

TENDER DOCUMENT

Name of work: A. Designing, Construction, Testing & Commissioning of In House Gene Function Analysis Platform for Crops (GFAPC) Green House (Air Conditioned) at NIPGR Campus New Delhi.

B. Designing, Construction, Testing & Commissioning of In House Gene Function Analysis Platform for Crops GFAPC Green House (Air Cooled) at NIPGR Campus New Delhi.

**CLIENT: DIRECTOR NIPGR,
NEW DELHI**

COST OF TENDER DOCUMENT: ₹ 1000.00



TENDER DOCUMENTS

Name of work: A. Designing, Construction, Testing & Commissioning of In House GFAPC Green House (Air Conditioned) at NIPGR Campus New Delhi.

B. Designing, Construction, Testing & Commissioning of In House GFAPC Green House (Air Cooled) at NIPGR Campus New Delhi.

Owner : Director, NIPGR, , New Delhi

Tender Issued to: _____

Place for submission/

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

Date & Time of Pre-bid Meeting: 14.09.2018 at 1200 hrs.

Date & Time for sale and submission of Tender Documents: 26.09.2018 at 1600 hrs.

Date & Time of Opening of Tenders: 01.10.2018 at 1500 hrs.

Consultant Engineer
NIPGR, New Delhi.

TENDER FORM

To

Director
NIPGR, New Delhi, India

Dear Sir,

I/We have read and examined the following Tender Documents relating to **A. Designing, Construction, and Testing & Commissioning of In House GFAPC Green House (Air Conditioned)** at NIPGR Campus New Delhi.

B. Designing, Construction, Testing & Commissioning of In House GFAPC Green House (Air Cooled) at NIPGR Campus New Delhi., Aruna Asaf Ali Marg New Delhi-110067, India.

- ☐ **Tender Notice**
- ☐ **General Conditions**
- ☐ **Instructions to bidders**
- ☐ **General Information**
- ☐ **Specific condition of contract**
- ☐ **Terms and Conditions of Contract Agreement**
- ☐ **Special Terms and conditions of Contract**
- ☐ **Technical specification and Bill of Quantities (Not to be filled)**
- ☐ **Instructions for Online Bid Submission**
- ☐ **Annexure I, II & III**
- ☐ **Drawing Plan**

I/We hereby offer to execute the work complete in all respects specified in the underwritten Memorandum within the time specified therein at the rates specified in the bill of Quantities and in accordance, with the specifications, designs, drawings(as approved) and instructions in writing referred to in the conditions of tender.

Tenderer's Signature and Seal

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 Fax: 011-26741658

TENDER NOTICE

File No.: NIPGR/Engg./7/15(2)/2018-19

Dated: 07.09.2018

Online tenders (in two bid system) are invited on behalf of the Director, NIPGR, New Delhi for the below mentioned work, from the firms having experience in similar installations work in Central/State Govt./Central/State Autonomous Bodies, so as to reach this office as per schedule given below.

Name of work: A. Designing, Construction, Testing & Commissioning of In House GFAPC Green House (Air Conditioned) at NIPGR Campus New Delhi.
B. Designing, Construction, Testing & Commissioning of In House GFAPC Green House (Air Cooled) at NIPGR Campus New Delhi.

Sl. No.	Estimated Cost (In lakhs)	EMD (In Lakhs)	Time for Completion	Date & time of pre-bid meeting	Last date & time for sale and submission of Tender Documents	Date & time of Opening of tenders
1.	2.	3.	4.	6.	5.	8.
1.	₹. 69.00	₹. 1.38	2 Months	14.09.2018 1200 Hrs.	26.09.2018 1600 Hrs.	01.10.2018 1500 Hrs.

Tender document can be obtained up to 1500 Hrs. on all working days from NIPGR office on payment of ₹ 1000.00 (₹ One thousand only) in cash (Non-refundable) towards the cost of tender from 07.09.2018 to 26.09.2018 up to 1600 hrs. **Tender documents can also be downloaded on line free of cost from our website www.nipgr.ac.in and Govt. CPP Portal <https://eprocure.gov.in/cppp/>**

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 26.09.2018 at 1600 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 tender will be accepted in respect of those contractors having completed at least three similar installations of each value not less than ₹.27.60 Lacs OR two similar installations of each value not less than ₹. 34.50Lacs OR one similar installation of each value not less than ₹. 55.20 Lacs during the last three years as on 31st Aug. 2018 in Central/State Govt./Central/State Autonomous Bodies.

The pre-bid meeting is scheduled for 14.09.2018 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.

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

Consultant Engineer

NIPGR New Delhi

GENERAL CONDITIONS

Online tenders are hereby invited from qualified contractors for the work of: **A.Designing, Construction, Testing & Commissioning of In House GFAPC Green House (Air Conditioned) at NIPGR Campus New Delhi.**

B. Designing, Construction, Testing & Commissioning of In House GFAPC Green House (Air Cooled) at NIPGR Campus New Delhi.

1. 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 ₹ 1,000.00 (₹ One thousand only) in cash from 07.09.2018 to 26.09.2018 from the NIPGR office, Aruna Asaf Ali Marg, New Delhi. **Tender documents can also be downloaded from our website www.nipgr.ac.in in free of cost.** The tender document is obligatory on the part of the tenderers & bid in no other form will be accepted.
2. The time allowed for the Designing, Construction, Testing & Commissioning of GFAPC Green House at NIPGR Campus New Delhi is 2 months to be reckoned from the 10th day after the date of written order to commence the work.
3. The tender shall be accompanied by **earnest money** of ₹ 138000.00 (Rs. One Lakh & Thirty eight thousand only) in the form of Demand Draft drawn in favour of the **"Director NIPGR New Delhi"** payable at New Delhi Any tender not accompanied by such earnest money will be rejected straight away.
4. The Tenderer will submit his tender in prescribed format after examining the tender documents, scope of work, specific conditions of contract, Instructions to bidders, General Information, Terms and Conditions of contract agreement, technical specification, Compliance statement, Price Bid, Price Schedule, special terms and conditions of contract, specific conditions of contract.
5. The offer shall remain valid for 180 days from the date of opening of Tender.
6. The tenderer shall submit a list of similar nature GFAPC Green House manufactured during the past three years along with complete details i.e names of person concerned, designation, telephone Nos., addresses of Institutes/Organizations, work order no., date of start, date of completion, quality of work done, value of the works and copies of the completion certificates along with the application.
7. **The agency must have Service / Branch office in Delhi NCR Region.**
8. The tenderer shall submit a copy of financial turnover certificate during the last three years ending 31st March 2018.
9. 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 award letter, the earnest Money deposited will be forfeited.
10. 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.
11. NIPGR will not pay any expense, whatsoever incurred by tenderer for the preparation and submission of tenders as well as sample.
12. The notice inviting tender, will form part of the contract agreement to be executed by the successful tenderer with the NIPGR.
13. All the correspondence on the tender shall be addressed to the Director, NIPGR, Aruna Asf Ali Marg New Delhi-67 and any communication addressed to anyone else shall not in any manner to be binding upon the NIPGR New Delhi.
14. The uploaded documents / certificates shall be verified with originals after opening of Technical Bid.

Consultant Engineer
NIPGR, New Delhi

Tenderer's Signature with Seal

INSTRUCTIONS TO BIDDERS

1. **GENERAL INSTRUCTIONS:** The items referred here-in shall cover the entire scope of the proposal which includes designing, construction, supply, testing and installation of the GFAPC Green House including the successful completion and the tests which the NIPGR desires.
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 14.09.2018 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. 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.

4. 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.

5. INSTRUCTION FOR FILLING THE TENDER.

Tenders shall be submitted ON-LINE, it shall be signed by one who has been authorized by the Board of Directors through a resolution. Copy of resolution and the authority letter in favour of the person signing must accompany the tender.

6. TENDERERS TO QUOTE FOR ALL ITEMS AND IN FIGURES:

The tenderer shall quote his rates in 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. The total amount shall be written both in figures and in words.

7. 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.

8. 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.

9. 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.

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10. 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 or otherwise of any charges incurred or to be incurred consequent on any misunderstanding or otherwise shall be admissible. The tenderer must sign & submit the certificate for site inspection Annexure-II.

11. SAMPLES

After award of work of the tender contractor shall arrange relevant samples at his own cost and deposit with Institute. These samples will be sealed by the NIPGR in the presence of the contractor, if he so desires and shall remain in the custody of the NIPGR for reference and comparison till the completion of work.

12. EARNEST MONEY:

The tenderer must deposit the earnest money ₹. 1,38,000.00 (₹. One lakh thirty eight 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.

13. 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.

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 non-judicial stamp paper as Annexure-I
- x) Site visit Certificate as per Annexure-II.

14. 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.

15. 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.

16. 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.

17. REFERENCE IN TENDER DOCUMENTS:

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

सलाहकार अभियंता, NIPGR

Seal & Signature of Contractor

GENERAL INFORMATION

1. Accepting Authority
Director, NIPGR, New Delhi
2. Earnest Money
Rs.138000 (₹ One lakh thirty eight thousand only) to be furnished with the tender in the form of the demand draft in favour of "Director, NIPGR payable at New Delhi. (No interest is payable on this deposit)
3. Security Deposit
A sum @ 10% of the gross amount of the bill shall be deducted from each R/Bill of contractor till the sum along with the sum already deposited as earnest money will amount to Security Deposit of 5% of the Tender value of the work. In addition, the contractor shall be required to deposit an amount equal to 5% of the Tender value of the contract as performance security within 10 days from the date of issue of award letter. Performance Security may be deposited as Demand Draft/Bank Guarantee of Scheduled Banks and State Bank of India.
4. Authority competent to grant extension of time
Director, NIPGR.
5. Tools & Plants
To be arranged by Tenderer
6. Authority competent to reduce the Compensation amount
Director, NIPGR.
7. Defect Liability/warranty period
36 months from the date of acceptance of completion by the NIPGR.
8. Authority Competent to Appoint Arbitrator
Director, NIPGR
9. Release of Security Deposit
The Performance Security shall be refunded to the Contractor on completion of the work and recording of completion certificate by the Institute. The balance shall be released after defect liability period of 36 months.

