



**INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH
TIRUPATI**

E -Tender Notice.

Ref: IISERT/ENGG/2022-23/03

Date: 29.09.2022

Online tenders are hereby invited in **two cover system** from Indian Nationals for the **Designing, Construction, Testing & Commissioning of In-House Gene Function Analysis Platform for Crops (GFAPC) Green Houses at IISER Tirupati Permanent Campus, Yerpedu (M), Chittoor (Dt)**. Bidders can download complete set of bidding documents from e-procurement Platform <https://eprocure.gov.in/eprocure/app> from 29.09.2022 Onwards. Bidders need to submit the bids online by uploading all the required documents through <https://eprocure.gov.in/eprocure/app>

Last Date/ Time for receipt of bids through e-procurement is: 15-10-2022 up to 15:00 hrs

Late bids shall not be accepted.

For further details regarding Tender Notification & Specifications please visit website: <https://eprocure.gov.in/eprocure/app> and www.iisertirupati.ac.in/tenders

CRITICAL DATE SHEET

Online Publication & Tender Document Download Date & Time	29/09/2022, 15:00 Hrs
Bid Submission Start Date & Time	08/10/2022, 17:00 Hrs
Pre-Bid Meeting Date & Time	04/10/2022, 11:00 Hrs
Bid Submission End Date & Time	15/10/2022, 15:00 Hrs
Technical Bid Opening Date & Time	17/10/2022, 15:00 Hrs
Price Bid Opening Date & Time	Will be announced after technical evaluation to the successful bidders.



**INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH
TIRUPATI**

E-Tender-Notice.

Name of Work	Designing, Construction, Testing & Commissioning of In-House Gene Function Analysis Platform for Crops (GFAPC) Green Houses at IISER Tirupati Permanent Campus, Yerpedu (M), Chittoor (Dt).
Tender Notification No	IISERT/ENGG/2022- 23/03
Date	29/09/2022
Estimated Cost	Rs 131 Lakhs
Tender Fee Amount	Rs. 1000/-
Last Date & Time of submission of Tender	15/10/2022 up to 15:00 Hrs
Address for submission of Tender	Engineering Department IISER Tirupati Email: engineering@iisertirupati.ac.in
Date & Time of opening of technical bid	17/10/2022 @ 15:00 Hrs

Bidding Procedures

Section I: Instructions for Online Bid Submission

Instructions to the Bidders to submit the bids online through the Central Public Procurement Portal for e-Procurement at <https://eprocure.gov.in/eprocure/app>.

1. Possession of valid Digital Signature Certificate (DSC) and enrolment / registration of the contractors / bidders on the e-Procurement/e-tender portal are prerequisite for e-tendering.
2. Bidder should register for the enrolment in the e-Procurement site using the “Online Bidder Enrolment” option available on the home page. Portal enrolment is generally free of charge. During registration, the bidders should provide only valid and true information including valid E-mail id. All the correspondence shall be made directly with the contractors/bidders through E-mail id as registered.
3. Bidder need to login to the site through their user ID / password chosen during enrolment / registration.
4. Then the Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by SIFY / TCS / nCode / eMudra or any other Certifying Authority recognized by Controller of Certifying Authorities (CCA) India on e- Token / Smartcard, should be registered.
5. The registered DSC only should be used by the bidder in the transactions and should ensure safety of the same.
6. Contractor / Bidder may go through the tenders published on the site and download the tender documents/schedules for the tenders.
7. After downloading / getting the tender document/schedules, the Bidder should go through them carefully and then submit the documents as required, otherwise bid will be rejected.
8. Any clarifications may be sought online through the tender site, through the contact details or during pre-bid meeting if any. Bidder should consider the corrigendum if any published before submitting the bids online. The Bidder is requested to submit their questions/ queries/ clarifications by email to reach the IISER Tirupati before the meeting. Bidders can send Pre-bid queries on their letter head referring tender number on e-mail address engineering@iisertirupati.ac.in before 03.10.2022 up to 17:00 Hours. Pre-bid meeting will be held on 04.10.2022 at 11:00 hours through ONLINE meet. The interested bidders can request to join the Pre-Bid meeting through email to engineering@iisertirupati.ac.in.
9. Bidder may log in to the site through the secured login by the user id / password chosen during enrolment / registration and then by submitting the password of the eToken / Smartcard to access DSC.
10. Bidder may select the tender in which he / she is interested in by using the search option and then move it to the ‘my tenders’ folder.

11. From my tender folder, he / she may select the tender to view all the details uploaded there.
12. It shall be deemed that the bidder has read and understood all the terms and conditions before submitting the offer. Bidder should go through the tender schedules carefully and upload the documents as asked; otherwise, the incomplete bid shall stand rejected.
13. Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and ordinarily it shall be in PDF /xls / rar / jpg / dwf formats. If there is more than one document, all may be clubbed together and provided in the requested format. Bidders Bid documents may be scanned with 100 dpi with black and white option. It is advisable that each document to be uploaded through online for the tenders should be less than 2 MB. If any document is more than 2MB, it can be reduced through zip / rar and the same if permitted may be uploaded. The file size being less than 1 MB the transaction uploading time will be very fast.
14. The bidders can update well in advance, the documents such as certificates, annual report details etc., under “My Space option” and these can be selected as per tender requirements and then send along with bid documents during bid submission. This will facilitate the bid submission process faster by reducing upload time of b i d s .
15. Bidder should submit the Tender Fee as specified in the tender. The hard copy should be posted / couriered / given in person to the Tender Inviting Authority, within bid submission due date and time as indicated in the tender. Scanned copy of the instrument should be uploaded as part of the offer.
16. **TENDER FEE & EMD EXEMPTION:**
 - (a) **Tender Fee of Rs. 1000/- (Rupees One Thousand only)** should be submitted ECS (Bank transfer / NEFT / RTGS) in favour of INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH TIRUPATI.
 - (b) **Bank A/c Details for crediting Tender Fee:**
Name: INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH Tirupati
Bank: State Bank of India, Korlagunta Branch
Account No: **35029946671**
IFSC Code: SBIN0001901
 - (c) **Bid Security/ Earnest Money Deposit (EMD):** All other bidders should submit an EMD of Rs. 2,62,000/- in the form of DD/ NEFT /RTGS.
 - (d) No interest will be paid on the Performance Security deposited/ remitted.
 - (e) The bidders will have to upload scanned copy of payment details towards Tender fee and the same will be accepted only on verification and confirmation by the Institute. Any delay in credit will not be entertained by the Institute.
17. The financial bid (price bid) i.e. bill of quantity (BOQ) of only technically qualified bidders will be opened online by a committee of members and the result will be displayed on the www.eprocure.gov.in which can be seen by all bidders who

participated in the tender.

18. **Time of completion: 75 days from the date of Award of Work.**
19. **Defect Liability/Maintenance Period:** As defined in the scope of the work elsewhere in the document.
20. **Contractors are advised to inspect and examine the site of work and its surroundings before submitting the tenders for better understanding of the site conditions.**
21. Tenders shall submit copy of their registration.
22. The contractor shall not sub-contract the work to sub-contractors or to any single sub-contractor.
23. The successful contractor shall provide a performance guarantee valid for 2 months beyond the completion of work, for his proper performance of the contract within 7 (seven) days from the date of receipt of letter of award. The performance Security shall be in the form of FD/Call Deposit to be pledged in favour of the **Director, INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH Tirupati**. In case the Performance Security is in the form of Bank Guarantee the same is to be sent to the **Director** in sealed envelope directly by the issuing Bank along with the forwarding letter indicating BG No. purposed of the BG, etc. The amount of the security shall be **5%** of the contract price. The performance security shall be valid until the contractor has executed and completed the works and remedied any defects and maintained the work therein in accordance with the contract. The Performance guarantee shall be returned to the contractor within 14 days from the date of successful completion of work plus maintenance period. If the contractor fails to perform the work as per terms and conditions of the contract, the performance security shall be forfeited.
24. If during the execution of the work the contractor encounters physical obstructions or physical conditions other than climatic conditions on the site, which obstructions or conditions were in his reasonable opinion not foreseeable by the contractor, the contractor shall forth with give notice thereof to the Superintending Engineer, IISER. On receipt of such notice, in his opinion feel that such obstructions/conditions could not have been reasonably foreseen by the contractor, after due consultation with the contractor determine any extension of time with no financial bearing to which the contractor is entitled.
25. **During execution, an employee with Min Qualification of B.E (Civil /Mech /Elec) or Equivalent to be deployed for ensuring quality of work.**
26. During the execution of the works, the contractor shall keep the site reasonably free from all unnecessary obstructions and shall store or dispose of any contractor's equipment and surplus materials and clear from the site any wreckage, debris, waste or temporary works in consultation with the Institute.
27. The labour **shall not be allowed to stay or put up labour sheds with in the campus**. Contractor has to decide accordingly.
28. Before issue of any completion certificate, the contractor shall clear away and

remove from that part of the site to which the completion certificate relates all contractors' equipment, surplus material, debris, waste material and temporary works of every kind.

29. The contractor while employing labour should ensure that all the statutory labour laws and regulations are adhered to.

In the event of

- (a) The amount or nature of extra or additional work
 - (b) Exceptionally adverse climatic conditions
 - (c) Other special circumstances which may occur other than through a default or breach of contract by the contractor or for which he is responsible.
30. Being such as fairly to entitle the contractor to extension of time for completion of the works or any section or part thereof, the Institute shall after due consultation with the contractor, determine the amount of such extension with no financial bearing and shall notify the contractor accordingly.
 31. If the contractor fails to complete the execution and completion of the works as specified in the work order, the contractor shall be bound to pay as liquidated damages a sum of 1% (percent) per week of delay for such default subject to a maximum of 10% of the contract price.
 32. When whole of the works has been substantially completed, the contractor shall give a notice to the Superintending Engineer, IISER, accompanied by a written undertaking to finish with due expedition any outstanding work during the defect liability period. Such notice and undertaking shall be deemed to be a request by the contractor to the Superintending Engineer, IISER, to issue a taking over certificate.
 33. Defect liability period shall be calculated from the completion of the work, certified by the Superintending Engineer, IISERT in the completion certificate.
 34. If the contractor fails to fulfil any of the obligations under this contract, the Institute shall be at liberty to terminate the contract thereby avoiding the contract and will be at liberty to allot the whole work or balance works to any other party at the risk and cost of the first party.
 35. All works are to be carried out as per current specification prevailing in the BIS/CPWD and directed by the Institute.
 36. Parties to submit PAN Card.
 37. Parties to submit GST Registration.
 38. Any deviation of quantity in the scheduled items during execution shall be intimated to the Institute before taking up the work.
 39. **Rates once accepted will not be enhanced due to variation in the rate of materials, labour and government taxes. Nothing extra payable.**
 40. No tools, plants or manpower will be supplied by the Institute for any purpose.
 41. No materials will be supplied by the Institute.
 42. Any dispute arising out of the contract shall be settled by the Superintending Engineer, IISERT.

