

## **TENDER DOCUMENT**

**Name of work:** Designing, Construction, Testing & Commissioning of Green House (Air Cooled) at NIPGR Campus, New Delhi.

**CLIENT:** DIRECTOR NIPGR,  
NEW DELHI

**COST OF TENDER DOCUMENT: ₹ 500.00**

## **TENDER DOCUMENTS**

**Name of work:** Designing, Construction, Testing & Commissioning of 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

**Administrative Officer  
NIPGR, New Delhi**

**Last date for sale of tenders:** 22.11.2013 up to 16:00 hrs.  
**Date/Time of submission :** 26.11.2013 before 15.00 hrs.  
**Date/Time of opening :** 26.11.2013 at 15.30hrs.

**Administrative Officer  
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 the Designing, Construction, Testing & Commissioning of Green House (Air Cooled) at NIPGR Campus, New Delhi.

- Tender Notice
- General Conditions
- Instructions to bidders
- General Information
- Specific conditions of contract
- Terms and Conditions of Contract Agreement
- Special Terms and conditions of Contract
- Bill of Quantities
- Technical Specifications
- Financial Bid \*

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 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 Tender No. NIPGR/7/15 (A)

Sealed item rate Tenders (in two bid system) are invited on behalf of the Director, NIPGR, New Delhi for the below mentioned work, from firms having completed at least three similar installations of each value not less than ₹ 8 Lacs OR two similar installations of each value not less than ₹ 12 Lacs OR one similar installation of each value not less than ₹ 16 Lacs during the last three years preferably in central/State Govt/Central/State Autonomous Bodies, so as to reach this office as per schedule detailed below.

**Name of work:** Designing, Construction, Testing & Commissioning of Green House (Air Cooled) at NIPGR Campus, New Delhi.

Sl. No.	Estimated Cost (In Lacs)	EMD (In ₹)	Time for Completion	Last date & time for sale of Tender Documents	Last date & Time of receipt of Tender	Date & time of opening of tenders
1.	2.	3.	4.	5.	6.	7.
1.	₹ 19.30	₹ 38,600.00	2 months	22.11.2013 16.00 Hrs.	26.11.2013 15.00 Hrs.	26.11.2013 15.30 Hrs.

Tender documents can be obtained upto 16.00 Hrs. on all working days on payment of ₹ 500.00 (₹ Five hundred only) in cash (Non-refundable) towards the cost of tender. The earnest money shall be in the form of Demand Draft of a Scheduled Bank issued in favour of the **Director, NIPGR, New Delhi**.

The tender documents can also be downloaded from our website [www.nipgr.ac.in](http://www.nipgr.ac.in). The tender documents downloaded from website must be accompanied with ₹ 500.00 (₹ Five hundred only) towards the cost of tender documents, otherwise the tender will not be considered.

Both the bids i.e. Technical & Price bids must be submitted on or before the above mentioned due date along with the appropriate EMD. The technical bid will be opened on the above date and time in the presence of the bidders, who wish to be present. The financial bid of only those tenderers who are assessed as technically qualified will be opened with prior intimation to the tenderer.

The contractor should have a solvency of the amount equal to estimated cost of the work. The solvency certificate should have been issued by the scheduled bank after the date of the advertisement. The performance report of the contractor and certificate of having satisfactory completed the work, issued by Competent Authority shall be enclosed with the documents.

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

**Administrative Officer  
NIPGR New Delhi**



## GENERAL CONDITIONS

1. Sealed tenders are hereby invited from manufacturers/ authorized dealers for the **Designing, Construction, Testing & Commissioning of Green House (Air Cooled) at NIPGR Campus, New Delhi.**

The tender document consists of General Conditions, Instructions to bidders, General Information, Tender form, Terms and Conditions of Contract Agreement, Special Terms and conditions of Contract, Technical specification and Price Bid which can be had at a cost of ₹ 500.00 each (₹ Five hundred only) (Non refundable) in shape of Demand Draft or Bankers Cheque from the Administrative Officer at NIPGR, Aruna Asf Ali Marg New Delhi-67. Purchase of tender document is obligatory on the part of the tenderers & bid in no other form will be accepted. The tender document can also be downloaded from our website: [www.nipgr.ac.in](http://www.nipgr.ac.in) and the cost of tender document for ₹ 500/- each should be submitted in the form of Demand Draft or Bankers Cheque in favour of Director NIPGR New Delhi payable at New Delhi in separate envelope along with the Sealed Tender.

