

# TATA INSTITUTE OF FUNDAMENTAL RESEARCH

Autonomous Institution of the Department of Atomic Energy, Government of India  
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Ref.: TIFR/PD/CF18-4/180007

April 6, 2018

NIT cum Tender Document (TWO PART PUBLIC TENDER) for the following works:

Cleaning of HVAC Duct System Comprising Supply Air Duct, Conduits, Grills, Vertical Masonry return air shaft etc. of 'C' Block High Velocity (HV) & all five floor of pelletron building AC system at TIFR, Mumbai as per attached tender document.

Tender No.	TIFR/PD/CF18-4/180007
Estimate Cost	Rs. 6,25,000/-
Tender Fee	Rs. 500/- by way of Demand Draft in favour of Registrar, TIFR, Mumbai
EMD	Rs. 12,500/- by way of Demand Draft in favour of Registrar, TIFR, Mumbai
Type of Tender	Two Part Public Tender
Time of Completion Job	Within 3 Months
Contact Persons	Shri Rajesh Sharma (Tel : 22782533) Technical services for any technical clarifications.
Last Date for Submission of Tender	20.4.2018 on or before 1730 Hours
Date of Opening Technical Bid (Part "II")	23.04.2018 at 1500 Hours (Only Technical Bid Part "II")

Both Financial Bid(Part I) and Technical Bid (Part II) to be submitted within the due date and time in separate envelopes and marked on top as Part I and Part II. These two sealed envelopes should be further put in one Master Envelope superscribed with the Tender No., Due Date in Bold Letters.

All prospective bidders are requested to visit our website regularly for any such updates/corrigendums.

Please see attached sheet for conditions of tender.

TATA INSTITUTE OF FUNDAMENTAL RESEARCH  
**Technical Services**

TENDER DOCUMENT

Cleaning of HVAC Duct system Comprising Supply  
Air Duct, Conduits, Grills, Return Air shaft etc. at  
TIFR, Colaba, Mumbai - 400 005

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# 1.0 CONDITION OF CONTRACT

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## GENERAL INFORMATION TO BIDDER

1. On behalf of Tata Institute of Fundamental Research (hereinafter referred to as the Institute) quotations are invited for cleaning of HVAC duct system comprises Supply air duct , conduits, grills, etc. at TIFR, Homi Bhabha Road, Navy Nagar, Colaba, Mumbai-400 005.
2. **Eligibility Criteria:** Bidders are required to comply with the following eligibility criteria:
  - a) Registration with GST/Work Contract Tax/Service Tax is mandatory. Those not registered with these authorities shall be disqualified.
  - b) **Should have** experience in execution of similar nature of works.
  - c) **Tenderers who wish to quote for this work should have done minimum three similar nature of job having comparable value in government/private organizations. Out of the three jobs one job should be of value not less than Rs. 5.0 Lakhs or two jobs should be of value not less than Rs. 3.7 Lakhs each or three jobs should be of value not less than Rs. 2.5 Lakhs each , executed during last 3 years. Only those bids satisfying this condition shall be processed.**
  - d) **Service Support, Spares and Tools:** Bidder should have Service Support Set-up like required tool, office, qualified technical personnel, etc. in metropolitan region of Mumbai to ensure minimum time for mobilization for work.
  - e) Bidder should visit the site before quoting to ascertain the nature of job. Only those bidders, who visited the site prior to quoting , shall be entertain and their bids shall be opened.
3. The Bids should be valid for 90 days from the closing date of the Tender.
4. There are two separate sealed envelope for Financial (Part-'I') & Technical Bid (Part-'II').Both the sealed envelopes should be put in another envelope duly sealed. Tenders in sealed envelopes duly superscribed with the Financial or technical part as the case may be, Tender No. and due date, etc. and shall be addressed to the Purchase Officer, Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, Mumbai - 400 005.
5. Technical Bid i.e. part 2 should contain;
  - a) **Earnest Money Deposit (EMD) of Rs.12,500.00**
  - b) Proof of Experience in carrying out **similar nature of work i.e. HVAC duct cleaning**
  - c) List of similar work in hand and works carried out by them for last 3 years indicating annual turnover, the agency for whom executed, value of work, etc.
  - d) Performance Certificates/ Copy of Pos
  - e) **PAN No.**
  - f) **Duly filled in technical details & questioner**
  - g) Details of local office & list of Technical Staff and tools & machinery
6. Tenders are to be on the prescribed form of TIFR. Tenderers should quote in figures as well as in words the rates and amounts tendered by them. All correction shall be attested by the dated initials of the tenderer.

