Dayalbagh Educational Institute
(DEEMED TO BE UNIVERSITY)
Dayalbagh, Agra

Ref: DEI/SC/BOT/PKD/2018-19/EOI-38 **Date: 02.02.2019**

Notice Inviting Expression of Interest

Letter of Intent for "Hitech Multi-Climatic Greenhouses"

ALL interested Manufacturers/Vendor/Entrepreneurs ARE INVITED to submit their "Expression of Interest" with the tentative specifications for our SPECIFIC requirements of various products/equipments/jobs etc. for establishing an "HITECH MULTI-CLIMATIC GREENHOUSES". The objective of this Letter of Intent is to select Manufacturers/Vendor/Entrepreneurs for COMPLETING a project ON "HITECH MULTI-CLIMATIC GREENHOUSES" at Dayalbagh Educational Institute, AGRA. We require Bidder for undertaking project for DEI HITECH MULTI-CLIMATIC GREENHOUSES - AGRA. The bidder will provide a GUI platform to derive insights and also PROVIDE platform to train the student/faculty via digital means to drive MULTIPLE ACTIVITIES based on data collection from Greenhouses.

Detailed Scope of work has been specified in **Annexure-I** (Scope of Work) of this document.

All interested Manufacturers/Vendor/Entrepreneurs are requested to submit their EOI in view of the objectives and scope of the work and CAN ALSO SUBMIT AN EFFICIENT alternative proposals.

All interested Manufacturers/Vendor/Entrepreneurs are requested to submit their proposals at the office of the undersigned as per following Schedule ONLY:

1. Time and last date of submission of the Proposal: 11.00 am on 12.02.2019
2. Time of EOI Proposal Opening: 11.30 am on 12.02.2019
3. Venue of EOI Proposal Opening: CAO, Dayalbagh Educational Institute, Dayalbagh Agra-5
4. Pre-Bid Meeting 11.00 am on 13.02.2019

Interested Contractors/Suppliers/Authorized dealers may put the proposal/document complete in all respect and other requisite documents in the box kept in the General Section, CAO, Dayalbagh Educational Institute, Dayalbagh, Agra- 282005. No one shall be entertained after this deadline under any circumstances what so ever, HOWEVER THEY MAY DEPUTE THEIR REPRESENTATTIVES ON THE PROPOSAL OPENEING DATE. For more details please visit the institute's website http://www.dei.ac.in or contact Prof. P. K. Dantu-9368191921. VENDORS ARE WELCOME TO VISIT THE PROPOSED SITE IF REQUIRED BEFORE SUBMITTING THE PROPOSAL.

Registrar
Dayalbagh Educational Institute
Dayalbagh, Agra-282005

1. Section I: Introduction

1.1 About DEI

The Dayalbagh Educational Institute is located amidst the tranquil environs of Dayalbagh, a self-contained colony renowned for its serene environment and secular establishments, in which its inhabitants lead an active, disciplined and co-operative community life dedicated to service, conforming to the high spiritual ideals of their faith. On the outskirts of the historic city of Agra, the campus is situated in garden settings, away from the din and noise of the city. Nestled between lush green fields, it provides an excellent ambience and academic setting which is in harmony with nature. This, along with a simple, disciplined and principled life, undoubtedly contributes to the strength of the social, moral and spiritual fiber of the institute's educational system. The Government of India declared the DAYALBAGH EDUCATIONAL INSTITUTE as an institution Deemed to be a University from the session 1981-82, under Section 3 of the University Grants Commission Act, 1956 (3 of 1956). The Institute has since been accorded the membership of the Association of Indian Universities. The Institute comprises six faculties, faculty of Arts, Commerce, Education, Engineering, Science and Social Sciences and three colleges, DEI Technical College, DEI PV Primary School and REI Intermediate College. From the session 1986-87, the DEI Technical College, a diploma level Engineering Institution, from the session 1995-96, the DEI Prem Vidyalaya Girls' Intermediate College, and from the session 2012-13, the REI Intermediate College have also been brought under the academic and administrative control of the Institute year. The vocational courses were started in the year 1993. The Women's wing of Technical College – Women's Polytechnic was started in the year 2004, and in the same year, the Institute initiated a major programme of Distance Education to benefit students residing at urban-suburban interfaces. In the year 2015, Dayalbagh Educational Institute was empanelled as Government Training Partner (GTP) with Uttar Pradesh Skill Development Mission (UPSDM), Department of Vocational Training & Skill Development, Uttar Pradesh State Government to train youth in various vocational skills. Also a Deen Dayal Kaushal Kendra was sanctioned to DEI by MHRD to offer BVoc, MVoc and PhD degrees in skilling.

Objective of the EOI

The objective of this EOI is to select vendor for conducting a project for DEI "HITECH MULTI-CLIMATIC GREENHOUSE". Scope of work has been specified in the document.

2. Section II: Instructions to Vendors

Special Instructions

2.1 **Performance Bank Guarantee**

2.1.1 The successful Bidder will have to furnish the performance security in form of a Bank Guarantee issued by any nationalized bank within 60 calendar days after completion of Goods delivery. The Bid Security in form of Bank Guarantee as per the Purchaser's format given in Form: 5. PBG is in form of Bank Guarantee, the issuing bank should be advised to send a direct confirmation of issue of irrevocable Bank Guarantee to the Purchaser. PG could also be in the form of NSCs / FD pledged in favour of the Institute.

The bank guarantee shall be given for 10% of the total cost for the project.

2.1.2 Performance Bank Guarantee shall remain valid for 5 Years from the date of successful completion of Product delivery Installation & Commissioning at DEI Site. No interest shall be paid by the Purchaser on the Bank Guarantee deposited by the Bidder.

2.2 **Return on Investment (RoI):** The vender/bidder will develop a Return on Investment plan for four years on plant/plants of their choice from Annexure II, which has to be actually demonstrated

2.3 **Low Cost Technology Preference**: The vender/bidder will suggest viable low cost technology to reduce the overall cost of the project and running cost of the project. Such vender /bidder will be given preferential treatment.

2.4 **Greenhouse, Mist house, seed sapling propagation unit and Data logging cum training center**

a. Structure – Will be made of Bamboo. Erection of structure will be undertaken by the Institute.
b. Cladding, fitting of solar panels, installing climate control system, various sensors, electric wiring, fogging, irrigation system, fixing of vertical farming, aeroponics, fogponics and other paraphernalia to make the greenhouses operational will have to be undertaken by the vender/ bidder.

General Instructions

2.5 **EOI Validity**

2.5.1 EOIs submitted by Venders shall remain valid for acceptance for ninety (90) calendar days from the next day of the last date mentioned in event date. An EOI valid for a shorter period may be rejected by the Purchaser as being non-responsive.

2.5.2 In exceptional circumstances, the Purchaser may solicit the Venders' consent to an extension of the EOI validity period. The request and responses thereto shall be made in writing. If a Vender accepts to prolong the period of validity, the Bid Security shall also be suitably extended. A Bidder may refuse such request which will not lead to forfeiting its Bid Security. A Bidder granting the request will neither be required nor permitted to modify its Bid.

