REQUEST FOR PROPOSAL

Establishment of Aeroponic facilities in Odisha

I. Introduction

The International Potato Center (CIP) was founded in 1971 as a research institution for the development of roots and tubers, providing sustainable solutions to the pressing global issues of hunger, poverty, and natural resource degradation. CIP is a global center, with headquarters in Lima, Peru, and offices in 20 developing countries across Asia, Africa, and Latin America. Working closely with our partners, CIP aims to achieve food security, greater well-being, and gender equity for the poor in the developing world. CIP promotes its mission through rigorous research, innovation in science and technology, and capacity strengthening in root and tuber cultivation and food systems.

CIP is part of the CGIAR Consortium, a global partnership uniting organization dedicated to research for a food-secure future. CGIAR research is dedicated to reducing rural poverty, increasing food security, improving human health and nutrition, and ensuring more sustainable management of natural resources. Donors include countries, foundations, and international entities.

The center is an autonomous entity, with an international board of trustees, established as an international organization in 1971 in Lima. CIP has the status and privileges and immunities of an international organization under its host country agreement with the Government of Peru as well as with various other countries in which it conducts research.

In India CIP is established as a Branch Office under regulation with the Reserve Bank of India to carry out research programs to increase the production and productivity of potato and sweet-potato at the national level in cooperation with the Indian Council for Agricultural Research (ICAR), and its associated research institutes working on potato (CPRI) and sweet-potato (CTCRI). Collaborate with universities and international research organizations to advance agricultural innovations in India and the region.

Potato is one amongst the key crops in Odisha, which is predominated with a rice-based cropping system. Average potato productivity in the state is low as 17 tons/ha, when compared to national average of 24 tons/ha, the reasons traced to multiple and are centred to lack of climate support and inefficient seed system in the region. Despite lower productivity, the state has a potential of up to 40 tons/ha, highlights the importance of quality seeds. Furthermore, availability of quality potato seeds in the state is a key concern and is becoming a challenging in the present climate crisis. To strengthen existing seed system, CIP is working in collaboration with OUAT and is establishing aeroponics facilities in Bhubaneswar (Odisha) for potato mini tuber production with an aim to achieve overall seed sector development in the state. The design specification and terms of reference are detailed below.
II. Object of the contest

List of Items and Specifications:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>PARTICULARS</th>
<th>Quantity</th>
<th>PROPOSED SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Aeroponic facilities</td>
<td>2 units</td>
<td>Detailed below</td>
</tr>
<tr>
<td>2.</td>
<td>Greenhouse</td>
<td>2 Nos</td>
<td>Detailed below</td>
</tr>
<tr>
<td>3.</td>
<td>Multipurpose and Cold chambers</td>
<td>2 Nos</td>
<td>Detailed below</td>
</tr>
<tr>
<td>4.</td>
<td>Additional Works</td>
<td>NA</td>
<td>Detailed below</td>
</tr>
</tbody>
</table>

Deliverables

- a) Providing good quality work as per the quotation submitted without any deviations.
- b) Ensuring quality materials are supplied/used and minimum spare accessories to be given.
- c) Complying with safety regulations.
- d) Handed over facilities, structures and other items by Oct 30, 2024

File No. 1

Design and Specifications of Aeroponics Facility for Potato Minituber Production

By

ICAR-Central Potato Research Institute, Shimla

for

International Potato Centre (CIP), Bhubaneswar (Odisha)
Minituber production facility will broadly consist of following sub-systems –

1. **Entry Chamber** – This chamber, to be constructed with brick-cement-concrete will be main entry point in to the facility. This will be connecting point for the aeroponic units 1 & 2, multipurpose chamber (MPC) and cold storage chamber (CSC). Entry chamber will have a rest-cum-change room, sanitization section, storage of chemicals & instruments, media preparation table and other related activities.

