply, Installation, Testing and Commissioning of EN 779: G4 Pre-filter in the return air raisr down to 10 microns with 90% efficiency. Filters shall be rated for 500 fpm face velocity and should have easy fixing method. EN 779: G4 Pre-filter in the return air raisr for 600 mm x 150 Mmm size.	12	NOS		
17	Supply, Installation, Testing and Commissioning of EN 779: G4 Pre-filter in the return air raisr down to 10 microns with 90% efficiency. Filters shall be rated for 500 fpm face velocity and should have easy fixing method. EN 779: G4 Pre-filter in the return air raiser for 300 mm x 150 Mmm size.	2	NOS		
18	Supply, Installation, Testing and Commissioning of perforated type Supply Air Grilles made of 20G SS 304 for HEPA filters of size 710mm x 710mm (Outer / Outer)	12	NOS		
19	Supply, Installation, Testing and Commissioning of perforated type Supply Air Grilles made of 20G SS 304 for HEPA filters of size 405mm x 405mm (Outer / Outer)	2	NOS		
20	Supply, Installation, Testing and Commissioning of perforated type Return Air Grilles made of 20G SS 304 complete with provision for fixing / holding the Pre-Filter (EN 779 : G4).Grill Size: 700 x 250 MM	12	NOS		
21	Supply, Installation, Testing and Commissioning of perforated type Return Air Grilles made of 20G SS 304 complete with provision for fixing / holding the Pre-Filter (EN 779 : G4).Grill Size: 300 x 250 MM	2	NOS		
22	Supply, installation, Testing and commissioning of magnehelic gauge with SS box flushed with the panels and tubes as per the specifications for measuring the room differential pressures. Shall be installed in the required locations, with necessary SS pressure sensing probes.	2	NOS		

23	Supply, Installation, Testing and Commissioning of sub floor preparation with self leveling compound. Sub floor preparation shall be done over existing flooring.	100	SQMTR		
24	Supply, Installation, Testing and Commissioning of 2 mm thick epoxy flooring. Flooring shall be finished with VDF flooring and self-leveling compound before the epoxy flooring	100	SQMTR		
25	Validation of cleanroom and documentation for cleanroom for air velocity test, DP test, particle count, cleanroom classifications, pressure balancing, temperature test, RH test, laminar flow visualization video, recovery test with video, etc. Validation shall be done by approved third party and documents shall be professionally prepared. All the formats shall be submitted for review and approval by the client. Whatever modifications, adjustments need to be done for achieving the proper results shall be carried out before final test. If the test results are not satisfactory, testing shall be repeated at no extra cost.	1	JOB		
26	Supply, erection, testing and commissioning of personal Air shower, single entry and single exit, high velocity, low pressure system SS 304 nozzles, pre and HEPA filters, completely self contained unit, utilizing low wall return (floor grill type not accepted) The unit shall be consisting of ISO class 7 cleanroom compatible pre- fabricated unit, having fluorescent lamp with acrylic cover, electronic ballast, both side red and green indicators, electro - magnetic latches on both sides of Dorma make to ensure both doors do not open simultaneously. 5.0 mm thick viewing glass, SS 304 finish handles of Dorma make, door closer with hold open arm of Dorma make, blower, control wiring emergency stop switch etc.	1	NOS		
27	Supply, installation, testing and commissioning of garment cubicle of size 1000 mm x 750 mm with GI powder coated sheet with pre filters, blower, HEPA filters suitable for 8 pairs as per the drawing. Garment cubicle shall have leveling bolt, hangers, UV tube light of 15 W, sliding glass door, etc. Garment cubicle shall be compatible for ISO Class 7 clean room	1	NOS		
28	Supply, installation, testing and commissioning of 1300mm or as per the approved drawing wide cross over bench made up of 20 G SS with necessary SS frame work	1	NOS		

	which has to fully fixed in the designated place in the change room. Bottom of bench will have pigeon holes for keeping day shoes / CR sleepers in two rows.				
29	Supply of set of cleanroom clothing suitable for Class 10000 clean room consisting of apron, cap, mouth cover, sleepers, etc. Size shall be medium size.	10	SET		
30	"Supply, laying, testing & commissioning of 1.1 KV 4C X 16 sq.mm FR PVC insulated copper conductor cable as per IS 694 with latest amendments & as per technical specifications. Cable shall be laid on the wall/ceiling through PVC conduits and as per the instructions of E.I.C. Make: Polycab/Havells/Finolex/RR Cables"	40	RMT		
31	Supply, Installation of suitable single compression PVC Gland, Copper Lugs and accessories for termination of 4CX16 sq.mm cable in the Distribution Board.	4	SET		
32	Supply, laying, termination, testing & commissioning of 1.1 KV 1C X 16 sq.mm FR PVC insulated copper conductor cable as per IS 694 with latest amendments & as per technical specifications & as per the instructions of E.I.C. Cable shall be laid on the wall/ceiling and rates are all inclusive of accessories like clamps. screws, saddles, etc required to lay on wall/ceiling Make: Polycab/Havells/Finolex/RR Cables"	40	RMT		
33	Supply, laying, termination, testing & commissioning of 1.1 KV 3C X 4 sq.mm FR PVC insulated copper conductor cable as per IS 694 with latest amendments for power circuits and laying on existing Concealed PVC Conduit on wall or False ceiling including suitable copper lugs for termination in DBs Make:Polycab/Havells/Finolex/RR Cables`	340	RMT		
34	Supply, laying, termination, testing & commissioning of 1.1 KV 3C X 2.5 sq.mm FR PVC insulated copper conductor cable as per IS 694 with latest amendments for power circuits and laying on existing Concealed PVC Conduit on wall or False ceiling including suitable copper lugs for termination in DBs Make:Polycab/Havells/Finolex/RR Cables	85	RMT		
35	Supply, laying, termination, testing & commissioning of 1.1KV 3C X 1.5 sq.mm FR PVC insulated copper conductor cable as per IS 694 with latest amendments for Lighting	225	RMT		