43. The specifications and mode of measurement for all the works shall be in accordance with CPWD specifications unless otherwise specified.
44. In the event of responsive parties quoting same rates, the Institute reserves the right to allot the work to the bidder having higher credentials in terms of turnover, similar work experience, etc.
45. The Institute reserves the right to accept or reject any or all tenders without assigning any reason thereof.
46. All the above requirements are compulsory for fulfilment as part of the tenders failing which tenders will be rejected.
47. All documents, registrations should be valid as on the date of tender.
48. GST as applicable will be deducted from the bills of the contractor.
49. The Party shall be responsible for the safety and wellbeing of all its workmen/employees during the period of execution of the work. The party shall provide all safety materials, gadgets, equipment's etc., to all its workmen/employees to ensure their safety during execution of the work. The Institute shall not be held responsible in case of any accidents, mishaps etc. to the party and its employees.
50. Any delay in completion of the works beyond the stipulated date due to reasons attributable to the contractor may eventually lead to cancellation of letter of award for which the contractor is not entitled to any compensation. The cancellation of letter of award would lead to forfeiture of performance security.
51. If any statutory tax/deduction/recovery is notified by the State/Central Govt, the same shall be deducted from the bill of the contractors as applicable from its effective date of coming into force.
52. The party who is allotted with the work, will have to sign on the measurement book as a token of acceptance of the measurement.
53. Conditions on strict adherence to covid safety protocols and precaution measures.
54. The details of the DD /any other accepted instrument, physically delivered, should tally with the details available in the scanned copy and the data entered during bid submission time, otherwise submitted bid shall not be acceptable or liable for rejection.
55. While submitting the bids online, the bidder shall read the terms and conditions and may accept the same to proceed further to submit the bid packets.
56. The bidder has to digitally sign and upload the required bid documents one by one as indicated. Very act of using DSC for downloading the bids and uploading their offers shall be deemed to be a confirmation that they have read, understood and agreed with all clauses of the bid document including General conditions of contract without any exception.
57. The bidder has to upload the relevant files required as indicated in the cover content.

In case of any irrelevant files, the bid may be rejected.

58. **Price Bid**

If the price bid format is provided in a spread sheet file like BoQ_XXXXX.xls, the rates offered should be entered in the allotted space only and uploaded after filling the relevant columns. The Priced-bid / BOQ template shall not be modified /replaced by the bidder; else the bid submitted is liable to be rejected for the tender.

59. The bidders are advised to submit the bids through online e-tendering system to the Tender Inviting Authority (TIA) well before the bid submission due date and time (as per Server System Clock). The TIA shall not be held responsible for any delay or the difficulties faced during the submission of bids online by the bidders.
60. The time settings fixed in the server side and displayed at the top of the tender site, shall remain valid for all actions of requesting, bid submission, bid opening etc., in the e-Tender system. The bidders should follow such time during bid submission.
61. After the bid submission (i.e. after Clicking “Freeze Bid Submission” in the portal), the acknowledgement number indicated by the system should be printed by the bidder and kept as a record of evidence for online submission of bid for the particular tender and also be used as entry pass to participate in the bid opening.
62. All the data being entered by the bidders would be encrypted using Public Key Infrastructure (PKI) encryption techniques to ensure the secrecy of the data. The data entered is not retrievable by unauthorized persons during the bid submission and until the time of bid opening by any person.
63. 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 openers’ public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.
64. The confidentiality of the bids is maintained with the use of Secured Socket Layer (SSL) 128-bit encryption technology. Data storage encryption of sensitive fields is done.
65. The bidder should logout of the tendering system using the normal logout option available at the top right hand corner and not by selecting the (X) exit option in the browser.
66. For any queries regarding e-Tendering process, the bidders may contact at address as provided in the tender document. Parallel for any further queries, the bidders are advised to contact over phone: **0120-4200462, 0120-4001002** or send an E-mail to cphp-nic@nic.in

67. Technical Eligibility Criteria

Eligibility Criteria for Work Experience.

To become eligible for participating in the bid process the bidders shall satisfy the following Work Experience Criteria

The Bidders should have satisfactorily completed similar works executed in IISER/IIT/Government Scientific Research Institutes/Govt Institutes only, during the last five years ending previous day of last date of submission of tenders as below. For this purpose, cost of work shall mean gross value of the completed work including cost of material supplied by Government/Client but excluding those supplied free of cost. This should be certified by an officer not below the rank of Executive Engineer/Project Manager or equivalent.

Three similar completed works each costing not less than **Rs. 52.40 lakhs**

OR

Two similar completed works each costing not less than **Rs. 78.60 lakhs**

OR

One similar completed works each costing not less than **Rs.104.80 lakhs**

Similar works shall mean Design, supply, Installation and commissioning of similar nature of Green House Installations in reputed organisations like IISER/IIT/Government Scientific Research Institutes/Govt Institutes only

Note: For the purpose of similar works, works executed in India only shall be considered.

Bidder should have had average financial turnover (Gross) of at least **Rs 65.50 Lakhs** on similar Installation works during the immediate last three consecutive years' balance sheets duly audited by Chartered Accountant

Bidder should not have incurred any loss (profit after tax should be positive) during the immediate last three consecutive financial years ending 31st March, 2022, duly certified and audited by the Chartered Accountant.

Bidder should submit an Undertaking that his firm has not been declared insolvent, and has not been blacklisted by any organisation during the preceding 3 years'.

Bidder should have Solvency of **Rs 52.40 Lakhs** certified by a Scheduled Bank and obtained not earlier than 12 months before the date of submission of bid.

Check List of documents to be submitted along with the tender:

1. Bid Security/ E M D .
2. Copy of Registration.
3. Undertaking not to sub-let the work. (Format enclosed with the tender)
4. Pan Card.
5. GST Registration certificate.
6. Documentary proof of work orders, completion certificates.
7. Proof of Financial Turnover certified by Chartered Accountant.
8. Income tax return statement in case of Eligibility works being for a Private entity.
9. Undertaking that firm has not been declared insolvent, and has not been blacklisted by any organisation during the preceding 3 years.
10. Solvency certificate issued within the last 6 months or having validity till closing date of tender.



**INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH
TIRUPATI**

Name of work : **Designing, Construction, Testing & Commissioning of In-House Gene Function Analysis Platform for Crops (GFAPC) Green Houses at IISER Tirupati Permanent Campus,**

Estimated Value of : **Rs 131 Lakhs**

Tender Enquiry No : **IISERT/ENGG/ 2022-23/03**

Completion Time : **75 days**



**INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH
TIRUPATI**

NOTICE INVITING TENDER

01.	Name of work	Designing, Construction, Testing & Commissioning of In-House Gene Function Analysis Platform for Crops (GFAPC) Green Houses at IISER Tirupati Permanent Campus, Yerpedu (M),
02.	Estimated Cost	Rs. 131 Lakhs
03.	Tender Fee	Rs. 1000/-
04.	Completion Time	As per tender conditions
05.	Last Date and Time for submission of E-Tender	15.10.2022 @ 15.00 hours Late bids shall not be accepted.
06.	a) Date and Time of Opening of E-Technical Bid	17.10.2022 @ 15.00 hours
	b) Opening of Price bid	After evaluation of technical bids, the date, time and place of opening of the Price bid will be intimated to technically qualified bidders.
07.	Defect Liability Period/ Maintenance period	36 Months
08.	Address for submission of Tender	Engineering Department. INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH Tirupati Andhra Pradesh. Email: engineering@iisertirupati.ac.in
09.	Procedure for submission of Bid	As per the e-bidding procedure.

Name of the Agency
Submitting the tender

Details to be furnished by the Contractor.

S. No	Description / Requirement from the tenderer	Tenderer's response should be clear, firm, complete & legible. necessary, separate sheet shall used.	Page No. (must be filled)
1	Name & Complete address of the tenderer with contact details:		
2(a)	Details of Tender Fee Payment		
2(b)	Details of EMD paid		
3	Details of Contract Registration with Govt. depts. Class and value (If available)		
4	Details of PAN		
5	GST Registration:		
6	Employees provident fund Registration:		
7	Employees State Insurance Registration:		
8	Work Experience certificate		
9	Financial Turn Over		
10	Undertaking not to sublet the work		
11	Undertaking of non-blacklisting		
12	Solvency Certificate		

Note: Self-Attested copy of relevant certificates for items 2 (a) -12 are to be enclosed

I/We hereby certify that the information furnished above and the attached documents as proof of the information are true and correct to the best of our knowledge.

I/We also authorize the IISER Tirupati or his representative to approach the source of the certificate to verify our competence, if required, for processing the tender.



**INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH
TIRUPATI**

INSTRUCTION TO TENDERERS

1. The tender value includes cost of Civil material, Transportation of materials, Tools and all other related material required for completion of the work.
2. Time is the essence of the contract. Being a time bound project, the contractor should make all efforts to complete the work in time.
3. Even though the overall completion period is indicated as **75 days** the work shall be completed progressively and handed over as per agreed split up schedule if any.
4. **The tenderers are advised to visit the site and get themselves acquainted with the site conditions before submitting the offers.**
5. Quoted rate shall remain valid for a period of **60 days** from the date of tender opening for the release of work order and will be firm throughout the contract period or till completion of work, once awarded and no cost escalation is allowed on any account.
6. The item rate offered is for finished item of works and shall provide for the complete cost towards fuel, tools, tackles, plant & machinery, temporary works, labour, materials, levies, taxes, transport, lay-out, repairs, rectifications, maintenance till handing over, supervision, labour colonies, establishment, services, roads, revenue expenses, overheads, profits & all other incidentals etc., complete. Rate quoted shall inclusive of GST. The applicable GST can be reimbursed by IISER Tirupati along with the running / final bill on production of documentary evidence by the agency for having paid the GST to the authorities concerned. **The Tenderer should be a GST Registered Contractor. If the proof of GST registration is not furnished the tender of the tenderer will not be eligible for opening price bid and become disqualified.**
7. Some minor changes are likely in the layout, design and specifications of the work. The rates quoted shall be deemed to be inclusive of all such contingencies.
8. The work shall be carried out as per drawings released then and there, BIS/CPWD specifications, and standard code of practice and as per the instructions of Institute. The brief description of items of work is given in the bill of quantities.