Tenderers Signature with Seal

Specific Conditions of Contract

Name of work: A. Designing, Construction, Testing & Commissioning of In House GFAPC Green House (Air Conditioned) at NIPGR Campus New Delhi.
B. Designing, Construction, Testing & Commissioning of In House GFAPC Green House (Air Cooled) at NIPGR Campus New Delhi.

Scope of work: The scope of work generally consist of providing of GFAPC Green House as described in the description of work, schedule of construction and bill of quantities and specifications as described in the contract documents. The contractors shall carryout and complete the said work under the contract in every respect in accordance with this contract documents and under directions and to the entire satisfaction of the Institute. If any item of the work to be executed is not covered under specification, the same shall be executed as per ISI standard / ISI code of practice as decided by the Institute.

It is not the intent to specify completely herein all aspect of design and constructional features of GFAPC Green House and details of work to be carried out, nevertheless, the construction and work shall confirm in all respect to high standard of engineering, design and workmanship and shall be capable of performing in continuous commercial operation in a manner acceptable to the Institute, who will interpret the meaning of the specifications and drawings and shall have the right to reject or accept any work or material, which in his assessment is not complete to meet the requirements of the specifications and or applicable code, and standards mentioned elsewhere in the specifications.

2. **Conformity with statutory Acts, Rules, Standards and Codes:** The construction and installation shall be carried out inconformity with DBT guidelines / rules. The installation shall also conform to requirements of Delhi Pollution Control Committee. Adherence of compliance shall be the sole responsibility of the contractor to the above and any or all such acts at New Delhi and applicable to the said work.

3. **Safety codes and regulations:** The contractor shall at his own expenses arrange for the safety provisions as per statutory regulations wherever applicable.

4. **Related documents:** These technical specifications shall be read in congestion with the general conditions of the contract as well as the schedule. In the event of any discrepancy Between these specifications and inter connected contract documents, the technical Requirements as per tender specifications shall prevail.

5. **Power supply:**

a) Unless otherwise specified power supply shall be provided by the department free of charge at one point for installation at site. Termination switchgear shall be provided by the contractor. Further extension of power wiring and supply if required shall be done by the contractor.

b) For Equipment's, the power supply shall be made available by NIPGR at the main incomer unit. The termination of their feeder in the main incomer unit shall be the responsibility of the contractor and nothing extra will be paid.

(ii) **Water supply:** Water supply shall be provided free of charge for construction purposes.

6. **Information to be supplied by Contractor after award of work:** within a period of one week from the date of receipt of award letter, contractor shall provide his program bar chart for submission of preliminary drawings (designing) for approval before, construction, testing, commissioning and handing over to the department. The contractor shall be required to submit in triplicate the following drawings & information for approval of the department before Starting the work:

1) All general arrangement drawings

2) Details of foundations for construction, load data, locations etc., of various assembled equipment as maybe needed generally by other agencies for purpose of their work.

3) Complete layout dimensions for every unit / group of units with dimensions required for erection purposes.

4) Any other drawing / information not specifically mentioned above but deemed to be necessary for the job to be done by the Agency.

5) On award of work, the contractor shall within one week submit 3 sets of detailed working drawings, containing details of construction layout, piping routes & size, Electrical wiring, critical sectional details as required. Any alternatives proposed by the Institute shall be incorporated and three fresh sets of drawings along with commented drawings shall be resubmitted by the contractor. After final approval 3 sets of approved working drawings (to scale) shall be submitted for the exclusive use of and retention by the In-Charge of GFAPC Green House.

7. Operation and maintenance manuals: Prior to completion of the work and handing over the GFAPC Green House the agency shall submit 3 set of following details:

- i) Comprehensive operation instructions, preventive and routine maintenance schedules
- ii) Manufacturer's construction catalogues and operating & maintenance instructions
- iii) Electrical control diagrams, piping scheme diagrams
- iv) List of recommended spare parts with spare part codes, specifications & source of procurements.

8. Contractor to provide all for testing: The contractor shall provide and pay for all necessary tools, instruments gadgets and testing equipment required for conducting various tests. Any defects in material and / or in workmanship detected during initial testing shall be rectified by the agency at his own cost. Initial testing shall be carried out in the presence of In-Charge or his representative to his entire satisfaction. The installation shall be commissioned after approval by Institute.

9. Virtual completion: On satisfactory completion of initial testing and commissioning, the installation shall be put to continuous running test for a period of 7 days for the purpose of taking over. Any defect in material and/ or in workmanship detected in the course of testing shall be rectified by the contractor at his own cost to the entire satisfaction of the Institute. The test shall be repeated after removal of defects. After successful completion of above tests, the GFAPC greenhouse shall be taken over.

10. Guarantee and defect liability period: The equipment covered by this contract shall be guaranteed by the Agency against faulty material and workmanship for a period of 36 months from the date of virtual completion and taking over the installation. Any part found defective shall be replaced free of costs by the contractor. The contractor shall guarantee that all equipment shall work satisfactorily and that the performance and efficiency of the equipment shall not be less than the specified values. If performance of equipment during guarantee period is not found satisfactory, the guarantee period will be extended till satisfactory performance is established for further period of reasonable time decided by NIPGR. The services of the contractor's personnel if requisitioned during the defect liability period shall be made available free of any cost to NIPGR. If the defects noticed during the guarantee period are not remedial within a reasonable time and / or some equipment or system as a whole remain out of order for a total period of one month (4 weeks) (Unless or otherwise extended) NIPGR shall have the right to rectify the defects at the contractor's risk & cost without prejudice to any other rights.

11. Maintenance: During the guarantee & defect liability, the contractor shall provide at no extra cost necessary Material and personal to carry out the repairs & routine maintenance of GFAPC Green House. The contractor shall attend to all problems experienced in the operation of the system within a reasonable time but not more than 24hr-48 Hrs. of receiving the complaint and take corrective action immediately.

12. Training of personnel at site: In order to enable NIPGR's staff to get acquainted with the operation and Maintenance of the of GFAPC Green House, the contractor at no extra cost to NIPGR shall train the departmental personnel during the period of construction, installation, testing and prior to virtual completion and taking over by NIPGR.

13. Storage of materials and safe custody:

The contractor shall be responsible for watch & ward and safe custody of his equipment and installation till they are formally taken over by NIPGR. Non-availability of lockable storage space due to any reasons shall not relieve the contractor of his contractual obligations in any way.

14. **Completion period:** All works, of supply installation, testing, commissioning and handing over of the of In GFAPC Green House in accordance with this contract shall be completed within the stipulated period of 02 months or within the extended time as has been allowed by Institute.

Consultant Engineer

NIPGR, New Delhi

Tenderer's Signature with Seal

TERMS & CONDITIONS OF CONTRACT AGREEMENT

SECURITY DEPOSIT

1. The earnest money amounting of ₹. 138000.00 (₹ One lakh thirty eight thousand Only) will be treated as security deposit of the successful tenderer.

COMPENSATION CLAUSE

2. The time allowed for carrying out the work as entered in the tender shall be strictly observed by the Tenderer, and shall be reckoned from the 10th day of the date on which the order to commence the work is given to the Tenderer. The Tenderer shall prepare and submit the details of delivery and installation for the execution of the said work within ten days of award of work for approval of the In charge, NIPGR. The work on the contract shall be executed according to the approved schedule 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 Tenderer) and the Tenderer shall pay as compensation an amount equal to one per cent per week up to 10% of the value of work as per contract, for every week that the work remains un-commenced or unfinished after the dates mutually agreed upon by the parties. Further to ensure good progress during the execution of the work, the Tenderer shall be bound in all cases in which the time allowed for any work exceeds one month to complete one fourth of the whole of the work before one fourth of the whole time allowed under the contract has elapsed, one half of work before one half of such time has elapsed and three fourth of the work before three fourth of such time has elapsed. In the event of the Tenderer failing to comply with this condition he shall be liable to pay as compensation an amount equal to one per cent of work order amount per week. Provided always that the entire amount of compensation to be paid under the provisions of this clause shall not exceed ten per cent of the awarded cost of work as shown in the tender. The Director, NIPGR, on a representation from the Tenderer, is however, empowered to reduce the amount of compensation and his decision in writing shall be final.

TIME EXTENSION

3. If the Tenderer 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 10 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 Institute 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.

COMPLETION OF WORK

4. Without prejudice to the rights of Institute under any clause hereinafter contained on completion of the work, the Tenderer shall be furnished with a certificate by the In charge or his representative of such completion, but no such certificate shall be given nor shall the work be considered to be complete until the Tenderer shall have removed from the premises on which the work has been executed, all 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 Tenderer, if the Tenderer 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, In charge, NIPGR may at the expense of the Tenderer 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 Tenderer 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.