	circuits and laying on existing Concealed PVC Conduit on wall or False ceiling. Make:Polycab/Havells/Finolex/RR Cables				
36	Supply, installation , testing & commissioning of 6Way Ready Made TPN Distribution Boards shall be surface/recess mounting vertical/horizontal type , 415 volts TPN MCB for Incoming, distribution board of sheet steel, dust protected ,duly powder painted, inclusive of 100 amps tinned copper interconnections with appropriate capacity size of PVC insulated copper conductor wires (ISI marked) suitable for mounting necessary isolators /MCBs/ELCBs etc., and suitable for concealed mounting /wall mounting with M.S enclosure fabricated out of min 18 SWG/20 SWG thick M.S CRCA sheet as per manufacturers standard, with concealed hinged door locking arrangement etc., including earthing clamps ,common neutral link, earth bar, din bar for mounting MCB's (but without MCB's) as required as per IS:13032 and IEC 60647-2 equivalent to Legrand Cat No.5076 71 (Make : Legrand/ ABB/ Siemens /equivalent approved)	2	NOS		
37	Supply, installation , testing & commissioning of ISI Marked and accepted standard of 63A, FP Miniature Circuit Breaker (MCB) of 'C' series suitable for 240/415 Volts AC , 50Hz, 10kA confirming to IS: 8828 : 1996, IEC: 60898-1 : 2002. MCBs and Distribution Boards should be the same make only. (Make:Legrand/ABB/Siemens/Schneider/Equivalent approved) (Equivalent to Legrand Catalog No. 4087 02	2	NOS		
38	Supply, installation , testing & commissioning of ISI Marked and accepted standard of 6-32A SP Miniature Circuit Breaker (MCB) of 'C' series suitable for 240/415 Volts AC , 50Hz, 10kA confirming to IS: 8828 : 1996, IEC: 60898 : 2002. MCBs and Distribution Boards should be the same make only. approved (Make: Legrand/ABB/Siemens/Schneider/Equivalent to Legrand Catalog No. 4085 87 to 4085 95)	20	NOS		
39	Supply , Fixing, Testing and Commissioning of 6 modular switch board including 16A Sockets -2No, information socket 1No., & 20/16A Switches -1Nos Indicator type with suitable PVC flush Box and cover plates with interconnections. Switch Boards shall be concealed on	20	NOS		

	the wall. (Make: Legrand /MK/ Equivalent to M/s. Legrand Catalog No. 572563,573629, 573671, 575742 & 573571). Switch boards shall be fixed in the wall panels/ to the ceiling panels/ walls/as instructed by E.I.C.				
40	Supply , Fixing, Testing and Commissioning of 6 modular switch board including 16A Sockets -2No, information socket 1No., & 20/16A Switches -1Nos Indicator type with suitable PVC flush Box and cover plates with interconnections. Switch Boards shall be concealed on the wall. (Make: Legrand /MK/ Equivalent to M/s. Legrand Catalog No. 572063, 573429,573471, 575740 & 573571). Switch boards shall be fixed in the wall panels/ to the ceiling panels/ walls/as instructed by E.I.C	20	NOS		
41	Supply and installation emergency switch (Push to release) with suitable transparent enclosure	1	NOS		
42	Supply, laying and fixing of DLP Plastic Trunking 150X50mm with 2 compartment (Equivalent to Legrand Cat No. 10432)	25	RMT		
43	Supply, laying and fixing of DLP Flexible Cover 65mm width (Equivalent to Legrand Cat No. 10521)	50	RMT		
44	Supply and fixing of Clip ON Partitions (Equivalent to Legrand Cat No. 010472)	25	NOS		
45	Supply and fixing of Joint for 65mm width cover (Equivalent to Legrand Cat No. 010801)	50	NOS		
46	Supply and fixing of Base Joint (Equivalent to Legrand Cat No. 010691)	25	NOS		
47	Supply and fixing of End Cap (Equivalent to Legrand Cat No. 010706)	10	NOS		
48	Supply and fixing of Internal Angles-ADJ FRM 80 Deg (Equivalent to Legrand Cat No. 010602)	10	NOS		
49	Supply and fixing of External Angles-ADJ FRM 60 Deg (Equivalent to Legrand Cat No. 010622)	5	NOS		
50	Supply and fixing of Flat Angles (Equivalent to Legrand Cat No. 010789)	5	NOS		
51	Supply and fixing of Flat Junctions (Equivalent to Legrand Cat No. 010732)	5	NOS		
52	Supplyand fixing of 4Module DLP SUPT.FR for 65mm Cover (Equivalent to Legrand Cat No. 010954)	39	NOS		
53	Supply, Installation, Testing & Commissioning of 6/16A 3 Pin Shutter Socket 3 Module AR (Equivalent to Legrand Cat No. 5734 67)	27	NOS		

