

**TECHNICAL BID PROFORMA**

Item Name: “CONSTRUCTION OF DRY ROOM FOR ALKALI METAL ION-SULFUR AND METAL ION BATTERY FABRICATION”

**Bidder Eligibility Criteria:**

| 1.0 | Bidder Eligibility Criteria-I<br>(Public Procurement – Preference to Make in India)  | Class I /<br>Class II | Local<br>Content<br>value | Reference,<br>Page No. |
|-----|--|-----------------------|---------------------------|------------------------|
| I   | Only 'Class-I local suppliers' and 'Class-II local suppliers', as defined under DIPP, MoCI Order No. P-45021/2/2017-PP (BE II) dated 16 <sup>th</sup> September 2020 and other subsequent orders issued therein. |                       |                           |                        |

**2.0 Technical Compliance:**

**CONSTRUCTION OF DRY ROOM FOR ALKALI METAL ION-SULFUR and METAL ION BATTERY  
FABRICATION**

**PRELIMINARY TECHNICAL QUALIFICATION COMPLIANCE SHEET**

| S.no  | Particulars of item   | Vendor confirmation / compliance |                                | Complied/not complied | Refercnce pg.no |
|---|---|----------------------------------|--------------------------------|-----------------------|-----------------|
| 1   | Minimum 4 years of experience of < 10% RH Dry Rooms in India  | Yes<br><input type="checkbox"/>  | No<br><input type="checkbox"/> |                       |                 |
| 2   | Test Lab to demonstrate exact job design replication/ performance in own facility or outside for witness testing  | Yes<br><input type="checkbox"/>  | No<br><input type="checkbox"/> |                       |                 |
| 3   | At least 2 satisfactory performance Dry Room certificates for < 10% RH Rooms supplied in India. To enclose certificates in support thereof.                 | Yes<br><input type="checkbox"/>  | No<br><input type="checkbox"/> |                       |                 |
| 4   | Financial Soundness (of the Bidder) certificate of net worth > 1 Cr. To enclose last audited financial statement in support thereof.                        | Yes<br><input type="checkbox"/>  | No<br><input type="checkbox"/> |                       |                 |
| 5   | The Dry Room supplier factory must be ISO 9001:2000 and ISO 14001 certified. Certificate to be enclosed.  | Yes<br><input type="checkbox"/>  | No<br><input type="checkbox"/> |                       |                 |
| 6   | Min 6 or more Installation of < 10% RH Dry Rooms at IIT's, CECRI, VSSC, DRDO or other authorized Government Organization or public and large organisations. | Yes<br><input type="checkbox"/>  | No<br><input type="checkbox"/> |                       |                 |
| <b>&lt;10% RH Dry-room</b>                  |   |                                  |                                |                       |                 |
| <b>Dry Rooms Performance Specifications</b> |   |                                  |                                |                       |                 |