2.6 **Cost of Bidding**

2.6.1 The Bidder/ Vender shall bear all costs associated with the preparation and submission of the EOI and any subsequent events/activities of Bidder related to this document.

2.6.2 The Purchaser will in no case be responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

2.7 **Language of EOI**

The EOI, as well as all correspondence and documents relating to the EOI exchanged by the Bidder and the Purchaser, shall be written in English. Supporting documents and printed literature that are part of the EOI may be in another language provided they are accompanied by an accurate translation of the relevant passages in English, in which case, for purposes of interpretation of the EOI, such translation shall govern.

2.8 **Bid Prices (Applicable only after EOI finalisation)**

Unless otherwise specified in the Scope of Work, Bidders shall quote for the entire Services on a Single Responsibility/ Turnkey basis such that the total Bid price covers all the obligations of the Bidder mentioned in or to be reasonably inferred from the Tender Document in respect of providing the product/services. This includes all requirements under the Bidder's responsibilities for successful implementation as per Scope of Work and, where so required by the Tender Document, the acquisition of all permits, approvals etc. and such other items and services as may be specified in the Tender Document, all in accordance with the requirements of the General Conditions of Contract.

2.8.1 Bidders are required to quote the price for the required items as per Scope of Work specified.

2.8.2 Bidders shall give a break-up of the prices in the manner and detail as asked for in the Price Bid given in failing which the Purchaser shall reserve the right to assume/extrapolate the prices for the item/services for which the price has not been quoted and the same will be binding on the Bidders. Responsibility for including all applicable taxes, duties and levies in the Bid lie with the Bidder and the Purchaser shall not be responsible for any error/omission on the part of the Bidder.

2.8.3 The taxes, duties and levies shall be indicated by the Bidder in the Price Bid and shall be quoted as the rates in force as on seven (7) calendar days prior to the last date of Bid submission as mentioned in event sheet. The total price quoted by the bidder should be inclusive of all taxes.

2.8.4 The prices/rates quoted by the Bidder shall remain firm (fixed) during the entire Contract Period and shall not be subject to any escalation/variation on any account, unless otherwise explicitly provided. A Bid submitted with an adjustable/variable price quotation will be treated as non-responsive and hence maybe rejected.

2.9 **Bidder to obtain his own information**

2.9.1 The Bidder shall for all purposes deemed to have independently obtained all necessary information for the purpose of preparing his EOI. The correctness of the details given in the Tender Document is for guideline information only, to help the Bidder prepare his EOI. The cost of visiting the sites shall be borne by the Bidder. Non-familiarity with the site conditions will not be considered a reason either for extra claims or for not providing services in strict conformity with scope and special conditions of the contract.

2.10 Clarification on Tender Document

2.10.1 Bidders requiring any clarification on the Tender Document may notify the Purchaser (at its postal/e-mail address given in Event Date) in writing not later than 1 day before the last date of EOI submission. Similarly, if a Bidder feels that any important provision in the documents is unacceptable, such an issue should be raised at this stage. The Purchaser will respond during pre-bid conference (date, time and venue will be as mentioned in Event Date) to any request for clarification or modification of the Tender Document. Authorized Representative of the Bidders will be allowed to attend the pre-bid conference. Personal queries from individuals shall not be entertained.

2.11.2 If deemed fit, written copies of the Purchaser's response (including explanation of queries without identifying its source) will be sent after pre-bid conference to all the Bidders in the form of addendum/corrigendum.

2.11 Amendment of Bidding Document

2.11.1 At any time prior to the deadline for submission of the EOIs, Purchaser may modify the Tender Document by issue of an addendum/corrigendum.

2.11.2 In addition, Purchaser may issue addendum/corrigendum to the Tender Document to make/reflect amendment(s) in terms & condition or Scope of Work specified in this Tender Document.

2.11.3 Any such addendum/corrigendum will be made available at the AGRA DEI website. No separate other communication in this regard shall be made with any Bidder. It will be the responsibility of the Bidder to regularly visit the website to keep themselves updated on such changes.

2.11.4 No clarification obtained through verbal communication by the Bidders from any officer, agent or employee of the Purchaser or any staff of the Program Management Consultant will be deemed as addendum/corrigendum to the Tender document.

2.11.5 The Purchaser, at its discretion for any reason whether at its own initiative or in response to a clarification requested by a bidder may add, modify or remove any element of the services of goods.

2.11.6 In order to provide Bidders / Venders reasonable time to take the addendum/corrigendum into account in preparing their EOIs, the Purchaser may, at its own discretion, extend the last date of Bid submission. In such an event, Bidders shall not be entitled to any compensation, in any form whatsoever.

2.12 General Instruction for Bid Preparation

2.12.1 The Bidders are advised to submit their EOIs complete in all respect. The Bidder shall submit a comprehensive list of attached forms/declarations/certificates etc. in response to Tender Document.

2.12.2 The Bidders in their own interest are advised to be very careful while writing quantity and rates in Price EOI. The quantity and rates should be written very neatly, preferably typed, and there should be no overwriting or corrections. In case there are some corrections or overwriting, the same should be signed by the Authorized Signatory. The quoted prices shall be inclusive of statutory taxes, duties and other levies.

2.12.4 The Scope of Work specified in this Tender Document shall be executed strictly in accordance with the conditions specified in the General Conditions of Contract and other conditions specified in various sections of this Tender Document. If any of the aforesaid conditions is not clear to a Bidder, clarification may be sought from the Purchaser as per the provisions of clause 2.10 (Clarification on Tender Document).

2.12.5 The Bidders must accept all the conditions specified in the Tender Document to facilitate early finalization of Bids. Separate set of commercial conditions (such as Bidder's standard printed conditions) enclosed with the offer and any reference thereto may prevent the Bid from being considered by the Purchaser.

2.13 Preparation of EOI/Proposal

2.13.1 Bidder may only submit one Bid/Proposal. If Bidder submits or participated in more than one EOI, such EOIs shall be disqualified.

2.13.2 The EOI/Proposal as well as all related correspondence exchanged by the Bidders and the Employer shall be written in English language, unless specified otherwise.

2.13.3 In preparing their EOI/Proposal, Bidders are expected to examine in detail the documents comprising

the EOI. Material deficiencies in providing the information requested may result in rejection of a EOI/Proposal.

2.13.4 The EOI shall not include any financial information. A Technical Proposal containing financial information may be declared non–responsive.

2.14 Corrupt Practice

2.14.1 The Purchaser requires bidders, SI, and contractors to observe the highest standard of ethics during the execution of such contracts.

The following definitions apply:

2.14.1.1 Corrupt practice means the offering, giving receiving, or soliciting, directly or indirectly, of anything of value to influence the action of any party in the procurement process or the execution of a contract.

2.14.1.2 Fraudulent practice means a misrepresentation or omission of facts in order to influence a procurement process or the execution of a contract.