7. When a contractor signs a tender in an Indian language, the total amount tendered should also be written in the same language.
8. The competent authority on behalf of T.I.F.R. does not bind himself 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 a reason. All tenders in which any of the prescribed conditions are not fulfilled or any condition including that of conditional rebate is put forth by the tenderer, shall be summarily rejected.
9. Canvassing in connection with tenders is strictly prohibited and the tenders submitted by the vendors who resort to canvassing will be liable to rejection.
10. All rates shall be quoted on the proper form of the tender alone & It will be obligatory on the part of the tenderer to tender and sign the tender document for all components/parts.
11. On acceptance of the tender, the name of the authorised representative(s) of the vendor, who would be responsible for taking instructions from the Chief Engineer, shall be communicated to the Chief Engineer.
12. The total amount should be written both in figures and in words. In case of figures the words `Rs.' Should be written before the figures of rupees and the words `P' after the decimal figures e.g. Rs. 1.15 paise and in case of words, the words `Rupees' should be preceded and the word `Paise' should be written at the end. Unless the rate is in whole rupees and followed by the word `only' it should invariably be upto two decimal places. While quoting the rates in schedule of quantities, the word `only' should be written closely following the amount and it should not be written in the next line.
13. Goods & Service Tax (GST) or any other tax on material in respect of this contract shall be payable by the vendor & TIFR will not entertain any claim whatsoever in this respect. **The bid should be inclusive of all taxes. The required Tax shall be deducted at applicable rates from each bill.**
14. The owner reserves the right to postpone the date of submission and opening of Quotations.
15. The parties shall quote in English their rates/prices both in figures, as well as the Words against each item of the work as detailed in the enclosed Schedule of Quantities. In the event of any discrepancy between the quoted rates/prices in words and that quoted in figures, the rates/prices quoted in words shall govern.

## GENERAL CONDITIONS OF CONTRACT

### 1.0 Definition of Terms :

- 1.1. In construing 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 works.
- 1.2 The term `Contractor' / `Bidder' / `Vender' shall mean the party whose quotation has been accepted by the Owner.
- 1.3 The `Owner/Purchaser/Client' shall mean Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, Mumbai - 400 005.
- 1.4 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 assignees approved by the Purchaser.
- 1.5 The Term `Inspector' shall mean any person appointed by/or on behalf of the Purchaser to inspect work under the contract or any person deputed by the Inspector for the purpose.
- 1.6 The term `Engineer' shall mean Engineer, Technical Services, Tata Institute of Fundamental Research, Colaba, Mumbai or some other person for the time being or from time to time duly appointed in writing by the Owner to act as Engineer for the purpose of the Contract or in default of such appointment the Purchaser.
- 1.7 The term `Specification' shall mean the specifications annexed to or issued with these Conditions of Contract.
- 1.8 The term `Site' shall mean the place or places at which the work is to be done by the Contractor.
- 1.9 The `Contract' shall mean acceptance of the work order placed on contractor.
- 1.10 `Tests on Completion' shall mean such tests as prescribed by the specifications or have been mutually agreed to between the Contractor and the Purchaser to be made before the site is taken over by the Purchaser.
- 1.11 `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 incorporate or not.

2. Words importing singular shall also include plural and vice versa where context requires. Quotations must be submitted in duplicate giving complete details; in particular, the offers should clearly specify applicable taxes, warranty/guarantee terms, completion period, etc.
3. **Quotation should be valid for a period of 90 days from the date of receipt. Completion period shall be 12 weeks**
4. Quotations containing erasures or alterations will not be considered.
5. Quotations which do not comply with the above conditions are liable to be rejected.
6. The Institute shall be under no obligation to accept the lowest or any quotation received in response to this inquiry and shall be entitled to reject any quotation without assigning any reason whatsoever.
7. Contract:
  - 7.1. Contractor should send their acceptance letter on receipt of 'Letter of Intent' or work order within 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 for work entrusted to and may revoke the contract.
8. Work at Site:
  - 8.1. Access to the works shall be allowed only to the Contractor, Sub-Contractors or his duly appointed representatives. The Contractor shall not object to the execution of work by other contractors or tradesman and shall afford them every facility for execution of their several works simultaneously with his own.
  - 8.2. 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 all reasonable facilities for the same. The Contractor shall provide sufficient fencing, notice boards etc. to guard the works and warn the public.
  - 8.3. The Contractor shall obey Central, local and State regulations and enactment pertaining to workmen and labour and the Engineer shall have the right to enquire into and decide all complaints on such matters.
9. Delays:
  - 9.1. The Contractor shall not be entitled to any compensation for any loss suffered by him on account of delays in commencing or executing the work, whatever the cause for such delays may be, including delays in procuring Government controlled or other materials and delay in obtaining instructions and decisions from Engineer-In-Charge. The Contractor shall, however, merit extension of time as hereinafter mentioned.