|  |   |  |                            |
|--|---|--|----------------------------|
|  | · Temperature: 22 °C ± 3 °C°  |  |                            |
|  | · Relative Humidity: Less than 10% RH   |  |                            |
|  | Clean room class: Class 10000 .   |  |                            |
|  | Air Change Per Hour (ACPH) of at least 20.  |  |                            |
| <b>Design Loads</b>  |   |  |                            |
|  | · People: 3 to 5 Nos. Maximum Personnel   |  |                            |
|  | Personnel Entry/Exits:5 times per hour  |  |                            |
|  | · Exhaust air: 30 to 50 CFM by the exhaust of Solvent Recovery System based on the number of personal.  |  |                            |
|  | · Fresh Air Supply: For Personnel and Dry Room Positive Pressure Equipment  |  |                            |
|  | · Connected Load: 10 KW plus Lights and Personnel ; Heat Dissipation to be assumed at 30% of Connected Load   |  |                            |
| <b>Dry Room Size &amp; Construction</b>  |   |  |                            |
|  | Dry room size   | 20 x 5 x 3 m   |                            |
|  | Air shower  | 1.55 m x 1 m ( 0.97m) x 2.3 m<br>H in powder coated finish |                            |
|  | Air Lock  | 3 x 3 ft with 1 nos. Doors.<br>(900 x 2100mm )             |                            |
|  | Change room   | 6 x 4 ft with 1 nos. Doors.<br>(900 x 2100mm )             |                            |
| <b>Specification and Requirements</b>  |   |  |                            |
| <b>S.N<br/>O</b>   | <b>TECHNICAL SPECIFICATION</b>  | <b>Complied/not<br/>complied</b>                           | <b>Refercnce<br/>pg.no</b> |
| <b>1</b>   | Moisture level in Lithium-ion battery processing areas should have less than <b>&lt;10% RH</b>  |  |                            |
| <b>2</b>   | Room temperature should be maintained at recommended levels, around 23-25C along with RH<10 %   |  |                            |
| <b>3</b>   | The air change rate in the production room should be 20 air changes per hour with maintenance of minimum fresh air introduction for positive room pressure and ventilation for engineers. Class 10K |  |                            |
| <b>4</b>   | The max dimensions can be (20 x 5 x 3(true ceiling))M excluding the air lock & change room for effective dry room area. Also include emergency Door and standard regulatory requirements if any     |  |                            |
| <b>5</b>   | 3 to 5 people to work inside at a time  |  |                            |
| <b>6</b>   | Double layer puff panels for insulation against air leakage.  |  |                            |
| <b>7</b>   | Max 5 door openings per hour.   |  |                            |
| <b>8</b>   | Dry room in ground floor and the dehumidifier can be in ground floor  |  |                            |
| <b>9</b>   | Installation location -Chennai  |  |                            |
| <b>10</b>  | Max power load inside the dry room-10KW (Average load will be less than 8KW)  |  |                            |
| <b>11</b>  | Materials transfer window (Three) of size at least 600mm X 600mm  |  |                            |
| <b>12</b>  | Anti-Static Epoxy Floor inside the dry room   |  |                            |
| <b>13</b>  | Air leakage   |  |                            |
| <b>14</b>  | Modular and detachable in case of facility need to be shifted to other location with minimum effort and cost  |  |                            |
| <b>SCOPE OF WORK</b>   |   |  |                            |
| Scope of work includes Detailed Design, Supply, Installation, Testing & Commissioning of 10% RH Dry Room system along with utilities to fulfill all the specification and requirement stated earlier and including the following items : |   |  |                            |

|                                   |   |  |  |
|-----------------------------------|---|--|--|
| <b>a</b>                          | Dehumidifiers   |  |  |
| <b>b</b>                          | DX Refrigeration Units  |  |  |
| <b>c</b>                          | Dry Room Enclosure with necessary Air shower, Air lock, View Windows and  |  |  |
| <b>d</b>                          | Air distribution system   |  |  |
| <b>e</b>                          | Refrigerant piping.   |  |  |
| <b>f</b>                          | Lighting inside dry rooms to maintain 400 Lux at work-area.   |  |  |
| <b>TECHNICAL SPECIFICATIONS-I</b> |   |  |  |
| <b>S.NO</b>                       | <b>Technical specification</b>  |  |  |
| <b>1</b>                          | <b>Dry Room Enclosure:</b>  |  |  |
|                                   | ● Panels shall be designed with interlocking mechanism that shall essentially be Tongue & Groove joint type, & necessary vapor barrier to be provided.  |  |  |
|                                   | ● Panels shall be modular pre-fab sandwiched PUF panel with inside & outside 0.6 mm thick pre-painted ( PPGI) sheet of shade RAL 9002.  |  |  |
|                                   | ● Polyurethane Foam shall be with density of minimum 40 kg/m <sup>3</sup> .   |  |  |
|                                   | ● The enclosure shall be designed for required structural strength.   |  |  |
|                                   | ● Ceiling shall be supported by structure,necessary structure by vendor as part of scope.   |  |  |
| <b>2</b>                          | <b>Windows:</b>   |  |  |
|                                   | ● Three (3) windows of size at least 600mm X 600mm at location in each of the Dry room.   |  |  |
|                                   | ● Each access (Air Shower & Emergency) door will have an observation window of suitable size.   |  |  |
| <b>3</b>                          | <b>Dehumidifiers</b>  |  |  |
|                                   | The dehumidifier shall be of the industrial type and manufactured to the highest consistency and reliability and ecology standards and the dehumidifier shall, therefore, be manufactured in an ISO 9001 and ISO 14001 certified manufacturing facility employing CNC sheet metal manufacturing.  |  |  |
|                                   | 1. The dehumidifiers shall be of the rotary type, employing the principle of chemical adsorption to remove moisture from the air on a continuous basis by use of desiccant media in rotor form.   |  |  |
|                                   | 2. The unit shall be minimum 50mm thick double skin recirculation type industrial dehumidifier shall be complete with reactivation fan motor unit, process fan bed drive motor, electric Reactivation , dampers, honeycomb Desiccant wheel built in controls, sensors and digital display unit all housed in a vapor tight sheet metal modular construction mounted on common frame work. |  |  |
|                                   | 3. The unit shall be provided with insulated housing and heat exchanger to cool the process out let air. The control panel shall be with RH / Dew point transmitter and control the process outlet conditions as per set condition. The design parameters are presented in Design Data.   |  |  |