9. The contractor has to furnish the security deposit, as per the Clause indicated elsewhere in this document, if the work is awarded.
10. Since the responsibility for the quality, workmanship and accuracy of any work being carried out under this contract lies with the contractor, the contractor should ensure that no work is done without the presence of contractor's representative at the work spot, whose strength depends on the value of contract awarded. The contract should arrange for surveying construction site at his own cost.
11. The decision of Institute shall be final and binding on the contractor regarding clarification of items in this tender schedule.
12. The works contract to be entered into with the successful tenderer will be governed by the CPWD Works Manual in force.
13. The contractor shall strictly adhere to all the labour laws in force.
14. To safeguard the persons working at height in roof, wall etc., sufficient number of Industrial Safety nets shall be provided at tenderer's cost in appropriate level and locations. The working hand including Supervisors, Labour should follow the COVID 19 guidelines, wear the personal protective items and safety measures such as helmets, safety belts, shoes, etc., before entering into working place.
15. The tenderer has to deploy adequate labour of required categories such as Unskilled, Skilled, Carpenter, Plumber, technically experienced, etc. so as to execute the works simultaneously in all areas of work.
16. The contractor shall follow norms of IISER Tirupati security system for movement of men & materials within the campus.
17. All the materials to be used in the work and the nature of work shall conform to the respective CPWD & BIS and Standard Specifications and shall be got approved by the Institute before actual incorporation in the work.
18. All materials brought by the Contractor for incorporation in the work shall be got inspected and approved by the Institute before they are incorporated in the work.
19. The contractor should extend full co-operation to the other contractors who may be doing other works in the same areas to enable them to execute their portions of work without any delay or difficulty.
20. Tenderers are requested to furnish the duly filled in E format attached as separate sheet along with a cancelled Cheque leaf to accept Electronic fund transfer / RTGS transfer for any payment from IISER Tirupati.
21. No mobilization advance will be given.
22. LD / Penalty clause is applicable as per CPWD Works Manual in force.
23. IISER Tirupati reserves its right to reject a tender due to unsatisfactory past performance in the execution of a contract awarded against a different Tender.
24. Tenders submitted after the due date and time will not be accepted.
25. The contractor's responsibility under this contract shall commence from the date of receipt of the LOI by the tenderer. The Contractor will have to plan his work

accordingly to complete the work in the scheduled period.

26. Defect liability period/Maintenance period shall be **36 (Thirty-Six) months**, starting from the completion of work as defined in scope of the work, certified by the Engineer in Charge, IISER in the completion certificate.
27. Any deviation to this tender terms & condition and schedules of this tender will cause total rejection of the offer submitted.
28. Incomplete offers will become liable for rejection.
29. If the tenderer deliberately gives wrong information in his tender or creates conditions favourable for the acceptance of his tender, IISER Tirupati reserves the right to reject such tender at any stage.
30. Canvassing in any form in connection with tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection
31. This tender notice shall be deemed to form an integral part of the contract to be entered into for this work.
32. The tenderers are advised to go through the condition stipulated in Tender document & code of conduct for Safety of Contract Labourer in details. Any violation thereof will invite punitive action being taken against them. While quoting the rate all the above factors are to be considered.

33. Compensation for Delay:

If the contractor fails to maintain the required progress or to complete the work and clear the site on or before the contracted or extended period of completion, he shall, without prejudice to any other right or remedy of the IISER Tirupati on account of such breach, pay as agreed compensation an amount calculated as stipulated below or such smaller amount as may be fixed by the IISER Tirupati on the contract value of the work for every week that the progress remains below or that the work remains incomplete. This will also apply to items or group of items for which separate period of completion has been specified.

For this purpose, the term 'Contract Value' shall be the value at contract rates of the work as ordered and the compensation for delay is by way of recovery at 1 percent of contract value per week of delay provided always that the total amount of compensation for delay to be paid under this condition shall not exceed 10% of the contract value or of the contract value of the item or group of items of work for which a separate period of completion is given.

The amount of compensation may be adjusted or set-off against any sum payable to the Contractor under this or any other contract with the IISER Tirupati.

34. Arbitration:

Except where otherwise provided for in the contract all questions and disputes relating to the meaning of the specifications, designs, drawings and instructions hereinbefore 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 way arising out of or relating to the contract, designs, drawings, specifications,

estimates, instructions, orders or these conditions or otherwise concerning the work 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 Director of IISER Tirupati and if Director is unable or unwilling to act, to the sole arbitration of some other person appointed by the Director, willing to act as such arbitrator. The cases referred to arbitration shall be other than those for which the decision of the Institute is expressed in the contract to be final and conclusive. There will be no objection if the arbitrator so appointed is an employee of IISER Tirupati and that he had to deal with the matters to which the contract relates and that in the course of his duties as such he had expressed views on all or any of the matters in dispute or difference. The place of arbitration shall be Tirupati.

The arbitrator to whom the matter is originally referred being transferred or vacating his office or being unable to act for any reason, Director as aforesaid at the time of such transfer, vacation of office or inability to act, 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. Subject as aforesaid the provision of the Arbitration & Reconciliation Act, 1996 or any statutory modification or re-enactment thereof and the rules made there under and for the time being in force shall apply to the arbitration proceeding under this clause. It is a term of the contract that the party involving 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. The arbitrator(s) may from time to time with consent of the parties enlarge the time for making and publishing the award. The work under the Contract shall, if reasonably possible, continue, during the arbitration proceedings and no payment due or payable, to the Contractor shall be withheld on account of such proceeding.

The Arbitrator shall be deemed to have entered on the reference on the date he issues notice to both the Parties fixing the date of first hearings. The arbitrator shall give a separate award in respect of each dispute or difference referred to him. The venue of arbitration shall be such place as may be fixed by the Arbitrator in his sole discretion. The award of the arbitrator shall be final, conclusive and binding on all parties to this contract.

In the event of disputes or differences arising between one public sector enterprise and a Govt. Department or between two public sector enterprises the above stipulations shall not apply or its amendments for arbitration shall be applicable.

42. Force Majeure clause:

If at any time during the continuance of this contract the performance in whole or in part by either party of any obligations under this contract shall be prevented or delayed by reason, of any war, hostilities, acts of the public enemy, civil commotion, sabotage, fires, explosions, epidemics, restrictions or acts of GOD (hereinafter referred to as events) then provided notice of happening of any such events is given by either party to other within twenty one days from the date of occurrence thereof neither party shall reason of such events be entitled to terminate

this contract nor shall either party have any such non-performance and delay is resumed as soon as practicable after such events has come to an end or ceased to exist. If the performance in whole or part of any obligation under this contract is prevented or delayed by reason or any such event claims for extension of time shall be granted for period considered reasonable by IISER Tirupati subject to prompt notification by the tenderer to IISER Tirupati of the particulars of the events and supply to the IISER Tirupati if required of any supporting evidence. Any waiver of time in respect of partial instalment shall not be deemed to be a waiver of time in respect of remaining deliveries.

The correspondence exchanged against the tender from both tenderer and IISER Tirupati through email are considered as valid document legally though it is not signed. It is treated as valid confirmations made on behalf of the respective company and very much comes under the legal ambit of the business transaction and hence it is binding on both the parties to the business.

Any transaction pertaining to the tender from both the parties of business done round the clock irrespective of the office or business hours of the companies, are valid legally and binding on both the parties. This applies to the extent only in such cases where deadline time for transaction is not specifically declared by either or both the parties to the business.

In case Letter of Intent (LOI) is issued through email, the PC generated time and date of mail shall be construed as the official time and date of release of LOI. In as much as this date is within the last date of validity given by the tenderer the LOI is said to have been issued within the validity period and shall be bidding on both the parties to the business.

Tenderers participating in the tender should declare in their technical bid that whether they have been black-listed / kept on hold for a specified period /given Business holiday for a specified period by any Public sector undertaking or Government departments. The reasons for such action with details and the current status of such hold shall be clearly furnished to IISER Tirupati. If no such details are mentioned in the offer, then it will be construed that the subject tenderer is not under any such hold. But at a later date if it comes to the notice of IISER Tirupati about any such hold under enforcement on the subject tenderer, IISER Tirupati will have every right to reject the offer of such vendors at any point of time and also under any stage of the finalisation of the subject tender irrespective of the status of the subject tenderer in that tender. Such tenderers will not be permitted to participate in the further tender proceedings and will be communicated suitably. They will not be also considered for any ongoing tenders even if participated till the hold is officially lifted and confirmed in writing.

GENERAL CONDITIONS OF CONTRACT

1. The general conditions given in the CPWD GCC 2022 to be strictly followed while execution of the work.
2. No night work will be permitted without the written permission of the Institute.
3. Permission for erection of temporary work sheds etc., at site will have to be obtained

from IISER Tirupati in writing in advance.

4. The works contract to be entered into with the successful tenderer will be governed by the CPWD works Manual 2019 or the latest in force.
5. The successful tenderer /Contractor shall observe all safety regulations and take necessary safety precaution as called for and Safety Precautions enclosed herewith.
6. In all matters of dispute, the decision of the Director, INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH Tirupati & Shall be final and binding on the tenderer /contractor.
7. Some changes are likely in the quantities furnished as well as in the layout, design and specifications of the work. The rate quoted shall be deemed to be inclusive of all such contingencies.
8. No material shall be incorporated in the work until the inspecting Engineer certified in writing that such materials have been inspected and approved by him or else the rejected material should be removed from site immediately.
9. The Contractor shall closely scrutinize all the drawings issued in connection with the work by this organization and bring to the notice of the Institute if any discrepancies, omissions in the drawings before undertaking the actual work pertaining thereto.
10. The contractor should extend full co-operation to the other contractors who may be doing other works in the same areas to enable them to execute their portions of work without any delay or difficulty.
11. The power required for work will be at free of cost. However, the contractor should ensure safety precautions while handling electrical equipment. Power source will be shown near to the working place. Necessary cables etc. shall be in the scope of contractor. Water has to be arranged by the contractor as per requirement.

SPECIAL CONDITIONS OF CONTRACT

1. **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.
2. **Safety codes and regulations:** The contractor shall at his own expenses arrange for the safety provisions as per statutory regulations wherever applicable.
3. **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.

4. 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 switch gear 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 IISERT 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 source alone shall be shown for construction purpose to the contractor, but the water source needs to be tapped by the contractor at his own expense.

5. 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.

6. 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.

7. 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.

8. 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.

9. 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. The scope of the maintenance includes supply and installation of all the consumables required for the facilities for their smooth functioning during the 36-month maintenance period including RO water purifier, Air-cooled system, etc. 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 IISERT.

The services of the contractor's personnel if requisitioned during the defect liability period shall be made available free of any cost to IISERT. 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) IISERT shall have the right to rectify the defects at the contractor's risk & cost without prejudice to any other rights.

10. 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-48hrs. of receiving the complaint and take corrective action immediately.

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

12. 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 IISERT. Non-availability of lockable storage space due to any reasons shall not relieve the contractor of his contractual obligations in any way.

GENERAL SAFETY PRECAUTIONS TO BE FOLLOWED AT WORK SITE DURING EXECUTION

The following safety measures should be strictly adhered to, during execution of works at sites.