2. **Production systems – Two aeroponic systems** are to be installed under two (fan pad cooled and insect proof) greenhouses having N-S orientation of grow boxes. Greenhouse will have UV stabilized polythene sheet rooftop, insect proof 40/50 mesh netting on sides, covered with rollable polythene sheets for occasional natural aeration for temperature management. Each aeroponic system will have six insulated grow boxes made of polystyrene and fitted with nutrient solution supply & misting system, individual plant holding devices, canopy management system, mechanical crop lifting system, nutrient solution cooling systems, electrical control panels, sensors, actuators and other accessories. A common RO water system will also be installed outside the greenhouse for both the units.

3. **Multipurpose chamber (MPC)** – A multipurpose chamber made of pre-fabricated puff panels with temperature control (2-24° C) and RH control having eight layer racks with LED lights, HEPA filter, control panel, hooter and other accessories. This unit is to be used for *in vitro* plant hardening, minituber greening after harvesting, mini tuber chitting before the time of planting in fields and packaging for supply to the end users.

4. **Cold storage chamber (CSC)** – A mini cold storage made of pre-fabricated puff panels will be installed for final long term storage of mini tubers after greening. This unit will have suitable racks in which greened minituber will be stored using PVC crates and bags. In this unit temperature (2-3 °C) and humidity (85-95 %) will be maintained for proper storage of seed material.
**AEROPONICS UNIT**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Item/ part</th>
<th>Details/specifications/material</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Entry chamber</td>
<td>Entry room of dimensions 7000x5000x3300 mm.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Roof extended 40 mm on all the sides. Roof dimensions 7800x5800 mm.</td>
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<tr>
<td></td>
<td></td>
<td>Inside the entry chamber a rest-cum-change room of size 2700x1500 mm, equipped with all the accessories and an exhaust fan of size 240-300 mm.</td>
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<tr>
<td></td>
<td></td>
<td>Entry room to be constructed using conventional <strong>brick and concrete materials</strong>.</td>
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<tr>
<td></td>
<td></td>
<td>180x90 cm table for lab equipment and chemicals.</td>
</tr>
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<td></td>
<td></td>
<td><strong>Total number of split ACs - 01, 1.5 T</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>(Voltas/carrier/blue star five star rated)</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air curtain on both the doors to green house.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total number of air curtains - 02 SLIDE -2, 5</strong></td>
</tr>
<tr>
<td>B.</td>
<td>Multi-purpose chamber</td>
<td>Multipurpose cold chamber of dimensions of 5000x4000x3000 mm made of pre-fabricated puff panels of thickness 100 mm.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Equipped with suitable industrial cooling system to maintain temp 2-24° C.</td>
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<tr>
<td></td>
<td></td>
<td>Humidifier for maintaining RH up to 90%, in the chamber.</td>
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<td></td>
<td></td>
<td>8 layer stainless steel racks with LED tubes spaced at 20 cm distance.</td>
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<td></td>
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<td>Insulated flooring finished with suitable lining material.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A canopy made of suitable steel columns and trusses and pre-coated rust proof metallic sheets over the chamber extending <strong>60 cm</strong> beyond all the walls.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Cooling systems complete – 02 no.</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Humidifier with controller, 5-7 lph capacity- 01 no.</strong></td>
</tr>
<tr>
<td></td>
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<td>SLIDE 2, 5</td>
</tr>
</tbody>
</table>
C. Cold storage chamber
(Details in file no 4 & 5)

A cold chamber of dimensions 5000x4000x3000 mm made of puff panels of thickness 100 mm and equipped with suitable industrial air cooling system to maintain temp 2-3°C, ultrasonic humidifier for maintaining RH up to 95%, 8 layer stainless steel racks with two LED lights, insulated flooring finished with suitable lining material. A canopy made of suitable steel columns and trusses and pre-coated rust proof metallic sheets to be installed over the chamber extending 60 cm beyond all the walls.

SLIDE – 2, 5

Cooling systems complete – 02 no.

Humidifier with controller, 3-5 lph capacity- 01 no.

D. Aeroponic systems

Aeroponic systems will be installed in TWO HIGH TECH (fan pad cooled) greenhouses SLIDE 2, 3 & 4.

Details of aeroponic units

1. Configuration

Aeroponic systems will be installed in TWO HIGH TECH (fan pad cooled) greenhouses SLIDE 2, 3 & 4.

Six grow tunnels/box in each green house (APU-1 and APU-2) to be installed.

