



टाटा मूलभूत अनुसंधान संस्थान
TATA INSTITUTE OF FUNDAMENTAL RESEARCH
भारत सरकार के परमाणु ऊर्जा विभाग की स्वायत्त संस्था एवं समविश्वविद्यालय
(An Autonomous Institute of the Department of Atomic Energy,
Government of India, and a Deemed University)
सर्वेक्षण संख्या 36 / पी, गोपनपल्ली गांव, सेरिलिंगमपल्ली मंडल, रंगारेड्डी जिला, हैदराबाद - 500 046
36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District, Hyderabad - 500 046

Telephone:+91-40-20203009	Date:19.07.2024
Website : www.tifrh.res.in	Email: krishnaae@tifrh.res.in

NOTICE INVITING TENDER

(TWO PART PUBLIC TENDER) for the following works:

Supply, Installation, Testing and commissioning of New clean room and related works for Laser lab in FReT-B,TIFR,Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist.,Hyderabad-500046.	
निविदा सं. Tender No.	TIFR/PD/CF24-60/240410
निविदा का प्रकार Type of Tender	Two Part Tender (Part-I: Technical Bid and Part- II: Price Bid)
अनुमानित लागत Estimated Cost	Rs.13,27,140/-
ईएमडी की लागत Cost of EMD	Rs.26,545/- (डिमांड ड्राफ्ट "टीआईएफआर सेंटर फॉर इंटरडिसिप्लिनरी साइंसेज" के पक्ष में तैयार किया जाना है, जो हैदराबाद में देय है (तकनीकी बोली भाग - I के साथ संलग्न किया जाना है)।" Rs.26,545/- (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).
बोली पूर्व बैठक और समय Pre bidding meeting & Time	25.07.2024 at 14:00 Hrs
निविदा प्रस्तुत करने की अंतिम तिथि Last Date for Submission of Tender	30.07.2024 by 13:00 Hrs
बोली खोलने की तिथि (केवल भाग-I: तकनीकी बिड) Date of Opening Bids(Only Part-I: Technical Bid)	30.07.2024 at 15:30 Hrs
निविदा शुल्क Tender Fee	"रु.500/- रुपये (हैदराबाद में देय "टीआईएफआर सेंटर फॉर इंटरडिसिप्लिनरी साइंसेज" के पक्ष में तैयार किया जाने वाला डिमांड ड्राफ्ट (तकनीकी बोली भाग-I के साथ संलग्न किया जाना है)।" 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)).

- "यदि भाग "I" और भाग "II" बोलियों को अलग-अलग लिफाफों में सील नहीं किया जाता है तो निविदा को अस्वीकार कर दिया जाएगा।"



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- In case the Part "I" and Part "II" bids are not sealed in separate envelopes the tender will be rejected.
- तकनीकी बोली में मूल्य का कोई संकेत नहीं होना चाहिए।
The technical bid should not contain any indication of the price.
- निविदा शुल्क और ईएमडी के भुगतान के बिना प्राप्त तकनीकी बोली को सरसरी तौर पर अस्वीकार कर दिया जाएगा। The Technical Bid received without payment of tender fees and EMD shall be summarily rejected.

संपर्क: श्री कृष्ण, दूरभाष: 040- 20203009 किसी भी तकनीकी या वाणिज्यिक शर्तों के लिए निविदा में उल्लिखित स्पष्टीकरण Contacts: Mr. Krishna, Tel: 040- 20203009 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 30.07.2024 by 13:00 Hrs.

(Rajasekhar. R)

Head-Technical Services



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TENDER DOCUMENT

Supply, Installation, Testing and commissioning of New clean room and related works in Laser lab in FReT-B, 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 30.07.2024 by 13:00 Hrs



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TECHNICAL BID

VOLUME-I

Supply, Installation, Testing and commissioning of New clean room and related works in Laser lab at TIFR, Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist., Hyderabad-500046.



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Tender Notice	:	TIFR/PD/CF24-60/240410
Name of Work	:	Supply, Installation, Testing and commissioning of New clean room and related works in Laser lab in FReT-B, 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.13,27,140/-
EMD	:	Rs.26,545/- (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).
Delivery Period	:	90 Days (Completion Period)
Validity	:	Seventy Five (75) 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 and commissioning of New clean room and related works in Laser lab in FReT-B, 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	25.07.2024 at 14:00 Hrs
c)	Closing date & time of receipt of bids	30.07.2024 by 13:00 Hrs
d)	Date & time of opening of Sealed Cover-I containing Technical Bid	30.07.2024 at 15:30 Hrs
e)	Date of opening of Sealed cover-II containing Financial of eligible bidders	To be intimated to eligible bidders subsequently which is likely to be within 7 days after opening of Technical Bid

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.



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- 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 and commissioning of New clean room and related works in Laser lab in FReT-B, 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/Declaration Letter 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 and commissioning of New clean room and related works in Laser lab in FReT-B, 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.



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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 (**two Running Bill**) shall be 35% of the work order value. All interim 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 i.e. Original invoice, Inventory, etc. All interim bills will be paid within **30** 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.



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SECTION-II

ELIGIBILITY CRITERIA FOR TENDER QUALIFICATION

Supply, Installation, Testing and commissioning of New clean room and related works in Laser lab in FReT-B, 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, 2024 audited by CA.
4. The Agencies/Contractors should have an average annual turnover of **Rs.5.30** lakhs during three previous financial years ending March 31, 2024.
5. The Agencies/Contractors should have a latest solvency certificate issued by any nationalized bank of value not less than **Rs.5.30**.
6. The Agencies/Contractors 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.
7. The Agencies/Contractors should have valid PAN from Income Tax Authority, GST registration No. etc. and any other registration applicable/mandatory for contract.
8. The Agencies/Contractors should have executed similar installations of Clean rooms works successfully at least
 - 8.1. One similar work costing **Rs.10.61** Lakhs or
 - 8.2. Two similar works costing **Rs.7.96** Lakhs or
 - 8.3. Three similar works costing **Rs.5.30** Lakhs 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 value of executed works shall be brought to the current costing level by enhancing the actual value of work at a simple rate of 7% per annum calculated from the date of completion to the last date of receipt of applications for tender.

The Agencies/Contractors should furnish copies of work orders along with BOQ and completion certificates are mandated from the clients in support of the above.



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Note:

- ❖ Agencies/Contractors are advised to inspect the site to understand the scope of work comprehensively before submission of tender.
- ❖ Agencies/Contractors should arrange the site inspection to TIFR officials for the qualifying works at their own cost if required.
- ❖ 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.



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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) Labour License Details :
- 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)



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SCHEDULE – B

Major Clean Room Works (Copies of the completion certificate to be enclosed)

A. Similar work of costing **Rs.10.6** lakhs or two similar works of costing **Rs.7.96** lakhs or 3 similar works of costing **Rs.5.30** Lakhs during last 7 financial years ended on end date of receiving tender for Research Institutes, Universities, Private Laboratories, R & D institutes, etc

S r. N o	Name of the project & Address	Descr iption of work in brief	Name of the Engineer	Name of the client 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 /uncomplete d or the contract was terminated from either side? Give Details.	Any other relevant information relevant information
							Stipula ted	Actual		
1.										
2.										



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B. List of works in progress above Rs.5.30 lakhs.

S No.	Name of the project & Address	Description of work in brief	Name of the Engineer with full postal address	Name of the Client. 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.								
3.								

Signature of the Applicant (s)



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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	Qualifications	Project Experience	Nature of works handled	Name of the project Handled	Date from which employed in your organization	Indicate special experience in Air Conditioners installation & Testing projects 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)



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SCHEDULE – D

FINANCIAL POSITION AND WORKING RESULTS

	2021-22	2022-23	2023-24
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)



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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 arose 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 Clean room
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



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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/CF24-60/240410
Name of Work	Supply, Installation, Testing and commissioning of New clean room and related works in Laser lab in FReT-B, TIFR, Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist., Hyderabad-500046.
Estimated Cost	Rs.13,27,140/-
Time Limit	90 days (Completion Period)
Earnest Money Deposit	Rs.26,545/- (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)).
Tender Fee	Rs.500/- (Rupees One Thousand only) (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)).
Last Date & Time of Submission of Tender	30.07.2024 by 13:00 Hrs
Date & Time of Opening of Technical Bid	30.07.2024 at 15:30 Hrs

2. **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 and commissioning of New clean room and related works in Laser lab in FReT-B, 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



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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.