ARBITRATION

5. Except where otherwise provided in the contract all questions and disputes relating to the meaning of the specifications, designs, drawings and instructions here in before mentioned and as to the quality of workmanship or materials used on the work or as to any other question, claim, right, matter or thing whatsoever, in any arising out of or relating to the contract, designs, drawings, specifications, estimates, instructions, orders or these conditions or otherwise concerning the works, or the execution or failure to execute the same whether arising during the

progress of the work or after the completion or abandonment thereof shall be referred to the sole arbitration of the person selected from out of a panel of names to be supplied upon a request in writing by party invoking the arbitration by the Director, NIPGR, at the time of the dispute. It will be no objection to any such appointment that the arbitrator so appointed was associated with the work and that he had to deal with the matters to which the contract relates and that in the course of his duties in association with the In charge, NIPGR, he had expressed views on all or any of the matters in dispute or difference. The arbitrator to whom the matter is originally referred being unable to act for any reason, the Director shall appoint another person to act as arbitrator in accordance with the terms of the contract. Such person shall be entitled to proceed with the reference from the stage at which it was left by his predecessor. It is also a term of this contract that no person other than a person appointed by the Director as aforesaid shall act as arbitrator. In all cases where the amount of the claim in dispute is ₹ 50000/- (₹ Fifty thousand only) or above, the arbitrator shall give reasons for the award. Subject as aforesaid the provisions of Arbitration and Cancellation Act 1996 or any statutory modifications or re-enactment thereof and the rules framed there under and for the time being in force shall apply to the arbitration proceeding under this clause. It is also a term of the contract that while invoking arbitration the party invoking arbitration shall specify the dispute or disputes to be referred to arbitration under this clause together with the amount or amounts claimed in respect of each such dispute.

It is also a term of the contract that if a party does not make any demand for arbitration in respect of any claim(s) in writing within 90 days of receiving the intimation from the In charge that the bill is ready for payment, the claim if any, shall be deemed to have been waived and absolutely barred and the owner shall be discharged and released of all liabilities under the contract in respect of these claims.

CARRYING OUT OF WORK

6. All the work shall be carried out strictly and in accordance with 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 BIS specifications applicable as on the date of tenders shall be followed.

INSPECTION OF WORK

7. 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 In charge, NIPGR or his in-charge of the work and the Tenderer shall at all times, during the usual working hours and at all other times at which reasonable notice of the intention of the In charge to visit the works shall have been given to the Tenderer, 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 Tenderer's agent shall be considered to have the same force as if they had been given to the Tenderer himself.

8. Installation, Testing & Commissioning of the supplied equipment's will be done at our site by the bidder in the presence of In Charge of our Institute.

Consultant Engineer

NIPGR, New Delhi

Tenderer's Signature with Seal

SPECIAL TERMS AND CONDITIONS OF CONTRACT

1. **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/Statuary bodies during the currency of contract, the same shall be borne by Institute.

2. **FORCE MAJEURE:** The right of the Tenderer 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 Tenderer, including not limited to acts of God, or of the public enemy, restraints of a sovereign state, firms, floods, unusually severe weather.

3. **JURISDICTION:** Not withstanding 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 Director, NIPGR and only the said court shall have jurisdiction to try any such actions and/or proceedings to the exclusion of all other courts.

4. **SCOPE OF WORK:** The scope of work is as per enclosed BOQ & Technical specification details. The Tenderer should note that during the preparation of detailed working drawings, according to which the Tenderer has to execute the work covered under this contract, may undergo changes. The scope drawings for the entire work are not enclosed, but only a few indicating the probable nature of construction are attached. The scope of work is thus not limited only to the details. Agency shall take the approval of all drawings required before execution of work.

5. **In charge Role:** The In charge shall carry out general supervision and direction of the work. He has authority to stop the work. Whenever he considering such stoppage necessary to ensure the proper execution of the work. He shall also have authority to inspect and reject all work and materials, which do not conform to the specifications and to direct the application of Tenderer's forces to any portion of the work, as in his judgment is required, and to order the said force increased or diminished and to decide questions which arise in the execution of the work. The In charge shall have the right to suspend the work or part thereof at any time and no claim whatsoever on this account shall be entertained. In case of any clarification the Tenderer may appeal to the Director, NIPGR whose decision shall be final and binding on the Tenderer. The above inspection shall, however, not relieve the Tenderer of his responsibilities in regards to defective materials or workmanship and the necessity for rectifying or replacing the same.

6. **TENDERER'S RESPONSIBILITY FOR THE MANNER OF EXECUTION OF WORKS:** The Tenderer shall be solely responsible for the manner and the method of executing the work. The work shall be subject to the approval of In charge from time to time for purposes of determination of the question whether the work is executed by the Tenderer in accordance with the contract.

7. **ACTION AND COMPENSATION PAYABLE IN CASE OF BAD WORK:** If it shall appear to In charge, NIPGR or his representatives, that any work has been executed with unsound, imperfect or unskilful 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 specifications the Tenderer shall on demand in writing from the In charge specifying the work materials, articles complained or not with-standing that the same have been inadvertently passed, certified and paid for, forthwith rectify or remove and reconstruct the work so specified in whole or in part as the case may require, or as the case, remove the materials or articles so specified 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 In charge in his demand aforesaid, then the Tenderer shall be liable to pay compensation at the rate of one percentage on the amount of the quoted amount for every week not exceeding ten weeks while his failure to do so that continue and in the case of any such failure In charge, 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 Tenderer.

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

9. **Terms of payment:** - Payment will be made 75% against delivery of material of work Order amount at site and balance shall be paid after satisfactory Testing and commissioning and hand over of GFAPC Green House.

10. **No work shall be under taken without the approval of working drawings:** No work shall be undertaken at site by contractor until detailed approved working drawings marked 'Good' for execution/construction for the same is issued by the Institute in writing. Any work done without the aforesaid drawing shall be at the contractor's own risk and costs

11. **Approval of samples:** Before undertaking fabrication of Structure of greenhouse body, doors/windows and any other item or any item of work for use in work the contractor shall arrange and manufacture at his own cost the relevant samples which shall be approved by the In-Charge. These samples will be sealed by the In-Charge in the presence of the contractor, if he so desires and shall remain in the custody of the In-Charge for reference and comparison till the completion of work.

12. **Income Tax, GST and other taxes:** Deduction on account of Income Tax, GST, etc., shall be made at the rate prescribed by the relevant authority from time to time from the gross payments due to the contractor in accordance with the Govt. Act & Rules in force and as amended from time to time.

13. Program chart

13.1 The Contractor shall prepare an integrated program chart for the execution of work, showing clearly all activities from the start of work to completion, with details of manpower, equipment and machinery required for the fulfilment of the program within the stipulated period or earlier and submit the same for approval of the -in-Charge within one week of the issue of letter of acceptance for the contract.

13.2 The work has to be completed in stages as indicated in the Milestones and the program should be prepared in such a manner to achieve these Milestones as indicated therein or earlier.

13.3 The program chart should include the following: -

a) Descriptive note explaining sequence of various activities.

b) Program of procurement of machinery / equipment's having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the contractor.

14. Completion certificate and completion plans

Within three days of the completion of the work, the contractor shall give notice of such completion to the In-Charge and within Seven days of the receipt of such notice, the In-Charge shall inspect the work and if there is no defect in the work, shall furnish the contractor with a final certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and/or (b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall be executed all scaffolding, surplus materials, rubbish and all huts and sanitary arrangements required for his/their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and cleaned off the dirt from all wood work, doors, windows, walls, floor or other parts of the building, in, upon, or about which the work is to be executed or of which he may have had possession for the purpose of the execution; thereof, and not until the work shall have been measured by the In-Charge. If the contractor shall fail to comply with the requirements of this Clause as to removal of scaffolding, surplus materials and rubbish and all huts and sanitary arrangements as aforesaid and cleaning off dirt on or before the date fixed for the completion of work, the In-Charge may at the expense of the contractor remove such scaffolding, surplus materials and rubbish etc., and dispose of the same as he thinks fit and clean off such dirt as aforesaid, and the contractor shall have no claim in respect of scaffolding or surplus materials as aforesaid except for any sum actually realized by the sale thereof.

15. Vendor should have local factory trained engineers to extend the service support.

Note: Point to point compliance of the all technical specifications, including five conditions and structural drawings (should be mentioned the orientation for best sun exposure) must be submitted. The attached drawing can be considered for improvements/modifications. After completion of work, final drawings with the information of all instruments and technical details must be provided by the agency.

Consultant Engineer

NIPGR, New Delhi.

Tenderers Signature with Seal

Schedule of Quantity

Name of work: A. Designing, Construction, Testing & Commissioning of In House Gene function analysis platform crop Green House (Air Conditioned) for at NIPGR Campus New Delhi.

B. Designing, Construction, Testing & Commissioning of In House Gene function analysis platform crop Green House (Air Cooled) at NIPGR Campus New Delhi.