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|  | <p>4. The dehumidifier framework/casing shall be made from tubular stainless steel hollow section, duly welded, and is of industrial design and robust body of industrial quality, for maximum durability, life, and strength. All sections shall be constructed using double-skinned panels with Industrial framework. The external skin shall be pre coated (PPGI) sheet of thickness 1mm and internal skin shall be of 1mm thick GI. The panels shall be minimum 50 mm thick with 48 kg/m<sup>3</sup> density Rockwool / Fibre glass insulation. All cold sections in the dehumidifier shall be with thermal barrier to prevent condensation.</p>                 |  |  |
|  | <p>5. The Dehumidifier shall have a Single Rotor Design. The <b>dehumidifier</b> shall consist of a high efficiency desiccant rotor/bed mounted on a horizontal fixed shaft arrangement with bypass arrangement modulating the air quantity through face &amp; bypass damper.</p> <p>6. All sections shall incorporate access doors/panels</p>   |  |  |
|  | <p>7. In order to have vapour tight construction, most of the access doors for coils/ fans/ rotor shall be bolted. The access doors requiring frequent opening e.g. Filter section shall be with quick release latches for ease of operation.</p>  |  |  |
|  | <p>8. View glass shall be provided openable on all access doors, whenever moving parts are located example Fans &amp; Rotor.</p>   |  |  |
|  | <p>9. The vendor shall ensure that the total air leakage not to exceed 1 to 1.5%. The dehumidifier shall be of industrial design for maximum durability life and strength with advanced component welding and joining techniques to ensure a vapour tight (Zero vapour leakage) construction to achieve a leakage standard complying with SMACNA class 6, which allows a maximum leakage of 16cfm/100sq ft. of the casing surface at a pressure of 6" /150 mm water column gauge.</p>  |  |  |
|  | <p>10. Special care shall be taken to ensure that doors, handles, hinges, etc. shall be robust enough to with stand heavy industrial usage.</p>  |  |  |
|  | <p>11. Dehumidifier shall be complete with study MS painted basic frame/skid mounted so as to allow for lift during transportation and installation.</p>   |  |  |
|  | <p>12. For the environmental protection, the Dehumidifier shall be placed under suitable shed/ cover / room to be provided by user as per bidder requirements .</p>  |  |  |
|  | <p>13. The bidders shall describe the tests that will be conducted at their/ manufacturers' works. They shall furnish a test certificate / certificates to the effect that such tests have been duly performed.</p>  |  |  |
|  | <p>15 The factory tests to be conducted on the Dehumidifier shall include – the following:</p> <p>VII. All Functional Testing</p> <p>VIII. Performance testing of desiccant rotor for design configuration at designed velocity at proportionally reduced airflow under simulated operating controlled condition in test lab shall be shown in test facility of manufacturer.</p> <p>IX. Leakage test per SMACNA class 6</p> <p>X. Functional test of fans and Desiccant rotor drive mechanism.</p> <p>XI. Interlocking of control system</p> <p>XII. Safety checks.</p> <p>16. However, the performance testing to be carried out at site during commissioning.</p> |  |  |