2.14.1.3 Collusive practices mean a scheme or arrangement between two or more bidders, with or without the knowledge of the DEI, designed to influence the action of any party in a procurement process or the execution of a contract.

2.14.1.4 Coercive practices means harming or threatening to harm, directly or indirectly, persons, or their property to influence their participation in a procurement process, or affect the execution of a contract.

2.14.2 The Purchaser will reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent collusive or coercive practices in competing for the Contract.

2.14.3 The Purchaser will sanction a party or its successor, including declaring ineligible, either indefinitely or for a stated period of time, to participate in projects if it at any time determines that the Bidder has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for, or in executing, a DEI contract.

2.14.4 Furthermore, Bidders shall be aware of the provision stated in clause 3.15 (Termination of Contract) of the General Conditions of Contract.

2.15 Conflict of Interest

2.15.1 Bidder shall hold DEI's interest paramount, without any consideration for future work and strictly avoid conflict with other assignment or their own corporate interest.

2.15.2 Bidder should not be engaged in any such business (excluding any work assigned to them by DEI) which has conflict of interest with the project for which the EOIs are being submitted.

2.15.3 DEI considers a conflict of interest to be a situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations, and that such conflict of interest may contribute to or constitute a prohibited corrupt practice. A Bidder may be considered to be in a conflict of interest with one or more parties in this bidding process if, including but not limited to:

Receive or have received any direct or indirect subsidy from any of them; or have common controlling shareholders, or Have the same legal representative for purposes of this EOI, or Have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the EOI of another Bidder, or Influence the decisions of the DEI regarding this bidding process.

2.15.4 Bidders have an obligation to disclose any situation of actual or potential conflict that impacts their capacity to serve the best interest of Purchaser, or that may reasonably be perceived as having this effect. If the Bidder fails to disclose said situations and if the Purchaser comes to know about any such situation at any time, it may lead to the disqualification of the Bidder during bidding process or the termination of its Contract during execution of assignment.

2.16 Right of Purchaser to Accept or Reject EOIs

2.16.1 The Purchaser reserves the right to accept or reject any EOI, and to annul the bidding process and reject all EOIs at any time prior to award of Contract, without thereby incurring any liability to the affected

Bidder or Bidders or any obligation to inform the affected Bidder or Bidders of the grounds for the Purchaser's action.

2.16.2 The right to accept the EOIs in response to this Tender Document will rest with the Purchaser. The Purchaser further does not bind himself to accept and reserves the authority to reject any or all the EOIs received without assigning any reason whatsoever.

2.17 EOI Opening

2.17.1 Time for opening the EOIs. The EOIs will be opened as per dates given in the portal.

2.17.2 The submitted EOIs must be readable through open standards interfaces. Unreadable and or partially submitted EOI files will be considered incomplete and rejected for further EOI evaluation.

2.18 EOI Evaluation

2.18.1 The evaluation process of the EOI document, proposed to be adopted by the Purchaser is indicated under this clause.

2.18.2 Evaluation Qualification EOI

a) First the Pre-Qualification Proposal will be evaluated and only those bidders who qualify the requirements will be eligible for next set of evaluations. Technical Proposal of Venders / Bidders, who do not meet the Pre-Qualification criteria will not be opened.

b) Documents and required forms submitted by the bidders as part of the Pre-Qualification criteria will be opened and evaluated for compliance in this stage of evaluation.

2.18.3 Evaluation of Technical EOI

Kindly add support documents like design sheets, data sheets, certificates whatever necessary to support your technical EOI

a) Only those Bidders, who meet all the pre-qualification criteria stated above, shall be asked to submit Techno-Commercial Bid. DEI will review the documents of the bidder. Evaluation shall be on the basis of technical specifications proposed subject to compliance with requirements. EOIs that are not substantially responsive are liable to be disqualified at DEI discretion.

b) In order to assist in the examination, evaluation and comparison of EOIs, the Purchaser may at its discretion ask the Bidder for a clarification regarding its EOI. The clarification shall be given in writing immediately, but no change in the price shall be sought, offered or permitted. Bidder should fill and upload following required documents, which has to be used in Technical Evaluation.

2.18.4 **Pre-Qualification Criteria:**

1	a) The bidder should be a registered entity for at least 3 years while providing products/services to Govt Sector/Institutes. b) Consortium is limited to three members only, out of which any one partner will satisfy 1(a) and only one will be lead bidder.	a) Certificate of Incorporation/Registration b) Consortium Agreement to be furnished
2	The Bidder or Consortium should have developed and deployed Centre of Excellence /Remote Labs / Greenhouse /Turn Key Projects in Industries/ Government / private organizations in India, of min value of `400 Lakh in not more than three work awards/ purchase orders.	Work order or Purchase order of the same to be Submitted as documentary evidence
3	The Bidder or Consortium should have delivered Remote access/Cloud based electrical infrastructure solutions and Controls / Automation/Virtual Instrumentation based software solutions to Utilities/ Government / private organizations in India for the last 3 preceding years' work awards/ purchase orders to be provided.	Work order or Purchase order of the same to be Submitted as documentary evidence
4	The Bidder or Consortium should have delivered IIOT/SCADA Based Solutions to Govt Sector/industries	Work order or Purchase order of the same to be Submitted as documentary evidence

5	The bidder shall not have been blacklisted by any Government agencies/ Utilities/ Departments at the time of bidding.	a) A self-declaration by the Bidder as per format specified to be submitted. b) In case of consortium, each member will need to submit the declaration.

EOI "HITECH MULTI-CLIMATIC GREENHOUSES"	
Evaluation Criteria	**Points**
(i) Specific prior Experience of the Bidder - Bidder in its name should have in the last Three years.	
a) Has successfully deployed or implemented across Government / Semi Government / private organizations of value not less than ₹400 Lakhs on deployment of complete or part of this solution across all installations in a single order.	30
If the value is between ₹200 to ₹400 Lakhs	10
b) Has implemented or deployed 3 or more projects / Trainer modules related to at least 5 of the following technologies:Electrical Utilities, Solar, Motor Generator systems, Greenhouse, simulation, Cloud infrastructure.	20
If less than 3 projects with combination of at least 3 technologies but more than 3 projects	10
Sub- Total	50
(ii) Training Centre CAPABILITIES	
a) Has successfully deployed or implemented projects related to LabVIEW more than 100 Lakhs in Govt Research Institutes / IITs / NITs / Deemed Universities	10
If the value is between 50 to 100 Lakhs	5
b) Has developed learning modules and content for Technical training programs of Govt/Private organizations	5
c) Has developed monitoring platform software to represent Climatic Zone Creation in Greenhouse	5
SUB- TOTAL	20
(iii) Qualifications and Competence	
a) Has filed patents or published papers in reputed national/international conferences/journals on topics related to this project	15
b) Has delivered at least 3 IT Infrastructure solutions	10
c) Has delivered solutions related to Teaching &Training OR Monitoring/SCADA system related to this project	5
SUB- TOTAL	**30**
TOTAL	**100**

Annexure-I

Scope of Work

Scope of Work: Hitech Multi-Climatic Greenhouses

TYPE AND QUALITY OF MATERIALS AND WORKMANSHIP:

The Design, Engineering, Manufacture, Supply, Installation, Testing, Software Source Code based on LABVIEW and performance of the equipment shall be in accordance with latest appropriate IEC/Indian Standards. Project to be completed within **350 Days** from the Award of the contract and also maintain digital mode of communication in the form of PERT/BAR chart reporting structure to track the project progress on timely basis.

