

TENDER DOCUMENT

Name of work: **Supply, Installation, Testing & Commissioning of VRF system for Tissue Culture Labs of New Lab Block at NIPGR Campus, New Delhi.**

CLIENT: **DIRECTOR, NEW DELHI**

COST OF TENDER DOCUMENT:- ₹ 500.00/-

TENDER DOCUMENT

Name of work: **Supply, Installation, Testing & Commissioning of VRF system for Tissue Culture Labs of New Lab Block at NIPGR Campus, New Delhi.**

Owner: **Director, NIPGR New Delhi**

Tender Issued to : _____

Place for submission / opening of tender document: **NIPGR Campus,
Aruna Asaf Ali Marg,
New Delhi-110067**

Date & Time of Pre-bid Meeting: **11.01.2019 at 1200 hrs.**

Last date & time for sale of tender documents: **18.01.2019 before 1500 hrs.**

Date & time of submission of tender documents: **21.01.2019 up to 1500 hrs.**

Date & Time of Opening of Tenders: **22.01.2019 at 1500 hrs.**

**Consultant Engineer
NIPGR**

TENDER FORM

To

**The Director
NIPGR, JNU CAMPUS, New Delhi.**

Dear Sir,

I/We have read and examined the following Tender Documents relating to **"Name of work: Supply, Installation, Testing & Commissioning of VRF system for Tissue Culture Labs of New Lab Block at NIPGR Campus, New Delhi.**

- Tender Notice
- General Conditions
- Instructions to Bidders
- General Information
- Memorandum
- Schedule of Quantities (not to be filled)
- General Conditions of Contract Agreement
- Special terms & conditions of contract.
- Terms & Conditions
- Instructions for Online Bid Submission
- Technical Specifications
- Drawings
- Annexure – I, II & III

I/We hereby offer to execute the work complete in all respects specified in the under written Memorandum within the time specified therein or during the allowed extended time at the rates specified in the bill of Quantities and in accordance, with the specifications, designs, drawings and instructions in writing referred to in the conditions of tender.

(Seal & Signature of Contractor)

NATIONAL INSTITUTE OF PLANT GENOME RESEARCH
(Department of Biotechnology, Ministry of Science and Technology, Govt. of India)
Aruna Asaf Ali Marg, New Delhi-110067
Phone: 011-26735161, 26735138 Fax: 011-26741658

TENDER NOTICE
(Tender No.: NIPGR/Engg./5/14/2018-19)

Online tenders (in two bid system) are invited on behalf of the Director, NIPGR, New Delhi from manufacturer or their authorized dealers for specialized category of HVAC work from approved and eligible contractors of CPWD / State PWD and those on approved list of MES, Railways, Govt. Autonomous organizations, State / Central Govt. undertaking / PSUs / other reputed organizations for the following work:

Name of work: Supply, Installation, Testing & Commissioning of VRF system for Tissue Culture Labs of New Lab Block at NIPGR Campus, New Delhi.

Sl. No.	Estimated Cost (In ₹)	EMD (In ₹)	Time for Completion	Date & time of pre-bid meeting	Last date & time for sale of tender documents	Date & Time of submission of tender documents	Date & Time of Opening of Tenders
1.	2.	3.	4.	5.	6.	7.	8.
1.	₹ 45,00,000.00	₹ 90,000.00	45 days	11.01.2019 1200 Hrs.	18.01.2019 1500 Hrs.	21.01.2019 1500 hrs.	22.01.2019 1500 Hrs.

Tender document can be obtained up to 1500 Hrs. on all working days from NIPGR office on payment of ₹ 500.00 (₹ Five hundred only) in cash (Non-refundable) towards the cost of tender from 01.01.2019 to 21.01.2019 up to 1500 hrs. **Tender documents can be downloaded on line free of cost from our website www.nipgr.ac.in and Govt. CPP Portal <https://eprocure.gov.in/cpppl/>**

The earnest money shall be in the form of Demand Draft of a Scheduled Bank issued in favour of the **Director, NIPGR, New Delhi** so as to reach the undersigned latest by 21.01.2019 at 1500 hrs.

Tenderers registered with M.S.M.E. & N.S.I.C. in the above-mentioned service /activity are exempted from submission of E.M.D.

The bids will be accepted in respect of those contractors having successfully completed at least three similar works of each value not less than ₹ 18.00 Lacs **OR** two similar works of each value not less than ₹ 22.50 Lacs **OR** one similar work of value not less than ₹ 36.00 Lacs during the last three years ending 31st Oct. 2018. Similar works means working experience of "S.I.T.C. of VRF system" in Government organizations, Govt. Autonomous organizations, **OR** other reputed organizations. Annual Financial Turnover of last 3 years at least ₹ 36.00 lacs on 31.03.2018.

The pre-bid meeting is scheduled for 11.01.2019 at 1200 hrs. as mentioned above so as to satisfy tenderer with the terms & conditions & technical specifications of subject work.

Intending tenderers must enclose self-attested copies of Completion Certificates of having completed the work satisfactorily issued by an appropriate competent authority. Also, agency must submit authorization certificate from manufacturer without which tender will not be considered.

The Director, NIPGR reserves the right to accept or reject all or any of the tender without assigning any reasons thereof.

Consultant Engineer
NIPGR

GENERAL CONDITIONS

1. Online tenders are hereby invited from qualified contractors for the work of: **Name of Work: Supply, Installation, Testing & Commissioning of VRF system for Tissue Culture Labs of New Lab Block at NIPGR Campus, New Delhi.**
2. **PRE-BID MEETING:-** All the tenderers who are eligible as per terms & conditions of tender and wish to quote are advised to visit this Institute on 11.01.2019 at 1200 hrs. with all related documents / details pertaining to subject work with detailed specifications of each items with abstract of quantity to satisfy Institute and tenderer themselves with the scope of work and terms & conditions of contract.
3. The tender document consists of Tender form, Notice inviting tender, Instructions to bidders, General Information, General Conditions of contract Agreement, technical specification and Schedule /Bill of quantities etc. which can be had at a cost of ₹ 500.00 (₹ Five hundred only) in cash from 01.01.2019 to 21.01.2019 from the NIPGR office, Aruna Asaf Ali Marg, New Delhi. **Tender documents can also be downloaded from our website www.nipgr.ac.in free of cost.** The tender document is obligatory on the part of the tenderers & bid in no other form will be accepted.
4. The time allowed for the completion of work is **45 Days** to be reckoned from the 10th day after the date of written order to commence the work.
5. Every tender shall be accompanied by earnest money for ₹ 90,000.00 (₹. Ninety thousand only) in the form of demand draft drawn in favour of the Director, NIPGR ,payable at New Delhi. Any tender not accompanied by such earnest money will be rejected straight away.
6. The contractor will submit his tender after examining the tender documents, scope of work, specifications, clauses, additional terms of contract agreement, special terms & conditions, bill/Schedule of quantities, instructions to bidders, general information, and instruction for on-line bid, etc.
7. The offer shall remain valid for 180 days from the date of opening of Tender. The value of tender can be increased or decreased and any item can be added, deleted, withdrawn or substituted without any notice as per the requirements of without assigning any reason.
8. If a tenderer whose tender is accepted fails to undertake the work as per terms of the contract within 10 days to be reckoned from the date of issue of work order, the earnest Money deposited will be forfeited.
9. NIPGR does not bind itself to accept the lowest or any tender and reserves the right to reject any or all tenders without assigning any reason as well as for the transportation of samples.
10. NIPGR will not pay any expense, whatsoever incurred by tenderer for the preparation and submission of tenders.
11. This notice inviting tender, will form part of the contract agreement to be executed by the successful tenderer.
12. The successful tenderer shall have to sign the contract agreement within 15 days of the allotment of work.
13. All the correspondence on the tender shall be addressed to the Director, NIPGR.
14. The uploaded documents / certificates shall be verified with originals after opening of Technical Bid.
15. Payment will be released after deduction of tax at source as per Rule in force.

Consultant Engineer
NIPGR

Seal & Signature of Contractor

INSTRUCTIONS TO BIDDERS

1. GENERAL INSTRUCTIONS:

The works referred here-in shall cover the entire scope of the proposal which includes supplying and installation of material including the successful completion and the tests which the desires to get carried out. The "Owner" where appearing in these documents shall mean Director, NIPGR.

2. TENDERERS TO STUDY ENTIRE TENDER DOCUMENT CAREFULLY:

Submission of a tender by a tenderer implies that he has read all the stipulations contained in this tender document and has acquainted himself of the nature, scope and specifications of the works to be followed.

3. TENDERER TO SUBMIT THE ENTIRE TENDER DOCUMENT ON-LINE.

The tenderer shall submit all documents issued to him for the purpose of this tender after duly filling the same in all respects. Tenders which are found to be vague or incomplete shall be rejected summarily.

4. INSTRUCTION FOR FILLING THE TENDER.

Tenders shall be forwarded ON-LINE, it shall be signed by one who has been authorized by the Company / Agency. Copy of authority letter in favour of the person signing must accompany the tender.