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|          | <p>19 The Dehumidifier shall be dispatched only after inspection and both witness tests, as detailed above, have been accepted.</p> <p>20 User shall be intimated in advance of the date of the tests, which they will witness, at their option.</p> <p>21 The dehumidifier manufacturer shall have sufficient factory trained service personnel in major metro towns to provide a quick and efficient service back up, whenever required.</p>  |  |  |
| <b>4</b> | <b>Desiccant Wheel:</b>   |  |  |
|          | <p>m) The Desiccant Wheel shall transfer mainly the latent / moisture with minimal heat carryover.</p> <p>n) The rotor shall be of inorganic fiber (glass fibre) or equivalent corrosion-proof material. The desiccant media shall have in situ synthesized metal silicate desiccant on an inert inorganic fibre substrate. The net organics in the honey comb media shall not exceed 2%. The substrate of the rotor shall not made from asbestos or any other synthetic material and shall not have any toxic desiccant like Lithium chloride etc. The surface of media shall have special edge hardening so as to ensure a smooth surface and long life of both the media not seal. The desiccant media shall not use any organic burn off process as this will weaken. The media structure. The desiccant media shall have a perimeter flange which should encircle the entire perimeter so as to allow greater durability to maintain within/onto structural integrity and thermal stability due to process and reactivation airflow.</p> <p>o) The <b>desiccant honeycomb rotor media</b> shall be <u>adsorbent</u>, non toxic, non flammable, fully water washable .</p> <p>p) Any acidic dessicant media using acids for synthesizing the adsorbent shall not be accepted.</p> <p>q) The honeycomb rotor shall have a continuous SS perimeter flange both for providing a smooth contact for the teflon covered silicon seal, as well as strong structural integrity.</p> <p>r) The media shall be water washable.</p> <p>s) Dehumidifier rotor honeycomb media shall be PH neutral. It shall be resistant to most chemicals.</p> <p>t) The Dehumidifier rotor shall have metalwork made from SS 304 both on perimeter flange and rim.</p> <p>u) The media shall be held rigidly by a structural spoke system. The rotor below 1800mm diameter shall be for monolithic design</p> <p>v) The rotor drive must be complete with chain driven motor. The full sprocket shall be provide on the full perimeter of Rotor and shall be driven through a slip free chain mechanism, by a robust bed drive motor.</p> <p>w) The desiccant media shall not fracture due to repeated temperature and moisture cycling and on contacting water from the Pre-cool section, and all the materials of construction shall be non-toxic and non-corrosive.</p> |  |  |

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|          | <p>x) Seals shall be made of high temperature silicon with PTFE coated face for low friction. The seals shall be bulb type and suitable for service temperature upto 300°C seals should not be fastened, screwed or riveted, but should be of the slip on type so that seals are simple and easy to replace with no tools required. The seals shall be designed for a minimum 6" inter-compartmental pressure difference, to prevent any leakage across the seal section.</p>  |  |  |
| <b>5</b> | <b>Dehumidifier Reactivation Energy Performance Requirements</b>   |  |  |
|          | <p>c) Preference will be given for complete equipment configuration with lowest energy consumption. The Battery limits for Power consumption for Reactivation heater shall not be more than 60 KW for &lt; 10% RH Dry Room, respectively.</p> <p>d) Total KW for regeneration shall not exceed the battery limits as per above point . For every extra KW there shall be a loading on the capitalised cost @ Rs. 8 Lacs/ KW.</p>   |  |  |
| <b>6</b> | <p><b>Air Cooled Condensing Unit</b><br/>General specifications of the condensing unit and air conditioning system for controlling the temperature inside the Dry Room and for Pre-cooling the Fresh air into the Dehumidification System shall be as follows -</p> <p>j) Compressor - scroll type inverter / digital modulating for a continuous, stepless and smooth turn down capacity control</p> <p>k) Condensor fan with copper tubes and anti-corrosive coated aluminium fins</p> <p>l) Fan cycling head pressure controller</p> <p>m) Oil separator</p> <p>n) Suction accumulator</p> <p>o) Suction pressure gauge, head pressure gauge</p> <p>p) Phase loss monitor</p> <p>q) Low &amp; High pressure switch</p> <p>r) System shall be complete with solenoid valves , regulating valves, load control mechanism, safety controls and operating controls.</p> |  |  |
| <b>7</b> | <b>Duct work for Supply &amp; Return Air</b>   |  |  |
|          | <p>a) MS sheet fully/continuously welded duct of thickness 1.6 mm, with 50mm thick Rock wool insulation and Aluminium cladding of thickness 0.6mm, required for the air distribution system. This shall include construction, assembly &amp; installation of the ducting system and shall conform to the SMACNA-1995 standards suitable for low RH application with necessary vertical &amp; horizontal sealing arrangement (welding).</p>   |  |  |
|          | <p>b) All duct work including straight sections, tapers, elbows, branches, show pieces, collars, terminal boxes and other transformation pieces must be factory-fabricated</p>   |  |  |
|          | <p>c) All vertical &amp; horizontal joints shall be welded to ensure 100% zero leakage.</p>  |  |  |
|          | <p>d) Duct work shall be designed based on dehumidifier location from dry</p>  |  |  |