2. The tender documents shall be placed in sealed cover as mentioned in Procedure of Submission of tender and addressed to the Director, NIPGR Aruna Asaf Ali Marg New Delhi-67. The filled and sealed tender should be submitted in two separate envelopes containing technical & price bids to the Administrative Section of NIPGR, New Delhi on or before 26.11.2013 upto 3.00 P.M. and shall be opened on the same day at 3:30 PM in the presence of tenderers or their authorized representative. Any envelope received after the said date and time shall not be entertained under any circumstances and no consideration what so-ever shall be given to anything that might be contained in any such envelope.

3. The time allowed for the Designing, Construction, Testing and commissioning of above equipments is 2 months to be reckoned from the 10<sup>th</sup> day after the date of written order to commence the work.

4. The tender shall be accompanied by earnest money of ₹ 38,600.00 (₹ Thirty eight thousand & six hundred 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.

5. 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.

6. The offer shall remain valid for 90 days from the date of opening of Tender.

7. The tenderer shall submit a list of the similar in nature 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, value of the works and copies of the completion certificates along with the application.

8. The tenderer shall submit a copy of the latest Income tax clearance certificate / Sales tax clearance certificate along-with the copies of the audited balance sheets of the past three years.

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.

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 be binding upon the NIPGR New Delhi.

**Administrative Officer  
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 design, construction, supply, testing and installation of the Green house (Air Cooled) including the successful completion and the tests which the NIPGR desires testing and commissioning shall be carried out.

### 2. PROCEDURE FOR SUBMISSION OF TENDERS:

a) The following procedure shall be adopted for submission and opening of tenders. The sealed envelope SUPERSCRIBED on top of envelope as Tender for "Designing, Construction, Testing & Commissioning of Green House (Air Cooled) at NIPGR Campus, New Delhi."

#### ENVELOPE NO.- 1 i.e. Technical bid

The sealed envelopes shall contain separately the Earnest money deposit and the cost of Tender document if downloaded from Website and Technical Bid will be opened first.

#### ENVELOPE NO.- 2 i.e. Price bid

This sealed envelopes shall contain only Financial bid of the tender as per the items /specifications. This envelope shall be opened only after the EMD contained in envelope No.1 is found in order and technically qualified as per the requirements of NIPGR. The date of opening of Price Bid shall be intimated to the technically qualified bidders in the later stage.

The sealed cover-containing envelope 1 & 2 shall be opened on the prescribed date and time in the presence of tenderers or their authorized representative.

- b) Quotation should be submitted directly by the original manufacturer by its sole authorized person.
- c) The bidder shall bear all costs associated with the preparation and submission of its bid irrespective of the conduct or outcome of the bidding process.
- d) The bidder should not indulge in any corrupt, fraudulent, collusive, coercive practices during the entire process of procurement and execution of contract/order.
- e) Before the deadline for submission of the bid, NIPGR reserves the right to modify the bidding document and to extend or not to extend the date of submission. Such amendment/modification will be notified to bidders receiving the bidding document in writing or by fax/ email and will also be hosted on NIPGR website.
- f) A bidder may withdraw, substitute, or modify its bid after it has been submitted by sending a written notice signed by the authorized signatory before the date of submission of the bid. Any re-submission or modification in the bid should be submitted before the date & time of submission of bid as originally conveyed in the invitation of bid.
- g) No bid may be withdrawn, substituted or modified in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Bid Form or any extension thereof.
- h) For items covered under Two-Bid -Tender System, quotation/offer should be submitted in two separate envelopes containing Technical and Price bid and these put in one envelope.

### 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 items to be followed.

### 4. TENDERER TO SUBMIT THE ENTIRE TENDER DOCUMENT:

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. TENDER SHALL BE WRITTEN IN ENGLISH LANGUAGE:**

Every tender shall be written in English language. All information such as documents and drawings supplied by the tenderer will also be in the English language only. Drawings and designs shall be dimensioned according to the metric system of measurements. Tenders shall be forwarded under cover or a letter type written on the tenderer's letter-head and duly signed by the tenderer. Signatures must be in long hand, executed in ink by a duly authorized principal of the tendering firm. No oral, telegraphic or telephonic tenders or subsequent modifications there-to shall be entertained; If a tender is submitted on behalf of the firm, then all the partners shall sign or may be signed by one in whose favor all the partners have given General Power Of Attorney. In case of tender submitted by a company, 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 favor of the person signing must accompany the tender.