3. Earnest Money Deposit (EMD): EMD shall be submitted in the form of Demand Draft / Pay Order / Banker’s cheque issued by a Scheduled Bank, drawn in favor of **“TIFR Center for Interdisciplinary Sciences”**, (To be enclosed with the Technical Bid (Part-I))

Earnest Money Deposit (EMD): Every Bidder has to pay EMD of amount as specified elsewhere in this tender by Demand Draft in favor of **“TIFR Center for Interdisciplinary Sciences”** along with the offer. Quotations received without EMD shall be rejected and no correspondence whatsoever will be entertained. For successful bidders the EMD will be adjusted against Performance Guarantee and will be refunded after completion of work /supply of material at site and for unsuccessful bidders EMD will be refunded after placing the order to successful bidder.

4. Performance guarantee

The tenderer, whose tender is accepted, will be required to furnish a performance guarantee of 2.5% of the tendered amount within 7 (seven) working days from the date of intimation. 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.

The Performance Guarantee shall be initially valid up to the stipulated date of completion **plus 60 days** beyond that. In case the time for completion of work gets enlarged, the contractor shall get the validity of performance Guarantee extended to cover such enlarged time for completion of work. The performance guarantee shall be returned to the contractor, without any interest, after recording of the completion certificate for the work by the competent authority.



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The Engineer-in-charge shall make a claim under the Performance guarantee 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:

- a) 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.
- b) 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.

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

5.Security Deposit: The tenderer, whose tender is accepted, will also be required to furnish by way of Security Deposit for fulfillment of his contract, an amount equal to 5% of the tendered value of the work. Earnest Money deposited at the time of tenders will be treated as part of the Security Deposit.

or

The successful tenderer shall permit TIFR, Hyderabad at the time of making any payment to him for work done under the contract to deduct a sum at the rate of 5% of the gross amount of each running bill till the sum along with the sum already deposited as earnest money, will amount to security deposit of 5% of the tendered value of the work. Such deductions will be made and held by TIFR by way of Security Deposit unless he has / they have deposited the amount of Security at the rate mentioned above in cash or in the form of Fixed Deposit Receipts.

In case a fixed deposit receipt of any bank is furnished by the contractor to TIFR, Hyderabad as part of the security deposit 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, Hyderabad to make good the deficit.

All compensation or the other sums of money payable by the contractor under the terms of this contract may be deducted from, or paid by the sale of a sufficient part of his security deposit or from the interest arising there from, or from any sums which may be due to or may become due to the contractor by TIFR or any account whatsoever and in the event of his Security Deposit being reduced by reason of any such deductions or sale as aforesaid, the contractor shall within 10 days make good in cash or fixed deposit receipt tendered by the State Bank of India or by



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scheduled banks (if deposited for more than 12 months) endorsed in favor of the TIFR, HYDERABAD, any sum or sums which may have been deducted from, or raised by sale of his security deposit or any part thereof.

Security Deposit shall be initially valid up to one year from the date of completion of work. In case the time for completion of work gets enlarged, the contractor shall get the validity of Security Deposit extended to cover such enlarged time for completion of work. The Security Deposit shall be returned to the contractor, without any interest, after completion of defect liability period.

Security Deposit as deducted above can be released against Bank Guarantee issued by a Scheduled Bank on its accumulation to a minimum of Rs.5 Lakhs subject to the condition that amount of such Bank Guarantee, except last one, shall not be less than Rs.5 Lakhs. Bank Guarantee should be submitted which will be valid upto the expiry of defect liability period.

6. 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.

7. 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.

8. 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.



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

9. 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 recovered will be issued by the Department.

10. 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.

11. 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.

12. 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.

13. 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:



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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.

14.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



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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'/'Vendor' shall mean the Bidder whose tender has been accepted by the Owner 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 part 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. 'Electrical 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.



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- 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 labor 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.
- 3.4. The contractor should follow safety precautions and maintain safety PPE's to their workmen throughout the project. Penalty will be imposed by TIFRH if violation of safety precautions.

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



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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, the Contractor shall maintain a proper hindrance register and record all such events with due signature of E-I-C on occurrence of such instances 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:
- 7.3. '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



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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 Owner/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 labor license 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. Guarantee and Defects Liability Period:

- 9.1. 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.
- 9.2. If the defects are 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.



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10. Terms of Payment

The contractor will be paid only Two Running Account (RA) Bill 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.

10.1.Bill Format:

Tender Item No.	Description of Items (At least 2 lines)	Unit	Tender Quantity	Executed Quantity	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.

10.2.Measurement Format:

Tender Item No.	Description of Item & Location against each Measurement taken	Nos.	Length	Width	Height	Qty.	Remarks

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



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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

10.3. Final Payment:

Payments of Final bill shall be made after deduction of security deposit /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.

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

11.1.Scope:

- 11.1.1. 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.
- 11.1.2. The Contractor/Manufacturer/Supplier shall quote for all the materials along with accessories as mentioned in the enquiry.
- 11.1.3. All the supply shall be in accordance with relevant I.S. Specifications and recognized standards.

11.2. Inspection & Testing and commissioning of Material:

- 11.2.1. Contractor/Manufacturer/Supplier shall submit the lists of Type Tests and Routine Tests to be conducted on the material in the Technical Data Sheet.
- 11.2.2. 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.
- 11.2.3. 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.

11.3.Test Certificates:

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

11.4. Taxes & Duty:

- 11.4.1. Contractor/Manufacturer/Supplier shall quote the basic price of material. Excise Duty, Custom Duty, Sales Tax, GST, Octroi, Delivery Charges, Transit Insurance and/or any other charges, if any, must be indicated separately.
- 11.4.2. TIFR being a research institute of Govt. of India, is eligible for Excise Duty Exemption on equipment supplies. Necessary exemption certificate will be provided by TIFR.



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11.4.3. Transit Insurance: The Transit Insurance from the point of dispatch to the site of erection shall be in the scope of Supplier and the cost shall be indicated separately.

11.5. Delivery of Material:

11.5.1. The Contractor/Manufacturer/Supplier 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.

11.5.2. 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.

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

11.6. Guarantee:

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

11.7. 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.

11.8. 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.

11.9. 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



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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.

11.10.Rejection of Defective Equipment:

- 11.10.1. 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.
- 11.10.2. 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.

11.11.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.



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11.12. 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.

11.13. 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.

11.14. 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.

11.15. 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.

11.16. Termination of Contract by the Purchaser:

- 11.16.1. 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



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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 –

- 11.16.1.1. has abandoned the Contract, or
 - 11.16.1.2. 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
 - 11.16.1.3. 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
 - 11.16.1.4. 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
 - 11.16.1.5. 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
 - 11.16.1.6. 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.
- 11.16.2. 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.



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- 11.16.3. 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.
- 11.16.4. 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.
- 11.16.5. 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 proceeds 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.

12. Contractor's Representative:

The Contractor/Supplier shall employ at least one qualified representative (i.e.Hvac supervisory License 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.



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

13. 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.

14. Delivery of Material at Site:

The Contractor/Supplier/Manufacturer shall arrange for safe transit and delivery of material at site and unloading the material at site.

15. Validity of Tender:

The quotation should be valid for 75 days after opening of the Part—I: Technical Bids.

16. 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.

17. Spare Parts & Manuals:

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

18. Training:

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

19. 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.



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20. Drawings and Documentation:

Contractor should make and submit the drawing as per the site conditions and take approval from EIC.As-built drawings as specified in this technical specifications shall be submitted by the Contractor.

21. Permissions and Approvals:

All statutory permissions and approvals from Electricity authority as may be required for commissioning of the entire system shall be carried out by the contractor. 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.

22. 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.



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SECTION-V

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

1.0 DUCTING:

1.1 GSS DUCTING WITH MS ANGLE FRAMES:

GI sheets shall be as per IS 277 – 120 Grade. Fabrication shall be as per SMACNA 2005. Ducting shall be factory fabricated and delivered at site. Thickness of the sheet and type connector shall be as per the following table.

Duct Dimension (mm)	500 Pa	
	Sheet Gauge	Connector
0 - 450	26	TDF
451 - 750	26	TDF
751 - 900	24	TDF
901 - 1000	22	TDF
1001 - 1200	22	Slip-on
1201 - 1300	20	Slip-on
1301 - 1500	20	Slip-on
1501 - 1800	20	Slip-on
1801 - 2100	18	Slip-on
2101 - 2200	18	Slip-on
2201 - 2400	18	Slip-on
2401 - 2700	16	Slip-on

Duct Dimension (mm)	1000 Pa	
	Sheet Gauge	Connector
0 - 450	24	MS angle frame - 40x40x3 mm
451 - 750	24	MS angle frame- 40x40x3 mm
751 - 900	22	MS angle frame- 40x40x3 mm
901 - 1000	20	MS angle frame- 40x40x3 mm
1001 - 1200	20	MS angle frame- 40x40x3 mm
1201 - 1300	18	MS angle frame- 40x40x6 mm
1301 - 1500	18	MS angle frame- 40x40x6 mm
1501 - 1800	18	MS angle frame- 40x40x6 mm
1801 - 2100	16	MS angle frame- 40x40x6 mm
2101 - 2200	16	MS angle frame- 40x40x6 mm
2201 - 2400	16	MS angle frame- 40x40x6 mm
2401 - 2700	16	MS angle frame- 40x40x6 mm



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For GSS ducting, rivets shall be of MS. The distance between the rivets shall not exceed 100mm. The distance between bolt & nuts shall not exceed 100mm.