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|           | rooms.  |  |  |
|           | e)The successful bidder will carryout CFD analysis of the Airflow patterns and Distribution in the Dry Room so as to verify a proper and uniform air distribution management from the supply air and return air grills/ diffusers. User may request for such a verification of the projected air distribution pattern, prior to the manufacture of the ducting. |  |  |
| <b>8</b>  | <b>HVAC Air Duct Leakage Testing</b>  |  |  |
|           | <b>Scope</b>  |  |  |
|           | The air ducts are tested as per SMACNA Class 6 at 4 inch Pressure. It involves inserting temporary plugs in openings in a section of duct and connecting a blower and a pressure measurement system   |  |  |
|           | <b>Procedure</b>  |  |  |
|           | a) Ducts are to be tested at 100% maximum of static pressure before any duct is insulated externally.   |  |  |
|           | b) Calculate the allowable leakage for each section using a leakage factor of 2% of Design Air Flow for that section.   |  |  |
|           | c) Select a limited section of duct for which the estimated leakage will not exceed the capacity of the test apparatus.   |  |  |
|           | d) Connect the blower and flow meter to the duct section and provide temporary seals at all openings in the ductwork.   |  |  |
|           | e) Start the blower motor with the inlet damper closed. Increase pressure until the required level is reached.  |  |  |
|           | f) Let the system run for 5-10 min to stabilize   |  |  |
|           | g) Note the reading of differential pressure from the orifice manometer .   |  |  |
|           | h) Calculate the actual leakage versus allowable leakage  |  |  |
|           | i) Actual leakage should be less than or equal to calculated leakage  |  |  |
|           | j) Read the flow meter and compare the leakage in cfm. Reading should be 2% or less of design flow for the duct section being tested.   |  |  |
|           | k) If reading is more than <2% of design flow, depressurize duct, repair all leaks, and retest until <2% or less of design flow is obtained.  |  |  |
|           | l) Complete test reports and obtain owner's witness signature.  |  |  |
|           | m) Remove all temporary blanks and seals.   |  |  |
| <b>9</b>  | <b>Fire Dampers</b>   |  |  |
|           | a) Combined Motorized Smoke & Fire dampers with actuators carrying UL 555 Certificate for 90 minutes' fire rating and smoke leakage class I with temperature category 176 deg C.  |  |  |
|           | b) The dampers shall be multi leaf type.  |  |  |
|           | c) The damper shall consist of outer frame, damper blades, linkage, Electrical actuator, reversible, automatic spring return, fail safe type & extended sleeves. The blades & outer frame shall be formed out of 1.6 mm thick GSS.  |  |  |
|           | d) All Fire dampers shall be complete with extended factory fabricated & fitted duct sleeves. The joints at the sleeve end shall be slip-on type. The minimum thickness of GSS shall be 18 G.   |  |  |
| <b>10</b> | <b>Grills, Diffusers &amp; Dampers:</b>   |  |  |
|           | a) All supply & return air diffusers shall be of Powder coated extruded aluminum sections and removable core type. Volume control dampers shall be provided for all diffusers.  |  |  |