SLIDE 2, 7, 8, 12

APU-1 (3+3 box configuration)

In this unit, there will be two solution tanks. The first three grow boxes will be connected to the solution Tank-1A and the remaining three to the solution Tank-1B. Each grow box will be equipped with a solenoid valve to supply the nutrient solution in the grow boxes one by one.

SLIDE 7, 8, 13, 15.

APU -2 (3+3 box configuration)

In this unit, there will be two solution tanks. The first three grow boxes will be connected to the solution Tank-2A and the remaining three to the solution Tank-2B. Each grow box will be equipped with a solenoid valve to supply the nutrient solution in the grow boxes one by one.

SLIDE – 7, 8, 13, 15

2. Layout

Grow boxes will be along NE-SW direction as indicated in SLIDES 2, 3
3. **Grow box details**  
   All grow boxes will be fabricated in **TWO parts**. Box part A and Box part B. Both A & B overall length **7420 mm** each.  
   A and B boxes will be connected through delivery and drain/return solution pipes.  
   Boxes will be closed from all the sides.  
   *Total length of grow boxes (in APU 1+2) 89.04+89.04 m*

4. **Grow box frame**  
   Boxes to be installed inside steel frames made of GI pipe (20 x 20 x 1.6 mm) as shown in SLIDE 17,18.  
   **Upper collar** (on which canopy stand will rest) will be fabricated using GI pipe of size 40x20x1.6 mm. SLIDES 17,18.

5. **Grow box sides and floor**  
   **Grow box sides and floor** to be made from **25 mm thick, EXTRUDED polystyrene foam**, density 32kg/cub m or more, compressive strength 300-310 k Pa. Sheet size 1250 x 600 x 25 mm.  
   Polystyrene sheets to be sandwiched between steel frame and metal strips (2mm thickness) of width 25 mm with the help of suitable stainless steel fasteners.  
   Boxes will be lined (for leak proofing) from inside with **black polythene** sheet (made from fresh raw material) of thickness 200-250 micron, UV stabilized.

6. **Box top culture panel**  
   Box top culture panels **made of 50mm thick, EXTRUDED polystyrene foam**, density 32kg/cub m or more, compressive strength 300-310 k Pa. Sheet size 1250 x 600 x 25 mm.  
   Panels will be grooved 70x6 mm from sides (SLIDE 17,20,21) and be placed across the length. Top will be covered with 125 cm wide UV proof polythene sheet (minimum 50 micron) with preferably lower surface **black and upper white**.  
   Holes (28/32 per cover sheet) of diameter 31 mm will be drilled and inserted with UV stabilized plant holding inserts SLIDE 22.  
   *(DOW polystyrene panel to be used for fabrication of boxes)*  
   *Total number of box top culture panels – 144+144 = 288*  
   *Total number of plug & jacket inserts required- 10000*
7. Solution chamber
Internal specifications of nutrient solution tank
APU-1 and II (Two tanks each)
Solution tank A  1800 x 900 x1000 mm (L x W x D)
Solution tank B  1800 x 900 x1000 mm (L x W x D)
Both the nutrient solution tanks will have a common wall of 900mm. Tanks are
to be made of bricks plastered and surfaced with vitrified tiles of white/light blue
colour.  **60x60 cm manhole (SS lid covering)** and two holes of diameter 15 cm
each. At the bottom, mini chamber (tank in tank of size **30x30x20 cm**) to be
provided for gathering nutrient solution.
Walls (thickness 25 cm) with one reinforcing of RCC of thickness 15 cm.

**Total number of solution chambers/tanks – 02+02**

8. pH sensing and dosing system
Near the nutrient solution chamber **Two pH sensing systems** along with a dozing
pump and acid solution tank will be installed for round the clock maintenance of
solution pH.
**HANNA PRODUCTS**
BL 981411-1 (pH indicator and controller) with
HI2910 B/5 pH Electrode
**BL 15 Dosing pump 02 number**
Or SIMILAR

9. Nutrient solution pump
Multistage centrifugal pump along with **main line filter** and necessary **valves** for
nutrient solution supply to the plant roots through nozzles.
**Three phase, discharge 2700 lph at 32 m head.**

**SHAKTI SHI/SHN 4-4 (1.0 hp, 3ph, Chambers and all moving parts in contact
with solution made of stainless steel, other parts painted with non-gloss black
paint) OR SIMILAR**
A stand by pump will be installed in all aeroponic units for alternate/emergency
operation. Pumps will be fitted on SS frame.