5. TENDERERS TO QUOTE FOR ALL ITEMS AND IN FIGURES & WORDS:

The tenderer shall quote his rates in words and figures with reference to each item and must enter for all the items shown in the attached Bill of quantities. Incomplete offer shall be liable for rejection. In case there is a discrepancy in "words" and "figures". the rate in words will be taken as correct for evaluation of tender. All quantities should be calculated as per percentage given by the contractor and total should be given of every sub head and grand total should also be given of all heads. The total amount shall be written both in figures and in words.

6. VALIDITY PERIOD OF OFFERS:

The rates quoted in the tender shall hold good for 180 days from the date of opening of the tender. The validity period shall be extendable with the mutual consent of both the parties. No tenderer can withdraw/or modify his tender or revoke the same within the said period of 180 days. If a tenderer on his own withdraws or revokes the tender or revises or alters or modifies the tender for any item or condition within a period of aforesaid 180days his earnest money deposit shall stand forfeited.

7. TENDERER TO SIGN ALL PAGES:

The tenderer shall stamp and sign at the bottom right hand corner of every page of the tender documents in token of acceptance of tender conditions and for the purpose of identification.

8. ERASURES AND ALTERATIONS:

Tenders containing erasures and alterations of the tender documents are liable to be rejected unless these are authenticated by the person signing the Tender Documents.

9. TENDERER TO SATISFY HIMSELF OF SITE CONDITIONS:

Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tender regarding nature of the site conditions, the means of access of the site, the accommodation they may require and in general obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender in any manner. A tenderer shall be deemed to have full knowledge of the site, whether he inspects it or not and no compensation shall be allowed for the same. The tenderer must sign & submit the certificate for site inspection Annexure-II.

10. EARNEST MONEY:

The tenderer must deposit the earnest money for ₹ 90,000.00 (₹. Ninety thousand only) in the form of Demand Draft only drawn in favour of the **Director, NIPGR, payable at New Delhi**. Earnest money of the unsuccessful bidder(s) shall be refunded after expiry of the validity period of the tenders/allotment of works whichever is earlier. In case of successful tenderer the earnest money shall be adjusted against performance security.

11. TENDER LIABLE TO REJECTION:

Tenders which do not fulfill all or any of the conditions laid down in this notice, or contain conditions not covered and / or not contemplated by the Conditions of contract and/or expressly prohibited therein or stipulate additional/alternative conditions shall be liable to be rejected and his earnest money will be forfeited.

Tenders shall also be liable for rejection on any of the following grounds :-

- i) Tenders submitted late
- ii) Tenders containing remarks uncalled for.
- iii) Conditional tenders
- iv) Tenders not submitted on-line on prescribed Performa.
- v) Telegraphic tenders.
- vi) Tender submitted without E.M.D.
- vii) Not submitted required documents as per tender.
- viii) Tenders with NIL consideration.
- ix) Undertaking on judicial stamp (Annexure-I)
- x) Site visit certificate (Annexure-II)
- xi) O.E.M. or authorization certificate from the manufacturer.

12. CORRESPONDENCE:

Tenderers must mention their postal address and telephone number(s) of the Chief Executive/authorized agent or attorney in the tender. The tender submitted by the tenderer will be rejected if he or his agent cannot be contacted on the last known address or on the intimated telephone number(s) after reasonable search in which event earnest money may be forfeited by the NIPGR.

13. NOT TO ASSIGN ANY REASON FOR REJECTION OF TENDER:

NIPGR hold absolute discretion to accept or reject the lowest or any other tender without assigning any reason. No claim on this account shall be entertained.

14. AMENDMENT IN TENDER DOCUMENTS:

NIPGR reserves the right to revise or amend the Bid Documents up to the date prior to the date notified for opening of the tenders and also the right to postpone the date of submission and opening of tenders without assigning any reason, whatsoever.

15. REFERENCE IN TENDER DOCUMENTS:

Director, NIPGR New Delhi shall be referred as "Owner" in all the documents of Tender documents/contract agreement.

Consultant Engineer
NIPGR

Seal & Signature of Contractor

GENERAL INFORMATION

- 1 Accepting Authority Director, NIPGR
New Delhi.
- 2 Reference Book As per specifications
- 3 Earnest money For ₹ 90,000.00 (₹. Ninety thousand only) to be furnished with the tender in the form of the demand draft (No interest is payable on Earnest Money and security deposit)
- 4 Security deposit The security deposit will be collected by deductions from the running bills of the contractors at the rate mentioned below and the earnest money, if deposited at the time of tender, will be treated as part of security deposit. Performance security may be accepted as Bank Guarantee/DD of Scheduled Banks and State Bank of India. A sum @ 10% of the gross amount of the bill shall be deducted from each running bill of the contractor till the sum along with the sum already deposited as earnest money, will reach to the extent of 5% of the tendered value of the work as security deposit. In addition, the contractor shall be required to deposit an amount equal to 5% of the tendered value of the contract as Performance Security within the period prescribed for commencement of work in the letter of award issued to him.
- 6 Authority competent to grant extension of time Director or authorized person by Director,
- 7 Tools & plants To be arranged by contractor
- 8 Schedule of Minimum wages As per notification issued by Govt. of NCT.
- 9 Authority competent to reduce the compensation amount Director ,
- 10 Defect Liability Period One year from the date of acceptance of completion by the Institute. .
- 11 Release of Security Deposit The performance security shall be refunded to the contractor on completion of the work and recording of completion certificate by Institute and the balance amount be released after defect liability period.
- 12 Authority Competent to Appoint Arbitrator Director, NIPGR

Consultant Engineer
NIPGR

Seal & Signature of Contractor

MEMORANDUM

- a) Name of work **Supply, Installation, Testing & Commissioning of VRF system for Tissue Culture Labs of New Lab Block at NIPGR Campus, New Delhi.**
- b) Estimated cost ₹ 45 00,000.00 (Approx.)
- c) Earnest money ₹ 90,000.00 (₹. Ninety thousand only) in the form of Demand Draft in favour of "Director, NIPGR payable at New Delhi. (No interest is payable on earnest money).
- d) Time allowed for the completion of work (to be reckoned from 10th day after the date of issue of written order to commence work) 45 Days

Place
Date:

(Seal & Signature of AGENCY)

SCHEDULE OF QUANTITIES

ITEM NO.	DESCRIPTION OF ITEM	QTY.	UNIT	RATE	AMOUNT
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Attached at pages _____ to _____

Should this tender be accepted, in whole or in part I/We hereby agree to abide by and fulfill all the terms & provisions of the conditions of tender as applicable or in default there of a sum of for ₹ 90,000.00 (₹. Ninety thousand only) deposited by me/us as earnest money in favour of Director, NIPGR, New Delhi., shall stand absolutely forfeited to .

I/We agree:

- (i) that should I/We fail to commence the work specified in the above mentioned Memorandum the without prejudice to any other right or remedy shall be at liberty to forfeit the earnest money. Otherwise the said earnest money shall be retained and adjusted towards security deposit mentioned in the above Memorandum
- (ii) to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein.

The names and postal addresses and contract phone nos. of our representative(s) authorized to deal with this tender are:

1)

2)

3)