The specifications of the components should meet the technical specifications mentioned in all Section below. Any supplies which have not been specifically mentioned in this Contract but which are necessary for the design, engineering, manufacture, supply & performance or completeness of the project shall be provided by the Bidder without any extra cost and within the time schedule for efficient and smooth operation and maintenance of the plant.

Note: All Design Documents & Soruce Codes Based on LABVIEW to be handed over to DEI after project Completion & Training.

Proposed site view of the proposed project

GREEN HOUSE AND SUPPORTING SEED PROPOGATION CHAMBER & MIST HOUSE & MAINTENANCE SHED SPECIFICATIONS:

1.0 Tropical Climatic Zone (Temperature 20-25°C, Humidity 40-70%) Each 800sqm Each (20m*40m)

2.0 Cold Climatic Zone (Temperature 10-14°C, Humidity 30-60%) Each 800sqm Each (20m*40m)

3.0 Monsoon Climate Zone (Temperature 22-30°C, Humidity 70-95%) Each 800sqm Each (20m*40m)

4.0 Seed Propagation Chamber with Conveyor & Automatic Fertigation control Each 130 Sq. m

5.0 Mist House with QI -Index Measurement Each 120 Sq. m

6.0 Bamboo Maintenance Shed to place Agriculture Equipment's Each 130 Sq. m

Appropriate Chillers & Heating Control Units to be used to create the climatic zones in the Greenhouse.
45% >& Above Transparent Solar Panels to be installed /Erected on top of the Greenhouse up to 180KW total Power Generation capacity. 800sqm will be divided into 100sqm*3 internally for Hydroponics, Aeroponics, Fogponics & Vertical Farming facility in all 3 Green Houses.36 CERAME

GREEN HOUSE EQUIPMENT'S WITH FITMENT ACCESSORIES: FOR REGULAR CULTIVATION WORK

- Horizontal 4 stroke single cylinder water cooled diesel engine OHV
- Combustion Chamber: Direct injection (DI)
- Max. Torque: 4.2 kg-m/1600 rpm
- Max. HP as per IS 13539 1996: 13.0 HP @ 2400 rpm
- SFC (Specific Fuel Cons): 190g/hp/hr
- Governor System: Mechanical, Centrifugal type
- Cooling System: Condenser Type Thermo siphon cooling system
- Starting System: Hand cranking
- Lighting System: 12 Volts/35 Watts
- Std. Pulley (DIA): 100 mm/optional 120 mm
- Dry Weight: 125 Kgs
- All type of Fitment & Connecting Accessories suitable for Green House Works

SOFTWARE, SENORS & DATA ACQUISITION:

SL.NO	PRODUCT DESCRIPTION	QTY
01.	Power Supply Set for Sensors & its fitment accessories 5V,12V,24VDC	60 Sets
02.	Industrial Grade PC I7 with WIFI Transceiver Product to Comply the following standards UL60950-1, 1999/5/EC* and 2014/53/EU	05
03.	IOT Enabled NI based cDAQ DAQ Based SCADA Modules: Product to Comply the following standards • IEC 61010-1, EN 61010-1 • UL 61010-1, CSA 61010-1 • EN 60079-0:2012, EN 60079-15:2010 • IEC 60079-0: Ed 6, IEC 60079-15; Ed 4 • UL 60079-0; Ed 5, UL 60079-15; Ed • CSA 60079-0:2011, CSA 60079-15:2012,2014/35/EU; Low-Voltage Directive (safety) • 2014/30/EU; Electromagnetic Compatibility Directive (EMC) • 94/9/EC; Potentially Explosive Atmospheres (ATEX)	08
04.	Green House Air Vent Open/Close Fitments	60
05.	Software GIS, Plant Growth Monitor, LabVIEW Licenses 50 user Academic BUNDEL	01 Set
06.	Wiring, Electrical Motor Control Panel up to 5HP	01 Set
07.	Cloud Software Central 50 user License Pack	01 Set
08.	Climatic Zone Simulator 50User License Pack – Academic use Version	01 Set
09.	3 phase sockets with switch	30
10.	CPU power socket with switch	50

11.	5v supply PCB board	30
12.	Relay card up to 128 Channel	04 Set
13.	2 din pin connector male and female	10
14.	Plug type male and female connectors	10
15.	IP65 box 160mm*120mm*60mm or higher	30
16.	Temperature & Humidity Sensor Duct Mount Output RS485	12 Sets
17.	Atmos Pressure sensor, AQI Sensor Rf/Ethernet /RS485	06 Sets
18.	CPU power socket with switch	6
19.	5v supply PCB board	6
20.	2and 3 din pin connector male and female	6
21.	IP66 box 120mm*160mm*40mm or higher	6
22.	LED RGB with Dimmer controls 30-60W (SCADA Controlled)	120 Sets
23.	Lux and solar radiation sensors	09 Sets
24.	Water quality Sensor	09 Sets
25.	Level sensor	03 Sets
26.	Flow and Soil Moisture sensor	30 Sets
27.	Temperature & Humidity Sensor Plug & play Type RF/WIFI Enabled	03 Sets
28.	Signal conditioning boards for Isolation & Protection	12 Sets
29.	5v supply PCB board	6
30.	omega connectors male and female	12
31.	SCADA Controller	w.r.t requirement
32.	Image Processing & Neural Network Computational Plant Life Cycle Analysis 1 User license	01 Set
33.	Humidifier & Temperature PID Control Unit	06 Sets
34.	Carbon dioxide, Oxygen, VOC sensor	06 Sets

1. Height of MCPH -6 m to 7 m (Normally 6.5 m)
2. Height of Gutter– 4 m to 4.5 m (Normally 4.5 m)
3. Height of Top Vent- 1m(or 10% area of covered area whichever is higher)
4. Bay Size-8 m x 4 m.
5. Corridors – Maximum 2m all sides for area calculation.
6. Type -Saw tooth design.
7. Shape – Aero dynamic
8. Structure –Hot Dip Galvanized structure. Galvanization of the structural members of BIS standards and should not be less than 300 GSM.
9. Stability of Structure – Structure should with standminimum wind speed of 150 km/hr.

POLYCARBONATE		
Sr. No.	**Description**	**Specification**
1.	Multi-layered Polycarbonate sheet.	**Fixed properties**- <200 micron thick, UV stabilized, UV blocking IR Reflective Cooling, diffused, Anti dust, Anti drip. **Optional property**-Anti sulphur for the crops where sulphur consumption is high.