1. The safety code as given in the CPWD GCC 2022 to be strictly followed while execution of the work.
2. Ensuring proper lashing of the components while being transported in vehicles.
3. The materials should not be allowed to extend or overflow the sides of the vehicles.
4. The speed restrictions within the Institute must be strictly adhered to.
5. The work to be executed keeping the campus clean and any dirty area during the execution, it is the responsibility of the contractor to clean the space.
6. All personal protective equipment conforms with standard specification and Contractor including and labour engaged on the work are required to scrupulously adhere to the safety regulations, safety precautions and measurers. Any violation thereof will invite punitive action being taken against them. Also, contractors with frequent violations of safety regulations will not be entrusted with further work in this organization.
7. In the event of any injured/fatal accident for the work men during the course of contract period, the compensation and other medical expenses towards the incident is lies with the contractor. No way is IISER Tirupati responsible.
8. Following the latest developments and restrictions imposed in the country and state in view of the COVID-19, the agency should have strict compliance towards the rules and precautionary measures mentioned in the orders issued by the State Government from time to time. The submission of bids should be in the tender box placed at main gate of Institute. Also, successful agency should ensure all safety precautions, social distancing norms during the execution of work.

MOVEMENT OF VEHICLE

1. The vehicle should not travel at more than 20 kmph in our premises.
2. The Driver of the vehicle must possess valid license and produce on demand by the Security Staff.
3. The driving should 'KEEP TO THE LEFT' at all places.
4. The vehicle should not be parked in road which could obstruct the vehicular traffic.

TERMS AND CONDITIONS REGARDING COMPLIANCE WITH VARIOUS LABOUR LAWS BY THE CONTRACTORS FOR IISER Tirupati

1. The Contractor shall not employ in connection with the work any person who has not completed 18 years of age.
2. The Contractor shall in respect of labour employed by him, comply with or cause to be complied with the following statutory provisions and rules and in regard to all matters provided therein.
 - a) The Contract Labour (Regulation & Abolition) Act 1970
 - b) The Minimum Wages Act 1948 and related Central Rules.
 - c) The Payment of Wages Act 1936 and related Central Rules.
 - d) The Employee's Provident Fund & Miscellaneous Provisions Act 1952.
 - e) The Employees State Insurance Act 1948.
 - f) The Workmen Compensation Act 1923.
 - g) The Industrial Disputes Act 1947.
 - h) The payment of bonus act 1965

And any other law or modifications to the above or to the Rules made thereunder from time to time.

3. The Contractor employing 20 or more workmen is required to obtain license from the authorities (The Deputy Chief Inspector of Factories / Assistant Commissioner of Labour as the case may be). The license shall be amended and /or renewed wherever, there is an increase in the workmen employed by him or in the event of contract being extended or renewed. The Contractor shall inform the license number to the IISER Tirupati Management before taking up the work.
4. The Contractor (Licensed or unlicensed) shall promptly furnish every information and document required by IISER Tirupati authorities for the purpose of fulfilling their obligations as Principal Employer and shall render all necessary assistance for the same.

REGISTERS & RECORDS: -

The Contractor shall maintain all registers and records in the proper manner and as required by the regulations of the various authorities concerned and indemnify the Employer from the consequences due to any inaccurate or faulty documentation on the part of the Contractor.

PAYMENT OF BILLS: -

All payments to be made to the Contractor, under this contract shall be by NEFT or RTGS within a reasonable time, after the certification of bills by the execution department, as per the payment terms mentioned below and elsewhere in the document.

- i. 30% will be paid after completion of sub structure/ supply of super structure material.**
- ii. 45% will be paid after completion all major civil works and supply of E&M components.**
- iii. 17.5% will be paid after completion of installation of facility upon handing over / commissioning.**
- iv. 2.5% will be paid after completion of 1st year of maintenance.**
- v. 2.5% will be paid after completion of 2nd year of maintenance.**
- vi. 2.5% will be paid after completion of 3rd year of maintenance.**

CANCELLATION OF CONTRACT FOR CORRUPT ACTS: -

IISER Tirupati, whose decision shall be final and conclusive, shall without prejudice to any other right or remedy which shall have accrued shall accrue thereafter to IISER Tirupati cancel the contract in any of the following cases and the Contractor shall be liable to make payment to IISER Tirupati for any loss or damage resulting from any such cancellation to the same extent as provided in the case of cancellation for default, If the Contractor shall: -

Offer or give or agree to give to any person in IISER Tirupati service any gift or consideration of any kind, as an inducement or reward for doing or for bearing to do or for having done or for borne to do any act, in relation to the obtaining or execution of this or any other contract for IISER Tirupati service,

OR

Enter in to a contract with IISER Tirupati in connection with which commission has been paid or agreed to be paid by him or with his knowledge, unless the particulars of any such commission and the terms of payment thereof have previously been disclosed in writing to IISER Tirupati.

OR

Obtain a contract with IISER Tirupati as a result of ring tendering or by non-bonafide methods of competitive tendering, without first disclosing the fact in writing to IISER Tirupati.

CANCELLATION OF CONTRACT FOR INSOLVENCY ASSIGNMENT OF TRANSFER OR SUBLETTING OF CONTRACT: -

IISER Tirupati, without prejudice to any other right or remedy which shall have accrued or shall accrue thereafter to IISER Tirupati shall cancel the contract in any of the following cases: **If the Contractor,**

- (a) Being an individual or if a firm any partner thereof shall at any time be adjudged bankrupt or have a receiving order for administration of his estate, made against him or shall take any proceedings for liquidation or composition under any bankruptcy Act or assignment of his effects of composition or arrangement for the benefit of his creditors or purport to do so, or if any application made under any Bankruptcy Act for the time being in force for the sequestration of his estate or if a trust deed be granted by him on behalf of his creditors

OR

- (b) Being a Company, shall pass a resolution or the Court shall make an order for the liquidation of its affairs, or a receiver or Manager on-behalf of the debenture holders shall be appointed or circumstances shall arise which entitle the Court or debenture holders to appoint a receiver or Manager,

OR

- (c) Assigns, Transfers, Sub-lets or attempts to assign, transfer or sub-let any portion of the work without the prior written approval of the IISER Tirupati.
- (d) Whenever IISER Tirupati exercise the authority to cancel the contract under this conditions, IISER Tirupati may have the work done by any means at the Contractor's risks and expenses provided always that in the event of the cost of the work so done (as certified by concerned officer which is final and conclusive) being less than the contract cost, the advantage shall accrue to the IISER Tirupati and if the cost exceeds the money due to Contractor under the contract, the Contractor shall either pay the excess amount ordered by Institute or the same shall be recovered from the Contractor by other means.
- (e) In case the IISER Tirupati carries-out the work under the provisions of this condition the cost to be taken into account in determining the excess cost to be charged to the Contractor under this condition shall consist of the cost of the materials, hire charges of tools and plants and/or labour provided by the IISER Tirupati with an addition of such percentage to cover superintendence and establishment charges as may be decided by Institute, whose decision shall be final and conclusive.

CANCELLATION OF CONTRACT IN PART OR FULL FOR CONTRACTOR'S DEFAULT:

If the Contractor:

- (a) Makes default in carrying out the work as directed and continues in that state after a reasonable notice from Institute or authorised representative.
- (b) Fails to comply with any of the Terms and Conditions of the contract or after reasonable notice in writing with orders properly issued there under.
- (c) IISER Tirupati may without prejudice to any other right or remedy which shall have accrued or shall accrue thereafter to IISER Tirupati, CANCEL the contract as whole or

in part thereof or only such work order or items of work in default from the contract. Whenever IISER Tirupati exercise the authority to cancel the contract as whole or part under this condition IISER Tirupati may complete the work at the contractor's risk and cost (as certified by Concerned officer, which is final and conclusive) being

less than the contract cost, the advantage shall accrue to the IISER Tirupati. If the cost exceeds the moneys due to the Contractor under this contract the Contractor shall either pay the excess amount ordered or the same shall be recovered from the Contractor by other means. In case the IISER Tirupati carries out the work or any part thereof under the provisions of the conditions the cost to be taken into account in determining the excess cost to be charged to the Contractor under this condition shall consist of the cost of the materials, hire charges of tools and plant and/or Labour provided by the IISER Tirupati with an addition of such percentage to cover the superintendence and establishment charges as may be decided by the concerned officer, whose decision shall be final and conclusive.

TERMINATION OF CONTRACT ON DEATH OF CONTRACTOR: -

without prejudice to any of the rights or remedies under this contract, if the Contractor dies, or if the firm is dissolved or the company is liquidated, IISER Tirupati shall have the option of terminating the contract without compensation to the Contractor.

SPECIAL POWER TO TERMINATION: -

If at any time after the award of contract, IISER Tirupati shall for any reason whatsoever not require whole or any part of the work to be carried out the Officer concerned shall give notice in writing of the fact to the Contractor who shall have no claim to any payment of compensation or otherwise howsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not derive in consequence of the foreclosing of the work.

LABOUR: -

The Contractor shall remain liable for the payment of all wages or other moneys to his workpeople or employees under the payment of Wages Act 1936, Employees Liability Act. 1938, Workmen's Compensation Act 1923 or any other Act or enactment, relating thereto and rules framed, there under from time to time.

PRECAUTIONS AGAINST RISK: -

The Contractor shall be responsible for providing at his own expense for all precautions to prevent loss or damage from any and all risks and to minimize the amount of any such loss or damage and for the necessary steps to be taken for the said purpose.

RATE FOR ADDITIONAL ITEM / SUBSTITUTED ITEM:

This will be as per the rate analysis based on the market rate for material and Labour prevailing at the time of execution at place of work as ascertained by concerned Engineer raised to the overall tender percentage at which the work was awarded to cover overheads / establishment /profit.

CORRIGENDUM /AMENDMENT:

It is tenderer's responsibility to watch for any corrigendum or amendment till the opening of a particular tender that will be posted only at IISER Tirupati and CPPP web site.



SCOPE OF WORK & TECHNICAL SPECIFICATIONS

Name of work : Designing, Construction, Testing & Commissioning of In-House Gene Function Analysis Platform for Crops (GFAPC) Green Houses at IISER Tirupati Permanent Campus, Yerpedu

Estimated Value of work : Rs 131 Lakhs

Tender Enquiry No : IISERT/ENGG/2022-23/03

Period of Contract : 75 days

Scope of work & Technical Specification

Scope of work: The scope of work generally consists of providing of GFAPC Green House as described in the technical specification and bill of quantities including designing, supply, installation and commissioning 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.

General Specifications applicable to all type of facilities:

The Green houses shall be Conventional steel building (CSB). The roof and wall shall be of polycarbonate sheet. The scope of agency shall be to design, manufacture, supply and erect in all respects.

The successful bidder should get the structural design done as per the prevailing Indian standard codes and other relevant Standard and get it vetted. The structural design of greenhouse shall be approved by Government institutions or any approved agency/ authorized personnel by the Government.