|           |   |  |  |
|-----------|---|--|--|
|           | b) Supply air grilles shall be of powder coated extruded aluminium construction. They shall be complete with Volume control dampers of aluminium mounted directly on grilles  |  |  |
|           | c) All dampers shall be louvered dampers (of GI) of robust construction and tightly fitted in epoxy painted MS angle iron frame. They shall be provided with suitable links, levers and quadrants as required for their proper operation, control or setting in any desired position. Dampers and their operating devices shall be made robust, easily operable and accessible through suitable access doors in the ducts / false ceiling. Where required, dampers shall have an indicating device, clearly showing the damper position at all times. |  |  |
|           | d) Supply / Return air grilles / diffusers identification labeling to be done by the Bidder/ Vendor as per the Owner.   |  |  |
| <b>11</b> | <b>Air Shower</b>   |  |  |
| a)        | Air shower shall comprise of CRCA powder coated enclosure with fan motor unit, filter, plenum for supply & return air, nozzles, door with leak tight gasket, Antiskid floor panel, service panel with electronic control system, HEPA filter, light fitting, control panel, etc.  |  |  |
| b)        | The panel shall be of sandwich type with exterior powder finish as per the interior design.   |  |  |
| c)        | Door shall be of leak tight epoxy powder coated with window, gasket, automatic door closer, electromagnetic lock etc.,  |  |  |
| d)        | The fan shall be dynamically and statically balanced with 3 phase motor, dampers and anti- vibration mounting.  |  |  |
| e)        | HEPA Filter shall be of mini pleat construction   |  |  |
| f)        | Back-up pre filters to be provided for HEPA Filter .  |  |  |
| g)        | Air Shower shall be adjustable cycle from 15 – 120 seconds with necessary control logic unit.   |  |  |
| h)        | Panic Switch for emergency cut-off with hooter to be provided.  |  |  |
| <b>12</b> | <b>Control Panel:</b>   |  |  |
| a)        | PLC based control panel shall be provided with touch screen facility. The touch screen shall be located outside the dry room for ease of operation & start up.  |  |  |
| b)        | The electrical switch gear shall be from Siemens/ Schneider/ equivalent.  |  |  |
| c)        | PLC shall be Allen Bradley / equivalent make.   |  |  |
| d)        | An interior digital display of Dew point temperature shall be made available.   |  |  |
| e)        | Audible and visual alarms shall be provided at the dry room.  |  |  |
| f)        | SCADA or similar software for continuous data logging of system parameters and on line display of operating parameters. (P in, P out, R in, R out temperatures, RH / Dew point for P in and P out, relative pressure (process & react).   |  |  |
| g)        | RS 485 communication ports  |  |  |
| h)        | Ethernet port   |  |  |



|   |  |  |  |
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| i)  | Mod bus communication protocol   |  |  |
| j)  | 7 inch or appropriate size HMI color touch panel for easy operation / control.   |  |  |
| k)  | Battery backup of settings.  |  |  |
| l)  | Security features provided to prevent unauthorized manipulation of system Parameters   |  |  |
| <b>Installation &amp; Commissioning/ Training</b> |  |  |  |
| a)  | Vendor has to do installation of Dry-rooms at <b>Site</b> . Vendor shall depute requisite manpower at premises to complete the installation / erection of Dry-rooms, ducting, dehumidifiers, condensers etc.   |  |  |
| b)  | After completion of installation & commissioning, the vendor shall demonstrate the performance of system as per the specifications.  |  |  |
| c)  | Vendor shall arrange to train user in operation of the Dry-room plant / equipment for necessary number of days until the user is confident and satisfied with the performance of the system (minimum 4 days) at site at vendor's cost. Later, once actual battery work is commissioned, if any issue arises, vendor should come and address it at no cost. |  |  |
| <b>Warranty &amp; AMC</b>                         |  |  |  |
| a)  | The vendor shall provide a warranty of the dry-rooms for a period of 24 months from date of successful commissioning and 3 <sup>rd</sup> year maintenance for free   |  |  |
| b)  | Vendor shall quote separately with this tender for AMC (Annual maintenance contract), (labour only) for a period of at least 2 years after the expiry of warranty. s   |  |  |

**TECHNICAL SPECIFICATIONS COMPLIANCE**

|   |   |  |  |  |  |
|---|---|--|--|--|--|
| 1 | The Dry rooms (<10%RH) shall include all items as mentioned and other items as may be required to complete the same to meet the design requirement . Bidder / Vendor to confirm on the same with all supporting catalogs / drawings . |  |  |  |  |
|---|---|--|--|--|--|

| S. NO | Item Description  | Qty    | Remarks  | Fully Complied with (Yes/No) | Refercnce pg.no |
|-------|---|--------|--|------------------------------|-----------------|
| 1     | Dry rooms of dimensions as per <b>data below. Drawing should be submitted along with technical bid, which need to be approved by the purchase committee before opening the financial bid.</b> | 01 No  | one number for <10% RH Dry Room along with Air Locks   |                              |                 |
| 2     | Dehumidifiers & Air Cooled Condensers   | 01 set | One set for <1% RH Dry Room & one set for <10% RH Dry Room   |                              |                 |
| 3     | Ducting along with Grills, Diffusers, Dampers, Fire Damper, duct support etc  | 1 set  | One set each for <10% RH dry room. Ducting to be routed from Dehumidifiers to Dry-rooms as per attached facility layout . Fire |                              |                 |