NETS		
Sr. No	**Part Name**	**Description**
1.	40 mesh insect net to all four sides of curtains	UV Stabilized, 2.5 m width (height) (for vegetables & flowers) minimum 25 % of floor area. The stitching below 3.2 m width are not allowed.
2.	Shade Net (On top underneath polythene/Polycarbonate)	Thermal net / Aluminet operated through manual gear pulley system. Gear wire manual operation system with rotary handle having ball bearings. Shade Nets 40/50/75 percent based on crop requirement of any colour.
3.	30 mesh insect net	UV stabilized to be fixed at top vent

Note

1. The width of insect net srolls available is 3.6 meter or more. The stitch in below 3.6 meter is not permitted. Above 3.6m, if needed, the double stitching shall be done with machine using UV stabilized thread.

SPECIFIC REQUIREMENTS:

Sr.No	Particulars	Description
01	Bottom apron	UV stabilized woven polythene/Polycarbonate160 GS Manda height of 1m above ground and 50 cm buried below ground (Total width 1.5 m) with profile spring assembly on all the four sides on the top.
02	Side wall curtain	Insect net 40 mesh fixed and polythene/Polycarbonate movable fitted to curtain pipe with plastic / GI clamps and supported by GI guard 20 / 22 mm OD pipes 2.0 mm thick on corridor pipes

MI COMPONENT:

S. No.	Description of Items	Unit	
		Sqm	**800**
A	**Drip System**		
1	Main and Submain Line PVC 63 mmx4kg/cm^2	Meter	48
2	Main Line PVC 75 mmx4 kg/cm^2	Meter	0
3	16 mm LLDPE Lateral line CL-2	Meter	70

4	Inline 16mm, 1.3 to 2.4LPH @ 20-40 cmCL2	Meter	1500
5	Ball Valve 63 mm (MouldedSeal, Plain)	Nos.	2
6	Ball Valve 75 mm (MouldedSeal, Plain)	Nos.	0
7	Sub main Flush Valve 40mm	Nos.	2
B	**Fogging System**		
1	Main and Sub mail Line PVC 50 mm x 6kg/cm^2	Meter	42
2	Main and Sub mail Line PVC 63 mm x 6kg / cm^2	Meter	0
3	16 mm LLDPE Lateral line	Meter	400
4	4 wayFogger Assembly with HPLPD	Nos.	96
5	Ball Valve 50mm (Teflon Seal, Plain)	Nos.	1
6	Ball Valve 63mm (Teflon Seal, Plain)	Nos.	0
7	Sub main Flush Valve 40mm	Nos.	2
8	GI Wire 2 mm thick	Meter	350
C	**Filtration Unit**		
1	Disc filter25 m3/hr	Nos.	1
2	Disc filter40 m3/hr	Nos.	0
3	Sand filter/Hydrocyclone filter 10 m3/hr	Nos.	1
4	Sand filter/ hydrocyclone filter 25m3/hr	Nos.	0
5	Sand filter/ Hydrocyclone filter 40 m3/hr	Nos.	0
6	Mani fold GI +GMV/HDPE	Nos.	1
7	Ventury Assembly Complete	Nos.	1
8	Air Release Valve Assembly1"	Nos.	1

FAN AND PAD COOLED SYSTEM:

1. Corridors – Maximum 2m all sides for area calculation.
2. Shape – Aero dynamitic
3. Structure – Hot Dip Galvanized structure. Galvanization of the structural members of BIS standards and should not be lessthan 300 GSM.
4. Stability of Structure – Structure should with stand to minimum wind velocity of 150 km/hr.
5.

S.No.	Particulars	Description
1.	Multi-layered Polycarbonate/Polythene film	**Fixed properties**- 200 micron thick, UV stabilized, UV blocking IR Reflective Cooling, diffused, Anti-dust, Anti-drip. **Optional property**-, Antisulfur for the crops where sulfur consumption is high. For rose cultivation (As per farmer choice)
2.	Automated	Humidity and temperature control inside the Green house

NETS		
SrNo	**Part Name**	**Description**
1.	Thermal Shade Net (On top underneath polythene/Polycarbonate)	Thermal Net: -Thermal net inside greenhouse 50% with nylon support cables, pulleys, side support with clamps, plastic clamps etc. with manual gear pulley system
2.	40 mesh insect net	Insect net 40 mesh on outside Cooling Pad to prevent the entry of insect from cooling pad

Fans and Pad for cooling system		
Sl.No	**Part Name**	**Description**
1.	Fans	Exhaust fans of 50"withHot Dip Galvanized body, 1.5hpmotor3phase, beltdrivewithlouvers in each bay of 8m. The height of the fans is to be determined based on the plant height which is proposed to be grown in the greenhouse. The fan blades and frame are to be made of non-corrosive materials like aluminum / stainless steel. The fan to pad distance should not exceed 40 m. The air flow rate should be of 75 cubic meter / minute / sq.mof pad. The water flow rate should be of 9 litre per minute/linear meter pad. The uniform distribution of water on pad is to be maintained.
2.	Cooling Pad (BIS specifications)	Cellulose cooling pad of size 1.8 m width and 0.1 m thickness alongwith Hot Dip Galvanized water collecting gutter, profiles to fix pads, PVC water distribution system, pump complete
3.	Civil work	Construction of brick wall in CM1:4,0.3 m thick,0.9 m height above ground and 0.45 m below ground, 32 m long for cooling pad side and 0.15 m thick 0.2 m height above ground and 0.2 m below ground at three sides with duly plastered on both sides.
3.	Electrical control panel	Consisting of MCB, Relay, switches, RYB Indicator, panel, Voltmeter, MS body duly painted etc. (for fan and pad). All the electrical gadgets and appliance used must meet BIS standards
4.	Water tank	Multi layered plastic water tank 2000 lits. X 2no., for cooling pad 1000 l - 1008 m^2 2000 l - 2080m^2 4000 l – 4000m^2
5.	Climate control system	
A	Fan Pad System	✓ Numbers of fan depends upon size of Fan-fad house,and it should be capable of exhausting air volume in one minute. ✓ Exhaust Fans – 50"however it depends upon size of fan-pad house with louvers, 1.5 HP – 3 phase ISI standard electric motor. ✓ Cellulose cooling pads of 1.8 meter with 100 mm / 150 mm thickness covering the area properly, PVC water distribution system, screen / disc filter, valve, and pumps, etc. ✓ Control panel with manual operation, temp and humidity sensors. ✓ The necessary digital controller with sensory device & accessories of standard quality as per requirement should be provided to operate the fan & pad system for controlling temperature& humidity inside the Green house.

B	Fogging System	✓ In consist of four-wayanti-leak fogger 28 of flow rate (working pressure should be mentioned at which we will be able to get required particle size, fogger spacing along the lateral and lateral spacing) and particle size 80-100 micron, 16 mm lateral class-3, PVC pipe 6 kg / cm2, valves, filter, pump, panel with volt meter, MCB, relay, temp and humidity sensor etc. complete application rate 3 mm/hr.