Dated the _____ day of _____ 2018

Signature of Tenderer

BILL OF QUANTITY

Name of Work- VRF SYSTEM FOR LAB AT NIPGR ,NEW DELHI

Sl No.	Description	Unit	Qty	Rate (Rs)	Amount (Rs)	MAKE
1	Variable Refrigerant Flow System					
	Supply, Installation, Testing and Commissioning of Modular type VRF Outdoor Units Equipped with Highly Efficient Scroll Compressor with 100 % inverter technology, special heat exchanger, outdoors sB(A) level less than 66 at a distance 1 meter, Centrifugal Fan for condensor, Outdoor Units having front Suction & Top Discharge with Y branch as required					VOLTAS / Mitsubishi Heavy/ O General / Toshiba
	Outdoor Unit					
	Supply/ Installation/ Testing & Commissioning of Modular type VRF Outdoor units , equipped with Full Inverter Scroll compressor,equipped with Advanced Permanent Magnet DC Motor special acryl precoated heat exchanger, low noise condenser fan, auto check function for connection error, auto address setting, microprocessor panel, Minimum COP 3.7 at 100% Load at 35 Deg C Outside and 27 Deg C inside with capacities as mentioned below :					
A	36 HP (Heating + Cooling) (18 HP X 2 No)	Nos.	1			
B	24 HP (Heating + Cooling) (12 HP X 2 No)	Nos.	1			
2	Indoor Units -4 Way Standard Cassette Type					
	Supply / Installation/ Testing & Commissioningof Indoor units equipped with pre-filter, fan section with low noise fan, multispeed motor, coil section with DX coil, outer cabinet, drain pan, insulation, pipe connections. of various capacities as per specifications and drawings. Capacities should be designed at 19 Deg C WBT Inside Condition.					
a	4 TR	Nos.	14			
3	Supply/ Installation/ Testing & Commissioning of Y-joints for Indoor units	No	12			
4	Refrigerant Piping					
	Supplying & Installation of interconnecting following size of refrigerant copper pipe & required all fitting duly insulated with Elastometric Nitrile rubber insulation as per tender specification between each set of indoor & outdoor units as per specification all piping inside the room shall be properly supported with M.S. Hanger. Exposed pipe should be UV coated					MANDEV/ MAX FLOW
	41.3 mm dia with 19 mm thick insulation	Rmt.	15			
	38.1 mm dia with 19 mm thick insulation	Rmt.	10			
	34.9 mm dia with 19 mm thick insulation	Rmt.	30			
	31.8 mm dia with 19 mm thick insulation	Rmt.	10			
	28.6 mm dia with 19 mm thick insulation	Rmt.	20			
	25.4 mm dia with 19 mm thick insulation	Rmt.	16			
	22.2 mm dia with 19 mm thick insulation	Rmt.	20			
	19.1 mm dia with 13 mm thick insulation	Rmt.	25			
	15.9 mm dia with 13 mm thick insulation	Rmt.	104			
	12.7 mm dia with 13 mm thick insulation	Rmt.	20			
	9.5 mmdia with 13 mm thick insulation	Rmt.	84			
5	Providing and fixing 1.6 mm thick Galvanised steel sheet factory fabricated covered cable tray of the following sizes including knock out holes with screws and fixing accessories like bends, tees etc.					RICCO / NATIONAL
A	450 mm wide x 75 mm deep	Rmt	15			
B	300 mm wide x 75 mm deep	Rmt.	15			

NOT TO BE FILLED

6	Drain Piping				
	Providing and fixing rigid PVC Piping complete with fittings, supports as per specification and duly insulation with 6 mm thick closed cell nitrile rubber insulation .				PRINCE / SUPREME
A	40 mm dia	Rmt.	70		
B	32 mm dia	Rmt.	50		
7	Transmission ,Control Wiring				
	Supply ,installation ,testing and commissioning of control cum trans-mission wiring of copper between indoor and outdoor unit .				
	(3 core x1.5 Sq mm)	Rmt.	300		
8	HVAC PANELS (for OutdoorUnits)				
	Supply , Design ,Installation , Testing & Commissioning of LT Panel for Outdoor VRV Unit , floor mounted , indoor type cubical panel made out of 16 SWG thick gland CRCA sheet , dust and vermin proof,lockable hinged doors with 16 SWG thick gland plate. Panel will be powder coated of color siemens grey shed. The Panel including providing and fixing the following switchgear as required.	No	1		CPRI Approved make
	INCOMER				
	1 nos.160 A TPN MCCB (KA)with solid neutral link (01 no.)				
	METERING &INDICATION				
	Amp Meter (01 No.)				
	Volt Meter (01 Set)				
	Phase Indication Light LED type (01 Set)				
	Control MCB 6 Amp .(03 Nos .)				
	Current Transformer 400 / 5S (01 Set)				
	BUS -BAR				
	TPN Aluminium busbar 200 Amp with color coded hest shrinkable sleeves.(01 set)				
	OUTGOINGS				
	100 amps MCCB with ELCB (01 nos.)				
	63 amps MCCB with ELCB (01 nos.)				
	40 amps Single Phase MCB for indoor (02 nos.)				
9	Power cable				
	Supply and Fixing of following size of XLPE / PVC insulated Copper conductor Armoured , overall PVC sheathed L.K.V grade cables conforming to relevant IS code and technical specifications. Quoted rate should be inclusive of Gland, thimble, earthing and Cable tray				Havells / National/ Paramount/ Polycab
	4C X 16 Sqmm	Rmt	10		
	4C X 10 Sqmm	Rmt	10		
10	SITC of Power socket for indoor unit alongwith neccassary cable and conduit from outdoor panel	No	14		
11	Civil works along with modification in False Ceiling	Lot	1		
				Total	
				GST @18%	
				Grand Tota	

NOT TO BE FILLED

GENERAL CONDITIONS OF CONTRACT AGREEMENT

1. SECURITY DEPOSIT

The person/persons whose tender may be accepted (herein after called the contractor) shall permit NIPGR at the time of making any payment to him for works done under the contract to deduct such sum as will amount to 10 % of all moneys so payable to be held by the Institute, by way of security deposit. Earnest money shall also be adjustable towards this security deposit. All compensation or other sums of money payable by the contractor to NIPGR under terms of this contract may be deducted from his security deposit or from any account what so ever, and in the event of his security deposit being reduced by reason of any such deduction, the contractor shall within 10 days thereafter make good in cash any sum or sums which may have been deducted from his security deposit or any part thereof.

2. COMPENSATION CLAUSE

The time allowed for carrying out the work as entered in the tender shall be strictly observed by the contractor, and shall be reckoned from the 10th day of the date on which the order to commence the work is given to the contractor, and within ten days of award of work the contractor. The work on the contract shall be executed according to the approved drawings as aforesaid and shall throughout the stipulated period of the contract be proceeded with all due diligence (time being deemed to be the essence of the contract on the part of the contractor) and the contractor shall pay as compensation an amount equal to one percent per week of work order amount as, may decide on the value of work as per contract, . Provided always that the entire amount of compensation to be paid under the provisions of this clause shall not exceed ten percent of the awarded cost of work as shown in the tender. The Director, NIPGR on a representation from the Agency, is however; empowered to reduce the amount of compensation and his decision in writing shall be final.

3. TIME EXTENSION

If the contractor shall desire an extension of the time limit for completion of the work on the grounds of his having been unavoidably hindered in its execution or on any other ground he shall apply in writing to the NIPGR, within 15 days of the date of the hindrance on account of which he desires such extensions as aforesaid but before the expiry of time limit and the NIPGR, if in his opinion(which shall be final)reasonable grounds as shown thereof ,authorized such extension of time if any, as may, in his opinion be necessary or proper.

4. COMPLETION OF WORK

Without prejudice to the rights of NIPGR under any clause hereinafter contained on completion of the work, the contractor shall be furnished with a certificate by the NIPGR or his representative of such completion, but no such certificate shall be given nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work has been executed, all scaffolding ,surplus materials and rubbish, and cleaning off the dirt from all doors, walls, floors, or any other parts of buildings said to have been completed, and the measurements in the said certificate shall be binding and conclusive against the contractor, if the contractor shall fail to comply with the requirements of this clause as to the removal of scaffolding, surplus materials, and rubbish and cleaning off dirt on or before the date fixed for the completion of the work, NIPGR, may at the expense of the contractor have removed such scaffolding ,surplus materials and rubbish and dispose of the same as he thinks fit and clean off such dirt as aforesaid and the contractor shall forth with pay the amount of all expenses so incurred, and shall have no claim in respect of any such scaffolding or surplus materials as aforesaid except for any such sale proceeds actually realized by the sale thereof.

5. ADDITIONS/ALTERATIONS/ DEVIATIONS

5.1 The NIPGR, shall have power to make any alterations or omissions or additions or substitutions in the original specifications ,drawings ,designs and instructions that may appear to him to be necessary or advisable during the progress of the work, and the contractor shall be bound to carry out the work in accordance with any instructions which may be given to him in

writing signed by the NIPGR and such alterations, additions or substitutions shall not invalidate the contract and any altered, additional or substituted work which the contractor may be directed to carry out in the manner above specified as part of the work shall be carried out by the contractor on same conditions in all respects on which he agreed to do the main work. The time for the completion of the work shall be extended in the proportion that the altered additional or substituted work has to the main work at the sole discretion of the NIPGR, and his decision in this regard shall be final and binding on the contractor.

All tenderers are required to quote as per specifications stipulated hereunder. Rates for all items shall be quoted as specified hereunder. After the award of the contract, the work shall be carried out as per approved samples. Rates for extra/substituted items, should they become necessary during the execution of the work shall be settled on analysis of rate to be submitted by the contractor for such items.

Quantities in the B.O.Q. or estimated quantities which can vary up to $\pm 50\%$ during the execution of the work. Payment shall be made as per actual quantum executed without any change in the contracted rate due to variation in quantity, if any.

6A. CARRYING OUT OF WORK

All the work shall be carried out in accordance strictly as per the specifications given in the tender to the total satisfaction of the Institute. In the case of an item for which specification are not available in the said specifications relevant CPWD / BIS specifications applicable as on the date of tenders shall be followed.

7. QUALITY CONTROL OF MATERIAL

7.1 If it shall appear to the Engineer or the Director, that any work has been executed with unsound, imperfect, or unskillful workmanship or with materials or articles provided by him for the execution of the work are unsound, or of a quality inferior to that contracted for or otherwise not in accordance with contract, the contractor shall on demand in writing from the Engineer specifying the work materials or articles complained of not with standing that the same may have been inadvertently passed, certified and paid for forthwith rectify, or remove & reconstruct the work so specified in whole or in part, as the case may require, or as the case may remove the materials or articles so specified and provide other proper and suitable material or articles at his own charge and cost and in the event of his failing to do so within a period to be specified by Engineer, in his demand as aforesaid then the contractor shall be liable to pay compensation at the rate of 1% on the contract agreement of work for everyday till rectify or remove, and re-execute the work or replace with other, materials or articles complained of as the case may be at the risk and expense in all respects of the contractor.