**Total no. of pumps for nutrient solution supply - 04+04**
**Pump for RO water supply , ½ hp - 01**

**An additional 500 l master solution tank with 1/4hp pump in each greenhouse**
10. **Plumbing, Nozzles & filters**
   Two lines of **hollow cone** misting nozzles (flange type, nonmetallic, with cleanable **cylindrical Stainless Steel** filter of minimum filtering area 300 sq mm) spaced at **50cm** are to be fitted on **25 mm (ID)** PVC pipes inside each growth chamber. Pipes with fitted nozzles will rest over CPRI pipe stand units spaced at **1.2m** (SLIDE 16).

   **Hinged type nozzle holder, quick coupling/threaded cap and hollow cone nozzle 80-90 deg spread angle.**

   Nozzle discharge- **30+ 3 l/hr,**

   Drop size very fine (<136 micro m)

   Nozzle spacing **500 mm**

   Number of nozzles per box/tunnel –60

   **Estimated total no. of nozzles in all the12 boxes 360+360**

   Make of nozzle element **ARAG or TEE JET or similar.**

   **Total main line filters in APU-1 & 2 – 06+06**

   An additional filter will be provided in each solution tank for filtering incoming return solution.

   **Total number of return solution filters – 04 no.**

11. **Solenoid valves**

   Solenoid valves to be installed for operating nozzles of one grow box at a time.

   SLIDE – 8 & 13.

   **Estimated total no. of solenoid valves - 06+06**

12. **Delivery and return solution piping**

   PVC pipes for pressurized delivery (**schedule 40**) of nutrient solution and for collecting back same solution for recirculation.

   A **bypass** connection **having PRV** to be provided for regulating flow to the nozzles.

   Return solution pipe of suitable pressure rating.

   All the pipes will be insulated with insulation pipes of silicon foam rubber (density 0.4-0.45 g/cu cm, elongation 250-300%) or with nitrile rubber tube (closed cell, 9-10 mm wall thickness). Pipe size as indicated in **SLIDE 8 & 10.**

   **Estimated total delivery pipe length 25mm-250 m, 32mm - 20m**
13. **Valves and pressure gauge**
   Nonmetallic ball valves at all necessary points to control flow of solution to different chambers. **Non return valves** to be provided on bypass section to control gravity flow of nutrient solution from supply section.
   Pressure gauges at all the important points to be installed.
   
   **Estimated no of pressure gauges -16 and PRVs -4**

14. **Nutrient solution chilling unit**
   5T capacity water chillers with SS 304 heat exchanger. Safety controls, pipe insulation, filtration unit, canopy covering and other accessories required. Chiller structure will be made of suitable **stainless material**. Installation as shown in SLIDE 28.
   
   **No of units – 02+02** (*Carrier/Blue star or equivalent*)

15. **Plant netting and lifting system**
   Plant canopy netting and potato picking system will be installed to pick up three culture panels as one unit for picking of mini tubers (*SLIDES 23-27*). Each group of three box tops (culture panels) will be provided with SS square section pipe (13mm) frame to install canopy management nets for holding plants upright and for lifting of tops through worm gear operated lifting mechanism.
   
   **Estimated SS pipe required for one frame -12.5 m**
   
   **Total no. of frames – 48+48**
   
   Nylon net of 8x8 cm opening and net tightening SS hooks (2mm) for net installation to be provided for canopy management.
   
   **Quantity of net - 750 sq m, No of hooks -3000**

16. **Note**
   In aeroponic system all the components which come in contact with nutrient solution (except pumps) are to be made of non-reacting materials like SS or plastic or similar materials. In whole structure nut bolts, screws and other fasteners will be of **STAINLESS STEEL**.