SPECIFIC REQUIREMENTS:

S.No.	**Description of Items**	**Unit**	
		Sq m	**800**
A	**Drip System**		
1	Main and Sub-mainline PVC 63 mmx4kg/cm^2	Meter	48
2	Main Line PVC 75 mmx4 kg/cm^2	Meter	0
3	16mmLLDPELateral line CL-2	Meter	70
4	Inline 16mm, 1.3 to 2.4LPH @ 20-40 cmCL2	Meter	1500
5	Ball Valve 63 mm (MouldedSeal, Plain)	Nos.	2
6	Ball Valve 75 mm (MouldedSeal, Plain)	Nos.	0
7	Sub main Flush Valve 40mm	Nos.	2
B	**Fogging System**		
1	Main and Sub mail Line PVC 50 mmx6kg/cm^2	Meter	42
2	Main and Sub mail LinePVC 63 mmx6kg/cm^2	Meter	0
3	16mmLLDPE Lateral line	Meter	400
4	4 wayFogger Assembly with HPLPD	Nos.	96
5	Ball Valve 50mm (Teflon Seal, Plain)	Nos.	1
6	Ball Valve 63mm (Teflon Seal, Plain)	Nos.	0
7	Sub main Flush Valve 40mm	Nos.	2
8	GI Wire 2 mm thick	Meter	350
C	**Filtration**		
1	Disc filter25 m3/hr	Nos.	1
2	Disc filter40 m3/hr	Nos.	0
3	Sand filter/hydrocyclone10 m3/hr	Nos.	1
4	Sand filter/hydrocyclone filter 25m3/hr	Nos.	0
5	Sand filter/hydrocyclone filter 40 m3/hr	Nos.	0
6	Manifold GI+GMV/HDPE	Nos.	1
7	Ventury Assembly Complete	Nos.	1
8	Air Release Valve Assembly 1"	Nos.	1

TRANSPARENT SOLAR PANEL (SPV) ELECTRICAL CHARACTERISTICS: 180 kW (size of plant)

Poly/mono crystalline module of 150 Wp or higher with at least 45% transparency, high performance efficiency, highly resistance to water, abration, hail impact, humidity and other environmental factors. Designed and manufactured to comply with international standard.

(Please specify the make and specification of the modules. Attach a data sheet of the modules)

RATED POWER (Watt): **150- 170**

OPEN CIRCUIT VOLTAGE-Voc (Volt) 23.5

MAXIMUM POWER VOLTAGE-Vmp (Volt) 19.2

SHORT CIRCUIT CURRENT-Isc (Amp) 9.50

MAXIMUM POWER CURRENT-Imp (Amp) 8.90

TRANSPARENCY: at least 45%

OUTPUT TOLERANCE (%) ±5

CELLS 36

CELL LAYOUT 9 x 4

ELECTRICAL CONNECTION

JUNCTION BOX IP 67

OUTPUT CABLES 4mm

CONNECTORS MC4 Compatible

PROTECTION SCHOTTKY

GENERAL

FRAMES ANODIZED ALUMINIUM

BACK SHEET TRANS

LOCKING CORNER KEY TYPE

MECHANICAL CHARACTERISTICS

MODULE DIMENSIONS (mm) 1968 *987

WEIGHT (KG, APPROX) 21

WARRANTY

Module warranty (25 years) and (efficiency) >16%

MOUNTING STRUCTURE, BATTERY & INVERTER SPECIFICATIONS:

MODULE MOUNTING STRUCTURE:

The mounting structure shall have to be designed by the Contractor after spot verification. The module mounting structure is required to be made of hot dip galvanized MS/ treated Bamboo/Aluminum angles of required size for MS size 50 mm X 50 mm X 6 mm as per requirement. The thickness of galvanization in case of galvanized MS is 80 microns. All the nuts, bolts are made of good quality SS. Modules shall be mounted on the tin/Diana rooftop of three adjacent buildings. The height of the buildings is above 35feet having steel structure. Facilities must be provided for cleaning of modules by providing water pipes and tap for every row or column and stair (MS) must be provided to reach each rooftop. Space must be provided in between rows for proper maintenance and cleaning. Mounting Structure must be designed to withstand all weights of modules and cleaner and to withstand wind speed of 150km/hr. Tilt angle of modules south facing should be 22-degreeadjustment, and therefore array should be designed to have uniform tilt from top to bottom row and if necessary additional structure be provided. Aluminum/MS clamps, bracket, L foot hook or any other items required must be of good quality. Anti-theft Nut& Bolts must be used for modules

TECHNICAL SPECIFICATION OF MODULE MOUNTING STRUCTURE:

Specification: As per IS Mounted frame parallel to sloped roof surface:

Structure to be capable of withstanding a wind load of 150 km / hr

Angle of inclination designed to suit site requirement. Since the base structure is made of bamboo, the mounting structure details may be understood well by site visit.

ARRAY SUB JUNCTION BOX & MAIN JUNCTION BOX :

The Array Junction boxes shall be dust, vermin and waterproof and made of FRP / powder coated Aluminum with full dust / ABS / Thermo Plastic. The Junction Boxes confirms to IP 65 standard and IEC 62208. J. Bs have hinged door with EPDM rubber gasket to prevent water entry. The terminals shall be connected to Cupper bus bar arrangement of proper size. The junction boxes shall have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and outgoing cables. All the wire/cables must be terminated through cable lugs. The J. Bs shall be such that input & output termination can be made through suitable cable gland. Suitable marking shall be provided on the bus bar for easy identification and cable ferrules shall be fitted at the cable termination points for identification. Each J. Bs have suitableearthing provision. It will be placed at 5 feet height or above as per site requirement for easy accessibility. Each Junction Box shall have suitable arrangement monitoring and disconnection for each of the groups.

DC DISTRIBUTION BOARD:

The DCBD shall be provided in between Solar Array and Power Conditioning Unit. It consists of MCCB of suitable ratings for connection and disconnection of array input and also Voltmeters, Ammeters& Charging Discharging Amp Hour Meters. It has LED indication for ON and OFF status as per requirment.