8. INSPECTION OF WORK

All work under or in course of execution or executed in pursuance of the contract shall at all times be open to the inspection and supervision of Engineer, or his subordinate in-charge of the work and the contractor shall at all times, during the usual working hours and at all other times at which reasonable notice of the intention of the Engineer to visit the works shall have been given to the contractor, either himself be present to receive order and instructions or have a responsible agent duly accredited in writing present for that purpose. Orders given to the contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.

The work during its progress shall be inspected by the authorized representative of the Institute / Engineer-in-charge on behalf of NIPGR and the contractor shall extend all co-operations to the engineers inspecting the work.

9. AGENCY'S RISKS

All risks of loss of or damage to physical property and of personal injury and death which arise during and in consequence of the performance of the contract other than the excepted risks are the responsibility of the contractor.

Consultant Engineer
NIPGR

Seal & Signature of Contractor

SPECIAL TERMS AND CONDITIONS OF CONTRACT

1. SPECIFICATIONS:

If specifications for an item of work are not covered as per approved Specifications of tender, the same shall be decided by the Institute and shall be binding on the contractor.

The Director shall have the power to insist upon the contractor to purchase and use such materials of approved make which may in his opinion be necessary for proper and reasonable compliance with the specifications and execution of work.

In the event of any variation/discrepancy in the specification of tender documents the decision of the Institute shall be final binding and conclusive on the contractor.

2. CONTRACTOR TO BE LIABLE FOR ALL TAXES ETC. - The rates specified in the tender shall be inclusive of GST, royalty etc. However if any fresh taxes are imposed by State/Central/Statutory bodies during the currency of contract, the same shall be borne by Institute.

3. FORCE MAJEURE:

The right of the contractor to proceed with the work shall not be terminated because of any delay in the completion of the work due to unforeseeable causes beyond the control and without the fault or negligence of the contractor, including not limited to acts of God, or of the public enemy, restraints of a sovereign state, firms, floods, unusually severe weather.

4. JURISDICTION:

Not with standing any other courts having jurisdiction to decide the questions forming subject matter of a suit any and all actions and proceedings arising out of or relative to this contract (including any arbitration in terms thereof) shall lie only in the court of competent Civil jurisdiction in this behalf at New Delhi., where this contract is to be signed on behalf of and only the said court shall have jurisdiction to try any such actions and/or proceedings to the exclusion of all other courts.

5. SITE WORKING RULES AND REGULATIONS:

a) The contractor shall furnish NIPGR, the Power of Attorney name and signature of his authorized representative who will be present for the execution of the works at site for execution of the works.

b) Save as otherwise specifically provided in this Agreement the rates and prices herein, unless otherwise stipulated elsewhere in this Agreement, include all the costs, expenses and outlays of the contractor for executing the works and fulfilling all the obligations of the Contractor under this agreement.

6. Scope of work

The scope of work is as per schedule of Bill/quantity. All aspects of Firefighting including site alignment. Electric supply and water, if any, required for the execution of work shall be provided by institute from one point free of cost.

7. CONTRACTOR'S RESPONSIBILITY FOR THE MANNER OF EXECUTION OF WORKS

The contractor shall be solely responsible for the manner and the method of executing the work. The work shall be subject to the approval of NIPGR from time to time for purposes of determination of the question whether the work is executed by the contractor in accordance with the contract.

8. TIME LIMIT :The entire work is required to be completed within 45 days after the date of award of contract.

9. SUBMISSION OF BILLS:

Contractor is to submit the bills and record of measurements in approved Performa of the NIPGR or his representative for works executed by him. The Bill shall be submitted after Completion of work. Payment shall be released after completion of work only.

10. TERMS OF PAYMENT

The entire work executed under this contract shall be guaranteed by the contractor to give Zero defect and trouble free usage for one year after the date of completion of this contract, during this period, any

defect in any component of the job on account of bad workmanship or use of sub-standard materials shall be replaced/rectified to the entire satisfaction of the Institute at his cost. 5% of the contract value shall be retained by the Institute during the guarantee period as security deposit for this purpose. The security can be in the form of deduction from the payment due to the contractor during performance guarantee period i.e. one year after the date of completion if no defect as above are noticed during the period or if noticed they are attended to satisfactorily by the contractor.

11. ACTION AND COMPENSATION PAYABLE IN CASE OF BAD WORK:

If it shall appear to NIPGR, or our representatives, that any work has been executed with unsound, imperfect or unskillful workmanship or with materials of any inferior description or that any materials or articles provided by him for the execution of the work are unsound or of a quality inferior to the contracted for, or otherwise not in accordance with the contract and provide other and suitable materials or articles so specified at his own cost and in the event of his failing to do so within a period to be specified by the NIPGR in his demand aforesaid, **then the contractor shall be liable to pay compensation at the rate of one percent on the amount of the work order** for every week not exceeding ten days while his failure to do so that continue and in the case of any such failure NIPGR, may rectify or remove, and re-execute the work or remove and replace with other materials or articles complained of, as the case may be at risk and expenses in all respects of the contractor.

1. The works shall be inspected by authorized representative of NIPGRs. The contractor shall extend full co-operation and render all necessary facilities for inspection of the work to the inspecting authority without any additional cost to NIPGR,. It must be noted that any observations/ comments/ recommendations of the said Technical representative of NIPGR shall be binding on the contractor.

2. It shall always prevail, unless otherwise specifically stated, that the entire provisions of Tender document been opened upon and accepted for compliance by the contractor without any reservation.

**Consultant Engineer
NIPGR**

Seal & Signature of Contractor

TERMS & CONDITIONS

Name of Work: Supply, Installation, Testing & Commissioning of VRF system for Tissue Culture Labs of New Lab Block at NIPGR Campus, New Delhi.

1. The site of work is at NIPGR Campus, Aruna Asaf Ali Marg, New Delhi – 110067 and contractor must visit site before quoting the rates and also sign the site visit certificate enclosed as per Annexure-II.
2. The rates are inclusive of Transportation, loading, unloading & handling charges and nothing extra will be paid.
3. The rates are inclusive of GST, other taxes, etc., and nothing extra will be paid.
4. The contractor shall make his own arrangement for the security of material at site.
5. The contractor shall arrange all T&P and nothing extra will be paid.
6. The EMD of un-successful bidders shall be returned after issue of work order to lowest agency.
7. In case agency fails to comply with terms & conditions the EMD of the agency shall be forfeited.
8. The security deposit @ 10% shall be deducted from the bill and shall be refunded after completion of defect liability period.
9. No advance payment will be made.
10. Any damage to any existing installations during the execution of work shall be the responsibility of the contractor and will be made good to the satisfaction of the engineer-in-Charge and nothing extra shall be paid.
11. Any kind of accident / electrocution caused due to negligence or during the course of normal work etc., shall be responsibility of the contractor. The contractor shall be responsible for all the compensation to the staff engaged by him.
12. All safety precautions shall be taken so as to avoid any accident or inconvenience to the members of the staff.
13. All equipments shall be guaranteed for 12 months or for the period of standard guarantee / warranty offered by the manufacturer (whichever is later) from the date of completion & handover to the department. Against unsatisfactory performance and/or breakdown the equipment or component or any other part of the installation so found defective in guarantee period shall be replaced/repaired by the contractor free of cost to the satisfaction of Engineer-in-Charge. Manufacturer's warranty shall also be submitted in original.
14. In case the site clearance and damages are not attended, a recovery amounting to ₹ 10,000.00 (₹ Ten thousand only) shall be made.
15. The work shall be completed within 45 days after the date of issue of work order, if not recovery @ 1% per day subject to maximum of 10% of quoted amount if the work is not completed with stipulated time of completion.
16. The tender must be submitted on-line with E.M.D. amounting to ₹ 90,000.00 (₹. Ninety thousand only) by way of Demand Draft drawn in favour of "**DIRECTOR, NIPGR**", New Delhi.
17. The material supplied shall be got approved by the Engineer-in-charge before installation and carrying out the work.

18. Factory test reports of the machines shall be submitted before installation.
19. Warranty card issued by the manufacturer of machines installed will also be submitted with bill.
20. The tenderer must submit all the technical data, catalogue of equipments proposed by them with product code to install along with technical bid. If, the same is not submitted, their tender shall not be considered and the financial bid shall be opened only for those bidders whose catalogue / manuals are approved by the Institute. The rates quoted by the agency shall be valid for 180 days after issue of work order.
21. The Institute also reserved the right to reduce / increase the scope of work.
22. The agency must submit the authorization certificate from manufacturer without which tender will not be considered.
23. The layout of the lab is provided along with the tender. The agency has to submit HVAC layout drawings (Execution drawings) of carrying out the work and nothing extra shall be paid.
24. The work shall be carried out as per the specifications of the tender and direction of Engineer-in-charge.
25. The electric supply shall be provided at single point to the nearest DB available in the electrical room of the Institute. Any electrical material such as electrical wire, MCB, MCCB, thimble, etc., not mentioned and required during execution may be taken into account in item 8 of tender and nothing extra shall be paid.