17. **Electrical controls:**
   Separate control panels to be installed for aeroponic unit and green house as shown in SLIDE 30.
   
   I. Separately eight channel timers (*Selec/multispan*) for operating one tunnel at a time will be installed. On time and off time may vary from 1-50 sec and 1-60 min. Another stand by timer will be installed in such a way that any timer at any time can be used. Selector switch for switching between auto and manual mode of operation; and another one switch for day and night operation.
   
   **Estimated no. of timers –02+02**
II. There should be provision (switches etc.) for sensor/time activated as well as manual (Bypass) operation (in case of failure of all control equipment like temp controller or timer and contactor) of all the fans and pumps.

III. Display of supply voltage, amperage (current) and frequency.

IV. Display of temp (of nutrient solution tank, grow box, green house and ambient temperature) in main panel. Four temperatures to be displayed.

V. Nutrient solution pumps, solenoid valves, cooling fan and cooling pad pump are to be connected with timer/ temperature controller through suitable contactors.

VI. Contactors – Schneider, MCB - Schneider/Hager, Internal wiring - Lapp/Finolex/ or similar quality make preferably.

VII. LED Lights (6 tubes) in each APU, entry chamber, MPC and cold chamber to be provided.

VIII. Digital over and under voltage protection with surge protection device and neutral failure protection to be provided.

IX. Light indicators as per requirement.

X. Two point earthing with all the structures and grow boxes connected with suitable strip connectors.

18. Spare components/accessories

1. Timers 02 no (besides installed in control panel)
2. Temperature controller 02 no (with sensor)
3. Contactor 02 no
4. Solenoid valves 05 no
5. Panel electrical switch 04 no
6. Styrofoam sheets 05 no 50 mm, 10 no 25 mm
7. Nozzle assembly with filter 10 no
8. Pressure gauge 04 no
9. PRV 02 no.
10. Main line filters 02 no.
11. Lifting worm gear 04 no
12. Side rolling gear 02 no
13. Portable pH/EC/TDS/Temperature meter with calibration check - Two no

Having 8 pin Din connector for probe, probe lead at least 1m long
LC display, pH range selection, mS/Sec range selection,
TDS (ppm) range selection and temp selection
pH resolution – 0.1, EC 0.01mS/cm, TDS- 1 ppm
EC TDS temperature auto compensation
Make Hanna- Model HI 9813-6 or equivalent
**A) High Tech Greenhouse for housing aeroponic systems**

1. Size of greenhouse - 17.94 x 12.6m  
2. No of greenhouses - 02 Nos  
3. Minimum center height of greenhouse - 4.8 m  
4. Minimum side/gutter height of greenhouse - 3.25 m  
5. Grid size - 6.25 x 2.56 m  
6. No of dome - 2 Nos per greenhouse  
7. Insect proof chamber behind cooling pad - 12.6 x 1.5 m  
8. Emergency exit, one in each greenhouse - 1.8 x 0.9 m  
9. Pad side exit, one in each greenhouse - 1.8 x 0.9 m

### GREENHOUSE

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Particulars</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1.     | Structure   | Dome shape.  
          |             | All structure members fabricated from G.i. Pipe of class B, thickness is 2mm.  
          |             | (Thickness tolerance +or-10%).  
          |             | The structural design should be sound enough to withstand prevailing wind  
          |             | speed in coastal Orissa.  
          |             | **Size of structure members**-  
          |             | Column 60mm, truss bottom – 50mm, wall runner purlin 32mm,  
          |             | Arch 48mm OD, W Members -33mm OD, Top Purlin -42mm OD, End Purlin -  
          |             | 42mm OD, Cross Member -42mm OD (provided 2Nos at each corner), Pad  
          |             | Chamber Hockey – 42mm OD, Tie Bars -33mmOD (provided 2 lines in each  
          |             | dome), Curtain rolling Pipe- 27mm OD. GI gutter 1.2 mm thick. |
| 2.     | Buffer chambers between greenhouse and main entry chamber | Size 2.4 x 1.8 m made from square GI Pipe of 40x40mm & 32mmx32mm.  
          |             | Providing 10 cm brick wall up to 90 cm height.  
          |             | All room covered with transparent multiwall PC Sheet 8 mm.  
          |             | One door of buffer chamber to be connected with the main entry chamber &  
          |             | another door towards APU-1 & 2.  
          |             | Doors made from aluminum Section using bakelite/PVC Sheet on lower half &  
          |             | glass on Upper half.  
          |             | **Air Curtains** 105 mm to be provided over the first door of each buffer chamber. |
| 3.     | Cooling fans | Cooling fans (90cm) with galvanized body, 1.0 HP motor 3 phase, belt drive with  
          |             | louvers, Munter or equivalent quality.  
          |             | **Total 04+04 fans** |
| 4.     | Exhaust fans | Exhaust fan of 45 cm to remove the hot air inside - Two fans |
### Civil work