S.N.	Description	Unit	Qty.	Rate in INR	Amount in INR
1	Designing, Construction, Testing & Commissioning of In house GFAPC Air Conditioned Green House(As per technical specifications as mentioned in Technical Bid). Overall Area of Air-Conditioned Green House (640 Sq.ft.) Size of Green House:- 32 ft. x 20 ft., Actual cooling area 580sqm. Side Height:- 8 ft., Centre Height:- 12 ft. Buffer Room Size:6ftx5ftx9ft entrance to be provided with air curtain MODEL:- ARC Shape, complete as per Enclosed Technical specifications, design & layout plan and drawings made by agency as per design and complete in all respect as per instruction of In-charge.				NOT TO BE FILLED
1a)	Structural works	Each	2		
1b)	Civil works	Each	2		
1c)	Air Conditioned & Cooling Works	Each	2		
1d)	Humidification arrangement works	Each	2		
1e)	Heating & Lighting Sytem works	Each	2		
1f)	Controlling arrangements works	Each	2		
1g)	Electrification &Plumbing works	Each	2		
Total Amount(Part A)					
2	Designing, Construction, Testing & Commissioning of In house GFAPC Air Cooled Green House (As per technical specifications as mentioned in Technical Bid). Overall Area of Air-Cooled Green House (640 Sq.ft.) Size of Green House:- 32 ft. x 20 ft., Side Height:- 8 ft., Centre Height:- 12 ft. Buffer Room Size:6ftx5ftx9ft entrance to be provided with air curtain MODEL:- ARC Shape, complete as per Enclosed Technical specifications, design & layout plan and drawings made by agency as per design and complete in all respect as per instruction of In-charge.				NOT TO BE FILLED
	Structural works	Each	2		
	Civil works	Each	2		
	Air cooling Works	Each	2		
	Humidification arrangement works	Each	2		
	Heating & Lighting Sytem works	Each	2		
	Controlling arrangements works	Each	2		
	Electrification &Plumbing works	Each	2		
Total Amount(Part B)					
Total Amount(Part A+Part B)					
<u>Add GST@5%</u>					
Net Total Amount(Part X)					

S.N.	Description	Unit	Qty.	Rate in INR	Amount in INR
3	Providing & Fixing of industrial grade RO water unit system with 200litres/hr. capacity to provide filtered water for all green houses and also provide & fix polymer storage water tanks (4 layers) of capacity of 2000ltrs(1Nos.) and 1000ltr(1nos.) on stable structured elevated platform so as to supply of water to all other tanks of Green House smoothly with plumbing fittings etc ,complete in all respect as per instruction of In-charge. (Make: Kent,Aqua fresh or equivalent make)	Each	1		NOT TO BE FILLED
				Total Amount	
				Add GST RO@18%	
				Total Amount(Part Y)	
				Grand Total Amount(PART X+ Part Y)	
					Seal & Sign of Agency
Consultant Engineer					

Specifications for Green house air cooled: 2 Units

Designing, Construction, Testing & Commissioning of In House GFAPC Green House (Air Cooled) at NIPGR Campus New Delhi. House with following technical and operational details

Overall Size of Green House Facility: Total Area 640 Sq.ft.

Total Size: - 32' x 20'

Side Height: - 8'

Centre Height: - 12'

With

Buffer Room Size : 6' x 5' x 9' Air Curtain to be ~~with~~ provided at entrance .

MODEL: - ARC Shape.

PHYSICAL STRUCTURE

a) STRUCTURE STEEL FRAME :-

DESCRIPTION:-

* BL1-P framing Pipe Anti-corrosive, Humidity resistant GI pipe as per IS 1239 class B anti-corrosive, humidity resistant, hot dip galvanized zinc coated for maximum wind load conditions, structural trusses will sustain for absolute wind load 150Kg/hr.

WIND LOAD STRENGTH :-	150 km/Hr. *BL3-P rigid, wind resistant frame.
GALVANIZED COAT :-	ISI standard :- IS 4736-1968/ISO65-1973
Weight: -	16-18 Kg/length of 20 ft.
Thickness: -	2mm \pm 0.5mm
Trusses: -	47 mm x 47 mm .
Vertical Supports :-	47 mm x 47 mm.
Purlins: -	47 mm x 47 mm.
Runners: -	47 mm x 47 mm.
Support :-	47 mm x 47 mm (As per DBT guide lines)
Doors :-	Anodised Aluminium doors(2Nos.) of size-6ftx3.0ft with polycarbonate sheet of 6mm thick as cladding material with proper locking arrangement(Godrej cylindrical lock (Brass)),door stoppers, door brush at the bottom and hydraulic door closers(Each 2Nos.),

CONSTRUCTION: IS- 2645 Civil construction of.* BL3-P Internal walls, ceilings, and floors resistant to liquids and chemicals. Curtain wall 2' above and 2' below GL. All compete as required. Digging/excavation 2.5ft below ground level and provide 4"inch thick Cement concrete in Foundation in ratio of 1:3:6 and Brick work to check the lateral movements of water etc.

Digging: -	2' ft. wide & 2.5ft depth
PCC in Foundation:-	PCC in 4" thick , WIDE :-18"
FIRST Course (Brick Work):-	13"
SECOND Course (Brick Work): -	13"
Third Course (Brick Work):-	9"
Brick work upto	3.0ft above third course in 9" course.
Frame Base Block :-	2.5ft x 9" x 9". At equal distance as per structure Supporting legs.
Curtain wall :-	3' (height) above Ground Lvl.
Damp Proof Course (DPC)	2 inch thick and water proofing to be done with

Asa

water Proofing compound course of applying cement slurry @4.40kg/sqm mixed with water proofing compound.

Plastering in 1: 6

Curtain wall to be plastered outside and duly Painted by water proof snocem / waterproof paint in smooth & even in approved colour. Curtain wall inside to fixed/finished by with Anti slippery **vitrified** flooring tiles (approved make & size of vitrified tiles) up to aluminium frame base.

Flooring inside – Cement concrete floor base to be made of Crushed brick bats in 4 inch thick and cement concrete of 1:2:4 in 2 inch thick and further finished /flushed with Anti slippery **vitrified** flooring tiles (approved make & size of vitrified tiles) on the floor as well as on Curtain wall up to base of aluminium frame complete with proper drainage arrangements, slope etc. complete as required.

Plinth Protection all along Green House: 2 ft wide with cement concrete at 1:2:4 ratio, 50mm thickness, over a base of 75mm, thickness, made out in cement concrete with 40mm thickness brick ballast in ratio of 1:4:8, the work to including curing of the top surface and proper compaction of the under surface.

Air Curtain:

Size: 3' wide heavy duty, cabinets of Air curtain are made of cold rolled Mild Steel Sheets. The blowers are made of high quality aluminum Sheets with ½ HP motor & double blower system, powder coated finish at pre entry point with auto main ON / OFF operation at the time of door opening/closing. **(One no. will be provided).**

Accessories:

Stainless Steel Wash Basin (1 No.) with disposal pipe, tap, angle wall, ball valves, Drainage Points, plumbing, polymer pipe water connection with one tap connection with corrosion free coated GI pipe/polymer pipes of (3/4")etc. ISI standard material will be provided. Water Connection to be tapped from nearest water point as per site. All GI pipe/polymer pipes and fittings to be arranged and laid and buried up to 600mm depth of G.L. by agency all complete as per direction of Institute

Electrification:

High quality ISI approved fittings with copper multi strand twisted **Fire Resistant Grade (ISI make)** wires stds. of safety with proper M.C.B. duly fitted in Control Panel and a 5kVA voltage Stabilizer with a 40W tube light in Buffer Room with appropriate electrical points of 5/15 amps combined switch & socket completed as required.

Copper Cable make: Finolex/Plaza/kalinga
MCB/Power Point Make: Havells/ Legrand

Laying of one PVC insulated and PVC sheathed/XLPE power cable(copper) of 1.1kv grade of size 35sqmm armored cable direct in ground including excavation, sand cushioning, protective covering and refilling of trenches etc . from greenhouse control panel to existing nearby Power supply panel at site with all necessary fitting & fixture all complete nothing extra shall be paid.

False Ceiling:

False ceiling with polycarbonate sheet to the gutter height would also be done and 18" exhaust fan at the front top side of the greenhouse and mesh (box type) at the back side will also be provided to maintain the temperature inside greenhouse.

Glazing (Conventional): 6 mm Thick double walled poly Carbonate Sheet

Plastic material unbreakable. Liquid and chemicals resistant. Properly installed and regularly maintained greenhouse glazing will be provided a suitable barrier for transgenic research materials. Working area will be covered with 6mm thick Multiwall polycarbonate sheet.*BL4-P standard.

UV stabilized double layered 6 mm thick transparent polycarbonate with at least 90% transmission. The sheets are to be fixed on roof and over all sides of the green house and further the sides & roof covering with anodized aluminium stripping, geeignet gasket and silicon (translucent) treatment for proper holding, insulation and thermal safety complete as required.

SPECIFICATION POLYCARBONATE SHEET:

Thickness	: 6mm multiwall.
Sound insulation dB	: 18
Make	: Bayer/Acewell / SABIC LEXAN USA
Clear code	: 112
Impact Performance	: 40°C to +120°C
Both Side UV stabilised	
Std lengths	: 2.1 m x 11.8 m
Sheet Structure	: 6/2 RS
LAXAN sheet	: DIN 4102 St.
Approx. weight g/m ²	: 1300
U.L Temperature	
Rating	: 100°C
Value W/m ² K	: 3, 5
Sound Insulation	
DIN52210:	: 18db
Multiwall	: Impact resistant, Energy saving.
Impact Resistant	: 200 times of GLASS
LIGHT TRANSMISSION: - 82 – 85% . Depending upon thickness and Colour selection.	
Excellent Thermal Insulation: 3.5 down.to2.4 (Float Glass Kivalue5.8)	
Safe Fire Performance	: Self-extinguishing and difficult to ignite
Light Weight: Weight ranging from 1.3 Kgs/ Sqms for 6mm.	
Thermal conductivity	: DIN52612W/2°C -0.21
Light Transparency	: 65%
UV	: Both Sides
Fixing	: Aluminium Strip
Sealing	: Geeignet gasket
Perforated Anti dust	: Aluminium Tape
Screw	: SS non Magnetic
*BL4-P walls and ceilings sealed with internal shell.	
Fixing with aluminium Profile: - Anodized, strengthened, sealed internal shell.	
Specification	: Anodized ,strengthened ,sealed internal shell.
Size	: 2" inch

Arwa

Weight	: 1.25 Kg / 12 feet
Length	: 12 feet
Screw	: SS non Magnetic / High quality GI
Thermal safety	: Silicon

Evaporating Cooling System(ECS) Technology for COOLING SYSTEM

ECS CONSTRUCTION MATERIAL:- Eco friendly.