**6. VALIDITY PERIOD OF OFFERS:**

The rates quoted in the tender shall hold good for 90 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 90 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 90 days his earnest money deposit shall stand forfeited.

**7. TENDERER TO SIGN ALL PAGES:**

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

**8. ERASURES AND ALTERATIONS:**

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

**9. TENDERER TO SATISFY HIMSELF OF SITE CONDITIONS:**

Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tender regarding nature of the site conditions, the means of access of the site, the accommodation they may require and in general obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender in any manner. A tenderer shall be deemed to have full knowledge of the site, whether he inspects it or not and no compensation or otherwise of any charges incurred or to be incurred consequent on any misunderstanding or otherwise shall be admissible.

**10. EARNEST MONEY:**

The tender shall be accompanied by earnest money of ₹ 38,600.00 (₹ Thirty eight thousand & six hundred only) in the form of Demand Draft only drawn in favor of 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.

**11. TENDERER TO QUOTE BOTH IN FIGURES AND WORDS:**

The bidder shall quote their rates for all the items both in figures as well as words given as per the attached Schedule of quantities at Financial Bid. The amount of each item shall be worked out and the requisite total given. Special care shall be taken to write percentage in figures and words, and the amount in figures only in such a way that interpolation is not possible. The total amount shall be written both in figures and in words.



## 12. 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 tender document and/or expressly prohibited therein or stipulate additional/alternative conditions shall be liable to be rejected and his earnest money will be forfeited.

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

- i) Tenders submitted late
- ii) Tenders containing remarks uncalled for.
- iii) Conditional tenders
- iv) Tenders not submitted on prescribed Performa.
- v) Telegraphic tenders.
- vi) Tender submitted without EMD/Cost of Tender Documents

## 13. 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.

## 14. NIPGR NOT TO ASSIGN ANY REASON FOR REJECTION OF TENDER:

Director, 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.

## 15. AMENDMENT IN TENDER DOCUMENTS:

NIPGR reserves the right to revise or amend the Bid Documents upto 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.

NIPGR also reserves the right to change the quantities of the units while issuing the letter of award of work.

## 16. REFERENCE IN TENDER DOCUMENTS:

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

## 17. REASONABILITY OF PRICES :

- a) Please quote best minimum prices applicable for a premier Research Institution, leaving no scope for any further negotiations on prices.
- b) The quoting party should give a certificate to the effect that the quoted prices are the minimum and they have not quoted the same item on lesser rates than those being offered to NIPGR to any other customer nor they will do so till the validity of offer or execution of the purchase order, whichever is later.
- c) Copies of at least last three manufacturing orders of the last 3 years received from other customers along with details of such supply orders preferably in India for the same item/model may be submitted with the offer giving reasons of price difference of their supply order & those quoted to us, if any.
- d) The party must give details of identical or similar constructions, if any, done to any CSIR/DBT or other government organization during last three years along with the final price paid and Performance certificate from them.

Administrative Officer  
NIPGR New Delhi

Tenderers Signature with Seal

## GENERAL INFORMATION

- |  |  |
|--|--|
| 1. Accepting Authority                                   | Director, NIPGR, New Delhi   |
| 2. Earnest Money   | ₹ 38,600.00 (₹ Thirty eight thousand & six hundred only) to be furnished with the tender in the form of the demand draft in favor 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 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.  |

**Tenderers Signature with Seal**



## Specific Conditions of Contract

**Name of work:** Designing, Construction, Testing & Commissioning of Green House (Air Cooled) at NIPGR Campus, New Delhi.

1. **Scope of work:** The scope of work generally consist of providing of greenhouse 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 greenhouse 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. (i) **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 equipments, 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. Dedicated Earthing bus 2 x 2 Nos. shall be provided with copper strip by NIPGR, if required.

(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), 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 may be 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 by the contractor.



5) List of items to be carried out by the department in accordance with the tender accepted.

**7. Commencement of work and completion of drawings:** On award of work, the contractor shall submit within one week 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 6 sets of approved working drawings (to scale) shall be submitted for the exclusive use of and retention by the In-Charge.

**8. Operation and maintenance manuals:** Prior to completion of the work and handing over the greenhouse the contractor 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.

**9. 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 contractor 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.