<table>
<thead>
<tr>
<th>7.</th>
<th>Civil work</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main entry chamber size</strong></td>
<td>- 7.0 x 5.0 x 3.3 m</td>
</tr>
<tr>
<td><strong>Roof size</strong></td>
<td>- 7.8 x 5.8 m</td>
</tr>
</tbody>
</table>

Brick concrete, wash-cum-change room inside, **tiled floor**, four doors connecting multipurpose cold chamber and two aeroponics units. **SLIDES 2, 4 & 5**

**Green house**

1. Brick walls – 25 cm plastered brick wall 45 cm above the G.L. (Left, right of green house & buffer chamber)
2. 25 cm Plastered brick wall 90-105cm above G.L. (Fan side)
3. 25 cm Plastered brick wall 90-105cm above G.L. (Pad side)
4. 10 cm PCC floor inside the green house & buffer chamber
5. 7.5 cm PCC floor inside the insect proof pad chamber
6. 8 mm thick anti-skid tiles to be provided in grow box front area, pathways, buffer chamber and tanks.
7. Plinth protection around all 0.9 m round the green houses
8. Suitable drains around the whole facility
9. Nutrient solution tanks, brick work, – two no. in each green house, (details in design document **SLIDE- 29**)
10. Water reservoir - Tank of brick work for cooling pad 1500x1000x1000 (with tiling) – 01 no in each green house.
11. Area below grow boxes, PCC and 2 cm deeper as compared to pathways.

### Cladding

<table>
<thead>
<tr>
<th>8.</th>
<th>Cladding</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong> Front of both the green houses will be provided with poly-carbonate sheet (8mm). Similar poly-carbonate sheet to be provided over the roof of insect proof chamber behind cooling pad.</td>
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<tr>
<td><strong>2.</strong> 200 micron UV stabilized clear polysheet (Ginegar/ Greenpro/ ESSN) fixed on G.I. Pipe structure using GI Profile &amp; Coated Spring.</td>
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<tr>
<td><strong>3.</strong> Front side, left &amp; right side: 40/50 mesh (Garware/ Metior make) insect net, 1.5 m behind cooling pad, on side walls of greenhouse to cover full height, behind exhaust fans (20 cm clearance).</td>
<td></td>
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<tr>
<td><strong>4.</strong> Rollable curtain of 200 micron UV stabilized clear polysheet, in two sections over the side wall overlapping insect net.</td>
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</table>

### Shade Net

<table>
<thead>
<tr>
<th>9.</th>
<th>Shade Net</th>
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<tbody>
<tr>
<td><strong>Inside greenhouse:</strong> 35% shade net in each green house with sliding pulley &amp; rope mechanism.</td>
<td></td>
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</table>

### Visitors’ window

<table>
<thead>
<tr>
<th>10.</th>
<th>Visitors’ window</th>
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<tbody>
<tr>
<td>Fixed glass window. Size 100x60 cm in each GH</td>
<td></td>
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</tbody>
</table>
B) R.O. water supply system

<table>
<thead>
<tr>
<th>S. No</th>
<th>Particulars</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>R.O. System</td>
<td>Capacity 200 liter/hour with UV Tubes. (No. - 01)</td>
</tr>
<tr>
<td>2</td>
<td>RO Water tank with pump</td>
<td>RO water storage tank 1000-liter capacity – <strong>01 no.</strong></td>
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<tr>
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<td>Master solution tank (300 l) with 0.25 hp pump – <strong>02 no.</strong></td>
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<td></td>
<td></td>
<td>Pumps, 0.5 HP for RO water – <strong>01 no</strong></td>
</tr>
<tr>
<td>3</td>
<td>Water supply line</td>
<td>Separate supply lines for ordinary and RO water in the green house as per requirements.</td>
</tr>
</tbody>
</table>