18 GA GI Sheets /Aluminium : Tray Side , Top etc

Cooling Media : 100 mm thick Cellulose Pad at velocity of 1 to 3 m /s to give efficiency from 60 to 95 %.

Filtration : CALBA ISI 25 to 55 viscous in line micro fibre filter for 30 μ efficiency.

Miscellaneous : Fasteners , Galvanized, Rivet- Aluminium.

PVC pipe : 20mm/25mm/32mm with L & T . for over Flow & drainpipe.

Water Tank : PVC Tank 1000 liters.

Monoblock pumpset : **1.1. HP with thermal protection.** (Crompton/servo make)

Axial Flow fan : 30" (2 NOS.) in each Compartment.

40 x 40 Mesh : For extra protection from deserts sand/dust fitted.

Technical Parameters of Celdek Cellulose Pad: Evaporative cellulose pads are made from a specially formulated cellulose paper impregnated with special compounds to prevent rot, early moss formation and ensure a long service life.

1. Celdek pad is made of specially impregnated cellulose and treated to provide efficient watts.
2. Paper ambient condition 25⁰C – 45⁰C.
3. Estimated cooling load: 101.520 BTUs/Hrs.
4. Total water flow 7.56 LPM per sq.ft. of the top pad surface. Bleed of equal to 10% of total water rates.
5. High saturation efficiency.
6. Self cleaning feature.
7. No setting or Shrinkage of product.
8. Low pressure drop characteristics.
9. Impregnation makes the material stiff and self supporting.
10. CeL Pad Cross angle :- $a = 45^{\circ} b = 45^{\circ}$
11. Nominal Efficiency :- 88%
12. Bleed : 10%
13. Make :- **HuTek Thailand make**
14. Temperature: - **10 to 12⁰C Below. ambient.@ 45% RH.**
15. Cooling Pad Size:- **20' x 5' x 100mm**

Evaporative Cooling System (ECS): Fan & Pad system (Pad size: 20' x 5' x 4" thick) with Celdak Cellulose Pads to acquire proper CFM of air movement per sq.ft. of area will be provided. Even water delivery through distribution pipe will be ensured. Water bleeding mechanism will be built in to lessen water pollution. The Bleed off rate will be set to a 10 w valve (**Through BCW technology**) 5% less than the evaporation rate. Slow water contamination and efficient water flow, **online water filter**, capacity calculated on required water flow rate will be provided. Facility is essentially made for water softening and filtration unit to prolong the life of the pad. On back side of Celdak Cellulose pad and heavy duty Slow Speed Axial Flow Fans 30" with Aluminium louvered covering will be provided to achieve temperature 28⁰C \pm 10⁰C below ambient temperature throughout the year.

Technical Specifications Cellulose Pad:

Humidification System : This is very important feature of the Green house for growing of plants. It creates fine mist inside the chamber and increases the RH. Manufactured of high quality plastic material, resistant to chemicals

humidity:- Installation with leakage prevention device (LPD) fogger does not drip during the function.

Humidity Range :- Up to 90 % Through Micro Humidification to create the 60-80% accuracy $\pm 3 - 5\%$

Fogger discharge range:-7.0 LPH,

Operating Pressure:-4.0 bar, the average droplet size: 50 to 100 μm .

Density of one fogger:- 4.0 m,

Mister/Fogger Make :- NANDAN (Israel) / Netafim (Israel)

Head Control Unit- The same head control to be used for humidity & irrigation.

Microfogging / Micromisting :- Installation with leakage prevention device (LPD) fogger does not drip during the function.

Working pressure :- 4 bar at this pressure, the average droplet size :- 50 to 100 μm .

Density :- One fogger to 0.3 m – 0.4 m² for propagation.

Patten :- Type of Fogger:- Cross / four way nozzle ,hanging type.

Pipe Imported ; - 16 mm LLDPE (10 kg/cm²) colour BLACK with red strip. Motor:- 1.1 HP monoblock pump (Crompton/servo) :- 1 No. Filter (Screen) :- Kelba (ISI)

Pressure meter:- 10 bar one. Return gutter, control valve assembly Tank :- 1000 litres

PVC pipe :- 32 mm/ 25mm.

List of Material for each chamber

Micro nozzle for way plasto / DAN	: 20 nos.
1 HP monoblock pump (ISI Make)	: 1 no.
Double layer 500 ltrs tank	: 1 no.
LLDPE (imported pipe)	: 75 m
Micro 5 Kg KELBA ISI line filter	: 1 no.
Return gutter, control valve assembly, pressure gauge	: 1 no.
PVC pipe (32 mm/25mm)/GI fittings. complete	: 1 no.

Slow Speed Axial Flow Fans 2 nos. (36" Box type)

Shutters come with automatic shutter opener. This opener system allows the shutters to fully open as soon as the fan starts to run. Air delivery normally lost due to dirty shutters or to hold shutters open is thus eliminated.

List of Material for Each Chamber:- 30" Slow axial flow fan – 2 nos. Aluminium louvers – 2 nos. GI/AI pad fittings – Complete, 1 HP monoblock – 1 no. 500 liters double layer water tank – 1 no., GI Tray, water Distribution system – 1 no., 32 mm / 25 mm PVC pipe with fittings, Line filter :- 1 no. The external surface area of the Fan and pad are covered with filter screen of 40 x 40 mesh Stainless Steel mesh covering (as per DBT bio safety guidelines) to avoid dispersal of pollen.

Heating System: - Providing Heavy duty Paralytic Technique Which is ideal for heating in biotech work and greenhouse. Inbuilt auto thermal cut off device, Biotech grade 2.5 KW. It has ISI standard make heating element and ISI standard 900 rpm speed fan they prevent SO₂ injury to plants as caused by other make of heater due to improper combustion of fuel gases

as a common phenomenon seen in green house . Input 200-240 VAC, 50 HZ, single phase.
Ambient 5°C to 50°C , RH upto 90%.
No. of Heater : 2 Nos.

AUTOMATIC CONTROL SYSTEMS :- Microprocessor Photosynthesis control Panel for TEMPERATURE, HUMIDITY and LIGHT duly fixed in Buffer Area.

- a) Relative Humidity + Temperature Real Time Microprocessor Controller
- b) Programmable Photoperiodic Controller
- c) Cyclic Timer
- d) Main Switch (Rotary) L&T make.
- e) Individual Indicator.

Technical specifications

MICROPROCESSOR PHOTOSYNTHESIS MONITOR PANEL

With Mains ON/OFF Switch (L&T Make), Light Indicator for main Light, Heating, Cooling & Humidity.

Relative Humidity + Temperature Real Time Microprocessor Controller

Input : RH+Temperature Sensor

Display, RH : Upper : 4 digit, 7 segment 0.56" (14.2 mm) green LED display

Display, Temperature : Lower : 4 digit, 7 segment 0.56" (14.2 mm) red LED display

Accuracy : RH : +/- 3% RH

Temperature: +/-0.3% deg C

Microclimatic Temperature Controller Specifications:

Feathers touch operation. Set point locks within the setting panel to protect setting changes. Level lock to ensure that the parameter can be read but cannot be changed. Sensor failure indication. Real time microprocessor based PID Controller, 4 digit LED display for displaying measured (14mm, 8mm) / displaying settings, soft touch operation, Platinum sensor probe Pt-100, Selection of unit °C, °F .Display resolution 0.1°. Automatic hysteresis control. Wide selectable temperature range, ranges from 0° to 100°C. 4 KVA load can be directly connected to the powered out put. Input- 200-240 VAC, 50 Hz. Single phase. , Ambient 5°-50°C, RH upto 90%.

Microclimatic Humidity Controller Specification: Microprocessor based, On/Off control for Humidifying/Dehum, Hysteresis/Differential 1% - 9%, Delay timer 0-240 sec, Direct / Reverse selectable, Lock functions to prevent miss operating, Feather touch operation, Fast response sensor – line resistance < 100, Display Accuracy – indicating value $\pm 0.2\% \pm 1$ digit.

Photoperiodic Timer Real time microprocessor based. Clock Accuracy ± 2.5 sec/day @20°C 1 Channel, 1 Week Program 16 memory locations adjustable to the minutes/hrs, power backup(Holiday programming) 150 Hrs. Running reserve. Random switching can be activated by pressing any key Summer/Winter time changeover PROGRAM SAVING BY EEPROM

Input- 200-240 VAC, 50 Hz. Single phase. , Ambient 5°-50°C, RH upto 90%.

Plitz Timer/ cyclic Timer for Humidity/Irrigation: Specific for fogging, misting system, controlled by timer. To avoid the water logging condition in the Transgenic Green House each. Specification: -

0-999 Min/sec On, 0-999 Min/sec OFF
automatic cycling. Accuracy quartz
Power output can be directly drive misting unit load upto 4.4 KVA.
Input 200 V to 240 V.A.C, Phase-Single, 50 Hz.
Ambient 4°C to 50°C, RH upto 90%.