**10. Virtual completion:** On satisfactory completion of initial testing and commissioning, the installation shall be put to continuous running test for a period of 2 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 greenhouse shall be taken over.

**11. Guarantee and defect liability period:** The equipment covered by this contract shall be guaranteed by the contractor 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 all 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 remedy the defects at the contractor's risk & cost without prejudice to any other rights.

**12. 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 greenhouse. The contractor shall attend to all problems experienced in the operation of the system within a reasonable time but not more than 48 Hrs. of receiving the complaint and take corrective action immediately.

**13. Training of personnel at site:** In order to enable NIPGR's staff to get acquainted with the operation and Maintenance of the greenhouse, 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.

**14. 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.

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

Administrative Officer  
NIPGR, New Delhi.

Tenderer's Signature with Seal



## **TERMS & CONDITIONS OF CONTRACT AGREEMENT**

### **SECURITY DEPOSIT**

1. The earnest money amounting to ₹ 38,600.00 (₹ Thirty eight thousand & six hundred 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 10<sup>th</sup> 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 percent per day 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 lapsed, 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 percent or such smaller amount as the NIPGR, may decide of the value of balance work for everyday that the due quantity of work remains incomplete. Provided always that the entire amount of compensation to be paid under the provisions of this clause shall not exceed ten percent of the awarded cost of work as shown in the tender. The Director, NIPGR, on a representation from the 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 Incharge 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, Incharge, 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 Incharge 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 subordinate 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.

#### **INSURANCE**

8. The following insurance cover is to be provided by the Tenderer in the joint names of the employer and the Tenderer for the period from the start date till completion of entire work.

- a) Cover against damage to other people's property caused by the Tenderer's acts or omission;
- 1) Cover against death or injury caused by the Tenderer's acts or omission to:
  - i) Anyone authorized to be on the site;
  - ii) Third parties who are not on the site;
9. No Escalation in rates shall be paid.
10. Tenderer Superintendence, Supervision, Technical Staff & Employees.  
The Tenderer shall provide all necessary superintendence during execution of the work and as along thereafter as may be necessary for proper fulfilling of the obligations under the contract.
11. The tenderer must visit the site at NIPGR, Aruna Asaf Ali Marg New Delhi before quoting the rates.
12. Canvassing whether directly or indirectly, in connection with tenders is strictly prohibited and the tenders submitted by the Tenderers who resort to canvassing will be liable to rejection.
13. The rates for equipments shall be inclusive of VAT, Service Tax, other taxes, octroi, etc., and nothing extra will be paid.

14. No T&P will be issued by the department.
15. The final payment shall be made only after completion of the work subject to certification by Institute.
16. The site of work is at NIPGR, Aruna Asaf Ali Marg, New Delhi
17. The Technical specifications of the equipments required are as per Tender Document.
18. Installation, Testing & Commissioning of the supplied equipments will be done at our site by the bidder in the presence of In Charge of our Institute.

Administrative Officer  
NIPGR, New Delhi.

Tenderer's Signature with Seal



## **SPECIAL TERMS AND CONDITIONS OF CONTRACT-**

### **1. TENDERER TO BE LIABLE FOR ALL TAXES ETC.**

The rates specified in the tender shall be NIPGR New Delhi and inclusive of VAT, or any taxes, duties and other charges etc., in respect of the contract and the rates shall be firm irrespective of any variation in the prevailing rates of taxes, levies, octroi, etc., and any fresh imposition of any of these by State/Central/Statutory bodies. The contractor shall indemnify the Director against levy of any taxes, etc., in regard to this contract and in the event of the Director being assessed for any of the said imports, Director shall have the right to recover the total amount so assessed from the contractor's dues and the contractor shall also be responsible for all costs or expenses that may be incurred by Director in connection with any proceedings or limitation in respect of the same.

### **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 with standing any other courts having jurisdiction to decide the questions forming subject matter of a suit any and all actions and proceedings arising out of or relative to this contract (including any arbitration in terms thereof) shall lie only in the court of competent Civil jurisdiction in this behalf at New Delhi, where this contract is to be signed on behalf of 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 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.

### **5. Incharge Role:**

The Incharge 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 Incharge 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 Incharge 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. SUBMISSION OF BILLS:**

Tenderer is to submit the bills in triplicate to the Incharge for works executed by him. Payment will be released on prorata basis of completion of work.