10. Taking Over:

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

11.0 Extension of Time:

11.1 If the Contractor is delayed in the progress of work by changes ordered in the work, or by any cause, which the Engineer shall decide to justify the delay, then the time of completion shall be extended by a reasonable time. No such extension shall be allowed unless requested for extensions are made in writing by the Contractor/Supplier to the Engineer within 15 days from the date of occurrence of the delay.

12.0 Other Damages:

12.1 The Contractor 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 Sub-Contractor 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 shall indemnify the Purchaser and hold him harmless in respect of all and any expenses or 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.

12.2 The Contractor 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 third parties.

12.3 The Contractor 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'.

12.4 The Contractor 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 existence of this contract or at common law in respect of any employee of the Contractor 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.

12.5.1 The Purchaser, with the concurrence of the Engineer, 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.

13.0 Terms of Payment:

Unless otherwise agreed to in writing between the Purchaser and the Contractor/Supplier, payment for the work will be made as follows:

**100% Pro-rata on satisfactory completion of the work after 30 days of receipt of your bill.**

14.0 You will provide contractor's all risk insurance for your men, material and machines and absolve us of all risk and liabilities whatsoever pertaining to your men , materials and machines.

15.0 You may require to arrange for photo passes for your personnel and get the same verified by the police department as per the procedure by our Establishment Department before beginning the work. You will have to follow the security guideline of institute.

16.0 You will ensure that your workmen follow safe practices at works.

17.0 You will ensure that your supervisor is present at site at all times when the works in progress.

18.0 As and when called for by us you will provide all necessary details/test reports.

19.0 **Performance guarantee:** The tenderer, whose tender is accepted, will be required to furnish a performance guarantee of 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 / FDR issued by a Scheduled Bank .

The Performance Guarantee shall be initially valid upto 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.

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 the Director, TIFR.

**20.0 Time of Completion:** Time required to complete the job is maximum 3 months from the date of Purchase Order or Letter of Intent. Work shall commence immediately from the date of Purchase Order.

## DESCRIPTION OF WORK & TECHNICAL SPECIFICATION

1. The work comprises for cleaning of HVAC duct system comprises cleaning of supply air duct , conduits, grills, etc. of 'C' block HV systems & all the five floor of Pelletron building at TIFR, Homi Bhabha Road, Navy Nagar, Colaba, Mumbai-400 005.
2. **Drawings of the areas, where HVAC duct need to be cleaned, is not available. Therefore, bidders must visit the site prior to quoting to ascertain themselves the nature & amount of work. Mere quoting on the basis of tender will not be accepted & their bids shall be summarily rejected.**
3. The work consists of cleaning of Air-conditioning system with AHU. The AC system like 'C' block High Velocity (HV), positioned in 'A' block basement, covers 4 floors of 'C' Block ( Ground, Mezzanine, 1<sup>st</sup> & 2<sup>nd</sup> floor), where supply air travels through vertical round metallic conduits within dummy building column. These high velocity cool air conduits opened up in rooms of either side of dummy column at each floor & feed in to the room through attenuator box. These conduits animates from the main round ducting in basement. The return air from each floor is taken back through masonry return air vertical shaft running from 2<sup>nd</sup> floor to 'A' block basement.
4. The HVAC system of 'C' block HV is more than 45 years old. The system were cleaned during the year 2004-05. **The ducts are insulated from inside and proper care should be taken while cleaning this insulated duct so that the insulation should not be damaged. Vertical conduit ducts leading from horizontal rectangle duct at basement to the individual rooms at Gr., Mezz.,1<sup>st</sup> & 2<sup>nd</sup> floor of 'C' Block are small in diameter. The vendor should have proper brush with a long compressed air pipe to reach up to 2<sup>nd</sup> floor from basement.**
5. The floors of Pelletron building are typical. Each floor has got dedicated AHU with ducting for air-conditioning of rooms & labs in that floor. The supply air duct travel in the center passage above the false ceiling & return air travels back to the AHU room through space left around the duct .
6. **The HVAC system operates continuously & The contractor shall have to carry out work in continuance (day & night) and in scheduled manner. The work should be, preferably, carried out during weekend including Sundays so that there are minimum disturbances to end-users.**
7. Equipment, Materials and Labor: The HVAC system cleaning contractor shall possess and furnish all necessary equipment, materials and labor to adequately perform the specified services. The contractor shall assure that its employees have received safety equipment training, medical surveillance programs, individual