PAN: _____

TIN: _____

**Consultant Engineer
NIPGR**

Seal & Signature of Contractor

Instructions for Online Bid Submission

1. The tender documents are available on our website www.nipgr.ac.in & www.eprocure.gov.in and same can be downloaded.
2. Tender documents may be downloaded from ITPO's website www.nipgr.ac.in and CPPP site <https://eprocure.gov.in/eprocure/app> as per the schedule as given in the tender document.
3. Bids shall be submitted online only at CPPP website: <https://eprocure.gov.in/eprocure/app>. Tenderers/Contractors are advised to follow the instructions provided in the 'Instructions to the Contractors/Tenderer for the esubmission of the bids online through the Central Public Procurement Portal for eProcurement at <https://eprocure.gov.in/eprocure/app>'. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.
4. Not more than one tender shall be submitted by one contractor or contractors having business relationship. Under no circumstance will father and his son(s) or other close relations who have business relationship with one another (i.e when one or more partner(s)/director(s) are common) be allowed to tender for the same contract as separate competitors. A breach of this condition will render the tenders of both parties liable to rejection.
5. The bidders are advised to visit CPPP website <https://eprocure.gov.in/eprocure/app> at least 3 days prior to closing date of submission of tender for any corrigendum / addendum/ amendment.
6. Bids will be opened as per date/time as mentioned in the **Tender Document**. After online opening and evaluation of technical bids, the results of their qualification as well Price-Bid opening will be intimated.

Submission of Tender

The tender shall be submitted online in two parts, viz., Technical bid and Financial bid.

All the pages of bid being submitted must be sequentially numbered by the bidder irrespective of nature and content of the documents before uploading.

The offers submitted by hand/Post/Fax/email shall not be considered. No correspondence will be entertained in this matter.

The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.

More information useful for submitting online bids on the CPP Portal may be obtained at:
<https://eprocure.gov.in/eprocure/app>.

REGISTRATION

- 1) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL: <https://eprocure.gov.in/eprocure/app>) by clicking on the link "Online Bidder Enrolment" on the CPP Portal which is free of charge.
- 2) As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
- 3) Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.
- 4) Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / nCode / eMudhra/ Nic etc.), with their profile.

- 5) Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's to others which may lead to misuse.
- 6) Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / e-Token.

SEARCHING FOR TENDER DOCUMENTS

- 1) There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, Organization Name, Location, Date, Value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as Organization Name, Form of Contract, Location, Date, Other keywords etc. to search for a tender published on the CPP Portal.
- 2) Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the CPP Portal to intimate the bidders through SMS / e-mail in case there is any corrigendum issued to the tender document.
- 3) The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

PREPARATION OF BIDS

Bidder should take into account any corrigendum published on the tender document before submitting their bids.

- 1) Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
- 2) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF/JPG formats. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.
- 3) To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, GST Certificate etc.) has been provided to the bidders. Bidders can use "My Space" or "Other Important Documents" area available to them to upload such documents. These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

SUBMISSION OF BIDS

- 1) Bidder should log into the site well in advance for bid submission so that they can upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
- 2) The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
- 3) Bidder has to select the payment option as "offline" to pay the tender fee / EMD as applicable and enter details of the instrument.
- 4) Bidder should prepare the EMD as per the instructions specified in the tender document. The original should be posted/couriered/given in person to the concerned official before bid opening date/time as mentioned in critical date sheet or as specified in the tender documents. The details of the DD/any other accepted instrument, physically sent, should tally with the details available in the scanned copy and the data entered during bid submission time. Otherwise the uploaded bid will be rejected.

- 5) Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. If the price bid has been given as a standard BoQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BoQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.
- 6) The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.
- 7) All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid opener's public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.
- 8) The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
- 9) Upon the successful and timely submission of bids (i.e. after Clicking "Freeze Bid Submission" in the portal), the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.
- 10) The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.

ASSISTANCE TO BIDDERS

- 1) Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.

Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is 1800 3070 2232, 91-7878007972 and 91-7878007973.

III) TECHNICAL SPECIFICATIONS:

A) EQUIPMENTS (AIRCONDITIONING UNITS) :

1.0 SCOPE

The scope of this Section comprises the supply, erection testing and commissioning of the air-conditioning system conforming to these specifications and in accordance with the requirements given in Schedule of Equipments.

2.0 VARIABLE REFRIGERANT FLOW SYSTEM :

General

- The scope of this section comprises the design, supply erection, testing and commissioning of VRF type system equipped hermetically sealed with scroll compressor, each module of outdoor unit shall have Minimum #1 Inverter Compressor, conforming to these specification and in accordance with the requirements of Drawing and Schedule of Quantities. The prices quoted shall include all the equipment ancillary material as specified and all such items whatsoever and which may be required to fulfill the intent and purpose as laid down in the specification and the approved drawings. The contractor shall calculate equipment capacity based upon design parameters specified for the system design & verify all the quantities and sizes of refrigerant pipe, fitting, cables, control cable, pipes, insulation, indoor units, and outdoor units etc. before installation to avoid any shortfall or surplus. The tenderer shall also include all necessary MS frame work for installation of outdoor in VRF based air condition system. The cost quoted by tendered shall also include the refrigerant gas R-410A & its charging for proper & specified functioning of air conditioning system .
- The scope in the tender schedule also covers detailed designing of complete air-conditioning system Inverter Scroll technology VRF air conditioner with air cooled outdoor units system capable of cooling and heating (reverse cycle) as per individual or season requirement suitable for operation on 415 V, 3 Phase, 50 Hz AC electric supply.
- The outdoor units shall have both cooling & heat pump mode, consisting of one / multiple scroll compressor. It should have single circuit of refrigerant piping and multiple in door units of various types. Each indoor unit should have capability to cool or heat as per seasonal weather changes and as per Bill of Quantity.
- The tendered shall quote only makes for which he has satisfactorily executed the job and shall also furnish certificate to the effect that the such equipment has performed satisfactorily under Indian weather conditions at least for a period of one year from its commissioning. The performance certificate from the end user shall also be enclosed with the tender documents.
- The firm should comply with the parameters as specified in the terms & conditions.
- The project of air-conditioning is required to be executed in time bound and professional manner. The equipments involved in air-conditioning are complex in nature comprising of

instrumentation, control and central management system. The job, therefore calls for highest order of technical expertise and also requirement of experience of air-conditioning installation with proven performance. This consent shall also covers aspects of desired assistance in the field of design, development, testing, execution, completion & maintenance/ maintenance spares of the air-conditioning system.

- Notwithstanding the technical details as specified in the tender, the manufacturers may offer/ indicate systems and necessary design & features applicable for the offered products at the tendering stage.

2.1 OUTDOOR UNIT

- i. The outdoor unit shall be factory assembled, weather proof casing (Material of construction of casing shall be vendor's standard design), constructed from heavy gauge GI sheets steel panels and coated with baked enamel finish. The outdoor unit shall be completely factory wired, tested with all necessary controls, acoustic jackets for compressors, hydrophilic & anticorrosive coating on condenser fins & filled with first charge of refrigerant before delivering at site The Unit should have a minimum of 3.2 C.O.P at 100% load at 35 Deg C Outside / 27 Deg C Inside.
- ii. The VRF equipment should be capable so that refrigerant piping between indoor units and outdoor unit shall be capable of proving 1000 m total piping length and longest equivalent piping length as 180m.
- iii. The outdoor unit shall be factory tested and filled with first charge of refrigerant R-410A before delivering at site.
- iv. It should also be provided with duty cycling for variable compressors delivering the capacity / power consumption from 20-100% to follow variation in cooling & heating loads & switching starting sequence for better stability and prolonging equipment life.
- v. The unit shall be provided with its own microprocessor control panel with provision for integration with the building management system for Air-conditioning system.
- vi. The machine must have a sub cool feature to use coil surface more effectively through proper circuit/ bridge so that it prevents the flushing of refrigerant from long piping due to this effect thereby achieving energy savings.
- vii. The outdoor unit should be fitted with low noise aero spiral design fan with aero fitting grill for spiral discharge airflow to reduce pressure loss and should be fixed with DC fan motor for better efficiency.

- viii. The unit shall be designed in such a way that cleaning of drain Pan should be easy & inspection/ replacement of compressor should be easy.
- ix. The condensing unit shall be designed to operate safely when connected to multiple fan coil units.