All bolts, nuts & washers shall be of GI. Bolt & nuts shall provide with both sides washers. Good quality self-adhesive rubber gaskets with 5 mm thickness shall be used.

Ducting shall be supported on MS pre painted 'L' shaped brackets with required cross bracing for all the ducts which are running along the wall. All the MS supports shall be painted with one coat of red-oxide and two coats of black enamel paint. For hanging ducts supported from the true ceiling, GI full threaded rod and slotted angle shall be used as per the following table.

S. No.	Duct Size	Thickness of formed channel	Gauge	Rod dia.	Anchor Fastener
1	Up to 500mm	1.0mm	20	8 mm	M 8
2	501 – 1000mm	1.5 mm	16	8 mm	M 8
3	1001 – 1500mm	2.0mm	14	10 mm	M 10
4	Above 1500mm	3.0mm	14	12 mm	M 12

Anchor fasteners made shall be Hilti / Fischer.

Ducting supports shall be provided at every 2400mm distance. Ducting supports shall be provided on both sides of the wall / partition when it is passing through the wall / partition. Ducting shall not be supported on the wall or false ceiling. Duct support shall not be sagging. Proper care should be taken to avoid duct leakages. Sealant shall be used if required. Vanes in elbows and collar take off shall be provided. Sealant shall be applied to all transverse joints and longitudinal joints for ducting. Measurements for the ducting shall be taken at the center line.

Duct sleeves made of 18 G sheet shall be provided at wall crossings. MS angle frames shall be provided on the both sides and at the middle to take the weight of the wall. The sleeve size shall be 50mm more than duct size. Duct shall be supported on both sides of the wall / sleeve.

Gap between the sleeve and duct shall be filled with fiber glass material tightly around the duct. This needs to be done by an HVAC contractor.

On both sides of the wall, fire sealant shall be applied on the surface. This work will be part of civil work / interior work.

Each duct piece shall not be longer than 4' and shall be smaller wherever required as per the drawing and as per the site conditions. Full elbows / partial elbows shall be as required.



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Ducting shall be subjected to pressure testing at designed pressure as per SMACNA. Necessary opening of ducts, taking of take offs, providing dummies, etc. shall be done before conducting the duct pressure test.

The air distribution system shall be tested and balanced so that the requisite temperature and air flow are maintained throughout the space to be air-conditioned or ventilated. The CONTRACTOR shall provide all instruments required for testing and balancing of air distribution system. Complete air balance report shall be submitted for approval.

1.2..VOLUME CONTROL DAMPERS:

- Volume control dampers shall be made out of 18G/1.25 mm thickness galvanized steel sheet frame with 20G/1.0 mm thick blade. Blades should be double skinned aluminum aerofoil construction and opposed blades should be at 50mm pitch centers. The blades should be mounted in nylon bushes operated by an interior wheel gear system. The operating lever or knob shall have locking arrangement and markings of various positions including open and closed position. VCD shall be low leakage type and volume control of 0-100% complete with neoprene rubber gasket, nuts, bolts, screws, linkages, flanges etc.

1.3..FUSIBLE LINK FIRE DAMPERS:

- Fire and Smoke Dampers (FSD) shall be installed in supply air duct when they pass through AHU room walls as shown in the drawings and as per specifications. The Fire Dampers shall be operated with at least 90 minutes fire rating as per UL 555S - Class II for fire and smoke management rated for 90 min. & tested at CBRI Roorkee, India. Fusible Link should be rated for 720C. Each FSD shall be of multi leaf type, low leakage and shall be tested in the factory and will be certified by the manufacturer in form of the test certificate.

1.4.THERMAL INSULATION OF DUCT:

- VCD/Motorized VCD's and Motorized Fire Dampers shall be insulated with 40 Kg. / cub. mt. density 25 mm thick. Class 'O' nitrile rubber insulation. Thermal conductivity shall be 0.04 W / m. deg. K. Insulation material shall be fixed to the VCD/Motorized VCD's and Motorized Fire Dampers with adhesive. All angle joints shall be covered with 6 inch wide insulation. All insulation joints shall be sealed with 50 mm wide self-adhesive tape recommended by the supplier of insulation. Insulation shall be finished properly around the dampers etc..25 mm thk. Class 'O' Nitrile rubber insulation for supply air ducting shall be insulated with 40 Kg. / cub. mt. density. Thermal conductivity shall be 0.04 W / m. deg. K. Insulation shall have



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factory laminated aluminum foil. Thickness of the aluminum foil shall be minimum 70 microns. All joints shall be sealed with self adhesive aluminum tape.19 mm thk. Class 'O' Nitrile rubber insulation for return air ducting shall be insulated with 40 Kg. / cub. mt. density. Thermal conductivity shall be 0.04 W / m. deg. K. Insulation shall have factory laminated aluminum foil. Thickness of the aluminum foil shall be minimum 70 microns. All joints shall be sealed with self adhesive aluminum tape. Insulation measurements shall be taken over the insulation.

AIR DISTRIBUTION WORKS-APPROVED MAKES

S.No.	Item	Approved Makes
1	Factory Fabricated Ducting	Ductofab/Radiant/Aswa/Zeco/Equivalent.
2	GI Sheets	SAIL / Jindal / Tata
3	Double Skin Plenum	Sagar Air / Vayhan Air/Asawa /Equivalent
4	VCD	V Star / Sagar Air /Asawa / Airmaster / Systemair/Equivalent
5	Fire Dampers	Airmaster / Systemair/Asawa /Equivalent
6	Actuator	Belimo/Siemens/Jhonson/Equivalent
7	Insulation	Armacell / K Flex / ALP Aeroflex/Equivalent
8	Diffusers	V Star / Sagar Air /Asawa / Airmaster / Systemair/Equivalent



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2.CLEANROOM WALL SYSTEM:

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

2.1.Wall Panel:

- Demountable, non-progressive module of 48 inch (1220mm) wide capable of four direction lateral expansion with reusable components.
- 80 mm thk. Modular powder coated clean room wall panels 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., 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 is 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 the wall on side.
- Hollow metal flush doors and frames in the 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 Owner/Consultant.
- Cleanroom support system shall consist primarily of bottom floor track and top runner system. Partition panel shall be with no exposed fasteners. Finish shall be with Marine 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 the 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 the same.
- Return Air Raisers in the panel: 700 x 50 mm size of return air raisers shall be provided in the 80 mm panel or as required made of 24 G shall be provided in the cleanroom panels wherever



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required and as per the drawing in the above cleanroom wall panels of following width. 25 mm thick insulation shall be provided at the back of the return air risers. Return risers shall be provided with one set of MS angle frames with 25 x 25 x 3 mm thick MS angle for connecting to ducting. MS angle frames shall be painted with one coat of primer and two coats of finish paint. Tentative drawing is enclosed and however needs to be provided as per actual requirement.

3.INSTALLATION:

- Utilize methods of construction, which minimize the generation of contaminants.
- Partition components shall assemble into 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.

4.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 drawings 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 Owner.
- Care should be taken so that the wall system does 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.

5.MANUFACTURER'S TEST DATA:

- Provide necessary test results for structural requirements and outlined in the following:



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- 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 the opposite side of the 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 the darkened side of all. Any visible light through the 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.

6.PRODUCT DELIVERY, HANDLING AND STORAGE:

- Delivery: Deliver materials in their original unopened packages.
- Handling: Exercise care in handling 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 the job site. Remove all rubbish and cartons and leave the job site broom clean.
- Protect the work of others during execution of work, and repair any damages caused.

7.FINISH:

- For ISO class 7 clean rooms, provide uniform color factory applied on both faces of all panels, Minimum paint thickness be 60 Microns.

8. CEILING SYSTEM:

Provide walkable ceiling panels of 50 mm thk. made up 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.,. 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 filled with PUF insulation of density 42 kg / cub. mt.,. The ceiling system is 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.



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- The ceiling panels shall be supported from the 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 to 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.

9. FIRE RATING:

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

10.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 drawing.

11.CEILING SUSPENSION LAYING.

- Ceiling panel suspension hookup details showing the locations at which the Panels shall be suspended from the true ceiling.
- Showing other systems like HVAC ducts, cable trays, conduits, piping running between the suspenders.
- Showing locations of HEPA filters, light fixtures in ceiling panels.

12.SEALANTS AND JOINT FILLER:

12.1.General:

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



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- Except as otherwise indicated, joint sealers are required to establish and maintain airtight and waterproof continuous seals on a permanent basis, within 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 Owner.