54	Supply, Installation, Testing & Commissioning of 20A Switch IND SP 1Way 1Module AR (Equivalent to Legrand Cat No. 5720 63)	39	NOS		
55	Supply and installation of over door light unit equivalent to Cat No. Legrand 572453	2	NOS		
56	Supply, Installation, testing and commissioning of Air Curtain With Sensor & Remote Specifications: Size of Opening: 1000 (Width) & 2.5Mtrs Height, Size of Air Curtain: 1000mm, Body: GI powder coated from jindal steel with inner & outer body (Vibration free technology), Speed: Single, Suction : Front, Grills : ABS Plastic,, Motor : Continuous rating, Power supply: 230V, 50Hz, Single Phase, Noise Level: 50-55 dB. Make: Euronics/Russell/ or Equivalent to Euronics ABE 3	1	NO		
57	Design, Supply, installation, testing and commissioning of conventional fire alarm system comprises fire alarm panel, multi sensor detectors with base, Manual call point, Strobe, required 2 Core 1.5Sq.mm Armoured Red cable, other required accessories etc to complete the system. Make: System Sensor/Equivalent	1	LOT		
58	Supply and installation of Stainless steel 304 wire mesh cable tray with required accessories for ceiling mounting. Size: 30mm X 200mm (HeightXWidth) Make: Cablofil/Equivalent	12	RMT		
59	Supply, laying, termination, testing & commissioning of vermin proof, industrial type 2x2 feet 36W ceiling mounted LED light. Colour Temperature :6500K Make:Phillips/Wipro/Equivalent	17	NOS		
60	Supply, laying, termination, testing & commissioning of vermin proof, industrial type 1x1 feet 18W ceiling mounted LED light. Colour Temperature :6500K Make:Phillips/Wipro/Equivalent	4	NOS		
61	Supply, Installation, Testing and commissioning of Card based Single Door Access Controller comprises of following features and components: Smart Card and Mobile Phone(BLE), Ethernet, PoE, Wi-Fi and BLE, Door Lock, Door Sense, Exit Reader, Exit Switch, RS-485/RS-232, Wiegand IN/OUT, IP65 Rated Controller	2	NOS		

	with Built-in Readers, Tri-color LED and Buzzer, 12VDC Power Supply through Adaptor or Battery Backup, Exit button, Electro Magnetic lock - 600lb and 10No.s Smart Cards				
62	Room Type Temperature & Relative Humidity Sensor for Measuring room air Temperature & Humidity (High Accuracy - +/- 0.2 deg.C and +/- 2% RH)	1	NOS		
63	Cleanroom monitoring / display unit to be installed outside the room connecting to 1 no. T&RH Sensors installed inside the room. Display units shall be suitable for cleanroom installation with SS plate/ powder coated GI and round edges	1	NOS		
64	Supply , Fixing, Testing and Commissioning of modular switch board including 3 No.s 6A switches with suitable PVC flush Box and cover plates with interconnections. Switch Boards shall be concealed on the wall. (Make: Legrand /MK/ Equivalent to M/s. Legrand Catalog No. 573400/573600). Switch boards shall be fixed in the wall panels/ to the ceiling panels/ walls/as instructed by E.I.C	4	NOS		
65	Supply , Installation, Testing and commissioning of 63A, AC 4 pole power contactor with 2 NO & 2 NC contacts. Make: Schneider/ ABB/Siemens /Equivalent to Catalog no. Schneider A9C20868	2	NOS		
				Sub Total (D)	
				GST@18% (E)	
				Total Amount in Rs. (F=D+E)	

Total amount in words: Rs.....

..... only.

Note:

1. **Rates are all inclusive of profit, packing & forwarding, transport, loading & unloading, labour and taxes etc.,**
2. **Hyderabad has right to delete any above items from scope of work or may increase /reduce quantities as per its requirement during execution of work. No claim or compensation of such deletion/increase/decrease will be accepted/paid to the contractor. Payment will be made as per actual quantities executed at tender rates.**
3. **Manufacturer's warranty of respective supply items to be provided.**
4. **For any above item quantity exceeding more than 10% of projected Qty, contractor shall take prior approval from TIFR Engineer- In -Charge in writing.**
5. **For any deviating items, the contractor shall take prior approval from TIFR Engineer In Charge with proper rate analysis.**