health protection measures, and manufacturer's product and material safety data sheets as required for the work by the comply with applicable national safety codes and standards.

8. The HVAC system cleaning contractor shall perform the services specified here in accordance with the current published standards of the National Air Duct Cleaners Association (NADCA). The Contractor shall be responsible for the removal of visible surface contaminants and deposits from within the HVAC system in strict accordance with these specifications.
9. The HVAC system includes any interior surface of the facility's air distribution system for conditioned spaces and/or occupied zones. This includes the entire heating, air-conditioning and ventilation system from the points where the air enters the system to the points where the air is discharged from the system. The return air grilles, return air ducts to the air handling unit (AHU), the interior surfaces of the AHU, mixing box, coil compartment, condensate drain pans, humidifiers and dehumidifiers, supply air ducts, fans, fan housing, fan blades, air wash systems, spray eliminators, turning vanes, filters, filter housings, reheat coils, and supply diffusers are all considered part of the HVAC system. The HVAC system may also include other components such as dedicated exhaust and ventilation components and make-up air systems.
10. HVAC System Component Inspections: Prior to the commencement of any cleaning work, the HVAC system cleaning contractor shall perform a visual inspection of the HVAC system to determine appropriate methods, tools, and equipment required to satisfactorily complete this project. The cleanliness inspection should include air handling units and representative areas of the HVAC system components and ductwork.
11. The cleanliness inspection shall be conducted without negatively impacting the indoor environment through excessive disruption of settled dust, microbial amplification or other debris. In cases where contamination is suspected, and/or in sensitive environments where even small amounts of contaminant may be of concern, environmental engineering control measures should be implemented. Damaged system components found during the inspection shall be documented and brought to the attention of the **owner**.
12. Site Evaluation and Preparations: Contractor shall conduct a site evaluation, and establish a specific, coordinated plan which details how each area of the building will be protected during the various phases of the project.
13. Inspector Qualifications: Qualified personnel should perform the HVAC cleanliness inspection to determine the need for cleaning. At minimum, such personnel should have an understanding of HVAC system design, and experience in utilizing

accepted indoor environmental sampling practices, current industry HVAC cleaning procedures, and applicable industry standards.

#### 14. General HVAC System Cleaning Requirements

- (A) Containment: Debris removed during cleaning shall be collected and precautions must be taken to ensure that Debris is not otherwise dispersed outside the HVAC system during the cleaning process.
- (B) Particulate Collection: Where the Particulate Collection Equipment is exhausting inside the building, HEPA filtration with 99.97% collection efficiency for 0.3-micron size (or greater) particles shall be used. When the Particulate Collection Equipment is exhausting outside the building, Mechanical Cleaning operations shall be undertaken only with Particulate Collection Equipment in place, including adequate filtration to contain Debris removed from the HVAC system. When the Particulate Collection Equipment is exhausting outside the building, precautions shall be taken to locate the equipment down wind and away from all air intakes and other points of entry into the building.
- (C) Controlling Odors: Measures shall be employed to control odors and/or mist vapors during the cleaning process.
- (D) Component Cleaning: Cleaning methods shall be employed such that all HVAC system components must be Visibly Clean as defined in applicable standards (see NADCA Standards). Upon completion, all components must be returned to those settings recorded just prior to cleaning operations.
- (E) Air-Volume Control Devices: Dampers and any air-directional mechanical devices inside the HVAC system must have their position marked prior to cleaning and, upon completion, must be restored to their marked position.
- (F) Service Openings: The contractor shall utilize service openings, as required for proper cleaning, at various points of the HVAC system for physical and mechanical entry, and inspection.
  - 1. Contractor shall utilize the existing service openings already installed in the HVAC system where possible.
  - 2. Other openings shall be created where needed and they must be created so they can be sealed in accordance with industry codes and standards.
  - 3. Closures must not significantly hinder, restrict, or alter the airflow within the system.
  - 4. Closures must be properly insulated to prevent heat loss/gain or condensation on surfaces within the system.
  - 5. Openings must not compromise the structural integrity of the system.
  - 6. Construction techniques used in the creation of openings should conform to