2.1.1 Compressor

- i. The VRF Outdoor units shall be comprising of Efficient Scroll compressors with minimum #1 Inverter Scroll Compressor should respond efficiently in accordance to the variation in cooling or heating load requirement.
- ii. The Outdoor unit 14 HP & above shall be comprising of 2 Compressors with Minimum 50% Inverter type scroll compressor.
- iii. Upto 12 HP Outdoor Module shall comprise of Single Inverter Scroll Compressor

2.1.2 Oil Recovery system

Unit shall be equipped with an oil recovery system to ensure stable operation with long refrigeration piping lengths.

The system must be provided with oil balancing circuit to avoid poor lubrication.

2.1.3 Refrigerant Circuit

The refrigerant circuit shall include liquid and gas shut-off valves and a solenoid valve at condenser end.

The equipment must have inbuilt refrigerant stabilization control for proper refrigerant distribution.

All necessary safety devices shall be provided to ensure the safe operation of the system.

2.1.4 Heat Exchanger

The heat exchanger shall be constructed with copper tubes mechanically bonded to aluminium fins to form a cross fin coil.

The aluminium fins shall be covered by anti-corrosion resin / hydrophilic film.

The unit shall be provided with necessary number of direct driven low noise level propeller type fans arranged for vertical discharge. Each fan shall have a safety guard.

2.1.5 Safety Devices

All necessary safety devices shall be provided to ensure safe operation of the system.

Following safety devices shall be part of outdoor unit: - high pressure switch, fuse, fan drive overload protector, fusible plug, crankcase heater, over load relay, overload protection for inverter.

- 2.1.6 The outdoor roof mounted units shall be provided in such a fashion that these do not affect the overall aesthetics and ambience of the building. If required these units shall be suitably camouflaged to give good aesthetic look. These provisions, however, shall be discussed, if required, at a later date and the prices for the same shall be worked out separately as extra item.
- 2.1.7 Noise levels for outdoor units shall not be more than 60 db (measured at a point 1 meter in front of the unit at a height of 1.5 meters).

2.2 INDOOR UNITS

All indoor units as specified shall have; in general, noise levels should be low. For critical applications noise levels below these limits may, however, be specified during design stage.

- i. Each unit shall have electronic control valve to control refrigerant flow rate respond to load variation of the room.
- ii. The address of the indoor unit shall be set automatically in case of individual and group control.
- iii. In case of centralized control system, it shall be possible to set the address of individual indoor unit through a liquid crystal remote controller.
- iv. The fan shall be dual suction, aerodynamically designed, Turbo, multi blade type, statically & dynamically balanced to ensure low noise and vibration free operation of the system. The fan shall be direct driven type, mounted directly on motor shaft having support from housing.
- v. Indoor unit shall have cleanable type filter fixed to an integrally moulded/ moulded plastic frame. The filter shall be slide in and neatly insertable type. It shall be possible to clean the filters either with compressed air or water.
- vi. Each unit shall have Electronic control expansion valve for variable refrigerant Flow Effect.
- vii. Each indoor high wall unit shall be with cordless remote controller as standard features.. The controller shall have self diagnostic features for each and quick maintenance and service. The controller shall be able to change fan speed and angle of swing flap (for high wall) individually as per requirement.

3.0 Y-Joint/Ref net séparation

Supply & installation of the Y-Joint/ Ref-net separation refrigeration pipe joints and headers in the appropriate orientation to enable correct distribution of refrigerant. The

Distribution Joints should be factory insulated with pre-formed sections of Expanded Polystyrene/Equivalent.

B) REFRIGERANT COPPER PIPING:

1.0 Refrigerant Piping

Refrigerant piping for the air-conditioning system shall be upto 19.1 mm dia of soft seamless copper tubes & for above 19.1 mm dia the pipe material shall be of hard seamless copper tubes with pipes material being hard drawn copper pipe. Forged copper fittings shall be used for the refrigerant piping. The refrigerant piping arrangements shall be in accordance with good engineering practices as applicable to the air-conditioning industry, and shall include charging connections, suction line insulation and all other items normally forming part of proper refrigerant circuits except Y joint/separation tubes.

The thickness of refrigerant circuit piping shall be as per detail given below :

Outer Dia(mm)	Minimum wall thickness (mm)
6.35 mm	0.80 mm
9.5 mm	0.80mm
12.7 mm	0.80 mm
15.9 mm	1.00 mm
19.1 mm	1.00 mm
22.2 mm	1.00 mm
28.6 mm	1.00 mm
34.9 mm	1.10 mm
41.3 mm	1.25 mm

- Before jointing any copper pipe or fittings, its internals shall be thoroughly cleaned by passing a clean cloth via wire or cable through its entire length. The piping shall be continuously kept clean of dirt etc. while constructing the joints. Subsequently it shall be thoroughly blown out using nitrogen gas.
- After completion of installation of the refrigerant piping, the refrigerant piping system shall be pressure tested using nitrogen gas at a suitable pressure as specified by OEM (Original Equipment Manufacturer). Pressure shall be maintained in the system for 48 hours. The system shall then be evacuated to vacuum of not less than 700 mm Hg and held for 24 hours.
- The supplier of air-conditioning system shall choose sizes as designed and erect proper interconnections of the complete refrigerant circuit.

- The suction line pipe size and the liquid line pipe sizes shall be selected according to the manufacturer's specified diameter. All refrigerant pipes shall be properly supported and anchored to the building/structure using steel hangers, fasteners, brackets and supports which shall be fixed to the building/structure by means of inserts or expansion shields or anchor fasteners of adequate size and number to support the load imposed thereon.
- Entire liquid and suction refrigerant pipe lines including all fittings, valves and strainer bodies, etc. shall be insulated with 13mm thick nitrile rubber upto pipe size of 15.9mm dia and above that with 19mm thick nitrile rubber as specified in BOQ.

2.0 REFRIGERANT PIPE INSULATION

Refrigerant pipe insulation:

- All suction pipes and low temperature / pressure liquid pipes of the refrigerant pipe work shall be insulated with slip on closed cell nitrile rubber fire retardant pipe insulation having a wall thickness of not less than 13 mm for soft pipe / 19mm for hard pipe.
- The thermal conductivity of the insulation material shall not exceed 0.032 W/m K at 0 deg C. mean temperature. The density of the insulation material shall not be less than 33+/- Kg/ cum.
- All joints of the insulation shall be sealed with 100 mm width x 3 mm thick self adhesive tapes of the same material as insulation and shall be of the same make as the basis insulation material.
 - All insulated refrigerant pipes shall be mechanically protected with a coat of polyshield of approved colour (starbond 30-36 or equivalent) of minimum 5 mil thickness.

C) THERMAL/ACOUSTIC INSULATION:

1.0 GENERAL:

Scope of this specification comprises of supplying, installing, testing and commissioning of insulation on duct, pumps, chilled/hot water piping, chillers, expansion tank, AHU room and duct acoustic lining.

2.0 INSULATION

2.1 SCOPE

The scope of this section comprises the supply and application of insulation conforming to these specifications.

2.2 MATERIAL

Thermal insulation material for Ducts shall be closed cell chemically cross linked polyethylene of Thermal conductivity of the insulation material shall not exceed 0.035 W/m²K or 0.243 BTU - in / (hr-ft²-°F) at an average temperature of 23°C. Nominal density of polyethylene foam material shall be 33 Kg/m³. The product shall have temperature range of -40 °C to 100°C. The

insulation material for duct surfaces shall be faced with special composite aluminum foil and fire rated for Class 0 as per BS 476 Part 6: 1989 for fire propagation test and for Class 1 as per BS 476 Part 7, 1987 for surface spread of flame test. Water vapour permeability shall be not less than 0.024 perm inch (2.48×10^{-14} Kg/m.s.Pa i.e. $\mu \geq 7000$: Water vapour diffusion resistance).

Thickness of the insulation shall be as specified for the individual application. Insulation material delivered at site shall be accompanied with manufacturer's test certificate for thermal conductivity values, density, water vapour permeability and fire properties. Samples of insulation material from each lot delivered at site may be selected by Owner's site representative and gotten tested for thermal conductivity and density at Contractor's cost. Adhesive used for sealing closed cell chemically cross linked polyethylene foam insulation shall be Pidilite's SR 998 or equivalent suitable for closed cell foam insulation based on polychloroprene with special rosin and tacky fire (Starglue R-242). The adhesive shall be non-flammable in dry form and minimum solid 18 to 24% with heat, water & chemical resistance. The adhesive application method shall strictly be as per adhesive manufacturer's technical data sheet.

Ducting insulation thickness shall be as per table below.

Ducting position	Thickness
SA duct in RA path	13mm
SA duct exposed	25mm

3.0 DUCT INSULATION

External thermal insulation shall be provided as follows:

The thickness of chemically cross-linked polyethylene material shall be as shown on drawing or identified in the schedule of quantity. Following procedure shall be adhered to:

Duct surfaces shall be cleaned to remove all grease, oil, dirt, etc. prior to carrying out insulation work. Measurement of surface dimensions shall be taken properly to cut special composite aluminum foil faced chemically cross-linked polyethylene foam sheets to size with sufficient allowance in dimension. Cutting of faced polyethylene foam sheets shall be done in a manner for each face of the duct surface separately with adjustable blade to make 90° cut in thickness of polyethylene foam sheet. Hacksaw or blades are not acceptable tools for cutting the insulation.