TECHNICAL SPECIFICATION OF DCDB ENCLOSURE MATERIAL:

Sheet Steel Epoxy Powder coated Mounted type: Wall mounting type Cable entry:
Bottom No. of glands with cable size: 6 nos. for 95 sq. mm / 70 sq. mm. cable size MCB: 2 nos.,
400 A DC Am-meter: 1 no. (0 to 150 A) for measuring Solar display
DC Ammeter: 1 no. (-150 to 0 & 0 to +150 A) for measuring Battery Charge & discharge display
DC Volt Meter: 2 no. (0 to 400 V DC) for SPV & Battery DC Ampere Hour Meter: 1 no.
Earthing terminal size: M75 Accessories: as per requirement

TECHNICAL SPECIFICATION OF BATTERY ISOLATION DEVICE:

Fuse: 1 no., 400 A 600 V DC HRC Fuse with DC insulator Fuse Holder: 1 no., 400 A 600 V DC Link Cupper rating: 400 A (-) No of incoming glands with cable size : 02 nos. for 95 sq. mm / 70 sq. mm. cable size

POWER CONDITIONING UNIT (PCU):

As SPV array produces direct current (DC), it is necessary to convert this to alternating current (AC) and adjust the voltage levels before powering equipment designed for nominal mains AC supply. Conversion shall be achieved using an electronic inverter and the associated control and protection devices. All these components of the system are termed the Power Conditioning Unit or simply the PCU. In addition, the PCU shall also house MPPT (Maximum Power Point Tracker), to maximize Solar PV array energy input into the system. PCU refers to combination of Charge controller and inverter and shall be supplied as integrated unit or different units of charge controller and inverter depending on rating & size of the power plant. Maximum Power Point Tracker (MPPT): Maximum Power Point Tracker (MPPT) shall be integrated into the PCU to maximize energy drawn from the SPV array. The MPPT should be Microprocessor / Microcontroller based to minimize power losses. CHARGE CONTROLLER (MPPT /PWM): DC electricity from the array is used to feed inverter as well as charge the battery bank for night time use. The total energy received from the array being dependent upon the availability of sunshine during the day which in turn varies from season to season; there may be occasions when the Power Plant generate surplus energy. Similarly in monsoon season, prolonged overcast sky could cause Battery Bank getting drained beyond the maximum allowed depth of discharge (DOD). To guard against battery overcharge or deep discharge, the charge controller is incorporated. INVERTER: It is a hybrid inverter based on PWM technology. The DSP controller is used for controlling the whole unit in quick time. Input voltage range being 300-700V DC it is ideally suitable for 240 V 3000 AH battery operation. Rating of the inverter one is 125.0 KVA, 240 V DC / 415 (±3%) V AC, 3 phase, 50 (±5%) Hz, sine wave inverter with inbuilt PWM / MPPT Charge controller of rated 300-700 V DC, 125 KW. voltage wave is good quality sine wave. External battery charging facility through AC is also to be provided.

TECHNICAL SPECIFICATION OF THE INVERTER: (125+75KVA) HYBRID INVERTER

1. Rating of the PCU 125 KVA& 75KVA 440 V AC 4 W sine wave with inbuilt MPPT Charge Controller suitable to charge 240 V 2000 AH Battery Bank. Since two inverters are used, they should be properly connected to run in master slave mode. All wiring for proper inverters operation will be done by the vendor.
2. Nominal DC Input Voltage (SPV Array) 300 V -700V DC
3. Low Voltage cut off (SPV Array) 300 V
4. High Voltage cut off (SPV Array) 700 V

5. Nominal DC Input Voltage (Battery) 240V
6. Low Voltage cut off (Battery) 216 V
7. High Voltage cut off (Battery) 300 V
8. Type of Controller MPPT PWM based
9. Switching device IGBT Based
10. Continuous Rating 125 KVA + 75KVA
11. Over Load Capacity 150% for 30 sec. 12. Output wave form Pure sine wave output.
12. Total Harmonic Distortion 90% at full load with Transformer less topology for higher efficiency.
13. Cooling Forced air cooling with temperature-controlled cooling fan
14.. Ambient temperature 0-55°C 19. Humidity range 0-95%
15. LED/LCD Display Display will indicate system major functional parameter like main status, Solar status, Charging status, Battery status. Etc
16.Protection Battery over/ under voltage, Output short circuit, Over load, Phase reversal, Mains high/ low, Voltage cut off, high temperature, Battery wire removal, Reverse flow of current, Input surge voltage, surge current, over/ under frequency
17.Enclosure Rust & moisture resistance sheet metal with powder coating Painting.
18. Efficiency of the inverters should be more than 92% at full load.

DATA LOGGER/MONITORING SYSTEM:

Data logging system may be an integrated part of the inverter or a separate unit. All the relevant information will be stored in a data logger. The inverter will be equipped with an RS485/ RS232, and Ethernet slandered interface. PC based monitoring and data logging system (with software capable of generating various required data).

BATTERY BANK:

240V Battery Bank with Tubular LMLA batteries, in **Transparent SAN containers**, having a storage capacity of 2000AH. The Battery Bank should be comprised of 120 nos. of 2V 2000Ah each (under Standard Test Condition), LMLA Lead Acid Battery (in **Transparent SAN containers**) having long service life (minimum 3 years warranty). Battery Bank connection to the PCU is taken through DCDB for preventing damage to the battery. The Storage Batteries/Battery Bank must conform to the latest edition of IEC/ equivalent BIS Standards as specified below: General Requirements & Methods of Test - IEC 61427. Tubular Lead Acid - IS 1651/IS 13369. TECHNICAL SPECIFICATION OF BATTERY Manufacturer: Exide Industries Ltd./HBL Power Systems/Southern Batteries /Accumulator Manufacturing Company (Others not allowed) Battery Type : Low Maintenance tubular plate lead-acid battery, solar grade in Transparent SAN container. Storage Capacity: 240 V 2000 AH (**@C/10**) Cell Voltage (cell) : 2 Volt Container : SAN (Styrene Acrylonitrile Resin) Transparent container. Efficiency: Amp hour ≥90% and Watt hour≥75% Max Depth of Discharge : 80% Cell cut off voltage : 1.85 V / cell. Electrolyte: Battery Grade Sulphur acid Standard : IS 1651. Accessories : Each Battery Bank will contain suitable wooden rack, hydrometer, thermometer, cell connector and connecting leads etc ,Design Cycle : 1500 cycle at 80 % DOD 4000 cycle at 40 % DOD 7500cycle at 20 % DOD Charge Efficiency : Shall be more than 90% up to 70% state of charge. Rack : Suitable size and adequately strong Battery Rack should be supplied with each Battery Bank

AC DISTRIBUTION BOARD:

Sheet metal Enclosure with powder coating painting having AC MCB / MCCB. ACDB also have LED Indicator. TECHNICAL SPECIFICATION OF ACDB Enclosure material: Sheet Steel Epoxy Powder coated Mounted type: Wall mounting type Earthing terminal size : M20 Cable entry : Bottom No. of glands with cable size : 6 nos. for 70/95 sq. mm. Accessories : per requirement MCB/ MCCB : MCB/ MCCB for connection & disconnection of PCU from load MCB : MCB for power supply to control room & Battery room loads Feeder : Output to control panel through MCB

CABLES:

All the cables are Type : PVC insulated and sheathed Materials : All DC Cables are Copper & AC Cables are Aluminum Working voltage : Up to 1100 V State voltage : 650 V/1.1 KV Color : To suit Red, Black, Blue Temperature : -15 deg. C to + 70 deg. C Standard : IS 1554 part -1/ 694-1990 Cable Size & Schedule : as per attached sheet 10 LIGHTNING AND OVER VOLTAGE PROTECTION SYSTEM: The SPV Power Plant is provided with lightning and over voltage protection connected with proper earth pits. The lightning conductor is made of 20-25 mm diameter, 3000-3500 mm. long GI spike as per provisions of IS. The lightning conductor is

grounded through 25 mm. X 5 mm. thick GI strip with earth pit. There shall be required no of suitable lightning arrestors installed in array field.