LIGHTING SYSTEM

Photo synthetically Active Radiation Lamp (P Ac Ra).

Lamps for supplementing the natural day light by 100 $\mu\text{moles/m}^2/\text{s}$ additive only and as per DIN and IEC standard using High Flex Fluorescent Lighting system and HPS/HQI Lamps equally distributed inside the entire Hardening Chamber.

"Since plants use energy between 400 and 700 nanometers and light in this region is called Photosynthetically Active Radiation or PAR, we could measure the total amount of energy emitted per second in this region and call it PAR watts. This is an objective measure in contrast to lumens which is a subjective measure since it is based on the response of the subjects (humans). PAR watts directly indicates how much light energy is available for plants to use in photosynthesis. These three measures of photosynthetically active radiation, PAR watts per square meter, PPF PAR and YPF PAR are all legitimate, although different, ways of measuring the light output of lamps for plant growth. They do not involve the human eye response curve which is irrelevant for plants. Since plant response does "spill out" beyond the 400 nanometer and 700 nanometer boundaries, some researchers refer to the 350 – 750 nanometer region as the PAR region. Using this expanded region will lead to mildly inflated PAR ratings compared to the more conservative approach in this discussion. However, the difference is small"

External Shading: 75% agro shading net green colour (agro shade net) with rolling arrangement connecting pipe etc. can be rolled when required.

Energy saving	: 60 %
Diffused light transmission	: 70-30
Shade percentage	: 75%
Material	: UV resistant material. Colour Green.

Specification:- Protects against frost radiation, provides uniform shade and reduced day temperature.

These lamps are provided for increasing day length with specific wave length & spectrum and using in green house globally for best production in floriculture crops. Some technical details are given below:

These lamps are DIN Germany & IEC international & JIN Japan standard lamp for

- 1) Night break technique
- 2) Day length manipulation.
- 3) Supplement the natural day light.
- 4) Higher rate of carbon fixation.

We will provide PAR with photo simulator (Osram/Philips Make) and its fittings are specific action spectra lamps for photosynthesis for research & commercial product in each chamber with fittings will also be provided in the corridor.

Technical specification of PAR lamps

Lamp Wattage (W)	36
Luminous Flux	1350
Luminous Efficacy (Lm/U)	19.3
Photosynthesis Watt (W)	
(Photosynthetic effects of Lamp)	5.58

Efficacy (mw/w) (Results of Effectiveness)	
Photosynthetic radiation	79.7
Photosynthesis (w/m ²) Capability of	
Photosynthetic radiation which adjusted light lux	4.13
PAR Value (Effectiveness of light Beam area)	5.45
400-700nm	25.5
350-500nm	7.26
600-700nm	13.2

Spectroradiometer measured to (400-700 nm).

Percentages are the amount of photons relative to sunlight.

Material list:

1. Total PAR lamp 36watt: 15 nos.
2. Electronic Ballast: 15 nos.
3. Normal fluorescent lights: 1 no.
4. Tube light fixture good finish powder coated – 16 nos.

Miscellaneous Items:

1. Miscellaneous like Stainless steel wash basin with all fittings, Aluminium ladder, Plumbing polymer pipes with all fittings (ISI or equivalent) to be provided for proper functioning of system.
2. Flexible expendable polymer hose with different water discharge streams in each area (technical data to be submitted).
3. Electrical and water supply shall be provided by institute up to nearby as per site. However all fittings of electrical and water supply connections working should be provided by agency.

Bench Structure :- Table Frame :- 25 mm x 25 mm GI
Top strappings :- 19 mm x 19 mm GI Perforated GI sheet 1.5 mm thick
Size of Table :- 4.0ft(L)x2.0(B)ftx3.0ft(Ht)
Total No. of Bench - 6 No

Benches should be bearable for Standard 1200Kg. per bench weight limit.

Amu

Specification for Air conditioned Green house (2 units)

Designing, Construction, Testing & Commissioning of In House GFAPC Green House (Air Conditioned) at NIPGR Campus New Delhi. with following technical and operational details:-

Overall Size of Green House Facility –Overall area - 640 Sq.ft. Including separate cooling area.

Total Size: - 32' x 20'

Side Height: - 8'

Centre Height: - 12'

Vestibule/Buffer Room Size : 6' x 5' x 9' Buffer Area entrances to be provided with Air Curtain (1No.)

MODEL: - ARC Shape.

PHYSICAL STRUCTURE

a) STRUCTURE STEEL FRAME :-

DESCRIPTION:-

* BL1-P framing Pipe Anti-corrosive, Humidity resistant GI pipe as per IS 1239 class B anti-corrosive, humidity resistant, hot dip galvanized zinc coated for maximum wind load conditions, structural trusses will sustain for absolute wind load 150Kg/hr.

WIND LOAD STRENGTH :-

150 km/Hr. *BL3-P rigid, wind resistant frame.

GALVANIZED COAT :-

ISI standard :- IS 4736-1968/ISO65-1973

Weight: -

16-18 Kg/length of 20 ft.

Thickness: -

2mm \pm 0.5mm

Trusses: -

47 mm x 47 mm .

Vertical Supports :-

47 mm x 47 mm.

Purlins: -

47 mm x 47 mm.

Runners: -

47 mm x 47 mm.

Support :-

47 mm x 47 mm (As per guide lines)

Doors :-

Anodised Aluminium doors(3Nos.) of size-6ftx3.0ft
With clear polycarbonate sheet of 6mm thick as cladding material with proper locking arrangement(Godrej cylindrical lock (Brass)),door stoppers, door brush at the bottom and hydraulic door closers(3Nos.),

CONSTRUCTION: IS- 2645 Civil construction of.* BL3-P Internal walls, ceilings, and floors resistant to liquids and chemicals. Curtain wall 2' above and 2' below GL. All compete as required. Digging/excavation 2.5ft below ground level and provide 4"inch thick Cement concrete in Foundation in ratio of 1:3:6 and Brick work to check the lateral movements of water etc.

Digging: -

2' ft. wide & 2.5ft depth

PCC in Foundation:-

PCC in 4" thick , WIDE :-18"

FIRST Course (Brick Work):-

13"

SECOND Course (Brick Work): -

13"

Third Course (Brick Work):-

9"

Brick work upto

3.0ft above third course in 9" course.

Frame Base Block :-

2.5ft x 9" x 9". At equal distance as per structure
Supporting legs.

Curtain wall :-

3' (height) above Ground Lvl.

Damp Proof Course (DPC)

2inch thick and water proofing to be done with

water Proofing compound course of applying cement slurry @4.40kg/sqm mixed with water proofing compound.

Plastering in 1: 4

Curtain wall to be plastered outside and duly Painted by water proof snocem / waterproof paint in smooth & even in approved colour. Curtain wall inside to fixed/finished by with Anti slippery **vitrified** flooring tiles (approved make & size of vitrified tiles) up to aluminium frame base.

Flooring inside – Cement concrete floor base to be made of Crushed brick bats in 4 inch thick and cement concrete of 1:2:4 in 2 inch thick and further finished /flushed with Anti slippery **vitrified** flooring tiles (approved make & size of vitrified tiles)on the floor as well as on Curtain wall up to base of aluminium frame complete with proper drainage arrangements, slope etc. complete as required.

Plinth Protection all along Green House: 2.ft wide with cement concrete at 1:2:4 ratio, 50mm thickness, over a base of 75mm, thickness, made out in cement concrete with 40mm thickness brick ballast in ratio of 1:4:8, the work to including curing of the top surface and proper compaction of the under surface.

Air Curtain:

Size: 3' wide heavy duty, cabinets of Air curtain are made of cold rolled Mild Steel Sheets. The blowers are made of high quality aluminum Sheets with ½ HP motor & double blower system, powder coated finish at pre entry point with auto main ON / OFF operation at the time of door opening/closing. **(two no. will be provided)**. Electronically balanced air curtain with double blower and atomized ON/OFF operation w.r.t. door opening at the entrance of buffer area.

Accessories:

Stainless Steel Wash Basin (1 No.) with disposal pipe,tap,, angle wall, ball valves, Drainage Points, plumbing, polymer pipe water connection with one tap connection with corrosion free coated GI pipe/polymer pipes of (3/4")etc. ISI standard material will be provided. Water Connection to be tapped from nearest water point as per site. All GI pipe/polymer pipes and fittings to be arranged and laid and buried up to 600mm depth of G.L. by agency all complete as per direction of Institute. Flexible expandable polymer hose with 7 different water discharge streams in each area (technical detail must submit)

Electrification:

High quality ISI approved fittings with copper multi strand twisted **Fire Resistant Grade (ISI make)** wires stds. of safety with proper M.C.B. duly fitted in Control Panel and 1nos.of 5 KVA Voltage Stabilizer with a 40W tube light (6Nos.) in Buffer Areas with appropriate electrical points of 5/15 amps combined switch & socket completed as required.

Copper Cable make: Finolex/Plaza/kalinga
MCB/Power Point Make: Havells/ Legrand

Laying of one PVC insulated and PVC sheathed/XLPE power cable(copper) of 1.1kv grade of size 40sqmm armored cable direct in ground including excavation, sand cushioning, protective covering and refilling of trenches etc . from greenhouse control panel to existing nearby Power supply panel at site with all necessary fitting & fixture all complete nothing extra shall be paid.