Material shall be fitted under compression and no stretching of material shall be permitted. A thin film of a compatible adhesive or Polychloroprene insulation adhesive (Starglue R-242) shall be applied on the back of the insulating material sheet and then on to the metal surface. When adhesive is tack dry, insulating material sheet shall be placed in position and pressed firmly to achieve a good bond. All longitudinal and transverse joints shall be sealed by providing 6 mm thick 75 mm wide polyethylene foam tape. The adhesive shall be strictly as recommended by the manufacturer. All longitudinal and transverse joints shall be sealed by self adhesive Al foil tape 75 mm wide and the insulated ducts strapped with PVC straps at each 750 mm C/C.

5.0 ACOUSTIC LINING OF DUCTS:

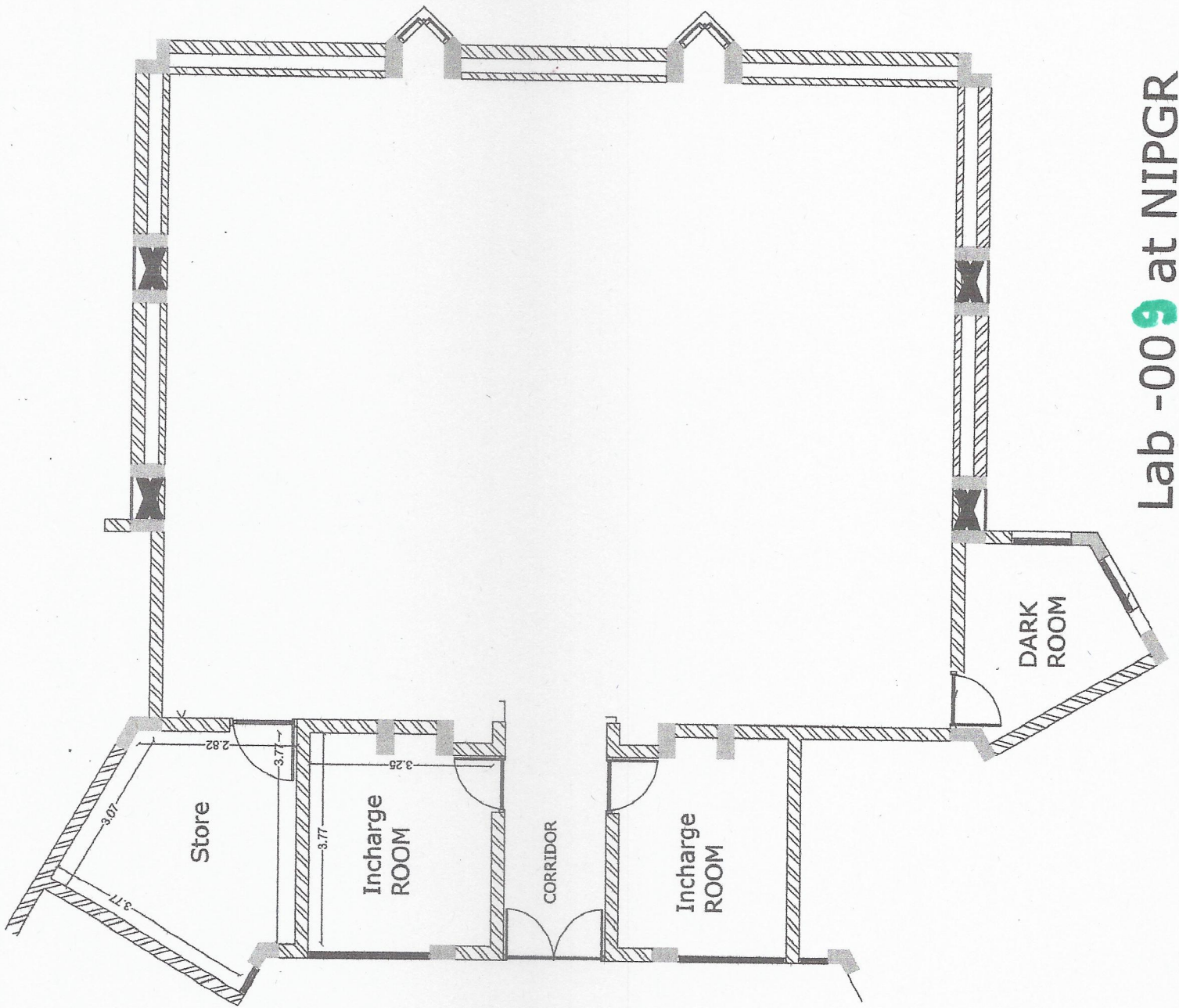
For acoustic lining ducts the material shall be resin bonded fibre glass of density 32 kg/m^3 . All duct upto a distance of 5m from AHU outlet or as shown in the drawing shall be acoustically lined from inside.

5.1 Application:

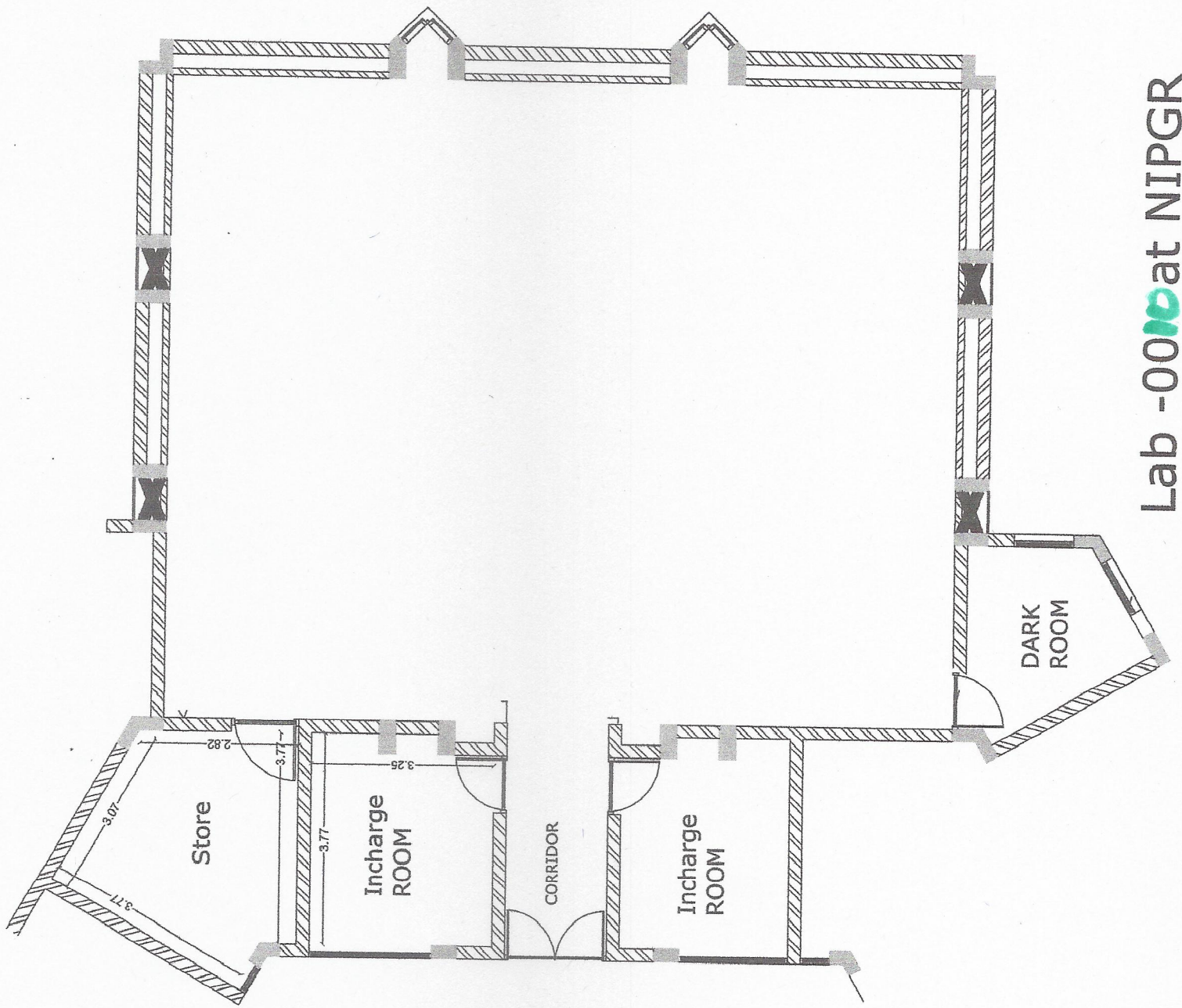
5.1.1 Duct Lining:

- Clean the inner surface of duct which is to be lined with wire brush to remove the dirt.