EARTHING SYSTEM:

Each array structure of the PV yard should be grounded properly. In addition, the lightning arrestor should also be provided inside the array field. Provision should be kept be provided inside the array field. Provision should be kept for shorting and grounding of the PV array at time of maintenance work. All metal casing/ shielding of the plant should be thoroughly grounded in accordance with IEC acts/ IE Rules. PCU ACDB & DCDB will be earthed properly. Earthing for array and distribution systems and power plant equipments are made with GI pipe and copper flat of suitable size 2000-3000 mm. long 25-30 mm. diameter including accessories and using charcoal and salt as per IS3043. The array structure is grounded to earth pit through 25 mm X 5 mm. copper strip.

FIRE EXTINGUISHER:

BIS standard Portable fire extinguisher with sand bucket and sand pits will be provided in the control room & battery room for fire caused by electrical short circuits.

SPECIFICATION CHANGE OVER SWITCH:

A separate change over switch of 3Ø, 32A 230V should be suitably installed out site of the ACDB to isolate the existing connected load from the SPV system and cater the power to the existingload from conventional/grid line, in case of emergency.

SOLAR WATER DISTILLATION PLANTS/SOLAR STILLS:

4(Four) Numbers of BIS approved quality Solar Distillation Plants of 1000 mm x 1000 mm shall be installed on suitable GI structure. At least two numbers of plastic pots and one funnels are to be supplied along with each Solar Water Distillation Plants/Solar Stills. Proper storage of distilled water should be arranged.

SPECIFICATION OF SAND BUCKETS:

The sand bucket to be wall mounted made from at least 24 SWG sheet with bracket fixing on wall conforming IS 2546. Sand buckets should be with curved bottoms.

SPECIFICATION OF DANGER PLATES :

Danger plate to be installed wherever require as per Indian IE rule. The Danger plate should be vitreous enamelled white on both sides, and with inscription in signal red colours on front side as required. The inscription should be in Manipur (Bengali script) and English. The details specifications are as follows:- 1. Size : 200 mm X 150 mm X 2 mm. 2. Material : M.S

SPECIFICATION OF EXHAUST FAN:

The exhaust fan shall be fitted in the battery room and the control room. The exhaust fans shall be 250 mm in diameter and suitable for AC 230 V, 50 Hz supply. SPECIFICATION OF WIRING MATERIALS Control room wiring to be done by casing capping type 2C x 2.5 Sq. mm PVC insulated 1.1 KV grade Cu wire.

Data logging cum training Centre 185 sq. m.

GADGETS & SERVICES:

Sl. no	Descriptions	Qty
1	**MONITORING ZONE**	
1.1	**MONITORING AND CONTROL ROOM**	**1.00 Set**
1.1.1	Display Screens	**2.00 Set**
2	**Experience Centre Display**	
2.1	**WALL OF FAME**	**1.00**
2.1.1	Display Screens	**1.00**
2.2	**INTERACTIVE FARMING ZONE**	**1.00**
2.2.1	Interactive Display	**1.00**
3	**GENERAL ITEMS AND SERVICES**	
3.10	CCTV + SOUND (AUDIO/VIDEO) SYSTEM	**8.00**
3.20	HVAC AND DUCTING	**1.00 Set**
Sl.no	Control Room & Training Descriptions	**Qty**
1	MONITORING ZONE	
1.1	MONITORING AND CONTROL ROOM	**1.00 Set**
1.1.2	Workstations	**5.00 Sets**
1.1.3	Chairs	**5.00 Sets**
1.1.4	Pedestals	**Based on Requirement**
2	CENTER OF EXCELLENCE	
2.1	LOBBY AND RECEPTION	**1.00**
2.1.1	Reception Table	**1.00**
2.1.2	Wall Installation	**1.00 Set**
2.2	WALL OF FAME	**1.00 Set**
2.2.1	Wall Installations	**1.00 Set**
2.3	WASHROOM	**1.00 Set**
3	TRAINING ZONE	
3.1	TRAINING SESSION ROOM	**1.00 Set**
3.1.1	Tables with Computer & Accessories for Training	**42.00 Sets**
3.1.2	Chairs	**50.00 Sets**
4	GENERAL ITEMS AND SERVICES	
4.10	PARTITIONS	**1.00 Set**
4.20	PAINTING	**1.00 Set**
4.30	ELECTRICAL + NETWORKING	**1.00 Set**

TECHNICAL DETAILS:

Sl. NO	Product Description	Qty
01.	Dell/HP Server Silver/Gold Series Xeon Multicore latest generation processor, 64GB Server RAM, 5TB RAID Solution, redundant power supply, at least 2 Ethernet ports, Network Card Broadcom with Windows server 2016 License to be installed & Its connecting Accessories, 5 year onsite warranty	**01 Set**
02.	Intel i5/ i7, 8GB RAM, 1TB HDD, Win 10 Pro Including Keyboard Mouse &Its connecting Accessories, 5year onsite warranty.	**45 Sets**
03.	24 U Rack for Server &Its connecting Accessories	**01 Set**
04.	Forti Gate 100D Firewall & 24 Port Switches L2 Unmanaged &It connecting Accessories	**01 Set**

05.	Computer Monitors 18Inch & Above including Computer Table & Chair Fixed Type	**45 Sets**
06.	55Inch Display with ethernet option	**03 Sets**
07.	Wifi Hotspot Zone	**04 Sets**
08.	10KVA Online UPS with Battery ,2Hr Back Up	**01 Set**
09.	1KVA Online UPS with Battery ,2Hr Back Up	**01 Set**
10.	Local LAN Network Wiring and Connectivity to Datacenter & Green House Via Fiber	**w.r.t Requirement**

Annexure-II

List of Plants for Greenhouse cultivation

S. No.	Plant name
1	Gerbera (Perennial)
2	Capsicum (Seasonal)
3	Dutch Rose (Perennial)
4	Carnation (Perennial)
5	Orchid (Perennial)
6	Liliums (Seasonal)
7	Gypsophila/ Limonium (Seasonal)
8	Chrysanthemum (Seasonal)
9	Anthuriums
10	Cyclaman
11	Coriander (Seasonal)
12	Cucumber (Seasonal)
13	Muskmelon (Seasonal)
14	Brinjal (Seasonal)
15	Strawberry (Seasonal)
16	Raspberry
17	Broccolli/ English Vegetables/ Leafy Vegetables/ Swiss Chard
18	Cucumbers
19	Asparagus
20	Salad Lettuce
21	Tomatoes Salad type & Cherry type
22	Seedlings / saplings of vegetable crops & flowering plants
23	Medicinal & Aromatic Plants (Patchouli, Asafoetida, Kesar, Majoram, Lavender, Rosemary, Thyme, Basil, Piper longum, Piper chabba
24	Avocados