False Ceiling:

False ceiling area of the containment area, buffer area, roof and side walls shall be covered with 6 mm thick multiwall (4 layers) polycarbonate sheet to the gutter height would also be done and 18" exhaust fan at the front top side of the greenhouse and mesh (box type) at the back side will also be provided to maintain the temperature inside greenhouse.

Air modulation system should be made available on the Roof side with thermal controls with additional ceiling using Honey well/Siemens make actuators (Details must be provided)

Glazing (Conventional): 10 mm Thick Multiwalled walled (four layers) Polycarbonate Sheet
Plastic material unbreakable. Liquid and chemicals resistant. Properly installed and regularly maintained greenhouse glazing will be provided a suitable barrier for transgenic research materials. Working area will be covered with 10mm thick Multiwall polycarbonate sheet (4 layers). UV stabilized double layered 10mm thick transparent polycarbonate with at least 90% transmission. The sheets are to be fixed on roof and over all sides of the green house and further the sides & roof covering with anodized aluminium stripping, geegnet gasket and silicon (translucent) treatment for proper holding, insulation and thermal safety complete as required.
Double door Vestbule/buffer Entry of Size-6'x5'x9'(LxWxH) covered with 6mm thick multiwall (4layers) Metallic polycarbonate sheet

SPECIFICATION POLYCARBONATE SHEET :-

Thickness	: 10 mm multiwall.
Sound insulation dB	: 18
Make	: Bayer/Acewell / SABIC LEXAN USA
Clear code	: 112
Impact Performance	: 40°C to +120°C
Both Side UV stabilised	
Std lengths	: 2.1 m x 11.8 m
Sheet Structure	: 6/2 RS
LAXAN sheet	: DIN 4102 St.
Approx. weight g/m ²	: 1300
U.L Temperature	
Rating	: 100°C
Value W/m ² K	: 3, 5
Sound Insulation	
DIN52210:	: 18db
Multiwall	: Impact resistant, Energy saving.
Impact Resistant	: 200 times of GLASS
LIGHT TRANSMISSION: 82 – 85% Depending upon thickness and Colour selection.	
Excellent Thermal Insulation: 3.5 down to 2.4 (Float Glass Kivalue5.8)	
Safe Fire Performance	: Self-extinguishing and difficult to ignite
Light Weight: Weight ranging from 1.3 Kgs/ Sqms for 6mm.	
Thermal conductivity	: DIN52612W/2°C -0.21
Light Transparency	: 65%
UV	: Both Sides
Fixing	: Aluminium Strip
Sealing	: Geeignet gasket
Perforated Anti dust	: Aluminium Tape
Screw	: SS non Magnetic

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*BL4-P walls and ceilings sealed with internal shell.

Fixing with aluminium Profile: - Anodized, strengthened, sealed internal shell.

Specification : Anodized ,strengthened ,sealed internal shell.

Size : 2" inch

Weight : 1.25 Kg / 12 feet

Length : 12 feet

Screw : SS non Magnetic / High quality GI

Thermal safety : Silicon

Wind Load : 150Km/hr

3. Cooling System.

- Commercial Air-conditioning cooling arrangements with complete Backup ECS additive additive Force cooling system(Complete) using cellulose Cooling Pads and Axial Flow Fans based on the heat load with separative water cyclor unit.
- **Commercial air-conditioning unit having cooling capacity 24200 BTU/Hr. @12°C (6 Nos. 2 ton commercial split AC with Emerson CR-30, MAKE Compressor) with LP/HP controlling device, insulated accumulator** should be provided (Technical details must be provided with enclosure & details). Units should be designed on three phase supply for trouble free operations with HP/LP cut off devices.
- **Temperature range: 22°C to 30°C \pm 2° C throughout the year.**

6. Humidification System:

Advance air drying humidification system (Commercial Ultrasonic Humidifier) which gives non wetting effects consumption 1-18 ltrs./hr. with complete plumbing using ABS plastic pipes and fittings, 50 liter of Carboy and commercial RO system along with 1700 \pm 40 KHz ultrasonic humidifier having **Ceramic Disc size: Φ 20mm.** Titanium Coated. Mist Generation >900 ml/Hr. Stainless Steel 304 grade enclosure (Technical details must be provided failing which tender may be disqualified)

7. Microprocessor Control Panel .

(i) Programmable Photoperiodic Timer:

- Clock Accuracy \pm 2.5sec/day@20°C
- 1 Channel and Week Program
- 16 memory locations adjustable to the minutes
- Auto summer and winter time changing
- 1500 Hrs. Running reserve

(ii) Temperature Control System:

- Temp. Range: 0.1 to 59.9°C; Accuracy: \pm 1°C
- Hysteresis: 0.4°C with sensor probe Pt-100 Sensor cord 15 meters

(iii) Relative Humidity Control System:

- RH in the range of \pm 4%, Real RH: \pm 2%. \pm 1 digit (at 45%)
- Range: 30% to 90%

(IV) Remote alarm System for Temperature (Indoor & out Door along with Door opening)

(V)SPPR/OV/UV Protection

Humidity Range: - Up to 60% Through Micro Humidification to create the 45-60% accuracy \pm 3-5%

Fogger discharge range:-7.0 LPH,

Operating Pressure:-4.0 bar, the average droplet size: 50 to 100 pm.

Humidification System: Humidity range: Upto 90%, Piltz timer to maintain the humidity : Fogger discharge range:-7.0 LPH,

Parameters: **working pressure** 4.0 bar at this pressure. **The average droplet size:** 5 to 100 micron m.';
Density of one fogger: 4.0m, 1HP PUMP with nozzles,
Screen Filters, LLDPE pipes etc.
Returns gutter, control valve assembly tank: 500ltrs.
Microprocessors: Controlled Air exchanger fitted with HEPA filter & Pre filter modulated actuated

Heating System: - Radiant Heating System using Far infrared ray radiation backed up with commercial Paralytic heating arrangements with back up arrangement.

- Far infrared ray radiation -3.49×10^2 watt/m² and Anion radiation more than 500 ions/cc
- IP 65 electrical termination with overheating preventing device.
- Along with Backup arrangements.

Providing Heavy duty Paralytic Technique Which is ideal for heating in biotech work and greenhouse. Inbuilt auto thermal cut off device, Biotech grade 2.5 KW. It has ISI standard make heating element and ISI standard 900 rpm speed fan they prevent SO₂ injury to plants as caused by other make of heater due to improper combustion of fuel gases as a common phenomenon seen in green house. Input 200-240 VAC, 50 HZ, single phase. Ambient 5°C to 50°C, RH upto 90%. Along with backup arrangements.

Air modulation system should be available on the roof side with thermal controls, prefilters & axial driven heat evacuation arrangement (details must provide.)

No. of Heater : 2 Nos.

AUTOMATIC CONTROL SYSTEMS: Microprocessor Photosynthesis control Panel for TEMPERATURE, HUMIDITY and LIGHT duly fixed in Buffer Area.

- a) Relative Humidity + Temperature Real Time Microprocessor Controller
- b) Programmable Photoperiodic Controller
- c) Cyclic Timer
- d) Main Switch (Rotary) L&T make.
- e) Individual Indicator.

Technical specifications

MICROPROCESSOR PHOTOSYNTHESIS MONITOR PANEL

With Mains ON/OFF Switch (L&T Make), Light Indicator for main Light, Heating, Cooling & Humidity.

Relative Humidity + Temperature Real Time Microprocessor Controller

Input : RH+Temperature Sensor

Display, RH : Upper : 4 digit, 7 segment 0.56" (14.2 mm) green LED display

Display, Temperature: Lower: 4 digit, 7 segment 0.56" (14.2 mm) red LED display

Accuracy : RH : +/- 3% RH

Temperature: +/- 0.3% deg C

Microclimatic Temperature Controller Specifications:

Feathers touch operation. Set point locks within the setting panel to protect setting changes. Level lock to ensure that the parameter can be read but cannot be changed. Sensor failure indication. Real time microprocessor based PID Controller, 4 digit LED display for displaying measured (14mm, 8mm) / displaying settings, soft touch operation, Platinum sensor probe Pt-100, Selection of unit °C, °F. Display resolution 0.1°. Automatic hysteresis control. Wide selectable temperature range, ranges from 0° to 100°C. 4 KVA load can be

directly connected to the powered out put. Input- 200-240 VAC, 50 Hz. Single phase. , Ambient 5°-50°C, RH 30% to 90%.

Microclimatic Humidity Controller Specification: Microprocessor based, On/Off control for Humidifying/Dehum, Hysteresis/Differential 1% - 9%, Delay timer 0-240 sec, Direct / Reverse selectable, Lock functions to prevent miss operating, Feather touch operation, Fast response sensor – line resistance < 100, Display Accuracy – indicating value $\pm 0.2\% \pm 1$ digit.

Photoperiodic Timer Real time microprocessor based. Clock Accuracy $\pm 2.5\text{sec/day}$ @20°C 1 Channel, 1 Week Program 16 memory locations adjustable to the minutes/hrs, power backup(Holiday programming) 150 Hrs. Running reserve. Random switching can be activated by pressing any key Summer/Winter time changeover PROGRAM SAVING BY EEPROM

Input- 200-240 VAC, 50 Hz. Single phase. , Ambient 5°-50°C, RH 30% to 90%.

Plitz Timer/ cyclic Timer for Humidity/Irrigation: Specific for fogging, misting system, controlled by timer. To avoid the water logging condition in the Transgenic Green House each. Specification: -

0-999 Min/sec On, 0-999 Min/sec OFF

automatic cycling. Accuracy quartz

Power output can be directly drive misting unit load upto 4.4 KVA.