requirements of applicable building and fire codes, and applicable NADCA Standards.

7. Cutting service openings into flexible duct is not permitted. Flexible duct shall be disconnected at the ends as needed for proper cleaning and inspection.
8. Rigid fiberglass duct systems shall be resealed in accordance with NAIMA recommended practices
9. All service openings capable of being re-opened for future inspection or remediation shall be clearly marked and shall have their location reported to the **owner** in project report documents.

(G) Ceiling sections (tile): The contractor may remove and reinstall ceiling sections to gain access to HVAC systems during the cleaning process

(H) Air distribution devices (registers, grilles & diffusers): The contractor shall clean all air distribution devices.

(I) Air handling units, terminal units (VAV, Dual duct boxes, etc.), blowers and exhaust fans: The contractor shall insure that supply, return, and exhaust fans and blowers are thoroughly cleaned. Areas to be cleaned include blowers, fan housings, plenums (except ceiling supply and return plenums), scrolls, blades, or vanes, shafts, baffles, dampers and drive assemblies. All visible surface contamination deposits shall be removed in accordance with NADCA Standards. Contractor shall:

1. Clean all air handling units (AHU) internal surfaces, components and condensate collectors and drains.
2. Assure that a suitable operative drainage system is in place prior to beginning wash down procedures.
3. Clean all coils and related components, including evaporator fins.

(J) Duct Systems. Contractor shall:

1. Create service openings in the system as necessary in order to accommodate cleaning of otherwise inaccessible areas.
2. Mechanically clean all duct systems to remove all visible contaminants, such that the systems are capable of passing Cleaning Verification Tests (see NADCA Standards).

## 15. Health and Safety

(A) Safety Standards: Cleaning contractors shall comply with applicable, local requirements for protecting the safety of the contractor's employees, building occupants, and the environment. In particular, all applicable standards of the Occupational Safety and Health Administration (OSHA) shall be followed when working in accordance with this specification.

- (B) Occupant Safety: No processes or materials shall be employed in such a manner that they will introduce additional hazards into occupied spaces.
- (C) Disposal of Debris: All Debris removed from the HVAC System shall be disposed of as per the instruction of Engineer-in Charge.

16. Mechanical Cleaning Methodology

(A) Source Removal Cleaning Methods: The HVAC system shall be cleaned using Source Removal mechanical cleaning methods designed to extract contaminants from within the HVAC system and safely remove contaminants from the facility. It is the contractor's responsibility to select Source Removal methods that will render the HVAC system Visibly Clean and capable of passing cleaning verification methods (See applicable NADCA Standards) and other specified tests, in accordance with all general requirements. No cleaning method, or combination of methods, shall be used which could potentially damage components of the HVAC system or negatively alter the integrity of the system.

1. All methods used shall incorporate the use of vacuum collection devices that are operated continuously during cleaning. A vacuum device shall be connected to the downstream end of the section being cleaned through a predetermined opening. The vacuum collection device must be of sufficient power to render all areas being cleaned under negative pressure, such that containment of debris and the protection of the indoor environment are assured.
2. All vacuum devices exhausting air inside the building shall be equipped with HEPA filters (minimum efficiency), including hand-held vacuums and wet-vacuums.
3. All vacuum devices exhausting air outside the facility shall be equipped with Particulate Collection including adequate filtration to contain Debris removed from the HVAC system. Such devices shall exhaust in a manner that will not allow contaminants to re-enter the facility. Release of debris outdoors must not violate any outdoor environmental standards, codes or regulations.
4. All methods require mechanical agitation devices to dislodge debris adhered to interior HVAC system surfaces, such that debris may be safely conveyed to vacuum collection devices. Acceptable methods will include those, which will not potentially damage the integrity of the ductwork, nor damage porous surface materials such as liners inside the ductwork or system components.