12.2.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 modulus of elasticity, water absorption, and resistance (Aging, weight loss, deterioration) to heat exposures and to ozone and ultraviolet light.

13.EXECUTION:

13.1.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 the installer.
- Beginning work indicates acceptance of surfaces.

13.2.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 coordinate 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 the 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.

13.3.Cure and protection:

- Cure sealants in compliance with manufacturer’s instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability.
- Advise contractor of procedures required for cure 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 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 protect 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.
- 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.



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14. TECHNICAL SPECIFICATION FOR CLEAN BUILD:

14.1. 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:
 - On –going cleaning procedures.
 - Stages of ‘build clean’ construction.

14.2. Definitions:

- Build Clean Requirements: Requirements specified and supplemented by the Contractor for building in the clean environment.
- 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.
- Interstitial Space : The space between the cleanroom ceiling and true ceiling (roof slab) which houses exhaust duct work, clean supply and return ductwork, and electrical.
- 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.
- 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.
- Vacuum cleaning – Portable units.

14.3. 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. Owner will determine primary methods and procedures to be followed. Additional procedures for continued maintenance shall be established by the Contractor. Procedures shall be communicated to all tradesmen involved, and noticeably posted. Procedures shall



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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.

14.4.Submittal:

- The Contractor shall submit a description of “build clean” requirements and schedule.
- Product Delivery, Handling and Storage:
- Do not store more materials in the staging area than can be installed in one day’s work. Do not store contaminated materials in the staging areas.
- 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.
- 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 substrate 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:
- Daily trash removal.
- Daily clean up.
- No special ‘build clean’ requirements.
- Hard hats worn at all times.
- Heavy soled work shoes required
- Pressures wash all structural steel if necessary.
- Stage II exterior Building Skin and Interior Rough In:
- Concrete work complete, including sealer.
- Installation of all fire proofing, painting, mechanical, electrical, fire sprinklers and plumbing rough – ins.
- Access through temporary stairs and ladders.
- Equipment and materials access through material hoist or forklift.



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- No special garments required, except heavy soled boots and hard hats.
- 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.
- Concealed walls spaces vacuumed clean before double up.
- Fire sprinkler piping, plumbing piping and electrical conduit shall be wiped clean with solvent if necessary to remove any grease or oil on the outside surface of pipe.

15.MARINE EPOXY FLOORING

15.1.General:

- The sub floor preparation with self-leveling compound. Sub floor preparation shall be done over normal concrete floor. After the sub floor preparation, Marine epoxy flooring shall be done.
- 2 mm thick Marine epoxy flooring. Flooring shall be finished with VDF flooring and self-leveling compound before the Marine epoxy flooring.

16.SWINGING FLUSH DOORS AND FRAMES FOR CLEANROOMS:

- Swinging metal doors and frames of wall matching material location of which are indicated in schedule and in drawings.
- Vision glass and glass desiccant infill panels as per drawings.
- Finish hardware as specified in hardware schedule.

System Description:

- The door leaves are 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, dimensions in height are according to the precise needs of the rooms to be built. The door leaves on both sides flush with the door frame and the partition, vision glass, iron monger, shop fabricated factory finished, infill and attachment devices.

16.1.Submittals:

- 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.
- 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



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constructions, location and installation requirement of finish hardware and reinforcement, and details of joints on connections. Show anchorage and accessory items.

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

16.2.Delivery, Storage and Handling:

- 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.
- 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.
- 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 Owner/Consultant, otherwise remove and replace damage items as directed.
- Store doors and frames at the 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 a humidity chamber, if cardboard wrapper on door becomes wet, remove carton immediately. Provide ¼” (6mm) spaces between stacked doors to promote air circulation.

16.3.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



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-
- Float vision glass
 - Ashai
 - Lock (Mortise sash lock with
 - DORMA (lever handles)
 - Automatic door button (concealed) -BRITON EXIT hardware/DORMA

16.4.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.

16.5.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.

16.6.Fabrication:

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

16.7.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.

16.8.Execution:

- Verify site condition.
- Verify dimensions, tolerances and method of attachment with other work.
- Verify wall openings and adjoining air and vapor seal materials are ready to receive work in this section.



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- 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.
- Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- Install hardware using the template provided.
- Adjust operating hardware for smooth operation.
- Clean work after finishing.
- Remove protective material from pre finished metal surfaces.
- Wash down surfaces with an approved cleaning solution, applied with soft, clean wiping clothes. Take care to remove dirt from corners. Wipe surfaces clean.
- Protect finished work from damage.

17.FILTERS:

Total pressure drop across the AHU and all filters shall be calculated based on the filter banks provided and their initial and final pressure drops.

17.1.Pre Filters:

EN 779: G4 Pre-filter in the AHU shall be of 600 x 600 x 300 mm. Filters shall be rated for 400 fpm face velocity and should have an easy fixing method. Filters shall be assembled in the AHU with a filter frame.

17.2.Fine Filters:

EN 779: F9 Fine-filter in the AHU shall be of 600 x 600 x 300 mm filters. Filters shall be rated for 400 fpm face velocity and should have an easy fixing method with the filter frame in the AHU. Filters shall be assembled in the AHU with a filter frame.

17.3.Pre Filters in the Return Air Raisers:

EN 779: G4 Pre-filter in the return air raiser. Filters shall be rated for 250 fpm face velocity and should have an easy fixing method with the filter frame in the return air raiser. Filters shall be assembled in the return air riser with filter frame.

17.4.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



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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.

17.5.FILTER MODULE & HEPA FILTER :

HEPA Module made of 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 25 mmwg 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 owners / consultants or their representatives to observe the manufacturing of filters and witness the tests if they so desire. The owners / 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. Owners / Consultants will witness the Test of a few HEPA filters as desired. Shall have a knife edge suitable for gel seal filters.

17.6.GRILLES / DIFFUSERS:

Grilles shall be linear type made out of heavy extruded aluminum sections. The grilles shall be rectangular linear type for supply and return air. Supply air grilles shall have opposed blade volume control dampers of aluminum construction. All the grilles shall be powder coated with approved color shade. Teak wood frames treated with anti-termite solution shall be used wherever necessary. Grilles shall have concealed fixing screws. Ducting and all items at the back side of the grilles shall be painted with dull black paint. The discrete grilles will have end flanges. Ends of the continuous grilles shall have an end piece with three side flanges. Alignment strips shall be used for proper alignment.

18.MAGNEHELIC PRESSURE GAUGES:

Magnehelic pressure gauges shall have a range of 0 to 10 mm WC and shall be fitted with an SS box. Pressure shall be measured w.r.t. atmospheric pressure. Sensing probes made of brass and coated with nickel shall be installed in the areas for sensing the pressure. Reinforced PU tubes shall be laid



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from sensing probes to magnehelic gauges. These shall be installed in designated locations approved by the client.

19.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.
- 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 a vertical cable alley.
- Inter panel wiring shall be through a horizontal cable chamber at bottom.
- Separate terminal blocks shall be provided for power and control cables.

20.CLEANROOM LIGHTING:

- 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 the respective ballast box.

20.1.INSTALLATION:

- The light fixture manufacturer gives precise ceiling opening size before placing order to cleanroom contractor / ceiling manufacturer.



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- 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.

20.2.MAKE & MODEL:

- LED light shall be suitable for maintenance from bottom.

Light fixture : Wipro/Philips/Havells]

21.STANDARDS

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

CLEAN ROOM-APPROVED MAKES

S.No	ITEM DESCRIPTION	APPROVED MAKES
1.	SS TRAY	Legrand/Equivalent approved
2.	PUF PANEL	As per sample approved/TDS approved
3.	FILTERS,FILTER MODULE	Ultrafil/Spectrum/Mechmark/E quivalent approved.



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ELECTRICAL WORK:

1.SCOPE:

This specification is intended to cover the requirements of supply, installation, testing and commissioning of electrical wiring installation and other accessories required for its satisfactory operation. This covers the essential requirements or precautions regarding wiring installations for ensuring satisfactory and reliable service.

2.STANDARDS:

- The Electrical wiring installations and other accessories shall comply with latest IS: 732 - 1989 and National Electrical code – 1985 and to the latest amendments from time to time.