The architectural plans are attached to this tender document to provide general idea about work to be performed under the scope of the contract. The green house shall have robust water tightness at all joints and connections. **The design loads to be considered shall be as per IS 875.**

Sub Structure:

- SBC of soil – 20 t/Sqm.
- Minimum grade of concrete: M25.
- Plinth Level @ 1.2m from natural ground level.
- **Plinth Protection all around green house:** 2 ft. wide with cement concrete at 1:2:4 ratios, 50mm thickness, over a base of 75mm, thickness, made out in cement concrete with 40mm aggregate / brick ballast in ratio of 1:4:8.
- Post Construction Anti-termite treatment as per CPWD specification 2019

Super structure:

- No. of Storey – 1
- Finished floor level to False ceiling height – 8’ and the height from the finished floor level to apex of the true ceiling – 12’
- Shape of the roof: Arc shaped (Elevation enclosed)
- Flooring –Anti-skid Vitrified Tiles of 600mm x 600mm size of approved shade & brand shall be laid above PCC of 1:2:4 of 125 mm thick (min).
- Walls shall be made of brick work from FFL to a height of 2’ and above which it shall be polycarbonate sheet
- Damp proof course of 1:2:4 grade mixed with water proofing compound for a thickness of 50mm shall be laid along the brick wall.
- External plastering at 1:4 shall be of 15mm thickness and Internal plastering at 1:4 shall be of 12mm thickness
- The plastered surface shall be painted with Anti-Fungal emulsion paint /over coat of primer.
- The frame of the super structure shall be made of structural steel frame and coated with steel primer and enamel paint of approved colour.
- Necessary ramps and steps to be constructed for all the facilities.
- Plumbing lines from RO treated water tank to the respective facilities to be provided

Accessories:

Stainless Steel 204 grade Wash Basin (1 No.) of size 26”x18”10” with all necessary plumbing connection & taps (Chrome plated) for the same from the inlet water. Water Connection to be tapped from nearest water point as per site. Flexible expandable polymer hose of 30m length as approved by the engineer in charge (2 nos) at two source within the facility

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.

Electrification:

High quality ISI approved fittings with copper multi strand twisted FRLS (ISI make) wires std. 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.

Laying of one PVC insulated and PVC sheathed/XLPE power cable(copper) of 1.1kv grade of size 3.5 core 35sqmm armoured 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.

Water: Commercial RO unit having capacity of 250/Hr and separate Polymer storage tank of 3000 L capacity duly placed over a high-rise stable steel structure and concrete foundation. Inlet connection to the RO shall be taken from Institute source point. The RO outlet water shall be connected to the respective tanks of each facility for use.

A. Detailed specification of Air Cooled Green house (2 Nos)

Air-conditioned Green House at IISER Tirupati with following technical and operational details

Overall Size of Green House Facility: Total Area 640 Sqft.

Total Size: - 32' x 20' (As per the plan enclosed)

Side Height: - 8'

Centre Height: - 12'

With

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

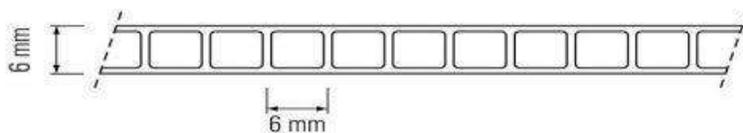
MODEL: - Arc Shape.

Wall :6mm thick multiwall (Two layered) Polycarbonate sheet of approved brand, shall be installed over the 2' brick wall and ensured the gaps between the brick wall and polycarbonate sheet are sealed water tight.

False Ceiling: False ceiling area of the containment area, buffer area, roof and side walls shall be covered with 6 mm thick multiwall (2 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.

Roof: The roof shall be of 10mm thick multiwall (four layered) Polycarbonate sheet of approved brand and installed over the structural steel truss, the roof shall not have any leakage

Specification of Polycarbonate Sheet: -



Thickness	: 6 mm multiwall.
UV radiation resistant on both sides	
Minimum Weight	:1.3 kg/ m ²
Sound Insulation DIN52210:	:18db
Multiwall	: Impact resistant, Energy saving.

Impact & Temperature resistance: 200 times of GLASS & -
Thermal conductivity : DIN52612W/2°C -0.21
Light Transparency : 65%
Fixing : Aluminium Strip
Sealing : Geeignet gasket
Perforated Anti dust : Aluminium Tape
Screw : SS non Magnetic

Anodized 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.),

Table

Frame: 25 mm x 25 mm GI (Coated with steel primer & enamel paint)
Top strappings: 19 mm x19 mm GI Table Top –Perforated GI sheet 1.5 mm thick
Size of Table: 4.0ft(L)x2.0(B)ftx3.0ft(H)
Total No. of Bench: 12 No

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

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 aluminium 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)

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 litres.
Mono block pump set : 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.

Celdek pad is made of specially impregnated cellulose and treated to provide efficient watts.

Paper ambient condition 25⁰C – 45⁰C.

Estimated cooling load: 101.520 BTUs/Hrs.

Total water flow 7.56 LPM per sqft. of the top pad surface. Bleed of equal to 10% of total water rates.

High saturation efficiency.

Self-cleaning feature.

No setting or Shrinkage of product.

Low pressure drop characteristics.

Impregnation makes the material stiff and self-supporting.

CeL Pad Cross angle : a = 45 ° b = 45 °

Nominal Efficiency: - : 88%

Bleed : 10%

Make : HuTek Thailand make

Temperature : 10 to 12°C Below. ambient.@ 45% RH.

Cooling Pad Size : 20'x 5' x 100mm

Evaporative Cooling System (ECS): Fan & Pad system (Pad size: 20' x 5' x 4" thick) with Celdek Cellulose Pads to acquire proper CFM of air movement per sqft. 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 Celdek Cellulose pad and heavy duty Slow Speed Axial Flow Fans 30" with Aluminium louvered covering will be provided to achieve temperature 280C ± 100C below ambient temperature throughout the year.

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.

Micro fogging / Micro misting: 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 mono block pump (Crompton/servo): 1 No. Filter (Screen): Kelba (ISI)

Pressure meter: 10 bar 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 mono block pump (ISI Make)	: 1 no.
Double layer 500 ltr 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 mono block: 1 no. 500 litres' 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.

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 digits, 7 segment 0.56" (14.2 mm) green LED display

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

Accuracy: RH: +/- 3% RH

Temperature: +/-0.3% °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 output. 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 $\pm 2.5\text{sec/day}$ @20°C
1 Channel, 1 Week Program 16 memory locations adjustable to the minutes /Hours, power backup (Holiday programming) 150 Hours. 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

LIGHTING (Philips /Osram /Crompton /Havells /equivalent make) - for plant growth purpose. Facility will be illuminated with Photosynthetically Active Radiation LED Lamps to provide an average illumination of 100 μ moles/m²/s. Grow Lamps in addition to these Lamps Adjusting lights of variable wavelength will be provided with higher efficacies and higher photosynthetic photon flux along with Smart Digital Selectable Controlling of Colour Spectrum. Wavelengths: 450nm, 660nm, 735nm & 5700K White / Wavebands: UV-A (380nm), Blue (400, 420 & 450nm), Green (520nm), Red (630, 660nm), Far Red (735nm), & White (5700K); Operated using higher ANDROID /IOS operating devices. Pure Warm white / Cool white can also be selectable.

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.

Bench Structure	: Table Frame: 25 mm x 25 mm GI (Coated with steel primer & enamel paint)
Top strappings	: 19 mm x19 mm GI (Perforated GI sheet 1.5 mm thick)
Size of Table	: 4.0ft(L)x2.0(B)ftx3.0ft(H)
Total No. of Bench	: 6 No

B. Specification for Air conditioned Green house (2 units)

Overall Size of Green House Facility –Overall area - 640 Sqft.

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.)

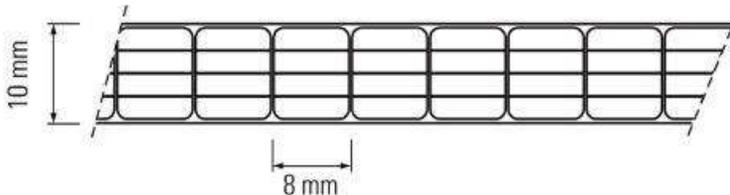
MODEL: - ARC Shape.

Wall: 10mm thick multiwall (Four layered) Polycarbonate sheet of approved brand, shall be installed over the 2' brick wall and ensured the gaps between the brick wall and polycarbonate sheet are sealed water tight.

False Ceiling: False ceiling area of the containment area, buffer area, roof and side walls shall be covered with 10 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.

Roof: The roof shall be of 10mm thick multiwall (four layered) Polycarbonate sheet of approved brand and installed over the structural steel truss, the roof shall not have any leakage

Specification of Polycarbonate Sheet: -



Thickness	: 10 mm multiwall.
UV radiation resistant on both sides	
Minimum Weight	:1.7 kg/ m ²
Sound Insulation DIN52210	:18db
Multiwall	: Impact resistant, Energy saving.
Impact & Temperature resistance	: 200 times of GLASS & -
Thermal conductivity	: DIN52612W/2°C -0.21
Light Transparency	: 65%
Fixing	: Aluminium Strip
Sealing	: Geeignet gasket
Perforated Anti dust	: Aluminium Tape
Screw	: SS non Magnetic

Anodized Aluminium doors (2Nos.) of size-6ftx3.0ft

with polycarbonate sheet of 10mm 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.).

Table

Frame	: 25 mm x 25 mm GI (Coated with steel primer & enamel paint)
Top strappings	: 19 mm x19 mm GI Table Top (Perforated GI sheet 1.5 mm thick)
Size of Table	: 4.0ft(L)x2.0(B)ftx3.0ft(H)
Total No. of Bench	: 12 No

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

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 aluminium 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.). Electronically balanced air curtain with double blower and atomized ON/OFF operation w.r.t. door opening at the entrance of buffer area.

3. Cooling System.

Air-conditioning cooling arrangements with complete Backup additive cooling system 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: 23oC ± 2 o C throughout the year.

4. Humidification System:

Advance air drying humidification system (Commercial Ultrasonic Humidifier) which gives non wetting effects consumption 1-18 ltr/hr. with complete plumbing using ABS plastic pipes and fittings, 50 litres of Carboy and commercial RO system along with 1700±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)

5. Microprocessor Control Panel.

(i) Programmable Photoperiodic Timer:

Clock Accuracy ±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: ±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 ±4%, Real RH: ±2%. ±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 μ m.

Humidification System: Humidity range: Upto 90%, Plitz 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: 500ltr.

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, pre-
filters & axial driven heat evacuation arrangement (details must provide.)

No. of Heater: 2 Nos.

AUTOMATIC CONTROL 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).
- 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 digits, 7 segment 0.56" (14.2 mm) green LED display

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

Accuracy: RH: \pm 3% RH

Temperature: \pm 0.3% °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 output. 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 ± 2.5 sec/day @20°C
1 Channel, 1 Week Program 16 memory locations adjustable to the minutes/hours, 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 V.A.C, Phase-Single, 50 Hz.