- Fixing 25 mm x 25 mm/50 mm GI frame work of 22 gauge 600mm distance screwed with the duct and making size as per requirement.
- Apply a cold setting adhesive compound over duct surface.
- The adhesive shall be non flammable vapor proof, odourless type.
- Fix insulation material of 25 mm thickness overlapped with Fiber glass R P Tissue, covering the material with 26 gauge perforated aluminum sheet of 30% perforation, fixed with GI screws



Lab -009 at NIPGR



Lab -00**10**at NIPGR

(Undertaking on a Non-Judicial Stamp Paper worth Rs. 100/- duly notarized)

I / We (bidder) hereby give an undertaking that:

- a) I/We have not been blacklisted / on holiday list / debarred during last three years by any Govt. Department/Govt. Autonomous Body/Institution, etc.;
- b) I/We do not have any dispute with any of the Govt. Departments/Govt. Autonomous Bodies/Institutions, etc.;
- c) I/We have never been certified as "Unsatisfactory Performer" for the said services provided to the Govt. Departments/Govt. Autonomous Bodies/Institutions;
- d) I/We have not submitted any fake/forged certificates/documents and later, if any such 'Certificates/Documents' found to be fake/forged or contains willful wrong/incorrect information, suitable legal action may be initiated against me/us/agency besides 'forfeiture of Earnest Money Deposit' and 'Blacklisting' etc.
- e) I/We shall not withdraw my/our bid after opening of Technical Bid and if done so, the NIPGR shall be authorized to forfeit the EMD submitted by me/us.

Seal and Signature of the Authorized
Person of the Agency

Name and designation of the
Authorized Person of the Agency

Place:

Date:

'CERTIFICATE FOR SITE INSPECTION'
Pre-qualification criteria of NIT

Certificate that we have visited the site on and assessed the nature and amount of work involved before submitting our offer. We will be able to complete the works within the stipulated time and to execute the work which suit to the site conditions.

(Signature of Bidder with Seal)

Name:

Address:

Date:

Consultant Engineer

CHECK-LIST FOR PRE-QUALIFICATION BID FOR: Supply, Installation, Testing & Commissioning of VRF system for Tissue Culture Labs of New Lab Block at NIPGR Campus, New Delhi.

Sl. No.	Documents asked for	Page number at which document is placed
1.	Earnest Money	
2.	Name of authorized person of the firm/agency, designation, address and office telephone numbers. If the bidder is a partnership firm/private or limited company, name designation, address and office telephone numbers of partners/ Directors also.	
3.	Undertaking on a Non-judicial Stamp Paper of ₹ 100/- (as per format prescribed in Annexure-I) along with tender document.	
4.	Self-attested copy of the GSTIN& PAN card issued by the respective authorities.	
5.	Proof of experiences of last five years ending 31 st Oct. 2018 as specified in the NIT along with satisfactory performance certificates and work orders from the concerned employers.	
6.	Annual turnover of last three financial years ending March 31 st 2018 duly certified by the Statutory Auditors.	
7.	Any other documents, if required.	

**Consultant Engineer
NIPGR**

**Signature of the Bidder
(Name and Address of the Bidder)
Telephone No.**

FINANCIAL BID

Name of work: Supply, Installation, Testing & Commissioning of VRF system for Tissue Culture Labs of New Lab Block at NIPGR Campus, New Delhi.

**CLIENT : DIRECTOR NIPGR
NEW DELHI**

1-

BILL OF QUANTITY

Name of Work- VRF SYSTEM FOR LAB AT NIPGR ,NEW DELHI

Sl No.	Description	Unit	Qty	Rate (Rs)	Amount (Rs)	MAKE
1	<u>Variable Refrigerant Flow System</u>					
	Supply, Installation, Testing and Commissioning of Modular type VRF Outdoor Units Equipped with Highly Efficient Scroll Compressor with 100 % inverter technology, special heat exchanger, outdoors sB(A) level less than 66 at a distance 1 meter, Centrifugal Fan for condensor, Outdoor Units having front Suction & Top Discharge with Y branch as required					VOLTAS / Mitsubishi Heavy/ O General / Toshiba
	<u>Outdoor Unit</u>					
	Supply/ Installation/ Testing & Commissioning of Modular type VRF Outdoor units , equipped with Full Inverter Scroll compressor,equipped with Advanced Permanent Magnet DC Motor special acryl precoated heat exchanger, low noise condenser fan, auto check function for connection error, auto address setting, microprocessor panel, Minimum COP 3.7 at 100% Load at 35 Deg C Outside and 27 Deg C inside with capacities as mentioned below :					
A	36 HP (Heating + Cooling) (18 HP X 2 No)	Nos.	1			
B	24 HP (Heating + Cooling) (12 HP X 2 No)	Nos.	1			
2	<u>Indoor Units -4 Way Standard Cassette Type</u>					
	Supply / Installation/ Testing & Commissioningof Indoor units equipped with pre-filter, fan section with low noise fan, multispeed motor, coil section with DX coil, outer cabinet, drain pan, insulation, pipe connections. of various capacities as per specifications and drawings. Capacities should be designed at 19 Deg C WBT Inside Condition.					
a	4 TR	Nos.	14			
3	Supply/ Installation/ Testing & Commissioning of Y-joints for Indoor units	No	12			
4	<u>Refrigerant Piping</u>					
	Supplying & Installation of interconnecting following size of refrigerant copper pipe & required all fitting duly insulated with Elastometric Nitrile rubber insulation as per tender specification between each set of indoor & outdoor units as per specification all piping inside the room shall be properly supported with M.S. Hanger. Exposed pipe should be UV coated					MANDEV/ MAX FLOW
	41.3 mm dia with 19 mm thick insulation	Rmt.	15			
	38.1 mm dia with 19 mm thick insulation	Rmt.	10			
	34.9 mm dia with 19 mm thick insulation	Rmt.	30			
	31.8 mm dia with 19 mm thick insulation	Rmt.	10			
	28.6 mm dia with 19 mm thick insulation	Rmt.	20			
	25.4 mm dia with 19 mm thick insulation	Rmt.	16			
	22.2 mm dia with 19 mm thick insulation	Rmt.	20			
	19.1 mm dia with 13 mm thick insulation	Rmt.	25			
	15.9 mm dia with 13 mm thick insulation	Rmt.	104			
	12.7 mm dia with 13 mm thick insulation	Rmt.	20			
	9.5 mmdia with 13 mm thick insulation	Rmt.	84			
5	Providing and fixing 1.6 mm thick Galvanised steel sheet factory fabricated covered cable tray of the following sizes including knock out holes with screws and fixing accessories like bends, tees etc.					RICCO / NATIONAL
A	450 mm wide x 75 mm deep	Rmt	15			
B	300 mm wide x 75 mm deep	Rmt.	15			
6	<u>Drain Piping</u>					

	Providing and fixing rigid PVC Piping complete with fittings, supports as per specification and duly insulation with 6 mm thick closed cell nitrile rubber insulation .					PRINCE / SUPREME
A	40 mm dia	Rmt.	70			
B	32 mm dia	Rmt.	50			
7	Transmission ,Control Wiring					
	Supply ,installation ,testing and commissioning of control cum trans-mission wiring of copper between indoor and outdoor unit . (3 core x1.5 Sq mm)	Rmt.	300			
8	HVAC PANELS (for OutdoorUnits)					
	Supply , Design ,Installation , Testing & Commissioning of LT Panel for Outdoor VRV Unit , floor mounted , indoor type cubical panel made out of 16 SWG thick gland CRCA sheet , dust and vermin proof,lockable hinged doors with 16 SWG thick gland plate. Panel will be powder coated of color siemens grey shed. The Panel including providing and fixing the following switchgear as required.	No	1			CPRI Approved make
	INCOMER					
	1 nos.160 A TPN MCCB (KA)with solid neutral link (01 no.)					
	METERING &INDICATION					
	Amp Meter (01 No.)					
	Volt Meter (01 Set)					
	Phase Indication Light LED type (01 Set)					
	Control MCB 6 Amp .(03 Nos .)					
	Current Transformer 400 / 5S (01 Set)					
	BUS -BAR					
	TPN Aluminium busbar 200 Amp with color coded hest shrinkable sleeves.(01 set)					
	OUTGOINGS					
	100 amps MCCB with ELCB (01 nos.)					
	63 amps MCCB with ELCB (01 nos.)					
	40 amps Single Phase MCB for indoor (02 nos.)					
9	Power cable					
	Supply and Fixing of following size of XLPE / PVC insulated Copper conductor Armoured , overall PVC sheathed L.K.V grade cables conforming to relevant IS code and technical specifications. Quoted rate should be inclusive of Gland, thimble, earthing and Cable tray					Havells / National/ Paramount/ Polycab
	4C X 16 Sqmm	Rmt	10			
	4C X 10 Sqmm	Rmt	10			
10	SITC of Power socket for indoor unit alongwith neccessary cable and conduit from outdoor panel	No	14			
11	Civil works along with modification in False Ceiling	Lot	1			
			Total			
			GST @18%			
			Grand Total			