3.RECESSED PVC CONDUIT WIRING SYSTEM:

- Making of chase : The chase in the wall shall neatly be made and shall be of suitable dimension to permit the conduit to be fixed in the manner desired by the Engineer-in-charge. In the case of buildings under construction, chases shall be provided in the wall, ceiling, etc. at the time of their construction and shall be filled up neatly after erection of conduit and brought to the original finish of the wall.
- Fixing of conduit in chase: The conduit shall be fixed by means of staples or by means of saddles not more than 600 mm apart. Fixing of standard bends or elbows shall be avoided as far as practicable and all curves maintained by bending the conduit pipe itself with a long radius which will permit easy drawing-in of conductors. All the threaded joints of rigid steel conduits shall be treated with approved preservative compound to ensure protection against rust.
- Inspection boxes : To permit periodical inspection and to facilitate replacement of wires, suitable inspection boxes shall be provided at convenient locations. They shall be mounted flush with the wall. The minimum size of inspection boxes shall be 75 x 75 mm. Suitable ventilation holes shall be provided in the inspection box covers.
- Types of accessories to be used: All outlets, such as switches and sockets, may be either of flush mounting type or of surface mounting type. The switches and other outlets shall be mounted on such boxes. The metal box shall be efficiently earthed with the earth continuity wire run along the conduit. When crossing through expansion joints in buildings, the conduit sections across the joint may be through flexible copper bellows of the same 33 size as PVC conduit. The Number of wires that can be drawn through a conduit shall be strictly as per IS 732 and as mentioned in Drawings.



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4. TESTING OF WIRING:

The following tests shall be carried out on all types of wiring on completion of the work and before energizing the installation:

- Insulation resistance test,
- Electrical continuity test,
- Earth continuity test,
- Earth electrode resistance test,
- Switch polarity test.

i) Insulation Resistance test: The insulation resistance shall be measured by using 500 v megger between the following points. Phase and neutral conductor with all fuses in position and all switches in closed condition and main switch in OFF position with lamps and other devices removed. Between earth and the whole system of conductors with all fuses in place, all switches closed and all lamps in position. Between all conductors connected to one phase of the supply of the above tests shall not be less than 50 divided by the number of points on the circuit. Where a whole installation is being tested, a lower value than that given by the above formula is acceptable subject to a minimum of one mega ohm.

The insulation resistance in mega ohm as obtained by each of the above tests shall not be less than 50 divided by the number of points on the circuit. Where a whole installation is being tested, a lower value than that given by the above formula is acceptable subject to a minimum of one mega ohm.

(ii) Electrical continuity test: Each and every circuit shall be tested for electrical continuity by using a multimeter.

(iii) Earth continuity test: The earth continuity conductor including metal conduit shall be tested for electrical continuity and the resistance of the same along with the earthing lead measured from the connection with the earth electrode to any point in the earth continuity conductor in the complete installation shall not exceed one ohm.

iv) Earth electrode resistance test: The earth electrode resistance shall be tested as specified in section

(v). Switch polarity test: Test shall be made to verify that all switches in every circuit have been fitted in the same conductor throughout and such conductor shall be marked for connection to the phase conductor.



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5.DISTRIBUTION BOARDS:

- All the distribution boards shall be with MCCBs/ MCBs as described in the respective schedule. The distribution boards shall be controlled by a switch fuse, miniature circuit breaker or an isolator as described in the respective schedule. Each outgoing circuit shall be provided either with MCB or a fuse on the phase. The neutral shall be connected to a common link and be capable of being disconnected individually for testing purposes. 34 The distribution boards shall be located as indicated in the respective electrical working drawings and as directed by Engineer - in - charge. The distribution boards shall be fixed on wall in the niche provided and marked with the details of circuits, source of supply, size of incoming wires Etc., All marking shall be clear and legible. The total load of the consuming devices shall be evenly distributed between the numbers of ways of distribution board. The consuming devices circuit shall be connected to the distribution board in proper sequence, so as to avoid unnecessary crossing of wires. Cables shall be connected to a terminal only by crimped lugs. Cables shall be rigidly fixed in such a manner that a clearance of at least 2.5cm is maintained between conductors of opposite polarity or phase and between the conductors and any material other than insulating material. The incoming and outgoing cables shall be neatly bunched.

6.MOUNTING HEIGHTS:

- The Mounting heights of various fixtures shall be as specified in the Drawings. 10.Flexible conduits are strictly not envisaged, only industrial type GI Bind flexible conduit shall be used in a spot where the conduits and bends cannot be possible to run.

7.L. T. CABLES:

- All power and distribution cables shall be 1100V grade, PVC / XLPE insulated and sheathed, armoured/unarmoured, multi strand aluminum conductor/ copper conductor cables unless otherwise specified. All control cables shall be 1100V grade PVC insulated and sheathed unarmoured multi-strand copper conductor cables unless otherwise specified. The cables shall conform to IS 1554-1988 & IS 7098:1988 with up to date amendments. Type test certificates of the cables from manufacturers for the particular drums shall be provided.Shop inspection shall be offered for routine tests if specifically asked for.

8.LAYING:

- The cables shall be thoroughly inspected for transit damage and irregularity in sheath
- Sufficient manpower with necessary equipment like jacks, rollers shall be provided for unwinding and laying the cables and dragging and twisting shall be avoided.



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- Unwinding methods shall be used to avoid twists & cable should be meggered before starting laying Cables shall be laid at a depth of at least 750mm from ground level with 50mm sand bedding, brick box with cushion for protection. Bending radius provision of at least 12 D shall be kept while laying. The trenches shall be filled and reinstated layer by layer leaving a crown on top
- H.T. and L.T. cables shall not be laid in the same trench. When more than one cable is laid in the same trench a gap of at least 150 mm shall be kept between the cables.
- Cables laid on walls; trenches shall be supported at every 600mm for vertical run and every 450mm for horizontal run. Suitable clamps shall be provided for fixing and support. Vertical runs near ground level shall be protected by GI Pipes of suitable size up to the height of at least 1200 mm.
- The length of the cables in schedule will be approximate and actual site measurements shall be taken by contractor prior to cutting any cable.
- Cable identification tags shall be provided at appropriate locations throughout the length of cables and at both ends.

9.JOINTING:

- Jointing or end termination of cables shall be done by a skilled person only. Straight through
- joints shall be avoided as far as possible. Heavy-duty compression type brass glands shall be used for all connections. Crimping type lugs with suitable brass/Chrome Plated hardware shall be provided for connections.
- The cables on panel side are connected to bus bars Cu or Al, Care should be taken to avoid heating & corrosion at the joints. All LT cable joints in outdoor and humid atmospheres shall be done with double compression glands only / if done by Single compression Gland should be accommodated by PVC HOOD Of Appropriate size.

10.GENERAL & CODES

- All the supply and work shall be in accordance with the relevant I.S. Specification and recognized standards and modern approved practice and shall meet the requirement of the latest issue of applicable codes, factory rates and regulations, supply codes and all standard accepted practice in locality where the installation is to be made.
- All the materials and accessories provided by Contractor under terms of this contract shall conform to the relevant Indian Standard Specifications. Samples of all equipment, materials and accessories to be supplied by the Contractor shall be submitted for the approval of the Engineer before they are supplied and used.
- Contractor shall provide all necessary labour, tools, and other requisite work like drilling, cutting, welding etc. at his own cost.



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- Good workmanship is the essence of this contract and shall be complied with at all time. The Contractor shall have the works supervised by qualified and experienced engineers. All the defects pointed out by the engineer shall be rectified immediately by the Contractor free of cost.
- The installation shall generally be carried out strictly in conformity with the requirement of latest edition of the Indian Electricity Act, 1910 as amended and the Indian Electricity Rules, 1956 framed there under and all others statutory regulations that may be relevant to the installation
- No alteration which may affect the structures and architecture of building shall be done without the prior approval of the engineer. All work shall be carried out in such a manner that it should not cause any inconvenience to other works which are under progress. The Contractor shall cooperate with other agencies in the area for the smooth execution of all works.
- Accidental damage to any property shall be reported immediately to site engineers and letter confirmed in writing.
- The equipment shall comply with the requirement of latest revision of following standard issued by BIS (Bureau of Indian Standards), unless otherwise specified.

11.EARTHING & LIGHTNING PROTECTION:

- IS : 3043 – 1987 Code of practice for earthing.
- IS : 2309 – 1989 Code of practice for Protection of buildings and allied structures against lightning.

12.LOW VOLTAGE SWITCHGEAR & PANELS:

- IS : 8623 – 1993 Specification for low voltage switchgear and control gear assemblies
- IS : 10118-1982 Code of practices for selection, installation and maintenance of switchgear and control gear.
- IS : 12063-1987 Classification of degrees of protection provided by enclosures of electrical equipment.
- IS :7752-1975 Guide for improvement of power factor in consumer installation IS : 12360-1988 Voltage bands for electrical installations including preferred voltages and frequency.
- IS : 2147 – 1962 Degrees of Protection provided by enclosures for low voltage switchgear and control gear.
- IS : 3070-1993 Metal oxide surge arresters with gaps for AC system. IS :13947-1993 L.V. Switchgears and control gears



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- IS:13032-1991 Miniature circuit breaker boards for voltage upto and including 1000 volts A.C.
- IS:13925-1998 Shunt capacitors for ac power systems having a rated voltage above 1000V.
- IS:12729-2004 Common specification for high voltage switchgear & controlgear standards.
- IS:1293-2005 Plug & socket outlets for household & similar purposes. IS:4160-2005 Interlocking switch socket outlets –specification IS:60309-2002 Plug socket –outlets & couplers industrial purposes.