Ambient 4°C to 50°C, RH 30% to 90%.

LIGHTING SYSTEM

LIGHTING (Philips /Osram/ Crompton/ Havells/equivalent make) - for plant growth purpose. Facility will be illuminated with Photosynthetically Active Radiation LED Lamps to provide an average illumination of 100 μ moles/m²/s. Grow Lamps in addition to these Lamps Adjusting lights of variable wavelength will be provided with higher efficacies and higher photosynthetic photon flux along with Smart Digital Selectable Controlling of Colour Spectrum. Wavelengths: 450nm, 660nm, 735nm & 5700K White / Wavebands: UV-A (380nm), Blue (400, 420 & 450nm), Green (520nm), Red (630, 660nm), Far Red (735nm), & White (5700K); Operated using higher ANDROID /IOS operating devices. Pure Warm white / Cool white can also be selectable.

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.

Table Frame : 25 mm x 25 mm GI (Coated with steel primer & enamel paint)
Top strappings : 19 mm x19 mm GI Table Top (Perforated GI sheet 1.5 mm thick)
Size of Table : 4.0ft(L)x2.0(B)ftx3.0ft(H)
Total No. of Bench : 12 No

C. Specifications High Tech Containment Facility

Overall Size of Complete Facility

Total Size: 30' x 30' (900 Sqft.) (inclusive of Cooling Zone and Entry Area will be made available on either side of containment area 150 Sqft each.

Actual Containment Size: 22' x 10' (660 Sqft. area will equally have divided into independent 3 chambers of 220 Sqft. each)

Side Height: - 8'

Center Height: - 12'

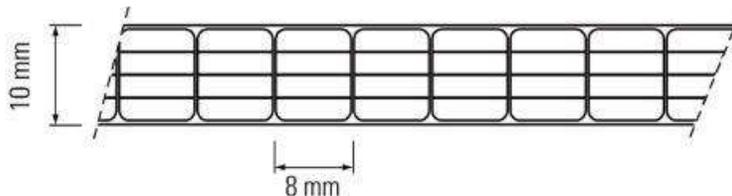
MODEL: Arc Shape

Wall :10mm thick multiwall (Four layered) Polycarbonate sheet of approved brand, shall be installed over the 2' brick wall and ensured the gaps between the brick wall and polycarbonate sheet are sealed water tight.

False Ceiling: False ceiling area of the containment area, buffer area, roof and side walls shall be covered with 10 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.

Roof: The roof shall be of 10mm thick multiwall (four layered) Polycarbonate sheet of approved brand and installed over the structural steel truss, the roof shall not have any leakage

Specification of Polycarbonate Sheet:



Thickness : 10 mm multiwall.

UV radiation resistant on both sides

Minimum Weight :1.7 kg/ m²
 Sound Insulation DIN52210 :18db
 Multiwall : Impact resistant, Energy saving.
 Impact & Temperature resistance: 200 times of GLASS & -
 Thermal conductivity : DIN52612W/2°C -0.21
 Light Transparency : 65%
 Fixing : Aluminium Strip
 Sealing : Geeignet gasket
 Perforated Anti dust : Aluminium Tape
 Screw : SS non Magnetic
 Anodized Aluminium openable doors (3Nos.) of size-6ftx3.0ft
 Shutter made of polycarbonate sheet of 10mm thick as cladding material with proper locking arrangement (Godrej cylindrical lock (Brass)), door stoppers, door brush at the bottom and hydraulic door closers, with compete leak proof rubber seal and standard locking arrangements

Shading System

External Shading System:

-75% agro shading net green colour (agro shade net) with manual rolling arrangement connecting pipe etc. The shading system can be rolled up and down when required.

Table

Bench Size: 9'×2'6" ×1.8' (L×W×H), Accommodation of benches: Total 2 bench. In each chamber (Coated with steel primer & enamel paint)

Stand/Legs: Made of galvanized steel, Steel expended metal bench top. Supporting frame. G.I. applied with steel primer and enamel paint.

Benches should be engineered for standard 800 kg. per bench weight limit

Air modulation system (Imported) should be made available on the Roof side with thermal controls, pre filters & axial driven heat evacuation arrangements (Details must be provided)

2. COOLING SYSTEM (Separate for each area)

Air-conditioning cooling arrangements with Backup additive cooling system. (Force Type Dual Cooling System) in all three Sections individually having temperature range of 24°C to 30 ± 2°C provided with strip curtains for individualize cooling area

24200 BTU/Hr commercial cooling capacity @ 12°C commercial air conditioning split units (4 Nos. in each section) having Emerson make compressor, accumulator, HP/LP controlling devices will be provided with additive supporting cooling arrangements of >90000 BTU/Hr. Cooling Load. Units will be designed on three phase supply for trouble free operations.

Temperature range: 24°C to 30°C ± 2°C throughout the year.

Additive Cooling System (Independent for each section)

ECS Construction MATERIAL: Eco friendly.

18 Ga GI Sheets : 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 : ISI 25 to 55 viscous filter for 30 μ efficiency.

Miscellaneous : Fasteners, Galvanized, Rivet- Aluminium.

PVC pipe ; 20mm/25mm/32mm with L & T.

Water Tank : PVC Tank 500 litres. (One for each section)

Mono block pump set: ½ HP Crompton Greaves make with thermal protection (One for each section)

Technical Specifications 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.

Paper ambient condition: 25°C - 45 °C

CeL Pad Cross angle: a = 45 ° b = 45 °, Nominal Efficiency: 88%

Estimated cooling load: 101, 520 BTUs/ Hr., Water Flow: 7.56LPM, Bleed :10%,

Make: HuTek / Equivalent make

Self-cleaning feature. High saturation efficiency

Cooling Pad Size -10' x 4' x 100mm duly fixed with 12" IP65 grade Axial flow fan 3 Nos. in each section

(Backside of Cooling Pad area further to be covered with UV stabilized 40 mesh duly fixed with Grippers)

Heating System (Individual for all the three Sections)

Radiant Heating System using Far infrared ray radiation backed up with commercial heating backup arrangements (Separate for each Section)

Passive Radiant heating system will be provided inside both the sections of Green House with uniform heat along the wall side. Having Far infrared ray radiation – 3.49 x 10² watt/m² and Anion radiation more than 500 ions / cc). IP 65 electrical termination with overheating preventing device. With

Heating System: - 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%.

Humidification System: (Individual for each Chamber)

Advance air drying humidification system which gives non wetting effects consumption 1-18 ltr. /hr. with complete plumbing using ABS plastic pipes and fittings, 50 liters of Carboy and commercial RO system with 1700±40 KHz ultrasonic humidifier having Ceramic Disc size: Φ 20mm.Titanium Coated. Mist Generation > 900 ml/Hr. Stainless Steel 304 grade enclosure. 25 Litres / hr. capacity commercial RO with 100 Litre polymer water storage tank will also be provided with compete ABS Plastic pipes and fittings.

AUTOMATIC CONROL STSTEMS: - Microprocessor Photosynthesis Control Panel: - (User friendly) for TEMPERATURE, HUMIDITY and LIGHT duly fixed in Pre Entry Area

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

f) Remote Alarm System for Temperature for all chamber

Technical specifications

Relative Humidity + Temperature Real Time Microprocessor Controller

Input: RH + Temperature Sensor

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

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

Accuracy: RH: +/- 3% RH

Temperature: +/-0.3% °C

Feather touch operation. Set point lock 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. 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 output. Input- 200-240 VAC, 50 Hz. Single phase. , Ambient 5°-50°C, RH upto 90%.

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 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 Glass House.

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%.

With Remote Alarm facility for temperature

User can connect Data SIM for sending SMS.

Easy to put contact numbers by using keys and LCD display.

User can get SMS on High / Low Temperature ranges.

Hooter output for local Audio Alarm.

GSM modem for SMS facility

Battery backup for 4hrs. in case of power failure.

LIGHTING SYSTEM

LIGHTING (Philips /Osram/ Crompton/ Havells/equivalent make) - for plant growth purpose. Facility will be illuminated with Photosynthetically Active Radiation LED Lamps to provide an average illumination of 100 μ moles/m²/s. Grow Lamps in addition to these Lamps Adjusting lights of variable wavelength will be provided with higher efficacies and higher photosynthetic photon flux along with Smart Digital Selectable Controlling of Colour Spectrum. Wavelengths: 450nm, 660nm, 735nm & 5700K White / Wavebands: UV-A (380nm), Blue (400, 420 & 450nm), Green (520nm), Red (630, 660nm), Far Red (735nm), & White (5700K); Operated using higher ANDROID /IOS operating devices. Pure Warm white / Cool white can also be selectable.

D. Miscellaneous items:

Electrical and water supply would be provided by Institute however fitting of all electrical and water supply connections should be provided by manufacturer

General Instructions:

All the supply and work shall be in accordance with the relevant codes and recognized standards and modern approved trade practice and shall meet the requirement of the latest codes, factory rules and regulations, supply codes and all standard accepted practice in locality where the installation is to be made.

All the materials and accessories provided by Contractor under terms of this contract shall conform to the relevant Indian Standard Specifications.

Samples of all equipment, materials and accessories to be supplied by the Contractor shall be submitted for the approval of the EIC IISERT before they are supplied and used.

Contractor shall provide all necessary labour, tools, and other requisite work like drilling, cutting, welding etc. at his own cost.

Good workmanship is the essence of this contract and shall be complied with at all time.

The Contractor shall have the works supervised by qualified and experienced engineers. All the defects pointed out by the engineer shall be rectified immediately by the Contractor free of cost.

The installation shall generally be carried out strictly in conformity with the requirement of latest edition of the Indian Electricity Act, 1910 as amended and the Indian Electricity Rules, 1956 framed there under and all others statutory regulations that may be relevant to the installation.

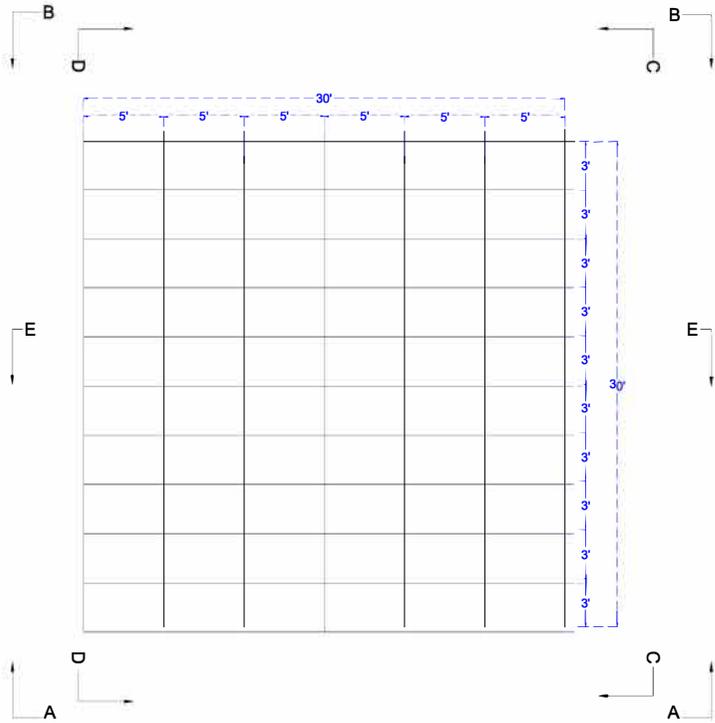
No alteration which may affect the structures and architecture of building shall be done without the prior approval of the engineer.