*Note: Fabricator will take utmost care in fabrication of green houses so that, the structure are strong enough to withstand high wind velocity in the area.*

xxxxxxxxxxxxxxxx
### File no. 3

**CIP multipurpose and cold chamber requirements**

1) **Multipurpose cold chamber with LED lights**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
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<tbody>
<tr>
<td><strong>Size</strong></td>
<td>5 x 4 x 3m (L x W x H)</td>
</tr>
<tr>
<td><strong>Doors</strong></td>
<td>200x100 cm, two doors</td>
</tr>
<tr>
<td><strong>Temperature</strong></td>
<td>2-24°C</td>
</tr>
<tr>
<td><strong>Cooling</strong></td>
<td>Industrial type, <strong>two cooling machines</strong>, Carrier/Blue star/Blue stone or equivalent.</td>
</tr>
<tr>
<td><strong>PUF panel</strong></td>
<td>100 mm thickness (Laminated).</td>
</tr>
<tr>
<td><strong>Shade cover</strong></td>
<td>Top of chamber to be covered by pre-coated sheets installed in hut shape with 75 cm extended to left and right.</td>
</tr>
<tr>
<td><strong>RH</strong></td>
<td>80-90%, (Humidifier 5-7 lph capacity)</td>
</tr>
<tr>
<td><strong>Racks</strong></td>
<td>SS racks, eight shelves, fitted with three 120 cm, 18 W LED tubes per shelf. Total number of LED tubes per rack 24 with individual switch for each shelf.</td>
</tr>
</tbody>
</table>

**File no. 5.**

**Total no of racks to be supplied** - **09**

2) **Cold storage chamber**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td>5 x 4 x 3m (L x W x H)</td>
</tr>
<tr>
<td><strong>Doors</strong></td>
<td>200 x100 cm, two doors</td>
</tr>
<tr>
<td><strong>Temperature</strong></td>
<td>2- 4°C</td>
</tr>
<tr>
<td><strong>Cooling unit</strong></td>
<td>Industrial type, two cooling machines, Carrier/Blue star/Blue stone or equivalent.</td>
</tr>
<tr>
<td><strong>PUF panel</strong></td>
<td><strong>100 mm thickness</strong> (Laminated) with insulated non slippery flooring.</td>
</tr>
<tr>
<td><strong>Shade cover</strong></td>
<td>Top of chamber to be covered by pre-coated sheets installed in hut shape with 75 cm extended to left and right.</td>
</tr>
<tr>
<td><strong>RH</strong></td>
<td>80-90%, (Humidifier 3- 5 lph capacity)</td>
</tr>
<tr>
<td><strong>Racks</strong></td>
<td>SS 302 racks, eight shelves as indicated in file no 5.</td>
</tr>
</tbody>
</table>

**Total no of racks to be supplied** - **09**
Additional work

2.5 m

3.0 m 1.5 m 5.0 m 1.5 m

Canopy shed for gen set Washroom Storage Guard room

1. Gen set with plinth and canopy
2. Washroom with all the fittings
3. Storage and other section with proper light fittings etc.
4. Add necessary windows, doors, fans, exhaust, water supply tank etc.

Other important requirements:
1. Electricity back up arrangement (62.5 kVA Genset, preferable of Kirloskar)
2. Guard room with an AC & toilet facilities (detailed above in the same page).
3. CCTV coverage of all establishments (10 cameras) with a smart LED TV for monitoring.
4. Minimum spare accessories (Strofoam sheets, Nozzle assembly with filter, Main line filters, Portable pH/EC/TDS/Temperature meters with calibration check etc.)
5. The facilities should have protection from stray animals, entering rats & rodents etc.