13.CABLE:

- IS:12943-1990 Brass glands for PVC cables.
- IS:1255-1983 Code practice for installation and maintenance of power cables upto and including 33kV rating.
- IS:10418-1982 Drums for electric cables.
- IS:7098-1988 Cross linked polyethylene insulated PVC sheathed cables. IS:1554-1988 PVC insulated (heavy duty) electric cables.
- IS:694-1990 PVC insulated (heavy duty) electric cables.

14.INTERNAL (POINT WIRING, FAN, FIXTURES):

- IS : 4648 – 1968 Guide for electrical layout in Residential buildings. IS : 732 - 1989 Code of practice for electrical wiring installations.
- IS:6665-1972 Code of practice for industrial lighting
- IS : 2268 – 1994 Electrical appliances electrical call bells and buzzers for indoor use.
- IS : 3646-1992 Code of Practice for interior illumination IS : 11037-1984 Electronic type fan regulators.
- IS:9537-1980 Conduits for electrical installation
- IS:14768-2000 Conduits fittings for electrical installations general requirements.
- IS: 14927-2001 Cable trunking & ducting systems for electrical installations IS : 1913 - 1978 General and safety requirement for luminaries
- IS:3528-1966 Waterproof electric lighting fitting
- IS:1944-1970 Code of practice for lighting of public thoroughfare



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15.OTHER CODES:

- SP30-1985 National Electrical code (Fourth Reprint 1998) NBC-2008 National Building Code First Reprint 2006 ECBC 2009 Energy Conservation Building Code

16.GENERAL:

- SP : 31-1986 Chart and treatment for electrical wiring installations. IS : 2551 – 1982 Danger notice plates.
- IS : 5216 - 1982 Guide for safety procedures and practices in Electrical work.

17.COMPLETENESS OF WORK:

- Contractor shall include and provide all necessary materials and labour for completing the job in an approved manner following all applicable standards and code of practices.



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ELECTRICAL APPROVED MAKES

S.No	Item Description	Approved Makes
1	LT Cables	Poly Cab/ Universal/Havells/KEI/ Equivalent Approved
2	Brass Cable Gland	Dowells/Crompton/Bico/Siemens/Commet/ Equivalent Approved
3	PVC Glands	Peeco,/Comet,/Dowells/Equivalent Approved
4	Cu Lugs	Peeco,/Comet,/Dowells/Equivalent Approved
5	Distribution Boards	Legrand/Schneider/Hager/ Equivalent Approved
6	MS Enclosure	Legrand/Schneider/Hager/ Equivalent Approved
7	MCB	Legrand/Schneider/Hager/ Equivalent Approved
8	MCCB	Legrand/Schneider/Hager/Equivalent Approved
9	Cu strip	99% Electrolyte Copper
10	LED lights	Phillips/Havells/Wipro/ Equivalent Approved
11	PVC Conduits	Sudhakar/Equivalent Approved
12	Energy Meter	Schneider/Equivalent Approved
13	DLP Trunking	Legrand/MK/ Equivalent Approved
14	All other items not covered above	As per approved samples and TDS



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SECTION-VI

ANNEXURES

ANNEXURE I

FORM OF PERFORMANCE GUARANTEE (BY BANK GUARANTEE)

- In consideration of the TIFR-Hyderabad, Hyderabad having agreed under the terms and conditions of Letter of Intent / Agreement No..... dated..... made between and..... (Here in after..... called "the said Contractor(s)") for the work..... (Here in after called "the said Letter of Intent / Agreement") having agreed to production of a 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, we.....(Indicate the name of the Bank) (hereinafter referred to as "the Bank") Here by undertake to pay to TIFR an amount not exceeding Rs..... (Rs only) on demand by TIFR.
- We..... (indicate the name of Bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from TIFR stating that the amount claimed is 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).
- We, the said bank, further undertake to pay to TIFR 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 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.
- We (indicate the name of 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 TIFR 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 TIFR certifies 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.
- We (indicate the name of Bank) further agree with TIFR that TIFR shall have the fullest liberty without our consent and without affecting in any manner our obligations 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 TIFR 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 TIFR or any indulgence by TIFR 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.
- This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).
- We..... (indicate the name of Bank) lastly undertake not to revoke this guarantee except with the previous consent of TIFR in writing.
- This guarantee shall be valid up to, unless extended on demand. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs (Rupees only) 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 guarantee, all our liabilities under this guarantee shall stand discharged.

Signed and sealed

Dated the day of..... for..... (indicate the name of Bank) *(Note: The Letter of Intent shall form part of the Agreement)



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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 Occ



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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 Gol 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:

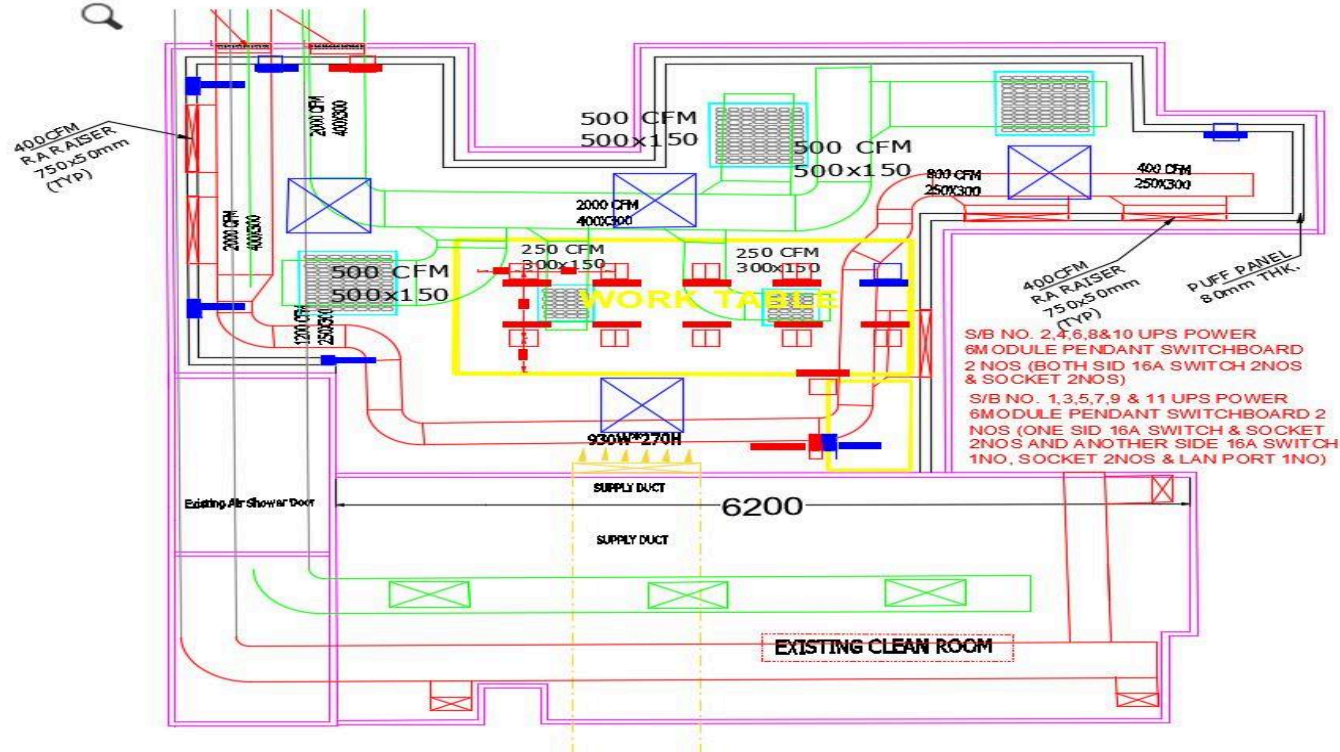
Seal & Signature of the Bidder

NOTE:

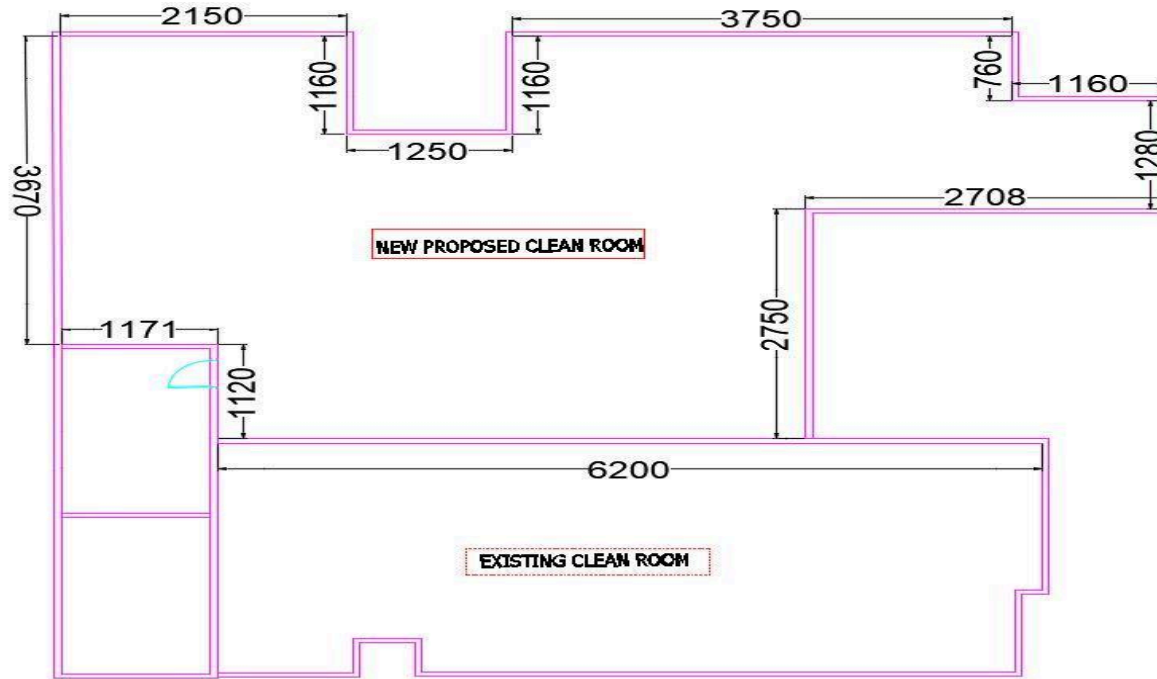
Self-certification that the item offered meets the minimum local content (as above) giving details of the location(s) at which the local value addition is made in case the bidder wishes to avail the benefits under the make in India policy, if applicable.

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.

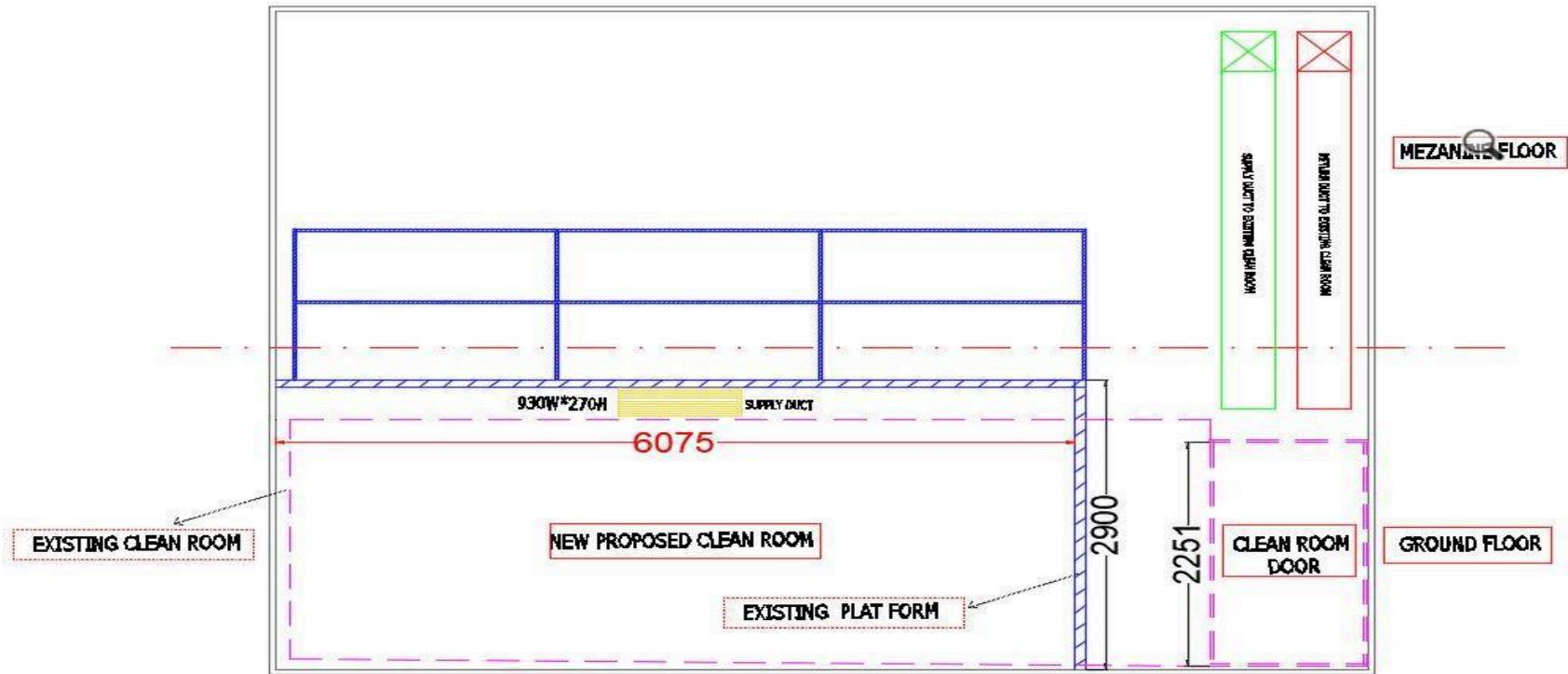
DUCTING LAYOUT DRAWING



CLEAN ROOM DRAWING



SECTION VIEW





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SECTION-VII

FINANCIAL BID

INVITATION OF BIDS FOR

Supply, Installation, Testing and commissioning of New clean room and related works in Laser lab in FReT-B, TIFR, Survey No. 36/P, Gopanpally (Village), Serilingampally (Mandal), Ranga Reddy Dist., Hyderabad-500046.

PART II

FINANCIAL BID



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S.No	Description	Unit	Qty(A)	Unit Rate(B)	Total Amount(C= A*B)
1.	Supply, Installation, Testing and Commissioning of GSS ducting square / rectangular Factory Fabricated Ducting (120GSM) of thickness 0.63 mm sheet (24G) complete with gaskets, elbows, splitters, vanes, cowls, supports arrangement using GI full threaded rods and slotted rails as per drawings, air distribution specifications and requirements. Ducts are joined with iron angle frames with suitable nuts, bolts, gaskets etc., Proper care shall be taken to avoid noise and vibrations. Sleeves shall be provided at wall crossings. Ducting shall be designed for 1000 pascals ESP for supply & Return air ducting as per SMACNA-2005 & specifications. After installation of ducting and before cutting for branches/collars and before insulation, ducting shall be pressure tested at 1000 pascals as per SMACNA.	SQMTR	60		
2.	Supply, Installation, Testing and Commissioning of perforated type Supply Air Grilles made of 20G SS 304 for HEPA filters of following sizes: Grille Size suitable for S.No:14	NOS	3		
3.	Supply, Installation, Testing and Commissioning of perforated type Supply Air Grilles made of 20G SS 304 for HEPA filters of following sizes: Grille Size: suitable for S.No:15	NOS	2		
4.	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:suitable for S.No:18	NOS	5		



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5.	Supply, Installation, Testing and Commissioning of GSS made volume control damper with opposed blades as per the tender specification, frame shall be made of 18G GSS and blades shall be made of 20G aluminum aerofoil low leakage type and volume control of 0-100% complete with neoprene rubber gasket, nuts, bolts, screws, linkages, flanges etc.	SQMTR	2		
6.	Supply, Installation, Testing and Commissioning of fusible link and with limit switch fire damper with sleeve made of 16 G GI sheet. The damper shall have a fire rating of 90 minutes as per UL 555 listed stamped and shall be installed at all wall crossings in SA/ RA ducts. Size of the fire damper shall be less than 0.5 sq.ft.	SQMTR	0.5		
7.	Supply, Installation, Testing and Commissioning of 25 mm thk. Class 'O' Nitrile rubber insulation for supply air ducting for the cleanroom as per the specification. Insulation shall have factory laminated aluminum foil. Thickness of the aluminum foil shall be minimum 70 microns. All joints shall be sealed with self adhesive aluminum tape.	SQMTR	30		
8.	Supply, Installation, Testing and Commissioning of 19 mm thk. Class 'O' Nitrile rubber insulation for return air ducting for the cleanroom as per the specification. Insulation shall have factory laminated aluminum foil. Thickness of the aluminum foil shall be minimum 70 microns. All joints shall be sealed with self adhesive aluminum tape.	SQMTR	30		