(B) Cleaning of coils :- Any cleaning method may be used which will render the Coil Visibly Clean and capable of passing Coil Cleaning Verification (see applicable NADCA Standards). Coil drain pans shall be subject to Non-Porous Surfaces Cleaning Verification. The drain for the condensate drain pan shall be

operational. Cleaning methods shall not cause any appreciable damage to, displacement of, inhibit heat transfer, or erosion of the coil surface or fins, and shall conform to coil manufacturer recommendations when available. Coils shall be thoroughly rinsed with clean water to remove any latent residues.

17. Cleanliness Verification

(A) General: Verification of HVAC System cleanliness will be determined after mechanical cleaning and before the application of any treatment or introduction of any treatment-related substance to the HVAC system.

(B) Visual Inspection: The HVAC system shall be inspected visually to ensure that no visible contaminants are present.

1. If no contaminants are evident through visual inspection, the HVAC system shall be considered clean; however, the **owner** reserves the right to further verify system cleanliness through Surface Comparison Testing or the NADCA vacuum test specified in the NADCA standards.
2. If visible contaminants are evident through visual inspection, those portions of the system where contaminants are visible shall be re-cleaned and subjected to re-inspection for cleanliness.

18. Post-project Report

At the conclusion of the project, the Contractor shall provide a report to the **owner** indicating the following:

1. Success of the cleaning project, as verified through visual inspection.
2. Areas of the system found to be damaged and/or in need of repair.

19. Applicable Standards and Publications: The following current standards and publications of the issues currently in effect form a part of this specification to the extent indicated by any reference thereto:

- (A) National Air Duct Cleaners Association (NADCA): "Assessment, Cleaning & Restoration of HVAC Systems"
- (B) National Air Duct Cleaners Association (NADCA): "Understanding Microbial Contamination in HVAC Systems,"
- (C) National Air Duct Cleaners Association (NADCA): "Introduction to HVAC System Cleaning Services,"
- (D) National Air Duct Cleaners Association (NADCA): Standard 05 "Requirements for the Installation of Service Openings in HVAC Systems,"
- (E) American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE): Standard 62-89, "Ventilation for Acceptable Indoor Air Quality".
- (F) Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): "HVAC Duct Construction Standards - Metal and Flexible,"

# DATA SHEET & QUESTIONNAIRE

(To be submitted along with Technical Bid)

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**Project:** HVAC Duct cleaning

**Location:** 'C' Block HV AC system & All floors of Pelletron at TIFR ,Mumbai

1.0	To Confirm that the bidder had ascertained the nature of site & surrounding, and all local condition and restriction likely to affect the execution of the contract work	
2.0	To confirm that the bidder has seen HVAC system of 'C' block High Velocity(HV) Fan & All the floors of Pelletron building including their ducting route, return air path, air distribution unit in the room, etc.	
3.0	To confirm that bidder aware about the NADCA standard for duct cleaning & shall abide by the regulation while performing duct cleaning	
4.0	To confirm that necessary PO's & Work completion certificates are attached in technical bid as per point no. 2 of General conditions of contract	
5.0	To confirm that list of tools & tackles, required & available with you for duct cleaning, are attached.	

## Schedule of Quantities (Financial Bid Part I)

SR. NO.	DESCRIPTION	QTY	RATE	PRICE
1	Cleaning of Air- Conditioning system Comprising Supply Air Duct, Conduits, Grills, Vertical Masonry return air shaft, etc. of 'C' Block High Velocity (HV) HVAC system catering to Ground, Mezzanine, 1 <sup>st</sup> & 2 <sup>nd</sup> floors of 'C' block as per the attached specification	1Job		
2	Cleaning of Air- Conditioning system Comprising Supply Air Duct, Conduits, Grills, , etc. of the following floors of Pelletron building as per attached specification			
2.1	Pelletron Ground Floor	1Job		
2.2	Pelletron First Floor	1Job		
2.3	Pelletron Second Floor	1Job		
2.4	Pelletron Third Floor	1Job		
2.5	Pelletron Fourth Floor	1Job		
	Total Value			
	GST			
	GRAND TOTAL AMOUNT			

(Total Amount in Rs. -----  
-----)