III. Timetable

1. Invitation to applicant companies
2. Confirm your desire to participate
3. Inspection visits (if required)
4. Submission of Applicant Inquiries
5. Response to inquiries
6. Proposal submission
7. Opening and evaluation of proposals
8. Winner identification and communication to bidders
9. Contract signing
10. Contract commencement

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Invitation to applicant companies</td>
<td>June 27, 2024</td>
</tr>
<tr>
<td>2. Confirm your desire to participate</td>
<td>June 29, 2024</td>
</tr>
<tr>
<td>3. Inspection visits (if required)</td>
<td>N/A</td>
</tr>
<tr>
<td>4. Submission of Applicant Inquiries</td>
<td>July 01, 2024</td>
</tr>
<tr>
<td>5. Response to inquiries</td>
<td>July 03, 2024</td>
</tr>
<tr>
<td>6. Proposal submission</td>
<td>July 09, 2024</td>
</tr>
<tr>
<td>7. Opening and evaluation of proposals</td>
<td>July 12, 2024</td>
</tr>
<tr>
<td>8. Winner identification and communication to bidders</td>
<td>July 19, 2024</td>
</tr>
<tr>
<td>9. Contract signing</td>
<td>July 22, 2024</td>
</tr>
<tr>
<td>10. Contract commencement</td>
<td>July 23, 2024</td>
</tr>
</tbody>
</table>

(*) Please direct your inquiries via email to Mr Barun Raj (barun.raj@cgiar.org) copying Mr Arun Gugnani (a.gugnani@cgiar.org).
IV. Proposals

Proposals must address each of the elements listed in the Terms of Reference. Proposals may be rejected if they do not meet the requirements detailed in the call for proposals. All companies interested in participating and seeking clarification of this document must send their questions via email to CIP no later than July 01, 2024, attention to barun.raj@cgiar.org copying a.gugnani@cgiar.org.

They must submit their complete quotation, including technical specifications, by email to barun.raj@cgiar.org copying a.gugnani@cgiar.org no later than July 09, 2024.

The costs of preparing proposals are the sole responsibility of the applicant and will not be reimbursed by CIP.

V. Installation/delivery Location

International Potato Center (CIP), Odisha as indicated above.
VI. Process Evaluation

<table>
<thead>
<tr>
<th></th>
<th>Relevance %</th>
<th>Points (1-5)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of experience and client portfolio</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Similar works and implementations</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost</td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery time</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evaluation Matrix

(*) Only the offers that meet all the requirements included in this tender will be considered.

VII. CIP Rights

CIP reserves the right to accept or reject proposals in whole or in part and to cancel the process at any time if CIP has not signed the corresponding contract.

VIII. Letter of presentation

Sirs
International Potato Center (CIP)
NASC complex, DPS Marg
Pusa campus, New Delhi - 110012

Ref. TITLE

Dear Sir/Madam,

With this letter, our company [company name], represented by Mr. [name of the legal representative], requests to participate in the Selection Process for the provision of [xxxxxxxxxxx] at the main headquarters in La Molina, Lima", as communicated to us.

We certify that we have become aware of the conditions required for participants and we commit to abide by them in their entirety.

We are enclosing the documentation demonstrating that our company meets the requirements for participation in this process.

Yours faithfully,
## IX. Identification

<table>
<thead>
<tr>
<th>BIDDER IDENTIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of the company</td>
</tr>
<tr>
<td>Years in the market</td>
</tr>
<tr>
<td>Principal clients</td>
</tr>
<tr>
<td>RUC/TAX ID</td>
</tr>
<tr>
<td>Address</td>
</tr>
<tr>
<td>Contac person</td>
</tr>
<tr>
<td>Position</td>
</tr>
<tr>
<td>E-mail</td>
</tr>
<tr>
<td>Phone number/ cell phone number</td>
</tr>
<tr>
<td>Total Sales</td>
</tr>
<tr>
<td>2,021</td>
</tr>
<tr>
<td>2,022</td>
</tr>
<tr>
<td>2,023</td>
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<tr>
<td>Name and sign</td>
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<tr>
<td>of the legal</td>
</tr>
<tr>
<td>representative</td>
</tr>
</tbody>
</table>