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9.	Supply, Installation, Testing and commissioning of 80 mm thk. modular powder coated clean room wall panels 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., 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. Coving shall be painted as that of wall / ceiling panels. Panels shall have all the provisions required for services entry, return air grilles, switch boards, isolators, etc. The areas of doors / view panels 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 the factory as per the approved shop drawings. Shop drawings shall be submitted for review and approval. 25 mm dia PVC conduits with 1 No 6 module metal box shall be provided for electrical wiring one in each panel.	SQMTR	55		
10.	Supply, Installation, Testing and commissioning of 50 mm thk. modular powder coated clean room ceiling panels made of 0.8 mm thk for outer skin and 0.8mm thk 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, aluminum 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 the 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.	SQMTR	50		
11.	Supply, Installation, Testing and commissioning of powder coated clean room 50 mm thk. single leaf / double leaf flush doors 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, 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,	SQMTR	1.5		



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	double glazing see thru glass / view panel, hardware like door closure, SS handles, SS ball bearing butt hinges and automatic door bottom seal, etc. All the fittings shall be compatible for clean room. Complete door hardware and accessories shall be of Dorma make. Doors shall have automatic bottom flap to seal the gap below the door when the door is closed.(2000H*750W).				
12	Supply, 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 to the drawing enclosed.	RMT	85		
13	Supply, Installation, Testing and commissioning of 80 mm thk. modular powder coated clean room wall panels 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., 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. Coving shall be painted as that of wall / ceiling panels. Panels shall have all the provisions required for services entry, return air grilles, switch boards, isolators, etc. The areas of doors and view panels will not be included in the measurement. All cutouts shall be properly finished with end cover with concealed screws, etc. All cutouts shall be done at the factory as per the approved shop drawings. Shop drawings shall be submitted for review and approval. 32 mm dia GI conduits and 2/3 module GI metal box shall be provided for electrical wiring one in each panel as per the drawing. Return air raisers shall be provided in the panel of size 700 x 50 mm and opening shall be provided for air suction(Pre-filter) size 700 x 250 mm or as required made of 24 G shall be provided in the clean room panels wherever required and as per the drawing in the above cleanroom wall panels of following width,insulation shall be provided at the back of the return air risers. Return risers shall be provided with one set of MS angle frames with 25 x 25 x 3 mm thick MS angle for connecting to	SQMTR	13		



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	ducting. MS angle frames shall be painted with one coat of primer and two coats of finish paint. Tentative drawing is enclosed and however needs to be provided as per actual requirement. All cutouts shall be done at the factory as per the approved shop drawings.				
14	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. Dampers 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.	NOS	3		
15	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 305 x 305 x 150 mm filters. Dampers 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 seals will be provided.	NOS	2		
16	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. EN1822 H13 standard HEPA Filter for following sizes. Filters shall be box type with knife edge suitable for the above filter module with gel seal.HEPA Filter Size: 610mm x 610mm x150mm Ht (For Supply Module) - 500 cfm capacity	NOS	3		
17	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 for following sizes. Filters shall be box type with knife edge suitable for the above filter module with gel seal.HEPA Filter Size: 305mm x 305mm x 150mm Ht (For Supply Module) - 250 cfm capacity	NO	2		
18	Supply, Installation, Testing and Commissioning of EN 779: G4 Pre-filter in the return air grill down to 10 microns with 90% efficiency. Filters shall be rated for 500 fpm face velocity and should have	NO	5		



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	an easy fixing method. EN 779: G4 Pre-filter in the return air grill for following sizes: Filter Size: 700 x 250 MM				
19	Supply, installation, Testing and commissioning of magnehelic gauge with SS box with nozzles and tubes for measuring the room differential pressures. Shall be installed in the required locations, with necessary SS pressure sensing probes.	NO	1		
20	MARINE EPOXY FLOORING: Supply and making of 2 mm thick epoxy flooring. Sub floor preparation with self leveling compound. Flooring shall be finished with VDF flooring and self-leveling compound before the epoxy flooring. Sub floor preparation shall be done over normal concrete floor. After the sub floor preparation, epoxy flooring shall be done.	SQMTR	50		
21	Supply of a set of cleanroom clothing suitable for Class 10000 clean room consisting of apron, cap, mouth cover, sleepers, etc.	LOT	10		
22	Supply, laying, termination, testing and commissioning of vermin proof Bottom loading, industrial type 1x1 feet 18W ceiling mounted LED light. Color Temperature :6500K Make:Phillips/Wipro/Havells/Equivalent	NOS	5		
23	Supply, laying, termination, testing and 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 DB Make:Polycab/Havells/Finolex/RR Cables	RMT	20		
24	Supply, laying, termination, testing and 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	RMT	60		
25	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 circuits and laying on	RMT	30		



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	existing Concealed PVC Conduit on wall or False ceiling. Make:Polycab/Havells/Finolex/RR Cables				
26	Supply, installation , testing ,commissioning of 12 Way Ready Made SPN 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 manufacturer's 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 andIEC 60647-2 equivalent to Legrand Cat No.5076 12 (Make : Legrand/ ABB/Siemens /equivalent approved)	NOS	2		
27	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. 408702	NOS	2		
28	Supply, installation , testing and 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.408587 to 408595)	NOS	16		
29	Supply , Fixing, Testing and Commissioning of 6 modular switch boards 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. 572563,573629, 573671, 575742 , 573571).	NOS	6		



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	Switch boards shall be fixed in the wall panels/ to the ceiling panels/ walls/as instructed by E.I.C.				
30	Supply , Fixing, Testing and Commissioning of 6 modular switch boards (16A Sockets -2No,20/16A Switches -2Nos Indicator type) with suitable Metal flush Box and cover plates with interconnections. Switch Boards shall be concealed on the wall. (Make: Legrand /MK/ Equivalent to M/s. Legrand Catalogue No.(572563,573671,575742,573571)	NOS	16		
31	Supply , Fixing, Testing and Commissioning of 6 modular switch boards (16A Sockets -2No,20/16A Switches -2Nos Indicator type) with suitable Metal flush Box and cover plates with interconnections. Switch Boards shall be concealed on the wall. (Make: Legrand /MK/ Equivalent to M/s. Legrand Catalogue No.573471,572063,575740,689010)	SET	5		
32	Supply , Fixing, Testing and Commissioning of 3 modular switch boards(3nos 6A Switches -1No without Indicator type) with suitable Metal flush Box and cover plates with interconnections. Switch Boards shall be concealed on the wall. (Make: Legrand /MK/ Equivalent to M/s.Legrand Catalogue No. 573400, 575720,689008)	SET	1		
33	Supply, laying,Fixing of 25mm Heavy Duty PVC conduit (Black Colour) of ISI marked, laying in wall including cost of chipping of wall to conceal the pipe and plastering work with smooth finishing /laying in Puf Panel/laying on cable tray/ wall/ceiling/false ceiling /flooring accessories like, bends, PVC Junction Boxes, PVC Dummy Covers etc. to complete the work and as per instructions of Engineer in Charge. Make: Precision / Sudhakar	RMT	40		
34	Supply and installation of the over door 1W LED light unit shall have a red diffuser equivalent to Cat No. Legrand 572453	NOS	2		
35	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	RMT	10		



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36	Supply, Installation, Testing and commissioning of SPN Industrial Socket (Legrand P17 Tempra Pro 2P+E 32 A Low Voltage Surface Mounting Socket), (Make: Legrand /MK/ Equivalent to M/s. Legrand Catalog No. (5552 54)	NO	1		
37	Supplying, installing and commissioning Portable Fire extinguishers of ABC type of fire extinguisher of 2kgs. Capacity fitted with gun metal cap high carbon dioxide cartridge, with suitable wall mounting brackets etc., complete, conforming to IS: 15683. Make: NEWTECH/SAFEX/CEASEFIRE/ ECOFIRE/ ARIHANT/FYRAX	NOS	5		
				Sub-Total (D)	
				GST 18% (E)	
				GRAND TOTAL (D+E)	
Total Amount in Words RsOnly					



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NOTE:

1. Please mention the item rate in figures and also in words.
2. Rates are all inclusive of profit, Transport, Loading & Unloading, Shifting Taxes, Etc.
3. TIFR, Hyderabad has the right to delete any of the above items from scope of work or may increase/reduce quantities as per its requirement during execution of work. No claim or compensation for such deletion/increase/decrease will be accepted/paid to the contractor. Payment will be made as per actual quantities executed at tender rates.
4. Manufacturer's warranty of respective supply items to be provided.
5. For any above item quantity exceeding more than 10% of projected qty, contractor shall take prior approval from TIFR Engineer in writing.
6. For any deviating items, the contractor shall take prior approval from TIFR Engineer In charge with proper rate analysis.