|  |   |         |  |  |  |
|--|---|---------|--|--|--|
|  |   |         | Dampers in both SA & RA duly interlocked with Dehumidifier Main Panel to switch off the unit with indication . |  |  |
| 4  | Control Panel / Display for inside conditions | 01 set  | One panel outside dry room and other located near Dehumidifier for <10% RH dry room.                           |  |  |
| 5  | LED Lighting inside Dry-rooms.                | 01 lot  | One lot for each Dry- room to ensure at least 400 Lux lighting throughout the room                             |  |  |
| 6  | Air Shower                                    | 01 No.  | For providing an effective air wash to the personnel entering the Dry Room                                     |  |  |
| 7  | Double Glass insulated windows                | 03 Nos. | 3 windows in each dry-room   |  |  |
| 8  | Smoke detectors & Smoke Panel                 | 01 sets | One set for each Dry-room . .  |  |  |
| 9  | Emergency exit door                           | 01 No   | One emergency exit door for each Dry-room as per layout enclosed   |  |  |
| 10   | Documentation for hardware and software:      | 01 sets | a. 'As Built' Engineering Drawings   |  |  |
|  |   |         | b. Test Certificates for all items   |  |  |
|  | a. Operating manual                           |         | c. Operation Validation  |  |  |
|  | b. Service manual                             |         |  |  |  |
|  | c. Engineering drawings                       |         |  |  |  |
|  | d. Engineering designs                        |         |  |  |  |
|  | e. BOM  |         |  |  |  |
| <b>Vendor scope of Civil work (cost may be quoted separately for this work):</b> |   |         |  |  |  |

|                              |   |  |  |  |
|------------------------------|---|--|--|--|
| 1                            | Vendor Should quote solution for concrete flooring at site proposed by IITM for dehumidifier and Dry Room Area. Properly prepared floor with vapour barrier including epoxy coating of sufficient thickness to ensure vapour tight envelope for the dry room  |  |  |  |
| 2                            | Civil works like vapor proofing or painting of inside of building   |  |  |  |
| 3                            | Shed for dehumidifier & condenser   |  |  |  |
| 4                            | Necessary earthing and anti-static flooring   |  |  |  |
| 5                            | Dehumidifier size based on the vendor size.<br>Approximate Size 9M x 4M   |  |  |  |
| 6                            | Dry Room Area 1250Sqft (24M x 5M)   |  |  |  |
| 7                            | Main incoming power panel complete with Isolator & Circuit interrupter near the Dehumidifier main Panel, mainly for the Dry Room and related work.  |  |  |  |
| <b>User Scope of work:</b>   |   |  |  |  |
| 1                            | Site for installing the dry room, dehumidifier and condenser  |  |  |  |
| 2                            | Necessary permissions to carry out the work including the gate passes to vendor's personal  |  |  |  |
| <b>Terms and conditions:</b> |   |  |  |  |
| 1                            | Supplier should clearly mention about their service set up in India (preferably in South part of India) for prompt service support along with contact details of service engineers specially trained on the offered system. Service should be provided within 48 hrs from the report of technical problem so that machine down time is minimized. |  |  |  |
| 2                            | In case the Equipment / System remains non-operational for more than 5 days then warranty period will be extended for the equivalent period for which Equipment / System remained non-operational. Warranty extension in such case shall be done without prejudice to any other Term & condition of the contract.                                 |  |  |  |
| 3                            | Spares:<br>Supplier should confirm the availability of spares for next 10 years from the date of installation. All essential spares for day-to-day operation needs should be provided as standard supply.   |  |  |  |

|   |  |  |  |  |
|---|--|--|--|--|
| 4 | Pre-Installation Requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.   |  |  |  |
| 5 | Delivery Condition: The instrument should be delivered within 10-16 weeks.   |  |  |  |
| 6 | Vendor should provide the customer details along with the PO/installation report copy (from the last 3 years). Customer feedback will be taken into consideration before selecting L1. |  |  |  |

(Note: It is mandatory for the bidders to provide the compliance statement in tabular column format along with catalogue page number (comply/not comply) for the above points with document proof as required. Failing which bidders will be technically disqualified)

**SIGNATURE OF BIDDER ALONG WITH  
SEAL OF THE COMPANY WITH DATE**