All work shall be carried out in such a manner that it should not cause any inconvenience to other works which are under progress.

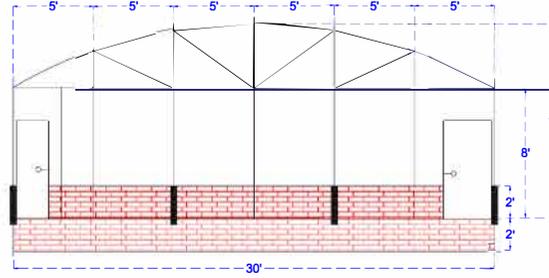
The Contractor shall co-operate with other agencies in the area for the smooth execution of all works.

Accidental damage to any property shall be reported immediately to site engineers and letter confirmed in writing.

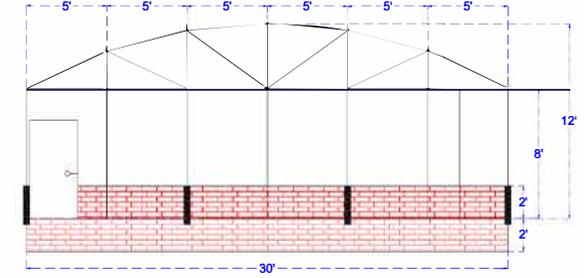
Water requirement for construction works shall be arranged by the Agency. Accommodation for the Labour to be arranged by the agency.



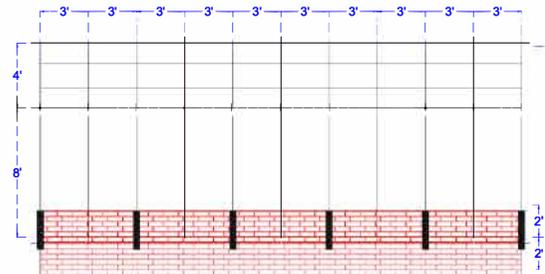
View A-A



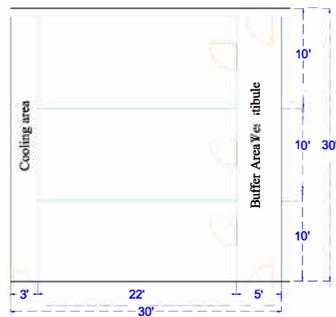
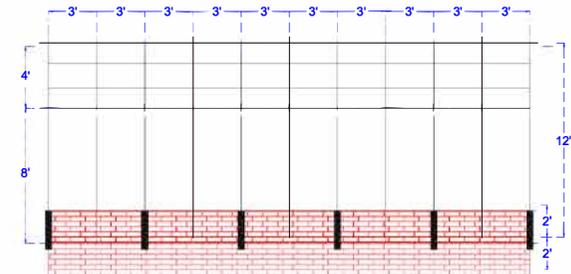
View B-B



View C-C



View D-D



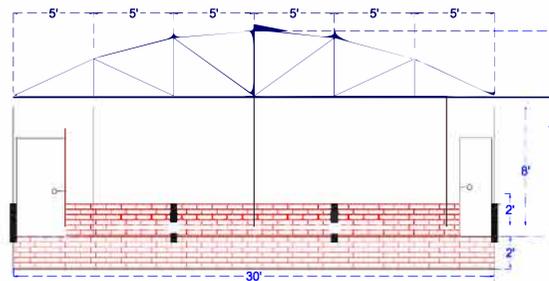
Plan Preview
High Tech Containment Facility

Overall size: 900 sq foot
 Chamber size:

- 10' X 22' (3nos)
- 3' X 30' (1nos)
- 5' X 30' (1nos)

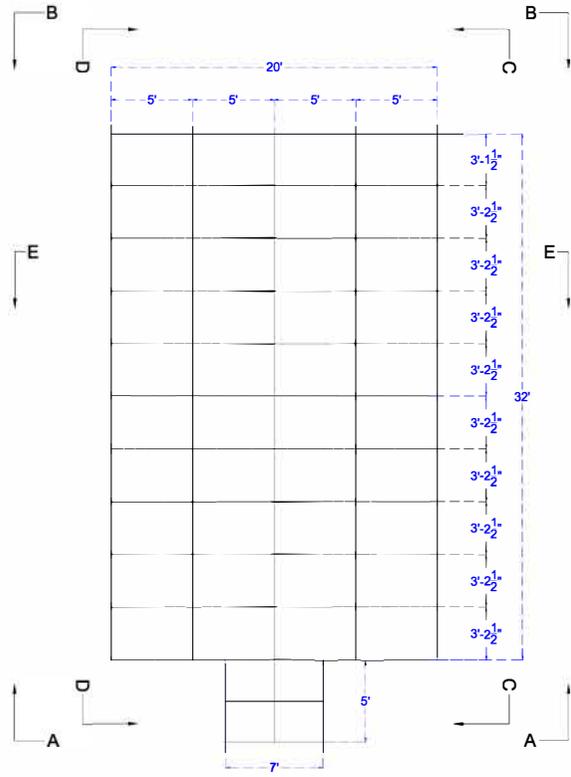
L X B : 30' x 30'
 Side Height : 8'
 Center height : 12'

View E-E

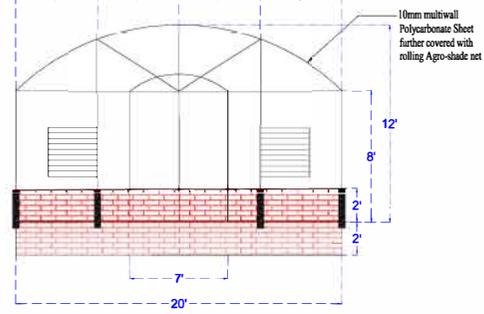


SITE:
 IISER Tirupati

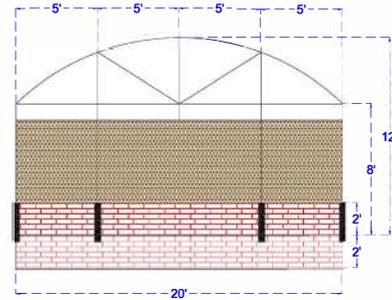
Description:
 Schematic Layout of
 High Tech Containment Facility



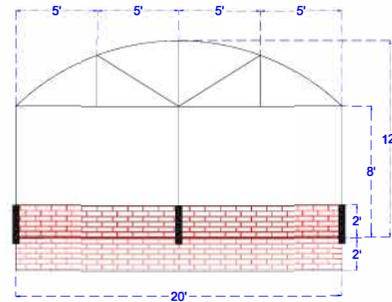
View A-A



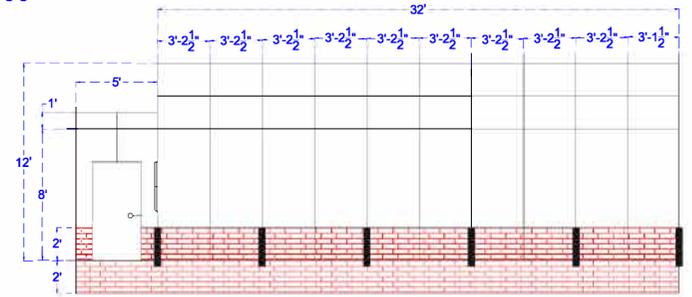
View B-B



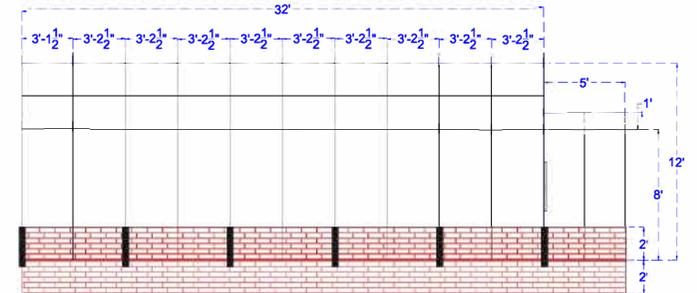
View E-E



View C-C



View D-D

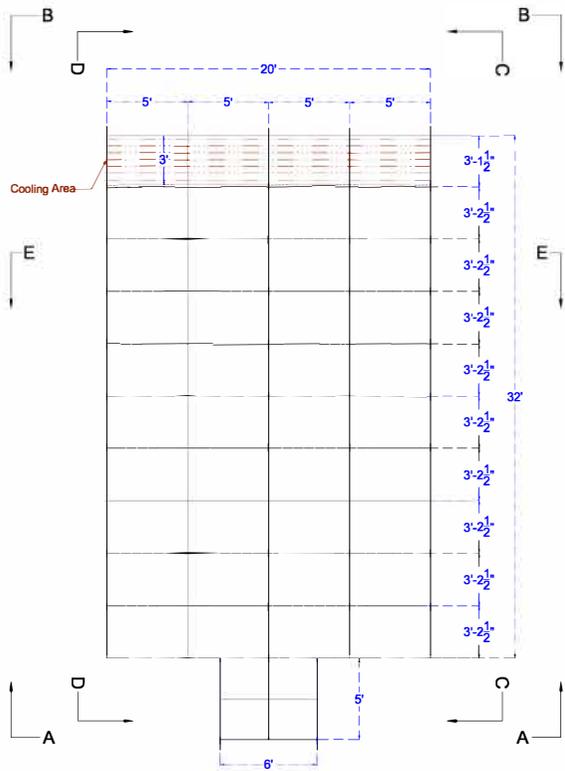


High Tech Air Cooled Green House

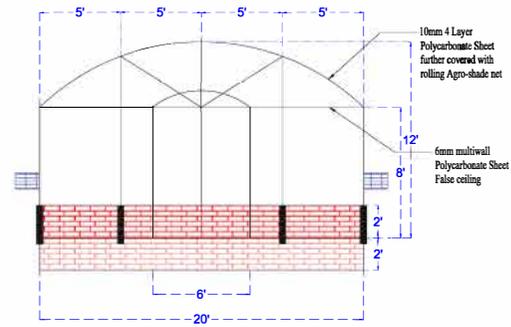
Overall Size of Green House Facility:

- Total Area: 640 Sq.ft.**
- Total Size: 32' x 20'**
- Side Height: 8'**
- Center Height: 12'**
- Buffer Room Size : 7' x 5' x 8'**

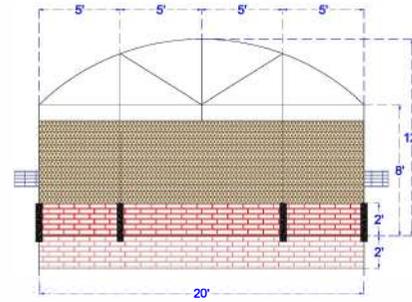
SITE: IISER Tirupati	Description: Schematic Layout of High Tech Air Cooled Green House
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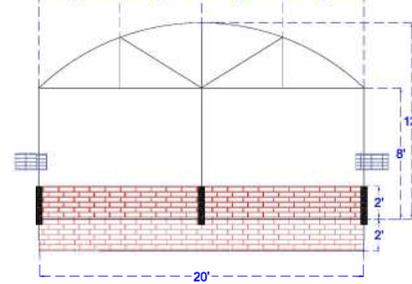
View A-A



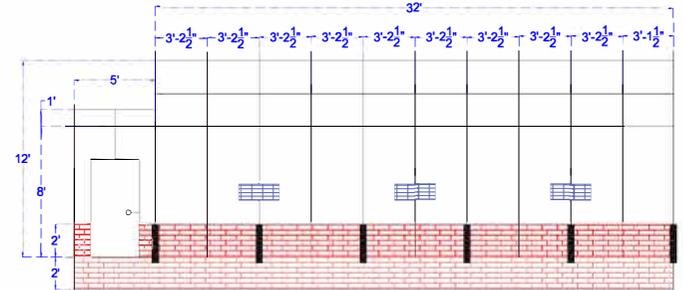
View B-B



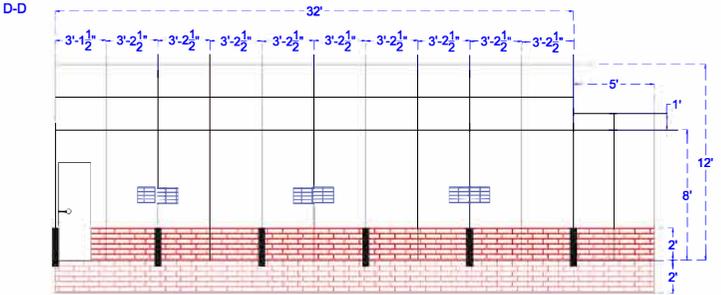
View E-E



View C-C



View D-D



Air conditioned Green House

Overall Size of Green House Facility:

Total area: 640 Sq.ft.
Total Size: 32' x 20'
Side Height: 8'
Centre Height: 12'
Vestibule/Buffer Room Size : 6' x 5' x 9'

SITE: IISER Tirupati	Description: Air conditioned Green House
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List of Approved Makes

S.No	Item/ Material	Approved Makes
1	Copper Cable	Finolex/Polycab/Havells
2	MCB/Power Point	Havells/ Legrand
3	POLYCARBONATE SHEET	Bayer/Ace well / SABIC LEXAN USA
4	Reinforcement Steel & Structural steel	TATA/JSW/Vizag steel
5	Cement	Ultra tech/Zuari/ACC
6	Tiles	Kajaria /Johnson/RAK
7	PAR lamps	Osram/Philips
8	Air Conditioning systems	Daikin, Mitsubishi, O-general
9	Air Curtains	Almonard , Mitsubishi
10	Electrical Rotary /ON-OFF Switches	L&T, Legrand,
11	Polycarbonate sheet	Sabic Lexan/Palram/ Bayer/Acewell
12	Aluminium	Jindal/ Bhoruka
13	Paint	Asian/Berger/Dulux
14	Cooling pads	HuTek / Equivalent
15	Plumbing Accessories	Astral/ Finolex/ Supreme
16	Sanitary Fittings	Jaguar/ Hindware/ Kohler
17	Light fittings	Philips /Osram/ Crompton/ Havells/equivalent make)



**INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH
TIRUPATI**

TO BE DULY TYPED, SIGNED AND STAMPED AND UPLOADED AS PDF IN THE E-TENDER. [THE OVERALL TOTAL OF THE PRICEBID TO BE INCORPORATED IN THE PROVIDED PRICEBID EXCEL FILE BoQ_XXXXX.xls AND UPLOADED]

Name of work : **Designing, Construction, Testing & Commissioning of In-House Gene Function Analysis Platform for Crops (GFAPC) Green Houses at IISER Tirupati Permanent Campus, Yerpedu**

Estimated Value of work : **Rs 131 Lakhs**

Tender Enquiry No : **IISERT/ENGG/2022-23/03**

Period of Contract : **75 days**

SCHEDULE 'A'
LIST OF WORKS AND PRICES

NAME OF WORK:

DETAILS & QUANTITIES of each item of work shown in the **BILL OF QUANTITIES** are only approximate. They are given as a guide for the purpose of tendering only and are liable to variation and alteration of the Competent Authority. The work under each item as executed shall be measured and priced at the corresponding rate quoted by the contractor in the **BILL OF QUANTITIES**

Sl. No.	Description of work	Total amount of work in Rupees	Period of contract
1.	Designing, Construction, Testing & Commissioning of In-House Gene Function Analysis Platform for Crops (GFAPC) Green Houses at IISER Tirupati Permanent Campus, Yerpedu (M), Chittoor (Dt).	Rs. 1,30,51,980/-	75 Days

Sl. No.	Item Description	Quantity	Units	Basic Rate / Unit (in Figures) To be entered by the Bidder	Total Amount	Total Amount in Words

BILL OF QUANTITIES

Tender Inviting Authority: Director , IISER Tirupati				
Name of Work: Designing, Construction, Testing & Commissioning of In-House Gene Function Analysis Platform for Crops (GFAPC) Green Houses at IISER Tirupati Permanent Campus, Yerpedu (M), Chittoor (Dt).				
Contract No: IISERT/ENGG/2022-23/03		Date: 29.09.2022		
Bidder Name:				
S.No	Description of facility	Quantity	Rate	Amount in Rs
1	<p>Designing, Construction, Testing & Commissioning of High Tech Air Cooled Green House with following technical and operational details Overall Size of Green House Facility: Total Area 640 Sqft. Total Size: - 32' x 20' Side Height: - 8' Centre Height: - 12' Buffer Room Size: 7' x 5' x 8' provided with Air Curtain MODEL: - Arc Shape. The facility shall be complete with the required accessories, Air Curtains, Humidification system, Lighting System with Photo Synthetically Active Radiation Lamps, Automatic control with Micro processor monitoring, Irrigation and commercial cooling system as given in the detailed technical requirements</p>			
2	<p>Designing, Construction, Testing & Commissioning Air conditioned Green House at IISER Tirupati with following technical and operational details Overall Size of Green House Facility – Overall area - 640 Sqft. 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 The facility shall be complete with the required accessories, Air Curtains, Humidification system, Lighting System with Photo Synthetically Active Radiation Lamps, Automatic control with Micro processor monitoring, Irrigation and commercial cooling system as given in the detailed technical requirements MODEL: - ARC Shape.</p>			

3	<p>Designing, Construction, Testing & Commissioning High Tech Containment Facility Area: 660 sq. ft. equally divided into three equal independent containment area using Galvanised tubular frames with doors. Over all Area ~900 Sqft Vestibule/Buffer Area- 150 sq. ft. Cooling Bays: 90 Sqft. having independent partition of 30 sqft area allocated specifically for respective containment chambers equally distributed in between the Bay. The facility shall be complete with the required accessories, Air Curtains, Humidification system, Lighting System with Photo Synthetically Active Radiation Lamps, Automatic control with Micro processor monitoring, Irrigation and commercial cooling system as given in the detailed technical requirements. Commercial RO unit having capacity of 250/Hr and separate Polymer storage tank of 3000 L capacity (Sintex / Pure well / Lotus) duly placed over a high-rise stable steel structure and concrete foundation.</p>			
	Total Rs.			

PRICE SCHEDULE

(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevant columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only) Quoted Rate is inclusive of GST

ANNEXURE – I

FORM OF UNDERTAKING

To,
Superintending Engineer,
INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH Tirupati.

I / We hereby offer to carry out the work of

I / We hereby carefully perused the following documents connected with the above noted work and agree to abide by the same.

1. Specifications (General & Particular)
2. Drawings
3. Schedule ‘A’,
4. Bill of Quantities
5. CPWD works Manual in force.

I / We agree to execute all the work referred to in the said documents upon the terms & conditions contained or referred therein and as detailed in Schedule ‘A’ and Bill of Quantities thereto and to carry out such deviations as may be ordered, vide conditions of the IISER Tirupati.

I / We further agree to refer all disputes, as required to the sole arbitration of an Officer, to be appointed by the Director, IISER Tirupati., in his sole discretion whose decision shall be final and binding.

WITNESS

Signature of the Contractor

Date:

1.

2.

ANNEXURE – II

FORM OF UNDERTAKING

To,
Registrar
INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH Tirupati
C/o Sree Rama Engineering College
Karakambadi Road, Tirupati - 517507

Tender No. **IISERT/ENGG/2022-23/03**
Notice Inviting Tender for **Designing, Construction, Testing & Commissioning of In-House Gene Function Analysis Platform for Crops (GFAPC) Green Houses** at IISER Tirupati Permanent Campus, Yerpedu (M), Chittoor (Dt).

Sir,

I /we hereby submit our tender for **Designing, Construction, Testing & Commissioning of In-House Gene Function Analysis Platform for Crops (GFAPC) Green Houses** at IISER Tirupati Permanent Campus, Yerpedu (M), Chittoor (Dt).

1.I/ We enclosed herewith the following in favour of INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH Tirupati towards Tender Fee.

Particular	Amount	Payment Reference Details	Payment Date
Tender Fee	500/-		

I / We hereby reconfirm and declare that I / We have carefully read, understood & complying the above referred tender document including instructions, terms & conditions, scope of work, schedule of quantities and all the contents stated therein. I / We also confirm that the rates quoted by me / us are inclusive of all taxes, duties etc., applicable as on date.

2.I/we have gone through all terms and conditions of the tender document before submitting the same.

Date:

Authorized Signatory

Seal

Name:

Place:

Designation:

Contact No:

ANNEXURE – III

FORM OF UNDERTAKING

To,
Registrar,
IISER Tirupati,
C/o Sree Rama Engineering College
Karakambadi Road, Tirupati - 517507

Sub: Designing, Construction, Testing & Commissioning of In-House Gene Function Analysis Platform for Crops (GFAPC) Green Houses at IISER Tirupati Permanent Campus, Yerpedu (M), Chittoor (Dt).

Sir,

With reference to the above, I hereby undertake not to sublet the work cited above, if the work is allotted to me.

Date:

Name of contractor

Signature and seal