**8. ACTION AND COMPENSATION PAYABLE IN CASE OF BAD WORK:**

If it shall appear to Incharge, NIPGR or his representatives, that any work has been executed with unsound, imperfect or unskillful workmanship or with materials of any inferior description or that any materials or articles provided by him for the execution of the work are unsound or of a quality inferior to the contracted for, or otherwise not in accordance with the contract specifications the Tenderer shall on demand in writing from the Incharge 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 Incharge in his demand aforesaid, then the Tenderer shall be liable to pay compensation at the rate of one percent on the amount of the estimate for every day not exceeding ten days while his failure to do so that continue and in the case of any such failure Incharge, 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.

9. 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.

**10. Exemption of Customs Duty and Excise Duty**

NIPGR is exempted from payment of Custom Duty and Excise Duty for supply of equipments etc. vide Govt. of India Notification No. 51/96 dt. 23/07/1996. Since the Customs Duty/ Excise Duty and clearance charges will be borne by the Institute, Bidders are requested to quote their rates accordingly. However it will be the responsibility of the Contractor to shift the equipment to site of work including opening of crates, transportation, loading and unloading. Nothing extra will be paid on any account.

**11. Terms of payment**

Installation and commissioning - 75% against delivery of material at site and balance shall be paid after satisfactory Testing and commissioning and hand over of Green House.

12. 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

**13. Approval of samples:**

Before undertaking fabrication of 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 Engineer-in-Charge. These samples will be sealed by the Engineer-in-Charge in the presence of the contractor, if he so desires and shall remain in the custody of the Engineer-in-Charge for reference and comparison till the completion of work.

**14. Income Tax and Vat Deduction:**

Deduction on account of Income Tax 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 section 194c of the Income Tax Act, 1961 in force and as amended from time to time.

**15. Program chart**

- 15.1 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.
- 15.2 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.
- 15.3 The program chart should include the following: -
- a) Descriptive note explaining sequence of various activities.



- b) Network (PERT / CPM / BAR CHART) which will indicate resources in financial terms, manpower and specialized equipment for every important stage.
  - c) Program for procurement of materials by the contractor.
  - d) Program of procurement of machinery / equipments having adequate capacity, commensurate with the quantum of work to be done within the stipulated period, by the contractor.
- 15.4 If at any time, it appears to the -in-Charge that the actual progress of work does not conform to the approved program referred above, the contractor shall produce a revised program showing the modifications to the approved program by additional inputs to ensure completion of the work within the stipulated time.
- 15.5 The submission of revised program or approval by the In Charge of such program or the furnishing of such particulars shall not relieve the contractor of any of his duties or responsibilities under the contract. This is without prejudice to the right of -in-Charge to take action against the contractor as per terms and conditions of the agreement.

#### 16. Completion certificate and completion plans

Within ten days of the completion of the work, the contractor shall give notice of such completion to the -in-Charge and within thirty 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.

#### 17. Completion plan to be submitted by the contractor:

The contractor shall submit completion plan as required vide General Specifications as applicable within thirty days of the completion of the work. In case, the contractor fails to submit the completion plan as aforesaid, he shall be liable to pay a sum equivalent to 2.5% of the value of the work subject to a ceiling of ₹ 15,000 (₹ Fifteen thousand only) as may be fixed by the Director, NIPGR New Delhi concerned and in this respect the decision of the Director, NIPGR New Delhi shall be final and binding on the contract

A. Time will be the essence of completion of contract. The time of completion of the project in all respects should be four months, following which 1% penalty per week of delay with a maximum of 10% beyond four months will be charged.

B. Vendor should have experience for making green house and minimum 3 user details should be provided by the bidders (satisfactory certificate/s of installations with similar or near to similar specifications made during the last three years).

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

D. Designing, Construction, Installation, Testing & commissioning should be done within four months from the date of purchase order.

E. Three years of warranty and subsequent CMC for five years. The tenderer should quote the rates for CMC separately.

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.

\*Vendors may survey the site at Aruna Asaf Ali Marg, NIPGR as required.

Administrative Officer  
NIPGR, New Delhi.