Input 200 V to 240 VA.C, Phase-Single, 50 Hz.

Ambient 4°C to 50°C, RH 30% to 90%.

LIGHTING SYSTEM

Photo synthetically Active Radiation Lamp (P Ac Ra). Photo synthetically Active Radiation Lamp: PAR LED illumination with flexible intensity..(Details of lighting system with collapsible lighting arrangement must be provided)Lamps for supplementing the natural day light by 400-1000 $\mu\text{moles/m}^2/\text{s}$ only and as per DIN and IEC standard using High Flex Fluorescent Lighting system and PAR LED Lamps in IP65 rating electrical laminar fittings OR HPS/HQI Lamps equally distributed inside the entire Hardening Chamber.

“Since plants use energy between 400 and 700 nanometers and light in this region is called Photosynthetically Active Radiation or PAR, we could measure the total amount of energy emitted per second in this region and call it PAR watts. This is an objective measure in contrast to lumens which is a subjective measure since it is based on the response of the subjects (humans). PAR watts directly indicates how much light energy is available for plants to use in photosynthesis. These three measures of photosynthetically active radiation, PAR watts per square meter, PPF PAR and YPF PAR are all legitimate, although different, ways of measuring the light output of lamps for plant growth. They do not involve the human eye response curve which is irrelevant for plants. Since plant response does "spill out" beyond the 400 nanometer and 700 nanometer boundaries, some researchers refer to the 350 – 750 nanometer region as the PAR region. Using this expanded region will lead to mildly inflated PAR ratings compared to the more conservative approach in this discussion. However, the difference is small”

External Shading: 75% agro shading net green colour (agro shade net) with rolling arrangement connecting pipe etc. can be rolled when required.

Energy saving : 60 %

Diffused light transmission : 70-30

Shade percentage : 75%

Material : UV resistant material. Colour Green.

Specification:- Protects against frost radiation, provides uniform shade and reduced day temperature.

These lamps are provided for increasing day length with specific wave length & spectrum and using in green house globally for best production in floriculture crops. Some technical details are given below:

These lamps are DIN Germany & IEC international & JIN Japan standard lamp for

- 1) Night break technique
- 2) Day length manipulation.
- 3) Supplement the natural day light.
- 4) Higher rate of carbon fixation.

We will provide PAR with photo simulator (Osram/Philips Make) and its fittings are specific action spectra lamps for photosynthesis for research & commercial product in each chamber with fittings will also be provided in the corridor.

Technical specification of PAR lamps

Lamp Wattage (W)	36
Luminous Flux	1350
Luminous Efficacy (Lm/U)	19.3
Photosynthesis Watt (W)	
(Photosynthetic effects of Lamp)	5.58
Efficacy (mw/w) (Results of Effectiveness)	
Photosynthetic radiation	79.7
Photosynthesis (w/m ²) Capability of	
Photosynthetic radiation which adjusted light lux	4.13
PAR Value (Effectiveness of light Beam area)	5.45
400-700nm	25.5
350-500nm	7.26
600-700nm	13.2

Spectroradiometer measured to (400-700 nm).

Percentages are the amount of photons relative to sunlight.

Material list:

1. Total PAR lamp 36watt: 20 nos.
2. Electronic Ballast: 20 nos.
3. Normal fluorescent lights: 1 no.
4. Tube light fixture good finish powder coated – 21 nos.

Miscellaneous Items:

1. Miscellaneous like Stainless steel wash basin with all fittings, Aluminium ladder, Plumbing polymer pipes with all fittings (ISI or equivalent) to be provided for proper functioning of system.
2. Flexible expendable polymer hose with different water discharge streams in each area (technical data to be submitted).
3. Electrical and water supply shall be provided by institute up to nearby as per site. However all fittings of electrical and water supply connections working should be provided by agency.

Table Frame: - 25 mm x 25 mm GI

Top strappings: - 19 mm x 19 mm GI Table Top –Perforated GI sheet 1.5 mm thick

Size of Table :- 4.0ft(L)x2.0(B)ftx3.0ft(Ht)

Total No. of Bench : - 12 No

Benches should be bearable for Standard 1200Kg. per bench weight limit.

Alon

Others:

- The company should also install an industrial grade RO water unit (capacity 200 L/h) that will be used to provide cooling water to all green houses, as well as for the growing plants. Additionally, providing & fixing polymer storage water tanks (2000 L and 1000L) in a stable elevated platform. Water to be taped from nearby water storage tanks of NIPGR.
- Three year warranty against i) all spare parts ii) electronic & electrical instruments iii) manufacturing defects.
- Tenderer must provide a trouble free after sales service within 24-48 Hrs. after the intimation of complaint. Tenderer must be ISO 9001:2015 certified and CE certified. Documentary proof must be attached with the tender.
- NIPGR reserves the rights to reject or accept any/all tender without assigning any reason thereof.
- The detailed specification needs to be given in Technical Bid with all commercial terms and conditions failing which tender will be rejected (**Constructional drawing mentioning Plan and 3 dimensional view needs to be submitted with the tender failing which tender may be rejected**)
- Tender are liable to be rejected if they are not inline with the technical specifications of the Tender Notice.

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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 later.

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 of content of the documents before uploading.

The offers submitted by 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.

(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 also that we will be able to execute the work suit to the site conditions.

(Signature of Bidder with Seal)

Name:

Address:

Date:

Consultant Engineer

NIPGR New Delhi

CHECK-LIST FOR PRE-QUALIFICATION BID FOR: Raising of existing boundary wall after dismantling and re-fixing of Fencing with the addition of concertina coil fencing 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) with on-line tender document.	
4.	Self-attested copy of the GSTIN& PAN card issued by the Income Tax Department.	
5.	Proof of experiences of last three years ending 31 st Aug., 2018 as specified in the NIT along with satisfactory performance certificates 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.	

Signature of the Bidder

(Name and Address of the Bidder)

Telephone No.





FINANCIAL BID

Name of work: A. Designing, Construction, Testing & Commissioning of In House Gene function analysis platform crop Green House (Air Conditioned) for at NIPGR Campus New Delhi.

B. Designing, Construction, Testing & Commissioning of In House Gene function analysis platform crop Green House (Air Cooled) at NIPGR Campus New Delhi.

CLIENT : DIRECTOR, NIPGR, NEW DELHI

Schedule of Quantity

Name of work: A. Designing, Construction, Testing & Commissioning of In House Gene function analysis platform crop Green House (Air Conditioned) for at NIPGR Campus New Delhi.

B. Designing, Construction, Testing & Commissioning of In House Gene function analysis platform crop Green House (Air Cooled) at NIPGR Campus New Delhi.

S.N.	Description	Unit	Qty.	Rate in INR	Amount in INR
1	Designing, Construction, Testing & Commissioning of In house GFAPC Air Conditioned Green House(As per technical specifications as mentioned in Technical Bid). Overall Area of Air-Conditioned Green House (640 Sq.ft.) Size of Green House:- 32 ft. x 20 ft., Actual cooling area 580sqm. Side Height:- 8 ft., Centre Height:- 12 ft. Buffer Room Size:6ftx5ftx9ft entrance to be provided with air curtain MODEL:- ARC Shape, complete as per Enclosed Technical specifications, design & layout plan and drawings made by agency as per design and complete in all respect as per instruction of In-charge.				
1a)	Structural works	Each	2		
1b)	Civil works	Each	2		
1c)	Air Conditioned & Cooling Works	Each	2		
1d)	Humidification arrangement works	Each	2		
1e)	Heating & Lighting Sytem works	Each	2		
1f)	Controlling arrangements works	Each	2		
1g)	Electrification &Plumbing works	Each	2		
	Total Amount(Part A)				
2	Designing, Construction, Testing & Commissioning of In house GFAPC Air Cooled Green House (As per technical specifications as mentioned in Technical Bid). Overall Area of Air-Cooled Green House (640 Sq.ft.) Size of Green House:- 32 ft. x 20 ft., Side Height:- 8 ft., Centre Height:- 12 ft. Buffer Room Size:6ftx5ftx9ft entrance to be provided with air curtain MODEL:- ARC Shape, complete as per Enclosed Technical specifications, design & layout plan and drawings made by agency as per design and complete in all respect as per instruction of In-charge.				
	Structural works	Each	2		
	Civil works	Each	2		
	Air cooling Works	Each	2		
	Humidification arrangement works	Each	2		
	Heating & Lighting Sytem works	Each	2		
	Controlling arrangements works	Each	2		
	Electrification &Plumbing works	Each	2		
	Total Amount(Part B)				
	Total Amount(Part A+Part B)				
	<u>Add GST@5%</u>				
	Net Total Amount(Part X)				

S.N.	Description	Unit	Qty.	Rate in INR	Amount in INR
3	Providing & Fixing of industrial grade RO water unit system with 200litres/hr. capacity to provide filtered water for all green houses and also provide & fix polymer storage water tanks (4 layers) of capacity of 2000ltrs(1Nos.) and 1000ltr(1nos.) on stable structured elevated platform so as to supply of water to all other tanks of Green House smoothly with plumbing fittings etc ,complete in all respect as per instruction of In-charge. (Make: Kent,Aqua fresh or equivalent make)	Each	1		
Total Amount					
Add GST RO@18%					
Total Amount(Part Y)					
Grand Total Amount(PART X+ Part Y)					
					Seal & Sign of Agency
Consultant Engineer					