Tenderer's Signature with Seal



## BILL OF QUANTITIES

**NAME OF WORK:** Designing, Construction, Testing & Commissioning of Green House (Air-Cooled) at NIPGR, Aruna Asaf Ali Marg, New Delhi

**Tender No.:** NIPGR/7/15

Sl. No.	Description	Unit	Qty Req.	Rate in INR,	Amount in INR
---------	-------------	------	----------	--------------	---------------

- |    |  |  |  |  |  |
|----|--|--|--|--|--|
| 1. | Air Cooled Green House (As per technical specifications as mentioned in Technical Bid). Overall Area of Air-Cooled Green House (675 Sq.ft.)<br>Size of Green House:- 32 ft. x 20 ft.,<br>Side Height:- 8 ft., Centre Height:- 12 ft.<br>Buffer Room Size: 7 ft. x 5 ft. x 8 ft. (ht.)<br>MODEL:- Dome Shape, complete as per Enclosed Technical specifications, design & drawings and complete in all respect as per instruction of Engineer-incharge. |  |  |  |  |
|----|--|--|--|--|--|

Rates not to be quoted

Administrative Officer  
NIPGR New Delhi

Seal & Signature of Agency

## TECHNICAL SPECIFICATIONS

High Tech Air Cooled Green House with following technical and operational details.

**Overall Size of Green House Facility 675 Sq.ft.**

**Total Size: - 32' x 20'**

**Side Height: - 8'**

**Centre Height: - 12'**

**With**

**Buffer Room Size : 7' x 5' x 8'      provided with Air Curtain**

**MODEL: - Dome 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 :-** 2' ( 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: 6**

Curtain wall to be plastered inside & out side and duly Painted by water proof snocem / waterproof paint in smooth & even in approved colour.

**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 flooring tiles with proper drainage arrangements etc. complete as required.

**Plinth Protection all along Green House:** 2.ft wide with cement concrete at 1:2:4 ratio, 2.0inch 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.), Drainage Points, plumbing, polymer pipe water connection with one tap connection with corrosion free coated GI pipe/polymer pipes of (3/4" or ½") etc. ISI standard material will be provided.

### **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

### **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): 6mm 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 6mm 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 <sup>2</sup>	: 1300
U.L Temperature	
Rating	: 100°C
Value W/m <sup>2</sup> 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
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  $25^{\circ}\text{C} - 45^{\circ}\text{C}$ .
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  $12^{\circ}\text{C}$  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  $28^{\circ}\text{C} \pm 10^{\circ}\text{C}$  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 pm.

**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  $\mu$ m.

Density :- One fogger to 0.3 m – 0.4 m<sup>2</sup> for propagation.

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

Pipe Imported ; - 16 mm LLDPE ( 10 kg/cm<sup>2</sup> ) 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/Al 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 SO<sub>2</sub> 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.

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**AUTOMATIC CONROL STSTEMS :- 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  $\pm 2.5$ 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 VA.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  $\mu$ moles /m<sup>2</sup> /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”

**Shading:** Overhead shading arrangements with manually rolling screens.



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

**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 <sup>2</sup> ) 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.

**Bench Structure** :- Table Frame :- 25 mm x 25 mm GI

Top strappings :- 19 mm x 19 mm GI

Distance Between Two pipes: - 2" (6 Nos.)

Administrative Officer  
NIPGR, New Delhi.

Tenderer's Signature with Seal



**FINANCIAL BID**

**NAME OF WORK: Designing, Construction, Testing & Commissioning of Green House(Air Cooled) at NIPGR, Aruna Asaf Ali Marg,  
New Delhi**

**CLIENT : DIRECTOR NIPGR**

**NEW DELHI**

**NAME OF WORK:** Designing, Construction, Testing & Commissioning of Green House(Air Cooled) at NIPGR, Aruna Asaf Ali Marg, New Delhi

Sl.	Description	Unit	Qty	Rate in INR	Amount in INR
1	Air Cooled Green House(As per Technical Specifications as mentioned in Technical bid)  Overall Area of Air Cooled Green House ( 675 Sq.ft.) Size of Green House :- 32ft x 20ft, Side Height:- 8ft , Center Height:- 12ft. Buffer Room Size : 7ft x 5ft x 8ft(ht.) MODEL :- Dome Shape, complete as per enclosed Technical specifications , design & drawings and complete in all respect as per instruction of Engineer-in Charge.	Each	2		
				Total Amount	
		(In words ₹-----)			
				Tenderers Signature with Seal	
				Administrative Officer	
				NIPGR, New Delhi.	



Size : 30' x 20' x 12' : 8' ( L x W x H at center : on sides)



						SH 1
						OF 1
REV.	BY:	DATE	CHD	APPD	REF.DRG.NO.	